

Data Sheet 1.14.002.--- MICON 5 short-travel keyswitches



SMT standard version



SMT low version



THT standard version

Terminals	Plunger / height [mm]	Operating force F_1 [N] (+- 20%)	Switching travel S_2 [mm] (+- 0.15 mm)	Operating life [operations] (test force)	Product (type) marking	Order no.
SMT	Standard 3.85	3.0	0.7	1,000,000 (4 N)	X	1.14.002.101/0000
SMT	Standard 3.85	4.5	0.8	250,000 (6 N)	Z	1.14.002.001/0000
SMT	Standard 3.85	5.5	0.9	1,000,000 (8 N)	W	1.14.002.111/0000
SMT	Standard 3.85	8.0	1.1	250,000 (12 N)	Y	1.14.002.011/0000
SMT	Standard 3.85	3.5	0.85	250,000 (6 N)	K	1.14.002.301/0000 ¹
SMT	Standard 3.85	1.5	0.5	1,000,000 (4 N)	J	1.14.002.201/0000 ²
SMT	Low 3.45	3.0	0.6	1,000,000 (4 N)	S	1.14.002.103/0000
SMT	Low 3.45	4.5	0.7	250,000 (6 N)	T	1.14.002.003/0000
SMT	Low 3.45	5.5	0.7	1,000,000 (8 N)	R	1.14.002.113/0000
THT	Standard 3.85	3.0	0.7	1,000,000 (4 N)	O	1.14.002.106/0000
THT	Standard 3.85	4.5	0.8	250,000 (6 N)	Q	1.14.002.006/0000
THT	Standard 3.85	5.5	0.9	1,000,000 (8 N)	N	1.14.002.116/0000
THT	Standard 3.85	8.0	1.1	250,000 (12 N)	P	1.14.002.016/0000

¹ Low noise

² Only for use in a redundant system with another SMT keyswitch of standard height

Mounting dimensions

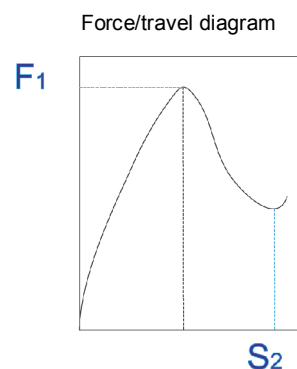
Length	6.4 mm
Width	5.1 mm
Height	See order number table

Mechanical design

Fixing	Soldering
Terminals	SMT L-type terminals, inward, tin-plated (lead-free) or THT
Contact system	Snap-action contact (snap disc)
Contact arrangement	1 normally-open contact
Contact material	Gold (Au)

Mechanical characteristics

Operating force F_1	See order number table
Switching travel S_2	See order number table



Data Sheet 1.14.002.--- MICON 5 short-travel keyswitches

Electrical characteristics

Rated voltage	0.02 - 35 V DC
Rated current	0.01 - 100 mA
Rated power, max.	1 W (ohmic load)
Contact resistance	< 100 mΩ
Bouncing time	< 5 ms
Insulation resistance	10 ⁹ Ω min.
Dielectric strength	250 V AC

Other specifications

Operating temperature	-40°C to +90°C
Storage temperature	-40°C to +90°C
Vibration resistance	5 g acc. to IEC 600 68-2-6
Constant environment	IEC 600 68-2-78 and 2-30
Variable environment	IEC 600 68-2-14 and 2-33
Flammability of materials	UL 94 V1
Operating life	See order number table.

Solder heat resistance / solderability

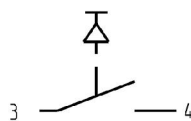
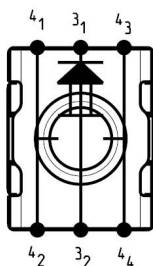
SMT version	DIN IEC 60068-2-58 and DIN EN 61 760-1
THT version	E DIN IEC 60068-2-20

Standard packaging:

SMT version	Blister reel with 2,100 pcs.
THT version	Tubes with 102 pcs. each

Circuit symbol according to IEC 617

Contact between the two exterior tracks is only ensured in operated condition.

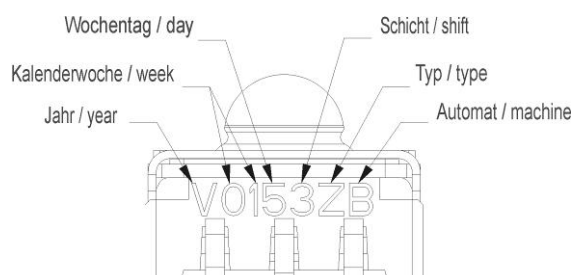


The two exterior tracks must be bridged on the printed circuit board.

Product marking according to (EN ISO 8402) DIN EN ISO 9001

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

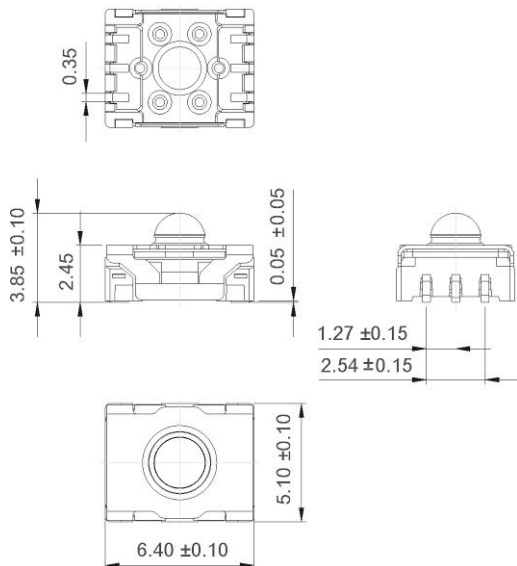
A 7-digit code is printed on the keyswitch, reflecting the production date, the type as well as the shift in which it was produced.



