multimec® 3C/3E

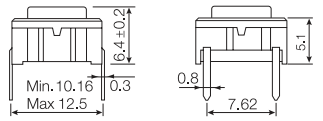
Technical Data

- through-hole or SMD
- 50mA/24VDC
- single pole/momentary
- 10.000.000 operations life time
- IP67 sealing
- temperature range:

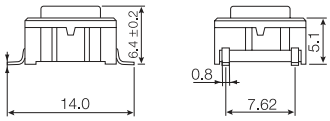
low temp:	-40/+115°C
high temp:	-40/+160°C
actuator:	
in PPS:	-40/+160°C
in polycarbonate:	-40/+85°C

Standard 3C

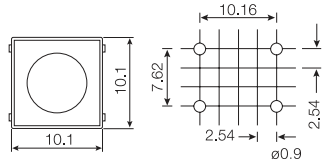
Dimensions (through-hole)



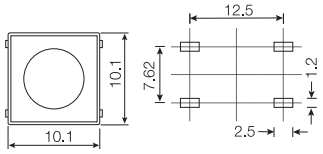
Dimensions (SMD)



PCB layout

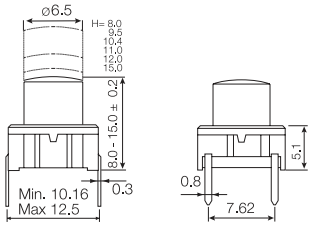


PCB layout

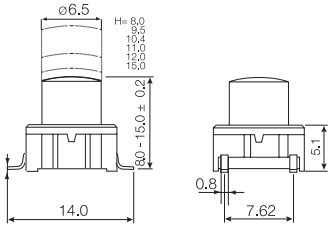


Variable heights 3E

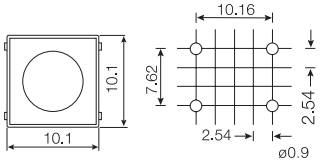
Dimensions (through-hole)



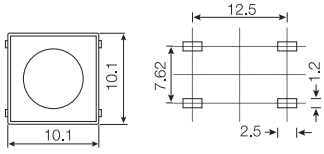
Dimensions (SMD)



PCB layout



PCB layout



How to order

3C

Switch

Mounting
T through-hole
S surface mount

L 6 low temp. white
L 9 low temp. black
H 9 high temp.

3E

Switch

Mounting
T through-hole
S surface mount

L low temp.
H high temp.

9 Black
Actuator made of PPS

-

Standard overall height
08.0
09.5
10.4
11.0
12.0
15.0

Custom heights:
3E is available in any height from 08.0 to 15.0mm.
Min. order qty. for custom heights is 2.000 pcs.

3E

Switch

T

Mounting
T through-hole

L low temp.

20 blue
23 grey
24 yellow
28 red
29 black
Actuator made of polycarbonate

-

Standard overall height
08.0
09.5
10.4
11.0
12.0
15.0

Switch and 3E actuator can be delivered unassembled.
The actuators made of polycarbonate can also be used for high temperature switches, however they must be mounted after soldering and the temp. range will be reduced to 85°C.

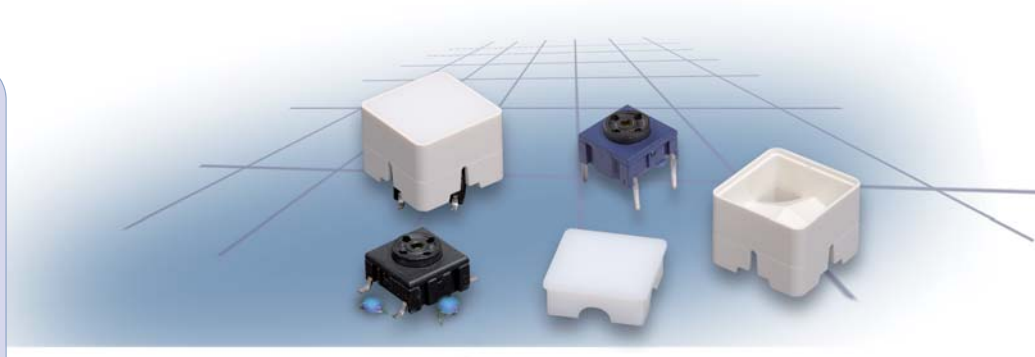
Ordering example: 3CTL6 and 3ETL9-09.5 or 3ETL23-08.0

For updates of products and/or changes of specifications please see **www.mec.dk**

