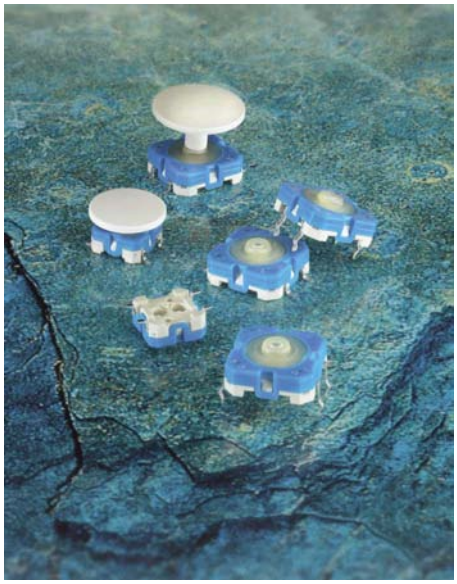


General data

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

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.

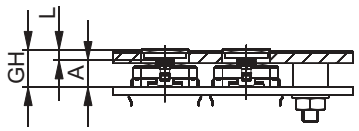
The features at a glance:
- Suitable for the most common soldering methods-
- Wave soldering bath for print versions
- Reflow soldering (SMD)
- Manual soldering
- SMD version suitable for processing with an automatic SMD assembly machine

Technical data

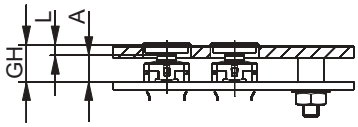
Dimensions	
Recommended key grid	see order block
Key grid max.	see order block
Length of housing	8.4 mm
Width of housing	8.4 mm
Overall height	$4.90^{+-0.1}$ mm
Mechanical design	
Mounting	soldering
Terminals	see order block
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials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

RACON 8, Typical system assembly with plunger under overlay

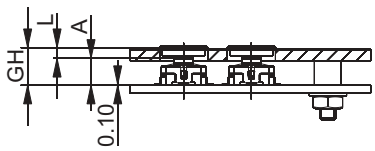
Solder terminal for PCB, outward



Solder terminal for PCB, inward



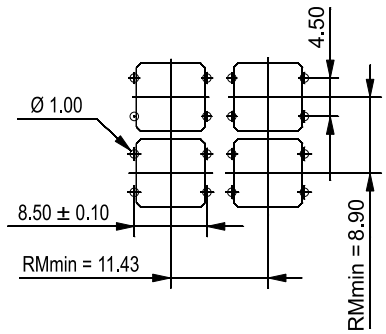
SMD gullwing (Z) terminal



Variable	Declaration	Solder terminal outward	Solder terminal inward	SMD-terminal
A	Height of keyswitch	A = 4.90 +/- 0.1 mm		
GH	Overall height	GH = A + L		GH = A + L + 0.1 mm
L	Length of plunger	L = GH - A		L = GH - A - 0.1 mm

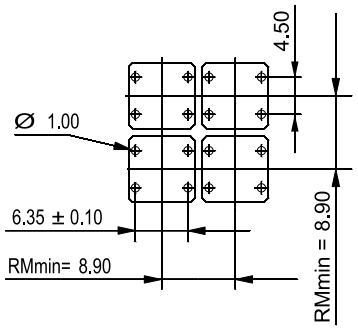
RACON 8, PCB hole pattern, smallest grid