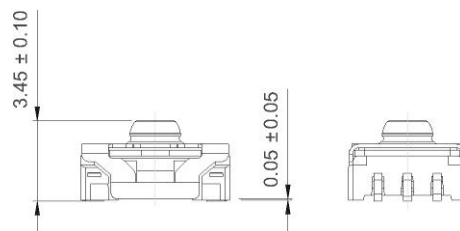
Data Sheet 1.14.002.--- MICON 5 short-travel keyswitches

SMT

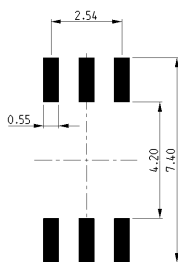
Dimensional drawing Standard version



Dimensional drawing Low version



Solder pad:



Placement instructions

Nozzle

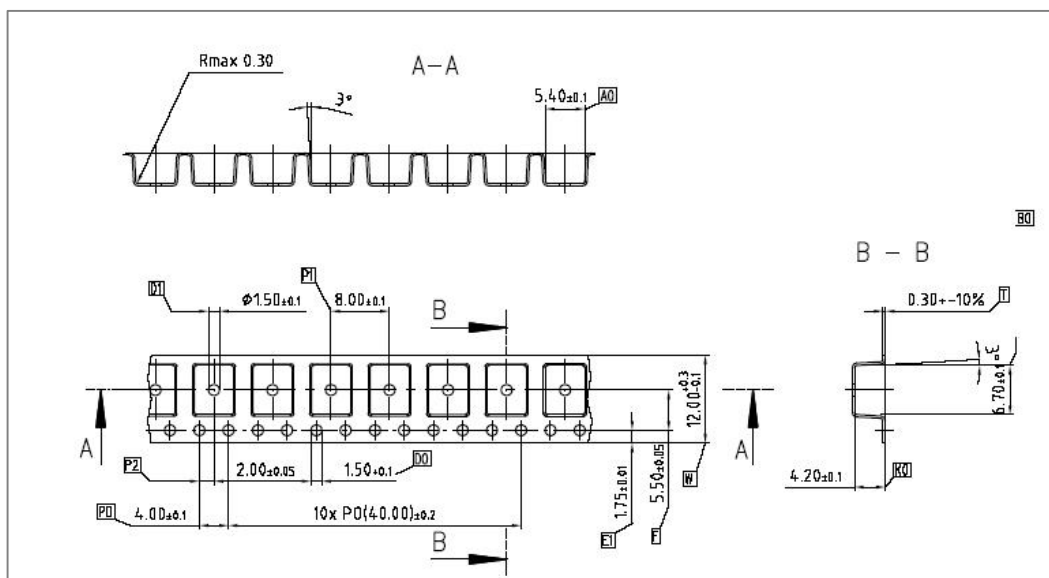
Special nozzle (Siemens Siplace Best.-Nr.: 348514-02)
Placement by means of revolver head

Suggestion for stencil printing:

150µm stencil with 10% pad reduction

The two exterior tracks must be bridged on the printed circuit board.

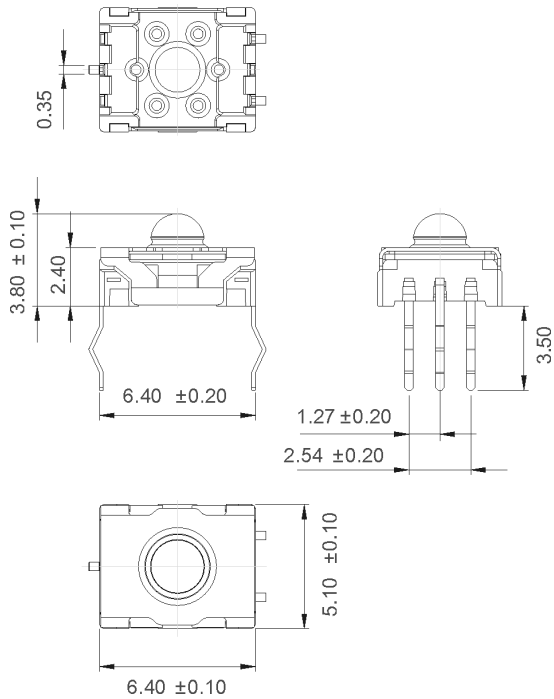
Blister reel:



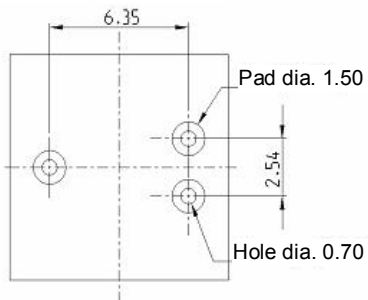
Data Sheet 1.14.002.---
MICON 5 short-travel keyswitches

THT

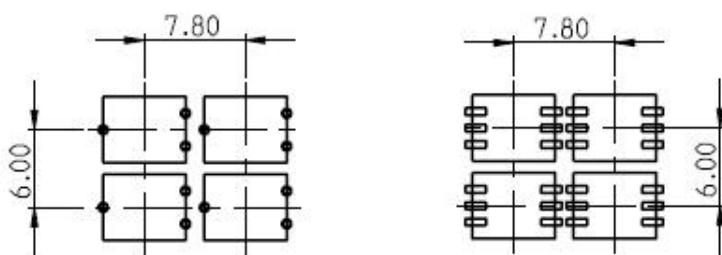
**Dimensional drawing
 Standard version**



**Hole pattern
 on PCB**



Minimum possible grid (keyswitch arrangement without plungers)



General information

The following range of system accessories is available with the MICON 5 keyswitch:

- Round plunger, opaque, non-illuminable
- Square plunger, illuminable
- Square plunger, spot-illumination
- Round plunger, opaque, ring illumination
- Signal indicator
- RK 90 keycap

The MICON 5 plungers are designed to match the standard keyswitch versions (3.85 mm height), i.e. the specifications in the data sheet are only applicable to the standard versions (THT and SMT).