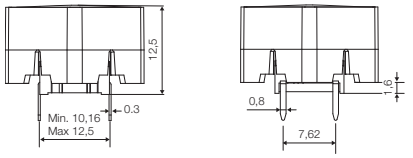
Foilmec™

Technical Data:

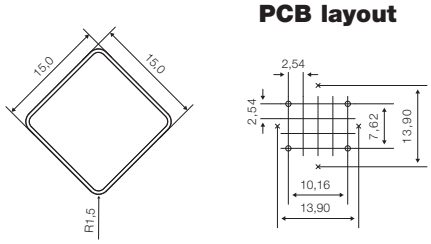
- through-hole or SMD
- 50mA/24VDC
- single pole/momentary
- 10.000.000 operations life time
- IP67 sealing
- temperature range:
  std. temp:-40/+115°C
  high temp:-40/+160°C
  keycap: -40/+85°C



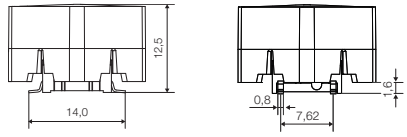
Dimensions (through-hole)



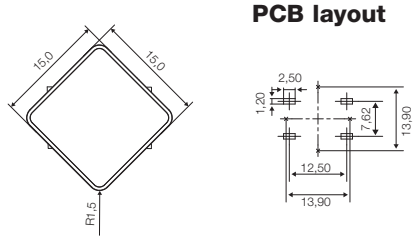
PCB layout



Dimensions (SMD)

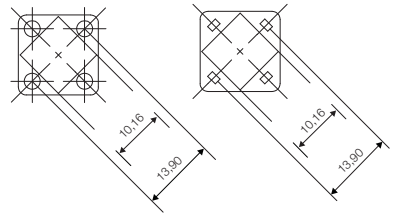


PCB layout



Recommended placement of LEDs

(TH Ø3mm) (SMD)



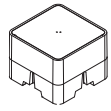
LED Recommendation

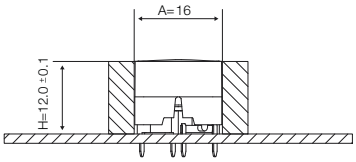
SMD: 1206 - 0805 - 0603 - 0402

TH: 3 mm - Ø max. 3,2 - Height Max. 6,5 mm

How to order

3 E	☐	☐☐	+	1 Y 0 6 1 6
Switch	**Mounting** **T** through-hole **S** surface mount	**L 6** low temp. **H 9** high temp.		**Cap white**





A: We recommend you to allocate enough space for travel of the foil and leave the area free from adhesive. Switch travel = 1 mm.
H: We recommend embossing the foil to follow the curve of the keycap.
The best tactile feeling is obtained with a small pretravel.
The dimension H is based on a flat foil. With an embossed foil the dimension will have to be adjusted.

Dimensions (mm) Unless otherwis specified, all tolerances ±0,2

Ordering example: 3ESH9 +1Y0616

For updates of products and/or changes of specifications please see **www.mec.dk**

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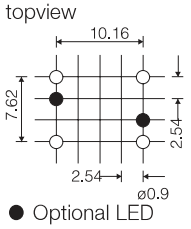
mec a/s sep. 2008

multimec® basic switches and tape & reel

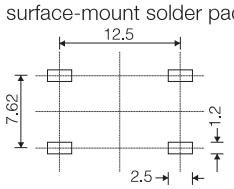
Recommended PCB layout

MULTIMEC®
topview

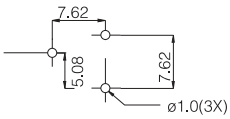


● Optional LED

MULTIMEC®
surface-mount solder pad

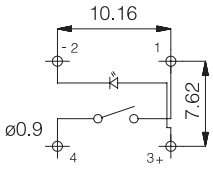


MULTIMEC®
Right Angle Version
topview

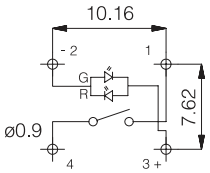


illumec™ PCB and Circuit Diagram

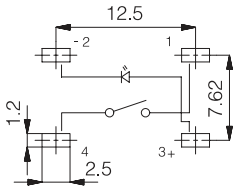
1 LED



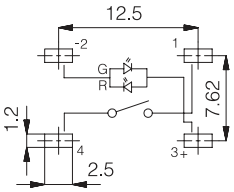
2 LEDS



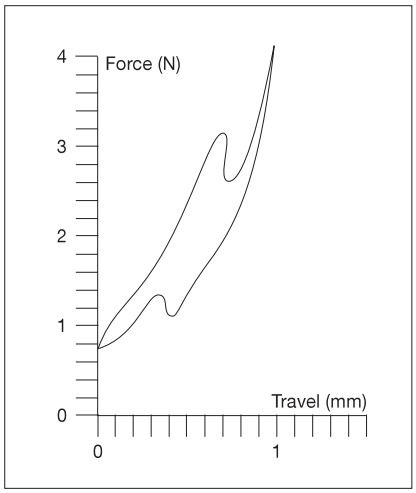
1 LED



2 LEDS



Operating Force
(typical example)