Solder terminal for PCB, outward



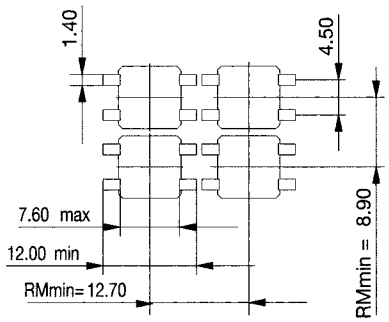
view on component side

Solder terminal for PCB, inward



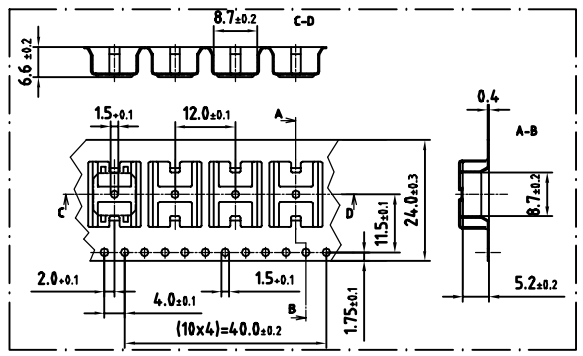
view on component side

SMD gullwing (Z) terminal

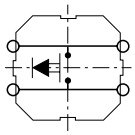


view on component side

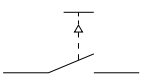
RACON 8, SDM-terminal, tape and reel drawing



Circuit diagram RACON 8



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

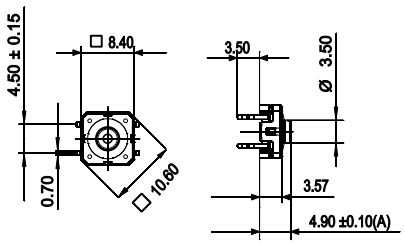


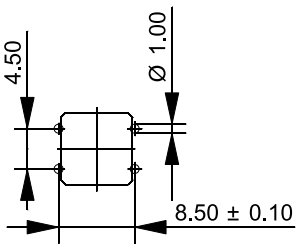
Accessories RACON 8

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





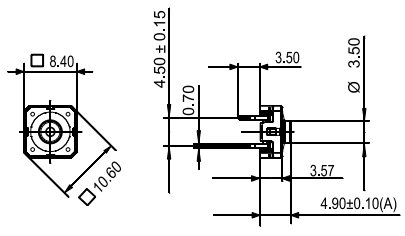
PCB footprint, view on component side

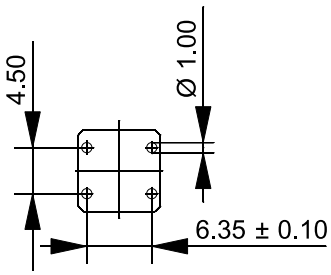
Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, outward	1 NO	A1	tubes à 60 piece	**1.14.100.501/0000**

Technical data see page 4 - 6

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

RACON 8, solder terminals for PCB, inward





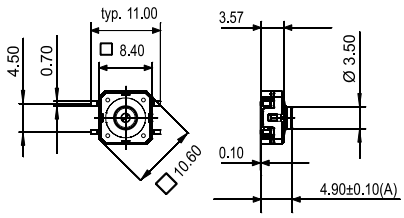
Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, inward	1 NO	B1	in tubes à 60 piece	**1.14.100.502/0000**

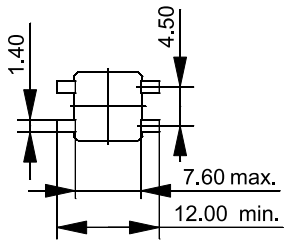
Technical data see page 4 - 6

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

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

RACON 8, SMD gullwing (Z) terminals





PCB footprint, view on component side

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

Technical data see page 4 - 6

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

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

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.

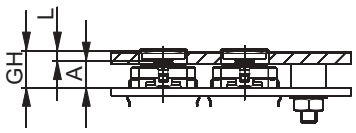
The features at a glance:
• Suitable for the most common soldering methods
- Wave soldering bath for print versions
- Reflow soldering (SMD)
- Manual soldering
• SMD version suitable for processing with an automatic SMD assembly machine