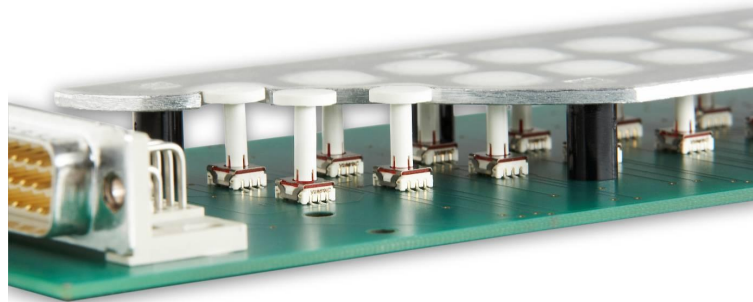
Mechanical strength 30 N max.

Round plungers, opaque, non-illuminable

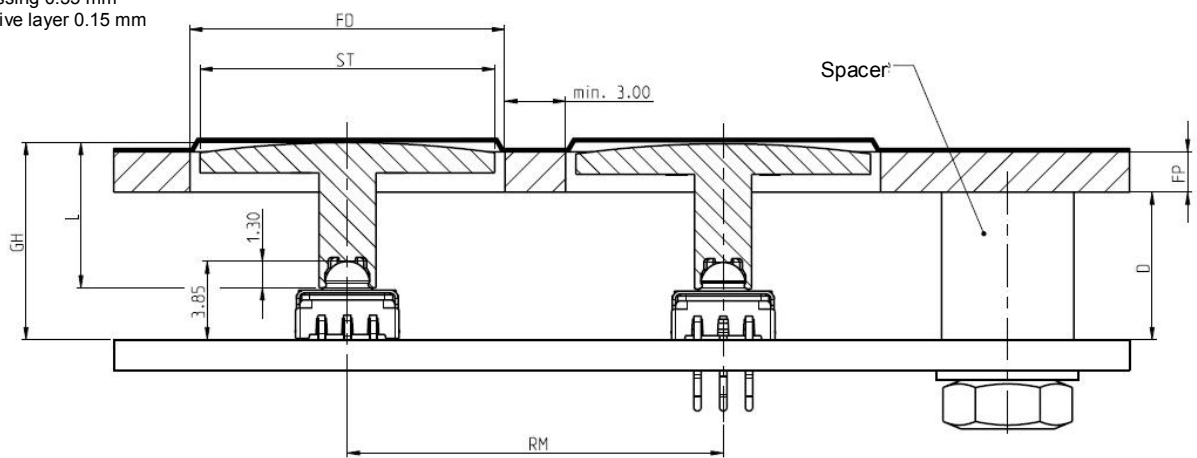


Plunger diameter [mm]	Plunger length L [mm]	Overall height with embossing [mm]	Plunger colour	Order no.
6.0	3.0	5.55	white	5.46.001.103/0200
6.0	3.45	6.0	white	5.46.001.104/0200
6.0	3.95	6.5	white	5.46.001.105/0200
6.0	4.45	7.0	white	5.46.001.106/0200
6.0	7.15	9.7	white	5.46.001.107/0200
6.0	9.95	12.5	white	5.46.001.108/0200
8.0	5.5	8.05	white	5.46.001.121/0200
8.0	10.3	12.85	white	5.46.001.122/0200
8.0	3.0	5.55	white	5.46.001.123/0200
8.0	3.45	6.0	white	5.46.001.124/0200
8.0	3.95	6.5	white	5.46.001.125/0200
8.0	4.45	7.0	white	5.46.001.126/0200
8.0	7.15	9.7	white	5.46.001.127/0200
8.0	9.95	12.5	white	5.46.001.128/0200
11.5	5.5	8.05	white	5.46.001.141/0200
11.5	10.3	12.85	white	5.46.001.142/0200
11.5	3.0	5.55	white	5.46.001.143/0200
11.5	3.45	6.0	white	5.46.001.144/0200
11.5	3.95	6.5	white	5.46.001.145/0200
11.5	4.45	7.0	white	5.46.001.146/0200
11.5	7.15	9.7	white	5.46.001.147/0200
11.5	9.95	12.5	white	5.46.001.148/0200
14.5	3.0	5.55	white	5.46.001.163/0200
14.5	3.45	6.0	white	5.46.001.164/0200
14.5	3.95	6.5	white	5.46.001.165/0200
14.5	4.45	7.0	white	5.46.001.166/0200
14.5	7.15	9.7	white	5.46.001.167/0200
14.5	9.95	12.5	white	5.46.001.168/0200
19.0	3.0	5.55	white	5.46.001.183/0200
19.0	3.45	6.0	white	5.46.001.184/0200
19.0	3.95	6.5	white	5.46.001.185/0200
19.0	4.45	7.0	white	5.46.001.186/0200
19.0	7.15	9.7	white	5.46.001.187/0200
19.0	9.95	12.5	white	5.46.001.188/0200

Typical system design under overlay, round plungers, opaque, non-illuminable



Recommended:
 Embossing 0.35 mm
 Adhesive layer 0.15 mm



D - Spacer length $D = GH - FP - 0.5$ (embossing height + adhesive layer)