Tape and reel is available for the parts listed and has the following specifications:

Reel diameter	ø330mm
Tape width	24mm
Pitch	see list
Tape and reel material	antistatic or better
Quantity per reel	see list

3A/3C/3E/3F multimec® tape & reel

Part No.	Ordering Code	Pitch	Quantity per reel
3ASH9	3ASH9R	16	500
3CSH9	3CSH9R	16	500
3ESH9	3ESH9R	16	500
3ESH9-08.0	3ESH9R08.0	20	250
3ESH9-09.5	3ESH9R09.5	20	250
3ESH9-10.4	3ESH9R10.4	20	250
3ESH9-11.0	3ESH9R11.0	20	250
3ESH9-12.0	3ESH9R12.0	20	250
All varimec below 12.5	R after the part no.	20	250
3FSH9	3FSH9R	20	250

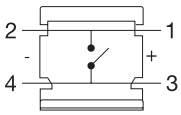
4F illumec™ tape & reel

Part No.	Ordering Code	Pitch	Quantity per reel
4FSH901	4FSH901R	20	250
4FSH922	4FSH922R	20	250
4FSH942	4FSH942R	20	250
4FSH961	4FSH961R	20	250
4FSH982	4FSH982R	20	250
4FSH92242	4FSH92242R	20	250
4FSH98222	4FSH98222R	20	250
4FSH98242	4FSH98242R	20	250

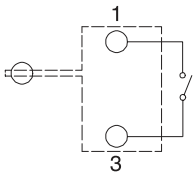
Specifications are according to EIA 600481-3 and IEC 60286-3

Circuit Diagram

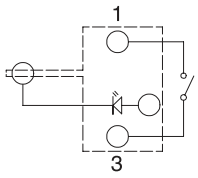
3A-3C-3E-3F



RAS



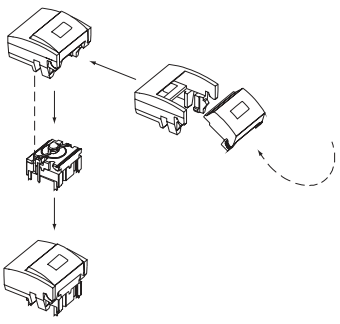
RAS w/LED



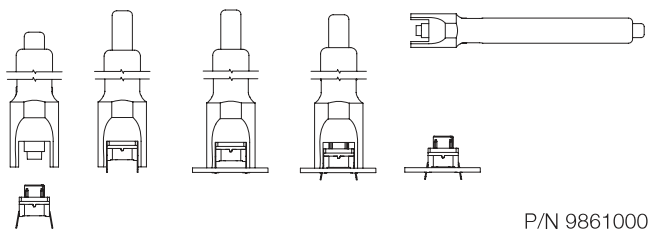
How to Assemble

multimec®
3AT + 1A/H + 2A/B

multimec®
3AT + 1B/C + 2A/B



Mounting Tool for Through-hole versions



P/N 9861000

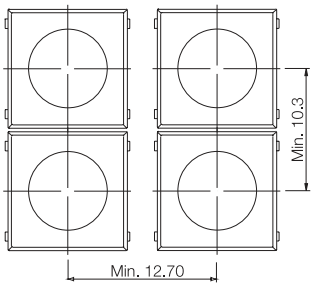
Specifications are subject to change without notice.

