



### **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.

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# **Specifications LED**

# 3 mm LED

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

# 2 mm LED

(valid for 25 °C)	Red LED	Green LED	Yellow LED
Max. forward current $I_F$ : Current reduction from: $T_0 = 50$ °C: Light current $f_V/I_F$ typ: Wavelength typ: Forward voltage $U_F/I_F$ typ: Reverse voltage $U_R/I_F$ typ: Ambient temperature, operating:	30 mA 0.5 mA/°C - 637 nm 1.8 V/20 mA 5 V/100 μA min. - 55 °C + 100 °C	30 mA 0.5 mA/°C - 569 nm 2.1 V/10 mA 5 V/100 μA min. - 40 °C + 100 °C	50 mA 0.8 mA/°C 250 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:
$R_{V} = \frac{U_{B} - U_{F}}{I_{F}}$	$P_{V} = I_{F}^{2} \mathbf{x} R_{V}$	$R_V = \frac{5V - 2.0 V}{0.02 A} = 150 \Omega$ (= 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. Operating travel Switching travel Robustness min.

### Electrical characteristics Rated voltage min. Rated voltage max. Rated current min. Rated current max.

see order block 19.05 mm

15 mm 15 mm 9.7 mm

soldering into PCB contacts tin-plated, fix contact Ag plated snap-action contact 1 NO Au/Ag spot-/fully illuminated see order block see order block

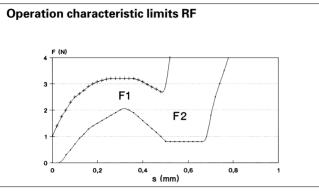
2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 V, Ag: 50 V Au: 0,01 mA, Ag: 0,1 mA Au: 100 mA, Ag: 250 mA

Other specifications-25 °CAmbient temp. operating min25 °CAmbient temp. operating max.+70 °CStorage temperature min40 °CStorage temperature max. (product)+80 °CStorage temperature max. (in tube)+50 °CResistance to constant environmentaccording to IEC 600 68-2-3 and 2-30Resistance at variable environment1,000,000Operating life min. Soldering time max. Flammability of materials2,5 sec.Storage temperature max.250 °C	Rated power max. (ohmic load) Contact resistance when new max. Contact resistance acc. to life max. Insulation resistance ESD strength (underneath overlay) Bouncing time max.	Au: 2 W, Ag: 12.5 W 100 mΩ 3 Ω 10 <sup>9</sup> Ω 15 kV 5 ms
	Ambient temp. operating min. Ambient temp. operating max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (in tube) Resistance to constant environment Resistance at variable environment Operating life min. Soldering time max.	+70 °C -40 °C +80 °C +50 °C according to IEC 600 68-2-3 and 2-30 according to IEC 600 68-2-14 and 2-33 1,000,000
	max.	



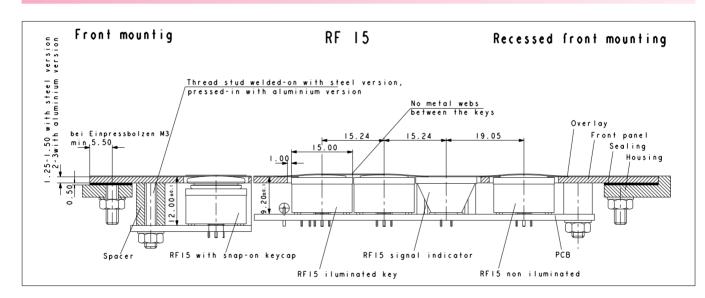
### Force/Travel Diagram – Keyswitch RF 15



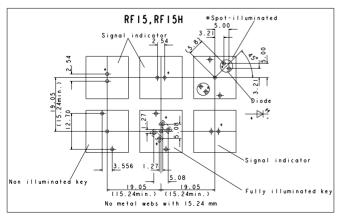
F 1 = Max. operating force F 2 = Force at contact

F 2 is max. 55% of F 1

# **Dimensional Drawing RF 15**



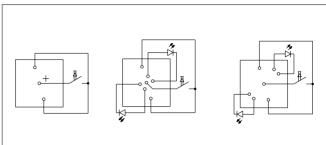
# Hole Pattern RF 15



View on component side, all hole diameters 1,1<sup>+/-0,1</sup> mm

### **PCB Keyswitches**

# **Circuit Diagram – Keyswitch RF 15**

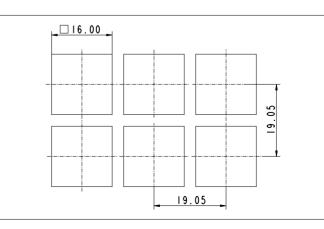


Keyswitch, non-illuminated

Keyswitch, fully illuminated Keyswitch, spot-illuminated

RF

# Hole Pattern – Front Panel





# RF 15 short-travel keyswitch, non-illuminated

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

Technical data see page 4 - 26

### Accessories:

Keycap for RF 15, snap-on, for overall height 12.5 mm: 5.46.654.059/0227

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

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



# RF 15 short-travel keyswitch, fully illuminated with 2 LEDs

Pict: red					
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Ag	fully illuminated 2 LEDs	red	red	2 mm	3.14.200.021/0000
Ag	fully illuminated 2 LEDs	green	green	2 mm	3.14.200.022/0000
Ag	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.200.023/0000
Ag	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.200.024/0000
Ag	fully illuminated 2 LEDs	blue	blue	2 mm	3.14.200.025/0000
Au	fully illuminated 2 LEDs	green	green	2 mm	3.14.200.012/0000
Au	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.200.013/0000
Au	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.200.014/0000
Au	fully illuminated 2 LEDs	blue	blue	2 mm	3.14.200.015/0000

Technical data see page 4 - 26

For keycaps, refer to RK 90 system design. Technical data of LED see seperate page at the beginning of this chapter.



# RF 15 short-travel keyswitch, 1 LED spot-illumination

		<u>OPProx 3</u> 010010 1 height	Housing Actuator Diode		
Pict.: red Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Ag	spot illumination 1 LED	opaque white	blue	3 mm	3.14.100.040/0000
Ag	spot illumination 1 LED	transparent	red	3 mm	3.14.100.041/0000
Ag	spot illumination 1 LED	transparent	green	3 mm	3.14.100.042/0000
Ag	spot illumination 1 LED	transparent	yellow	3 mm	3.14.100.043/0000
Au	spot illumination 1 LED	opaque white	blue	3 mm	3.14.100.030/0000
Au	spot illumination 1 LED	transparent	red	3 mm	3.14.100.031/0000
Au	spot illumination 1 LED	transparent	green	3 mm	3.14.100.032/0000
Au	spot illumination 1 LED	transparent	yellow	3 mm	3.14.100.033/0000

Technical data see page 4 - 26

Double-spot LED illumination available on request

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



### **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		Contact resistance when	
Colour of lens	see order block	new max.	100 mΩ
Recommended key grid	19.05 mm	Contact resistance acc.	
		to life max.	<b>3</b> Ω
Dimensions		Insulation resistance	10 <sup>9</sup> Ω
Length	15 mm	ESD strength (underneath	
Width	15 mm	overlay)	15 kV
Overall height	6.2 mm	Bouncing time max.	5 ms
Mechanical design		Other specifications	
Mounting	soldering into PCB	Ambient temp. operating	
Terminals	contacts tin-plated, fix	min.	-25 °C
	contact Ag plated	Ambient temp. operating	
Contact system	snap-action contact	max.	+70 °C
Contact arrangement	1 NO	Storage temperature min.	-40 °C
Contact materials	Au/Ag	Storage temperature max.	
Illumination	external 3 mm LED	(product)	+80 °C
	possible if height < 12 mm	Storage temperature max.	
		(in tube)	+50 °C
Mechanical characteristics		Resistance to constant	
Operating force max.	2 3 N	environment	according to
Operating travel	0.5 mm		IEC 600 68-2-3 and 2-30
Switching travel	0.5 mm	Resistance at variable	<b>.</b> .
Robustness min.	with through-plated PCB	environment	according to
	100 N		IEC 600 68-2-14 and 2-33
Electrical changed anistics		Operating life min.	1,000,000
Electrical characteristics	A 0. 02. \/ . A 2. \/	Soldering time max.	2,5 sec.
Rated voltage min.	Au: 0.02 V, Ag: 3 V	Soldering temperature	250 °C
Rated voltage max. Rated current min.	Au: 42 V, Ag: 50 V	max. Flammability of materials	250 °C UL 94 HB
Rated current max.	Au: 0,01 mA, Ag: 0,1 mA	Fiammability of materials	UL 34 ND
Rated power max	Au: 100 mA, Ag: 250 mA		