ST - Plunger diameter

FD - Front panel cut-out $FD = ST + 1$ mm

FP - Front panel thickness

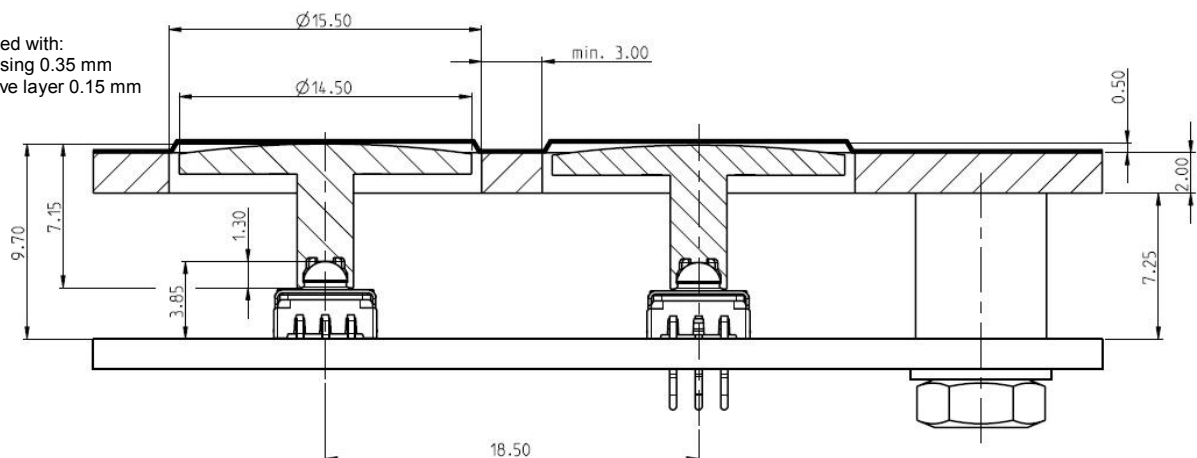
RM - Grid spacing $RM = FD + 3$ mm min.

GH - Overall height $GH = 3.85$ mm + L - 1.3

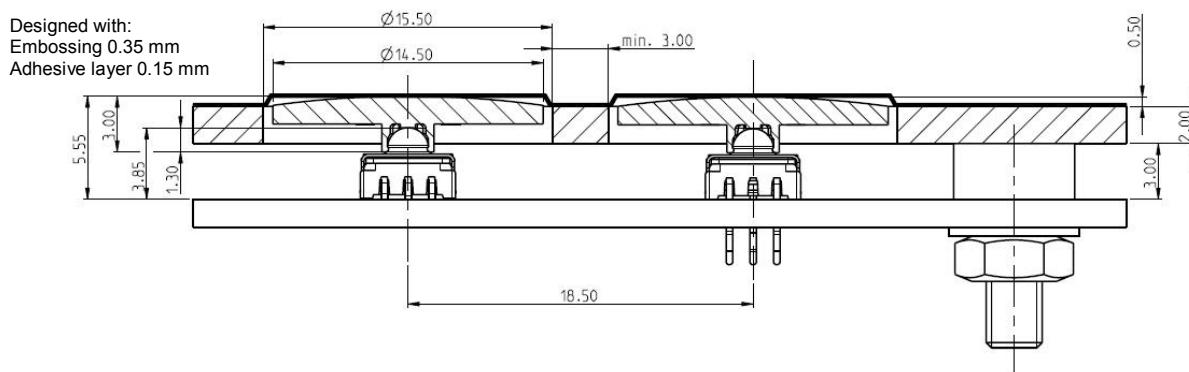
L - Plunger overall length L

RAFI standard system design, 9.70 mm height, round plunger, opaque, non-illuminable

Designed with:
 Embossing 0.35 mm
 Adhesive layer 0.15 mm



Lowest system design, 5.55 mm height, round plunger, opaque, non-illuminable



Square plungers, illuminable

Illuminable plungers 11 x 11 mm

Overall height GH with embossing [mm]	Lens colour	Order no.
9.70	red	5.05.511.470/2300
9.70	green	5.05.511.470/2500
9.70	yellow	5.05.511.470/2400
9.70	white	5.05.511.470/2200
9.70	blue	5.05.511.470/2600
12.5	red	5.05.511.471/2300
12.5	green	5.05.511.471/2500
12.5	yellow	5.05.511.471/2400
12.5	white	5.05.511.471/2200
12.5	blue	5.05.511.471/2600



Illuminable plungers 14.5 x 14.5 mm

Overall height GH with embossing [mm]	Lens colour	Order no.
9.70	red	5.05.511.475/2300
9.70	green	5.05.511.475/2500
9.70	yellow	5.05.511.475/2400
9.70	white	5.05.511.475/2200
9.70	blue	5.05.511.475/2600
12.5	red	5.05.511.476/2300
12.5	green	5.05.511.476/2500
12.5	yellow	5.05.511.476/2400
12.5	white	5.05.511.476/2200
12.5	blue	5.05.511.476/2600

