



1.14.001.501/0000

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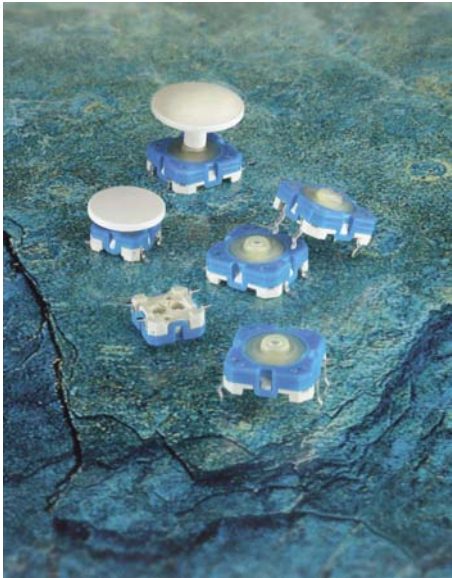
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General data

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).

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RACON 8



General data

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

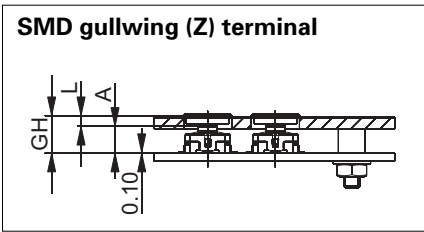
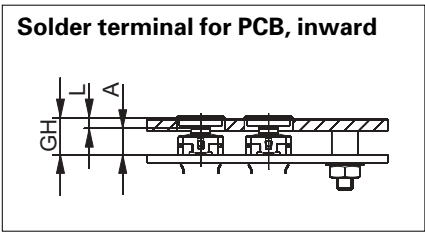
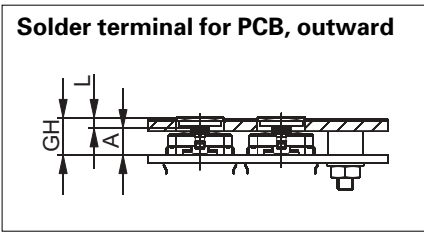
The features at a glance:

- Suitable for the most common soldering methods-
- Wave soldering bath for print versions
- Reflow soldering (SMD)
- Manual soldering
- SMD version suitable for processing with an automatic SMD assembly machine

Technical data

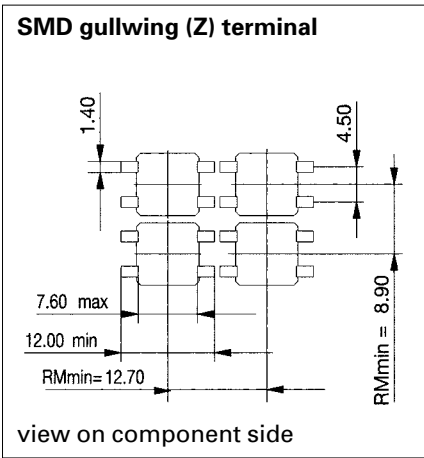
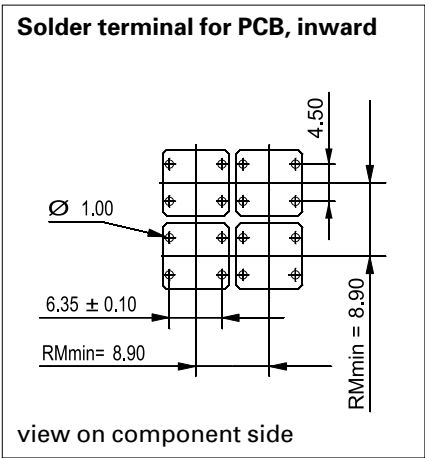
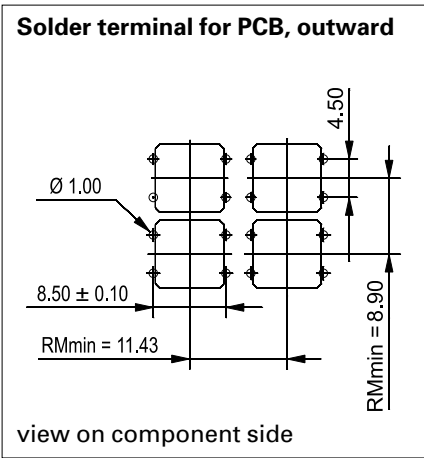
Dimensions		Insulation resistance	10 ⁹ Ω
Recommended key grid	see order block	Bouncing time max.	5 ms
Key grid max.	see order block	Other specifications	
Length of housing	8.4 mm	Ambient temp. operating min.	-40 °C
Width of housing	8.4 mm	Ambient temp. operating max.	+90 °C
Overall height	4.90 ^{+0.1} mm	Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Mechanical design		Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Mounting	soldering	Operating life at R _T = 23° C and test force = 1,5 x rated force	1000000
Terminals	see order block	Solderability / solder heat resistance PCB version	IEC 600 68-2-20
Contact system	snap-action contact	Solderability / solder heat resistance SMD version	EN 61760-1 and DIN IEC 600-68-2-58
Contact arrangement	1 NO	Flammability of materials	UL 94 HB
Contact materials	Au	Packing	see order block
Illumination	no	Produkt code	see order block
Mechanical characteristics			
Operating force	3.3 ^{+0.6} N		
Switching travel	0.34 ^{+0.1} mm		
Electrical characteristics			
Rated voltage min.	0.02 V		
Rated voltage max.	42 V		
Rated current min.	0.01 mA		
Rated current max.	100 mA		
Rated power max. (ohmic load)	1 W		
Contact resistance when new max.	100 mΩ		