Au: 2 W, Ag: 12.5 W

RF

Rated power max. (ohmic load)



Keyswitch,

spot-illuminated

### Force/Travel Diagram – Keyswitch RF 15 N

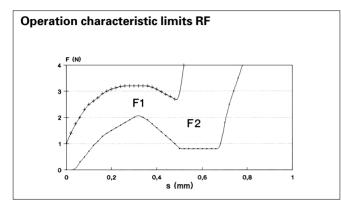
# Circuit Diagram – Keyswitch RF 15 N

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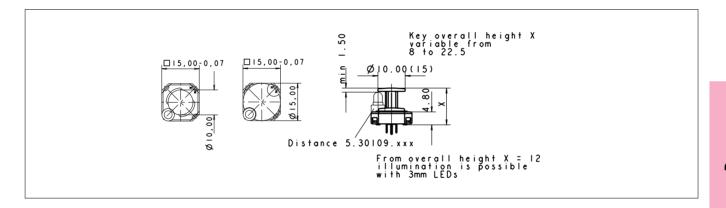
Keyswitch,

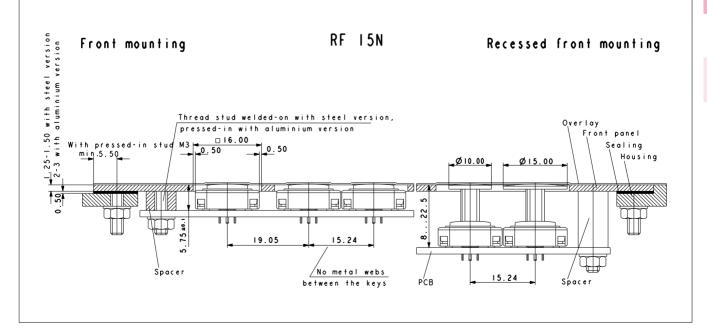
non illuminated



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

# **Dimensional Drawings RF 15 N**

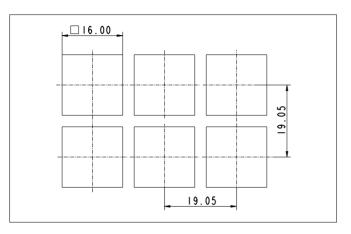




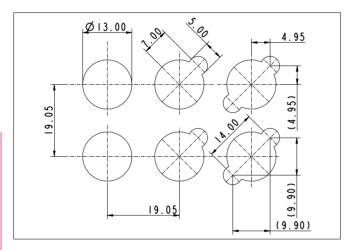


# Hole Patterns – Front Panel RF 15 N

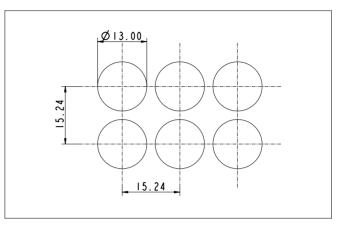
### RF 15 N without plunger



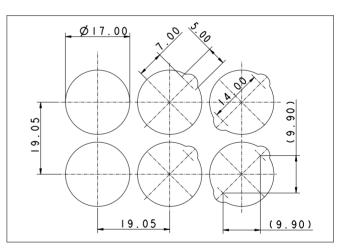
RF 15 N with plunger ø 10 mm, illuminated



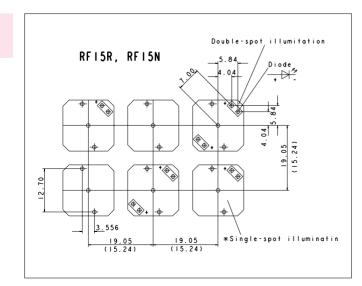
### RF 15 N with plunger ø 10 mm, non-illuminated



RF 15 N with plunger ø 15 mm, illuminated



# Hole Pattern RF 15 N



View on component side All hole diameters 1,1 <sup>+/- 0,1</sup> mm PCB layout Keyswitch 1/400" grid

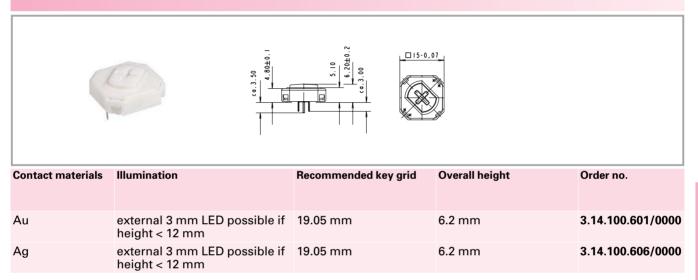
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### Accessories RF 15 N short-travel keyswitch

Description	Photo	Order no.	Page
LED yellow, 3mm	////	1.90.690.103/0000	5 - 20
LED spacer for RF 15 N, Ø 5 mm, spacing length 2.2 mm, light grey, for use with overall height of 12.5 mm		5.30.109.010/0756	
Extension plunger for RF 15 N, Ø 10 mm, overall height 22.5 mm	T	5.46.011.028/0710	
Extension plunger for RF 15 N, Ø 15 mm, overall height 22.5 mm	T	5.46.017.028/0710	

# RF 15 N short-travel keyswitch, non-illuminated



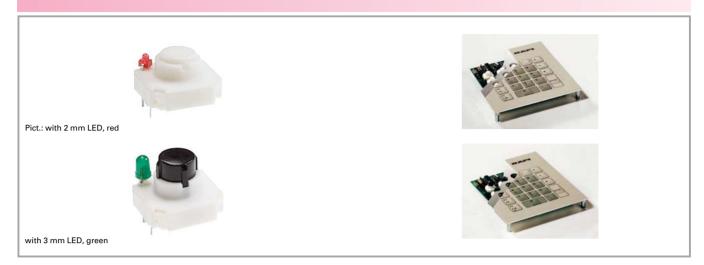
Technical data see page 4 - 32

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. Operating travel Switching travel Robustness min.

### **Electrical characteristics**

Rated voltage min. Rated voltage max. Rated current min. Rated current max. Rated power max. (ohmic load) 15.24 mm

15 mm 15 mm 9,7/12,5 mm

soldering into PCB contacts tin-plated, fix contact Ag plated snap-action contact 1 NO Au/Ag spot illumination see order block see order block

2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 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

Contact resistance when new max. Contact resistance acc. to life max. Insulation resistance ESD strength (underneath overlay) Bouncing time max.	100 mΩ 3 Ω 10 <sup>9</sup> Ω 15 kV 5 ms
Other specifications	
Ambient temp. operating	
min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max.	-40 C
(product)	+80 °C
Storage temperature max.	
(in tube)	+50 °C
Resistance to constant	
environment	according to
	IEC 600 68-2-3 and 2-30
Resistance at variable	
environment	according to
On exerting a life series	IEC 600 68-2-14 and 2-33
Operating life min. Soldering time max.	1,000,000 2,5 sec.
Soldering temperature	2,5 Sec.
max.	250 °C
Flammability of materials	UL 94 HB



Keyswitch,

spot-illuminated

### **Force/Travel Diagram – Keyswitch RF 15 R**

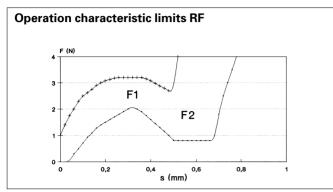
# **Circuit Diagram – Keyswitch RF 15 R**

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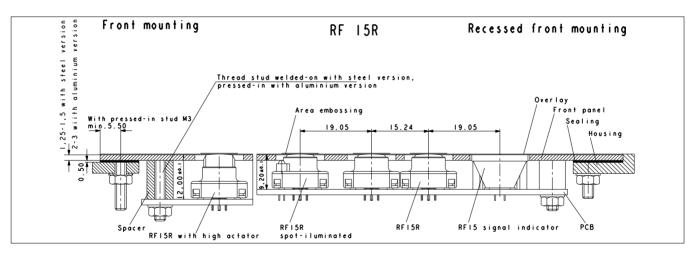
Keyswitch,

non-illuminated

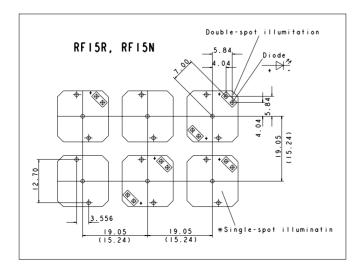


- F 1 = Max. operating force
- F 2 = Force at contact
- F 2 is max. 55% of F 1

# **Dimensional Drawing RF 15 R**



# Hole Pattern RF 15 R

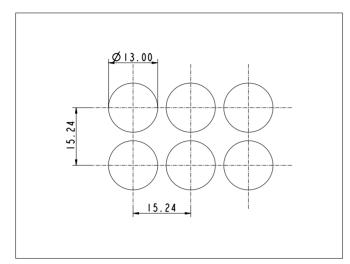


View on component side All hole diameters 1,1 <sup>+/- 0,1</sup> mm PCB layout Keyswitch 1/400" grid

