PCB Keyswitches

4

Product Survey

Versions	Recommended Key grid	Illumination		Keyswitch height	Contacts
		Keyswitch	Signal indicator		
RACON 8	≥ 12 mm	Non-illuminated		4.9 mm (variable plunger)	Gold
RACON 12	≥ 15.24 mm	Non-illuminated		4.95 mm (variable plunger)	Gold
RACON 12 V		Non-illuminated		4.95 mm (variabler plunger)	Gold
RACON 12 i	≥ 15.24 mm	Fully illuminated		9.7 mm	Gold
RF 15	≥ 19.05 mm	Non-illumi-nated / Fully/spot illuminated	Fully illuminated	9.7 mm or 12.5 mm (with keycap)	Gold or Silver
RF 15 N (low profile)	≥ 19.05 mm	Non-illumi-nated / Illumination by separate/ integrated LED (depending on overall height)		6.2 mm 9.7 mm 12.5 mm 22.5 mm (var. plunger)	Gold or Silver
RF 15 R (round)	≥ 15.24 mm	Non-illumi-nated / Spot illuminated		9.7 mm or 12.5 mm	Gold or Silver
RF 15 H (high profile)	≥ 20 mm	Non-illumi-nated / Fully illuminated		12.5 mm	Gold or Silver
RF 19	≥ 23 mm	Non-illumi-nated / Fully/spot illuminated	Fully illuminated	9.7 mm	Gold or Silver
RF 19, 1 NO + 1 NC	≥ 23 mm	Non-illuminated		9.7 mm	Gold or Silver

4

PCB Keyswitches

Versions	Recommended Key grid	Illumination		Overall height	Contacts
		Keyswitch	Signal indicator		
RF 19 H (high profile)	≥ 24 mm	Fully illuminated		12.5 mm	Gold or Silver
Main switch KN19	≥ 19.05 x 38.1 mm	Non-illumi-nated Spot illuminated with 1 LED		9.7 mm	Silver
RK 90 System	≥ 12.50 mm	Depending on the type of keyswitch used: – RACON (without plunger) – RF 15/RF 15 N – RF 19 – KN 19			
RG 85 III System	≥ 35/55 mm	Edge-illuminated and symbol illumination	Fully illuminated	14 mm	Silver
Full-Travel Keyswitch RS 76	≥ 19.05 mm	Non-illumi-nated Fully/spot illuminated		15.5/15.9 mm (with key caps)	RS 76 M: Gold RS 76 C: contactless
Keyswitches for Conductor Board	≥ 19.05 mm	Non-illuminated		19.5 mm (without key)	Gold

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Examples for Applications   Standards

RF 15

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 volltage U_B < 50 V
F. ex. 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 RACON 8/12, KN 19 and
Short-Travel Keyswitches RF 15/19**

The Short-Travel Main Switch KN 19 and data entry systems wich are built with Rafi short-travel switches according to our design proposals meet the requirements of the UL approbals for the American market.

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

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SOLUTIONS WITH PASSION

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

RAFI
SOLUTIONS WITH PASSION

RACON 8

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 print versions
  - Reflow soldering (SMD)
  - Manual soldering
• SMD version suitable for processing with an automatic SMD assembly machine. We suggest to use teflon coated pipettes for mounting.

Technical data

Dimensions

Length of housing	8.4 mm
Width of housing	8.4 mm
Height of housing	$4.90^{+-0.1}$ mm

Mechanical design

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

Mechanical characteristics

Operating force	$3.3^{+-0.6}$ N
Switching travel	$0.34^{+-0.1}$ mm

Electrical characteristics

Rated voltage min.	0.02 V
Rated voltage max.	42 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W
Contact resistance when new max.	100 mΩ

Insulation resistance	10^9 Ω
Bouncing time max.	5 ms

Other specifications

Ambient temp. operating min.	-40 °C
Ambient temp. operating max.	+90 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life at R_T = 23° C and test force = 1,5 x rated force	1000000
Solderability / solder heat resistance PCB version	IEC 600 68-2-20
Solderability / solder heat resistance SMD version	EN 61760-1 and DIN IEC 600-68-2-58
Flammability of materials	UL 94 HB
Packing	see order block
Produkt code	see order block

RAFI
SOLUTIONS WITH PASSION

RACON 8, Typical system assembly with plunger under overlay

Solder terminal for PCB, outward

Solder terminal for PCB, inward

SMD gullwing (Z) terminal

Variable	Declaration	Solder terminal outward	Solder terminal inward	SMD-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

Solder terminal for PCB, outward

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

view on component side

Solder terminal for PCB, inward

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

view on component side

SMD gullwing (Z) terminal

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

view on component side
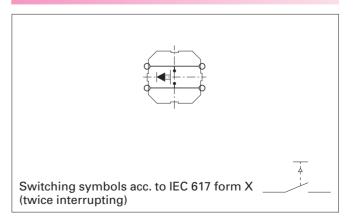
RACON 8, SDM-terminal, tape and reel drawing

Circuit diagram RACON 8

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

4

RACON

RACON short-travel keyswitches

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SOLUTIONS WITH PASSION
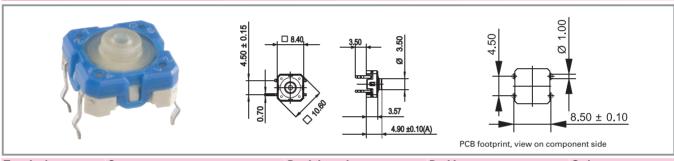
Typical accessories RACON 8

Description	Photo	Order no.	Additional accessories see page
Spacer, round, length 6.25 mm, red		**5.30.759.034/0000**	4 -70
Plunger for membrane data entry system		**5.46.167.311/0209**	4 -21
Keycaps, plastic, 9 x 9 mm, opaque, with pressure pad		**5.55.103.265/1013**	4 -80

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

RACON 8, solder terminals for PCB, outward
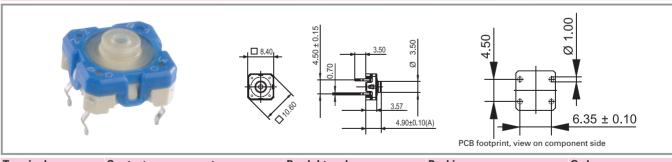
PCB footprint, view on component side

Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, outward	1 NO	A1	tubes à 60 piece	**1.14.100.501/0000**

Technical data see page 4 - 6

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

RACON 8, solder terminals for PCB, inward

PCB footprint, view on component side

Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, inward	1 NO	B1	tubes à 60 piece	**1.14.100.502/0000**
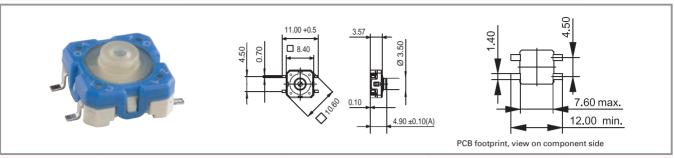
Technical data see page 4 - 6

For keycaps, refer to RK 90; for plungers, refer to accessories.

4

RACON

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

RACON 8, SMD gullwing (Z) terminals

PCB footprint, view on component side

Terminals	Contact arrangement	Produkt code	Packing	Order no.
SMD Gullwing (Z) terminals	1 NO	C1	tape and reel à 1000 piece	**1.14.100.503/0000**

Technical data see page 4 - 6

For keycaps, refer to RK 90; for plungers, refer to accessories.

4

RACON

Stock items are marked
by bold printed order numbers.

RAFI
SOLUTIONS WITH PASSION

RACON 12

General data

RACON 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 print versions
  - Reflow soldering (SMD)
  - Manual soldering
• SMD version suitable for processing with an automatic SMD assembly machine. We suggest to use teflon coated pipettes for mounting.

Technical data

Dimensions

Length of housing	12 mm
Width of housing	12 mm
Overall height	$4.95^{+-0.1}$ mm

Mechanical design

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

Mechanical characteristics

Operating force	$3.6^{+-0.7}$ N
Switching travel	$0.61^{+-0.1}$ mm

Electrical characteristics

Rated voltage min.	0.02 V
Rated voltage max.	42 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W
Contact resistance when new max.	100 mΩ

Insulation resistance	10^9 Ω
Bouncing time max.	5 ms

Other specifications

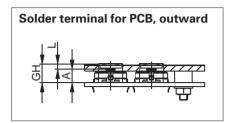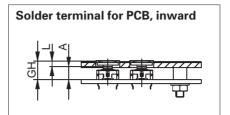|	
Ambient temp. operating min.	-40 °C
Ambient temp. operating max.	+90 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life at R_T = 23° C and test force = 1,5 x rated force	1000000
Solderability / solder heat resistance PCB version	IEC 600 68-2-20
Solderability / solder heat resistance SMD version	EN 61760-1 and DIN IEC 600-68-2-58
Flammability of materials	UL 94 HB
Packing	see order block
Produkt code	see order block

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RACON

RACON 12, Typical system assembly with plunger under overlay

Solder terminal for PCB, outward	Solder terminal for PCB, inward	SMD gullwing (Z) terminal

Variable	Declaration	Solder terminal outward	Solder terminal inward	SMD-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
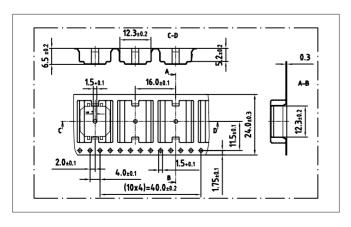
RACON 12, PCB hole pattern, smallest grid

Solder terminal for PCB, outward	Solder terminal for PCB, inward	SMD gullwing (Z) terminal
Ø 1.20	Ø 1.20	5.00
12.50 ± 0.10	10.00 ± 0.10	1.60
5.00	5.00	11.30 max
RMmin = 15.24	RMmin = 12.50	15.80 min
RMmin = 12.50	RMmin = 12.50	RMmin = 16.50
		RMmin = 12.50
view on component side	view on component side	view on component side
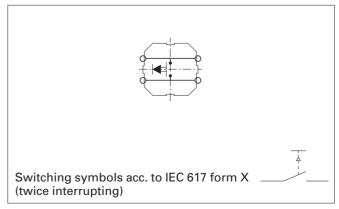
RACON 12, SMD-terminal, tape and reel drawing

6.5 ±0.2
12.3±0.2 C–D
5.2±0.2
0.3
1.5±0.1
16.0±0.1
A
A–B
12.3±0.2
24.0±0.3
11.5±0.1
2.0±0.1
1.5+0.1
4.0±0.1
B
1.75±0.1
(10x4)=40.0±0.2

Circuit Diagram RACON 12

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

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SOLUTIONS WITH PASSION
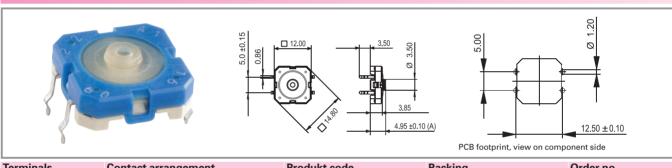
Typical accessories RACON 12

Description	Photo	Order no.	Additional accessories see page
Spacer, round, length 6.25 mm, red		**5.30.759.034/0000**	4 -70
Square plunger for membrane data entry system		**5.46.001.057/0209**	4 -22
Plunger for membrane data entry system		**5.46.168.050/0209**	4 -21
Keycaps, plastic, opaque, with pressure pad		**5.55.103.030/1013**	4 -82

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

RACON 12, solder terminals for PCB, outward
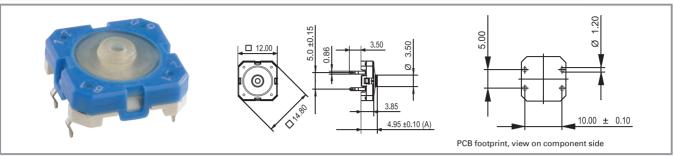
PCB footprint, view on component side

Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, outward	1 NO	A1	tubes à 45 piece	**1.14.001.501/0000**

Technical data see page 4 - 10

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

4

RACON

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

RAFI
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RACON 12, solder terminals for PCB, inward

PCB footprint, view on component side
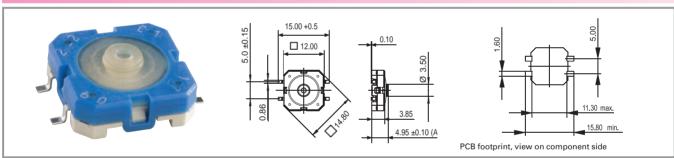
Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, inward	1 NO	B1	tubes à 45 piece	**1.14.001.502/0000**

Technical data see page 4 - 10

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

RACON 12, SMD gullwing (Z) terminals

PCB footprint, view on component side

Terminals	Contact arrangement	Produkt code	Packing	Order no.
SMD Gullwing (Z) terminals	1 NO	C1	tape and reel à 750 piece	**1.14.001.503/0000**

Technical data see page 4 - 10

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

4

RACON

RACON short-travel keyswitches

RACON 12 V 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	PCB terminals
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au
Illumination	no

Mechanical characteristics

Operating force	$3.6^{+-0.7}$ N
Switching travel	$0.61^{+-0.1}$ mm

Electrical characteristics

Rated voltage min.	0.02 V
Rated voltage max.	42 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W
Contact resistance when new max.	100 mΩ
Insulation resistance	10^9 Ω
Bouncing time max.	5 ms

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
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life at R_T = 23° C and test force = 1,5 x rated force	1000000
Solderability / solder heat resistance	according to IEC 600 68-2-20
Flammability of materials	UL 94 HB
Packing	in boxes à 100 piece
Produkt code	F 1

RAFI
SOLUTIONS WITH PASSION

PCB footprint RACON 12V

Ø1.20 (2x) 10.00 ± 0.10
5.00
6.00 ± 0.10
6.20
2.10
8.20
14.60
Ø1.50 (3x) 2.20 ± 0.20
15.00

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 with vertical adapter

6.60
0.86
5.00 ±0.15
12.95
4.95±0.1 (A)
13.60
10.60
12.70
2.85
Ø 3.50

Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal tin-plated	1 NO	F 1	in boxes à 100 piece	1.14.001.505/0000

Technical data see page 4 - 14
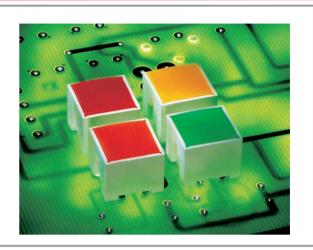
Plungers for overall height of 6.5 mm may not be used.