RACON 8, Typical system assembly with plunger under overlay

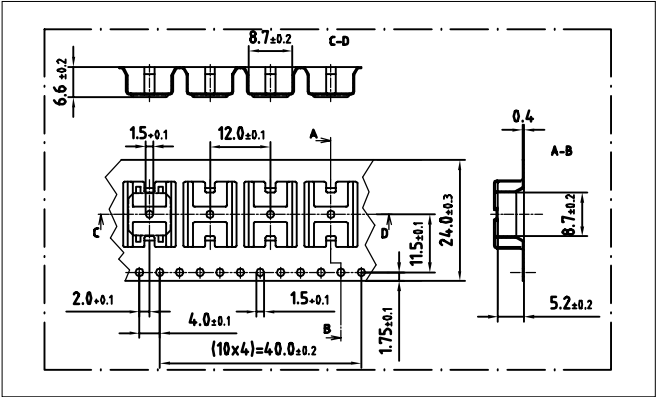


Variable	Declaration	Solder terminal outward	Solder terminal inward	SMD-terminal
A	Height of keyswitch		$A = 4.90 \pm 0.1 \text{ mm}$	
GH	Overall height		$GH = A + L$	$GH = A + L + 0.1 \text{ mm}$
L	Length of plunger		$L = GH - A$	$L = GH - A - 0.1 \text{ mm}$

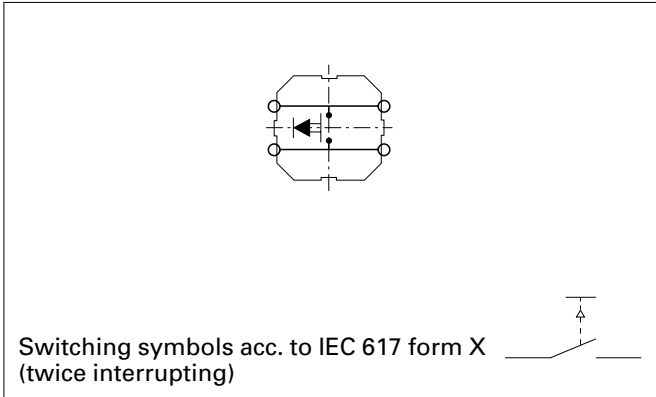
RACON 8, PCB hole pattern, smallest grid



RACON 8, SDM-terminal, tape and reel drawing



Circuit diagram RACON 8

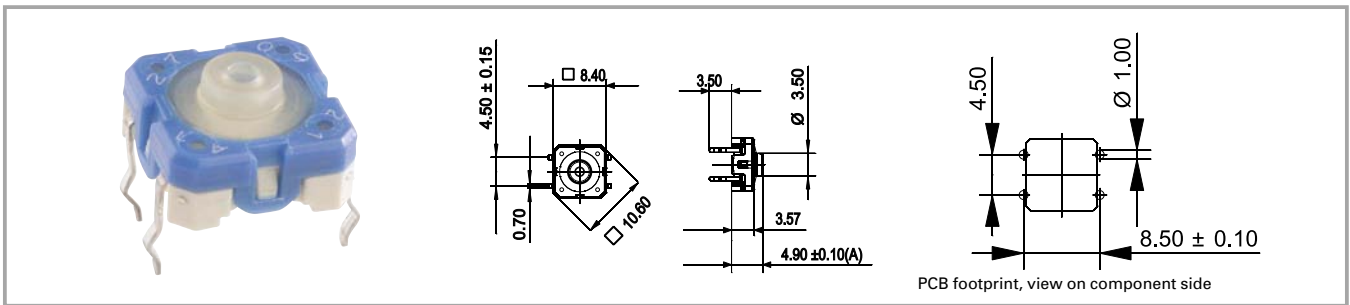


Accessories RACON 8

Description	Photo	Order no.	Page
Spacer, round, length 6.25 mm, red		5.30.759.034/0000	
Plunger for membrane data entry system		5.46.167.311/0209	