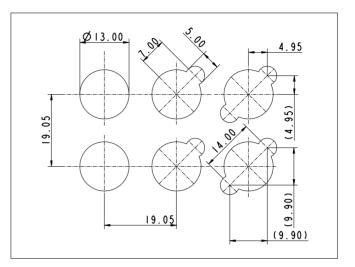


# Hole Pattern – Front Panel RF 15 R

RF 15 R, non-illuminated



RF 15 R, illuminated



4

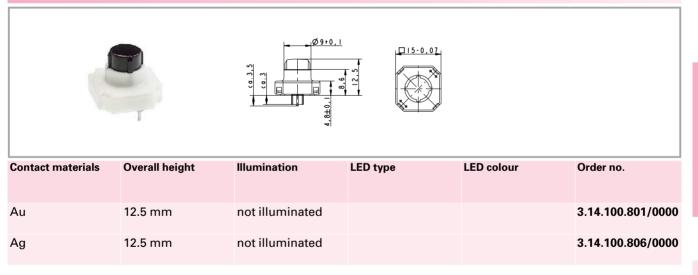


# RF 15 R low short-travel keyswitch, non-illuminated

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

Technical data see page 4 - 36

# RF 15 R high short-travel keyswitch, non-illuminated



Technical data see page 4 - 36

RF

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

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

Technical data see page 4 - 36

Versions with 2 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	4 6 7 8 7 8 8 7 8 8 9 9 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1	15-0.07 12		
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
Ag	12.5 mm	spot illumination 1 LED	3 mm	blue	3.14.100.840/0000
Ag	12.5 mm	spot illumination 1 LED	3 mm	red	3.14.100.841/0000
Ag	12.5 mm	spot illumination 1 LED	3 mm	green	3.14.100.842/0000
Ag	12.5 mm	spot illumination 1 LED	3 mm	yellow	3.14.100.843/0000

Technical data see page 4 - 36

Versions with 2 LEDs available on request.

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



### **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 19.05 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. **Operating travel** Switching travel Robustness min.

### **Electrical characteristics**

Rated voltage min. Rated voltage max. Rated current min. Rated current max. see order block 20 mm

15 mm 15 mm 12.5 mm

soldering into PCB see order block snap-action contact 1 NO Au/Ag not illuminated / fully illuminated see order block see order block

2 ... 3 N 0.5 mm 0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 V, Ag: 50 V Au: 0,01 mÅ, Ag: 0,1 mA Au: 100 mA, Ag: 250 mA

Rated power max. (ohmic load) Contact resistance when new max. Contact resistance acc. to life max. Insulation resistance ESD strength (underneath overlay) Bouncing time max.	Au: 2 W, Ag: 12.5 W 100 mΩ 3 Ω 10 <sup>9</sup> Ω 15 kV 5 ms
Other specifications	
Ambient temp. operating min.	-25 °C
Ambient temp. operating max.	+70 °C
Storage temperature min.	-40 °C
Storage temperature max. (product)	+80 °C
Storage temperature max.	
(in tube) Resistance to constant	+50 °C
environment	according to IEC 600 68-2-3 and 2
Resistance at variable	
environment	according to IEC 600 68-2-14 and
Operating life min.	1,000,000
Soldering time max.	2,5 sec.
Soldering temperature max.	250 °C

Flammability of materials

V 2-30 d 2-33

UL 94 HB



# Force/Travel Diagram – Keyswitch RF 15 H

# Operation characteristic limits RF

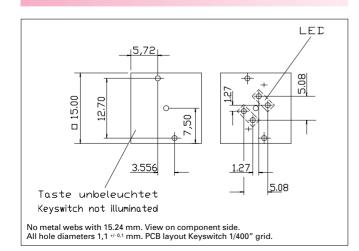
F 1 = Max. operating force F 2 = Force at contact

F 2 is max. 55% of F 1

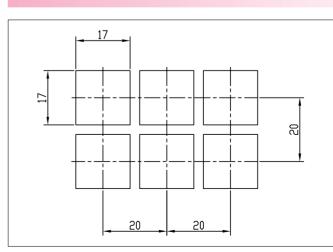
# **Dimensional Drawing**

### 1.25-1.50 with steel version 2-3 with aluminium version RF I5H Front mounting Recessed front mounting Thread stud welded-on with steel version pressed-in with aluminium version No metal webs between the keys Qverlay Front panel 20 20 15.24 Sealing 15.00 With pressed-in stud M3 Housing min 5 50 V//// 00 ±₀. 2. 111 τÚτ 111 т ф т ЩD Ш Spacer Blocking by means of O-ring RFI5H РĊВ

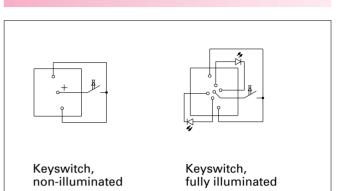
**Hole Pattern** 



# Hole Pattern – Front Panel



# Circuit Diagram – Keyswitch RF 15 H

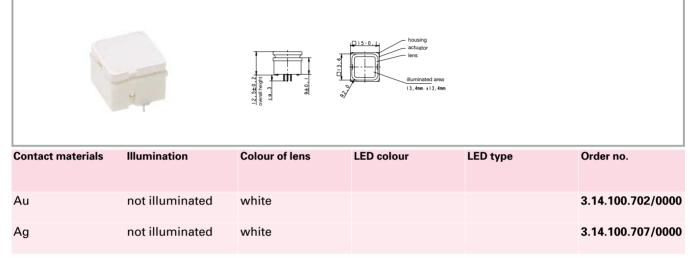




# Accessories RF 15 H short-travel keyswitch

Description	Photo	Order no.	Page
O-ring, black, for blocking the operating stroke	$\bigcirc$	5.30.120.009/0100	5 - 27

# RF 15 H short-travel keyswitch, non-illuminated



Technical data see page 4 - 42



# RF 15 H short-travel keyswitch, fully illuminated

Pict.: yellow		2. 154 0.2 coreal implification (0.3) 2.40.1	housing actuator lens illuminated area 13, 4mm x13, 4mm		
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LEDs	red	red	2 mm	3.14.200.731/0000
Au	fully illuminated 2 LEDs	green	green	2 mm	3.14.200.732/0000
Au	fully illuminated 1 LED	green	green super bright	3 mm	3.14.200.736/0000
Au	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.200.733/0000
Au	fully illuminated 1 LED	white	white	3 mm	3.14.200.735/0000
Au	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.200.738/0000
Au	fully illuminated 1 LED	blue	blue	3 mm	3.14.200.739/0000
Au	fully illuminated 2 LEDs	white	multi colour	3 mm	3.14.100.734/0000
Ag	fully illuminated 2 LEDs	red	red	2 mm	3.14.200.741/0000
Ag	fully illuminated 2 LEDs	green	green	2 mm	3.14.200.742/0000
Ag	fully illuminated 1 LED	green	green super bright	3 mm	3.14.200.746/0000
Ag	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.200.743/0000
Ag	fully illuminated 1 LED	white	white	3 mm	3.14.200.745/0000
Ag	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.200.748/0000
Ag	fully illuminated 1 LED	blue	blue	3 mm	3.14.200.749/0000
Ag	fully illuminated 2 LEDs	white	multi colour	3 mm	3.14.100.744/0000

Technical data see page 4 - 42

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 seperate page of the beginning of this chapter.