4

RACON

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

RACON short-travel keyswitches

RAFI
SOLUTIONS WITH PASSION

RACON 12 i

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

4

RACON

General information
Colour of lens	see order block
Recommended key grid	15.24 x 15.24 mm
Key grid max.	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	PCB terminals
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	$3.3^{+-0.6}$ N
Switching travel	$0.34^{+-0.1}$ mm

Electrical characteristics
Rated voltage min.	0.02 V
Rated voltage max.	42 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W
Contact resistance when new max.	100 mΩ
Dielectric strength AC min.	750 V
Insulation resistance	10^9 Ω
Bouncing time max.	5 ms

Other specifications
Ambient temp. operating min.	-40 °C
Ambient temp. operating max.	+80 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life at R_T = 23° C and test force = 1,5 x rated force	1000000
Solderability / solder heat resistance	according to DIN IEC 600 68-2-20
Flammability of materials	UL 94 HB
Packing	tubes à 45 piece

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

RACON short-travel keyswitches

RAFI
SOLUTIONS WITH PASSION
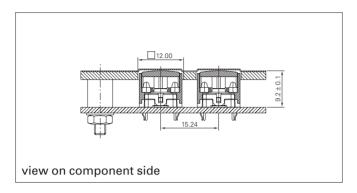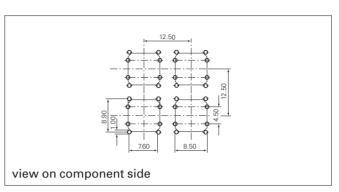
RACON 12i
typical system assembly

□12.00
9.2 ± 0.1
15.24

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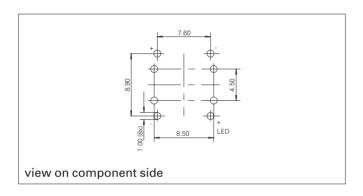
Explanation
Recommended area embossing 0.35 mm at glue spacer
thickness of 0.15 mm

RACON 12i smallest grid

12.50
12.50
8.90
1.00
4.50
7.60
8.50

view on component side

LED hole patterns

7.60
8.90
4.50
1.00 (8x)
8.50
LED

view on component side

Circuit Diagram RACON 12i

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

4

RACON

RAFI
SOLUTIONS WITH PASSION
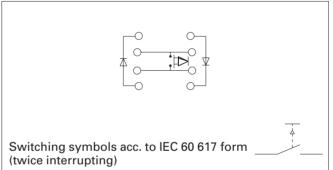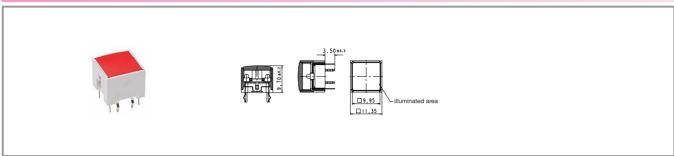
RACON 12 i, solder terminals for PCB

3,50 ±0,3

9,70 ±0,2

□ 9,95
□ 11,35

illuminated area

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

Technical data see page 4 - 16

If keycaps are used we recommend RK 90 keycaps 9 x 9 mm.
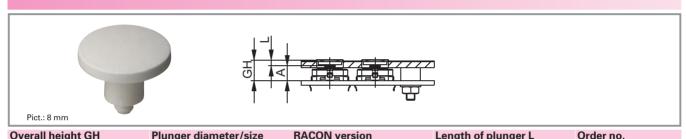
4

RACON

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

RACON special accessories

Pict.: 8 mm

Plunger for membrane data entry system

Pict.: 8 mm
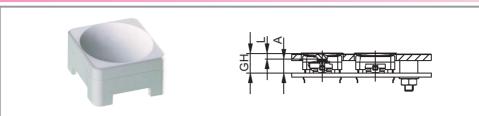
Overall height GH	Plunger diameter/size	RACON version	Length of plunger L	Order no.
6.5 mm	8 mm	RACON 8 Pin	1.6 mm	**5.46.167.101/0209**
6.5 mm	8 mm	RACON 8 SMD	1.5 mm	**5.46.167.102/0209**
6.5 mm	11.5 mm	RACON 8 Pin	1.6 mm	**5.46.167.060/0209**
6.5 mm	11.5 mm	RACON 8 SMD	1.5 mm	**5.46.167.061/0209**
6.5 mm	14.5 mm	RACON 8 Pin	1.6 mm	**5.46.168.060/0209**
6.5 mm	14.5 mm	RACON 8 SMD	1.5 mm	**5.46.168.061/0209**
6.5 mm	19 mm	RACON 8 Pin	1.6 mm	**5.46.169.060/0209**
6.5 mm	19 mm	RACON 8 SMD	1.5 mm	**5.46.169.061/0209**
7 mm	8 mm	RACON 8/12 Pin	2.1 mm	**5.46.167.107/0209**
7 mm	8 mm	RACON 8/12 SMD	2 mm	**5.46.167.106/0209**
7 mm	11.5 mm	RACON 8/12 Pin	2.1 mm	**5.46.167.064/0209**
7 mm	11.5 mm	RACON 8/12 SMD	2 mm	**5.46.167.067/0209**
7 mm	14.5 mm	RACON 8/12 Pin	2.1 mm	**5.46.168.064/0209**
7 mm	14.5 mm	RACON 8/12 SMD	2 mm	**5.46.168.067/0209**
7 mm	19 mm	RACON 8/12 Pin	2.1 mm	**5.46.169.064/0209**

4

RACON

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

RAFI
SOLUTIONS WITH PASSION

Overall height GH	Plunger diameter/size	RACON version	Length of plunger L	Order no.
7 mm	19 mm	RACON 8/12 SMD	2 mm	**5.46.169.067/0209**
9.7 mm	8 mm	RACON 8/12 Pin	4.8 mm	**5.46.167.094/0209**
9.7 mm	8 mm	RACON 8/12 SMD	4.7 mm	**5.46.167.311/0209**
9.7 mm	11.5 mm	RACON 8/12 Pin	4.8 mm	**5.46.167.047/0209**
9.7 mm	11.5 mm	RACON 8/12 SMD	4.7 mm	**5.46.167.050/0209**
9.7 mm	14.5 mm	RACON 8/12 Pin	4.8 mm	**5.46.168.047/0209**
9.7 mm	14.5 mm	RACON 8/12 SMD	4.7 mm	**5.46.168.050/0209**
9.7 mm	19 mm	RACON 8/12 Pin	4.8 mm	**5.46.169.047/0209**
9.7 mm	19 mm	RACON 8/12 SMD	4.7 mm	**5.46.169.050/0209**
12.5 mm	8 mm	RACON 8/12 Pin	7.6 mm	**5.46.167.096/0209**
12.5 mm	8 mm	RACON 8/12 SMD	7.5 mm	**5.46.167.099/0209**
12.5 mm	11.5 mm	RACON 8/12 Pin	7.6 mm	**5.46.167.058/0209**
12.5 mm	11.5 mm	RACON 8/12 SMD	7.5 mm	**5.46.167.059/0209**
12.5 mm	14.5 mm	RACON 8/12 Pin	7.6 mm	**5.46.168.058/0209**
12.5 mm	14.5 mm	RACON 8/12 SMD	7.5 mm	**5.46.168.059/0209**
12.5 mm	19 mm	RACON 8/12 Pin	7.6 mm	**5.46.169.058/0209**
12.5 mm	19 mm	RACON 8/12 SMD	7.5 mm	**5.46.169.059/0209**

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

4

RACON

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

RAFI
SOLUTIONS WITH PASSION

Square plunger for membrane data entry system

Overall height GH	Plunger diameter/size	RACON version	Length of plunger L	Order no.
7 mm	14 x 14 mm	RACON 12 Pin	2.1 mm	**5.46.001.064/0209**
9.7 mm	14 x 14 mm	RACON 12 Pin	4.8 mm	**5.46.001.060/0209**
12.5 mm	14 x 14 mm	RACON 12 Pin	7.6 mm	**5.46.001.063/0209**
7 mm	14 x 14 mm	RACON 12 SMD	2 mm	**5.46.001.057/0209**
9.7 mm	14 x 14 mm	RACON 12 SMD	4.7 mm	**5.46.001.058/0209**
12.5 mm	14 x 14 mm	RACON 12 SMD	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.

RF short-travel keyswitches

General data

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

Content

4

RF

RF short-travel keyswitches

RAFI
SOLUTIONS WITH PASSION

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

(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

RF

Calculating the series resistor:	Rated power of series:	Example for 5 Volt:
$R_V = \dfrac{U_B - U_F}{I_F}$	$P_V = I_F^2 \times R_V$	$R_V = \dfrac{5V - 2.0\ V}{0.02\ A} = 150\ \Omega$ (= standard value)

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

RF 15 short-travel keyswitch

General data

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

Technical data

General information

Colour of lens	see order block
Recommended key grid	19.05 mm

Dimensions

Length	15 mm
Width	15 mm
Overall height	9.7 mm

Mechanical design

Mounting	soldering into PCB
Terminals	contacts tin-plated, fix contact Ag plated
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au/Ag
Illumination	spot-/fully illuminated
LED colour	see order block
LED type	see order block

Mechanical characteristics

Operating force max.	2 ... 3 N
Operating travel	$0.5^{+0.2}$ mm
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: 42 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
Contact resistance acc. to life max.	3 Ω
Insulation resistance	10^9 Ω
ESD strength (underneath overlay)	15 kV
Bouncing time max.	5 ms

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	1000000
Solderability	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.
Flammability of materials	UL 94 HB

4

RF

RAFI
SOLUTIONS WITH PASSION

Force/Travel Diagram – Keyswitch RF 15

Operation characteristic limits RF
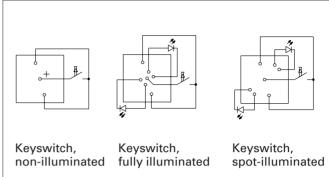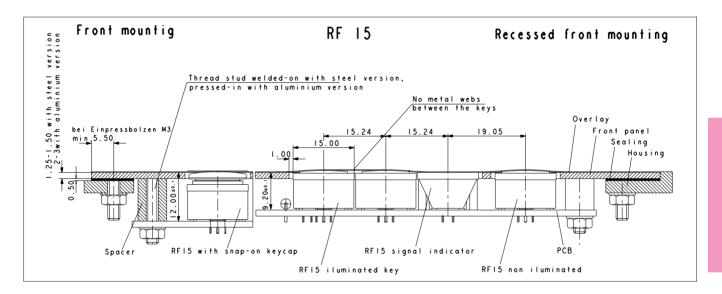
F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

Circuit Diagram – Keyswitch RF 15

Keyswitch, non-illuminated

Keyswitch, fully illuminated

Keyswitch, spot-illuminated

Dimensional Drawing RF 15
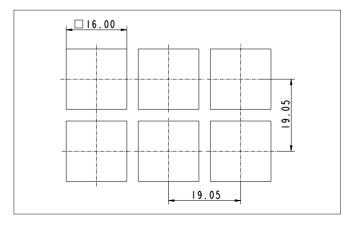
Hole Pattern RF 15
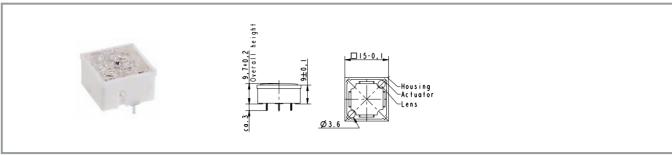
View on component side, all hole diameters 1,1 $^{+/- 0,1}$ mm

Hole Pattern – Front Panel

Stock items are marked
by bold printed order numbers.

4

RF

RF 15 short-travel keyswitch, non-illuminated

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

Technical data see page 4 - 26

Accessories:
Keycap for RF 15, snap-on, for overall height 12.5 mm: 5.46.654.059/0227
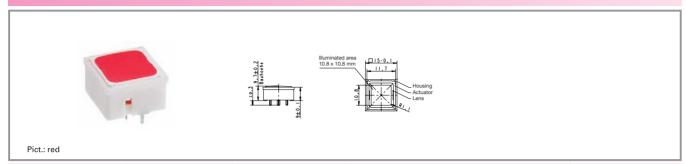
For keycaps, refer to chapter accessories and system RK 90.

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.

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

Pict.: red

Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
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
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
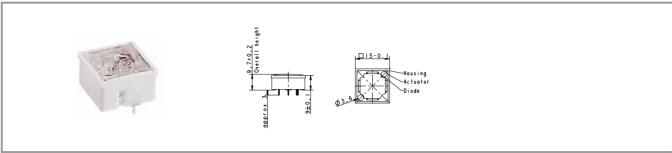
Technical data see page 4 - 26

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.
Ag	spot illumination 1 LED	opaque white	blue	3 mm	3.14.100.040/0000
Ag	spot illumination 1 LED	transparent	red	3 mm	**3.14.100.041/0000**
Ag	spot illumination 1 LED	transparent	green	3 mm	**3.14.100.042/0000**
Ag	spot illumination 1 LED	transparent	yellow	3 mm	**3.14.100.043/0000**
Au	spot illumination 1 LED	opaque white	blue	3 mm	3.14.100.030/0000
Au	spot illumination 1 LED	transparent	red	3 mm	**3.14.100.031/0000**
Au	spot illumination 1 LED	transparent	green	3 mm	**3.14.100.032/0000**
Au	spot illumination 1 LED	transparent	yellow	3 mm	**3.14.100.033/0000**

Technical data see page 4 - 26

Double-spot LED illumination 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.

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SOLUTIONS WITH PASSION

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.

LED 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 LED which are inserted into the recesses of the keyswitch housing. LED of keyswitches with overall heights of 12.5 mm or more should be placed onto LED spacers in order to obtain satisfactory illumination.

