



PCB Keyswitches

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Examples for Applications Standards





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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-Vol-tage Directive 73/23/EWG – be divided into the following groups:

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

All products with an operating voltage $U_B < 50 V$

F. ex. MICON, RACON, RF 15, RS 76, for these components no directive applies.

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

EMC-Law

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

Declarations of Conformity

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

Marking

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

UL-approval

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

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

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

PCB Keyswitches





General Data

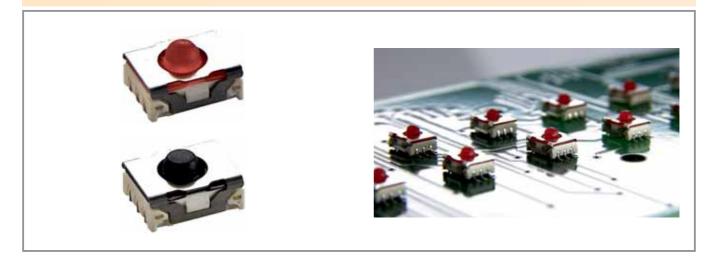
Short-travel switch range MICON 5, with sealed contact system, clear key click and extremely reliable switching. Use under overlay or under keycaps RK 90. THT and SMT versions which can be mounted automatically.

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MICON



NEW **MICON 5 - Short-travel keyswitches**



General Data

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

The features at a glance:

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

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

Technical Data

MICON

Dimensions Length of housing Width of housing **Overall height**

Mechanical design

Mounting Terminals Contact system Contact arrangement **Contact materials** Illumination

Mechanical characteristics Operating force F1 (±20%)

Switching travel S2 (±0.15 mm)

Electrical characteristics Rated voltage min. Rated voltage max.

6.4 mm 5.1 mm see order block

soldering see order block snap-action contact 1 NO Au no

see order block see order block

0.02 V 35 V

Rated current min. Rated current max. Rated power max. (ohmic load) Contact resistance when new Rated voltage restistance AC Insulation resistance

Other specifications

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

Operating life (test force) Solder heat resistance / Solderability Flammability of materials Packing Produkt code

0.01 mA 100 mA 1 W 100 m Ω 250 V $10^9 \Omega$

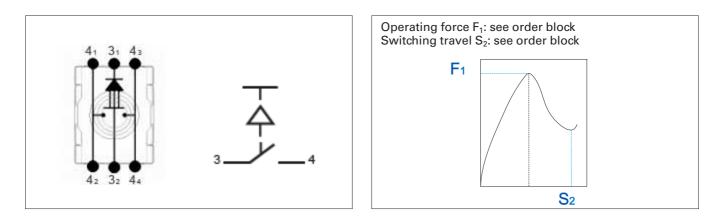
-40 °C +90 °C IEC 60068-2 -14, -30,-33, -78 see order block see order block

UL 94 V1 see order block see order block

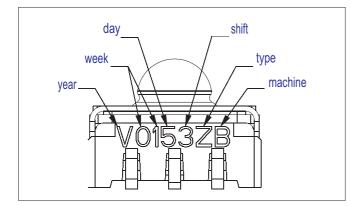


MICON 5 Circuit Diagram

MICON 5 Force-Travel Diagram



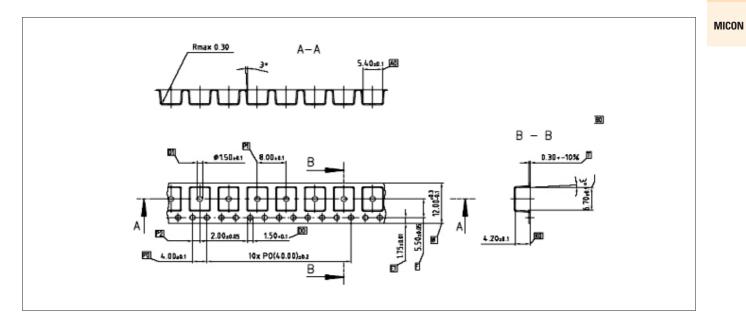
MICON 5 Product Code acc. to DIN EN ISO 9001 (EN ISO 8402)



Traceability acc. to (EN ISO 8402) DIN EN ISO 9001, 2000, 7.5.3

A 7-digit code is printed on the housing of the keyswitch. This code informs about production date, production shift and type of product.

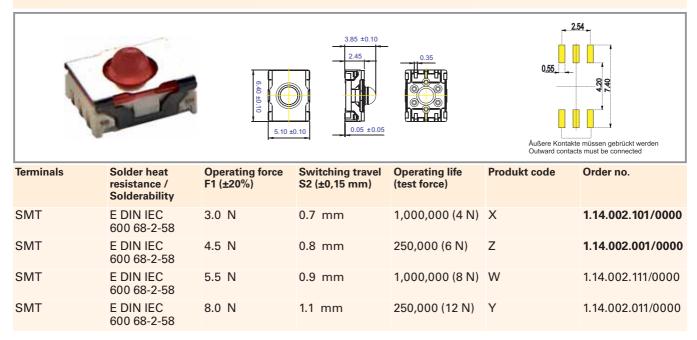
MICON 5 SMT Version, Tape and Reel Drawing



Δ



NEW MICON 5 - Short-travel keyswitch, SMT Standard



Technical data see page 4 - 4

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

Mounting hints:

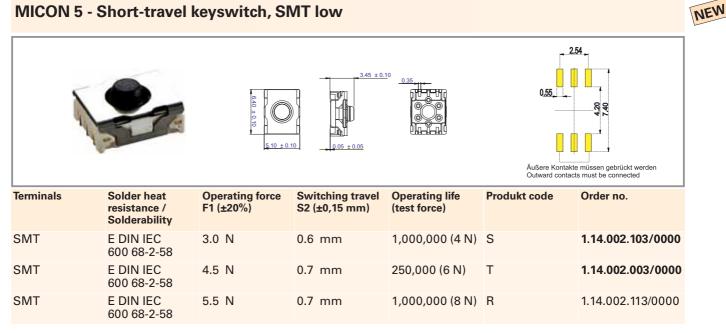
Special pipette (Siemens Siplace order no.: 348514-02), mounting with collect and place head Recommendation for screen printing: 150 µm stencil with 10% reduction of the pad size.

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MICON



MICON 5 - Short-travel keyswitch, SMT low

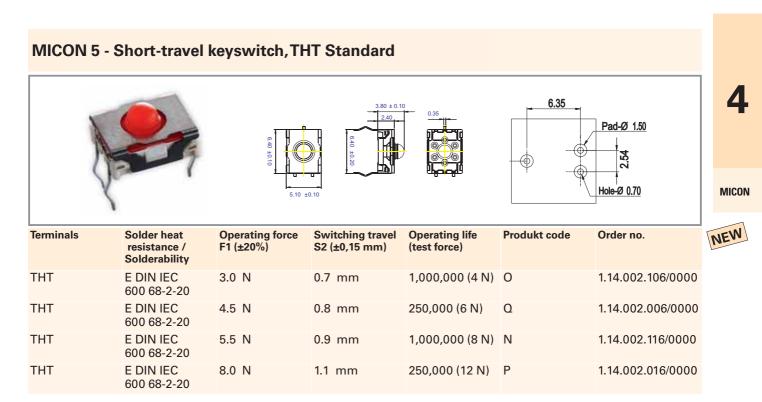


Technical data see page 4 - 4

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

Mounting hints:

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

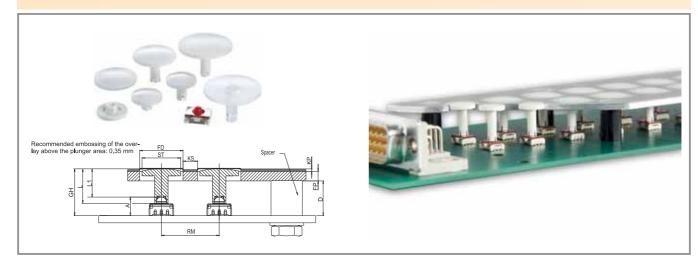


Technical data see page 4 - 4

Packing: in tubes with 102 pieces Keycaps see RK 90



NEW **MICON 5 - Plungers round, not illuminable**



General Data

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

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

Δ

Technical Data

General information

Plunger diameter/size MICON Length of plunger L

see order block see order block



NEW

4

MICON

MICON 5 - Plunger opaque, round, not illuminable

Beispiel: Gesamthöhe GH = 9,70 mm, L = 7,15 mm, ST = 14,5 mm Example: Overall height GH = 9.7 mm, L = 7.15 mm, ST = 14.5 mm 0.0000000000000000000000000000000000			
6.0 mm	3.00 mm	5.46.001.103/0200	
6.0 mm	3.45 mm	5.46.001.104/0200	
6.0 mm	3.95 mm	5.46.001.105/0200	
6.0 mm	4.45 mm	5.46.001.106/0200	
6.0 mm	7.15 mm	5.46.001.107/0200	
6.0 mm	9.95 mm	5.46.001.108/0200	
8.0 mm	3.00 mm	5.46.001.123/0200	
8.0 mm	3.45 mm	5.46.001.124/0200	
8.0 mm	3.95 mm	5.46.001.125/0200	
8.0 mm	4.45 mm	5.46.001.126/0200	
8.0 mm	5.50 mm	5.46.001.121/0200	
8.0 mm	7.15 mm	5.46.001.127/0200	
8.0 mm	9.95 mm	5.46.001.128/0200	
8.0 mm	10.30 mm	5.46.001.122/0200	
11.5 mm	3.00 mm	5.46.001.143/0200	
11.5 mm	3.45 mm	5.46.001.144/0200	
11.5 mm	3.95 mm	5.46.001.145/0200	
11.5 mm	4.45 mm	5.46.001.146/0200	
11.5 mm	5.50 mm	5.46.001.141/0200	
11.5 mm	7.15 mm	5.46.001.147/0200	
11.5 mm	9.95 mm	5.46.001.148/0200	
11.5 mm	10.30 mm	5.46.001.142/0200	

Stock items are marked by bold printed order numbers.

MICON 5 - Short-travel keyswitches



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

Technical data see page 4 - 8

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

4

MICON

MICON 5: Just feel it.



AUTOMOTIVE

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

INSTRUMENTATION-CONTROL-AUTOMATION

MEDICAL TECHNOLOGY

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

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

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

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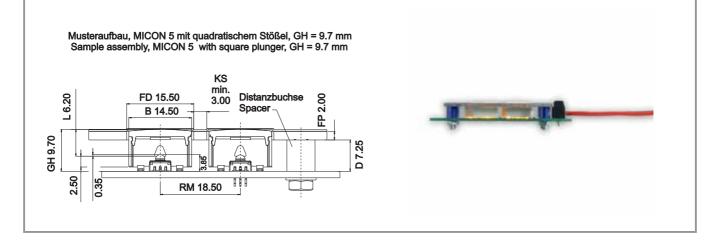


MICON 5 - Short-travel keyswitches



NEW

MICON 5 - Plungers square, illuminable



General Data

Description

- A Height of keyswitch: SMT = 3.85 mm, THT = 3.80 mm
- B Width of plunger (11 x 11 mm, 14,5 x 14,5 mm or 18 x 18 mm)
- D GH FP 0.5 mm (= embossing height 0.35 mm + glue height 0.15 mm)
- FD Front panel cut-out: B + 1 mm
- FP Thickness of front plate
- GH Overall height: A + 5.75 mm
- KS Glue strip min. 3 mm
- R Grid size: FD + KS
- The plungers can only be combined with MICON 5 version Standard (red bubble).

Technical Data

General information Overall height GH Colour of lens

see order block see order block

MICON



NEW

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

		Möglicher Bereich zur LED-Platzierung Permitted area for LED placement Lötpad Solder pad 3.6 Pic. with 2 LED OSRAM LO M676-Q1R1-24
Overall height GH	Colour of lens	Order no.
9.70 mm	red	5.05.511.470/2300
9.70 mm	green	5.05.511.470/2500
9.70 mm	yellow	5.05.511.470/2400
	yonon	01001011110012100
9.70 mm	white	5.05.511.470/2200
9.70 mm	blue	5.05.511.470/2600
	5100	0.00.011.470,2000
12.50 mm	red	5.05.511.471/2300
12.50 mm	green	5.05.511.471/2500
12.00 11111	groon	0.00.011.47 1/2000
12.50 mm	yellow	5.05.511.471/2400
12.50 mm	white	5.05.511.471/2200
		0.00.011.47172200
12.50 mm	blue	5.05.511.471/2600
12.50 mm	opaque blue	5.05.511.476/0600
12.30 mm		5.05.511.470/0000

Technical data see page 4 - 12

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

MICON

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

		Möglicher Bereich zur LED-Platzierung Permitted area for LED placement und die der der der der der der der der der de
Overall height GH	Colour of lens	Order no.
9.70 mm	red	5.05.511.475/2300
9.70 mm	green	5.05.511.475/2500
9.70 mm	yellow	5.05.511.475/2400
9.70 mm	white	5.05.511.475/2200
9.70 mm	blue	5.05.511.475/2600
12.50 mm	red	5.05.511.476/2300
12.50 mm	green	5.05.511.476/2500
12.50 mm	yellow	5.05.511.476/2400
12.50 mm	white	5.05.511.476/2200
12.50 mm	blue	5.05.511.476/2600

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Technical data see page 4 - 12

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

MICON



NEW

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

		Miglicher Besich zur LED-Pitzterung Permitted area for LED Placement Under State State Part State State Part State State Part State
Overall height GH	Colour of lens	Order no.
9.70 mm	red	5.05.511.480/2300
9.70 mm	green	5.05.511.480/2500
9.70 mm	yellow	5.05.511.480/2400
9.70 mm	white	5.05.511.480/2200
9.70 mm	blue	5.05.511.480/2600
12.50 mm	red	5.05.511.481/2300
12.50 mm	green	5.05.511.481/2500
12.50 mm	yellow	5.05.511.481/2400
12.50 mm	white	5.05.511.481/2200
12.50 mm	blue	5.05.511.481/2600

Technical data see page 4 - 12

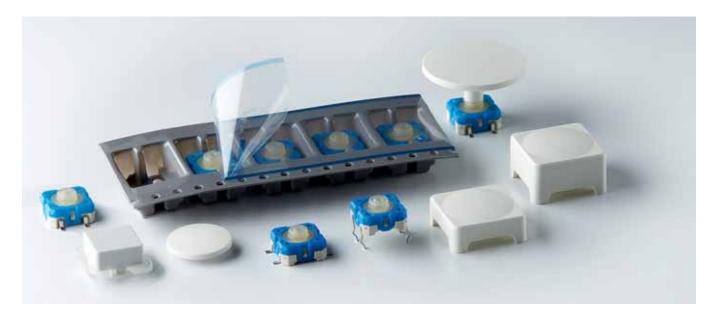
Can only be combined with MICON 5 version Standard (red bubble)

MICON

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PCB Keyswitches





General Data

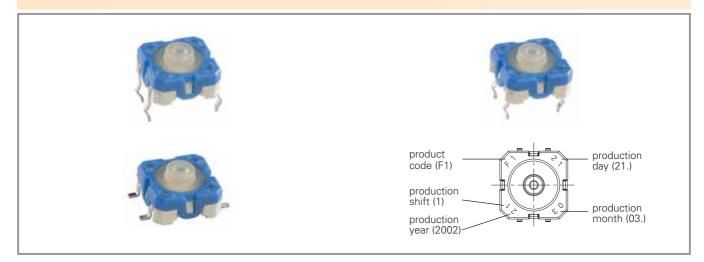
RACON short-travel keyswitches with sealed contact system and distinct key click, excellent switching reliability. For use under an overlay or with RK 90 keycaps. Print and SMD versions available (suitable for automatic assembly).

Content

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RK 90 II - Key cap system for RACON 12 with individual sealing NEW RK 90 II - Sealing frame	4 - 36 4 - 37	



RACON 8 - Short-travel keyswitch



General Data

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

When arranged under an overlay, RACON keyswitches should be combined with plungers.