For updates of products and/or changes of specifications please see **www.mec.dk**

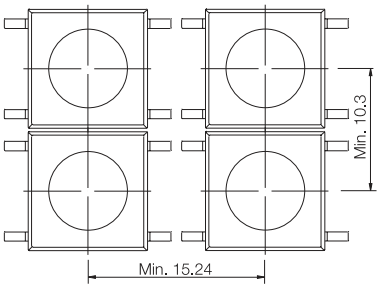
multimec® spacing

Basic switch spacing

through-hole

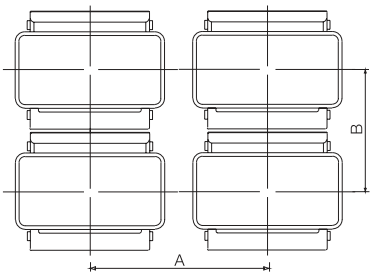


surface-mount

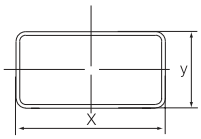


Recommended switch/cap spacing

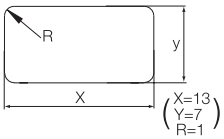
Switch spacing



Cap dimension

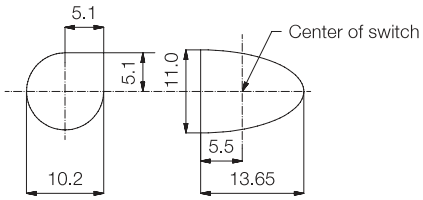


Panel cut-out

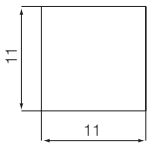


Panel Cut-out

1N **1V**



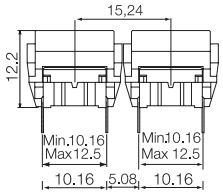
1T



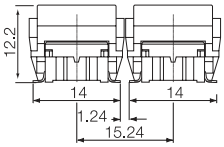
Spacing in mm

Spacing examples

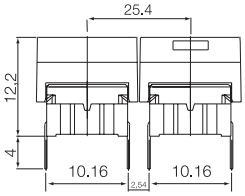
multimec®
3AT + 1B/C + 2A/B



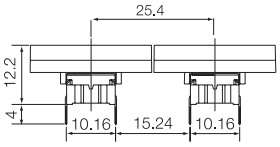
multimec®
3AS + 1B +2A/B
4AS +1B/1C + 2C/2D



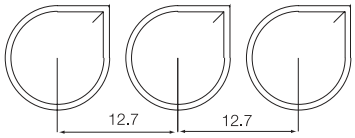
multimec®
3AT + 1A/H



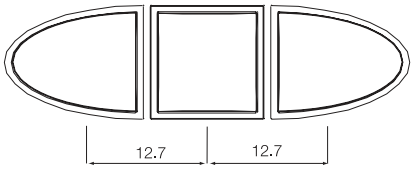
multimec®
3AT + 1M



multimec®
1N + 1N + 1N



multimec®
1V + 1T + 1V



Cap series	Recommended* min. switch spacing AxB	Nominal cap dimension W x H	Recommended min. panel cut-out
1A	12.7 x 10.16	12.6 x 10.1	13.0 x 10.5
1B/1C+2A/2B	15.24 x 15.24	15.1 x 15.1	15.5 x 15.5
1D/1E/1F	12.7 x 12.7	ø9.6	ø10.0
1K	15.24 x 15.24	14.3 x 14.3	14.7 x 14.7
1M	25.4 x 10.16	25.0 x 10.1	25.7 x 10.5
1N	12.7 x 12.7	ø9.8/□4.9	ø10.2/□5.1
1P/1Q/1R	15.24 x 10.16	6.5 x 12.5	7.0 x 13.0, R Max. 1.0
1S	12.7 x 10.16	ø6.5	ø7.0
1T	12.7 x 12.7	10.6 x 10.6	11.0 x 11.0
1U	12.7 x 12.7	ø10.6	ø11.0
1V (pointing outwards)	12.7 x 12.7	10.6 x 13.25	11.0 x 13.65
1X	12.7 x 12.7	9.4 x 7.4	9.8 x 7.9

*A dimension with surface mount version is min. 15.24. Depending on manufacturing technology it may be necessary either to reduce pad dimension, or to increase spacing.
In all applications the total assembly tolerance must be analysed by the user (board tolerance, front panel, assembly accuracy), to secure enough room for a free switch movement in the final product. The specifications on this page are to be considered as an aid only. MEC cannot be held responsible for the final assembly.