4

RF

Technical data

General information

Colour of lens	see order block
Recommended key grid	19.05 mm

Dimensions

Length	15 mm
Width	15 mm
Overall height	6.2 mm

Mechanical design

Mounting	soldering into PCB
Terminals	contacts tin-plated, fix contact Ag plated
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au/Ag
Illumination	external 3 mm LED possible if height 12 mm

Mechanical characteristics

Operating force max.	2 ... 3 N
Operating travel	$0.5^{+0.2}$ mm
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: 42 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
Contact resistance acc. to life max.	3 Ω
Insulation resistance	10^9 Ω
ESD strength (underneath overlay)	15 kV
Bouncing time max.	5 ms

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	1000000
Solderability	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.
Flammability of materials	UL 94 HB

Force/Travel Diagram – Keyswitch RF 15 N

Operation characteristic limits RF

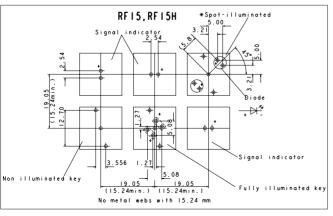F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

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

Ø10,00

Ø15,00

Ø10,00

min 1.50

Key overall height X
variable from
8 to 22.5

Ø10.00(15)

4.80

X

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 with steel version
2-3 with aluminium version

With pressed-in stud
min.5.50

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

M3

□16.00

0.50

0.50

0.50

5.75±0.1

19.05

15.24

Spacer

No metal webs
between the keys

Overlay
Front panel
Sealing
Housing

Ø10.00

Ø15.00

8...22.5

PCB

15.24

Spacer

Hole Patterns – Front Panel RF 15 N

RF 15 N without plunger

□16.00

19.05

19.05
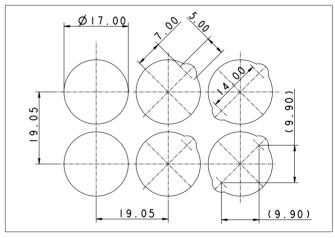
RF 15 N with plunger ø 10 mm, non-illuminated

Ø13.00

15.24

15.24

RF 15 N with plunger ø 10 mm, illuminated

Ø13.00
7.00
5.00
4.95
19.05
(4.95)
14.00
19.05
(9.90)
(9.90)
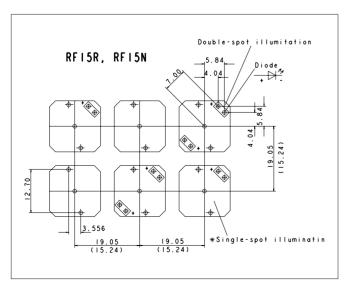
RF 15 N with plunger ø 15 mm, illuminated

Ø17.00
7.00
5.00
14.00
19.05
(9.90)
19.05
(9.90)

Hole Pattern RF 15 N

RF15R, RF15N

Double-spot illumitation

Diode

7.00
5.84
4.04
5.84
4.04
19.05
(15.24)

12.70

3.556
19.05
(15.24)
19.05
(15.24)

*Single-spot illuminatin
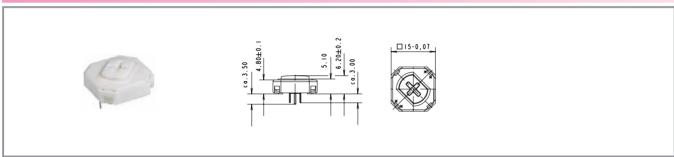
View on component side
All hole diameters 1.1 $^{+/- 0.1}$ mm
PCB layout Keyswitch 1/400" grid

Typical accessories RF 15 N short-travel keyswitch

Description	Photo	Order no.	Page
LED yellow, 3 mm		1.90.690.103/0000	
LED spacer for RF 15 N, 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 -72
Extension plunger for RF 15 N, Ø 10 mm, overall height 22.5 mm		**5.46.011.028/0710**	4 -68
Extension plunger for RF 15 N, Ø 15 mm, overall height 22.5 mm		**5.46.017.028/0710**	4 -69

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 < 12 mm	19.05 mm	6.2 mm	**3.14.100.601/0000**
Ag	external 3 mm LED possible if height < 12 mm	19.05 mm	6.2 mm	**3.14.100.606/0000**

Technical data see page 4 - 32

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

4

RF

RF short-travel keyswitches

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RF 15 R short-travel keyswitch

Pict.: with 2 mm LED, red

with 3 mm LED, green

General data

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

Technical data

General information

Recommended key grid	15.24 mm

Dimensions

Length	15 mm
Width	15 mm
Overall height	9.7/12.5 mm

Mechanical design

Mounting	soldering into PCB
Terminals	contacts tin-plated, fix contact Ag plated
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au/Ag
Illumination	spot illumination
LED colour	see order block
LED type	see order block

Mechanical characteristics

Operating force max.	2 ... 3 N
Operating travel	$0.5^{+0.2}$ mm
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: 42 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
Contact resistance acc. to life max.	3 Ω
Insulation resistance	10^9 Ω
ESD strength (underneath overlay)	15 kV
Bouncing time max.	5 ms

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	1000000
Solderability	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.
Flammability of materials	UL 94 HB

RAFI
SOLUTIONS WITH PASSION

Force/Travel Diagram – Keyswitch RF 15 R

Operation characteristic limits RF

F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

Circuit Diagram – Keyswitch RF 15 R

Keyswitch, non-illuminated   Keyswitch, spot-illuminated

Dimensional Drawing RF 15 R

Hole Pattern RF 15 R

View on component side
All hole diameters 1.1 $^{+/- 0.1}$ mm
PCB layout Keyswitch 1/400" grid
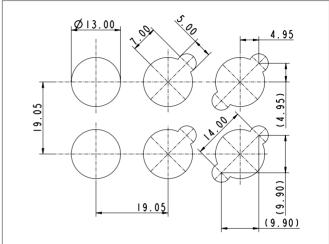
Hole Pattern – Front Panel RF 15 R

RF 15 R, non-illuminated
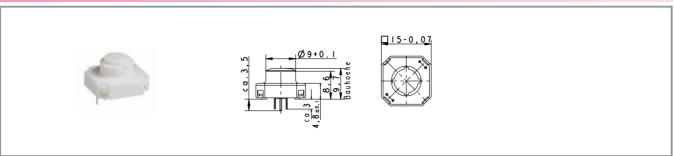
RF 15 R, illuminated
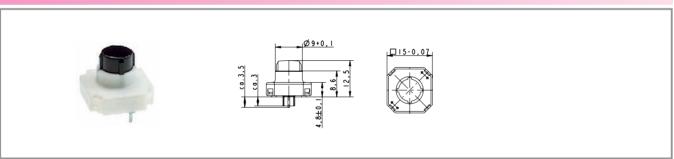
RF 15 R low short-travel keyswitch, non-illuminated

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

Technical data see page 4 - 36

RF 15 R high short-travel keyswitch, non-illuminated
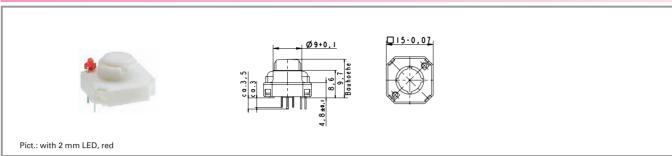
Contact materials	Overall height	Illumination	LED type	LED colour	Order no.
Au	12.5 mm	not illuminated			**3.14.100.801/0000**
Ag	12.5 mm	not illuminated			**3.14.100.806/0000**

Technical data see page 4 - 36

4

RF

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

RF short-travel keyswitches

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

Pict.: with 2 mm LED, red
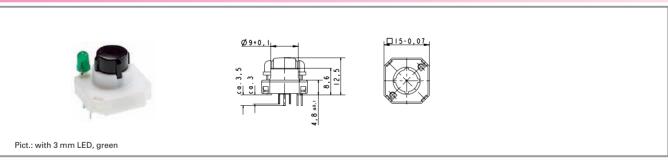
Contact materials	Overall height	Illumination	LED type	LED colour	Order no.
Au	9.7 mm	spot illumination 1 LED	2 mm	red	**3.14.100.531/0000**
Au	9.7 mm	spot illumination 1 LED	2 mm	green	**3.14.100.532/0000**
Au	9.7 mm	spot illumination 1 LED	2 mm	yellow	**3.14.100.533/0000**
Ag	9.7 mm	spot illumination 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 - 36

Versions with 2 LED available on request.
Technical data of LED see seperate page at the beginning of this chapter.

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 - 36

Versions with 2 LED available on request.
Technical data of LED see seperate page at the beginning of the chapter.

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

RF short-travel 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 into PCB
Terminals	see order block
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au/Ag
Illumination	not illuminated / fully illuminated
LED colour	see order block
LED type	see order block

Mechanical characteristics

Operating force max.	2 ... 3 N
Operating travel	$0.5^{+0.2}$ mm
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: 42 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
Contact resistance acc. to life max.	3 Ω
Insulation resistance	10^9 Ω
ESD strength (underneath overlay)	15 kV
Bouncing time max.	5 ms

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	1000000
Solderability	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.
Flammability of materials	UL 94 HB

4

RF

Force/Travel Diagram – Keyswitch RF 15 H

Operation characteristic limits RF
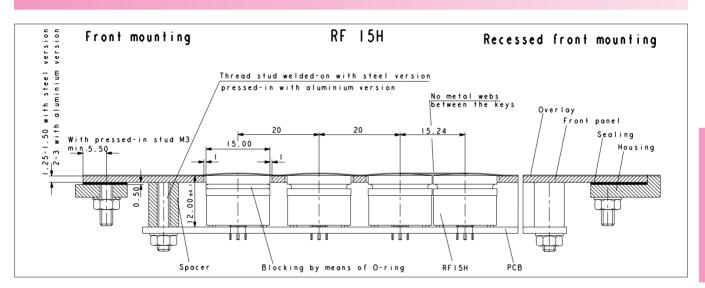
F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

Circuit Diagram – Keyswitch RF 15 H

Keyswitch,
non-illuminated

Keyswitch,
fully illuminated

Dimensional Drawing

Front mounting   RF 15H   Recessed front mounting

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

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

No metal webs
between the keys

Overlay
Front panel
Sealing
Housing

With pressed-in stud M3
min.5.50

20   20   15.24

15.00

12.00 ±0.1

0.50

Spacer   Blocking by means of O-ring   RF15H   PCB

4

RF

Hole Pattern

LED

5,72

□ 15.00
12.70
7,50

5.08
1.27

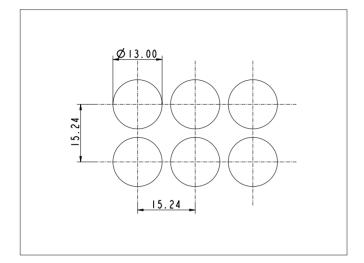3.556   1.27

5.08

Keyswitch not illuminated

No metal webs with 15.24 mm. View on component side.
All hole diameters 1,1 +/- 0,1 mm. PCB layout Keyswitch 1/400 grid.

Hole Pattern – Front Panel

17

17

20

20   20
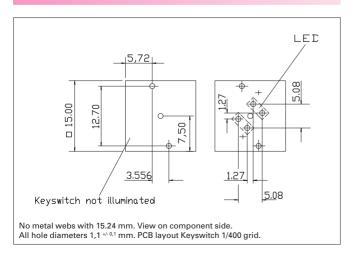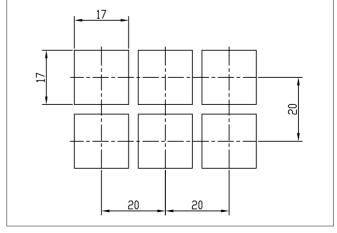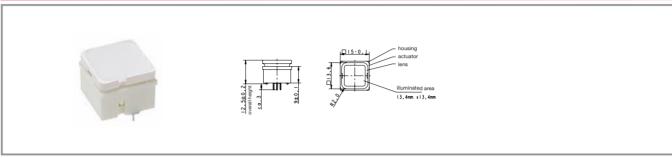
Typical accessories RF 15 H short-travel keyswitch

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

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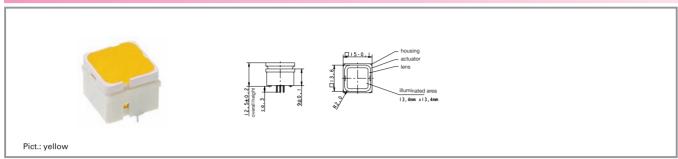
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white			**3.14.100.702/0000**
Ag	not illuminated	white			**3.14.100.707/0000**

Technical data see page 4 - 42

Keyswitches

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	fully illuminated 2 LED	white	multi colour	3 mm	3.14.100.734/0000
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

When using the keyswitches with multicolour LED 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

RAFI
SOLUTIONS WITH PASSION

RF 15 signal indicator

Pict.: green

Technical data

General information

Colour of lens	see order block
Recommended key grid	19.05 mm

Dimensions

Length	15 mm
Width	15 mm
Overall height	9.7 mm

Mechanical design

Mounting	soldering into 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
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Solderability	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.
Flammability of materials	UL 94 HB

4

RF

RAFI
SOLUTIONS WITH PASSION

Dimensional Drawing Signal Indicator RF 15

4 - 47

Front mountig   RF 15   Recessed front mounting

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

No metal webs
between the keys

Overlay
Front panel
Sealing
Housing

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

bei Einpressbolzen M3
min. 5.50

15.24   15.24   19.05

15.00

1.00

12.00±0.

9.20±0.

0.50

Spacer   RF15 with snap-on keycap   RF15 signal indicator   PCB

RF15 iluminated key   RF15 non iluminated

Hole Pattern

RF15, RF15H

*Spot-illuminated
5.00
3.21

Signal indicator
2.54

45°
5.00

2.54

19.05
(15.24min.)
12.70

5.08
1.27

3.21

Diode

Signal indicator

5.08

3.556   1.27
5.08

Non illuminated key

19.05   19.05
(15.24min.)   (15.24min.)

Fully illuminated key

No metal webs with 15.24 mm. 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

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 - 46

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.