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

RACON 8, solder terminals for PCB, outward



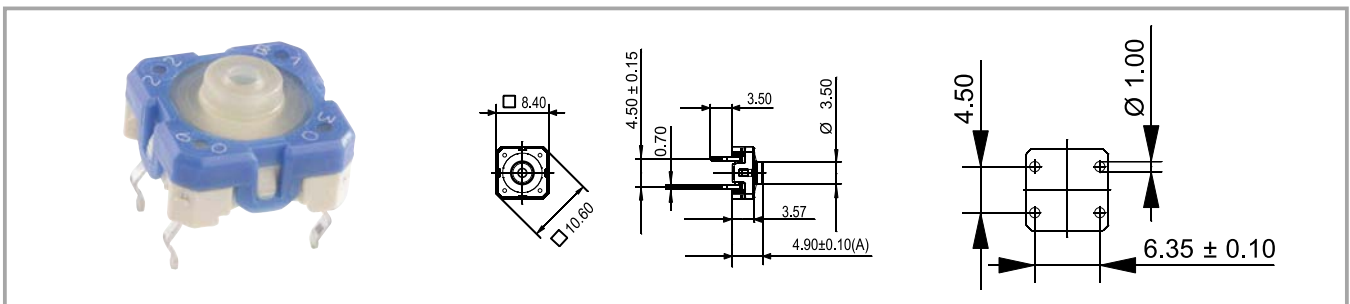
Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, outward	1 NO	A1	tubes à 60 piece	1.14.100.501/0000

Technical data see page 4 - 6

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

4

RACON 8, solder terminals for PCB, inward

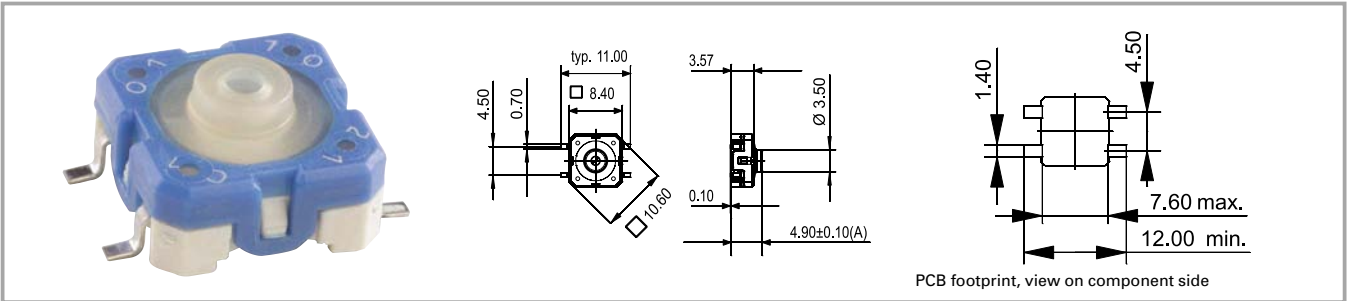


Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, inward	1 NO	B1	in tubes à 60 piece	1.14.100.502/0000

Technical data see page 4 - 6

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

RACON 8, SMD gullwing (Z) terminals



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

Technical data see page 4 - 6

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

RACON 12



General data

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

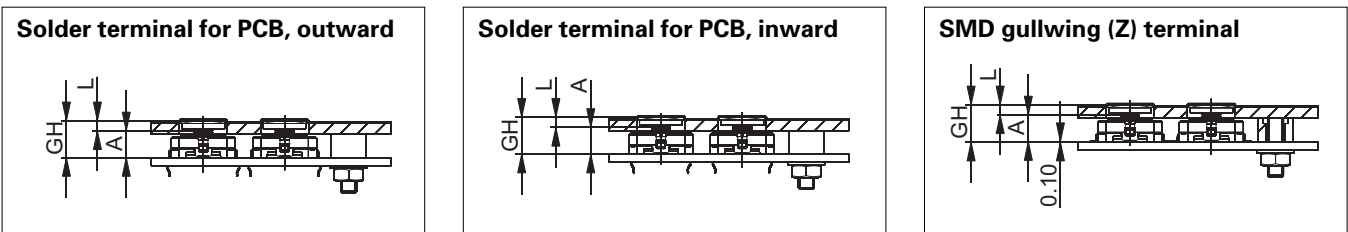
The features at a glance:

- Suitable for the most common soldering methods
 - Wave soldering bath for print versions
 - Reflow soldering (SMD)
 - Manual soldering
- SMD version suitable for processing with an automatic SMD assembly machine