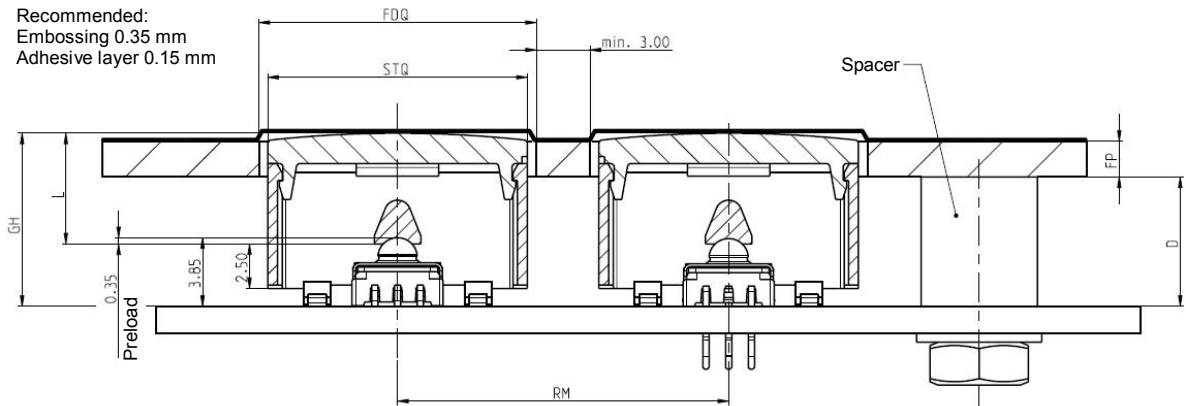
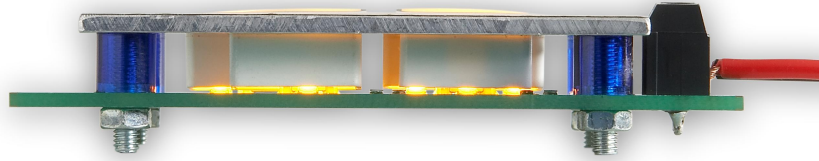


Illuminable plungers 18 x 18 mm

Overall height GH with embossing [mm]	Lens colour	Order no.
9.70	red	5.05.511.480/2300
9.70	green	5.05.511.480/2500
9.70	yellow	5.05.511.480/2400
9.70	white	5.05.511.480/2200
9.70	blue	5.05.511.480/2600
12.5	red	5.05.511.481/2300
12.5	green	5.05.511.481/2500
12.5	yellow	5.05.511.481/2400
12.5	white	5.05.511.481/2200
12.5	blue	5.05.511.481/2600



Typical system design under overlay, square plungers, illuminable



D - Spacer length $D = GH - FP - 0.5$ (embossing height + adhesive layer)
 L - Plunger length

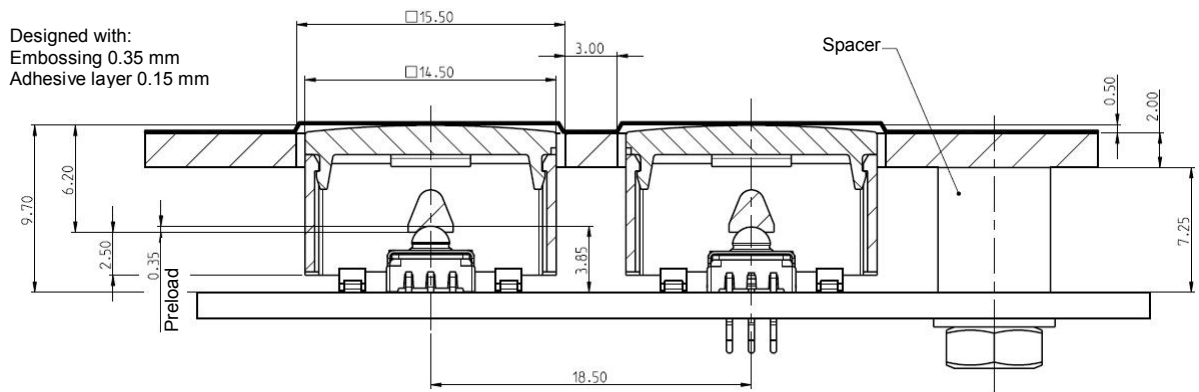
STQ - Width of square plunger

FDQ - Square panel cut-out $FDQ = STQ + 1$ mm

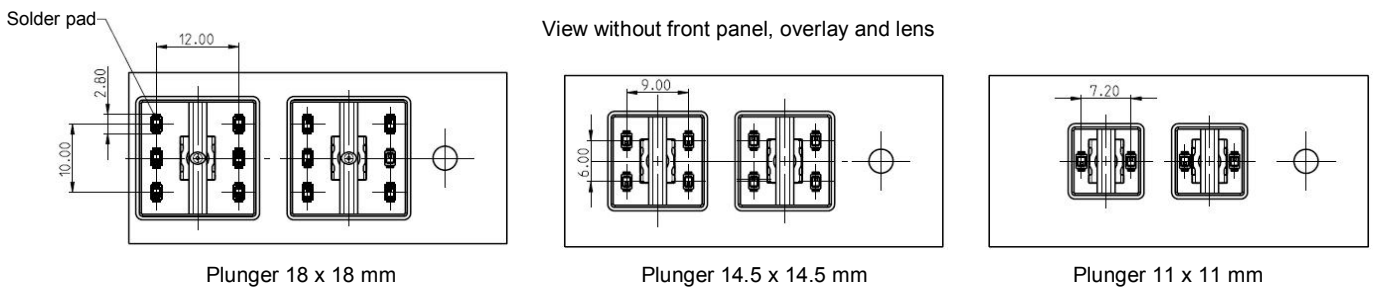
FP - Front panel thickness

RM - Grid spacing $RM = FDQ + 3$ mm min.