The features at a glance:

- Suitable for the most common soldering methods
 - Wave soldering bath for THT versions
- Reflow soldering for SMT version
- Vapour phase soldering for SMT versions
- Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machine
- IMDS listed
- You can download actual product information from our internet site www.rafi.de / Catalogues and Downloads

4

RACON

Technical Data

Di	mens	ions	

Length of housing Width of housing Height of housing

Mechanical design

Mounting Terminals Contact system Contact arrangement Contact materials Illumination

Mechanical characteristics

Operating force Switching travel

Electrical characteristics Rated voltage min. Rated voltage max. 8.4 mm 8.4 mm see order block

soldering see order block snap-action contact 1 NO Au no

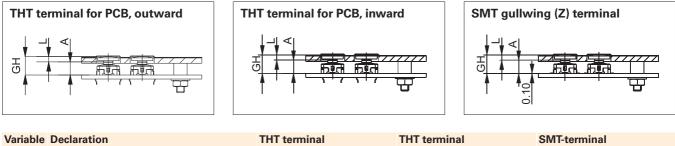
3.3^{±0.6} N 0.34^{±0.1} mm

0.02 V 35 V

Rated current min. 0.01 mA Rated current max. 100 mA Rated power max. 1 W (ohmic load) Contact resistance when new $100 \text{ m}\Omega$ max. Insulation resistance 10⁹ Ω Other specifications -40 °C Ambient temp. operating min. Ambient temp. operating max. +90 °C DIN EN 60068-2 -14, Resistance to environment -30,-33 and -78 Operating life 1,000,000 Solderability / Solder heat see order block resistance Flammability of materials UL 94 HB see order block Packing Produkt code see order block

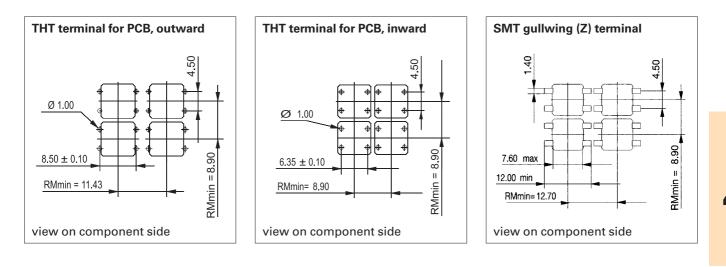


RACON 8, Typical System Assembly with Plunger under Overlay

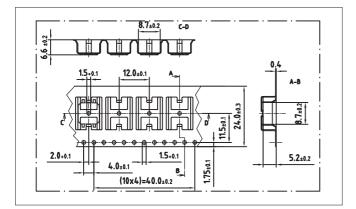


variable	Declaration	outward	inward	Sivi I-terminal
А	Height of keyswitch		A = 4.90 +/- 0.1 mm	
GH	Overall height	GH =	A + L	GH = A + L + 0.1 mm
L	Length of plunger	L = G	iH - A	L = GH - A - 0.1 mm

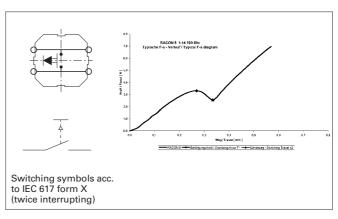
RACON 8, PCB Hole Pattern, Smallest Grid



RACON 8, SMT Terminal, Tape and Reel Drawing



Circuit Diagram Typical Force-Travel RACON 8 Diagram



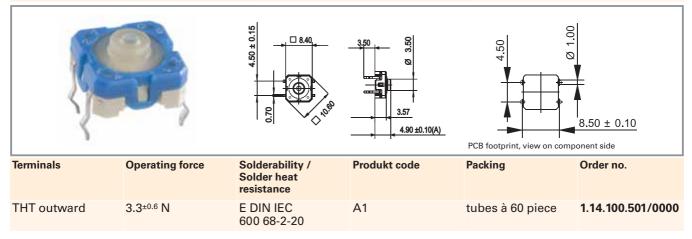


Typical accessories RACON 8 - Short-travel keyswitch

Description	Photo	Order no.	Additional acces- sories see page
Spacer, round, length 6.25 mm, red	11	5.30.759.034/0000	2 - 239, 4 - 82, 5 - 30
Plunger round		5.46.167.311/0209	4 - 32
RK 90 - Keycap body, for lenses 9 x 9 mm		5.55.103.265/1013	4 - 93

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

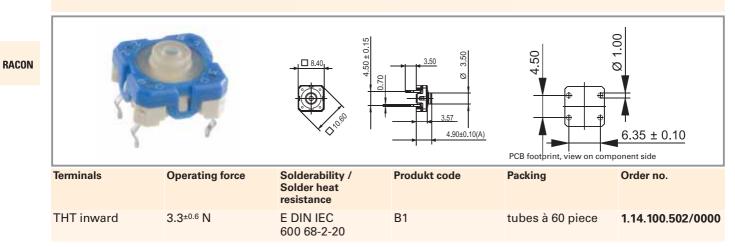
RACON 8 - Short-travel keyswitch, THT outward



Technical data see page 4 - 18

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

RACON 8 - Short-travel keyswitch, THT inward

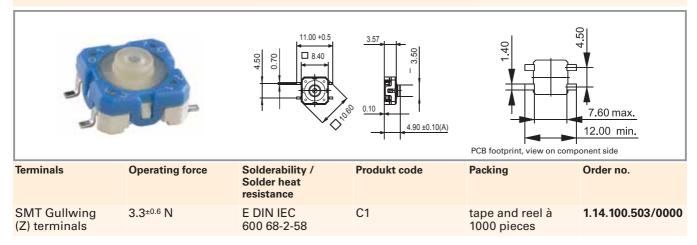


Technical data see page 4 - 18

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



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



Technical data see page 4 - 18

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

RACON

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RACON 12 - Short-travel keyswitch



General Data

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

The features at a glance:

- Suitable for the most common soldering methods
 - Wave soldering bath for THT versions
- Reflow soldering for SMTversions
- Vapour phase soldering for SMT versions
- Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machine
- IMDS listed

RACON

Technical Data

Dimensions

Length of housing Width of housing **Overall height**

Mechanical design

Mounting Terminals Contact system Contact arrangement **Contact materials** Illumination

Mechanical characteristics Operating force Switching travel

Electrical characteristics Rated voltage min. Rated voltage max.

12 mm 12 mm see order block

soldering see order block snap-action contact 1 NO Au no

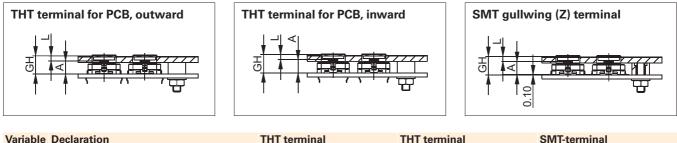
see order block see order block

0.02 V 35 V

Rated current min. 0.01 mA 100 mA Rated current max. Rated power max. 1 W (ohmic load) Contact resistance when new $100 \text{ m}\Omega$ max Insulation resistance $10^9 \Omega$ Other specifications Ambient temp. operating min. -40 °C Ambient temp. operating max. +90 °C Resistance to environment DIN EN 60068-2 -14, -30,-33 and -78 **Operating life** 1,000,000 Solderability / Solder heat see order block resistance Flammability of materials **UL 94 HB** see order block Packing Produkt code see order block

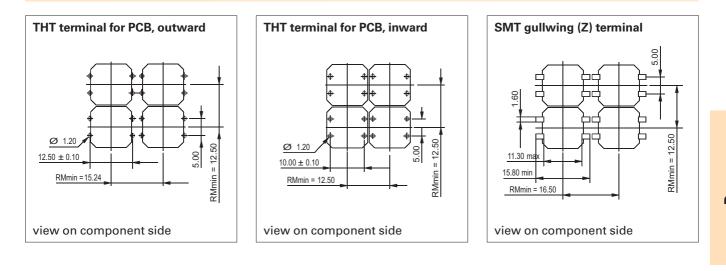


RACON 12, Typical System Assembly with Plunger under Overlay

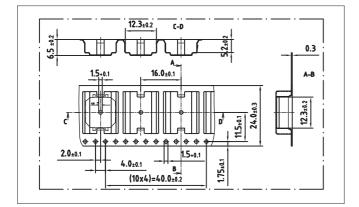


Variable	Declaration	outward	inward	SMI-terminal
A	Height of keyswitch		A = 4.95 ^{+/- 0.1 mm}	
GH	Overall height	GH =	A + L	GH = A + L + 0.1 mm
L	Length of plunger	L = G	βH - A	L = GH - A - 0.1 mm

RACON 12, PCB Hole Pattern, Smallest Grid

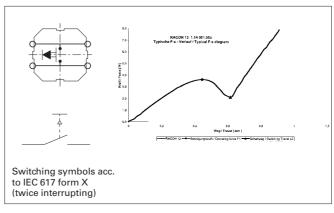


RACON 12, SMT Terminal, Tape and Reel Drawing



Circuit Diagram RACON 12

Typical Force-Travel Diagram



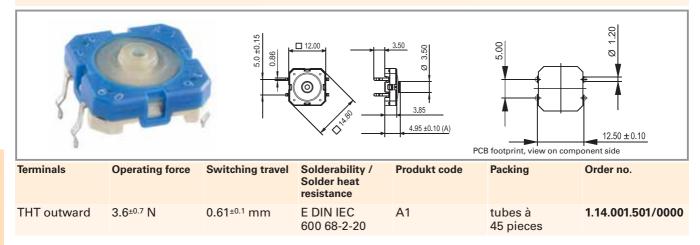


Typical accessories RACON 12 - Short-travel keyswitch

Description	Photo	Order no.	Additional acces- sories see page
Spacer, round, length 6.25 mm, red	100 C	5.30.759.034/0000	2 - 239, 4 - 82, 5 - 30
Square plunger for membrane data entry system	1	5.46.001.057/0209	4 - 34
Plunger round		5.46.168.050/0209	4 - 33
RK 90 - Keycap body, for lens 1 -module	*	5.55.103.030/1013	4 - 95

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

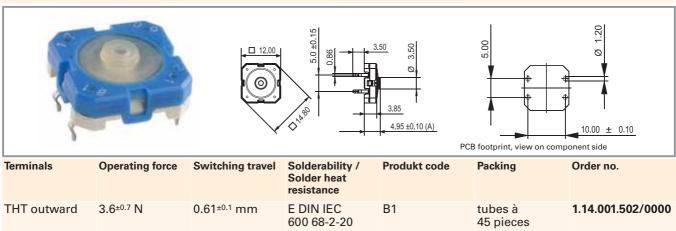
RACON 12 - Short-travel keyswitch solder terminals for PCB, outward



Technical data see page 4 - 22

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

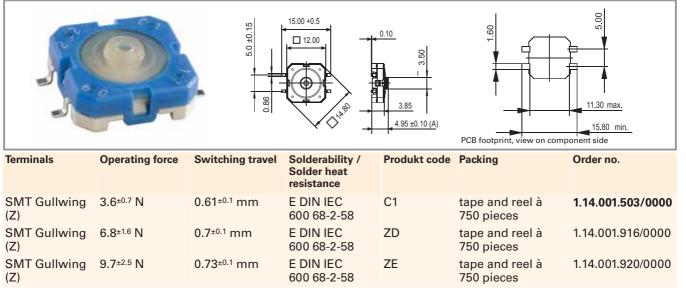




Technical data see page 4 - 22

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





Technical data see page 4 - 22

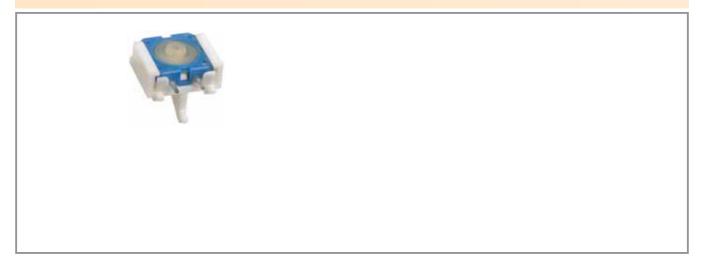
For keycaps refer to chapter "RK 90", plungers see "RACON special accessories".

RACON

PCB Keyswitches



RACON 12 V - Short-travel keyswitch with vertical adapter



General Data

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

Technical Data

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



Circuit Diagram RACON 12V PCB footprint RACON 12V Ø1.20 (2x) 10.00 ± 0.10 5.00 9 Drilling hole diagramm 00 ± 00.1 8.20 6.20 view on component side 14.60 Hatched areas: In this area no components and no conductor tracks Ø1.50 (3) +0.2015.00 Switching symbols acc. to IEC 617 form X (twice interrupting) view on component side

RACON 12V - Short-travel keyswitch with vertical adapter

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

Technical data see page 4 - 26

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

RACON

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RACON 12 i - Short-travel keyswitch



General Data

Application note

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

Technical Data

General information

Colour of lens Recommended key grid Key grid min.

Dimensions

LED colour

Operating force Switching travel

LED type

Length Width Overall height

Mechanical design Mounting

Terminals Contact system Contact arrangement Contact materials Illumination

Mechanical characteristics

Electrical characteristics

Contact resistance when new

Rated current max.

Rated power max. (ohmic load)

see order block 15.24 x 15.24 mm 12.5 x 12.5 mm

11.35 mm 11.35 mm 9.7 mm

soldering THT snap-action contact 1 NO Au fully illuminated 2 LED see order block standard 2 mm

3.3^{±0.6} N 0.34^{±0.1} mm

0.02 V 35 V 0.01 mA 100 mA 1 W Dielectric strength AC min. Insulation resistance

Electrical characteristics of LED

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

LED wavelength typ.

LED forward voltage UF at 20 mA

LED breakdown voltage U_{R} at 25 °C

Other specifications

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

Operating life Solderability / solder heat resistance Flammability of materials Packing 750 V 10⁹ Ω

red/green: 30, yellow: 50 mA red: 0.5 mA/degree C, yellow 0.8 mA/ degree C red 639, green 510-535, yellow 590 red: 1.8 V/20 mA, yellow: 1.9 V/20 mA min. 5 V/0.1 mA

-40 °C +80 °C see order block see order block

see order block

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

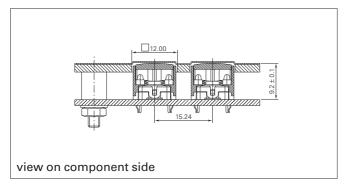
UL 94 HB tubes à 45 pieces

RACON

max.

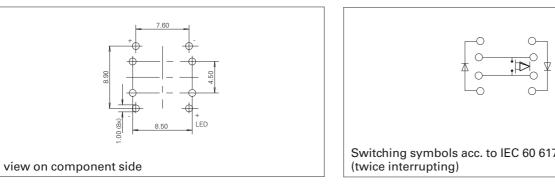


RACON 12i typical system assembly

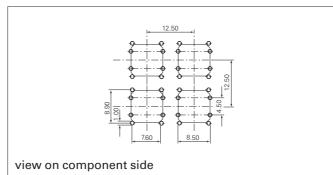


Explanation Recommended area embossing 0.35 mm at glue spacer thickness of 0.15 mm

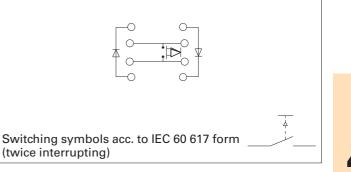
LED hole patterns



RACON 12i smallest grid

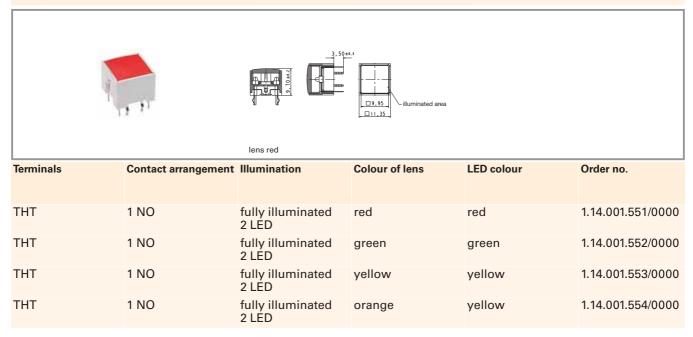


Circuit Diagram RACON 12i





RACON 12 i - Short-travel keyswitch



Technical data see page 4 - 28

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







General Data

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

Plunger round

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

RACON - Short-travel keyswitches



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

4

RACON - Short-travel keyswitches



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

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

Square plunger for membrane data entry system

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

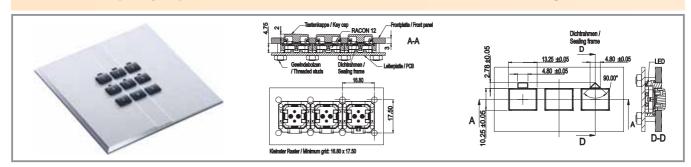
Front panel cut-out = 15 x 15 mm.

RACON

Δ



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



Technical Data

General information

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

The key cap system RK 90 II has been developed especially fort he short-travel keyswitch RACON 12. The lenses are snapped onto the sealing frame and then set onto the RACON 12 keyswitches. The PCB presses this units against the front panel, so they are sealed.

Two versions of the sealing frames are provided with light conductors, either in square ore triangle form. The lenses can be legended directly with laser. For bright letters (see picture) first white lenses are painted in dark, then the letters are cut out of the dark colour with laser.



RK 90 II - Sealing frame

	Sealing frame with square li	ght conductor	with snapped-on lens
Thickness of front panel	Light conductor	Order no. without lens	Note
3.00 mm	square	5.05.004.901/0000	Please order lens separately.
3.00 mm	triangular	5.05.004.902/0000	Please order lens separately.
3.00 mm	-	5.05.004.903/0000	Please order lens separately.

Technical data see page 4 - 36

Lenses:

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

Legended lenses on request.

RACON





General Data

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

Content **RF 15 - Short-travel keyswitch** 4 - 42 RF 15 - Short-travel keyswitch, non-illuminated 4 - 44 RF 15 - Short-travel keyswitch, fully illuminated with 2 LED 4 - 45 RF 15 - Short-travel keyswitch, 1 LED spot-illumination 4 - 46 **RF 15 N - Short-travel keyswitch** 4 - 48 4 - 51 RF 15 N - Short-travel keyswitch, non-illuminated 4 - 52 RF 15 R - Short-travel keyswitch RF 15 R - Low short-travel keyswitch, non-illuminated 4 - 55 4 - 55 RF 15 R - High short-travel keyswitch, non-illuminated RF 15 R - Low short-travel keyswitch, 1 LED spot-illumination 4 - 56 RF 15 R - High short-travel keyswitch, 1 LED spot-illumination 4 - 57 **RF 15 H - Short-travel keyswitch** 4 - 58 RF 15 H - Short-travel keyswitch, non-illuminated 4 - 60 RF 15 H - Short-travel keyswitch, fully illuminated 4 - 61 **RF 15 - Signal indicator** 4 - 62 RF 15 - Signal indicator, fully illuminated, 1 LED 4 - 64 **RF 19 - Short-travel keyswitch** 4 - 66 RF 19 - Short-travel keyswitch, non-illuminated 4 - 69 RF 19 - Short-travel keyswitch, fully illuminated with 2 LED 4 - 70 RF 19 - Short-travel keyswitch, 1 LED spot-illumination 4 - 71 **RF 19 H - Short-travel keyswitch** 4 - 72 RF 19 H - Keyswitch, non-illuminated 4 - 74 RF 19 H - Short-travel keyswitch, fully illuminated 4 - 75 **RF 19 - Signal indicator** 4 - 76 RF 19 - Signal indicator, 1/2 x 1-module 4 - 78 RF 19 - Signal indicator, 1/2 x 2-module 4 - 78 RF 19 - Signal indicator, 1 x 1-module 4 - 79 RF 19 - Signal indicator, 1 x 2-module 4 - 79 PCB Keyswitches 4 - 39



RF 15 - Keycap, snap-on, for overall height 12.5 mm4Spacers, round4Spacers, triangular4	- 81 - 81 - 82 - 83
- Faran 2	l - 83 l - 84

4



Specifications LED

3 mm LED

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

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

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

Calculating the series resistor:	Rated power of series:	Example for 5 Volt:	RF
$R_{V} = \frac{U_{B} - U_{F}}{I_{F}}$	$P_V = I_F^2 \times R_V$	$R_V = \frac{5V - 2.0V}{0.02 \text{ A}} = 150 \Omega \text{ (= standard value)}$	



RF 15 - Short-travel keyswitch



General Data

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

Technical Data

General information Colour of lens Recommended key grid

Dimensions

Length Width Overall height

Mechanical design

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

Mechanical characteristics

Operating force max. Switching travel

Robustness min.

see order block 19.05 mm

15 mm 15 mm 9.7 mm

soldering in PCB THT snap-action contact 1 NO see order block see order block see order block see order block

 $2.9^{\pm0.6}$ N 0.5^{+0.2} mm with through-plated PCB 100 N

Electrical characteristics

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

Rated power max. (ohmic load) Contact resistance when new max. Insulation resistance

Other specifications

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

Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering Au: 0.02 V, Ag: 3 V Au: 35 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA Au: 2 W, Ag: 12.5 W 100 mΩ 10⁹ Ω -25 °C +70 °C

+70 °C acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000

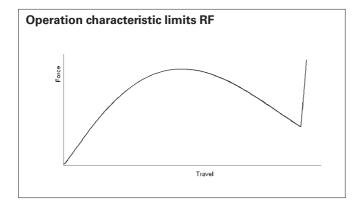
according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.