Technical data

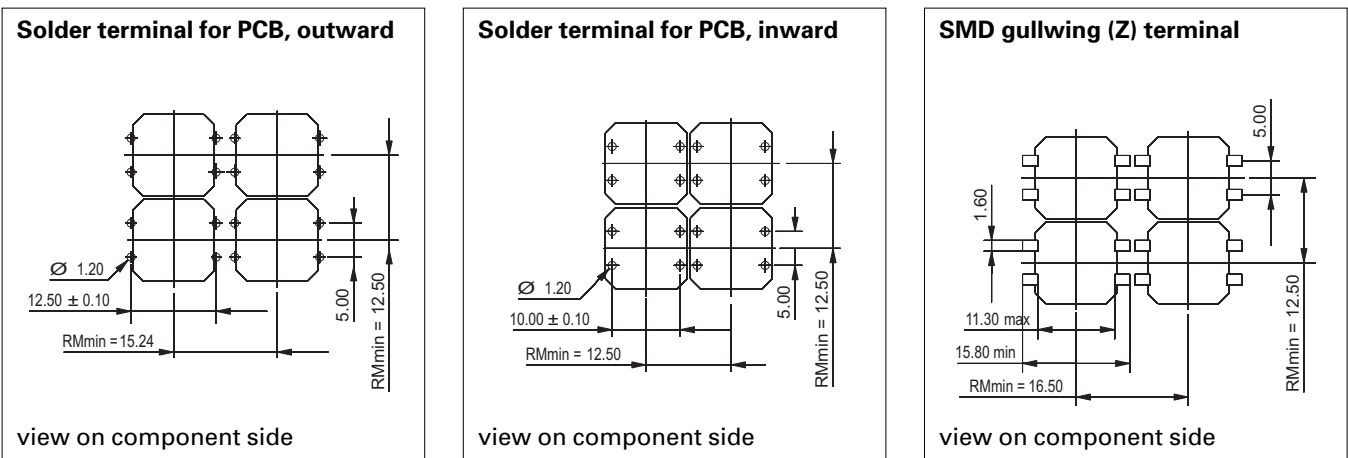
Dimensions		Insulation resistance	10 ⁹ Ω
Recommended key grid	see order block	Bouncing time max.	5 ms
Key grid max.	see order block	Other specifications	
Length of housing	12 mm	Ambient temp. operating min.	-40 °C
Width of housing	12 mm	Ambient temp. operating max.	+90 °C
Overall height	4.95 ^{+0.1} mm	Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Mechanical design		Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Mounting	soldering	Operating life at R _T = 23° C and test force = 1,5 x rated force	1000000
Terminals	see order block	Solderability / solder heat resistance PCB version	IEC 600 68-2-20
Contact system	snap-action contact	Solderability / solder heat resistance SMD version	EN 61760-1 and DIN IEC 600-68-2-58
Contact arrangement	1 NO	Flammability of materials	UL 94 HB
Contact materials	Au	Packing	see order block
Illumination	no	Produkt code	see order block
Mechanical characteristics			
Operating force	3,6 ^{+0.7} N		
Switching travel	0,61 ^{+0.1} mm		
Electrical characteristics			
Rated voltage min.	0.02 V		
Rated voltage max.	42 V		
Rated current min.	0.01 mA		
Rated current max.	100 mA		
Rated power max. (ohmic load)	1 W		
Contact resistance when new max.	100 mΩ		

RACON 12, Typical system assembly with plunger under overlay

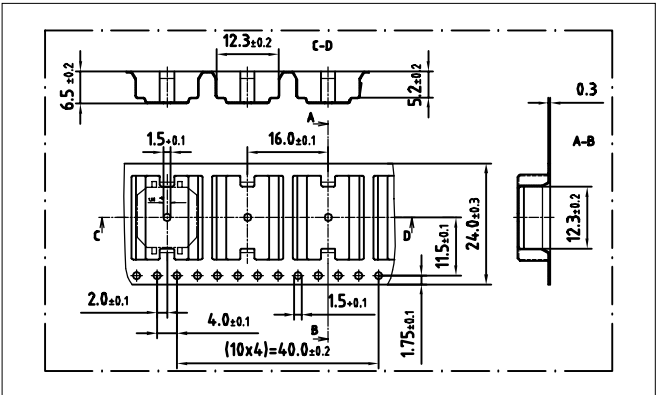


Variable	Declaration	Solder terminal outward	Solder terminal inward	SMD-terminal
A	Height of keyswitch	$A = 4.95 \pm 0.1 \text{ mm}$		
GH	Overall height		$GH = A + L$	$GH = A + L + 0.1 \text{ mm}$
L	Length of plunger		$L = GH - A$	$L = GH - A - 0.1 \text{ mm}$

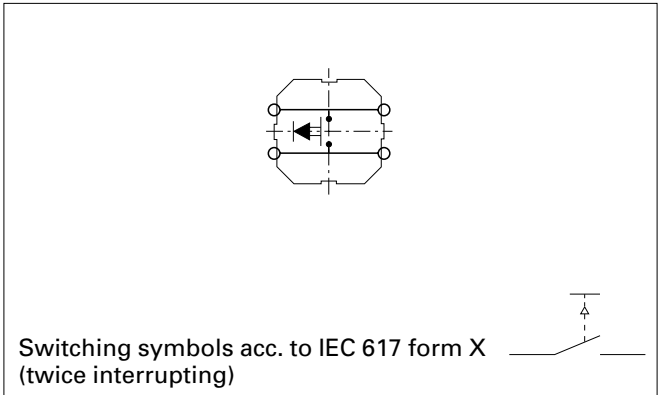
RACON 12, PCB hole pattern, smallest grid