RF short-travel keyswitches

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 into PCB
Terminals	contacts tin-plated, fix contact Ag plated
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au/Ag
Illumination	spot-/fully illuminated
LED colour	see order block
LED type	see order block

Mechanical characteristics
Operating force max.	2 ... 3 N
Operating travel	$0.5^{+0.2}$ mm
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: 42 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
Contact resistance acc. to life max.	3 Ω
Insulation resistance	10^9 Ω
ESD strength (underneath overlay)	15 kV
Bouncing time max.	5 ms

Other specifications
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	1000000
Solderability	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.
Flammability of materials	UL 94 HB

4

RF

RF short-travel keyswitches

Force/Travel Diagram – Keyswitch RF 19

Operation characteristic limits RF

F (N)

F1

F2

s (mm)

F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

Circuit Diagram – Keyswitch RF 19

Keyswitch,
non-illuminated

Keyswitch,
fully illuminated

Keyswitch,
spot-illuminated

Dimensional Drawing

Front mounting   RF 19   Recessed front mounting

Thread stud weided-on with steel version
pressed-in with aluminium version

No metal webs
between the keys

Overlay

Front panel

Sealing

Housing

19.05

With pressed-in stud M3
min. 5.5

19   19

22.86

1.25 with steel version
2-3 with aluminium version

0.5

9.2

1

1

Spacer   Illuminated key   Signal Indicator   PCB

4

RF
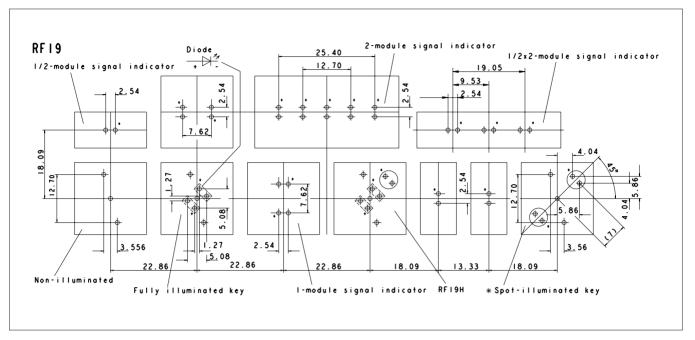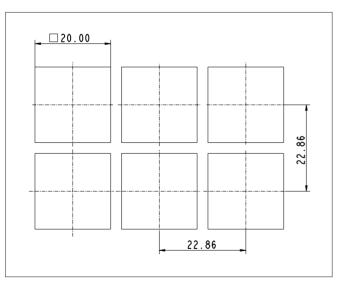
Hole Patterns RF 19

* 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

4

RF

Hole Patterns – Front Panel RF 19
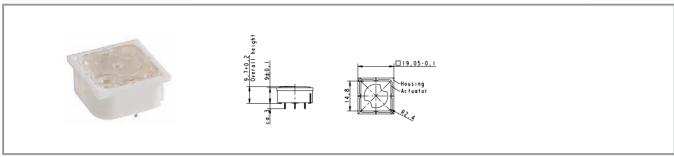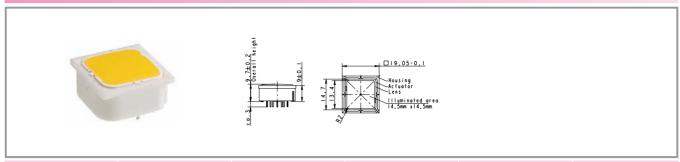
RF 19 short-travel keyswitch, non-illuminated

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

Technical data see page 4 - 50

Stock items are marked
by bold printed order numbers.

RF 19 short-travel keyswitch, fully illuminated with 2 LED
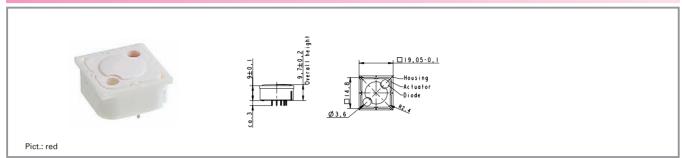
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LED	red	red	2 mm	**3.14.002.011/0000**
Au	fully illuminated 2 LED	green	green	2 mm	**3.14.002.012/0000**
Au	fully illuminated 2 LED	yellow	yellow	2 mm	**3.14.002.013/0000**
Au	fully illuminated 2 LED	orange	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

Technical data see page 4 - 50

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

4

RF

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

RAFI
SOLUTIONS WITH PASSION

RF 19 short-travel keyswitch, 1 LED spot-illumination

Pict.: red

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

Technical data see page 4 - 50

Versions with 2 LED available on request.
Technical data of LED see separate page at the beginning of this chapter.

4

RF

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

RF short-travel keyswitches

RAFI
SOLUTIONS WITH PASSION

RF 19 short-travel keyswitch, 1 NC + 1 NO

Technical data

General information

Recommended key grid   23 mm

Dimensions

Length   19.05 mm
Width   19.05 mm
Overall height   9.7 mm

Mechanical design

Mounting   soldering into PCB
Terminals   contacts tin-plated,
    fix contact Ag plated
Contact system   bridge contact
Contact arrangement   1 NC + 1 NO
Contact materials   Au/Ag
Illumination   none

Mechanical characteristics

Operating force max.   2 ... 3 N
Operating travel $0.5^{+0.2}$ mm
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 V
Rated voltage max.   Au: 42 V, Ag: 50 V V
Rated current min.   Au: 0.01 mA, Ag: 0.1 mA
    mA
Rated current max.   Au: 100 mA, Ag: 250 mA
    mA

Rated power max.
(ohmic load)   Au: 2 W, Ag: 12.5 W

For keycaps, refer to RK 90.

Contact resistance when
new max.   100 mΩ
Contact resistance acc.
to life max.   3 Ω
Insulation resistance 2×10^6 Ω
ESD strength (underneath
overlay)   15 kV
Bouncing time max.   5 ms

Other specifications

Ambient temp. operating
min.   -25 °C
Ambient temp. operating
max.   +70 °C
Storage temperature min.   -40 °C
Storage temperature max.
(product)   +80 °C
Storage temperature max.
(in tube)   +50 °C
Resistance to constant   according to
environment   IEC 600 68-2-3 and 2-30
Resistance at variable   according to
environment   IEC 600 68-2-14 and 2-33
Operating life min.   100.000
Solderability   according to
    E DIN IEC 600 28-2-20
Wave soldering   260 °C max.
Manual soldering   350 °C / 5 sec. max.
Flammability of materials   UL 94 HB

RAFI
SOLUTIONS WITH PASSION

Circuit Diagram

S1

1
2
3
4

Dimensional Drawing

Front mounting   RF 19   Recessed front mounting

Thread stud weided-on with steel version
pressed-in with aluminium version

No metal webs
between the keys

19.05

With pressed-in stud M3
min.   5.5

19   19   22.86

Overlay
Front panel
Sealing
Housing

1.25 with steel version
2-3 with aluminium version

1

0.5

9.2

1

Spacer   Illuminated key   Signal Indicator   PCB

4

RF

Hole Pattern

12.50±0.10
10.24±0.10

6.50

Ø1.70 ₋₀.₁₀

2:1

3

1

2

4

4.0±0.1

10.20±0.10

Ø1.40 ±0.10 (4x)

view on component side

Hole Pattern – Front Panel

☐20.00

22.86

22.86

RAFI
SOLUTIONS WITH PASSION

RF 19 short-travel keyswitch, non-illuminated

Contact materials	Contact arrangement	Illumination	Colour of lens	Order no.
Au	1 NC + 1 NO	not illuminated	opaque white	1.16.000.991/0000
Ag	1 NC + 1 NO	not illuminated	opaque white	1.16.000.990/0000

Technical data see page 4 - 56

4

RF

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

RF 19 H short-travel keyswitch

General data

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

Technical data

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

Dimensions
Length	19.05 mm
Width	19.05 mm
Overall height	12.5 mm

Mechanical design
Mounting	soldering into PCB
Terminals	contacts tin-plated, fix contact Ag plated
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au/Ag
Illumination	spot-/fully illuminated
LED colour	see order block
LED type	see order block

Mechanical characteristics
Operating force max.	2 ... 3 N
Operating travel	$0.5^{+0.2}$ mm
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: 42 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
Contact resistance acc. to life max.	3 Ω
Insulation resistance	10^9 Ω
ESD strength (underneath overlay)	15 kV
Bouncing time max.	5 ms

Other specifications
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	1000000
Solderability	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.
Flammability of materials	UL 94 HB

Force/Travel Diagram – Keyswitch RF 19 H

Operation characteristic limits RF

F 1 = Max. operating force
F 2 = Force at contact
F 2 is max. 55% of F 1

Circuit Diagram – Keyswitch RF 19 H

Keyswitch,
non illuminated

Keyswitch,
fully illuminated

Dimensional Drawing

RAFI
SOLUTIONS WITH PASSION
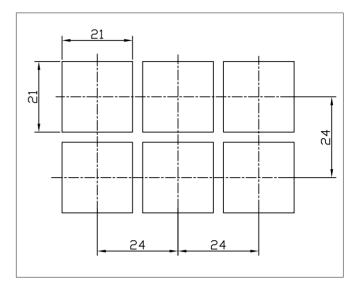
Hole Pattern RF 19 H

Keyswitch not illuminated

LED

* 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

Accessories RF 19 H short-travel keyswitch

Description	Photo	Order no.	Page
O-ring, black, 17.0 x 1.5, for blocking RF 19H keys		5.30.125.003/0100	5 - 27

RF 19 H keyswitch, non-illuminated
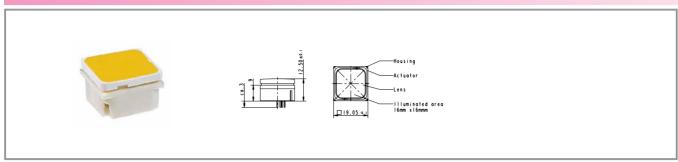
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white			3.14.001.501/0000
Ag	not illuminated	white			3.14.001.506/0000

Technical data see page 4 - 60

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

Keyswitches

RF short-travel keyswitches

RAFI
SOLUTIONS WITH PASSION

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 super bright	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 - 60

When using the keyswitches with multicolour LED 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 19 signal indicator

Pict.: 0.5 x 1-module, yellow

0,5 x 2-module, yellow

1 x 1-module, green

1 x 2-module, red

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	soldering into 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
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (in tube)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Solderability	according to E DIN IEC 600 28-2-20
Wave soldering	260 °C max.
Manual soldering	350 °C / 5 sec. max.
Flammability of materials	UL 94 HB

4

RF

RF short-travel keyswitches

Dimensional Drawing Signal Indicator RF 19

Front mounting   RF 19   Recessed front mounting

Thread stud weided-on with steel version
pressed-in with aluminium version

No metal webs
between the keys

Overlay
Front panel
Sealing
Housing

With pressed-in stud M3
min.   5.5

1.25 with steel version
2-3 with aluminium version

19.05

19   19

22.86

1   1

0.5

9.2

Spacer   Illuminated key   Signal Indicator   PCB

Hole Patterns RF 19

RF 19, RF 19H

Diode

2-module signal indicator

1/2-module signal indicator

1/2x2-module signal indicator

25.40

12.70

19.05

9.53

2.54   2.54   2.54   2.54

2.54

7.62

18.09

12.70

1.27

7.62

2.54   2.54

12.70

4.04

5.86

5.86

4.04

3.556   1.27   2.54   3.56   (7)

5.08

22.86   22.86   22.86   18.09   13.33   18.09

Non-illuminated

Fully illuminated key   1-module signal indicator   RF 19H   *Spot-illuminated key

5.08

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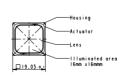 View on component side, all hole diameters 1.1 +/- 0.1 mm

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

4

RF

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SOLUTIONS WITH PASSION

RF 19 signal indicator, $^1/_2$ x 1-module
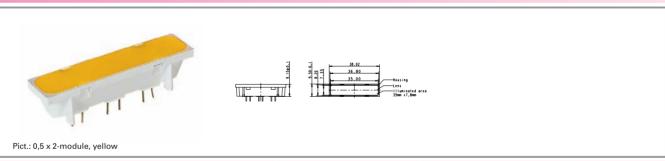
Pict.: 0.5 x 1-module, yellow

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 - 64

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

RF 19 signal indicator, $^1/_2$ x 2-module

Pict.: 0,5 x 2-module, yellow

4

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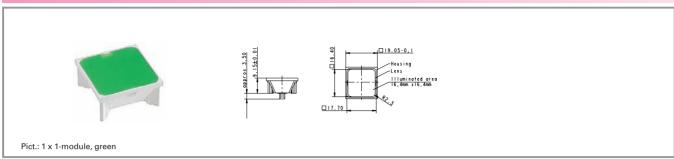
Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 3 LED	red	red	2 mm	3.14.002.908/0000
fully illuminated 3 LED	green	green	2 mm	3.14.002.909/0000
fully illuminated 3 LED	yellow	yellow	2 mm	3.14.002.910/0000
fully illuminated 3 LED	orange	yellow	2 mm	3.14.002.911/0000

Technical data see page 4 - 64

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

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

Keyswitches

RF 19 signal indicator, 1 x 1-module
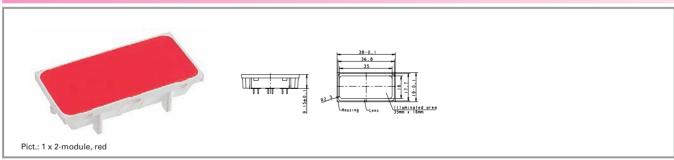
Pict.: 1 x 1-module, green

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 - 64

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, red

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
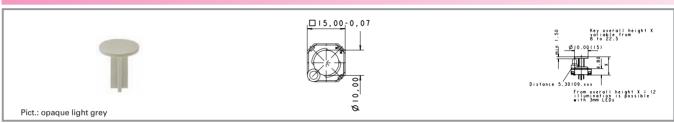
Technical data see page 4 - 64

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

4

RF

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RF special accessories

Pict.: opaque light grey

round and triangular versions

Extension plunger for RF 15 N, round head

□ 15,00-0,07

Ø 10,00

Ø 10,00

Key overall height X
variable from
8 to 22.5

min 1.50

Ø 10,00(15)

4.80

X

Distance 5.30109.xxx

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

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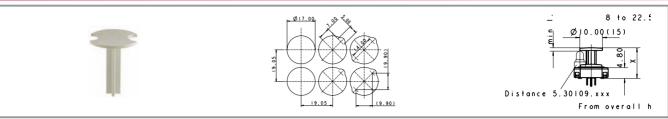
Length	Width	Overall height	Diameter	Colour	Order no.
		9 mm	10 mm		**5.46.011.036/0710**
		9.7 mm	10 mm		**5.46.011.030/0710**
		12.5 mm	10 mm		**5.46.011.037/0710**
		13 mm	10 mm		**5.46.011.038/0710**
		22.5 mm	10 mm		**5.46.011.028/0710**

Length of plunger = Overall height - 4.25 mm.