Δ



# **RF 15 signal indicator**



### Pict.: green

### **Technical data**

**General information** Colour of lens Recommended key grid

**Dimensions** Length Width Overall height

Mechanical design Mounting Illumination LED colour LED type

### Other specifications Ambient temp, operatin

Ambient temp. operating min.

see order block 19.05 mm

15 mm 15 mm 9.7 mm

soldering into PCB fully illuminated 1 LED see order block 2 mm

-25 °C

### Ambient temp. operating

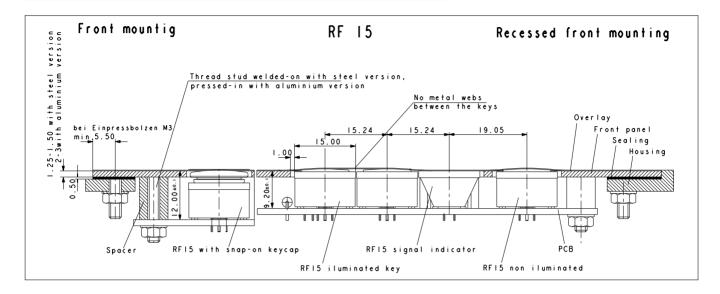
max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (in tube) Resistance to constant environment

Resistance at variable environment

Soldering time max. Soldering temperature max. Flammability of materials +70 °C -40 °C +80 °C +50 °C according to IEC 600 68-2-3 and 2-30 according to IEC 600 68-2-14 and 2-33 2,5 sec. 250 °C UL 94 HB



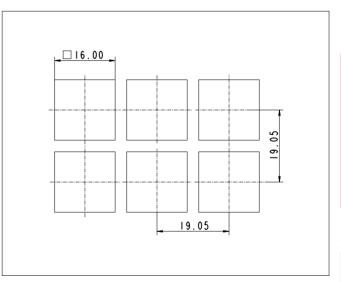
# **Dimensional Drawing Signal Indicator RF 15**



### **Hole Pattern**

### \*Spot-illuminated 3.21 + RFI5, RFI5H Siana 00 <u>,2.</u>54 امل ( 21 (15.24min.) 1 • Diode -,H\* 0.7 Signal indicator 3.556 1.27 5.08 Non illuminated key Fully illuminated key No metal webs with 15.24 mm. View on component side. All hole diameters 1,1 $^{\rm +/-0.1}$ mm.

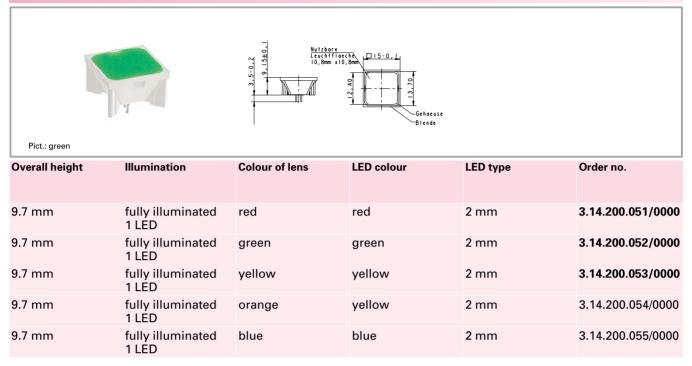
# Hole Pattern – Front Panel



4



# RF 15 signal indicator, fully illuminated, 1 LED



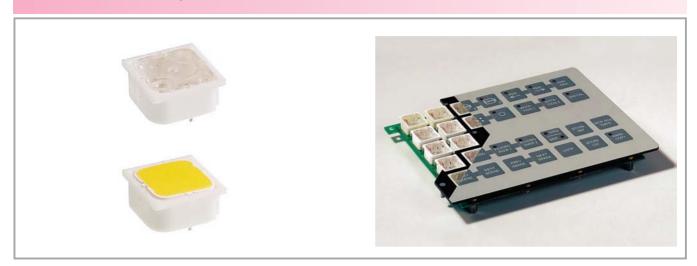
Technical data see page 4 - 46

For more information, see LEDs. Technical data of LED see seperate page of the beginning of this chapter.

4 - 48



### **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

RF

Length Width Overall height

**Mechanical design** Mounting Terminals

Contact system Contact arrangement Contact materials Illumination LED colour LED type

**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. see order block 23 mm

19.05 mm 19.05 mm 9.7 mm

2 ... 3 N

0.5 mm

0.5 mm

100 N

soldering into PCB contacts tin-plated, fix contact Ag plated snap-action contact 1 NO Au/Ag spot-/fully illuminated see order block see order block

with through-plated PCB

Au: 0,01 mÅ, Ag: 0,1 mA

Au: 100 mA, Ag: 250 mA

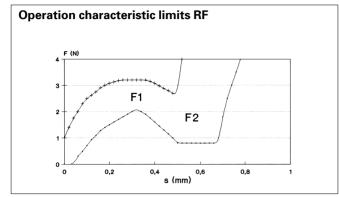
Au: 0.02 V, Ag: 3 V

Au: 42 V, Ag: 50 V

Rated power max. (ohmic load) Au: 2 W, Ag: 12.5 W Contact resistance when  $100 \text{ m}\Omega$ new max. Contact resistance acc. to life max. 3Ω Insulation resistance 10<sup>9</sup> Ω ESD strength (underneath 15 kV overlay) Bouncing time max. 5 ms Other specifications Ambient temp. operating -25 °C min Ambient temp. operating +70 °C max. Storage temperature min. -40 °C Storage temperature max. +80 °C (product) Storage temperature max. (in tube) +50 °C Resistance to constant according to environment IEC 600 68-2-3 and 2-30 Resistance at variable environment according to IEC 600 68-2-14 and 2-33 Operating life min. 1,000,000 Soldering time max. 2,5 sec. Soldering temperature 250 °C max. Flammability of materials UL 94 HB



# Force/Travel Diagram – Keyswitch RF 19



F 1 = Max. operating force

F 2 = Force at contact

F 2 is max. 55% of F 1

Front mounting

1.25 with steel version
 2-3 with aluminium version

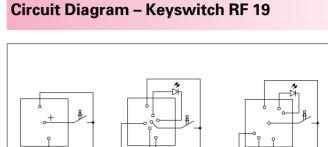
# **Dimensional Drawing**

With pressed-in stud M3

0.5

Spacer

min. 5.5



Keyswitch, non-illuminated

RF 19

No metal webs

19

Signal Indicator

between the keys

22.86

РСВ

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

19.05

19

Illuminated key

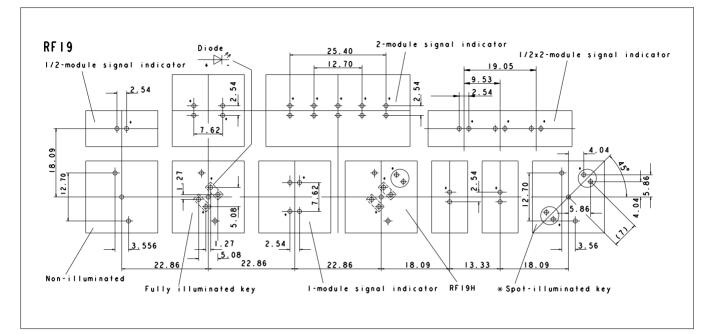
Keyswitch, fully illuminated Keyswitch, spot-illuminated



4

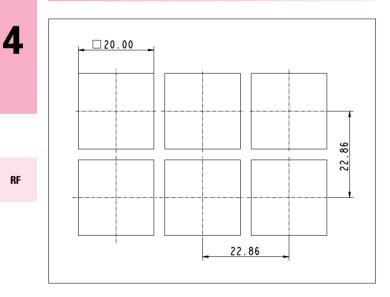


# Hole Patterns RF 19



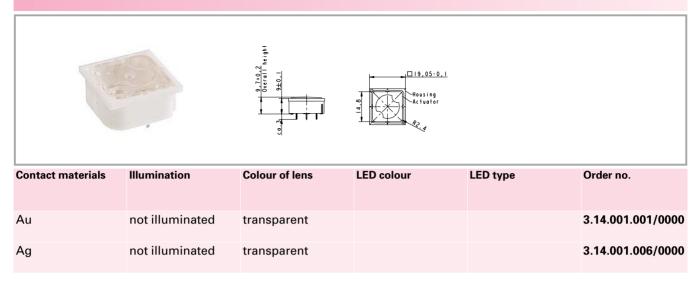
\* The LED may be positioned either on the left-hand or right-hand side. Standard version: LED on left-hand side View on component side, all hole diameters 1,1 +/- 0,1 mm

# Hole Patterns – Front Panel RF 19





# RF 19 short-travel keyswitch, non-illuminated



Technical data see page 4 - 50



# RF 19 short-travel keyswitch, fully illuminated with 2 LEDs

		<u>60.3</u> 0.47011 kcight	Housing Actualor Housing Housing Hilluminoled are H.Sum ild.Sum	a	
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LEDs	red	red	2 mm	3.14.002.011/0000
Au	fully illuminated 2 LEDs	green	green	2 mm	3.14.002.012/0000
Au	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.002.013/0000
Au	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.002.014/0000
Au	fully illuminated 2 LEDs	blue	blue	2 mm	3.14.002.015/0000
Ag	fully illuminated 2 LEDs	red	red	2 mm	3.14.002.021/0000
Ag	fully illuminated 2 LEDs	green	green	2 mm	3.14.002.022/0000
Ag	fully illuminated 2 LEDs	yellow	yellow	2 mm	3.14.002.023/0000
Ag	fully illuminated 2 LEDs	orange	yellow	2 mm	3.14.002.024/0000
Ag	fully illuminated 2 LEDs	blue	blue	2 mm	3.14.002.025/0000

Technical data see page 4 - 50

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



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

Pict.: red		60.3 0.140.2 0.140.	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	3.14.001.030/0000
Au	spot illumination 1 LED	transparent	red	3 mm	3.14.001.031/0000
Au	spot illumination 1 LED	transparent	green	3 mm	3.14.001.032/0000
Au	spot illumination 1 LED	transparent	yellow	3 mm	3.14.001.033/0000
Ag	spot illumination 1 LED	opaque white	blue	3 mm	3.14.001.040/0000
Ag	spot illumination 1 LED	transparent	red	3 mm	3.14.001.041/0000
Ag	spot illumination 1 LED	transparent	green	3 mm	3.14.001.042/0000
Ag	spot illumination 1 LED	transparent	yellow	3 mm	3.14.001.043/0000

Technical data see page 4 - 50

Versions with 2 LEDs available on request.