RACON 12, SMD-terminal, tape and reel drawing



Circuit Diagram RACON 12

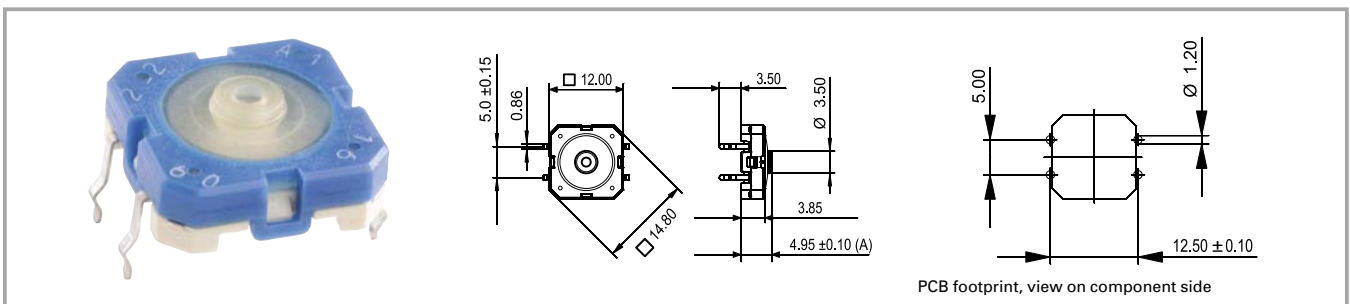


Accessories RACON 12

Description	Photo	Order no.	Page
Spacer, round, length 6.25 mm, red		5.30.759.034/0000	
Square plunger or membrane data entry system		5.46.001.057/0209	
Plunger for membrane data entry system		5.46.168.050/0209	

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

RACON 12, solder terminals for PCB, outward

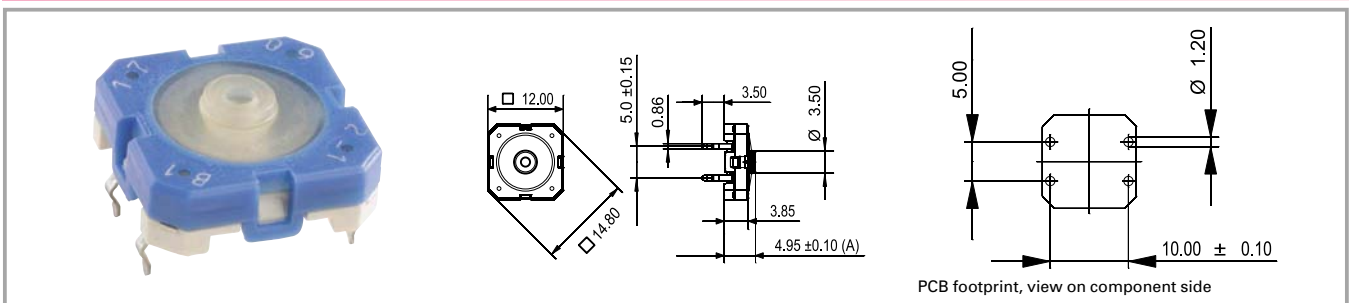


Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, outward	1 NO	A1	tubes à 45 piece	1.14.001.501/0000

Technical data see page 4 - 10

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

RACON 12, solder terminals for PCB, inward

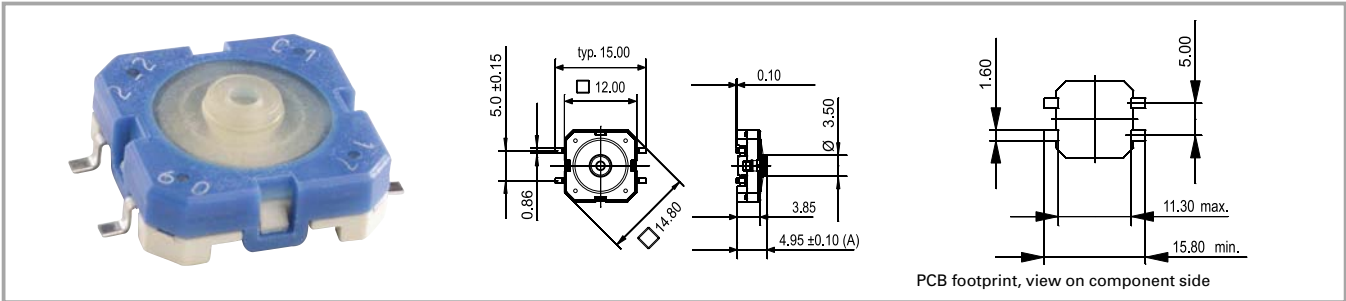


Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, inward	1 NO	B1	tubes à 45 piece	1.14.001.502/0000