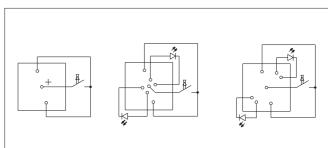
PCB Keyswitches



Force/Travel Diagram – Keyswitch RF 15

Circuit Diagram – Keyswitch RF 15



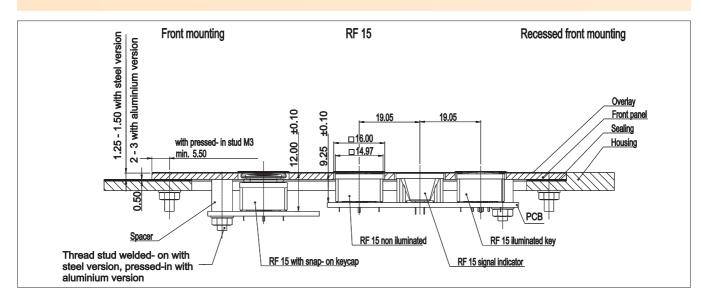


Keyswitch, non-illuminated

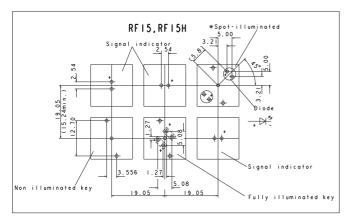
Keyswitch, fully illuminated

Keyswitch, spot-illuminated

Dimensional Drawing RF 15



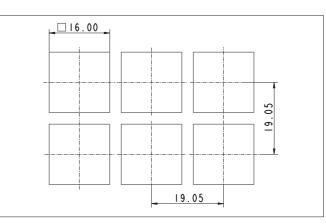
Hole Pattern RF 15



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

PCB Keyswitches

Hole Pattern – Front Panel





RF 15 - Short-travel keyswitch, non-illuminated

		co.3 0ver all height	Housing Actuator 6		
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	transparent	-	-	3.14.100.001/0000
Ag	not illuminated	transparent	-	-	3.14.100.006/0000

Technical data see page 4 - 42

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

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



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

	10.8	Nated area		
Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 2 LED	red	red	2 mm	3.14.200.011/0000
fully illuminated 2 LED	green	green	2 mm	3.14.200.012/0000
fully illuminated 2 LED	yellow	yellow	2 mm	3.14.200.013/0000
fully illuminated 2 LED	orange	yellow	2 mm	3.14.200.014/0000
fully illuminated 2 LED	blue	blue	2 mm	3.14.200.015/0000
fully illuminated 2 LED	red	red	2 mm	3.14.200.021/0000
fully illuminated 2 LED	green	green	2 mm	3.14.200.022/0000
fully illuminated 2 LED	yellow	yellow	2 mm	3.14.200.023/0000
fully illuminated 2 LED	orange	yellow	2 mm	3.14.200.024/0000
fully illuminated 2 LED	blue	blue	2 mm	3.14.200.025/0000
	fully illuminated 2 LED fully illuminated 2 LED	IlluminationColour of lensfully illuminated 2 LEDredfully illuminated 2 LEDgreenfully illuminated 2 LEDgreenfully illuminated 2 LEDorangefully illuminated 2 LEDorangefully illuminated 2 LEDgreenfully illuminated 2 LEDorangefully illuminated 2 LEDorangefully illuminated 2 LEDorange	IlluminationColour of lensLED colourfully illuminated 2 LEDredredfully illuminated 2 LEDgreengreenfully illuminated 2 LEDyellowyellowfully illuminated 2 LEDorangeyellowfully illuminated 2 LEDluebluefully illuminated 2 LEDgreengreenfully illuminated 2 LEDorangeyellowfully illuminated 2 LEDgreengreenfully illuminated 2 LEDgreengreenfully illuminated 2 LEDgreengreenfully illuminated 2 LEDgreengreenfully illuminated 2 LEDyellowyellowfully illuminated 2 LEDyellowyellowfully illuminated 2 LEDyellowyellowfully illuminated 2 LEDorangeyellowfully illuminated 2 LEDorangeyellowfully illuminated 2 LEDorangeyellow	IlluminationColour of lensLED colourLED typefully illuminated 2 LEDredred2 mmfully illuminated 2 LEDgreengreen2 mmfully illuminated 2 LEDyellowyellow2 mmfully illuminated 2 LEDorangeyellow2 mmfully illuminated 2 LEDorangeyellow2 mmfully illuminated 2 LEDorangeyellow2 mmfully illuminated 2 LEDgreengreen2 mmfully illuminated 2 LEDredred2 mmfully illuminated 2 LEDgreengreen2 mmfully illuminated 2 LEDgreengreen2 mmfully illuminated 2 LEDgreengreen2 mmfully illuminated 2 LEDyellowyellow2 mmfully illuminated 2 LEDyellowyellow2 mmfully illuminated 2 LEDorangeyellow2 mmfully illuminated 2 LEDorangeyellow2 mm

Technical data see page 4 - 42

For keycaps, refer to RK 90 system design.

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



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

	A A	<u>approx 3</u> 0 recall height	Housing Actuator Diode		
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	spot illumination 1 LED	opaque white	blue	3 mm	3.14.100.030/0000
Au	spot illumination 1 LED	opaque white	red	3 mm	3.14.100.031/0000
Au	spot illumination 1 LED	opaque white	green	3 mm	3.14.100.032/0000
Au	spot illumination 1 LED	opaque white	yellow	3 mm	3.14.100.033/0000
Ag	spot illumination 1 LED	opaque white	blue	3 mm	3.14.100.040/0000
Ag	spot illumination 1 LED	opaque white	red	3 mm	3.14.100.041/0000
Ag	spot illumination 1 LED	opaque white	green	3 mm	3.14.100.042/0000
Ag	spot illumination 1 LED	opaque white	yellow	3 mm	3.14.100.043/0000

Technical data see page 4 - 42

Double-spot LED illumination available on request

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



RF 15 N - Short-travel keyswitch



General Data

The RF 15N keyswitch provides a minimum overall height of 6.2 mm. The overall height can be varied by extension plungers which are inserted into the cross-like notches on the actuator tops.

LEDs can only be arranged separately next to the keyswitches up to an overall height of 10 mm (i.e. without plunger or with small plunger).

Keyswitches with overall heights of 12 mm or more can be provided with a maximum of 2 LEDs which are inserted into the recesses of the keyswitch housing. LEDs of keyswitches with overall heights of 12.5 mm or more should be placed onto LED spacers in order to obtain satisfactory illumination.

Technical Data

General information Colour of lens Recommended key grid

Dimensions Length Width Overall height

Mechanical design

Mounting Terminals Contact system Contact arrangement Contact materials Illumination

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

15 mm 15 mm 6.2 mm

soldering in PCB THT snap-action contact 1 NO see order block external 3 mm LED possible if height more than 12 mm

2.9^{±0.6} N 0.5^{+0.2} mm 100 with throughplated PCB N Electrical characteristics Rated voltage min.

Rated current min. Rated current max.

Rated voltage max.

Rated power max. (ohmic load) Contact resistance when new max. Insulation resistance

Other specifications

Ambient temp. operating min. Ambient temp. operating max. Storage temperature max. (in tube) Environmental restistance

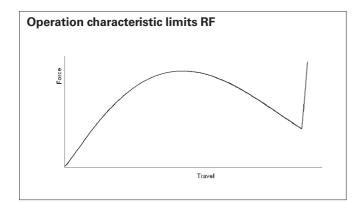
Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering Au: 0.02 V, Ag: 3 V Au: 35 V, Ag: 50 V Au: 0.01 mÅ, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA Au: 2W, Ag: 12.5W $100 \text{ m}\Omega$ $10^9 \Omega$ -25 °C +70 °C +50 °C acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000 according to E DIN

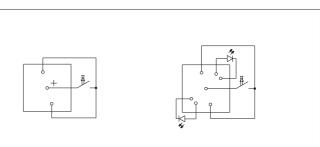
according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.



Force/Travel Diagram – Keyswitch RF 15 N

Circuit Diagram – Keyswitch RF 15 N



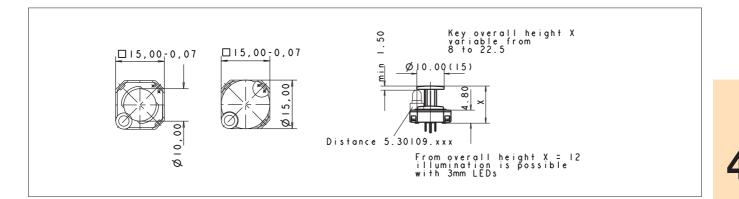


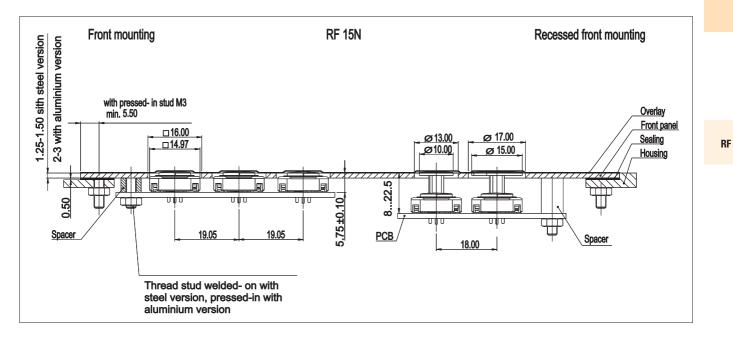
Keyswitch, non illuminated



spot-illuminated

Dimensional Drawings RF 15 N

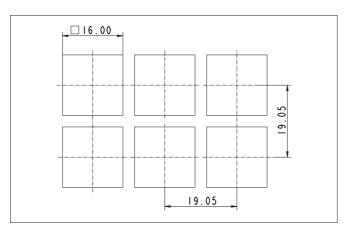




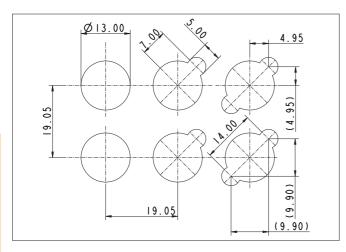


Hole Patterns – Front Panel RF 15 N

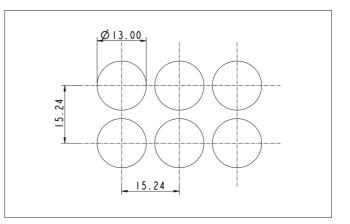
RF 15 N without plunger



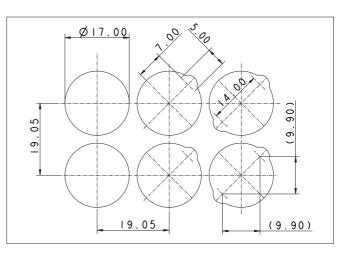
RF 15 N with plunger ø 10 mm, illuminated



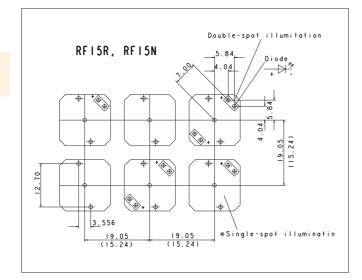
RF 15 N with plunger ø 10 mm, non-illuminated



RF 15 N with plunger ø 15 mm, illuminated



Hole Pattern RF 15 N



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

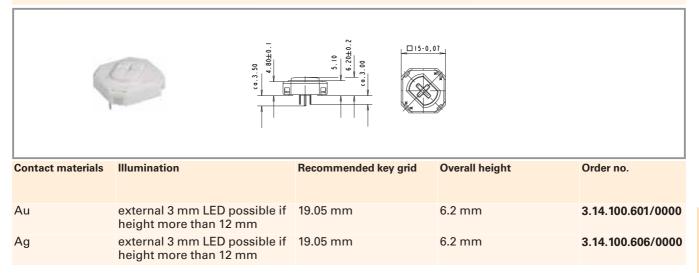
Δ



Typical accessories RF 15 N - Short-travel keyswitch

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

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



Technical data see page 4 - 48

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



RF 15 R - Short-travel keyswitch



General Data

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

Technical Data

General information Recommended key grid

Dimensions Length Width Overall height

Mechanical design

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

RF Mechanical characteristics Operating force max. Switching travel Robustness min. 15.24 mm

15 mm 15 mm see order block

soldering in PCB THT snap-action contact 1 NO see order block see order block see order block see order block

2.9^{±0.6} N 0.5^{+0.2} mm with through-plated PCB 100 N

Electrical characteristics

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

Rated power max. (ohmic load) Contact resistance when new max. Insulation resistance

Other specifications

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

Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering Au: 0.02 V, Ag: 3 V Au: 35 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA Au: 2 W, Ag: 12.5 W 100 mΩ 10⁹ Ω -25 °C +70 °C

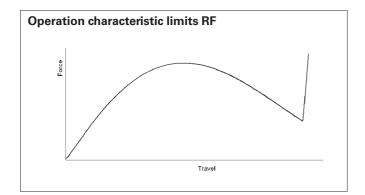
+70 °C acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000

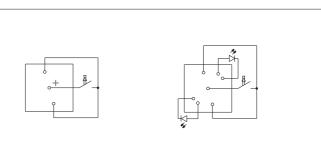
according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.



Force/Travel Diagram – Keyswitch RF 15 R

Circuit Diagram – Keyswitch RF 15 R

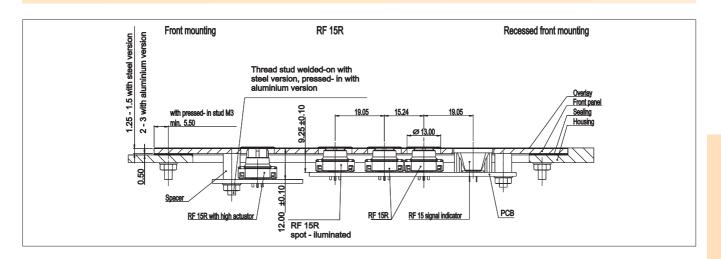




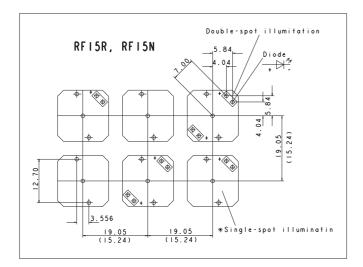
Keyswitch, non-illuminated



Dimensional Drawing RF 15 R



Hole Pattern RF 15 R

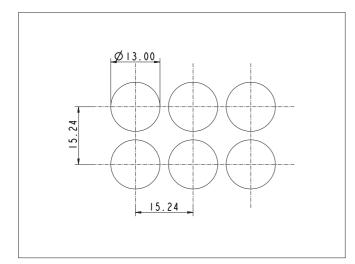


View on component side All hole diameters 1.1 +/- 0.1 mm PCB layout keyswitch 1/400" grid

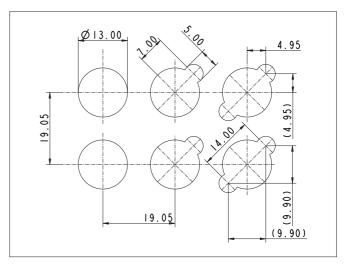


Hole Pattern – Front Panel RF 15 R

RF 15 R, non-illuminated



RF 15 R, illuminated



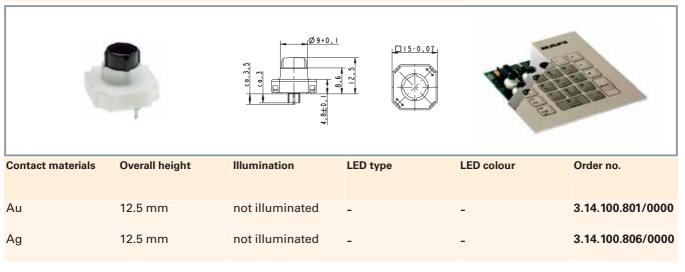


RF 15 R - Low short-travel keyswitch, non-illuminated

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

Technical data see page 4 - 52

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



Technical data see page 4 - 52



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

		co.3,5 6,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0	Г 60 007 Г 60 000		
Pict.: with 2 mm LED, re-	d				
Contact materials	Overall height	Illumination	LED type	LED colour	Order no.
Au	9.7 mm	spot illumination 1 LED	2 mm	red	3.14.100.531/0000
Au	9.7 mm	spot illumination 1 LED	2 mm	green	3.14.100.532/0000
Au	9.7 mm	spot illumination 1 LED	2 mm	yellow	3.14.100.533/0000
Ag	9.7 mm	spot illumination 1 LED	2 mm	red	3.14.100.541/0000
Ag	9.7 mm	spot illumination 1 LED	2 mm	green	3.14.100.542/0000
Ag	9.7 mm	spot illumination 1 LED	2 mm	yellow	3.14.100.543/0000

Technical data see page 4 - 52

Versions with 2 LEDs available on request.

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



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

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

Technical data see page 4 - 52

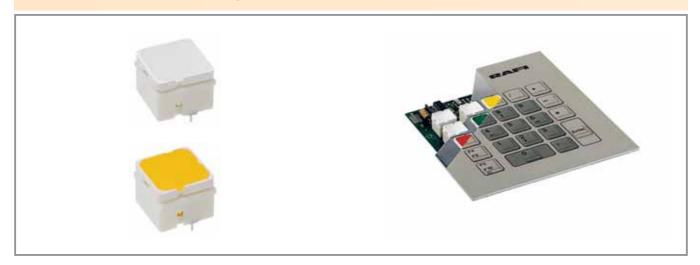
Versions with 2 LEDs available on request.