Technical data

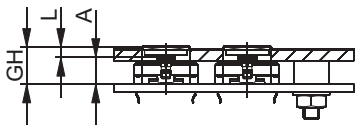
Dimensions	
Recommended key grid	see order block
Key grid max.	see order block
Length of housing	12 mm
Width of housing	12 mm
Overall height	$4.95^{+-0.1}$ mm
Mechanical design	
Mounting	soldering
Terminals	see order block
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au
Illumination	no
Mechanical characteristics	
Operating force	$3{,}6^{+-0{,}7}$ N
Switching travel	$0{,}61^{+-0{,}1}$ mm
Electrical characteristics	
Rated voltage min.	0.02 V
Rated voltage max.	42 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W
Contact resistance when new max.	100 mΩ
Insulation resistance	10^9 Ω
Bouncing time max.	5 ms
Other specifications	
Ambient temp. operating min.	-40 °C
Ambient temp. operating max.	+90 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life at R_T = 23° C and test force = 1,5 x rated force	1000000
Solderability / solder heat resistance PCB version	IEC 600 68-2-20
Solderability / solder heat resistance SMD version	EN 61760-1 and DIN IEC 600-68-2-58
Flammability of materials	UL 94 HB
Packing	see order block
Produkt code	see order block

RACON 12, Typical system assembly with plunger under overlay

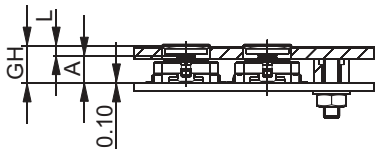
Solder terminal for PCB, outward



Solder terminal for PCB, inward



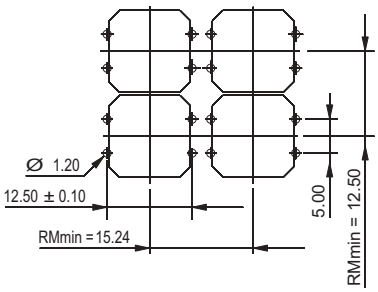
SMD gullwing (Z) terminal



Variable	Declaration	Solder terminal outward	Solder terminal inward	SMD-terminal
A	Height of keyswitch	A = 4.95 +/- 0.1 mm		
GH	Overall height	GH = A + L		GH = A + L + 0.1 mm
L	Length of plunger	L = GH - A		L = GH - A - 0.1 mm

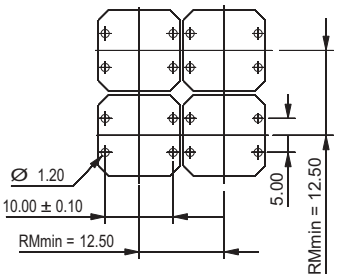
RACON 12, PCB hole pattern, smallest grid

Solder terminal for PCB, outward



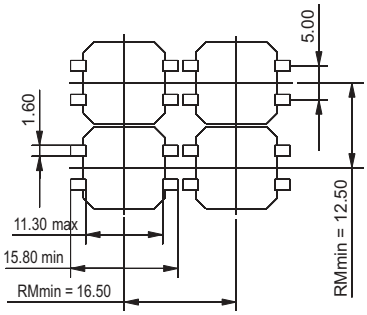
view on component side

Solder terminal for PCB, inward



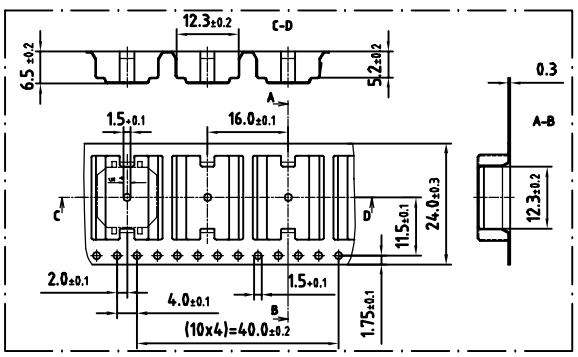
view on component side

SMD gullwing (Z) terminal

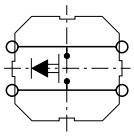


view on component side

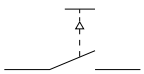
RACON 12, SMD-terminal, tape and reel drawing



