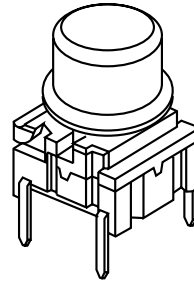


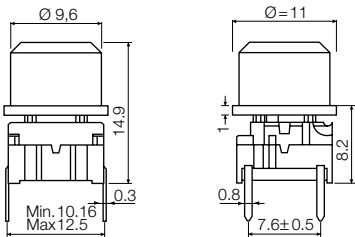
# multimec® 3F + 1D/1E/1F



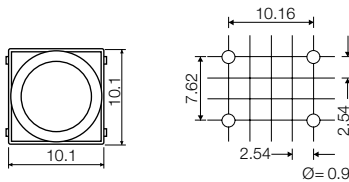
### Technical Data:

- 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

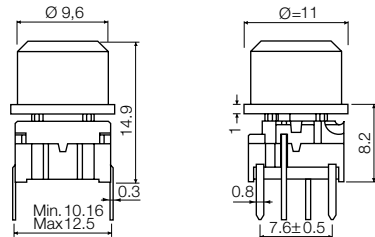
### Dimensions (through-hole)



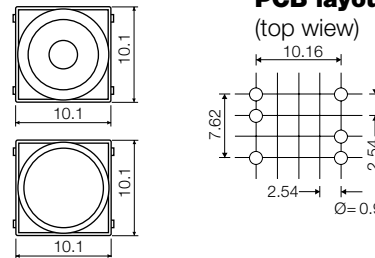
### PCB layout



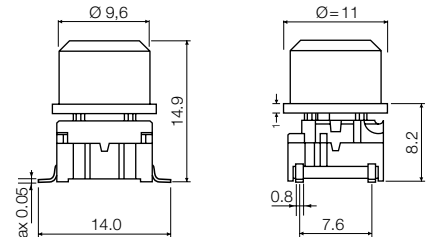
### Dimensions (w/LED)



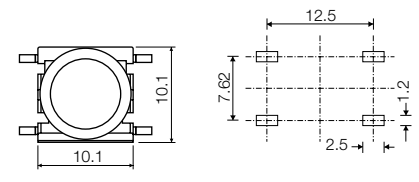
### PCB layout (top view)




### Dimensions (SMD)



### PCB layout






### HOW TO ORDER

|               |                          |                          |   |   |                          |                          |                            |                          |
|---------------|--------------------------|--------------------------|---|---|--------------------------|--------------------------|----------------------------|--------------------------|
| <b>3 F</b>    | <input type="checkbox"/> | <input type="checkbox"/> | + | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> |
| <b>Switch</b> | <b>Mounting</b>          | <b>L 6</b> low temp.     |   | <b>1 D</b>  | <b>00</b> blue           | <b>30</b> ultra blue     | <b>50</b> metal dark blue  |                          |
|               | <b>T</b> through-hole    | <b>H 9</b> high temp.    |   | <b>Cap</b>  | <b>02</b> green          | <b>40</b> dusty blue     | <b>53</b> metal light grey |                          |
|               | <b>S</b> surface mount   |                          |   |  | <b>03</b> grey           | <b>42</b> aqua blue      | <b>57</b> metal dark grey  |                          |
|               |                          |                          |   |   | <b>04</b> yellow         | <b>32</b> mint green     | <b>58</b> metal bordeaux   |                          |
|               |                          |                          |   |   | <b>06</b> white          | <b>33</b> tele grey      |                            |                          |
|               |                          |                          |   |   | <b>08</b> red            | <b>34</b> melon          |                            |                          |
|               |                          |                          |   |   | <b>09</b> black          | <b>38</b> noble red      |                            |                          |

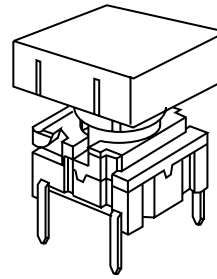
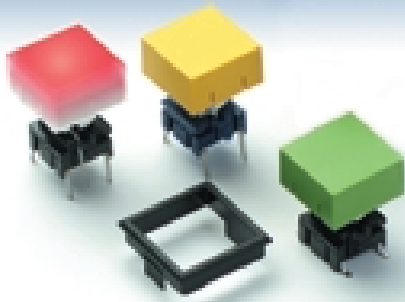
### Standard versions:

3FTL6  
3FTH9  
3FSH9  
3FSH9R

|               |                       |                          |                          |                          |  |                          |                          |                          |
|---------------|-----------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|
| <b>3 F</b>    | <b>T</b>              | <input type="checkbox"/> | <input type="checkbox"/> | +                        | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>Switch</b> | <b>Mounting</b>       | <b>L 6</b> low temp.     |                          | <b>LED</b>               | <b>Cap 1D</b>  | <b>1 1</b>               | <b>transparent</b>       | <b>Lens</b>              |
|               | <b>T</b> through-hole | <b>H 9</b> high temp.    |                          | <b>00</b> blue           |  |                          |                          |                          |
|               |                       |                          |                          | <b>20</b> green          | <b>Cap 1E</b>  | <b>00</b> blue           | <b>1</b> transparent     |                          |
|               |                       |                          |                          | <b>40</b> yellow         |  | <b>02</b> green          | <b>2</b> green           |                          |
|               |                       |                          |                          | <b>80</b> red            | <b>Cap 1F</b>  | <b>03</b> grey           | <b>4</b> yellow          |                          |
|               |                       |                          |                          | <b>2040</b> green/yellow |  | <b>04</b> yellow         | <b>8</b> red             |                          |
|               |                       |                          |                          | <b>8020</b> red/green    |  | <b>06</b> white          |                          |                          |
|               |                       |                          |                          | <b>8040</b> red/yellow   |  | <b>08</b> red            |                          |                          |
|               |                       |                          |                          |                          |  | <b>09</b> black          |                          |                          |

Ordering example: 3FTL620 + 1E032

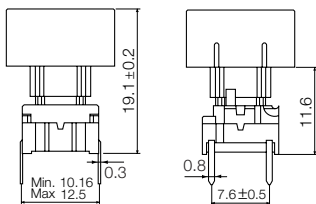
# multimec® 3F + 1K + 2K



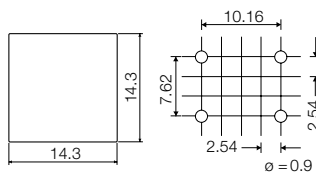
## Technical Data:

- 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

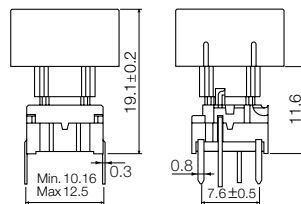
### Dimensions (through-hole)



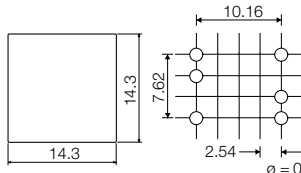
#### PCB layout



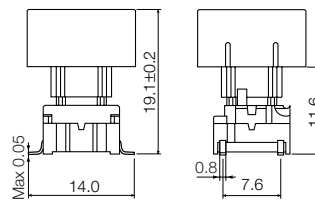
### Dimensions (w/LED)



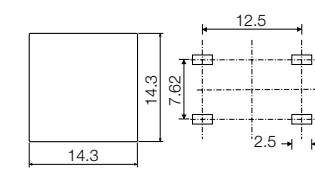
#### PCB layout (top view)



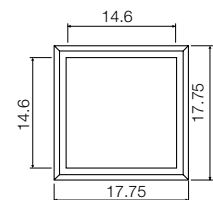
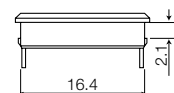
### Dimensions (SMD)



#### PCB layout



### Dimensions (Bezel) (Optional)



## HOW TO ORDER

|               |                          |   |   |            |  |   |              |   |
|---------------|--------------------------|---|---|------------|--|---|--------------|---|
| <b>3 F</b>    | <input type="checkbox"/> | <input type="checkbox"/>                      | + | <b>1 K</b> | <b>1 6</b>   | + | <b>2 K</b>   | <input type="checkbox"/>  |
| <b>Switch</b> | <b>Mounting</b>          | <b>L 6</b> low temp.<br><b>H 9</b> high temp. |   | <b>Cap</b> | <b>00</b> blue<br><b>02</b> green<br><b>03</b> grey<br><b>04</b> yellow<br><b>06</b> white<br><b>08</b> red<br><b>09</b> black |   | <b>Bezel</b> | <b>03</b> grey<br><b>06</b> white<br><b>08</b> red<br><b>09</b> black |

### Standard versions:

3FTL6  
3FTH9  
3FSH9  
3FSH9R

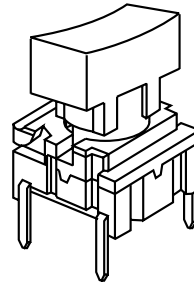
|               |                       |   |  |   |                        |   |              |   |
|---------------|-----------------------|---|--|---|------------------------|---|--------------|---|
| <b>3 F</b>    | <b>T</b>              | <input type="checkbox"/>                      | <input type="checkbox"/>                             | + | <b>1 K 1 1 1 6</b>     | + | <b>2 K</b>   | <input type="checkbox"/>  |
| <b>Switch</b> | <b>Mounting</b>       | <b>L 6</b> low temp.<br><b>H 9</b> high temp. | <b>LED</b>   |   | <b>Cap</b> transparent |   | <b>Bezel</b> | <b>03</b> grey<br><b>06</b> white<br><b>08</b> red<br><b>09</b> black |
|               | <b>T</b> through-hole |   | <b>23</b> green<br><b>44</b> yellow<br><b>88</b> red |   |                        |   |              |   |