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



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



23 mm

19.05 mm

19.05 mm

soldering into PCB

contact Ag plated

bridge contact

1 NC + 1 NO

Au/Ag

2 ... 3 N

0.5 mm

0.5 mm

100 N

none

contacts tin-plated, fix

9.7 mm

### **Technical data**

General information
Recommended key grid

**Dimensions** Length Width Overall height

**Mechanical design** 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. Au: 0,02 V, Ag: 3 V V Au: 42 V, Ag: 50 V V Au: 0,01 mA, Ag: 0,1 mA mA Au: 100 mA, Ag: 250 mA mA

max.

Flammability of materials

with through-plated PCB

Rated power max. (ohmic load)

Rated current max.

Au: 2 W, Ag: 12.5 W

For keycaps, refer to RK 90.

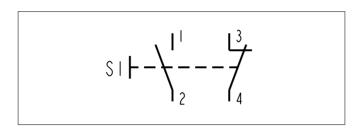
Contact resistance when  $100 \text{ m}\Omega$ new max. Contact resistance acc. 3Ω to life max.  $2 \times 10^6 \Omega$ Insulation resistance ESD strength (underneath 15 kV overlay) Bouncing time max. 5 ms Other specifications Ambient temp. operating min. -25 °C Ambient temp. operating +70 °C max. Storage temperature min. -40 °C Storage temperature max. (product) +80 °C Storage temperature max. (in tube) +50 °C Resistance to constant environment according to IEC 600 68-2-3 and 2-30 Resistance at variable environment according to IEC 600 68-2-14 and 2-33 100000 Operating life min. Soldering time max. 5 sec. Soldering temperature

265 °C UL 94 HB

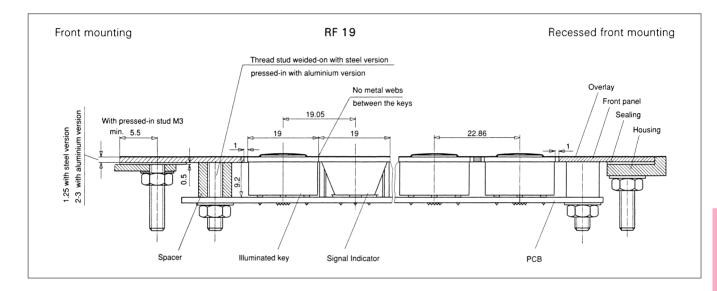
n I**l charac** 



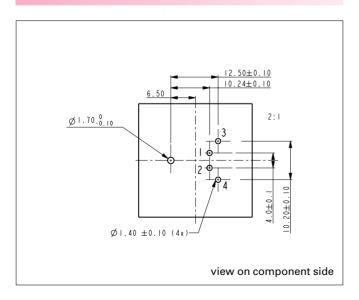
# **Circuit Diagram**



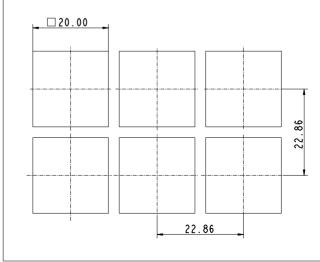
# **Dimensional Drawing**



# **Hole Pattern**

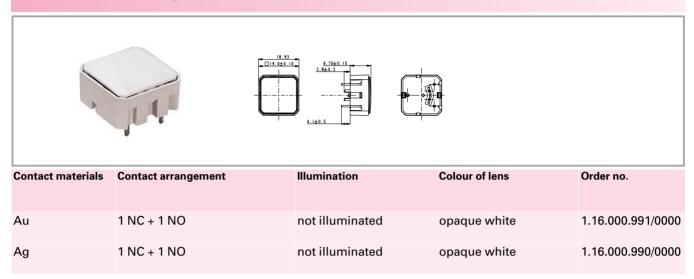


# Hole Pattern – Front Panel





# RF 19 short-travel keyswitch, non-illuminated



Technical data see page 4 - 56



### **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 23 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 arid

### **Dimensions**

Length Width Overall height

Mechanical design Mounting Terminals

Contact system

Illumination

LED colour

LED type

Contact materials

Contact arrangement

Operating force max.

**Electrical characteristics** 

**Operating travel** 

Switching travel

Robustness min.

Rated voltage min.

Rated voltage max.

Rated current min.

Rated current max.

- see order block 24 mm
- 19.05 mm 19.05 mm 12.5 mm

soldering into PCB contacts tin-plated, fix contact Ag plated snap-action contact 1 NO Au/Ag spot-/fully illuminated see order block

see order block **Mechanical characteristics** 2 ... 3 N 0.5 mm

0.5 mm with through-plated PCB 100 N

Au: 0.02 V, Ag: 3 V Au: 42 V, Ag: 50 V Au: 0,01 mÅ, Ag: 0,1 mA Au: 100 mA, Ag: 250 mA

Rated power max. (ohmic load) Au: 2 W, Ag: 12.5 W Contact resistance when  $100 \text{ m}\Omega$ new max. Contact resistance acc. to life max. 3Ω Insulation resistance  $10^{9} \Omega$ ESD strength (underneath 15 kV overlay) Bouncing time max. 5 ms Other specifications Ambient temp. operating -25 °C min Ambient temp. operating +70 °C max. Storage temperature min. -40 °C Storage temperature max. +80 °C (product) Storage temperature max. (in tube) +50 °C Resistance to constant according to environment Resistance at variable environment according to Operating life min. 1,000,000 Soldering time max. 2,5 sec. Soldering temperature max.

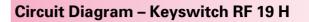
Flammability of materials

IEC 600 68-2-3 and 2-30 IEC 600 68-2-14 and 2-33

250 °C UL 94 HB



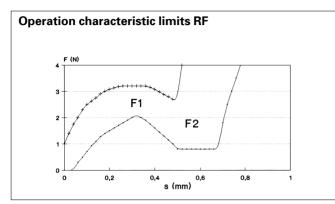
# Force/Travel Diagram – Keyswitch RF 19 H



₽

Keyswitch,

non illuminated

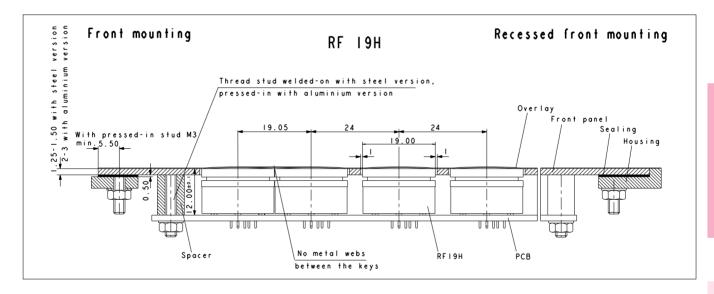


F 1 = Max. operating force

F 2 = Force at contact

F 2 is max. 55% of F 1

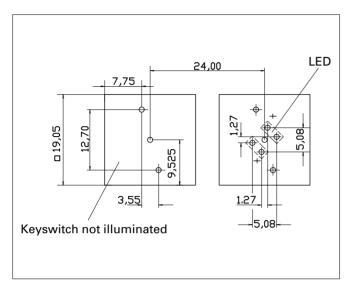
# **Dimensional Drawing**

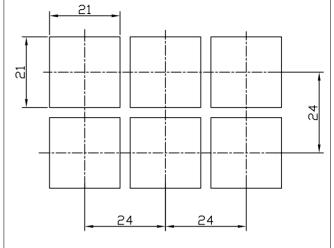


Keyswitch, fully illuminated



# 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

## Accessories RF 19 H short-travel keyswitch

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

# RF 19 H keyswitch, non-illuminated

RF

Δ

RF 19 H Keyswitch, non-illuminated								
	Y		Housing Actuator Lens Illuminated area I6mm x16mmm					
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.			
Au	not illuminated	white			3.14.001.501/0000			
Ag	not illuminated	white			3.14.001.506/0000			