Circuit Diagram RACON 12



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

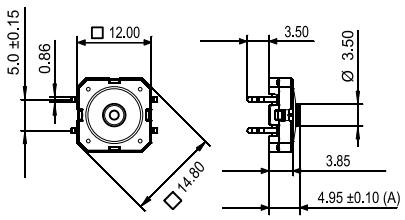


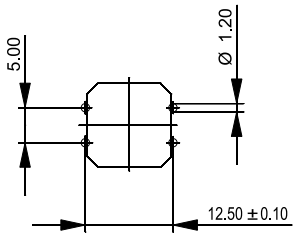
Accessories RACON 12

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





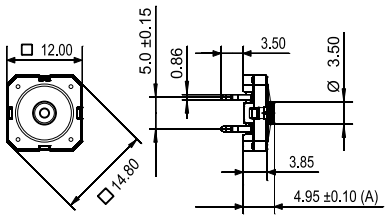
PCB footprint, view on component side

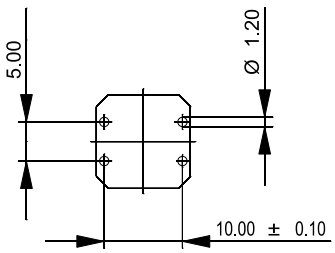
Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, outward	1 NO	A1	tubes à 45 piece	**1.14.001.501/0000**

Technical data see page 4 - 10

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

RACON 12, solder terminals for PCB, inward





PCB footprint, view on component side

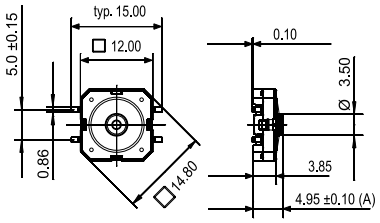
Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal for PCB, inward	1 NO	B1	tubes à 45 piece	**1.14.001.502/0000**

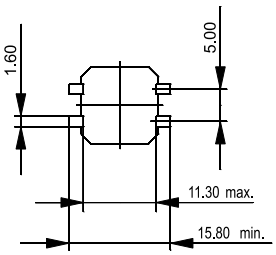
Technical data see page 4 - 10

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

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

RACON 12, SMD gullwing (Z) terminals





PCB footprint, view on component side

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

Technical data see page 4 - 10

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

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

RACON 12 V with vertical adapter

General data

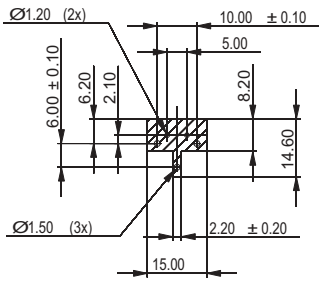
The RACON 12 V version can be used, for example, for PC plug-in boards and for measurement and control engineering applications. The vertical mounting adapter (support element) absorbs the operating force so that the pressure on the soldered terminals is reduced. For this mounting arrangement, the keyswitch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

Technical data

Dimensions	
Length	14.5 mm
Width	13.6 mm
Overall height	4.95 mm
Mechanical design	
Mounting	soldering
Terminals	PCB terminals
Contact system	snap-action contact
Contact arrangement	1 NO
Contact materials	Au
Illumination	no
Mechanical characteristics	
Operating force	$3{,}6^{+-0{,}7}$ N
Switching travel	$0{,}61^{+-0{,}1}$ mm
Electrical characteristics	
Rated voltage min.	0.02 V
Rated voltage max.	42 V
Rated current min.	0.01 mA
Rated current max.	100 mA
Rated power max. (ohmic load)	1 W
Contact resistance when new max.	100 mΩ
Insulation resistance	10^9 Ω
Bouncing time max.	5 ms

Other specifications	
Ambient temp. operating min.	-40 °C
Ambient temp. operating max.	+80 °C
Storage temperature min.	-50 °C
Storage temperature max. (product)	+85 °C
Storage temperature max. (in tube)	+85 °C
Resistance to constant environment	according to IEC 600 68-2-3 and 2-30
Resistance at variable environment	according to IEC 600 68-2-14 and 2-33
Operating life at R_T = 23° C and test force = 1,5 x rated force	1000000
Solderability / solder heat resistance	according to IEC 600 68-2-20
Flammability of materials	UL 94 HB
Packing	in boxes à 100 piece
Produkt code	F 1