Technical data see page 4 - 10

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

RACON 12, SMD gullwing (Z) terminals



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

Technical data see page 4 - 10

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

RACON 12 V with vertical adapter



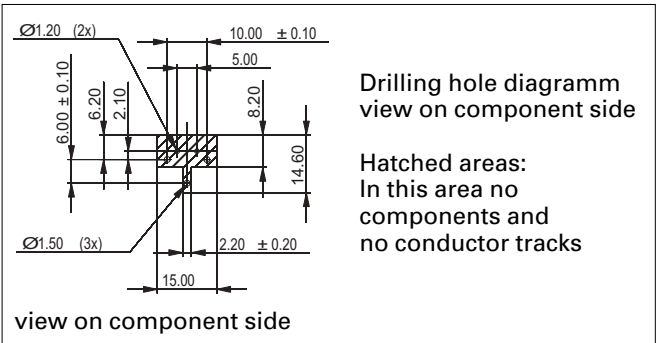
General data

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

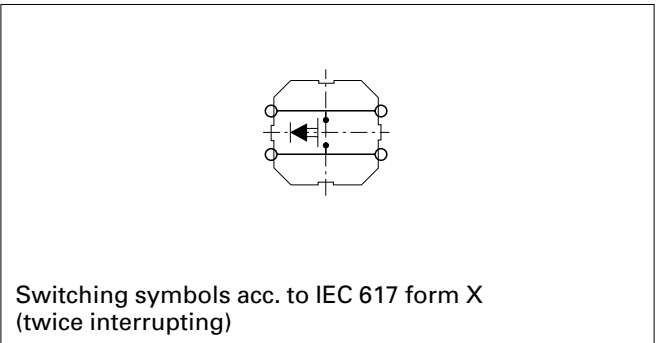
Technical data

Dimensions		Other specifications	
Length	14.5 mm	Ambient temp. operating min.	-40 °C
Width	13.6 mm	Ambient temp. operating max.	+80 °C
Overall height	4.95 mm	Storage temperature min.	-50 °C
Mechanical design		Storage temperature max. (product)	+85 °C
Mounting	soldering	Storage temperature max. (in tube)	+85 °C
Terminals	PCB terminals	Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Contact system	snap-action contact	Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Contact arrangement	1 NO	Operating life at $R_T = 23^\circ \text{C}$ and test force = 1,5 x rated force	1000000
Contact materials	Au	Solderability / solder heat resistance	according to IEC 600 68-2-20
Illumination	no	Flammability of materials	UL 94 HB
Mechanical characteristics		Packing	in boxes à 100 piece
Operating force	3,6 ^{+0,7} N	Produkt code	F 1
Switching travel	0,61 ^{+0,1} mm		
Electrical characteristics			
Rated voltage min.	0.02 V		
Rated voltage max.	42 V		
Rated current min.	0.01 mA		
Rated current max.	100 mA		
Rated power max. (ohmic load)	1 W		
Contact resistance when new max.	100 mΩ		
Insulation resistance	10 ⁹ Ω		
Bouncing time max.	5 ms		

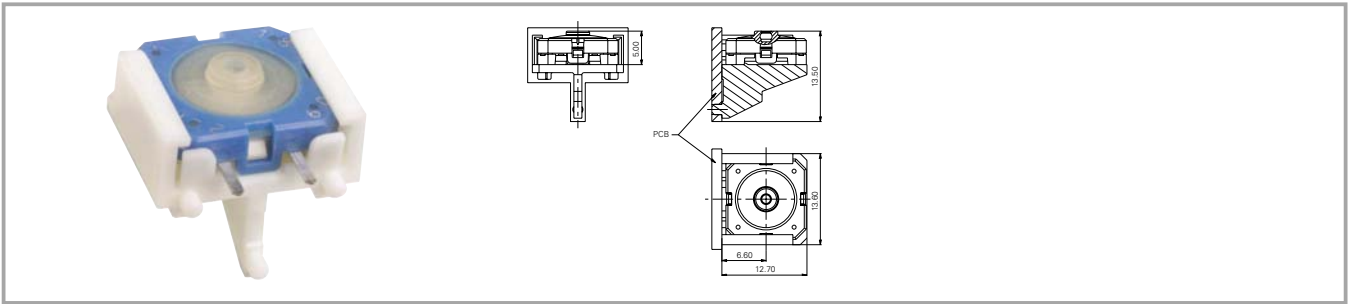
PCB footprint RACON 12V



Circuit Diagram RACON 12V



RACON 12 V with vertical adapter

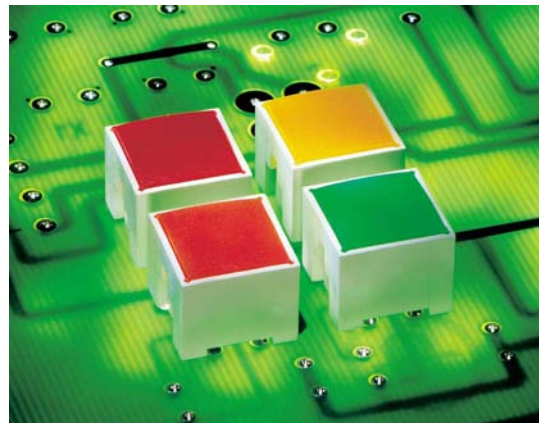


Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal tin-plated	1 NO	F 1	in boxes à 100 piece	1.14.001.505/0000

Technical data see page 4 - 14

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

RACON 12 i



General data

Application note

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

Technical data

General information

Colour of lens	see order block
Recommended key grid	15.24 x 15.24 mm
Key grid max.	12.5 x 12.5 mm

Dimensions

Length	11.35 mm
Width	11.35 mm
Overall height	9.7 mm

Mechanical design

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

Mechanical characteristics

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

Electrical characteristics

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

Bouncing time max.	5 ms
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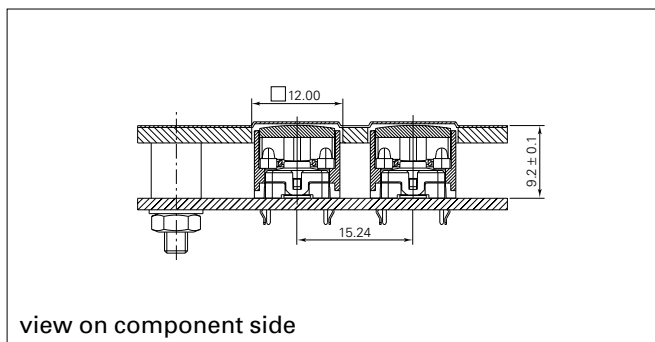
Other specifications