4

RF

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

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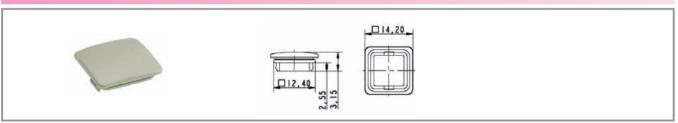
Extension plunger for RF 15 N, round head, with recess for LED

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**
		13 mm	15 mm		**5.46.017.038/0710**
		22.5 mm	15 mm		**5.46.017.028/0710**

Length of plunger = Overall height - 4.25 mm.
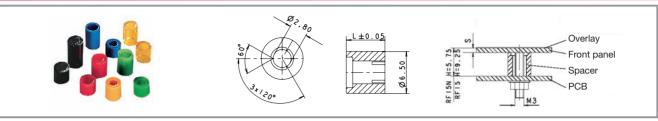
Keycap for RF 15, snap-on, for overall height 12.5 mm

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

4

RF

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

RAFI
SOLUTIONS WITH PASSION

Spacers, round
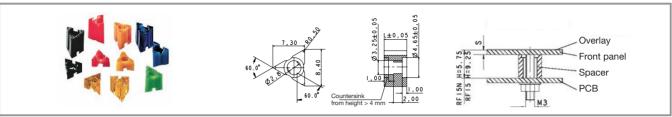
Length	Width	Overall height	Diameter	Colour	Order no.
3.50 mm				blue transparent	**5.30.759.023/0000**
4 mm				green	**5.30.759.025/0000**
4.25 mm				blue	**5.30.759.026/0000**
4.50 mm				red	**5.30.759.027/0000**
4.75 mm				blue transparent	**5.30.759.028/0000**
5 mm				black	**5.30.759.029/0000**
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**
9 mm				green	**5.30.759.046/0000**
10.00 mm				black	**5.30.759.043/0104**

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

Keyswitches

RAFI
SOLUTIONS WITH PASSION

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

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

LED spacer for RF 15 N

Pict.: opaque light grey

Length Characteristic 1	Width Characteristic 2	Overall height	Diameter	Colour	Order no.
2.2 mm		12.5 mm	5 mm	opaque light grey	5.30.109.010/0756
12 mm		22.5 mm	5 mm	black	5.30.109.019/0105

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

KN 19 short-travel main switch

General data

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

Content

4

KN
19

KN 19 short-travel main switch

KN 19 short-travel main switch

Pict.: 1NO + 1NC

2NO / 2NC

General data

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

Technical data

General information

Recommended key grid	19.05 x 38.1 mm

Dimensions

Length	37.8 mm
Width	18.8 mm
Overall height	9.7 mm

Mechanical design

Mounting	on PCB
Terminals	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 min. AC	12 V
Rated voltage min. DC	12 V
Rated voltage max. DC	50 V
Rated voltage max. AC	250 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
Storage temperature min.	-40 °C
Storage temperature max.	+80 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Approvals	ENEC, UL and CSA
Acc. to norm	VDE:0630,0750; IEC:1058-1.601-1; EN:61058,60601-1
Operating life AC	AC 250 V: 200000 /2A; 100000 /6A
Operating life DC	50000(10A/50V=)
Soldering time max.	3 sec.
Soldering temperature max.	350 °C
Defintion of flame class	UL 94 VO
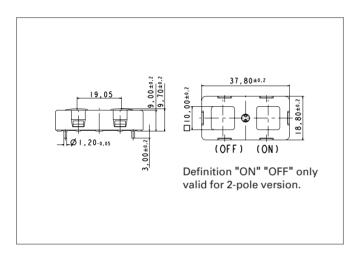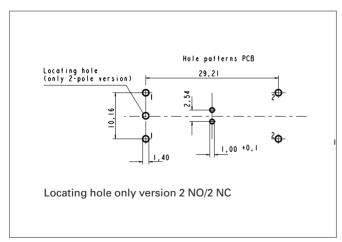
4

KN 19

Circuit Diagram

1 NO + 1 NC

2 NO/2 NC

Dimensional Drawing

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

Hole Pattern

Hole patterns PCB

Locating hole
(only 2-pole version)

29,21

Locating hole only version 2 NO/2 NC

View on component side.
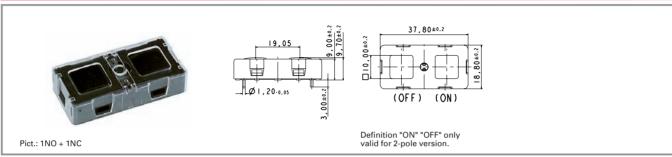
4

KN
19

Typical accessories KN 19 short-travel main switch

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

KN 19

Pict.: 1NO + 1NC

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

Contact arrangement	Rated voltage max. AC	Approvals	Order no.
1 NC + 1 NO	250 V	ENEC, UL and CSA	**1.12.000.001/0000**
2 NC / 2 NO	250 V	ENEC, UL and CSA	**1.12.000.501/0000**
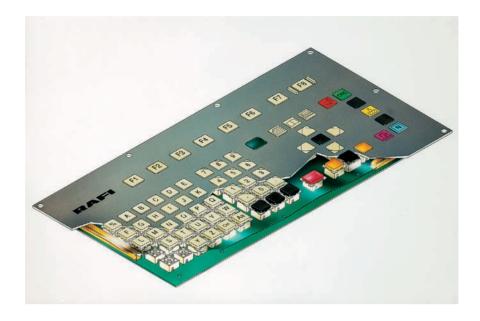
Technical data see page 4 - 74

Accessories:
Damping disk for keycaps to be glued on: 5.70.729.009/0000

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

RK 90 keycaps

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**
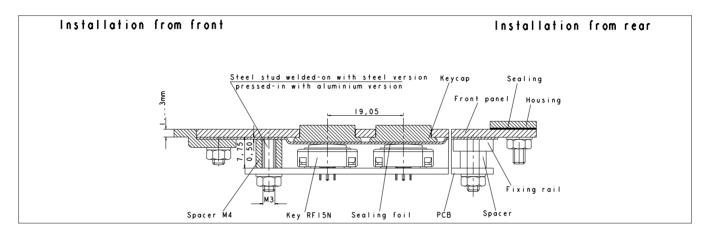
Design

Example with RF 15 keyswitches. Instead of RF 15 follo-wing keyswitches can be used:
- 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 for good industrial design. **Degree of protection: IP65 according to DIN in front of the panel, with silicone sealing.**

- -

Installation methods


```
Installation from front                    Installation from rear

              Steel stud welded-on with steel version   Keycap    Sealing
              pressed-in with aluminium version
                                                    Front panel    Housing
3mm                              19,05
                                                                   Fixing rail
7.75  0.50
M3                                                                 Spacer
      Spacer M4    Key RF15N    Sealing foil    PCB
```

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

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

- -

Legending

- **Laser printing:** This labelling method is possible for opaque keycaps. The symbols are engraved in the keycaps with laser.

- When using transparent lenses, the pressure pad can be legended by printing.

As the legending is protected by the lens, it is friction-proof.

- **Engraving:** With this method the keycaps are engraved with the required symbol and then inlaid with ink.

- -

Recommendations

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

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

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

4

RK 90

RK 90 keycaps

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
min.12,50   Front panel   Housing
3mm
0.50
0.75
Spacer   M3   Racon 12   Sealing foil   PCB   Spacer   Fixing rail
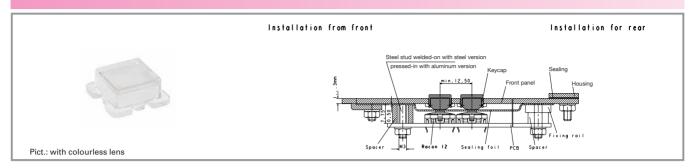
Pict.: with colourless lens

General data

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

Technical data

General information

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

Dimensions

Dimension keycap in front of front panel	8.85 x 8.85 mm
Dimension keycap behind front panel	11.5 x 11.5 mm
Dimension (c) hole patterns final size	9.00 x 9.00 mm
Dimension hole patterns punched size	9.20 x 9.20 mm
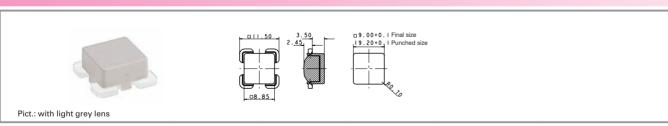
RK 90 keycaps, plastic, 9 x 9 mm

Pict.: with light grey lens

Size	Illuminability	Dimension keycap behind front panel	Dimension keycap in front of front panel	Dimension (c) hole patterns final size	Order no. actuator	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	

Technical data see page 4 - 80

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

4

RK 90

RAFI
SOLUTIONS WITH PASSION

RK 90 keycaps, plastic, 14 mm

Installation from front

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

Keycap   Lens   Front plane   Sealing   Housing

Installation from rear

19.05

1...3mm
0,50
12,75
M3

Spacer M4   M3   Sealing foil   **RF15**   Pressure pad   PCB   Frame   M3   Spacer   Fixing rail   M3

Pict.: with lens, opaque green
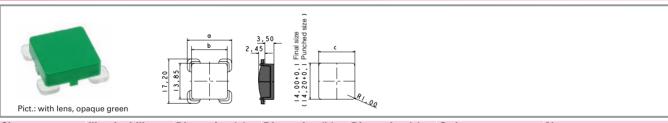
General data

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.

RK 90 keycaps, plastic, 14 mm, 1-module

Pict.: with lens, opaque green

a
b
17,20
13,85

3,50
2,45
Final size
Punched size
14,00+0,1
(14,20+0,1)

c
R1,00

4

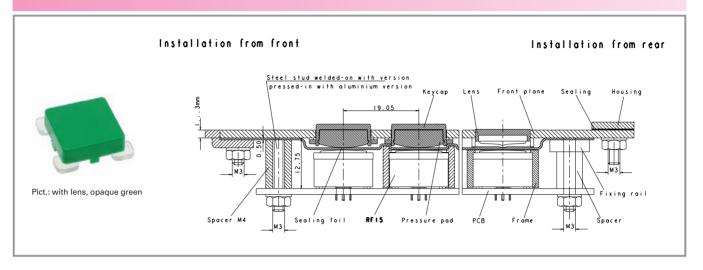| Size	Illuminability	Dimension (a) keycap behind front panel	Dimension (b) keycap in front of front panel	Dimension (c) hole patterns final size	Order no.	Note
1-module	yes	17.20 x 17.20 mm	13.85 x 13.85 mm	14.00 x 14.00 mm	**5.55.103.030/1013**	Please include the desired lens in your order

Lenses:
Lens RK 90, 14 x 14 mm, 1-module, opaque red: **5.46.681.001/0309**
Lens RK 90, 14 x 14 mm, 1-module, opaque yellow: **5.46.681.001/0409**
Lens RK 90, 14 x 14 mm, 1-module, opaque green: **5.46.681.001/0514**
Lens RK 90, 14 x 14 mm, 1-module, opaque blue: **5.46.681.001/0611**
Lens RK 90, 14 x 14 mm, 1-module, opaque light grey: **5.46.681.001/0700**
Lens RK 90, 14 x 14 mm, 1-module, transparent colourless: **5.46.681.021/1002**
Lens RK 90, 14 x 14 mm, 1-module, transparent red: **5.46.681.021/1307**
Lens RK 90, 14 mm, 1.5-module, transparent yellow: **5.46.681.021/1403**
Lens RK 90, 14 x 14 mm, 1-module, transpatent green: **5.46.681.021/1510**

RK
90

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

Keycaps, plastic, 1¼-module

Pict.: with lens, opaque light grey

Size	Illuminability	Dimension (a) keycap behind front panel	Dimension (b) keycap in front of front panel	Dimension (c) hole patterns final size	Order no.	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 include the desired lens in your order

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

RK 90 keycaps, plastic, 14 mm, 1½-module

Pict.: with lens, opaque light grey

Size	Illuminability	Dimension (a) keycap behind front panel	Dimension (b) keycap in front of front panel	Dimension (c) hole patterns final size	Order no.	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 include the desired lens in your order

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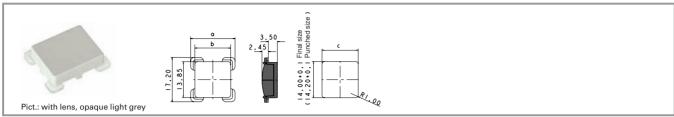Lens RK 90, 14 mm, 1.5-module, transparent green: **5.46.681.023/1510**

RK 90 keycaps, plastic, 2-module, pressure pad and lens
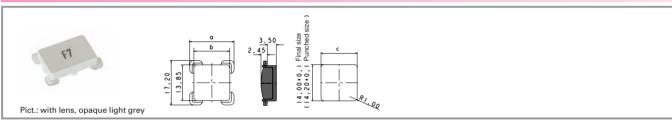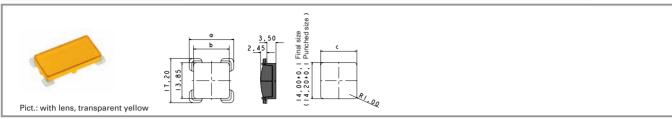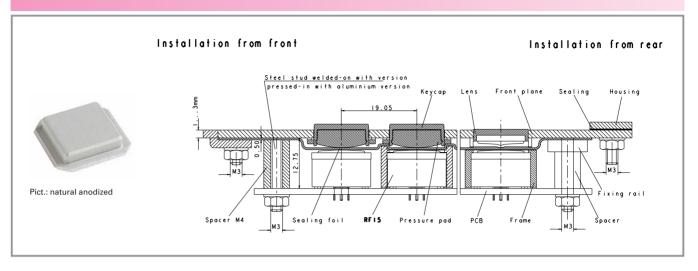
Pict.: with lens, transparent yellow

Size	Illuminability	Dimension (a) keycap behind front panel	Dimension (b) keycap in front of front panel	Dimension (c) hole patterns final size	Order no.	Note
2-module	no	17.20 x 31.20 mm	13.85 x 27.85 mm	14.00 x 28.00 mm	**5.55.103.077/1013**	Please include the desired lens in your order

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

4

RK 90

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

RK 90 keycaps, aluminum, 14 mm

Pict.: natural anodized
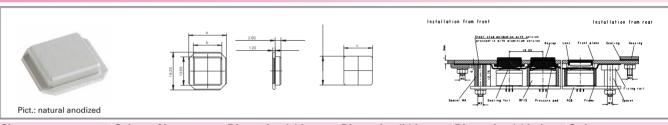
General data

The RK 90 system design with metal keycaps is fairly safe against mechanical, thermal or chemical effects. Combined with a metal front panel, this data entry system offers maximum protection against vandalism. Tried and tested RF 15/19 or RACON PCB keyswitches are employed 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.
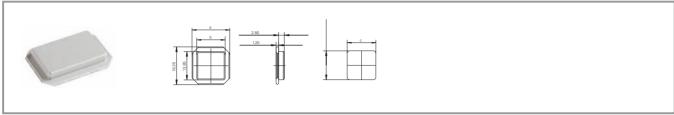
RK 90 keycaps, aluminum, 14 mm, 1-module

Pict.: natural anodized

Size	Colour of lens	Dimension (a) keycap behind front panel	Dimension (b) keycap 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**

4

RK 90

Stock items are marked by **bold printed** order numbers.
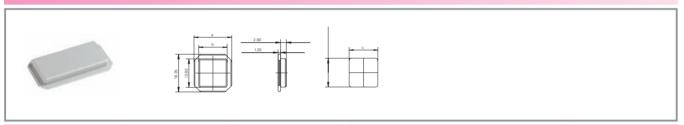
RK 90 keycaps, aluminum, 14 mm, 1^1/$_2$-module

Size	Colour of lens	Dimension (a) keycap behind front panel	Dimension (b) keycap in front of front panel	Dimension (c) hole patterns final size	Order no.
1^1/$_2$-module	aluminum colourless anodized	18.35 x 25.35 mm	13.85 x 20.85 mm	14.00 x 21.00 mm	**5.46.500.003/4010**

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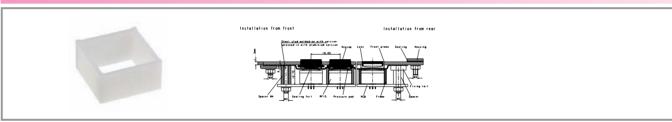
Size	Colour of lens	Dimension (a) keycap behind front panel	Dimension (b) keycap in front of front panel	Dimension (c) hole patterns final size	Order no.
2-module	aluminum colourless anodized	18.35 x 32.35 mm	13.85 x 27.85 mm	14.00 x 28.00 mm	**5.46.500.004/4010**

4

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

RK 90 special accessories

opaque light grey   charcoal grey

Blocking frame for RF 15, 1-module

Short text	Feature 1	Feature 2	Order no.
Blocking frame for RF 15	transparent		5.55.103.133/0214

Blocking frames can be used for blocking fitted RF 15 keys! The RK 90 keycaps cover the keyswitch in such a way that the blocked key cannot be visually distinguished from the functional keys.