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

RF



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 Recommended key grid

Dimensions

Length Width Overall height

Mechanical design

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

Mechanical characteristics

Operating force max. Switching travel Robustness min. see order block 20 mm

15 mm 15 mm 12.5 mm

soldering in PCB THT snap-action contact 1 NO see order block see order block see order block see order block

 $2.9^{\pm0.6}$ N $0.5^{+0.2}$ mm with through-plated PCB 100 N

Electrical characteristics

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

Rated current max.

Rated power max. (ohmic load) Contact resistance when new max. Insulation resistance

Other specifications

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

Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering Au: 0.02 V, Ag: 3 V Au: 35 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA Au: 2 W, Ag: 12.5 W 100 mΩ

 $10^9 \Omega$

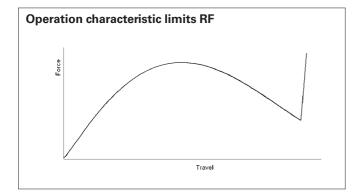
-25 °C +70 °C acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000

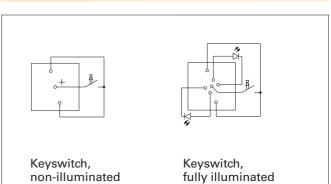
according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.



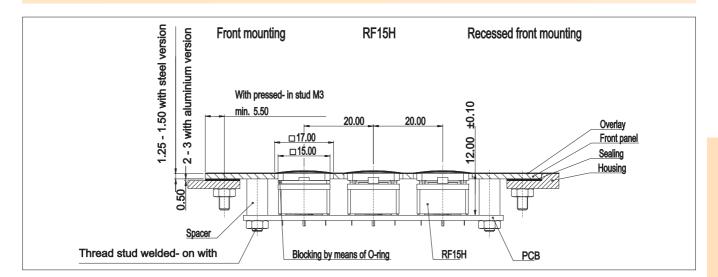
Force/Travel Diagram – Keyswitch RF 15 H

Circuit Diagram – Keyswitch RF 15 H

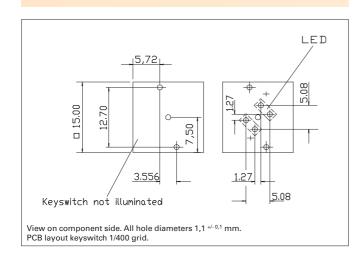




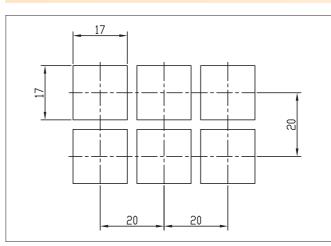
Dimensional Drawing



Hole Pattern



Hole Pattern – Front Panel





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	\bigcirc	5.30.120.009/0100	5 - 25

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

	N I I I I I I I I I I I I I I I I I I I	000ecal height	housing actuator lens illuminated area 13, 4mm x13, 4mm		
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white	-	-	3.14.100.702/0000
Ag	not illuminated	white	-	-	3.14.100.707/0000

Technical data see page 4 - 58



RF 15 H - Short-travel keyswitch, fully illuminated

housing actuator lens Under up of the state of the state						
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	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	white	white	3 mm	3.14.200.735/0000	
Au	fully illuminated 2 LED	orange	yellow	2 mm	3.14.200.738/0000	
Au	fully illuminated 1 LED	blue	blue	3 mm	3.14.200.739/0000	
Au/Ag	fully illuminated	yellow	multi colour	3 mm	3.14.101.903/0000	
Ag	fully illuminated	red	red	2 mm	3.14.200.741/0000	
Ag	fully illuminated	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	yellow	yellow	2 mm	3.14.200.743/0000	
Ag	fully illuminated	white	white	3 mm	3.14.200.745/0000	
Ag	fully illuminated	orange	yellow	2 mm	3.14.200.748/0000	
Ag	fully illuminated	blue	blue	3 mm	3.14.200.749/0000	
Ag	fully illuminated 2 LED	white	multi colour	3 mm	3.14.100.744/0000	

Technical data see page 4 - 58

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

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

RF



RF 15 - Signal indicator



Technical Data

General information Colour of lens Recommended key grid

Dimensions

Length Width Overall height

Mechanical design Mounting Illumination

LED colour LED type see order block 19.05 mm

15 mm 15 mm 9.7 mm

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

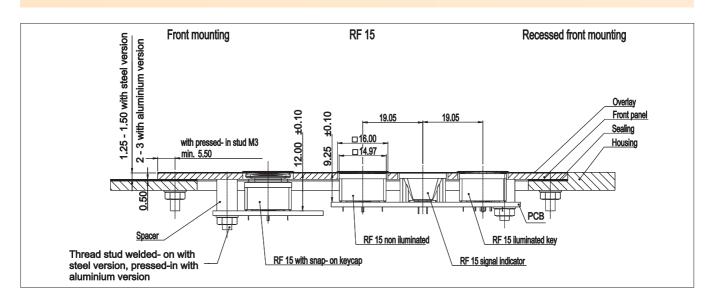
Other specifications

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

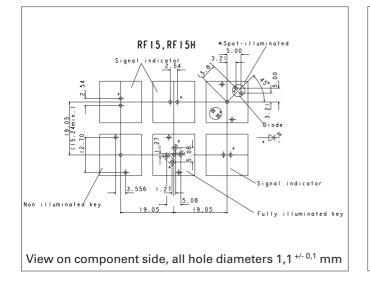
Solderability / solder heat resistance Wave soldering Manual soldering -25 °C +70 °C acc. to IEC 60068-2 -14, -30, -33 and -78 according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.



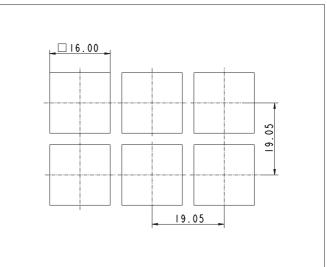
Dimensional Drawing Signal Indicator RF 15



Hole Pattern



Hole Pattern – Front Panel



4



RF 15 - Signal indicator, fully illuminated, 1 LED

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

Technical data see page 4 - 62

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

RF



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 Recommended key grid

Dimensions Length Width Overall height

Mechanical design

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

Mechanical characteristics

Operating force max. Switching travel Robustness min. see order block 23 mm

19.05 mm 19.05 mm 9.7 mm

soldering in PCB THT snap-action contact 1 NO see order block see order block see order block see order block

 $2.9^{\pm0.6}$ N $0.5^{+0.2}$ mm with through-plated PCB 100 N

Electrical characteristics Rated voltage min.

Rated voltage max. Rated current min.

Rated current max.

Rated power max. (ohmic load) Contact resistance when new max. Insulation resistance

Other specifications

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

Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering Au: 0.02 V, Ag: 3 V Au: 35 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA Au: 2 W, Ag: 12.5 W 100 mΩ 10⁹ Ω

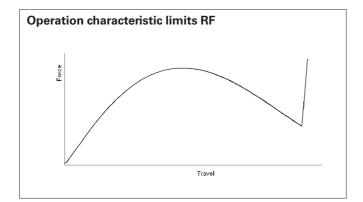
-25 °C +70 °C acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000

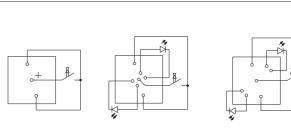
according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.



Force/Travel Diagram – Keyswitch RF 19

Circuit Diagram – Keyswitch RF 19



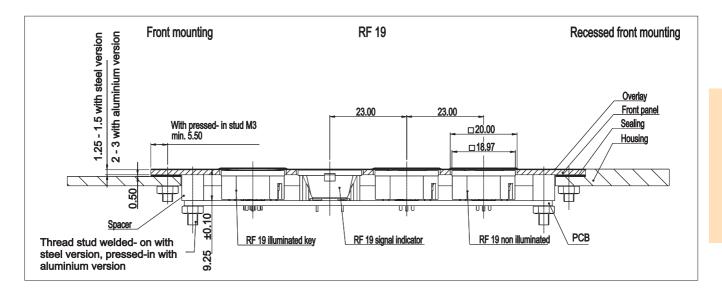


Keyswitch, non-illuminated

Keyswitch, fully illuminated

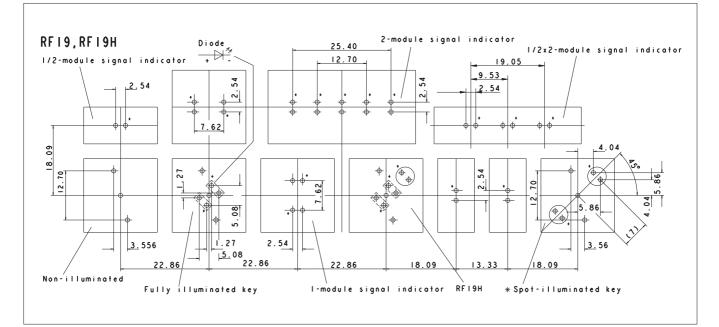
Keyswitch, spot-illuminated

Dimensional Drawing



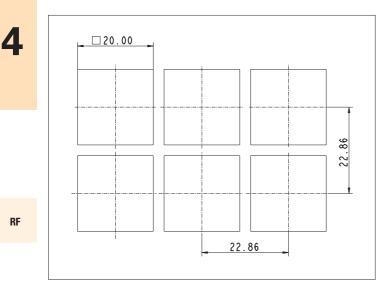


Hole Patterns RF 19



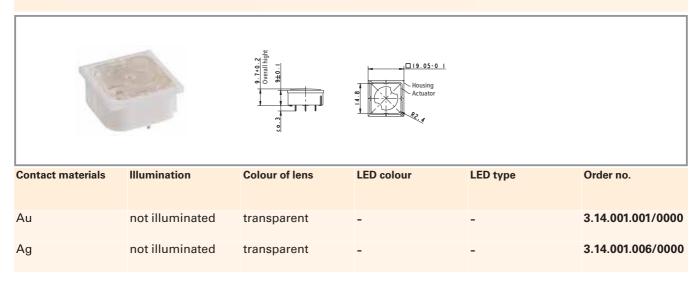
*The LED may be positioned either on the left-hand or right-hand side. Standard version: LED on left-hand side View on component side, all hole diameters 1.1 +/- 0.1 mm

Hole Patterns – Front Panel RF 19





RF 19 - Short-travel keyswitch, non-illuminated



Technical data see page 4 - 66



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

Contact materialsIlluminationColour of lensLED colourLED typeOrder no.Aufully illuminated 2 LEDredred2 mm3.14.002.0Aufully illuminated 2 LEDgreengreen2 mm3.14.002.0Aufully illuminated 2 LEDopaque white 2 LEDgreen2 mm3.14.002.0Aufully illuminated 2 LEDopaque white 2 LEDgreen2 mm3.14.002.0Aufully illuminated 2 LEDyellowyellow2 mm3.14.002.0Aufully illuminated 2 LEDorangeyellow2 mm3.14.002.0Aufully illuminated 2 LEDorangeyellow2 mm3.14.002.0	Hossing Hos							
Aufully illuminated 2 LEDgreengreen2 mm3.14.002.00Aufully illuminated 2 LEDopaque white opaque whitegreen2 mm3.14.002.00Aufully illuminated 2 LEDyellowyellow2 mm3.14.002.00Aufully illuminated 2 LEDyellowyellow2 mm3.14.002.00Aufully illuminated 2 LEDorangeyellow2 mm3.14.002.00								
2 LÉD2 LÉD2 LÉDAufully illuminated 2 LEDopaque white opaque whitegreen2 mm3.14.002.9Aufully illuminated 2 LEDyellowyellow2 mm3.14.002.0Aufully illuminated 2 LEDorangeyellow2 mm3.14.002.0	11/0000							
2 LÉD2 LÉDAufully illuminated 2 LEDyellowyellow2 mm3.14.002.0Aufully illuminated 2 LEDorangeyellow2 mm3.14.002.0	12/0000							
2 LÉD Au fully illuminated orange yellow 2 mm 3.14.002.0 2 LED 2 LED 2 mm 3.14.002.0	01/0000							
2 LÉD	13/0000							
Au full- illuminated blue blue 2 mm 2 14 000 0	14/0000							
Au fully illuminated blue blue 2 mm 3.14.002.0 2 LED	015/0000							
Ag fully illuminated red red 2 mm 3.14.002.0	21/0000							
Ag fully illuminated green green 2 mm 3.14.002.0	22/0000							
Ag fully illuminated yellow yellow 2 mm 3.14.002.0	23/0000							
Ag fully illuminated orange yellow 2 mm 3.14.002.0	24/0000							
Ag fully illuminated blue blue 2 mm 3.14.002.0	25/0000							
Ag fully illuminated opaque white green 2 mm 3.14.002.9	44/0000							
Ag fully illuminated white green 2 mm 3.14.002.0	26/0000							
Ag fully illuminated white yellow 2 mm 3.14.002.0	27/0000							

Technical data see page 4 - 66

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

RF



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

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

Technical data see page 4 - 66

Versions with 2 LEDs available on request.

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



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 Recommended key grid

Dimensions Length Width Overall height

Mechanical design

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

RF

Mechanical characteristics

Operating force max. Switching travel Robustness min. see order block 24 mm

19.05 mm 19.05 mm 12.5 mm

soldering in PCB THT snap-action contact 1 NO see order block see order block see order block see order block

 $2.9^{\pm0.6}$ N $0.5^{+0.2}$ mm with through-plated PCB 100 N

Electrical characteristics

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

Rated current max.

Rated power max. (ohmic load) Contact resistance when new max. Insulation resistance

Other specifications

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

Operating life min. (operations) Solderability / solder heat resistance Wave soldering Manual soldering Au: 0.02 V, Ag: 3 V Au: 35 V, Ag: 50 V Au: 0.01 mA, Ag: 0.1 mA Au: 100 mA, Ag: 250 mA Au: 2 W, Ag: 12.5 W 100 mΩ 10⁹ Ω

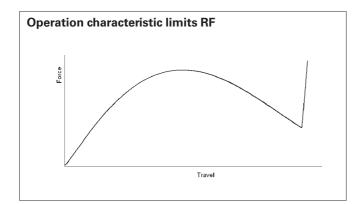
-25 °C +70 °C acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000

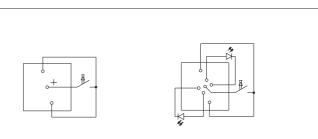
according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.



Force/Travel Diagram – Keyswitch RF 19 H

Circuit Diagram – Keyswitch RF 19 H



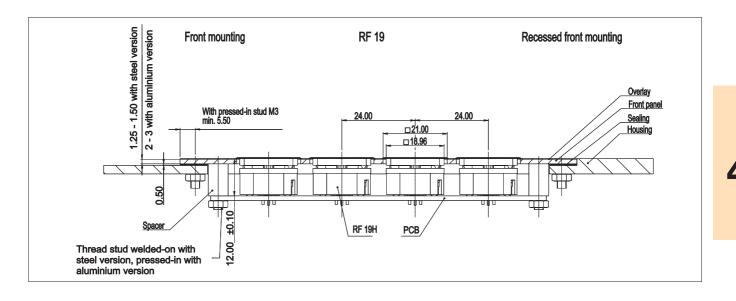


Keyswitch, non illuminated

Keyswitch,

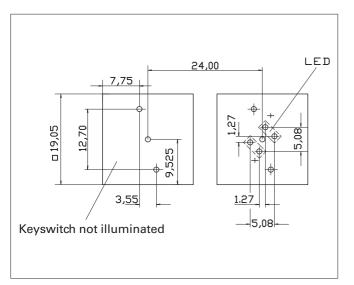
fully illuminated

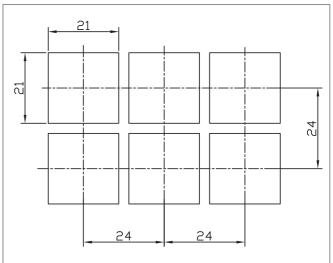
Dimensional Drawing





Hole Pattern RF 19 H





Hole Pattern – Front Panel RF 19 H

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

View on component side, all hole diameters

1.1 +/- 0.1 mm

Δ

RF

Typical accessories RF 19 H - Short-travel keyswitch

Description	Photo	Order no.	Additional acces- sories see page
O-ring, black, 16.0 x 1, for blocking RF 19H keys	0	5.30.125.007/0100	5 - 25

RF 19 H - Keyswitch, non-illuminated

	N N		Housing Actuotor Lens Illuminated area IGmm x16mmm		
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	not illuminated	white	-	-	3.14.001.501/0000
Au	not illuminated	white	-	-	3.14.001.501/0000 3.14.001.506/0000

Technical data see page 4 - 72



RF 19 H - Short-travel keyswitch, fully illuminated

		<u>12.39</u> ±0.1	Housing Actuator Lens Illuminated area IGmm ±16mm		
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LED	red	red	2 mm	3.14.002.613/0000
Au	fully illuminated 2 LED	green	green	2 mm	3.14.002.632/0000
Au	fully illuminated 1 LED	green	green super bright	3 mm	3.14.002.633/0000
Au	fully illuminated 2 LED	yellow	yellow	2 mm	3.14.002.653/0000
Au	fully illuminated 1 LED	white	white	3 mm	3.14.002.684/0000
Au	fully illuminated 2 LED	orange	yellow	2 mm	3.14.002.673/0000
Au	fully illuminated 2 LED	white	multi colour	3 mm	3.14.001.672/0000
Au	fully illuminated 1 LED	blue	blue	3 mm	3.14.002.683/0000
Ag	fully illuminated 2 LED	red	red	2 mm	3.14.002.623/0000
Ag	fully illuminated 2 LED	green	green	2 mm	3.14.002.642/0000
Ag	fully illuminated 1 LED	green	green super bright	3 mm	3.14.002.643/0000
Ag	fully illuminated 1 LED	blue	blue	3 mm	3.14.002.688/0000
Ag	fully illuminated 2 LED	yellow	yellow	2 mm	3.14.002.663/0000
Ag	fully illuminated 1 LED	white	white	3 mm	3.14.002.689/0000
Ag	fully illuminated 2 LED	orange	yellow	2 mm	3.14.002.678/0000
Ag	fully illuminated 2 LED	white	multi colour	3 mm	3.14.001.682/0000

Technical data see page 4 - 72

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

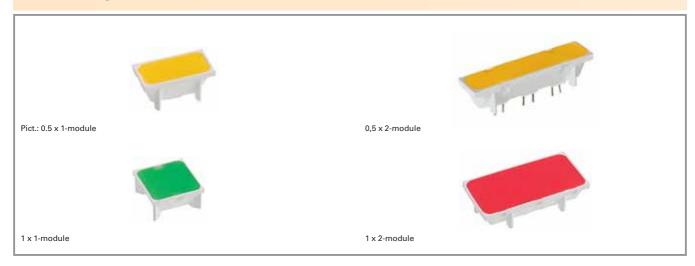
Technical data of LED see separate page at the beginning of this chapter.