Technical data see page 4 - 60



# RF 19 H short-travel keyswitch, fully illuminated

			Housing Actuator Lens Illuminated area ISmm ilSmm		
Contact materials	Illumination	Colour of lens	LED colour	LED type	Order no.
Au	fully illuminated 2 LEDs	red	red	2 mm	3.14.002.613/0000
Au	fully illuminated 2 LEDs	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 LEDs	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 LEDs	orange	yellow	2 mm	3.14.002.673/0000
Au	fully illuminated 2 LEDs	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 LEDs	red	red	2 mm	3.14.002.623/0000
Ag	fully illuminated 2 LEDs	green	green	2 mm	3.14.002.642/0000
Ag	fully illuminated 1 LED	green	green super bright	3 mm	3.14.002.643/0000
Ag	fully illuminated 1 LED	blue	blue super bright	3 mm	3.14.002.688/0000
Ag	fully illuminated 2 LEDs	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 LEDs	orange	yellow	2 mm	3.14.002.678/0000
Ag	fully illuminated 2 LEDs	white	multi colour	3 mm	3.14.001.682/0000

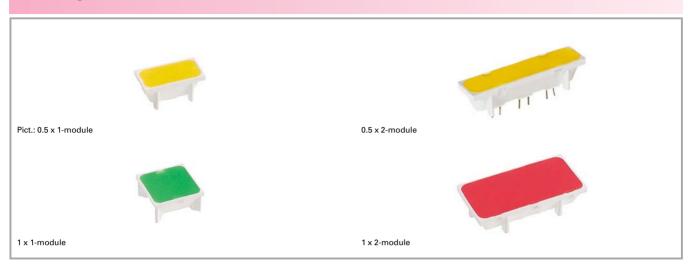
Technical data see page 4 - 60

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 seperate page of the beginning of this chapter.

Δ



# **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

#### Other specifications Ambient temp. operating min.

see order block 23/x mm

see order block see order block 9.15 mm

soldering into PCB see order block see order block see order block

-25 °C

#### Ambient temp. operating

max. Storage temperature min. Storage temperature max. (product) Storage temperature max. (in tube) Resistance to constant environment

Resistance at variable environment

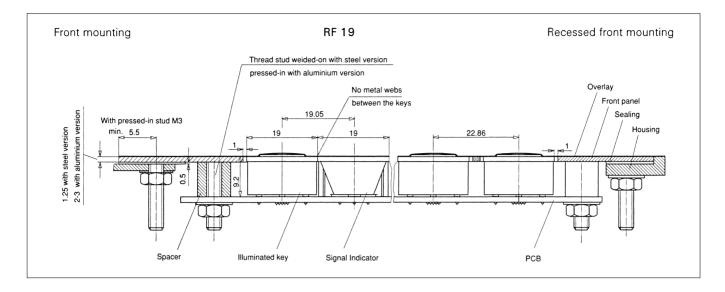
Soldering time max. Soldering temperature max. Flammability of materials -40 °C +80 °C +50 °C according to IEC 600 68-2-3 and 2-30 according to IEC 600 68-2-14 and 2-33 2,5 sec.

250 °C UL 94 HB

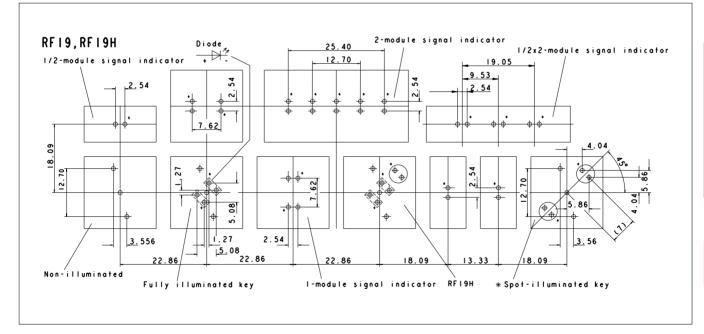
+70 °C



# **Dimensional Drawing Signal Indicator RF 19**



## Hole Patterns RF 19

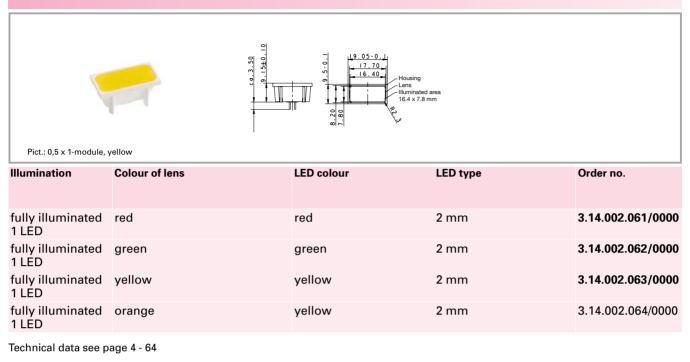


\* The LED may be positioned either on the left-hand or right-hand side. Standard verstion: LED on left-hand side View on component side, all hole diameters 1,1 +/- 0,1 mm

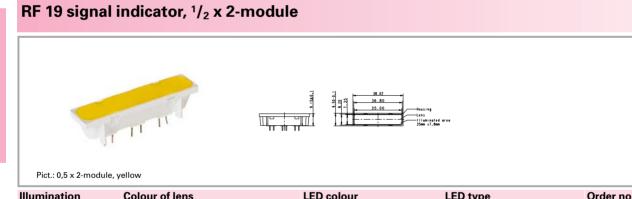
Front panel cut-out = outer keyswitch size + 1 mm



# RF 19 signal indicator, <sup>1</sup>/<sub>2</sub> x 1-module



For more information, see LEDs.



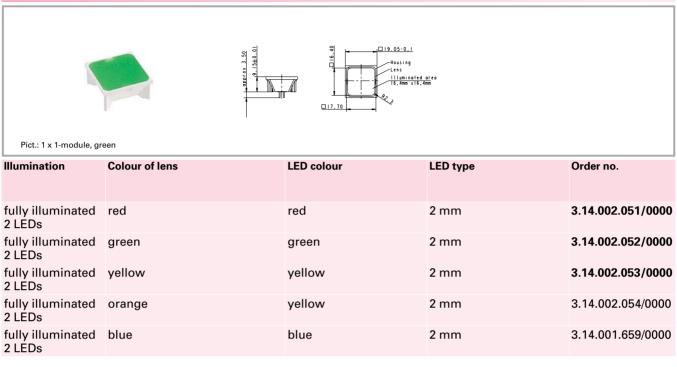
Illumination	Colour of lens	LED colour	LED type	Order no.
fully illuminated 3 LEDs	red	red	2 mm	3.14.002.908/0000
fully illuminated 3 LEDs	green	green	2 mm	3.14.002.909/0000
fully illuminated 3 LEDs	yellow	yellow	2 mm	3.14.002.910/0000
fully illuminated 3 LEDs	orange	yellow	2 mm	3.14.002.911/0000

Technical data see page 4 - 64

For more information, see LEDs.



# RF 19 signal indicator, 1 x 1-module



Technical data see page 4 - 64

For more information, see LEDs.

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

# RF 19 signal indicator, 1 x 2-module

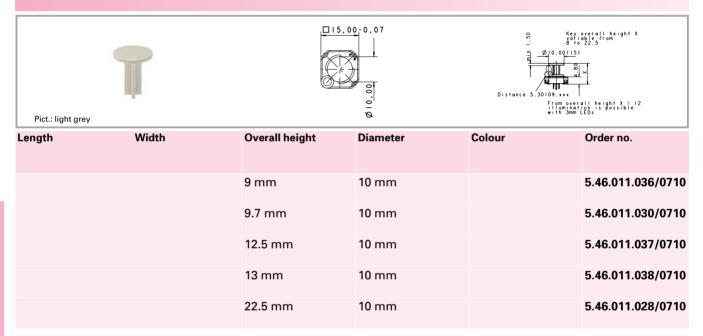
Pict: 1 x 2-module, red							
Illumination	Colour of lens	LED colour	LED type	Order no.			
fully illuminated 5 LEDs	red	red	2 mm	3.14.002.071/0000			
fully illuminated 5 LEDs	green	green	2 mm	3.14.002.072/0000			
fully illuminated 5 LEDs	yellow	yellow	2 mm	3.14.002.073/0000			
fully illuminated 5 LEDs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

For more information, see LEDs.