RAFI standard system design, 9.70 mm height, square plunger, illuminable

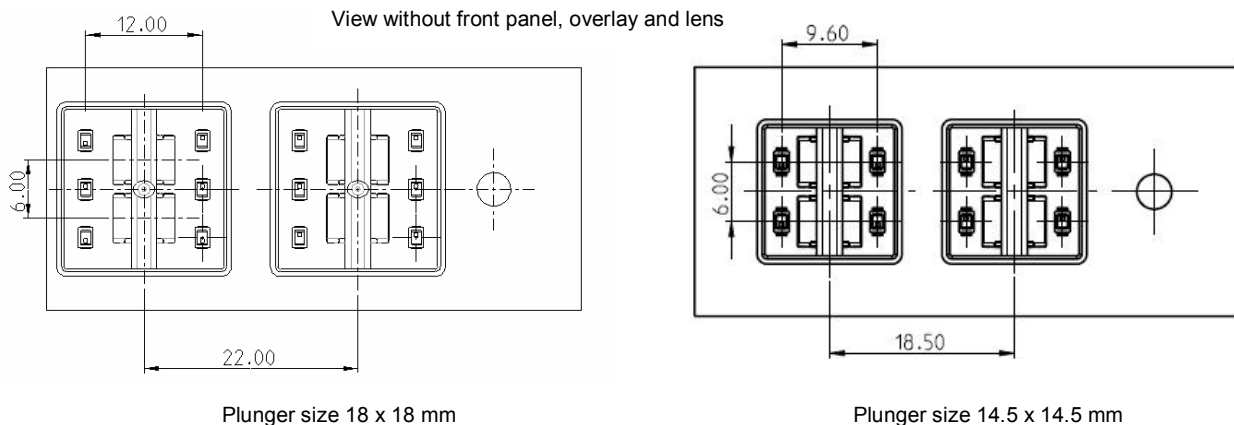


Possible arrangement of LEDs with square plunger, illuminable



Redundant system design with illuminable plungers (MICON 1.14.002.201, 1.5 N)

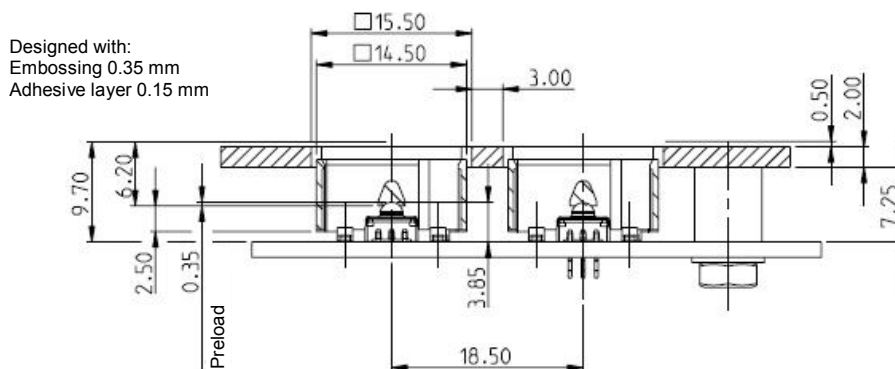
The keyswitch type 1.14.002.201/0000 is designed only for use in a redundant system with another SMT keyswitch of standard height. For a redundant system design, the plunger sizes 14.5 x 14.5 mm or 18 x 18 mm must be used.



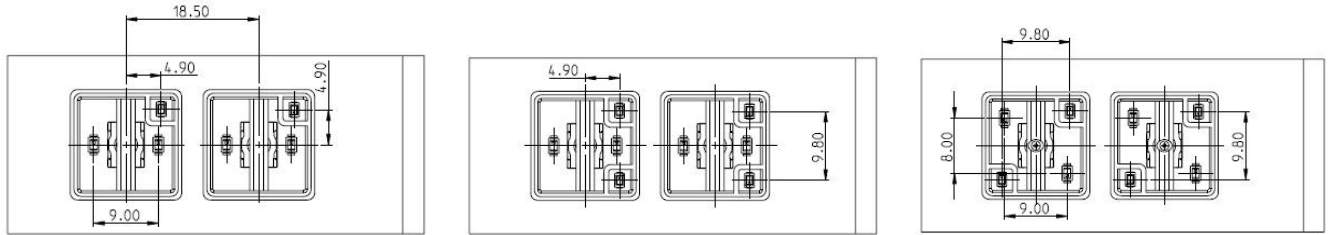
Square plungers, spot-illumination

Overall height GH with embossing [mm]	Lens colour	Dimensions [mm]	Spot-illumination	Order no.
9,70	white	14.5 x 14.5		5.05.511.649/2200
9,70	white	14.5 x 14.5		5.05.511.650/2200
9,70	white	14.5 x 14.5		5.05.511.651/2200
9,70	white	18 x 18		5.05.511.658/2200
9,70	white	18 x 18		5.05.511.659/2200
9,70	white	18 x 18		5.05.511.660/2200

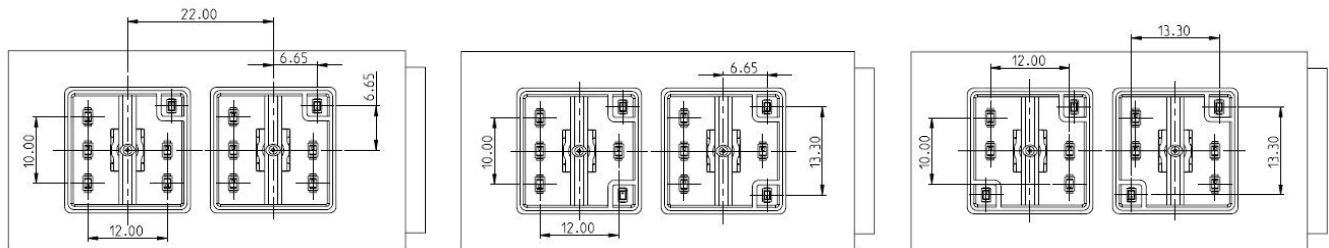
RAFI standard system design, 9.70 mm height, square plunger, spot-illumination