Δ

RF



RF 19 - Signal indicator



Technical Data

General information Colour of lens Recommended key grid

Dimensions

Length Width Overall height

Mechanical design

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

see order block see order block 9.15 mm

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

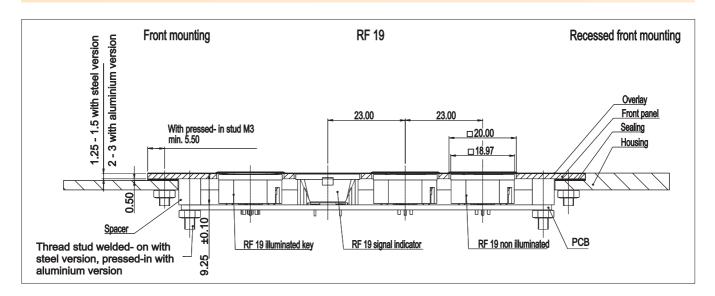
Other specifications

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

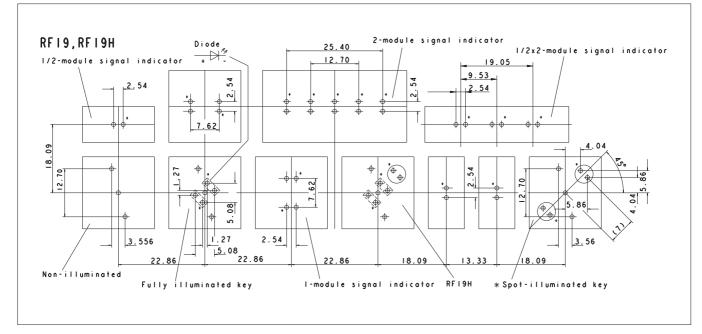
Solderability / solder heat resistance Wave soldering Manual soldering -25 °C +70 °C acc. to IEC 60068-2 -14, -30, -33 and -78 according to E DIN IEC 600 28-2-20 260 °C max. 350 °C / 5 sec. max.



Dimensional Drawing Signal Indicator RF 19



Hole Pattern RF 19



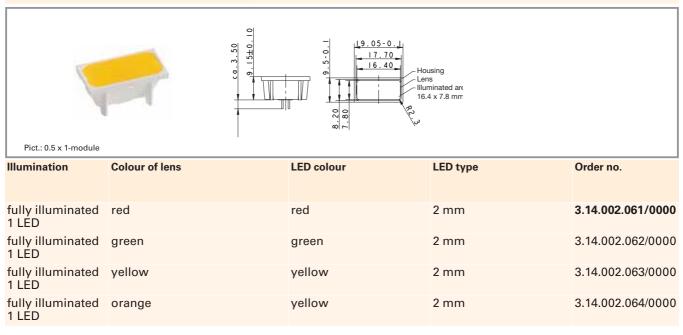
*The LED may be positioned either on the left-hand or right-hand side. Standard version: LED on left-hand side View on component side, all hole diameters 1.1 +/- 0.1 mm

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

RF

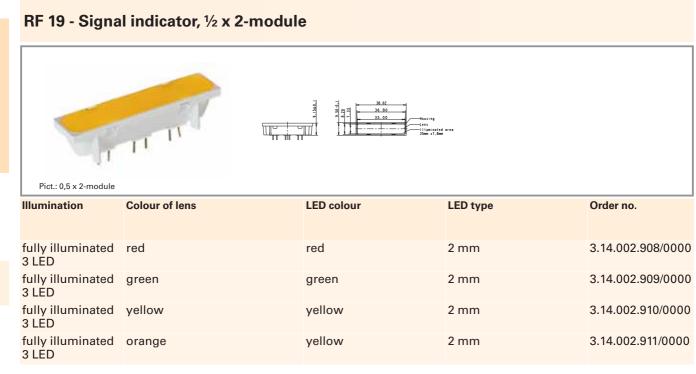


RF 19 - Signal indicator, 1/2 x 1-module



Technical data see page 4 - 76

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



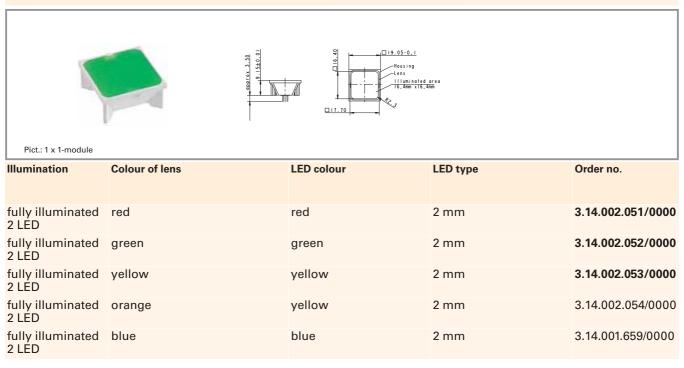
Technical data see page 4 - 76

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

RF



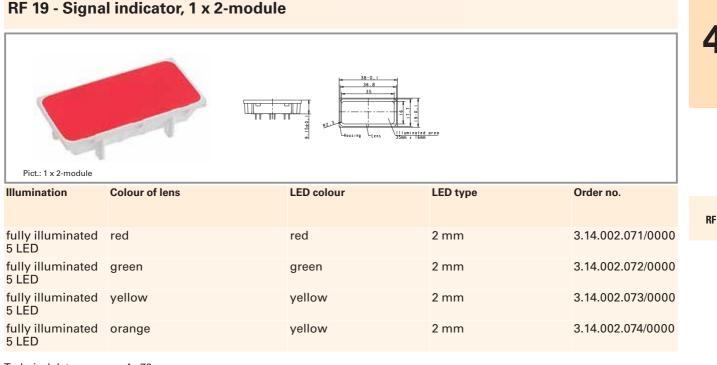
RF 19 - Signal indicator, 1 x 1-module



Technical data see page 4 - 76

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

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



Technical data see page 4 - 76

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



RF 15/19 - Special accessories



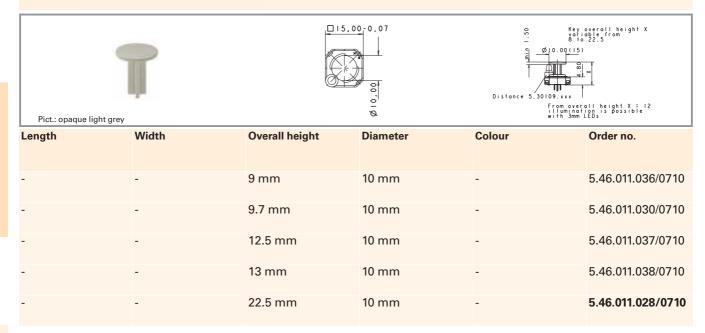
Technical Data

Dimensions Length Width

see order block see order block

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

RF 15 N - Extension plunger, round head



RF

Length of plunger = Overall height - 4.25 mm.

Width



Order no.

5.46.017.036/0710

5.46.017.030/0710

5.46.017.037/0710

5.46.017.028/0710

5.46.017.038/0710

T	Distance 5.30109.xxx From overall height X = 12 with 3mm LEDs

Diameter

15 mm

15 mm

15 mm

15 mm

15 mm

Colour

Overall height

9 mm

9.7 mm

12.5 mm

22.5 mm

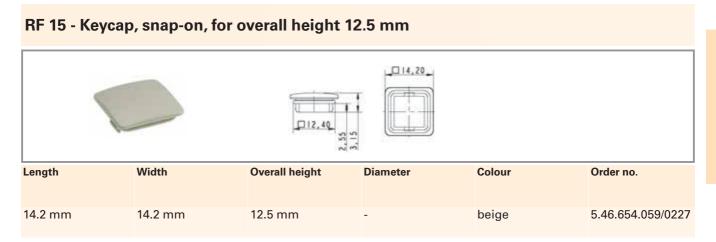
13 mm

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

Technical data see page 4 - 80

Length

Length of plunger = Overall height - 4.25 mm.



Technical data see page 4 - 80

RF



Spacers, round

6		3+120°	L±0.05	86 (SM HES) 15 52 (SM HES) 15 10 (SM	Overlay Front panel Spacer PCB
Length	Width	Overall height	Diameter	Colour	Order no.
3.50 mm	-	-	-	blue transparent	5.30.759.023/0000
4 mm	-	-	-	green	5.30.759.025/0000
4.25 mm	-	-	-	blue	5.30.759.026/0000
4.50 mm	-	-	-	red	5.30.759.027/0000
4.75 mm	-		-	blue transparent	5.30.759.028/0000
5 mm	-	-	-	black	5.30.759.029/0000
5.25 mm	-		-	yellow orange transparent	5.30.759.030/0000
5.50 mm	-	-	-	yellow	5.30.759.031/0000
5.75 mm	-	-	-	green	5.30.759.032/0000
6 mm	-	-	-	blue	5.30.759.033/0000
6.2 mm	-	-	-	blue	5.30.759.251/0000
6.25 mm	-	-	-	red	5.30.759.034/0000
6.50 mm	-	-	-	blue transparent	5.30.759.035/0000
6.75 mm	-	-	-	black	5.30.759.036/0000
7 mm	-	-	-	yellow orange transparent	5.30.759.037/0000
7.25 mm	-	-	-	yellow	5.30.759.038/0000
7.50 mm	-	-	-	green	5.30.759.039/0000
7.75 mm	-	-	-	blue	5.30.759.040/0000
8 mm	-	-	-	red	5.30.759.041/0000
8.25 mm	-	-	-	blue transparent	5.30.759.042/0000
10.00 mm	-	-	-	black	5.30.759.043/0104

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

RF



Spacers, triangular

1		60.0° 02.0° 60.0°	S 0 0 0 0 0 0 0 0 0 0 0 0 0	RF 158 H 15. 75 20. 61 H 15. 75 20.	Overlay Front panel Spacer PCB
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

RF

4

RF - Short-travel keyswitches



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

Technical data see page 4 - 80

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

RF 15 N - LED spacer

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

Technical data see page 4 - 80

Δ





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 00
KN 19 - Short-travel main switch	4 - 86
KN 19 - Short-travel main switch	4 - 88

KN 19



KN 19 - Short-travel main switch



General Data

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

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

KN

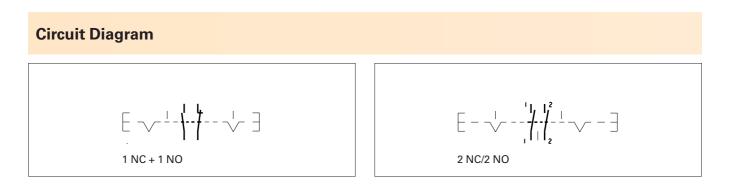
19

Me Мо

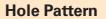
Ме

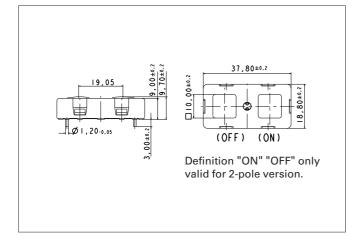
PCB Keyswitche	s

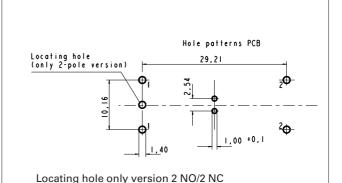




Dimensional Drawing







View on component side.





Approvals			
XXX	c FN us		
IEC 61058	UL 508,C22.2 No. 14-M91		

Typical accessories KN 19 - Short-travel main switch

Description	Photo		Additional acces- sories see page
KN19 - Absorption rubber		5.30.729.009/0000	

KN 19 - Short-travel main switch

	19.05 1	
Pict.: 1 NC + 1 NO		
Contact arrangement	Rated voltage AC max.	Order no.
1 NC + 1 NO	250 V	1.12.000.001/0000
2 NC / 2 NO	250 V	1.12.000.501/0000

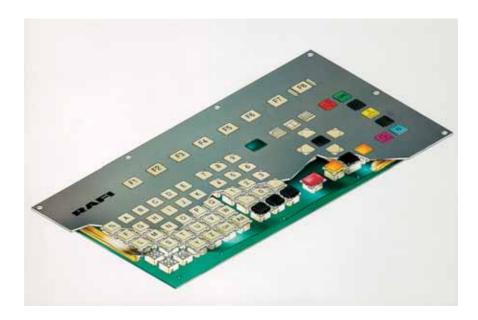
Technical data see page 4 - 86

Accessoires:

KN19 - Absorption rubber: 5.30.729.009/0000

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





General Data

Keycaps for RACON, RF 15 / RF 19 and KN 19 short-travel keyswitches

• You can insert a legend insert betweenlens and pressure paol of the transparent keycaps.

Content

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

Δ



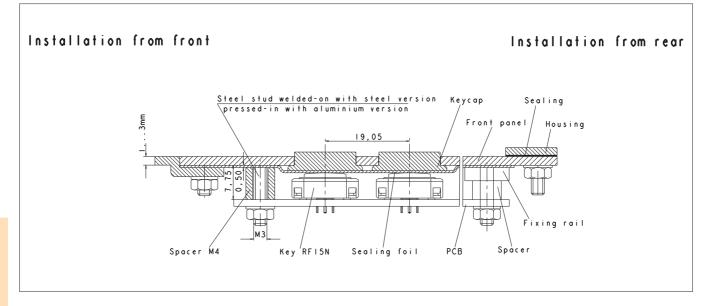
Keycap system RK 90

Example with RF 15 keyswitches. Instead of RF 15 following keyswitches can be used:

- MICON 5
- RACON 8/12
- RF 15 keyswitches and signal indicators
- RF 19 keyswitches and signal indicators
- Short-travel main switch KN 19

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

Installation methods



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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 frictionproof.

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



Recommendations

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

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

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

Cleaning liquids

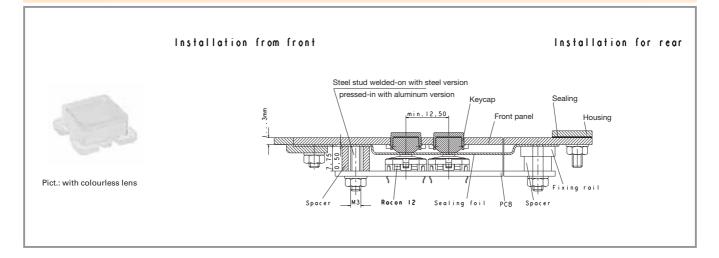
For the cleaning of the plastic keycaps please do not use cleaning liquids based on alcohol or acid.

RK 90

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RK 90 - Keycaps, plastic, 9 x 9 mm



General Data

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

This keycap is our first choice in a combination with the illuminated RACON 12 i short-travel keyswitch.

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

Technical Data

General information Colour of lens Size Degree of protection (with silicon seal) Illuminability

see order block 1-module IP65

see order block

Dimensions

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

Please order lens separately.



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

Pict.: with lens, lic	aht grey		2. <u>45</u>	9.00+0.1 Final size		
Size	Illuminability	Dimension keycap behind front panel	Dimension keycap in front of front panel	Dimension (c) hole patterns final size	Order no. without lens	Note
1-module	yes	11.5 x 11.5 mm	8.85 x 8.85 mm	9.00 x 9.00 mm	5.55.103.265/1013	Please order lenses separately.

Technical data see page 4 - 92

Lenses:

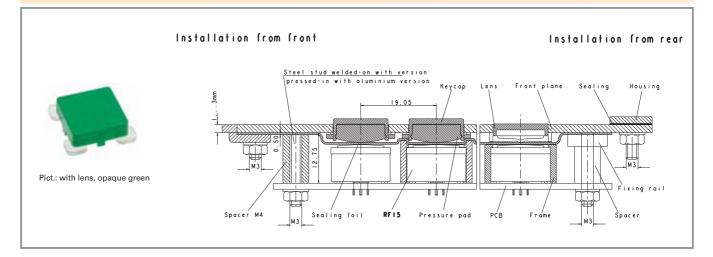
RK 90 - Lens, 9 x 9 mm, opaque red: 5.46.651.015/0309 RK 90 - Lens, 9 x 9 mm, opaque yellow: 5.46.651.015/0409 RK 90 - Lens, 9 x 9 mm, opaque green: 5.46.651.015/0514 RK 90 - Lens, 9 x 9 mm, opaque blue: 5.46.651.015/0611 RK 90 - Lens, 9 x 9 mm, opaque light grey: 5.46.651.015/0700 RK 90 - Lens, 9 x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

Δ

RK 90



RK 90 - Keycaps, plastic, 14 mm



General Data

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

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

Technical Data

General information Colour of lens Size Degree of protection (with silicon seal) Illuminability

see order block see order block IP65

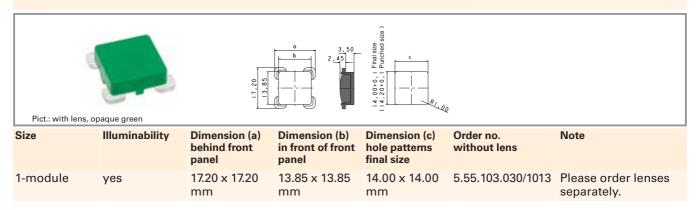
yes

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

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



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

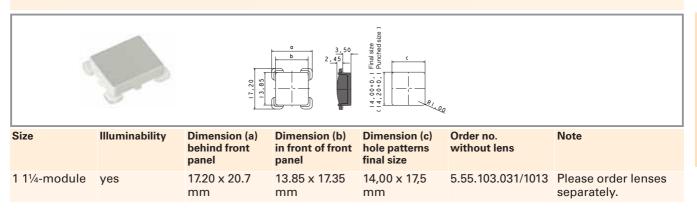


Technical data see page 4 - 94

Lenses:

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

RK 90 - Keycap body plastic, for lenses 11/4-module



Technical data see page 4 - 94

Lenses:

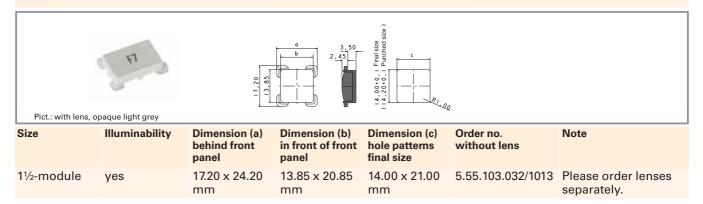
RK 90 - Lens, 14 mm, 1.25-module, opaque red: 5.46.681.002/0309

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

RK 90 - Lens, 14 mm, 1.25-module, transparent green: 5.46.681.022/1510



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

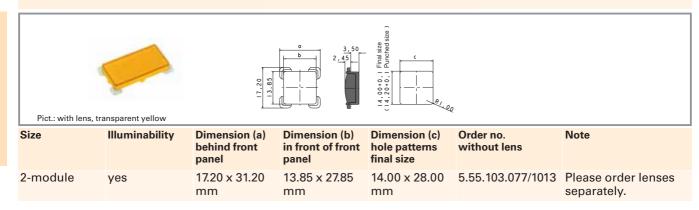


Technical data see page 4 - 94

Lenses:

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

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



Technical data see page 4 - 94

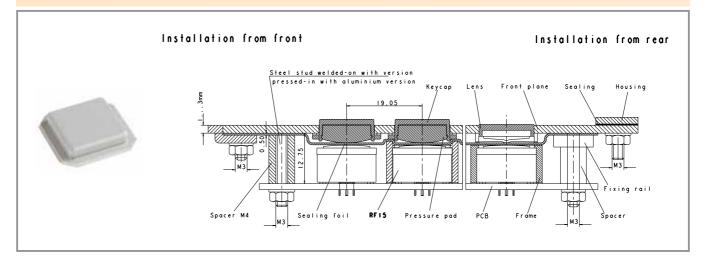
Lenses:

RK 90 - Lens, 14 mm, 2-module, opaque red: 5.46.681.004/0309 RK 90 - Lens, 14 mm, 2-module, opaque yellow: 5.46.681.004/0409

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



RK 90 - Keycaps, aluminum, 14 x 14 mm



General Data

The RK 90 system design with metal keycaps is fairly safe against mechanical, thermal or chemical effects. Combined with a metal front panel, this data entry system offers maximum protection against vandalism. Tried and tested MICON 5, RACON 8/12 or RF 15/19 PCB keyswitches are used underneath the metal keycaps.