Covers (blocking frame and lens) for RF 15, 1-module

Pict.: opaque light grey

Short text	Feature 1	Feature 2	Order no.
Cover for RF 15, 1.7 mm high, 1-module, opaque light grey	opaque light grey	1-module	5.00.350.802/0700

Covers consist of blocking frames and lenses. The blocking frame is used for blocking fitted RF 15 keys. The blocked key is fitted with lenses that are flush with the front panel.

4

RK
90

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

RAFI
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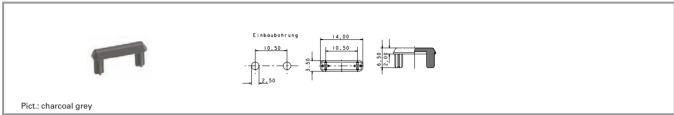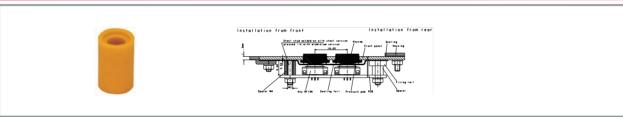
Fin, to avoid inadvertent operation

Pict.: charcoal grey

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

Spacer M 4

Short text	Feature 1	Feature 2	Order no.
Spacer M 4 for RK 90 with RF 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
Spacer M 4 for RK 90 with RF 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
Spacer M 4 for RK 90 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

Silicone foil 600 x 590x 0.45 mm, for RF 15, RF 15N, RACON 8/12

Short text	Feature 1	Feature 2	Order no.
Silicone foil 600 x 590x 0.45 mm, for RK 90 with RF 15, RF 15 N or RACON 8/12 keys	transparent	600 x 590 x 0.45 mm	7.16.102.006/0000

4

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 IP 65 (keylock switch IP 40).

Content

4

RG 85 III

RG 85 III short-stroke system

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	O V – LED
4	Edge illuminat./signal indicator 1st colour + 24 V DC +/- 20%
5	Symbol illumination + 24 V DC +/- 20%
6	Edge illuminat./signal indicator 2nd colour + 24 V DC +/- 20%
7/8	NC contact

Pushbutton Features

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

Signal Indicator Features
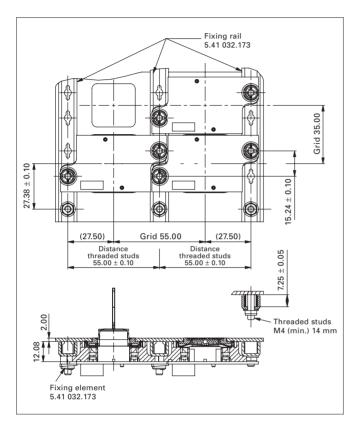
● Lens shape round, square or triangular (arrow shape)
● Lens material: Translucent plastic material
● Fully illuminated with 5 LED

4
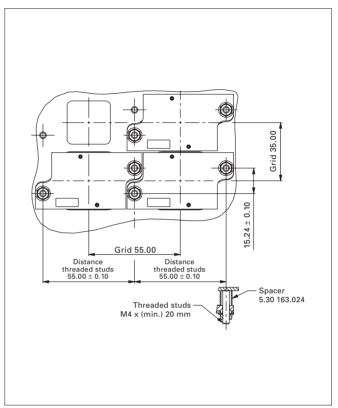
RG 85 III

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

3.00

Ø 30.00 +0.10 −0.05

R2.90 0.0 −0.10

□ 26.10 +0.10 0

4

RG
85 III

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RG 85 III keyswitch

Technical data

Dimensions

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

Mechanical design

Version	round or square
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	2 LED
Edge illumination	4 LED pro colour

Mechanical characteristics

Operating force approx.	3.5 N
Operating travel approx.	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 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
Resistance to constant environment	IEC 600 68-2-3 and 2-30
Resistance at variable environment	IEC 600 68-2-14 and 2-33
Operating life min.	1000000
Degree of protection rail mounting	IP40
Degree of protection single mounting	IP65
Flammability of materials	according to UL 94 HB
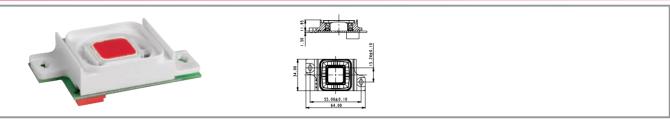
Typical accessories RG 85 III keyswitch

Description	Photo	Order no.	Additional accessories see page
Cable, 8 wires, with socket connectors on both ends, length 1 m		**5.03.772.261/0000**	4 - 110
RG 85 III lenses for keyswitches, round, stainless steel		**5.04.914.000/2000**	4 - 105
RG 85 III lenses for keyswitches, square, aluminum		**5.04.915.100/2000**	4 - 106

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RG 85 III

RG 85 III keyswitch, round design, without lens
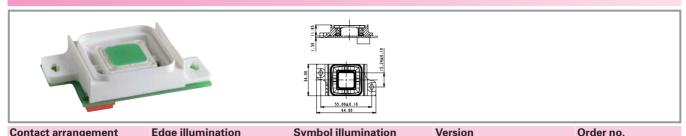
Contact arrangement	Edge illumination	Symbol illumination	Version	Order no.
1 NO	4 LED white		round	**3.99.400.111/2000**
1 NO	4 LED red		round	**3.99.400.111/3000**
1 NO	4 LED yellow		round	3.99.400.111/4000
1 NO	4 LED green		round	3.99.400.111/5000
1 NO	4 LED blue		round	**3.99.400.111/6000**
1 NO	4 LED white, 4 LED blue		round	3.99.400.111/7000
1 NO	4 LED green, 4 LED red		round	3.99.400.111/8000
1 NO	4 LED white	2 LED yellow	round	3.99.400.111/2400
1 NO	4 LED red	2 LED red	round	3.99.400.111/3300
1 NO	4 LED yellow	2 LED green	round	3.99.400.111/4500
1 NO	4 LED green	2 LED green	round	3.99.400.111/5500
1 NO	4 LED blue	2 LED blue	round	3.99.400.111/6600
1 NO	4 LED white, 4 LED blue	2 LED blue	round	3.99.400.111/7600
1 NO	4 LED green, 4 LED red	2 LED red	round	3.99.400.111/8300
1 NC + 1 NO	4 LED white		round	3.99.400.131/2000
1 NC + 1 NO	4 LED red		round	**3.99.400.131/3000**
1 NC + 1 NO	4 LED yellow		round	3.99.400.131/4000
1 NC + 1 NO	4 LED green		round	3.99.400.131/5000
1 NC + 1 NO	4 LED blue		round	3.99.400.131/6000
1 NC + 1 NO	4 LED white, 4 LED blue		round	3.99.400.131/7000
1 NC + 1 NO	4 LED green, 4 LED red		round	3.99.400.131/8000

Technical data see page 4 - 94

Please order lenses (round shape) separately.

4

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

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RG 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 - 94

Please order lenses (square shape) separately.

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

Keyswitches

RG 85 III keylock switch

Technical data

Dimensions

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

Mechanical design

Version	round or square
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	4 LED pro colour
Lock	cylinder lock, lock type 5201
Key removal position	Pos. 0 + 1

Mechanical characteristics

Rotating angle	1 x 90 °
Switching travel NO	1 mm

Electrical characteristics

Rated voltage min.	3 V
Rated voltage max.	42 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 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
Resistance to constant environment	IEC 600 68-2-3 and 2-30
Resistance at variable environment	IEC 600 68-2-14 and 2-33
Operating life min.	50000
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 - 109
RG 85 III lenses for keylock switches, square, aluminum		**5.04.915.201/2000**	4 - 109

4

RG
85 III

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

RAFI

RG 85 III keylock switch, round design, without lens
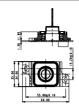
Contact arrangement	Edge illumination	Rotating angle	Version	Order no.
1 NO	4 LED white	1 x 90 °	round	**3.99.400.141/2000**
1 NO	4 LED red	1 x 90 °	round	**3.99.400.141/3000**
1 NO	4 LED yellow	1 x 90 °	round	3.99.400.141/4000
1 NO	4 LED green	1 x 90 °	round	3.99.400.141/5000
1 NO	4 LED blue	1 x 90 °	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 - 98

Please order lenses (round shape) separately.

4

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

RG 85 III keylock switch, square design, without lens

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

Technical data see page 4 - 98

Please order lenses (square shape) separately.

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

RAFI
SOLUTIONS WITH PASSION

RG 85 III signal indicator, without lens

Technical data

Dimensions
Length	64 mm
Mounting grid min.	55 x 35 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	5 LED for one colour

Electrical characteristics
Operating voltage 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
Resistance to constant environment	IEC 600 68-2-3 and 2-30
Resistance at variable environment	IEC 600 68-2-14 and 2-33
Degree of protection rail mounting	IP40
Degree of protection single mounting	IP65
Flammability of materials	according to UL 94 HB
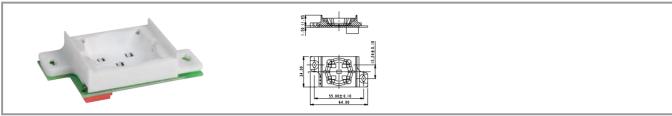
Typical accessories RG 85 III signal indicator, without lens

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 - 110
RG 85 III lens, square, for signal indicators		**5.04.903.009/0000**	4 - 110
RG 85 III lens, round, for signal indicators		**5.04.903.010/0000**	4 - 109
RG 85 III lens, triangular, for signal indicators		**5.04.903.011/0000**	4 - 110

4

RG
85 III

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

Keyswitches

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 - 102

Please order round, square or triangular lenses separately.

4

RG
85 III

RG 85 III accessories

RG 85 III lenses for keyswitches, round

Version	Form of lens	Legending colour	Legending text	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

RG 85 III

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

Keyswitches

RAFI
SOLUTIONS WITH PASSION

Version	Form of lens	Legending colour	Legending text	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

Keyswitches

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

Version	Form of lens	Legending colour	Legending text	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

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

4

RG 85 III lenses for keyswitches, square

Version	Form of lens	Legending colour	Legending text	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
aluminum	square	translucent white	3	5.04.915.103/2000

RG 85 III

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

Version	Form of lens	Legending colour	Legending text	Order no.
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
stainless steel	square	translucent white	3	5.04.914.103/2000

4

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

RAFI
SOLUTIONS WITH PASSION

Version	Form of lens	Legending colour	Legending text	Order no.
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.

Keyswitches

RG 85 III lenses for keylock switches, round

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

RG 85 III lens, round, for signal indicators

Version	Form of lens	Legending colour	Legending text	Order no.
plastic translucent	round			**5.04.903.010/0000**

4

RG
85 III

Keyswitches

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

RG 85 III lens, square, for signal indicators

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

Cable, 8 wires, with socket connectors on both ends

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

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

4

Fixing rail, length 490 mm

Version	Form of lens	Legending colour	Legending text	Order no.
length: 490 mm				**5.41.032.173/7512**

Spacer

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

4

Fixing piece for mounting the elements with the rail fixing method

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

RG
85 III

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

RS 76 full-travel keyswitches

The RAFI full-travel keyswitches RS 76 are modular systems for designing individual key blocks and keyboards in the 3/4 inch (= 19.05 mm) grid.

Definitions

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

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

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

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

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

Soldering
The soldering temperature should not exceed 250 °C, the soldering time not be longer tahn 3 seconds.
All RS 76 C-keyswitches can be soldered in solder bathes. The assembled PCB should be cleaned only by using brushing machines from the soldering side ot the PCB. The cleaning agend should not exceed the component side ot the PCB.

All keyswitches can be flow-soldered, provided that an acid fluxer is used and that the whole unit is cleaned afterwards in de-ionised water.

Cleaning
Keyswitches should not be washed in freon or similar substances as a lubricant is used, otherwise the operating life of the keyswitches will be reduced.
If complete keyboards are to be cleaned by dipping, it must be remembered that they keyboard may only be dipped in the dipping solution as far as the component side of the PCB.