Possible arrangement of LEDs with square plunger, spot-illumination, 14.5 x 14.5



Possible arrangement of LEDs with square plunger, spot-illumination, 18 x 18

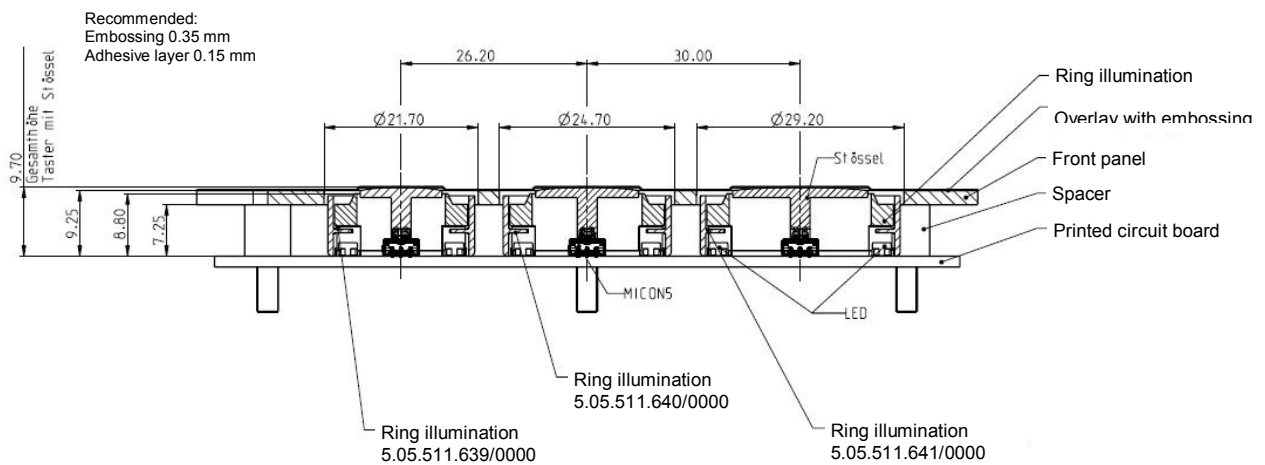


Round plunger, opaque, ring illumination

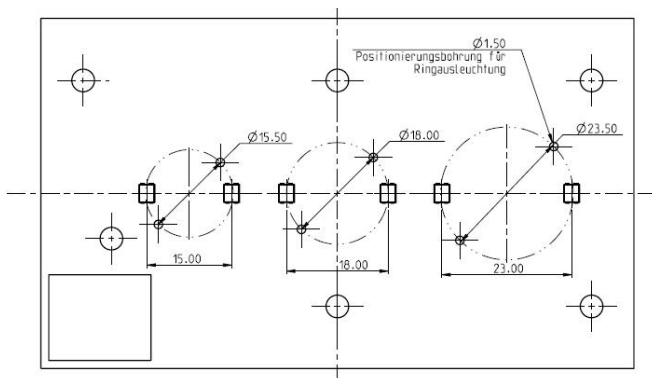
Overall height GH with embossing [mm]	Ring illumination diameter RA [mm]	Non-illuminated plunger diameter [mm]	Order no.
9.70	20.70	11.50	5.05.511.641/0000
9.70	23.70	14.50	5.05.511.640/0000
9.70	28.20	19.00	5.05.511.639/0000

A MICON system design with ring illumination is only possible with the type height 9.70 mm. We recommend back printing the ring illumination area with a diffusing ink. For the actuating area, back printing with an opaque ink is recommended.

Typical system design with 9.70 mm height, round plunger, opaque, ring illumination



Hole pattern of PCB

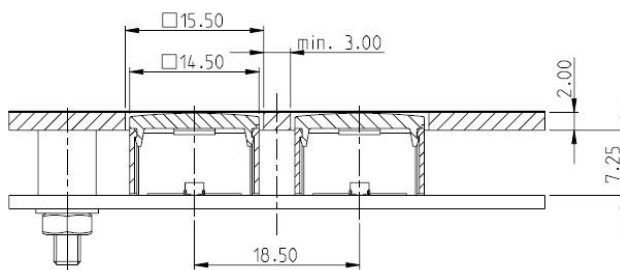


Signal indicator

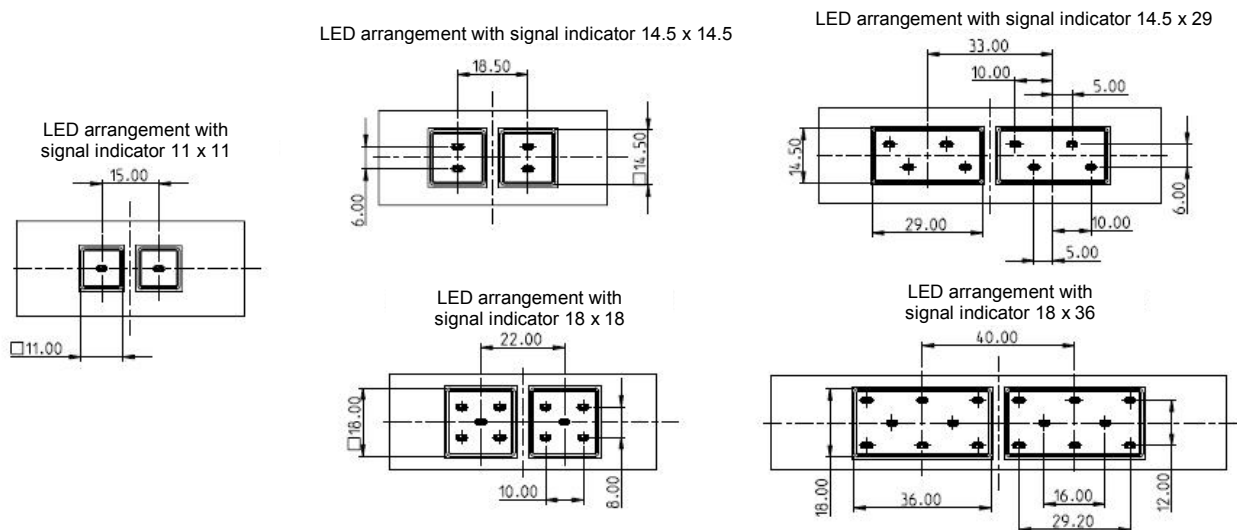
Overall height GH with embossing [mm]	Lens colour	Dimensions [mm]	Description	Order no.
9.70	white	11 x 11	1-module	5.05.005.182/2200
9.70	white	14.5 x 14.5	1-module	5.05.005.175/2200
9.70	white	18 x 18	1-module	5.05.005.176/2200
9.70	white	14.5 x 29	2-module	5.05.005.177/2200
9.70	white	18 x 36	2-module	5.05.005.178/2200