The keycaps can be provided with engraved, coloured anodized or laser-printed legends. This means that the legend is durable and cannot be removed by mechanical or chemical means.

Technical Data

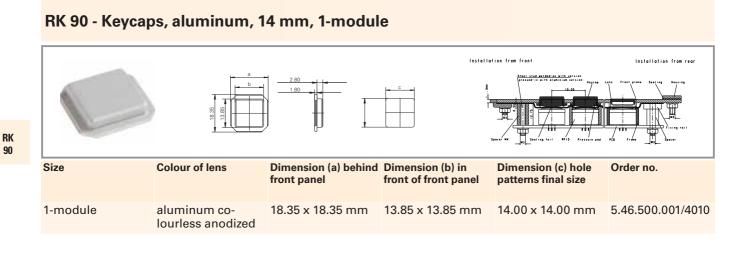
General information Colour of lens

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

Dimensions

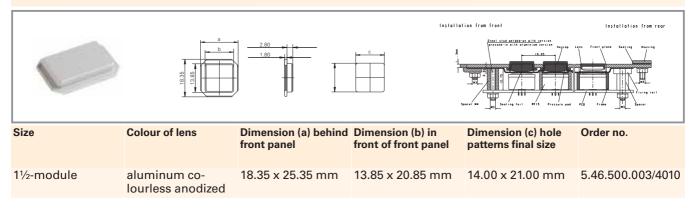
Dimension (b) in front of front panel Dimension (a) behind front panel Dimension (c) hole patterns final size Dimension hole patterns punched size

- see order block see order block
- see order block
- see order block



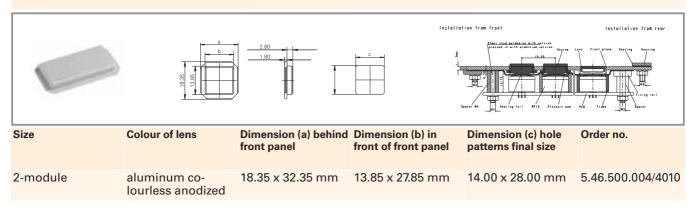


RK 90 - Keycaps, aluminum, 14 mm, 1¹/₂-module



Technical data see page 4 - 98

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

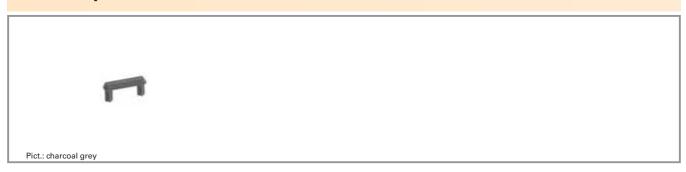


Technical data see page 4 - 98

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RK 90 - Special accessories



Technical Data

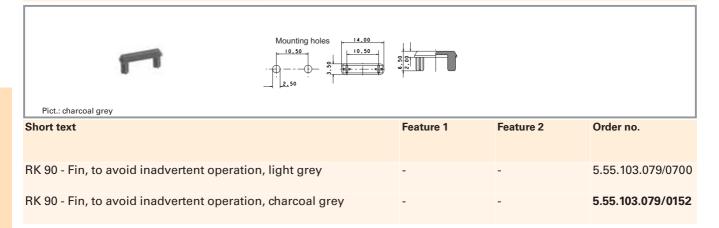
General information Colour

see order block

Dimensions Dimensions

see order block

RK 90 - Fin, to avoid inadvertent operation



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RK 90 - Spacer M 4

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

Technical data see page 4 - 100

RK 90 - Silicone foil 600 x 590 x 0.45 mm

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

Technical data see page 4 - 100

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General Data

Vandal-proof input system, ideally suited for elevator controls, info terminals, vending machines, etc.

- Edge illumination and symbol illumination possible
- Connection: Each module individually with an 8-pin Micro-Match socket connector
- Modular fixing system with quick fasteners or single fixing
- Contact arrangement: 1 NO contact or 1 NC + 1 NO contact
- 50 V/250 mA max.
- Degree of protection IP65 (keylock switch IP40).

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



System Features

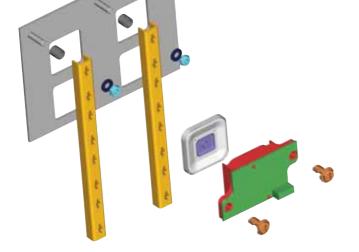
Perfectly suited for: elevator controls, info terminals, vending machines, etc.

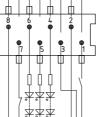
- Vandal proof construction
- Modular fixing system with quick fasteners or single fixing method using thread studs
- Connection with keyed 8-pin micro-match connector
- Degree of protection: IP40/65

Keylock Switch Features

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

Micro-Match Connector Pin Assignment





1/3 NO contact

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

Pushbutton Features

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

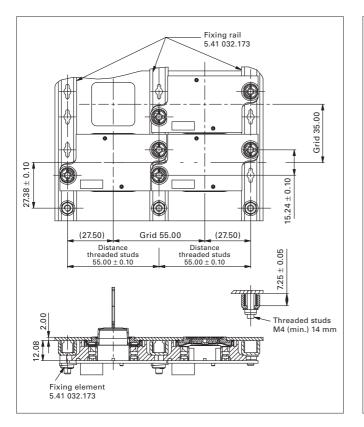
Signal Indicator Features

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

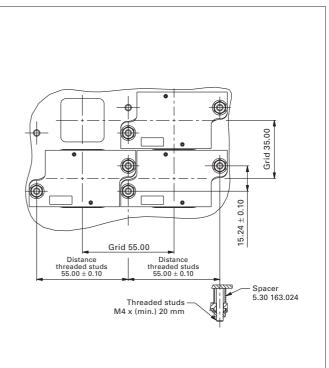


Installation plan

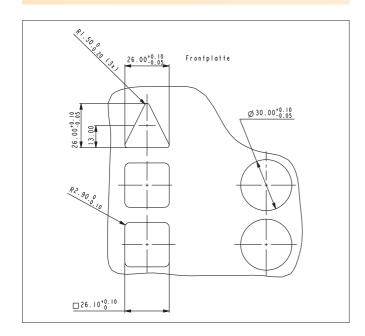
Rail fixing method



Single fixing method



Front panel



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RG 85 III - Keyswitch



Technical Data

Dimensions

Mounting grid min. Length Width

Mechanical design Version Mounting

Terminals

Contact system

Contact arrangement Contact materials Symbol illumination Edge illumination

Mechanical characteristics Operating force Operating travel Switching travel NO Switching travel NC

55 x 35 mm 64 mm 34 mm

see order block on U-rails or single mounting 8-pin Micro-Match® female connector snap-action (1 NO) or bridge contact (1 NC + 1 NO) see order block Ag see order block see order block

3.5 N 1 mm 1 mm 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	100 m Ω
max.	
Contact resistance acc. to	3 Ω
life max.	
Bouncing time max.	10 ms
Operating voltage for LED	24 ^{±20%} V
Input current LED	per colour/LED row
	9 - 16 mA

Other specifications

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

Operating life min. (operations) Degree of protection rail mounting Degree of protection single mounting Flammability of materials -25 °C +70 °C -40 °C +80 °C acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000 IP40

IP65

according to UL 94 HB

Typical accessories RG 85 III - Keyswitch

Description	Photo	Order no.	Additional acces- sories see page
Cable, 8 wires, with socket connectors on both ends, length 1 m	T	5.03.772.261/0000	4 - 122
RG 85 III - Lenses for keyswitches, round, stainless steel		5.04.914.000/2000	4 - 117
RG 85 III - Lenses for keyswitches, square, aluminum	150	5.04.915.100/2000	4 - 118

4 - 106

RG 85 III



RG 85 III - Keyswitch, round design, without lens

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

Technical data see page 4 - 106

Please order lenses (round shape) separately.

RG 85 III



RG 85 III - Keyswitch, square design, without lens

· h	The second			
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

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RG 85 III

Technical data see page 4 - 106

Please order lenses (square shape) separately.



RG 85 III - Keylock switch



Technical Data

Dimensions

Mounting grid min. Length Width

Mounting depth

Mechanical design Version Mounting

Terminals

Contact system Contact arrangement Contact materials Symbol illumination Edge illumination Lock

Key removal position

Mechanical characteristics Rotating angle Switching travel NO Switching travel NC

55 x 35 mm 64 mm 34 mm (35 mm with sealing) see order block

see order block on U-rails or single mounting 8-pin Micro-Match® female connector cross contact 1 NO Au alloy none see order block cylinder lock, lock type 5201 Pos. 0 + 1

1 x 90° 1 mm see order block

Electrical characteristics

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

Other specifications

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

Operating life min. (operations) Degree of protection rail mounting Degree of protection single mounting Flammability of materials -25 °C +70 °C -40 °C +80 °C acc. to IEC 60068-2 -14, -30, -33 and -78 50,000 IP40

IP65

according to UL 94 HB

Typical accessories RG 85 III - Keylock switch

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



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

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

Technical data see page 4 - 110

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

Please order lenses (round shape) separately.

RG 85 III



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

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

Technical data see page 4 - 110

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

Please order lenses (square shape) separately.



RG 85 III - Signal indicator, without lens



Technical Data

Dimensions Mounting grid min. Length Width

Mechanical design Version Mounting

Terminals

Illumination

Electrical characteristics Operating voltage for LED Input current LED 55 x 35 mm 64 mm 34 mm

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

24^{±20%} V depending on LED colour 20 - 30 mA

Other specifications

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

Degree of protection rail mounting Degree of protection single mounting Flammability of materials -25 °C +70 °C -40 °C +80 °C acc. to IEC 60068-2 -14, -30, -33 and -78 IP40 IP65

- -

according to UL 94 HB

Typical accessories RG 85 III - Signal indicator, without lens

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

RG 85 III



RG 85 III - Signal indicator, without lens

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

Technical data see page 4 - 114

Please order round, square or triangular lenses separately.

RG 85 III



RG 85 III - Accessories

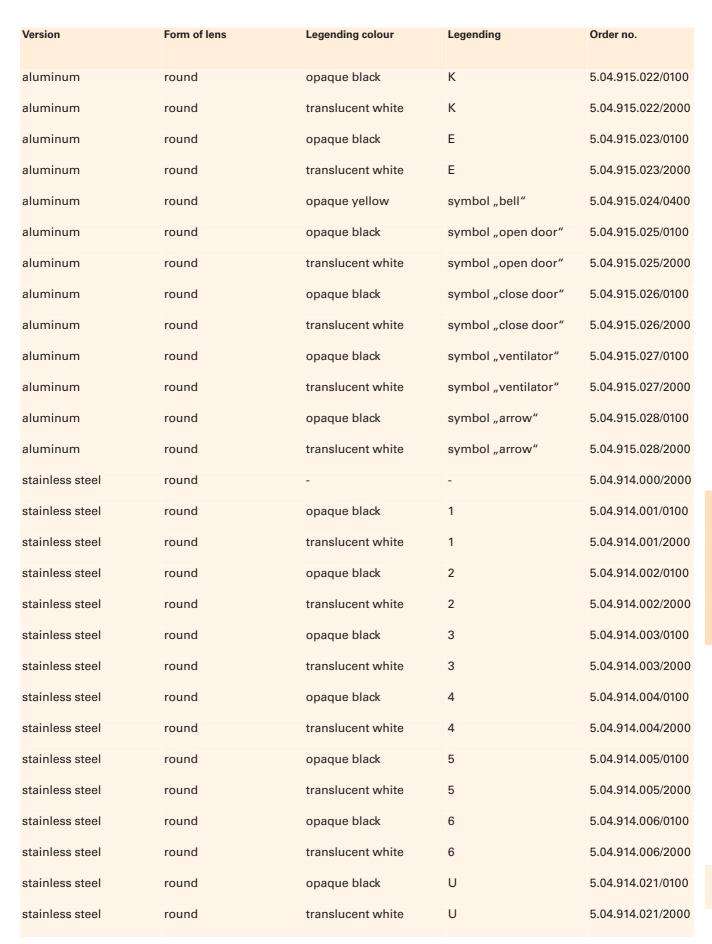


RG 85 III - Lenses for keyswitches, round



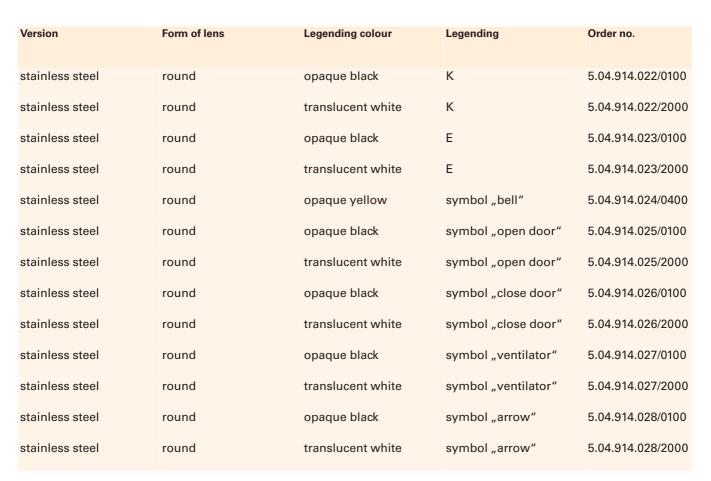
Version	Form of lens	Legending colour	Legending	Order no.
aluminum	round	-	-	5.04.915.000/2000
aluminum	round	opaque black	1	5.04.915.001/0100
aluminum	round	translucent white	1	5.04.915.001/2000
aluminum	round	opaque black	2	5.04.915.002/0100
aluminum	round	translucent white	2	5.04.915.002/2000
aluminum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

RG 85 III



RG 85 III





Technical data see page 4 - 114

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

RG 85 III - Lenses for keyswitches, square



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

SOLUTIONS WITH PASSION



Version	Form of lens	Legending colour	Legending	Order no.
aluminum	square	translucent white	3	5.04.915.103/2000
aluminum	square	opaque black	4	5.04.915.104/0100
aluminum	square	translucent white	4	5.04.915.104/2000
aluminum	square	opaque black	5	5.04.915.105/0100
aluminum	square	translucent white	5	5.04.915.105/2000
aluminum	square	opaque black	6	5.04.915.106/0100
aluminum	square	translucent white	6	5.04.915.106/2000
aluminum	square	opaque black	U	5.04.915.121/0100
aluminum	square	translucent white	U	5.04.915.121/2000
aluminum	square	opaque black	К	5.04.915.122/0100
aluminum	square	translucent white	К	5.04.915.122/2000
aluminum	square	opaque black	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

RG 85 III

4

PCB Keyswitches

Stock items are marked by bold printed order numbers.



Version	Form of lens	Legending colour	Legending	Order no.
stainless steel	square	translucent white	3	5.04.914.103/2000
stainless steel	square	opaque black	4	5.04.914.104/0100
stainless steel	square	translucent white	4	5.04.914.104/2000
stainless steel	square	opaque black	5	5.04.914.105/0100
stainless steel	square	translucent white	5	5.04.914.105/2000
stainless steel	square	opaque black	6	5.04.914.106/0100
stainless steel	square	translucent white	6	5.04.914.106/2000
stainless steel	square	opaque black	U	5.04.914.121/0100
stainless steel	square	translucent white	U	5.04.914.121/2000
stainless steel	square	opaque black	К	5.04.914.122/0100
stainless steel	square	translucent white	К	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.