Legending of keycaps

Keycaps can be legended by different methods:

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

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

Engraving
In this labour intensive process the keycaps are engraved with the required symbol, then inlaid with ink. Only used for small volumes.
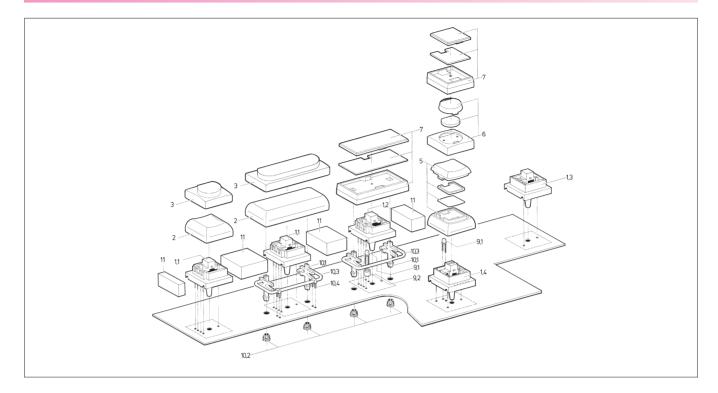
Laser-printing
This method of legending can be recommended when complete keyboards are required in different keyboard layouts for which RAFI will develop the respective software. The keyboards can then be legended within a short time. This method of legending ist particularly recommended for average to large volumes.

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

4

RS 76

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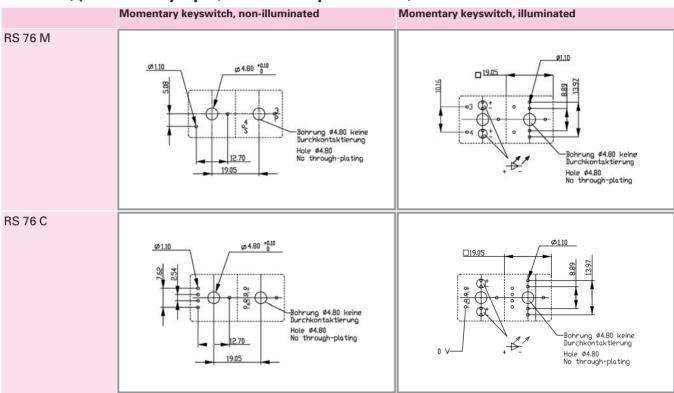
* These parts are included as a complete packet in the delivery of keycaps
  ≥ 2-module.

4

Hole Pattern PCB RS 76 M/RS 76 C
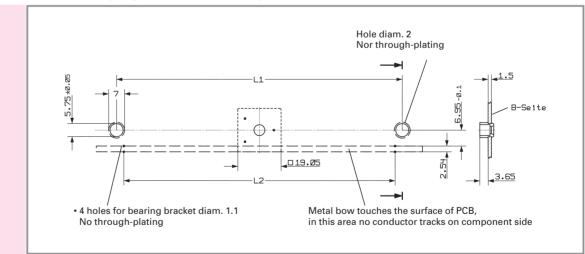
The hole patterns apply to the horizontal position of the keycaps only. Should they be in a vertical position, the momentary keyswitch must be mounted accordingly, i.e. rotated by 90°.

For 1 – 1³/₄-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 keycaps, additional holes must be provided for the accessories.
In the case of keycaps < 2-module, neither accessories nor holes are required.
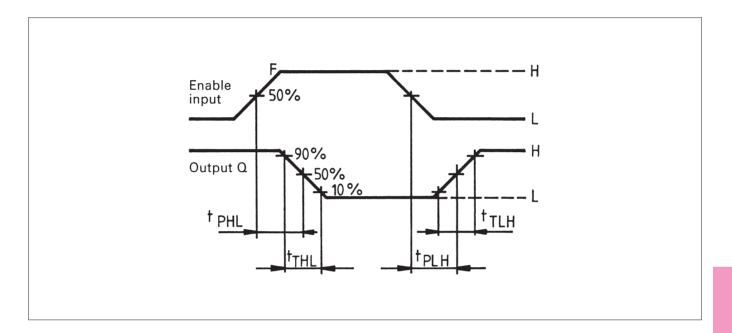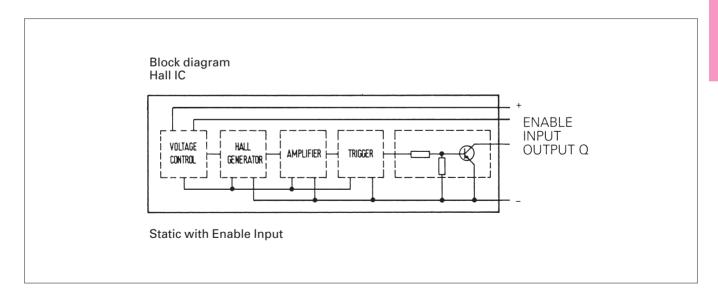
Specific Technical Data RS 76 C

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

Block diagram
Hall IC

Static with Enable Input
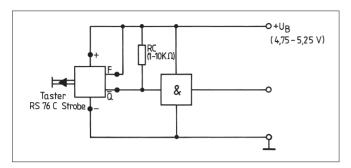
Examples for Application RS 76 C

Driving of logic components

Indication of logical states

Driving of a PNP transistor

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

Use in keyboards

RS 76 M keyswitch, non-illuminated

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

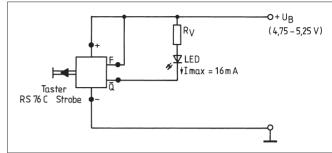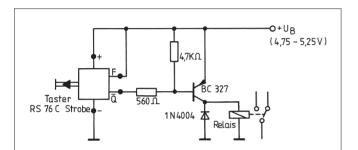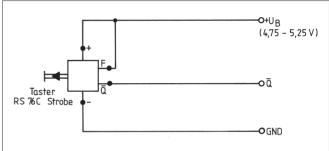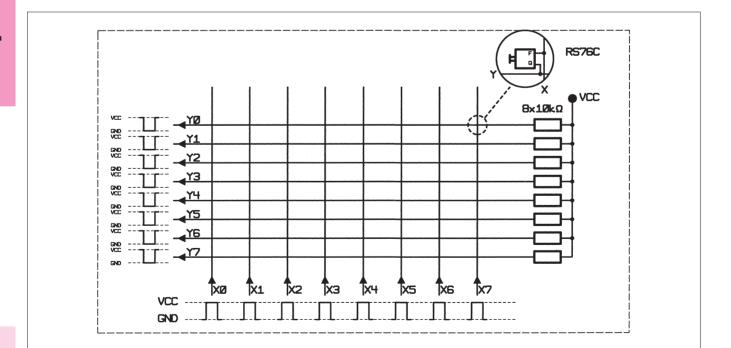|	
Rated voltage min.	2 V (with Diode 3 V)
Rated voltage max.	42 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max.	1 W
Contact resistance when new max.	100 mΩ (ohne Diode)

Contact resistance acc. to life max.	3 Ω (ohne Diode)
Insulation resistance	10^9 Ω
ESD strength max.	8 kV
Bouncing time max.	5 ms

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (rail)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	10^7
Degree of protection	IP40
Flammability of materials	UL 94 HB
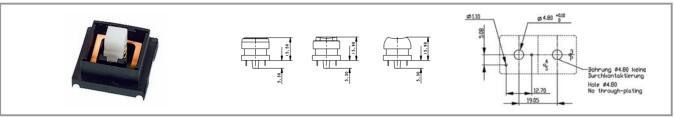
Typical accessories RS 76 M full-travel keyswitch, non-illuminated

Description	Photo	Order no.	Additional accessories see page
Keycap for RS 76 with legend insert		**5.04.665.221/5520**	4 -131
Keycap for RS 76, opaque, with nail protection		**5.80.000.000/0152**	4 -130
Keycap for RS 76, opaque		**5.82.000.000/0152**	4 -130

4

RS 76

RS 76 M keyswitch, non-illuminated
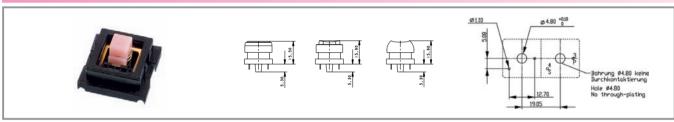
Contact function	Illumination	Contact arrangement	Contact materials	Operating travel	Operating force max.	Order no.
momentary	no	1 NO	Au alloy	4 mm	0.9 N	**3.13.002.502/0000**
momentary	no	1 NO	Au alloy	4 mm	1.4 N	**3.13.002.512/0000**

Technical data see page 4 - 120

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

RS 76 M keyswitch with diode, non-illuminated

Contact function	Illumination	Contact arrangement	Contact materials	Operating travel	Operating force max.	Order no.
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 - 120

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

4

RS 76

Keyswitches

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

RS 76 M keyswitch, illuminated

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.	42 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max.	1 W
Contact resistance when new max.	200 mΩ
Contact resistance acc. to life max.	3 Ω
Insulation resistance	10^9 Ω
ESD strength max.	8 kV
Bouncing time max.	10 ms

Other specifications

Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max. (rail)	+50 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	10^7 momentary, 10^5 latching
Degree of protection	IP40
Flammability of materials	UL 94 HB
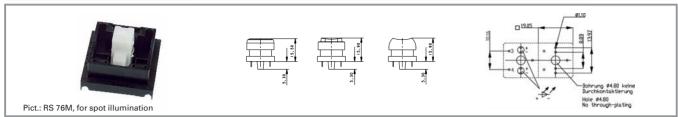
Typical accessories RS 76 M keyswitch, illuminated

Description	Photo	Order no.	Additional accessories see page
Cover for RS 76 IP40, 1-module, dark grey		**5.04.520.174/0152**	4 - 138
Keycap for RS 76 illuminated, with legend insert		**5.04.665.521/5520**	4 - 132
Keycap for RS 76, illuminated, with nail protection and legend insert		**5.04.665.911/5520**	4 - 133
Keycap for RS 76 with light bar		**5.82.110.000/0242**	4 - 132
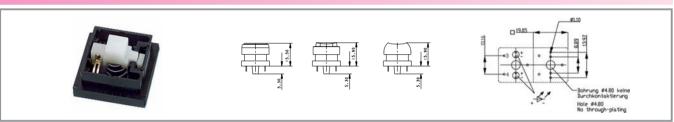
4

RS 76

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

Keyswitches

RS 76 full-travel keyswitches

RAFI
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RS 76 M keyswitch, illuminated, momentary

Pict.: RS 76M, for spot illumination

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

Technical data see page 4 - 122

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

RS 76 M keyswitch, illuminated, latching
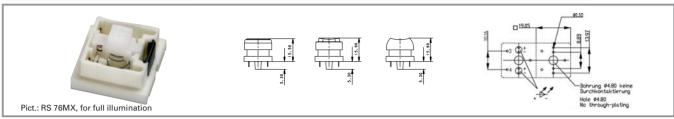
Contact function	Contact system	Illumination	Recommended key grid	Order no.
latching	bridge contact	spot illumination with 3 mm LED possible		3.13.002.022/0000

Technical data see page 4 - 122

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

4

RS
76

Keyswitches

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

4 - 123

RAFI
SOLUTIONS WITH PASSION

RS 76 MX keyswitch, fully illuminated

Pict.: RS 76MX, for full illumination

Contact function	Contact system	Illumination	Recommended key grid	Order no.
momentary	bridge contact	full illumination with 2 SMD LED possible		3.13.002.922/0000

Technical data see page 4 - 122
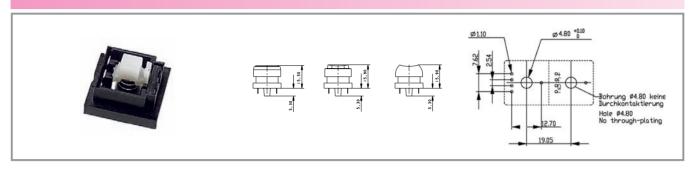
Accessories:
Keycap, fully illuminated, for RS 76 MX: 5.05.511.168/0209
Keycap, fully illuminated, for RS 76 MX: 5.05.511.168/0754

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

Keyswitches

RS 76 full-travel keyswitches

RAFI
SOLUTIONS WITH PASSION

RS 76 C keyswitch, non-illuminated

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 $U_{IH} = 2.4$V   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) bei 25 °C, t_{PHL} 3 µs
Output switching times (Q) bei 25 °C, t_{PLH} 4 µs
Output switching times (Q) bei 25 °C, t_{THL} 1 µs
Output switching times (Q) bei 25 °C, t_{TLH} 2 µs

Other specifications
Reliability of Hall-IC's 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
Resistance to constant environment   according to IEC 600 68-2-3 and 2-30
Resistance at variable environment   according to IEC 600 68-2-14 and 2-33
Operating life min.(mechanical)   see order block
Degree of protection   IP40
Flammability of materials   UL 94 HB

Typical accessories RS 76 C keyswitch, non-illuminated
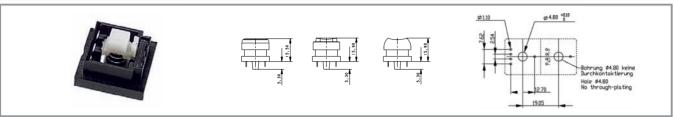
Description	Photo	Order no.	Additional accessories see page
Keycap for RS 76 with legend insert		**5.04.665.221/5520**	4 - 131
Keycap for RS 76, opaque, with nail protection		**5.80.000.000/0152**	4 - 130
Keycap for RS 76, opaque		**5.82.000.000/0152**	4 -130

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

RS 76

RS 76 C keyswitch, non-illuminated
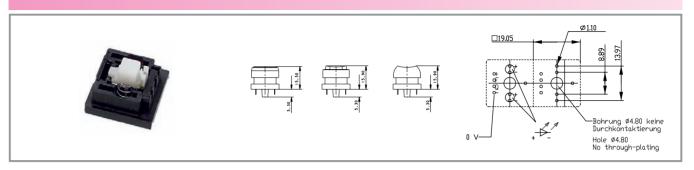
Contact function	Operating life min.(mechanical)	Illumination	Operating force max.	Operating travel	Order no.
momentary	10^8	no	0.7 N	4 mm	**3.13.001.010/0000**
momentary	10^8	no	1 N	4 mm	**3.13.001.210/0000**

Technical data see page 4 - 126

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

4

RS 76 C keyswitch, 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	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) bei 25 °C, t_{PHL}	3 µs
Output switching times (Q) bei 25 °C, t_{PLH}	4 µs
Output switching times (Q) bei 25 °C, t_{THL}	1 µs
Output switching times (Q) bei 25 °C, t_{TLH}	2 µs

Other specifications

Reliability of Hall-IC's 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
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life min.	see order block
Degree of protection	IP40
Flammability of materials	UL 94 HB

Typical accessories RS 76 C keyswitch, illuminated

Description	Photo	Order no.	Additional accessories see page
Cover for RS 76 IP 40, 1-module, dark grey		**5.04.520.174/0242**	4 - 138
Keycap for RS 76 IP 40, illuminated, with legend insert		**5.04.665.521/5520**	4 -132
Keycap for RS 76 IP 40, illuminated, with nail protection and legend insert		**5.04.665.911/5520**	4 -133

Stock items are marked
by **bold printed** order numbers.
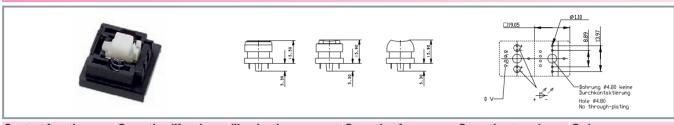
Typical accessories RS 76 C keyswitch, illuminated

Description	Photo	Order no.	Additional accessories see page
Keycap for RS 76 with light bar		**5.82.110.000/0242**	

RS 76 C keyswitch, illuminated, momentary

Contact function	Operating life min.	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 - 128

RS 76 C keyswitch, illuminated, latching

Contact function	Operating life min.	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 - 128

4

RAFI
SOLUTIONS WITH PASSION

Keycaps for RS 76, non-illuminated

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

Keycap for RS 76, opaque

Pict.: dark grey

Size of keycap	Illuminable	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**

Technical data see page 4 - 130

Keycap sets available in two-shot moulded design.