Other lens colours available on request

RAFI standard system design, 9.70 mm height, signal indicator



Possible arrangement of LEDs with signal indicator

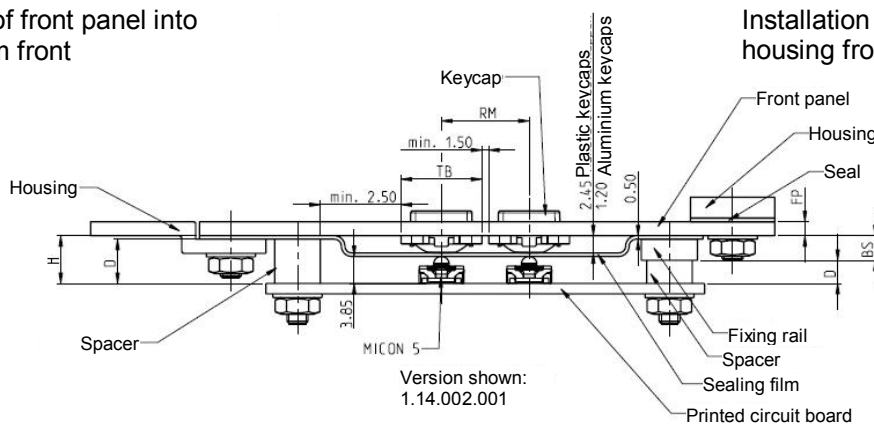


Typical system design under keycap, RK 90, 9 x 9 mm, IP65

System with sealing film
 (IP65 can be reached)

Installation of front panel into
 housing from front

Installation of front panel into
 housing from rear



- D - Spacer length $D = H - 0.20$ (rem. thickness of compressed DF)
- DF - Sealing film (0.50 mm)
- FP - Front panel (1.25 to 3 mm)
- H - Distance from front panel to PCB

- TB - Keycap collar (catalogue)
- RM - Grid spacing $TB + 1.50$ mm min.

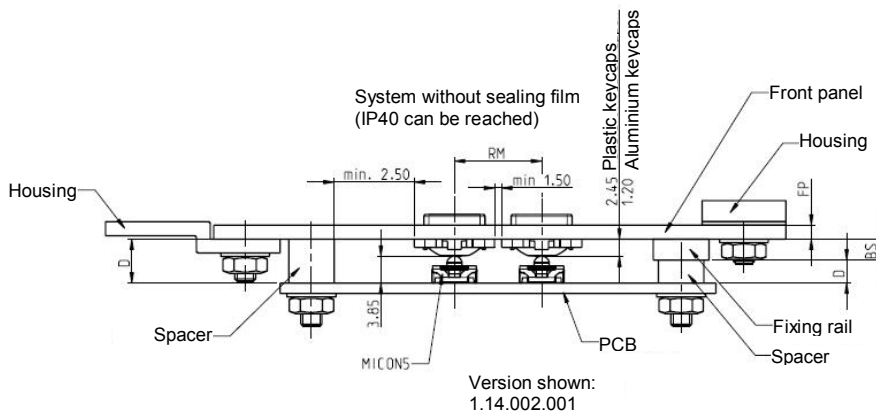
- BS - Fixing rail
- D - Spacer length $D = H - BS - 0.20$ (rem. thickness of compressed DF)
- DF - Sealing film (0.50 mm)
- FP - Front panel (1.25 to 3 mm)
- H - Distance from front panel to PCB

$H = 2.45 + 3.85 + DF$ (PCB version)
 $H = 2.45 + 3.85 + DF + 0.05$ (SMD version)

$H = 2.45 + 3.85 + DF$ (PCB version)
 $H = 2.45 + 3.85 + DF + 0.05$ (SMD version)

Typical system design under keycap, RK 90, 9 x 9 mm, IP40

System without sealing film
 (IP40 can be reached)



- D - Spacer length $D = 2.45 + 3.85$ (PCB version)
 $D = 2.45 + 3.85 + 0.05$ (SMD version)
- FP - Front panel (1.25 to 3 mm)

- TB - Keycap collar (catalogue)
- RM - Grid spacing $TB + 1.50$ mm min.

- BS - Fixing rail
- D - Spacer length $D = 2.45 + 3.85 - BS$ (PCB version)
 $D = 2.45 + 3.85 + 0.05 - BS$ (SMD version)
- FP - Front panel (1.25 to 3 mm)

Preliminary technical data, subject to modification.

3D data in step or igs format available on request.

RAFI GmbH & Co. KG
 Ravensburger Str. 128-134, D-88276 Berg/Ravensburg (Germany)
 Tel.: +49 751 89-0, Fax: +49 751 89-1300
 www.rafi.de, info@rafi.de