RG 85 III

4

4 - 120



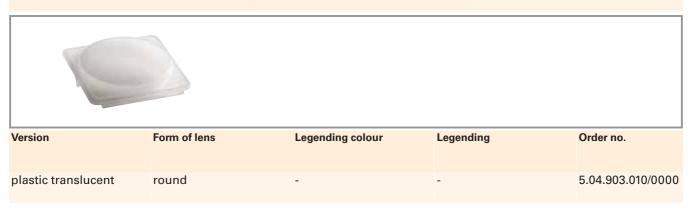
RG 85 III - Lenses for keylock switches, round

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

RG 85 III - Lenses for keylock switches, square

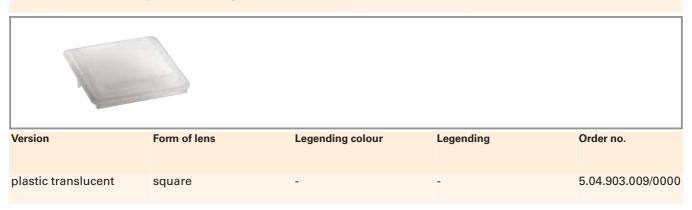
Version	Form of lens	Legending colour	Legending	Order no.
aluminum	square	-	-	5.04.915.201/2000
stainless steel	square	-	-	5.04.914.201/2000

RG 85 III - Lens, round, for signal indicators

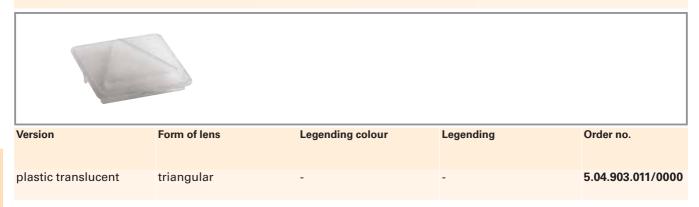




RG 85 III - Lens, square, for signal indicators



RG 85 III - Lens, triangular, for signal indicators



4

Cable, 8 wires	Cable, 8 wires, with socket connectors on both ends				
1					
Version	Form of lens	Legending colour	Legending	Order no.	
length: 1 m	-	-	-	5.03.772.261/0000	
length: 2 m	-	-	-	5.03.772.262/0000	

RG 85 III



Fixing rail, length 490 mm

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

Spacer

9				
Version	Form of lens	Legending colour	Legending	Order no.
mounting on rails	-	-	-	5.30.163.021/6000
single mounting	-	-	-	5.30.163.024/6000

Fixing piece for mounting the elements with the rail fixing method

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





General Data

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

Mechanical contact system RS 76 M

A gold alloy is used as the contact material and provides high contact reliability, low contact resistance and short bouncing time.

Solid-state contact system RS 76 C

The solid-state switch in Hall-IC technology ensures bounce-free and wear-free switching and a long operating life. Function: When pressing the keys, a permanent magnet changes its position relative to the Hall-IC and thereby generates an output signal. Their use is especially recommended in hostile environments and for heavy duty applications.

Content

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RS 76



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

Definitions

Momentary keyswitches

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

Latching keyswitches

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

Keycap materials

Keycap without legend insert: ABS Keycap with legend insert: – Keycap body: ABS

– Lens: PC

Keycap, n-module

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

Contact principle

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

Manual Soldering

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

Soldering process wave soldering

Wave soldering is permitted.

Legending of keycaps

Keycaps can be legended by different methods:

Two-shot moulding

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

Customer specific two-shot moulded keycaps on request.

Printing

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

Engraving

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

Laser-printing

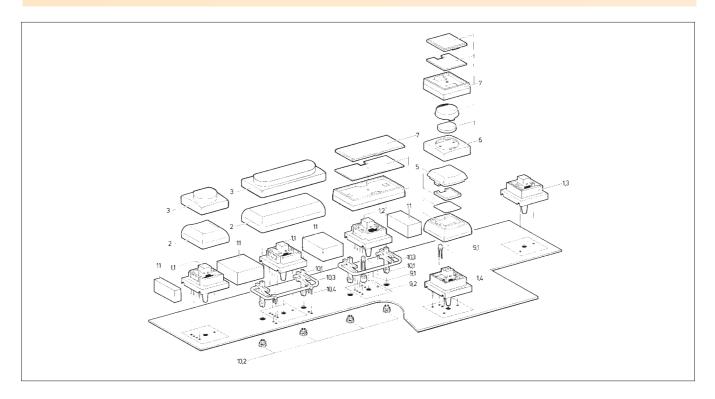
This method of legending can be recommended when complete keyboards are required in different keyboard layouts for which RAFI will develop the respective software. The keyboards can then be legended within a short time. This method of legending ist particularly recommended for average to large volumes.

Legend inserts

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



Design



No. Description

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

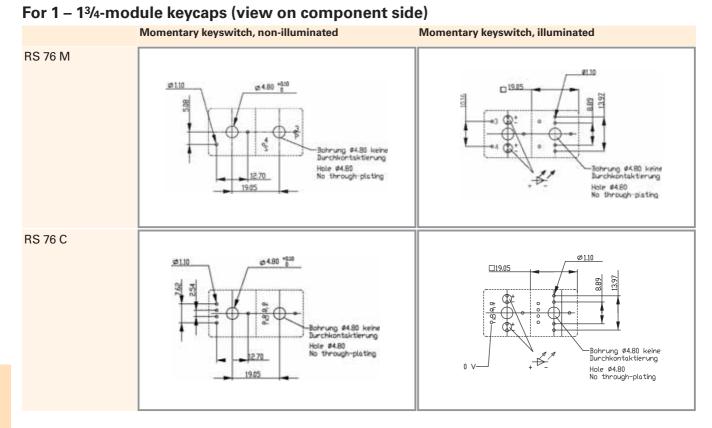
RS 76



Hole Pattern PCB RS 76 M/RS 76 C

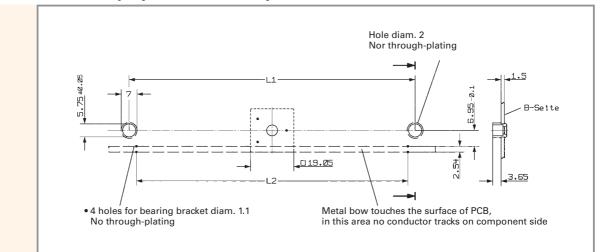
The hole patterns apply to the horizontal position of the keycaps only. Should they be in a vertical position,

the momentary keyswitch must be mounted accordingly, i. e. rotated by 90°.



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

RS 76 M/C



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

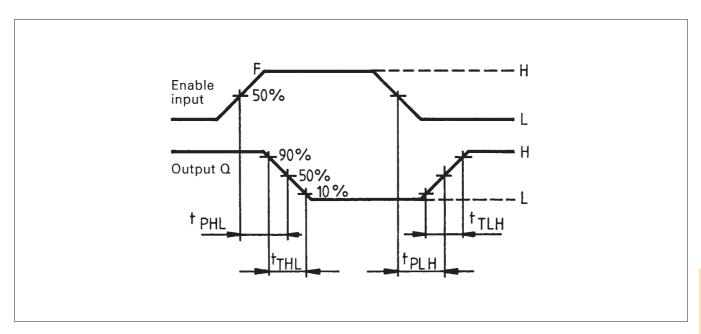
Important note: In the case of 2-, 3- and 8-module keycaps, additional holes must be provided for the accessories.

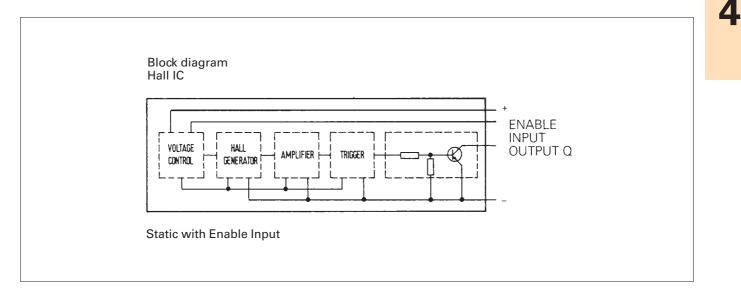
In the case of keycaps < 2-module, neither accessories nor holes are required.



Specific Technical Data RS 76 C

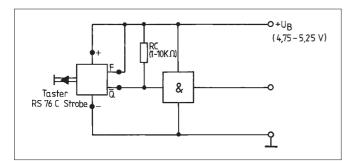
Output pulse diagram Dynamic characteristics (max.)		Tw = 25 °C	Tw = 50 °C	Tw = 70 °C
Turn-on delay time	t _{PHL}	3 µs	7 µs	10 µs
Turn-off delay time	t _{PHL}	4 µs	5 µs	6 µs
Fall/rise time	t _{PHL}	2 µs	2,5 µs	3 µs
	t _{PHL}	1 µs	1,5 µs	2,5 µs

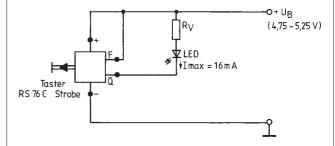






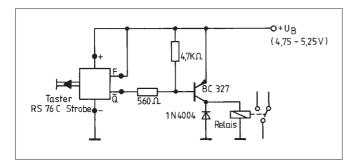
Examples for Application RS 76 C

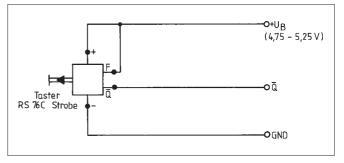




Driving of logic components

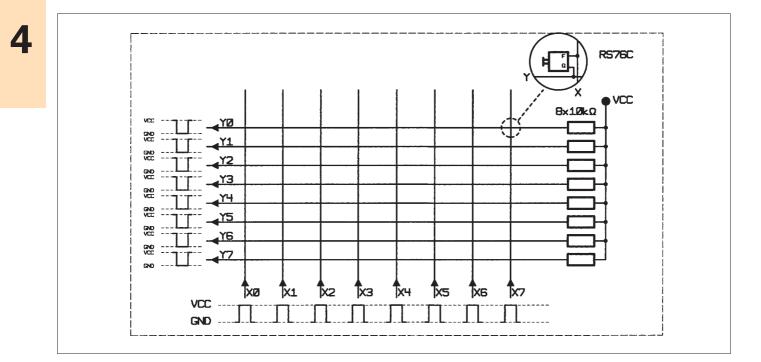
Indication of logical states





Driving of a PNP transistor

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





RS 76 M - Full-travel keyswitch, not illuminable



Technical Data

General information Recommended key grid

Mechanical design

Contact function Mounting Terminals

Contact system Contact arrangement Contact materials Illumination

Mechanical characteristics

Operating force max. Operating travel Switching travel Robustness min.

Electrical characteristics

Rated voltage min. Rated voltage max. Rated current min. Rated current max. 19.05 mm

momentary soldering solder terminals, tin-plated cross contact 1 NO Au alloy no

see order block 4 mm 1.5 - 2.8 mm 100 N

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

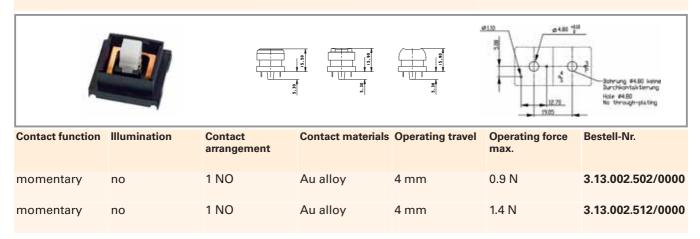
Rated power max. 1 W Contact resistance when new $100 \text{ m}\Omega$ (without diode) max. Contact resistance acc. to 3Ω life max. (without diode) Insulation resistance $10^9 \Omega$ ESD strength max. 8 kV Bouncing time max. 5 ms Other specifications Ambient temp. operating min. -25 °C +70 °C Ambient temp. operating max. -40 °C Storage temperature min. +80 °C Storage temperature max. (product) +50 °C Storage temperature max. (rail) Environmental restistance acc. to IEC 60068-2 -14, -30, -33 and -78 Operating life min. 107 (operations) Degree of protection IP40 Flammability of materials UL 94 HB

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

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



RS 76 M - Full-travel keyswitch, not illuminable



Technical data see page 4 - 132

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

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

Alto a 440 ⁴⁴⁰ a 440 ⁴⁴⁰						
Contact function	Illumination	Contact arrangement	Contact materials	Operating travel	Operating force max.	Bestell-Nr.
momentary	no	1 NO	Au alloy	4 mm	0.9 N	3.13.005.001/0000
momentary	no	1 NO	Au alloy	4 mm	1.4 N	3.13.005.011/0000

Technical data see page 4 - 132

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

RS 76



RS 76 M - Full-travel keyswitch, illuminable

Pict.: RS 76M, for spot illumination	RS 76MX, for full illumination	RS 76MX, keyboard fully illuminated

Technical Data

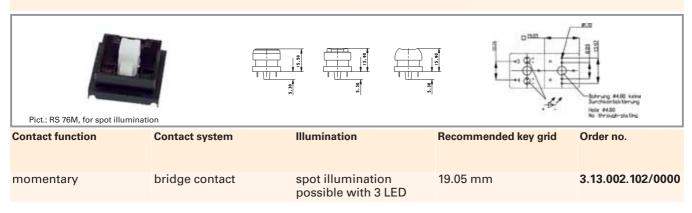
General information		Rated power max.	1 W
Recommended key grid	19.05 mm	Contact resistance when new	200 m Ω
		max.	
Mechanical design		Contact resistance acc. to	3 Ω
Contact function	see order block	life max.	
Mounting	soldering	Insulation resistance	10 ⁹ Ω
Terminals	solder terminals,	ESD strength max.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

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

Description	Photo	Order no.	Additional acces- sories see page
RS 76 - Cover IP40, 1-module, charcoal grey		5.04.520.174/0152	4 - 151
RS 76 C - Keycap, illuminated, with legend insert		5.04.665.521/5520	4 - 144
RS 76 C - Keycap, illuminated, with nail protection and legend insert	9	5.04.665.911/5520	4 - 145
RS 76 C - Keycap with light bar	-	5.82.110.000/0242	4 - 144



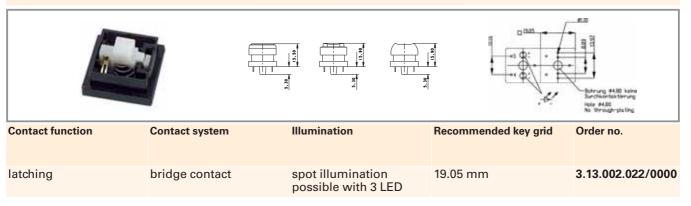
RS 76 M - Full-travel keyswitch, illuminable, momentary



Technical data see page 4 - 134

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

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



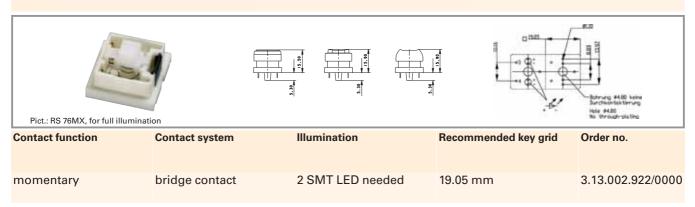
Technical data see page 4 - 134

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

RS 76



RS 76 MX - Full-travel keyswitch, fully illuminable



Technical data see page 4 - 134

Accessoires:

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

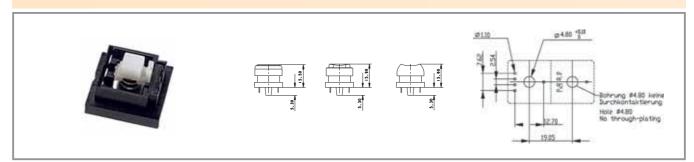
For accessories, refer to RS 76 special accessories.

For keycaps, see keycaps for RS 76.

The SMT LEDs are soldered on the back of the printed circuit board and shine through openings in the board and keyswitch housing.



RS 76 C - Full-travel keyswitch, not illuminable



Technical Data

Output residual current (Q) max. 10 µA

General information		Output saturation voltage	0.4 V
Recommended key grid	19.05 mm	(Q) max. bei 16 mA	
		ESD strength max.	8 kV
Mechanical design		Output switching times (Q)	3 µs
Contact function	momentary	at 25 °C, t _{PHL}	
Mounting	soldering	Output switching times (Q)	4 µs
Terminals	solder terminals,	at 25 °C, t _{PLH}	
	tin-plated	Output switching times (Q)	1 μs
Contact system	contactless with	at 25 °C, tтн∟	
	Hall-IC	Output switching times (Q)	2 µs
Illumination	no	at 25 °C, t _{TLH}	
Mechanical characteristics		Other specifications	
Switching travel off	0.8 2.4 mm	Reliability of Hall-IC at 25 °C	$\lambda = 2.5 \text{ x } 10^{-7} \text{ h}^{-1}$
Operating force max.	see order block	Ambient temp. operating min.	0°C
Operating travel	4 mm	Ambient temp. operating max.	+70 °C
Switching travel on	1.5 - 2.8 mm	Storage temperature min.	-40 °C
Robustness min.	100 N	Storage temperature max.	+80 °C
		(product)	
Electrical characteristics		Storage temperature max. (rail)	+50 °C
Operating voltage DC	4.75 5.25 V	Environmental restistance	acc. to IEC 60068-2
Supply current max. at $U_{IL} = 0$ V	0.5 mA		-14, -30, -33 and -78
Supply current max. at $U_{\rm H} = 5 V$	5 mA	Operating life min.	see order block
Input voltage (F) at $U_{IL} = 0$ V	0.4 V	(operations)	
Input voltage (F) at $U_{\rm H} = 2.4V$	5.25 V	Degree of protection	IP40
Output load current (Q) max.	16 mA	Flammability of materials	UL 94 HB

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

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



RS 76 C - Full-travel keyswitch, not illuminable

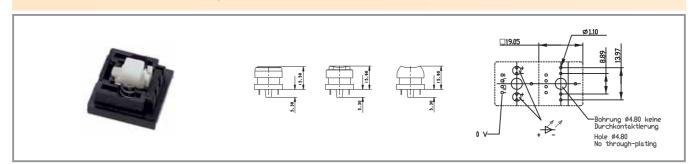
					borrung 44.80 krime burchkientaktierung Heir 44.80 No through-pioting
Contact function	Operating life min. (operations)	Illumination	Operating force max.	Operating travel	Order no.
momentary	10 ⁸	no	0.7 N	4 mm	3.13.001.010/0000
momentary	10 ⁸	no	1 N	4 mm	3.13.001.210/0000