For updates of products and/or changes of specifications please see **www.mec.dk**

multimec® technical specifications

RoHS Compatible

	3A-3C-3E-3F Low Temperature Versions		3A-3C-3E-3F High Temperature Versions		illumec™ 4A - 4F High Temperature Versions	
	Silver	Gold	Silver	Gold	Silver	Gold
Electrical Specifications						
Contact resistance	<30m Ω - typ. 10m Ω		<30m Ω - typ. 10m Ω		<30m Ω - typ. 10 m Ω	
Insulation resistance	>10M Ω		>10M Ω		>10M Ω	
Recommended load	0.5-50mA 24VDC	0.5µ-50mA 24VDC	0.5-50mA 24VDC	0.5µ-50mA 24VDC	0.5-50mA 24VDC	0.5µ-50mA 24VDC
Contact bounce	<2mS - typically 0.5mS		<2mS - typically 0.5mS		<2mS - typically 0.5mS	
Mechanical Specifications						
Standard actuation force (switch)	3.0N typ.		3.0N typ.		3.0N typ.	
Max. actuation force without cap	100N for 10 sec.		100N for 10 sec.		100N for 10 sec.	
Key travel (switch)	1 mm		1 mm		1 mm	
Life time (switch)	>10.000.000 cycles		>10.000.000 cycles		>10.000.000 cycles	
Temperature Range						
Working temperature	Min. -40°C Max. +115°C		Min. -40°C Max. +160°C		Min. -30°C Max. +85°C*	
Storage temperature	Min. -40°C Max. +115°C		Min. -40°C Max. +160°C		Min. -30°C Max. +85°C*	
Soldering IEC 68-2-20	Wave - max. 260°C for max. 10 sec., please refer to usage guidelines. Soldering iron - max. 350°C for max. 3 sec. Flux tight.		Infrared, vapour phase, wave - max. 240°C for max. 40 sec. or max. 260°C for max. 30 sec. Soldering iron - max. 350°C for max. 3 sec. Flux tight.		Infrared, vapour phase, wave - max. 240°C for max. 40 sec. or max. 260°C for max. 30 sec. Soldering iron - max. 350°C for max. 3 sec. Flux tight.	
Environmental Endurance IEC 68-2-3						
Temperature	+40°C		+40°C		+40°C	
Humidity	93% RH		93% RH		93% RH	
Duration	56 Days		56 Days		56 Days	
Temperature Cycling IEC 68-2-14						
Temperature limit	Min. -40°C - Max. +125°C		Min. -40°C - Max. +125°C		Min. -40°C - Max. +125°C	
Number of cycles	10		10		10	
Exposure time at each temperature	30 min.		30 min.		30 min.	
Recovery time before measurements	16 hrs.		16 hrs.		16 hrs.	
Sealing IEC 529	IP-67		IP-67		IP-67	
Cleaning	Standard methods - see usage guidelines		Standard methods - see usage guidelines		Standard methods - see usage guidelines	
Vibration Test IEC 68-2-6						
Cycles					10	
Cycles time					2 hrs.	
Material Specifications - Switches						
Housing	PBT UL94VO		PPS UL94VO		PPS UL94VO	
Actuator	PBT UL94VO		PPS UL94VO		PPS UL94VO	
Sealing + spring	Silicone rubber		Silicone rubber		Silicone rubber	
Contact spring	Stainless steel + 3µAg	Stainless steel + 1µAu	Stainless steel + 3µAg	Stainless steel + 1µAu	Stainless steel + 3µAg	Stainless steel + 1µAu
Fixed contacts	SnCu + 2µNI + 3µAg	SnCu + 2µNI + 1µAu	SnCu + 2µNI + 3µAg	SnCu + 2µNI + 1µAu	SnCu + 2µNI + 3µAg	SnCu + 2µNI + 1µAu
Terminals	SnCu + 2µNI + 3µSn100	SnCu + 2µNI + 3µSn100	SnCu + 2µNI + 3µSn100	SnCu + 2µNI + 3µSn100	SnCu + 2µNI + 3µSn100	SnCu + 2µNI + 3µSn100

Material Specifications - Caps & Bezels			
Material	**Parts**	**Temp limit**	**UL rating**
ABS	1A, 1B, 1C, 1D, 1E, 1F, 1H, 1K, 1M, 1N, 1P, 1Q, 1R, 1T, 1U, 1V, 1WA, 1WD, 1WP, 1X, 1ZA, 1ZB, 1ZC.	Max. 65°C	UL94HB
Polycarbonate	All lenses, 3E coloured actuators	Max. 85°C	UL94V1
LCP	Black actuator of 3E	Max. 160°C	UL94VO
PPS	1S, 2S	Max. 160°C	UL94VO
Polyamide	Actuator of Varimec™, 1GA/1GC	Max. 160°C	UL94VO
Legends Adhesion	ISO Class: 1/ASTM Class: 4B DIN EN ISO 2409		

* LED max. working temperature

Specifications are subject to change without notice.

For updates of products and/or changes of specifications please see **www.mec.dk**