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

Electrical characteristics of LED

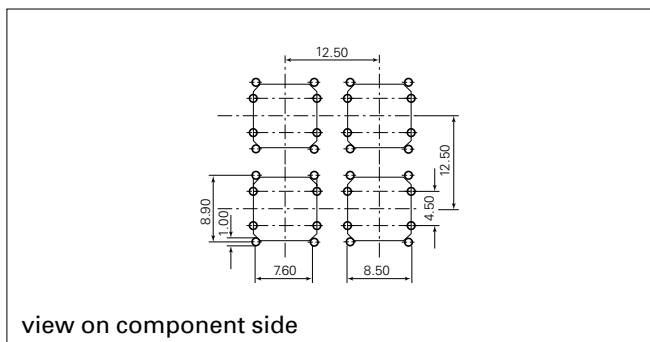
LED rated current max. I _F at 25°C	red/green: 30, yellow: 50 mA
LED current reduction beginning with 50 degree C	red: 0.5 mA/degree C, yellow 0.8 mA/degree C
LED wavelength typ.	red 639, green 510-535, yellow 590
LED forward voltage U _F at 20 mA	red: 1.8 V/20 mA, yellow: 1.9 V/20 mA
LED breakdown voltage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

RACON 12i typical system assembly

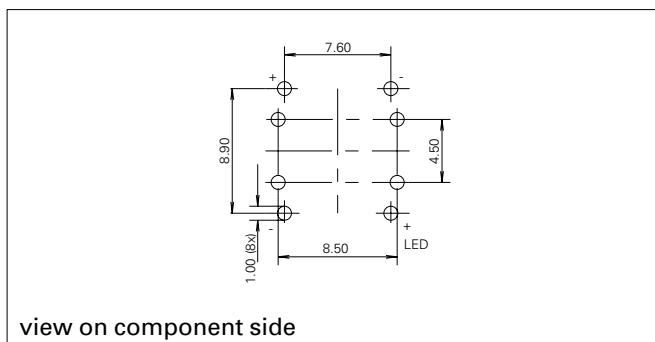


Explanation
Recommended area embossing 0.35 mm at glue spacer
thickness of 0.15 mm