Technical data see page 4 - 138

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



RS 76 C - Full-travel keyswitch, illuminable



Technical Data

General information Recommended key grid	19.05 mm	Output residual current (Q) max. Output saturation voltage	10 μA 0.4 V
Mashaniadalasinn		(Q) max. bei 16 mA	8 kV
Mechanical design		ESD strength max.	• · · ·
Contact function	see order block	Output switching times (Q)	3 µs
Mounting	soldering	at 25 °C, t _{PHL}	
Terminals	solder terminals,	Output switching times (Q)	4 µs
	tin-plated	at 25 °C, t _{PLH}	
Contact system	contactless with	Output switching times (Q)	1 μs
	Hall-IC	at 25 °C, tтн∟	
Illumination	with LED	Output switching times (Q)	2 µs
LED colour	see order block	at 25 °C, t _{TLH}	·
Mechanical characteristics		Other specifications	
Switching travel on	1.5 - 2.8 mm	Reliability of Hall-IC at 25 °C	$\lambda = 2.5 \text{ x } 10^{-7} \text{ h}^{-1}$
Switching travel off	0.8 2.4 mm	Ambient temp. operating min.	0°C
Operating force max.	0.7 N	Ambient temp. operating max.	+70 °C
Operating travel	4 mm	Storage temperature min.	-40 °C
Robustness min.	100 N	Storage temperature max.	+80 °C
hobustness min.	10011	(product)	100 0
Electrical characteristics		Storage temperature max.	+50 °C
Number of LED	see order block	(rail)	
Operating voltage DC	4.75 5.25 V	Environmental restistance	acc. to IEC 60068-2
	4.75 5.25 V 0.5 mA	Environmental resustance	-14, -30, -33 and -78
Supply current max. at $U_{IL} = 0V$		Operating life min	see order block
Supply current max. at $U_{\rm H} = 5 V$	5 mA	Operating life min.	See ofder block
Input voltage (F) at $U_{IL} = 0 V$	0.4 V	(operations)	1040
Input voltage (F) at $U_{IH} = 2.4V$	5.25 V	Degree of protection	IP40
Output load current (Q) max.	16 mA	Flammability of materials	UL 94 HB

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

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



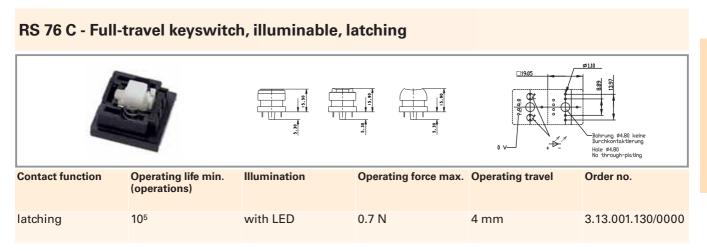
Typical accessories RS 76 C - Full-travel keyswitch, illuminable

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

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

					Bohrung #4.80 keine Durchkontaktierung Hole #4.80 No through-plating
Contact function	Operating life min. (operations)	Illumination	Operating force max.	Operating travel	Order no.
momentary	10 ⁸	with LED	0.7 N	4 mm	3.13.001.110/0000

Technical data see page 4 - 140



Technical data see page 4 - 140



RS 76 - Keycap, opaque

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

Keycap sets available in two-shot moulded design.

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

RS 76 - Keycap, opaque, with nail protection



Keycap sets available in two-shot moulded design.

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

SOLUTIONS WITH PASSION



RS 76 - Keycap with legend insert

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

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

Other colours on request.

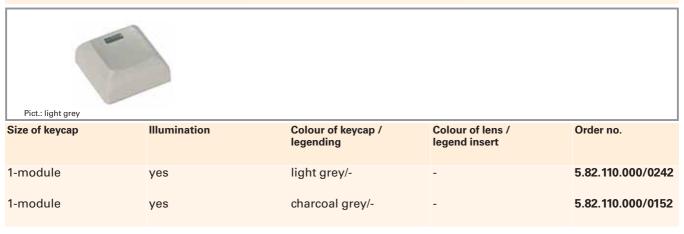
RS 76



RS 76 - Keycaps, illuminable



RS 76 - Keycap with light bar



Other colours on request.

RS 76 - Keycap, illuminable, with legend insert Pict.: charcoal grey Order no. Colour of keycap / Colour of lens / Size of keycap Illumination legending legend insert 1-module charcoal grey/colourless/white 5.04.665.521/5520 yes 1-module light grey/colourless/white 5.04.665.530/5520 yes

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

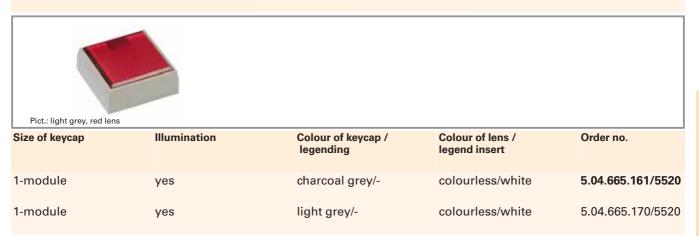


RS 76 - Keycap, illuminable, with nail protection and legend insert

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

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

RS 76 - Keycap, illuminable, with legend insert



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

Λ



RS 76 MX - Keycap, fully illuminable

	RS 76M>	keyboard fully illuminated		
Size of keycap	Illumination	Colour of keycap / legending	Colour of lens / legend insert	Order no.
1-module	yes	white/-	white translucent/-	5.05.511.168/0209
1-module	yes	light grey/-	white translucent/-	5.05.511.168/0754
1¼-module	yes	white/-	white translucent/-	5.05.511.169/0209
1½-module	yes	white/-	white translucent/-	5.05.511.170/0209
1¾-module	yes	white/-	white translucent/-	5.05.511.171/0209
1¼-module with light conductor	yes	white/-	white translucent/-	5.05.511.173/0209

Laser-printed versions available on request.



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



RS 76 - Keycap set, symbols A-Z

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

Other symbols and colours on request.

RS 76



RS 76 - Keycap set, symbols 0-9

0123456789				
Pict.: opaque light beige / brown	1		opaque with nail protection	charcoal grey / white
Size of keycap	Form of lens	Colour of keycap / legending	Symbol	Order no.
1-module	keycap opaque with nail protection	charcoal grey/white	0-9	5.00.999.504/0000
1-module	keycap opaque with nail protection	light grey/black	0-9	5.00.999.826/0000
1-module	keycap opaque	charcoal grey/white	0-9	5.00.999.529/0000
1-module	keycap opaque	light grey/black	0-9	5.00.999.827/0000

Other symbols and colours on request.

RS 76



RS 76 - Accessories



4



RS 76 - Cover IP40

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

Other colours on request.

RS
76

Δ





General Data

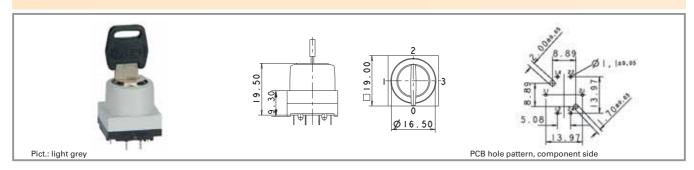
Keylock switches for PCB mounting. Matching with the RS 76 full-travel keyswitches and the RF 15 and RF 19 short-travel keyswitches.

Content	
MICROMEC - Keylock switch IP54	4 - 154
MICROMEC - Keylock switch IP54	4 - 156
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EUROLOCKS - Keylock switch IP54	4 - 159
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Priority keylock switch IP54	4 - 161
Rotary switch IP40	4 - 162
Rotary switch IP40	4 - 163

4



MICROMEC - Keylock switch IP54



Technical Data

General information Colour Form of collar

Dimensions Length of collar Width of collar Overall height

Mechanical design Mounting Terminals

Terminals Contact system

Contact function Contact materials Illuminability Lock Wafers Lock type Number of locking positions Main key Key removal position

Mechanical characteristics

Switching torque Robustness max. Dielectric strength AC min. Rated power max.

see order block square

19 mm 19 mm 19.5 mm

soldering tin-plated cross contact self cleaning see order block Au alloy no Micromec 5 001 500 on request see order block

0.04 ... 0.10 Nm

Electrical characteristics

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

Other specifications

Rotating angle Operating life Degree of protection from front side Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. Environmental restistance

Flammability of materials

see order block 10,000 IP54

-25 °C +70 °C -40 °C +80 °C acc. to IEC 60068-2 -14, -30, -33 and -78 UL 94 HB

Typical accessories MICROMEC - Keylock switch IP54

2 Nm

500 V

1 W

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

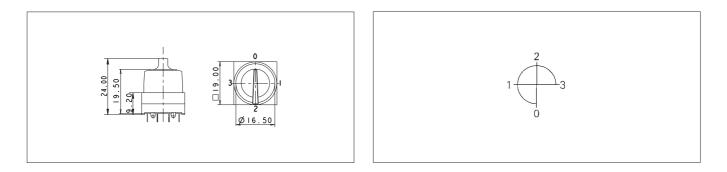
Keylock and rotary switches for PCB

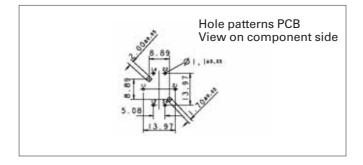


Typical accessories MICROMEC - Keylock switch IP54

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

Configuration Diagram/Dimensional Drawing





Switching position	Contact function
0	$-\underbrace{\begin{array}{c}11\\0\end{array}}^{11}\underbrace{\begin{array}{c}0\end{array}}^{12}\\0\end{array}\underbrace{\begin{array}{c}21\\0\end{array}}^{22}\\0\underbrace{\begin{array}{c}24\\0\end{array}}^{24}\end{array}$
1	$-\underbrace{11}_{0} \underbrace{12}_{14} \underbrace{21}_{0} \underbrace{22}_{24}$
2	$\underbrace{\begin{array}{ccc} 11 & 0 & 12 \\ 0 & 14 & 0 & 0 \\ 0 & 14 & 0 & 0 \\ 0 & 24 & 0 & 0 \\ \end{array}}_{0 24}$
3	$-\underbrace{\overset{11}{\overset{0}{\overset{12}{}}}_{0\underline{14}}}_{0\underline{14}} \underbrace{\overset{21}{\overset{0}{}}}_{0\underline{24}}$

Λ

Key

Swit-



MICROMEC - Keylock switch IP54

			3	and a second sec	10 1, 149.00
Pict.: charcoal grey	and the second s	I MILTOTION	0 16.50	5.06 13.91 PCB hole pattern, compone	nt side
Contact function	Colour	Rotating angle		Key removal position	Order no.
momentary	charcoal grey	1 x 40°	140	0	3.13.026.041/0000
momentary	light grey	1 x 40°	1	0	3.13.026.541/0000
latching	charcoal grey	1 x 90°		0	3.13.026.001/0000
latching	light grey	1 x 90°	1	0	3.13.026.501/0000
latching	charcoal grey	1 x 90°	1	0+1	3.13.026.006/0000
latching	light grey	1 x 90°	1	0+1	3.13.026.506/0000
latching	charcoal grey	2 x 90°		0	3.13.026.011/0000
latching	light grey	2 x 90°	1	0	3.13.026.511/0000
latching	charcoal grey	2 x 90°	1	0+1+2	3.13.026.016/0000
latching	light grey	2 x 90°	1	0+1+2	3.13.026.516/0000
latching	charcoal grey	2 x 90°		0	3.13.026.601/0000
latching	light grey	2 x 90°		0	3.13.026.851/0000
latching	charcoal grey	2 x 90°		0+1+3	3.13.026.606/0000
latching	light grey	2 x 90°		0+1+3	3.13.026.856/0000
latching	charcoal grey	3 x 90°		0	3.13.026.021/0000
latching	light grey	3 x 90°	1 3	0	3.13.026.521/0000
latching	charcoal grey	3 x 90°		0+1+2+3	3.13.026.026/0000
latching	light grey	3 x 90°		0+1+2+3	3.13.026.526/0000
latching	charcoal grey	4 x 90° without stop	$1 \bigoplus_{i=1\\ i \\ i$	0	3.13.026.031/0000
latching	light grey	4 x 90° without stop		0	3.13.026.531/0000
latching	charcoal grey	4 x 90° without stop		0+1+2+3	3.13.026.036/0000
latching	light grey	4 x 90° without stop		0+1+2+3	3.13.026.536/0000

Technical data see page 4 - 154

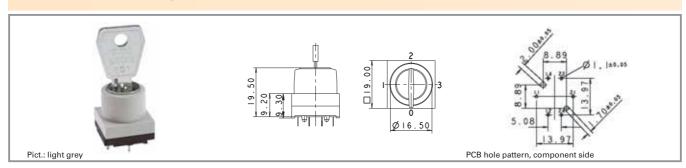
2 keys included. Other lock variants available on request.

4 - 156

4



EUROLOCKS - Keylock switch IP54



Technical Data

General information Colour Form of collar

Dimensions Length of collar Width of collar Overall height

Mechanical design

Terminals Contact system

Contact function Contact materials Illuminability Lock Wafers Lock type Number of locking positions Main key Symmetric key Key removal position cleaning latching Au alloy no Eurolocks 5

801

50

no

yes

cross contact self

see order block

square

19 mm

19 mm

19.5 mm

soldering

tin-plated

Electrical characteristics

Other specifications

Rotating angle Operating life Degree of protection from front side Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. Environmental restistance

Flammability of materials

see order block 10,000 IP54 -25 °C +70 °C

-40 °C +80 °C acc. to IEC 60068-2 -14, -30, -33 and -78 UL 94 HB

Symm Key re

Mechanical characteristics Switching torque Robustness max. Dielectric strength AC min. Rated power max.

0.04 ... 0.10 Nm 2 Nm 500 V

see order block

Typical accessories EUROLOCKS - Keylock switch IP54

1 W

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



EUROLOCKS - Keylock switch IP54

	2	95 1	2	10000 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-151; (m.m.
Pict.: light grey			Ø 16.50	PCB hole pattern, compone	nt side
Contact function	Colour	Rotating angle		Key removal position	Order no.
latching	charcoal grey	1 x 90°		0	3.13.009.001/0000
latching	light grey	1 x 90°		0	3.13.009.006/0000
latching	charcoal grey	1 x 90°		0+1	3.13.009.031/0000
latching	light grey	1 x 90°		0+1	3.13.009.036/0000

Technical data see page 4 - 158

2 keys included. Other lock variants available on request.

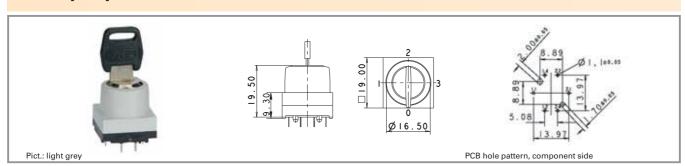
For the switching arrangement, refer to Micromec keylock switch IP54.

Key

Swit-



Priority keylock switch IP54



General Data

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

Technical Data

Dielectric strength AC min.

Rated power max.

General information		Electrical characteristics	
Colour	see order block	Rated voltage	2 35 V
Form of collar	square	Rated current max.	100 mA
	-	Contact resistance when new	100 m Ω
Dimensions		max.	
Length of collar	19 mm	Contact resistance acc. to	200 m Ω
Width of collar	19 mm	life max.	
Overall height	19.5 mm	Insulation resistance	10 ⁹ Ω
		ESD strength max.	8 kV
Mechanical design			
Mounting	soldering	Other specifications	
Terminals	tin-plated	Rotating angle	see order block
Contact system	cross contact self	Operating life	10,000
-	cleaning	Degree of protection from	IP54
Contact function	see order block	front side	
Contact materials	Au alloy	Ambient temp. operating min.	-25 °C
Illuminability	no	Ambient temp. operating max.	+70 °C
Lock	Micromec	Storage temperature min.	-40 °C
Wafers	5	Storage temperature max.	+80 °C
Lock type	001	Environmental restistance	acc. to IEC 60068-2
Number of locking positions	500		-14, -30, -33 and -78
Main key	on request	Flammability of materials	UL 94 HB
Key removal position	see order block		
Mechanical characteristics			
Switching torque	0.04 0.10 Nm		
Robustness max.	2 Nm		

Typical accessories Priority keylock switch IP54

500 V

1 W

Description	Photo	Order no.	Additional acces- sories see page
O-ring for keylock switch	\bigcirc	5.30.120.015/0100	5 - 25



Typical accessories Priority keylock switch IP54

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

Priority keylock switch IP54

Pict.: charcoal grey			00.61	2 3 6.50	PCB hole pattern, compone	nt side
Contact function	Colour	Rotating angle			Key removal position	Order no.
latching	charcoal grey	2 x 90°		1	0	3.13.027.001/0000
latching	light grey	2 x 90°		1	0	3.13.027.501/0000
latching	charcoal grey	2 x 90°		1	0+1+2	3.13.027.006/0000
latching	light grey	2 x 90°		1	0+1+2	3.13.027.506/0000
latching	charcoal grey	3 x 90°		1 - 3	0	3.13.027.011/0000
latching	light grey	3 x 90°			0	3.13.027.511/0000
latching	charcoal grey	3 x 90°			0+1+2+3	3.13.027.016/0000
latching	light grey	3 x 90°			0+1+2+3	3.13.027.516/0000

Technical data see page 4 - 160

2 sets of keys included.

Other lock variants available on request.

For the switching arrangement, see IP54 Micromec keylock switch.

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

Key

Swit-



Rotary switch IP40

Technical Data

General information Colour Form of collar

Dimensions Length of collar Width of collar Overall height

Mechanical design Mounting Terminals

Contact system

Contact function Contact materials Illuminability

Mechanical characteristics

Torque against stop min. Dielectric strength AC min. Rated power max. see order block square

19 mm 19 mm 24 mm

soldering tin-plated cross contact self cleaning see order block Au alloy no

0.45 Nm see order block 1 W

Electrical characteristics

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

Other specifications

Rotating angle Operating life Degree of protection from front side Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. Environmental restistance

Flammability of materials

see order block 50,000 IP40

-25 °C +70 °C -40 °C +80 °C acc. to IEC 60068-2 -14, -30, -33 and -78 UL 94 HB



Rotary switch IP40

Pict.: charcoal grey	24.00 9.50 9.00	0 3 2 2 9 16.50 PCB hole pa	ttern, componer	at 1, 144.89
Contact function	Colour	Rotating angle		Order no.
latching	charcoal grey	1 x 90°	1	3.13.007.001/0152
latching	charcoal grey	2 × 90°	1	3.13.007.011/0152
latching	charcoal grey	3 x 90°	1 - 3	3.13.007.021/0152
latching	charcoal grey	4 x 90°		3.13.007.031/0152

Technical data see page 4 - 162

Other colour variants available on request

Key

Swit-

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

RAFI:

3.14.001.033/0000 3.14.001.032/0000