PCB footprint RACON 12V

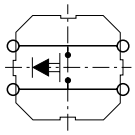


view on component side

Drilling hole diagramm
view on component side

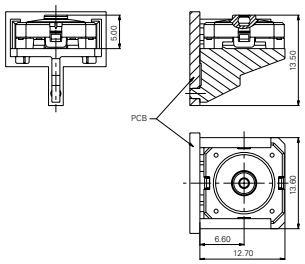
Hatched areas:
In this area no components and no conductor tracks

Circuit Diagram RACON 12V



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

RACON 12 V with vertical adapter



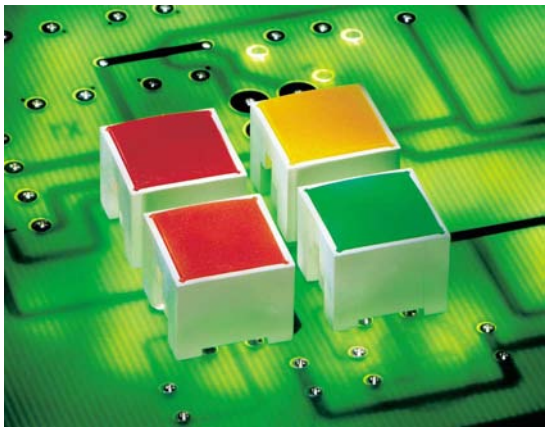
Terminals	Contact arrangement	Produkt code	Packing	Order no.
solder terminal tin-plated	1 NO	F 1	in boxes à 100 piece	1.14.001.505/0000

Technical data see page 4 - 14

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

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

RACON 12 i



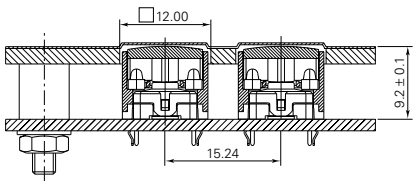
General data

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
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

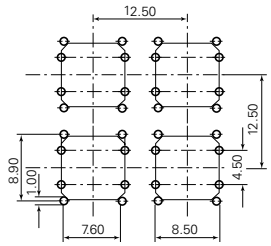
RACON 12i typical system assembly



view on component side

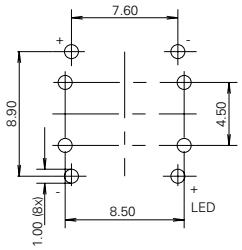
Explanation
Recommended area embossing 0.35 mm at glue spacer thickness of 0.15 mm

RACON 12i smallest grid



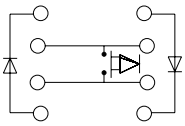
view on component side

LED hole patterns

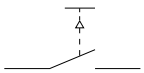


view on component side

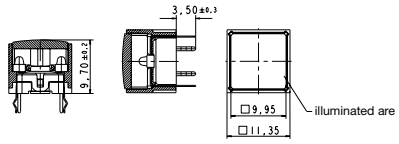
Circuit Diagram RACON 12i



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



RACON 12 i, solder terminals for PCB



lens red

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

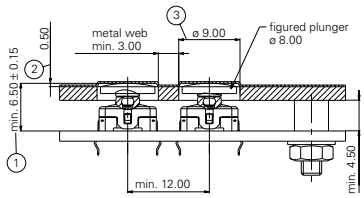
If keycaps are used we recommend RK 90 keycaps 9 x 9 mm.

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

RACON special accessories

Pict.: 8 mm

Plunger for membrane data entry system



Pict.: 8 mm

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

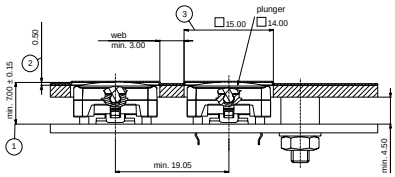
Stock items are marked by **bold printed** order numbers.

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.

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

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.

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