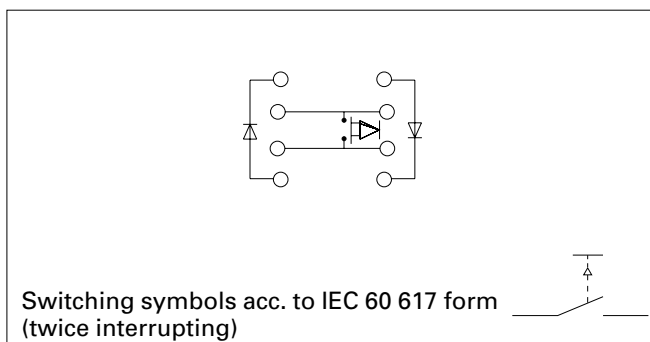
RACON 12i smallest grid



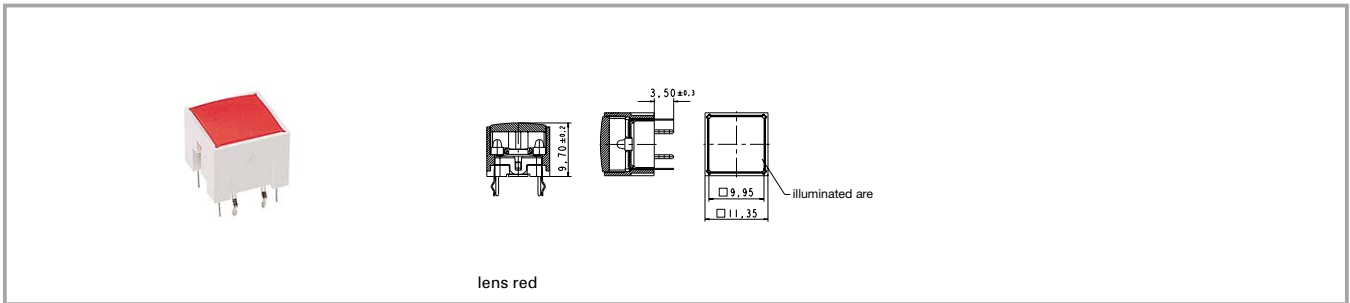
LED hole patterns



Circuit Diagram RACON 12i



RACON 12 i, solder terminals for PCB



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

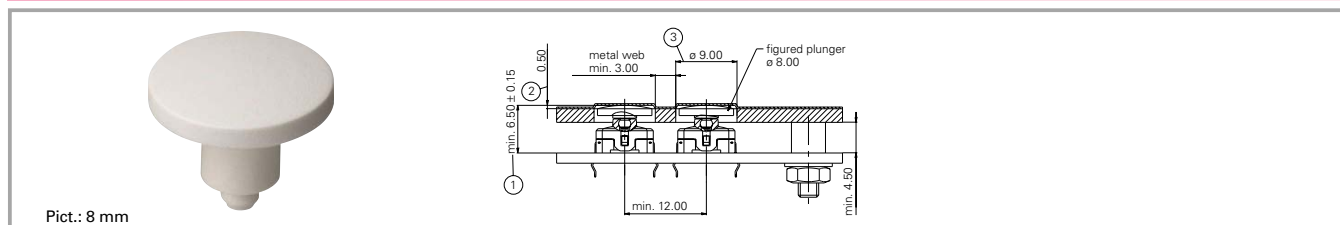
Technical data see page 4 - 16

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

RACON special accessories



Plunger for membrane data entry system

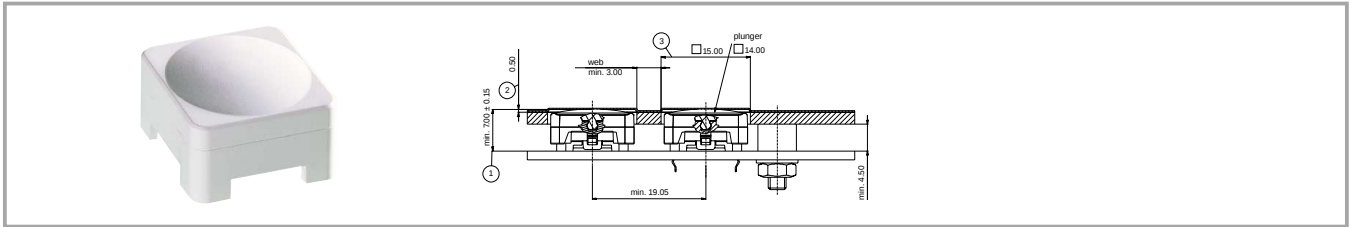


Overall height GH	Plunger diameter/size	RACON version	Length of plunger L	Order no.
6.5 mm	8 mm	RACON 8 Pin	1.6 mm	5.46.167.101/0209
6.5 mm	8 mm	RACON 8 SMD	1.5 mm	5.46.167.102/0209
6.5 mm	11.5 mm	RACON 8 Pin	1.6 mm	5.46.167.060/0209
6.5 mm	11.5 mm	RACON 8 SMD	1.5 mm	5.46.167.061/0209
6.5 mm	14.5 mm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

Overall height GH	Plunger diameter/size	RACON version	Length of plunger L	Order no.
7 mm	19 mm	RACON 8/12 SMD	2 mm	5.46.169.067/0209
9.7 mm	8 mm	RACON 8/12 Pin	4.8 mm	5.46.167.094/0209
9.7 mm	8 mm	RACON 8/12 SMD	4.7 mm	5.46.167.311/0209
9.7 mm	11.5 mm	RACON 8/12 Pin	4.8 mm	5.46.167.047/0209
9.7 mm	11.5 mm	RACON 8/12 SMD	4.7 mm	5.46.167.050/0209
9.7 mm	14.5 mm	RACON 8/12 Pin	4.8 mm	5.46.168.047/0209
9.7 mm	14.5 mm	RACON 8/12 SMD	4.7 mm	5.46.168.050/0209
9.7 mm	19 mm	RACON 8/12 Pin	4.8 mm	5.46.169.047/0209
9.7 mm	19 mm	RACON 8/12 SMD	4.7 mm	5.46.169.050/0209
12.5 mm	8 mm	RACON 8/12 Pin	0.36 mm	5.46.167.096/0209
12.5 mm	8 mm	RACON 8/12 SMD	7.5 mm	5.46.167.099/0209
12.5 mm	11.5 mm	RACON 8/12 Pin	0.36 mm	5.46.167.058/0209
12.5 mm	11.5 mm	RACON 8/12 SMD	7.5 mm	5.46.167.059/0209
12.5 mm	14.5 mm	RACON 8/12 Pin	0.36 mm	5.46.168.058/0209
12.5 mm	14.5 mm	RACON 8/12 SMD	7.5 mm	5.46.168.059/0209
12.5 mm	19 mm	RACON 8/12 Pin	0.36 mm	5.46.169.058/0209
12.5 mm	19 mm	RACON 8/12 SMD	7.5 mm	5.46.169.059/0209

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

Square plunger for membrane data entry system



Overall height GH	Plunger diameter/size	RACON version	Length of plunger L	Order no.
7 mm	14 x 14 mm	RACON 12 Pin	2.1 mm	5.46.001.064/0209
9.7 mm	14 x 14 mm	RACON 12 Pin	4.8 mm	5.46.001.060/0209
12.5 mm	14 x 14 mm	RACON 12 Pin	0.36 mm	5.46.001.063/0209
7 mm	14 x 14 mm	RACON 12 SMD	2 mm	5.46.001.057/0209
9.7 mm	14 x 14 mm	RACON 12 SMD	4.7 mm	5.46.001.058/0209
12.5 mm	14 x 14 mm	RACON 12 SMD	7.5 mm	5.46.001.059/0209

Front panel cut-out = 15 x 15 mm.