# RF special accessories Image: Constraint of the special accessories

# Extension plunger for RF 15 N, round head



Length of plunger = Overall height - 4.25 mm.



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

T				Distance 5.301	Key overall height X sto 22.5 from 10.00(15) 
Length	Width	Overall height	Diameter	Colour	Order no.
		9 mm	15 mm		5.46.017.036/0710
		9.7 mm	15 mm		5.46.017.030/0710
		12.5 mm	15 mm		5.46.017.037/0710
		13 mm	15 mm		5.46.017.038/0710
		22.5 mm	15 mm		5.46.017.028/0710

## Keycap for RF 15, snap-on, for overall height 12.5 mm





# Spacers, round

P		\$2.80 \$2.80 \$3,1/200		RF 15N H=5.75 RF 15 H=9.25	Overlay Front panel Spacer PCB <u>3</u>
Length	Width	Overall height	Diameter	Colour	Order no.
3.50 mm				blue transparent	5.30.759.023/0000
4 mm				green	5.30.759.025/0000
4.25 mm				blue	5.30.759.026/0000
4.50 mm				red	5.30.759.027/0000
4.75 mm				blue transparent	5.30.759.028/0000
5 mm				black	5.30.759.029/0000
5.25 mm				yellow orange transparent	5.30.759.030/0000
5.50 mm				yellow	5.30.759.031/0000
5.75 mm				green	5.30.759.032/0000
6 mm				blue	5.30.759.033/0000
6.2 mm				blue	5.30.759.251/0000
6.25 mm				red	5.30.759.034/0000
6.50 mm				blue transparent	5.30.759.035/0000
6.75 mm				black	5.30.759.036/0000
7 mm				yellow orange transparent	5.30.759.037/0000
7.25 mm				yellow	5.30.759.038/0000
7.50 mm				green	5.30.759.039/0000
7.75 mm				blue	5.30.759.040/0000
8 mm				red	5.30.759.041/0000
8.25 mm				blue transparent	5.30.759.042/0000
9.00 mm				green	5.30.759.046/0000
10.00 mm				black	5.30.759.043/0104