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

Keycap for RS 76, opaque, with nail protection

Pict.: light beige

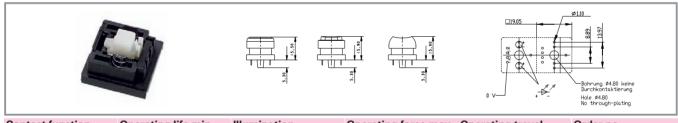| Size of keycap	Illuminable	Colour of keycap / legending	Colour of lens / legend insert	Order no.
1-module	no	charcoal grey/-		**5.80.000.000/0152**
1-module	no	light grey/-		**5.80.000.000/0242**

Technical data see page 4 - 130

Keycap sets available in two-shot moulded design.

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

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

Keyswitches

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RS
76

Keycap for RS 76 with legend insert

Size of keycap	Illuminable	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**

Technical data see page 4 - 130

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

Other colours on request.

4

RS
76

RAFI
SOLUTIONS WITH PASSION

Keycaps for RS 76, illuminated

light beige

Keycap for RS 76 with light bar

Pict.: light beige

Size of keycap	Illuminable	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**

Technical data see page 4 - 132

Other colours on request.

4

Keycap for RS 76, illuminated, with legend insert

Size of keycap	Illuminable	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**

RS 76

Technical data see page 4 - 132

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

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

Keyswitches

Keycap for RS 76, illuminated, with nail protection and legend insert

Pict.: light grey, yellow lens

Size of keycap	Illuminable	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**

Technical data see page 4 - 132

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

Keycap for RS 76, illuminated, with legend insert

Pict.: red

Size of keycap	Illuminable	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**

Technical data see page 4 - 132

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

4

RS 76

Keycap, fully illuminated, for RS 76 MX

Size of keycap	Illuminable	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
$1^1/_4$-module	yes	white/-	white translucent/-	5.05.511.169/0209
$1^1/_2$-module	yes	white/-	white translucent/-	5.05.511.170/0209
$1^3/_4$-module	yes	white/-	white translucent/-	5.05.511.171/0209
$1^1/_4$-module with light conductor	yes	white/-	white translucent/-	5.05.511.173/0209
5-module	yes	light grey/-	white translucent/-	5.00.888.171/0000

Technical data see page 4 - 132

Laser-printed versions available on request.

4

RS 76

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

Keyswitches

RAFI
SOLUTIONS WITH PASSION

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

Pict.: opaque light beige / brown

opaque light beige / brown

Keycap set for RS 76, symbols A-Z

Pict.: opaque light beige / brown

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

light beige

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

Technical data see page 4 - 136

Other symbols and colours on request.

4

RS
76

Keyswitches

RAFI
SOLUTIONS WITH PASSION

Keycap set for RS 76, 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**
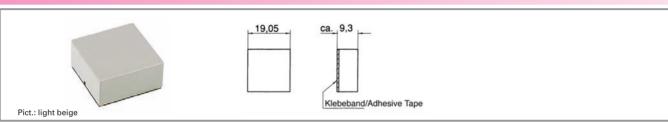
Technical data see page 4 - 136

Other symbols and colours on request.

4

RS
76

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

RS 76 accessories

Pict.: light beige   dark grey

Cover for RS 76 IP40

19,05   ca. 9,3

Klebeband/Adhesive Tape

Pict.: light beige

Short text	Feature 1	Feature 2	Order no.
Cover for RS 76 IP40, 1/4-module, charcoal grey	charcoal grey	$^1/_4$-module	**5.04.520.171/0152**
Cover for RS 76 IP40, 1/4-module, light grey	opaque light grey	$^1/_4$-module	**5.04.520.171/0242**
Cover for RS 76 IP40, 1/2-module, charcoal grey	charcoal grey	$^1/_2$-module	**5.04.520.172/0152**
Cover for RS 76 IP40, 1/2-module, light grey	opaque light grey	$^1/_2$-module	**5.04.520.172/0242**
Cover for RS 76 IP40, 3/4-module, charcoal grey	charcoal grey	$^3/_4$-module	**5.04.520.173/0152**
Cover for RS 76 IP40, 3/4-module, light grey	opaque light grey	$^3/_4$-module	**5.04.520.173/0242**
Cover for RS 76 IP40, 1-module, charcoal grey	charcoal grey	1-module	**5.04.520.174/0152**
Cover for RS 76 IP40, 1-module, light grey	opaque light grey	1-module	**5.04.520.174/0242**

Other colours on request.

4

RS
76

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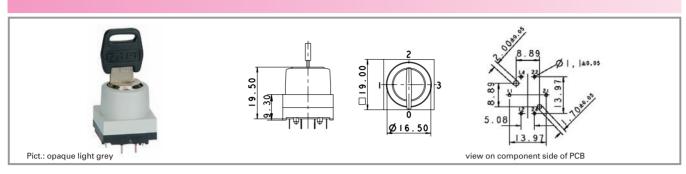by **bold printed** order numbers.

Keyswitches

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

**Key
Swit-
ches**

Keylock and rotary switches for PCB

RAFI
SOLUTIONS WITH PASSION

Keylock switch IP54, MICROMEC

Pict.: opaque light grey

view on component side of PCB

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 / arrangement	cross contact self cleaning
Contact function	see order block
Contact materials	Au alloy
Illuminability	no
Lock	Micromec
Wafers	5
Lock type	001
Number of locking positions	500
Main key	on request
Symmetric key	no
Group key	on request
Key removal position	see order block
General key	on request

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

Electrical characteristics
Rated voltage	2 ... 42 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	10000
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
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Flammability	UL 94 HB

Typical accessories Keylock switch IP54, MICROMEC

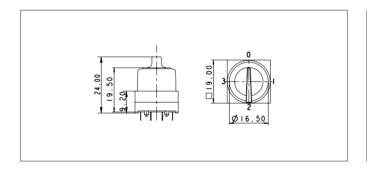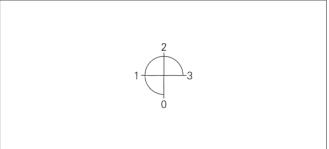| Description	Photo	Order no.	Additional accessories see page
O-ring for keylock switch		5.30.120.015/0100	5 - 25
Spare key, for single action, e.g. 1 x 90° (delivery content 1 key)		5.58.007.001/0000	

Key Switches
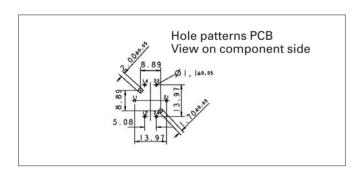
Accessories Keylock switch IP54, MICROMEC

Description	Photo	Order no.	Page
Spare key for double action, e.g. 2x90° (delivery content 2 keys)		5.58.008.001/0000	
Spare key for triple action, e.g. 3x90° (delivery content 3 keys)		5.58.009.001/0100	
Spare key for quadruple action, e.g. 4x90° (delivery content 4 keys)		5.58.010.001/0100	

Configuration Diagram/Dimensional Drawing

Hole patterns PCB
View on component side

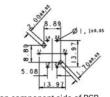| Switching position	Contact function
0	
1	
2	
3	

4

Key
Swit-
ches

Keylock switch IP54, MICROMEC

view on component side of PCB

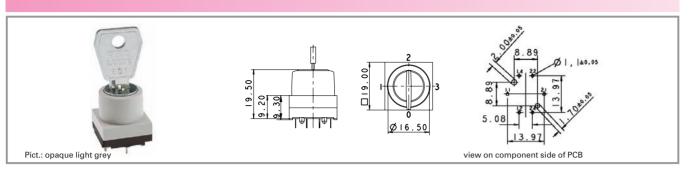| Contact function	Colour	Rotating angle		Key removal position	Order no.
momentary	charcoal grey	1 x 40°		0	**3.13.026.041/0000**
momentary	opaque light grey	1 x 40°		0	3.13.026.541/0000
latching	charcoal grey	1 x 90°		0	**3.13.026.001/0000**
latching	opaque light grey	1 x 90°		0	**3.13.026.501/0000**
latching	charcoal grey	1 x 90°		0+1	3.13.026.006/0000
latching	opaque 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	opaque 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	opaque 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	opaque 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	opaque 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	opaque 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	opaque 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	opaque 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	opaque light grey	4 x 90° without stop		0+1+2+3	3.13.026.536/0000

Technical data see page 4 - 140

2 keys included. Other lock variants available on request.

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

4

Key Switches

Keylock switch IP54, EUROLOCKS

Pict.: opaque light grey

view on component side of PCB

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 / arrangement	cross contact self cleaning
Contact function	latching
Contact materials	Au alloy
Illuminability	no
Lock	Eurolocks
Wafers	5
Lock type	801
Number of locking positions	50
Main key	no
Symmetric key	yes
Group key	no
Key removal position	see order block
General key	no

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

Electrical characteristics
Rated voltage	2 ... 42 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	10000
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
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Flammability	UL 94 HB

Typical accessories Keylock switch IP54, EUROLOCKS

Description	Foto	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.

Keyswitches

Keylock switch IP54, EUROLOCKS

Pict.: opaque light grey   view on component side of PCB

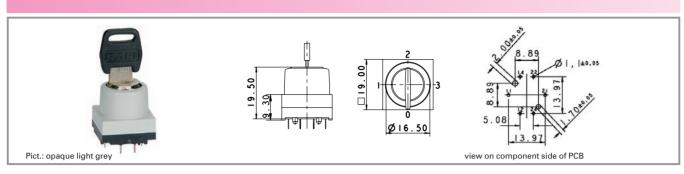| Contact function	Colour	Rotating angle		Key removal position	Order no.
latching	charcoal grey	1 x 90°	1 0	0	**3.13.009.001/0000**
latching	opaque light grey	1 x 90°	1 0	0	**3.13.009.006/0000**
latching	charcoal grey	1 x 90°	1 0	0+1	**3.13.009.031/0000**
latching	opaque light grey	1 x 90°	1 0	0+1	3.13.009.036/0000

Technical data see page 4 - 144

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

4

Key
Swit-
ches

Priority keylock switch IP54

Pict.: opaque light grey

view on component side of PCB

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 / arrangement	cross contact self cleaning
Contact function	see order block
Contact materials	Au alloy
Illuminability	no
Lock	Micromec
Wafers	5
Lock type	001
Number of locking positions	500
Main key	yes
Symmetric key	no
Group key	yes
Key removal position	see order block
General key	yes

Mechanical characteristics

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

Electrical characteristics

Rated voltage	2 ... 42 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	10000
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
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Flammability	UL 94 HB

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

Keyswitches

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Typical accessories Priority keylock switch IP54

Description	Photo	Order no.	Additional acces-sories see page
O-ring for keylock switch		5.30.120.015/0100	5 - 25
Set of keys for 2 x 90° type (delivery content 2 keys)		5.58.099.012/0000	
Set of keys for 3 x 90° type (delivery content 3 keys)		5.58.099.013/0000	

Priority keylock switch IP54

Pict.: charcoal grey

view on component side of PCB

Contact function	Colour	Rotating angle		Key removal position	Order no.
latching	charcoal grey	2 x 90°		0	**3.13.027.001/0000**
latching	opaque 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	opaque 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	opaque 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	opaque light grey	3 x 90°		0+1+2+3	3.13.027.516/0000

Technical data see page 4 - 146

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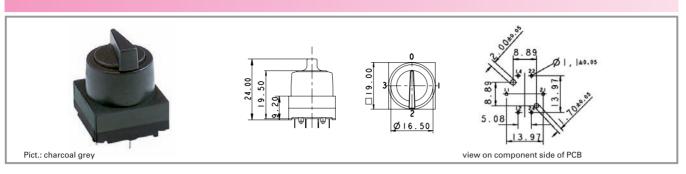Other lock variants available on request.
For the switching arrangement, see IP54 Micromec keylock switch.
Either 2 or 3 different keys are required, depending on the angle between positions. Key 1 can switch to position 1, key 2 can switch to position 1 and 2, etc.

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Rotary switch IP40

Pict.: charcoal grey

view on component side of PCB

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 / arrangement	cross contact self cleaning
Contact function	see order block
Contact materials	Au alloy
Illuminability	no

Mechanical characteristics
Torque against stop min.	0.45 Nm
Rated power max.	1 W

Electrical characteristics
Rated voltage max.	42 V

Other specifications
Rotating angle	see order block

Electrical characteristics
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

Other specifications
Operating life	50000
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
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Flammability	UL 94 HB

Electrical characteristics
ESD strength max.	8 KV

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Key Swit- ches

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

Rotary switch IP40

Pict.: charcoal grey

view on component side of PCB

Contact function	Colour	Rotating angle		Order no.
latching	charcoal grey	1 x 90°		3.13.007.001/0000
latching	charcoal grey	2 x 90°		3.13.007.011/0000
latching	charcoal grey	3 x 90°		3.13.007.021/0000
latching	charcoal grey	4 x 90°		3.13.007.031/0000

Technical data see page 4 - 148

Other colour variants available on request
For the switching arrangement, see IP54 MICROMEC keylock switch.

Key
Swit-
ches

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