4



# Spacers, triangular

2.75 mm       red       5.30.759.095/00         3 mm       blue transparent       5.30.759.096/00         3.25 mm       black       5.30.759.096/00         3.50 mm       yellow orange transparent       5.30.759.099/00         3.75 mm       yellow orange transparent       5.30.759.099/00         4 mm       green       5.30.759.109/00         4.25 mm       blue       5.30.759.109/00         4.25 mm       blue       5.30.759.109/00         4.75 mm       blue       5.30.759.102/00         4.75 mm       blue transparent       5.30.759.102/00         5.07 mm       blue       5.30.759.102/00         5.07 mm       blue       5.30.759.102/00         5.07 mm       blue       5.30.759.106/00         5.07 mm       blue       5.30.759.106/00         5.07 mm       can       5.30.759.106/00         6.27 mm       blue       5.30.759.106/00         6.25 mm       blue       5.30.759.109/00         6.25 mm       blue       5.30.759.109/00         6.25 mm       blue       5.30.759.109/00         6.25 mm       blue       5.30.759.109/00         6.25 mm       blue       5.30.759.110/00         6.			7, 30 60,0°	Countersink	RF 15N H=5. 75 RF 15 H=9. 25 S	Overlay Front panel Spacer PCB
2.75 mm       and       <	Length	Width	Overall height	Diameter	Colour	Order no.
3 mm         blue transparent         5.30.759.096/00           3.25 mm         black         5.30.759.096/00           3.50 mm         yellow orange transparent         5.30.759.096/00           3.75 mm         yellow orange transparent         5.30.759.096/00           4 mm         green         5.30.759.096/00           4.25 mm         green         5.30.759.096/00           4.25 mm         blue         5.30.759.096/00           4.50 mm         red         5.30.759.100/00           4.75 mm         blue transparent         5.30.759.103/00           5.00 mm         red         5.30.759.103/00           5.25 mm         blue transparent         5.30.759.103/00           5.25 mm         green         5.30.759.106/00           5.75 mm         green         5.30.759.106/00           6.75 mm         green         5.30.759.106/00           6.25 mm         green         5.30.759.106/00           6.25 mm         blue         5.30.759.108/00           6.25 mm         blue         5.30.759.108/00           6.25 mm         blue         5.30.759.101/00           6.50 mm         blue transparent         5.30.759.110/00           6.50 mm         blue         5.30.7	2.50 mm				blue	5.30.759.094/0000
3.25 mm       Antione       San 759,097/00         3.50 mm       Yellow orange ransparent       San 759,097/00         3.75 mm       Yellow       San 759,097/00         4 mm       green       San 759,097/00         4 mm       green       San 759,097/00         4.25 mm       green       San 759,100/00         4.25 mm       Iue       San 759,100/00         4.25 mm       Iue       San 759,100/00         4.50 mm       red       San 759,103/00         4.75 mm       Iue       San 759,103/00         5 mm       black       San 759,103/00         5.05 mm       Jue       San 759,103/00         5.25 mm       yellow orange transparent       San 759,103/00         5.75 mm       Iue       San 759,103/00         6.75 mm       Iue       San 759,103/00         6.25 mm       green       San 759,103/00         6.25 mm       Iue       San 759,103/00         6.30 mm       Iue       San 759,103	2.75 mm				red	5.30.759.095/0000
3.50 mm         5.30.759.098/00           3.75 mm         5.30.759.099/00           4 mm         green           4.25 mm         green           4.25 mm         blue           4.50 mm         red           4.50 mm         red           4.75 mm         blue           5.30.759.100/00           4.75 mm         blue transparent           5.30.759.103/00           5 mm         blue transparent           5.30.759.103/00           5 mm         blue           5.25 mm         s.30.759.103/00           5.25 mm         s.30.759.106/00           5.25 mm         green         s.30.759.106/00           5.75 mm         green         s.30.759.106/00           6.75 mm         green         s.30.759.106/00           6.20 mm         blue         s.30.759.106/00           6.21 mm         blue         s.30.759.108/00           6.22 mm         blue         s.30.759.108/00           6.25 mm         blue         s.30.759.110/00           6.25 mm         blue         s.30.759.110/00           6.25 mm         blue         s.30.759.110/00           6.75 mm         blue         s.30.759.	3 mm				blue transparent	5.30.759.096/0000
3.75 mm         itransparent         itransparent           4 mm         green         5.30.759.099/00           4 mm         green         5.30.759.100/00           4.25 mm         blue         5.30.759.101/00           4.50 mm         red         5.30.759.102/00           4.75 mm         blue         fransparent           5 mm         blue         fransparent           5 mm         black         5.30.759.103/00           5.25 mm         black         5.30.759.103/00           5.50 mm         yellow orange         fransparent           5.75 mm         green         5.30.759.106/00           6.75 mm         green         fransparent           6.20 mm         blue         fransparent           6.21 mm         blue         fransparent           6.22 mm         blue         fransparent           6.25 mm         blue         fransparent           6.25 mm         blue         fransparent           6.75 mm         blue         fransparent           6.75 mm         black         fransparent           7.75 mm         green         fransparent           7.75 mm         green         fransparent <tr< td=""><td>3.25 mm</td><td></td><td></td><td></td><td>black</td><td>5.30.759.097/0000</td></tr<>	3.25 mm				black	5.30.759.097/0000
4 mm       green       5.30.759.100/00         4.25 mm       blue       5.30.759.101/00         4.50 mm       red       5.30.759.102/00         4.75 mm       blue transparent       5.30.759.102/00         5 mm       blue transparent       5.30.759.104/00         5.26 mm       black       5.30.759.104/00         5.25 mm       black       5.30.759.106/00         5.26 mm       yellow orange transparent       5.30.759.106/00         5.75 mm       green       5.30.759.106/00         6.75 mm       green       5.30.759.106/00         6.75 mm       green       5.30.759.106/00         6.25 mm       green       5.30.759.106/00         6.25 mm       blue       5.30.759.106/00         6.25 mm       blue       5.30.759.106/00         6.25 mm       blue       5.30.759.106/00         6.25 mm       blue       5.30.759.106/00         6.75 mm       blue       5.30.759.101/00         6.75 mm       green       5.30.759.111/00         7 mm       green       5.30.759.111/00         7.25 mm       yellow       5.30.759.113/00         7.25 mm       green       5.30.759.113/00         7.50 mm <td>3.50 mm</td> <td></td> <td></td> <td></td> <td></td> <td>5.30.759.098/0000</td>	3.50 mm					5.30.759.098/0000
4.25 mm       blue       5.30.759.101/00         4.50 mm       red       5.30.759.102/00         4.75 mm       blue transparent       5.30.759.102/00         5 mm       blue transparent       5.30.759.104/00         5.25 mm       black       5.30.759.104/00         5.25 mm       black       5.30.759.104/00         5.25 mm       black       5.30.759.106/00         5.50 mm       green       5.30.759.106/00         5.75 mm       green       5.30.759.106/00         6.75 mm       green       5.30.759.108/00         6.2 mm       blue       5.30.759.108/00         6.25 mm       red       5.30.759.108/00         6.25 mm       red       5.30.759.108/00         6.25 mm       plue       5.30.759.108/00         6.25 mm       plue       5.30.759.109/00         6.50 mm       blue transparent       5.30.759.110/00         6.75 mm       plue       5.30.759.111/00         7 mm       yellow orange       5.30.759.111/00         7.25 mm       yellow       5.30.759.111/00         7.50 mm       green       5.30.759.113/00         7.50 mm       green       5.30.759.113/00	3.75 mm					5.30.759.099/0000
4.50 mm       red       5.30.759.102/00         4.75 mm       blue transparent       5.30.759.103/00         5 mm       black       5.30.759.103/00         5.25 mm       black       5.30.759.105/00         5.50 mm       s.30.759.105/00       green         5.50 mm       s.30.759.106/00       s.30.759.106/00         5.75 mm       green       s.30.759.106/00         6.75 mm       blue       s.30.759.106/00         6.2 mm       blue       s.30.759.106/00         6.25 mm       blue       s.30.759.106/00         6.25 mm       blue       s.30.759.106/00         6.25 mm       blue       s.30.759.106/00         6.25 mm       blue       s.30.759.106/00         6.50 mm       blue transparent       s.30.759.106/00         6.50 mm       blue       s.30.759.106/00         6.75 mm       blue       s.30.759.110/00         6.75 mm       blue       s.30.759.111/00         7.25 mm       s.30.759.112/00       s.30.759.112/00         7.25 mm       s.30.759.113/00       s.30.759.113/00         7.50 mm       s.30.759.113/00       s.30.759.113/00	4 mm				green	5.30.759.100/0000
4.75 mm       blue transparent       5.30.759.103/00         5 mm       black       5.30.759.104/00         5.25 mm       black       5.30.759.104/00         5.50 mm       yellow orange transparent       5.30.759.106/00         5.50 mm       s.30.759.106/00         5.75 mm       green       5.30.759.106/00         6 mm       blue       s.30.759.106/00         6.2 mm       blue       s.30.759.106/00         6.2 mm       blue       s.30.759.106/00         6.25 mm       preen       s.30.759.106/00         6.25 mm       blue       s.30.759.106/00         6.25 mm       blue       s.30.759.106/00         6.25 mm       blue       s.30.759.106/00         6.25 mm       blue       s.30.759.106/00         6.75 mm       blue       s.30.759.110/00         6.75 mm       black       s.30.759.111/00         7 mm       s.30.759.111/00       s.30.759.111/00         7.25 mm       s.30.759.113/00       s.30.759.113/00         7.50 mm       s.30.759.113/00       s.30.759.113/00	4.25 mm				blue	5.30.759.101/0000
5 mm       5.30.759.104/00         5.25 mm       yellow orange transparent 5.50 mm       5.30.759.105/00         5.50 mm       5.30.759.106/00         5.75 mm       green       5.30.759.106/00         6 mm       green       5.30.759.108/00         6.2 mm       blue       5.30.759.108/00         6.25 mm       blue       5.30.759.108/00         6.25 mm       plue       5.30.759.108/00         6.25 mm       plue       5.30.759.108/00         6.25 mm       plue       5.30.759.108/00         6.25 mm       plue       5.30.759.108/00         6.50 mm       plue       5.30.759.109/00         6.75 mm       plue       5.30.759.110/00         7.75 mm       plue       s.30.759.111/00         7.750 mm       plue       s.30.759.111/00         7.50 mm       plue       s.30.759.111/00         7.50 mm       plue       s.30.759.111/00	4.50 mm				red	5.30.759.102/0000
5.25 mm       5.30.759.105/00         5.50 mm       5.30.759.106/00         5.75 mm       green         6.75 mm       green         6.2 mm       blue         6.2 mm       s.30.759.106/00         6.2 mm       green         6.30 nmm       green         6.50 mm       green         7 mm       green         7.25 mm       green         7.25 mm       green         7.50 mm       green         9.000       green         9.000       green         9.000       green         9.000       green <t< td=""><td>4.75 mm</td><td></td><td></td><td></td><td>blue transparent</td><td>5.30.759.103/0000</td></t<>	4.75 mm				blue transparent	5.30.759.103/0000
5.50 mm         yellow         5.30.759.106/00           5.75 mm         green         5.30.759.107/00           6 mm         blue         5.30.759.108/00           6.2 mm         blue         5.30.759.108/00           6.25 mm         red         5.30.759.108/00           6.25 mm         red         5.30.759.108/00           6.25 mm         red         5.30.759.109/00           6.50 mm         blue transparent         5.30.759.110/00           6.75 mm         black         5.30.759.111/00           6.75 mm         black         5.30.759.111/00           7 mm         yellow orange         5.30.759.112/00           7.25 mm         green         5.30.759.113/00           7.50 mm         green         5.30.759.113/00	5 mm				black	5.30.759.104/0000
5.75 mm       green       5.30.759.107/00         6 mm       blue       5.30.759.108/00         6.2 mm       blue       5.30.759.253/00         6.25 mm       red       5.30.759.109/00         6.50 mm       blue transparent       5.30.759.110/00         6.75 mm       blue       5.30.759.111/00         7 mm       yellow orange       5.30.759.112/00         7.25 mm       yellow       5.30.759.113/00         7.50 mm       green       5.30.759.114/00	5.25 mm					5.30.759.105/0000
6 mm       blue       5.30.759.108/00         6.2 mm       blue       5.30.759.253/00         6.25 mm       red       5.30.759.109/00         6.50 mm       blue transparent       5.30.759.110/00         6.75 mm       black       5.30.759.111/00         7 mm       yellow orange       5.30.759.112/00         7.25 mm       yellow       5.30.759.113/00         7.50 mm       green       5.30.759.114/00	5.50 mm				yellow	5.30.759.106/0000
6.2 mm       blue       5.30.759.253/00         6.25 mm       red       5.30.759.109/00         6.50 mm       blue transparent       5.30.759.110/00         6.75 mm       black       5.30.759.111/00         7 mm       yellow orange       5.30.759.112/00         7.25 mm       green       5.30.759.113/00	5.75 mm				green	5.30.759.107/0000
6.25 mm       red       5.30.759.109/00         6.50 mm       blue transparent       5.30.759.110/00         6.75 mm       black       5.30.759.111/00         7 mm       yellow orange       5.30.759.112/00         7.25 mm       green       5.30.759.113/00	6 mm				blue	5.30.759.108/0000
6.50 mm       blue transparent       5.30.759.110/00         6.75 mm       black       5.30.759.111/00         7 mm       yellow orange transparent yellow orange transparent yellow       5.30.759.112/00         7.25 mm       5.30.759.113/00       5.30.759.113/00         7.50 mm       green       5.30.759.114/00	6.2 mm				blue	5.30.759.253/0000
6.75 mm       black       5.30.759.111/00         7 mm       vellow orange transparent       5.30.759.112/00         7.25 mm       vellow       5.30.759.113/00         7.50 mm       green       5.30.759.114/00	6.25 mm				red	5.30.759.109/0000
7 mm       yellow orange transparent yellow orange transparent yellow       5.30.759.112/00         7.25 mm       yellow       5.30.759.113/00         7.50 mm       green       5.30.759.114/00	6.50 mm				blue transparent	5.30.759.110/0000
7.25 mm     green     5.30.759.113/00       7.50 mm     green     5.30.759.114/00	6.75 mm				black	5.30.759.111/0000
7.25 mm       yellow       5.30.759.113/00         7.50 mm       green       5.30.759.114/00	7 mm					5.30.759.112/0000
	7.25 mm					5.30.759.113/0000
7.75 mm blue <b>5.30.759.115/00</b>	7.50 mm				green	5.30.759.114/0000
	7.75 mm				blue	5.30.759.115/0000

# **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

#### LED spacer for RF 15 N Pict.: light grey Length Width **Overall height** Diameter Colour Order no. **Characteristic 1 Characteristic 2** 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

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