### Standard versions:

3FTL622  
3FTL644  
3FTL688

**Ordering example:** 3FTL688 + 1K1116

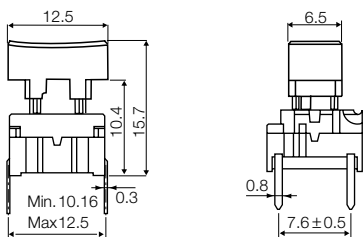
# multimec® 3F + 1P/1Q/1R



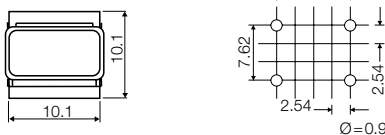
## Technical Data:

- 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

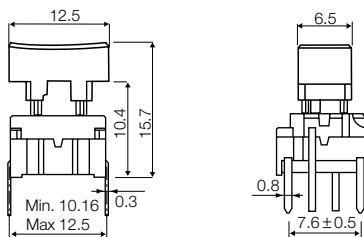
### Dimensions (through-hole)



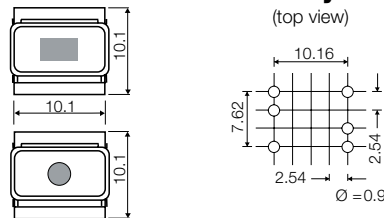
### PCB layout



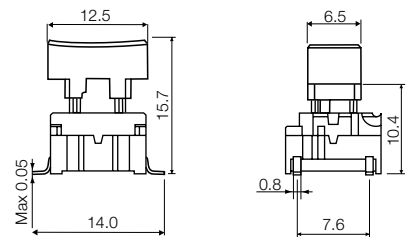
### Dimensions (w/LED)



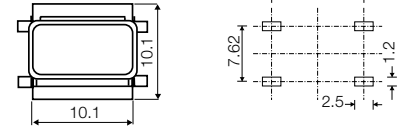
### PCB layout (top view)



### Dimensions (SMD)



### PCB layout



## How to order

**3 F**

**Switch**



**Mounting**

**T** through-hole  
**S** surface mount



**L 6** low temp.  
**H 9** high temp.

+

**1 P**

**Cap**



**00** blue  
**02** green  
**03** grey  
**04** yellow  
**06** white  
**08** red  
**09** black

### Standard versions:

3FTL6  
3FTH9  
3FSH9  
3FSH9R

**3 F**

**Switch**



**Mounting**

**T** through-hole



**L 6** low temp.  
**H 9** high temp.



**LED**

**00** blue  
**20** green  
**40** yellow  
**80** red  
**2040** green/yellow  
**8020** red/green  
**8040** red/yellow

+



**1Q**



**00** blue  
**03** grey  
**08** red  
**09** black

**1**

**Lens**

**1** transparent

### Standard versions:

3FTL600  
3FTL620  
3FTL640  
3FTL680  
3FTL62040  
3FTL68020  
3FTL68040

**1R**

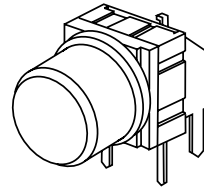


**Ordering example:** 3 FTL680 + 1Q091

# multimec® RAS + 1D/1K/1P/1S

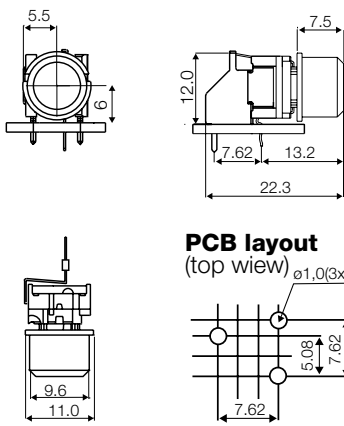


## Technical Data:

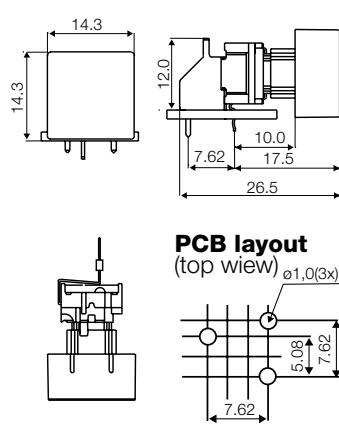


- through-hole only
- 50mA/24VDC
- single pole/momentary
- 10.000.000 operations life time
- IP67 sealing
- temperature range:  
low temp: -40/+115°C

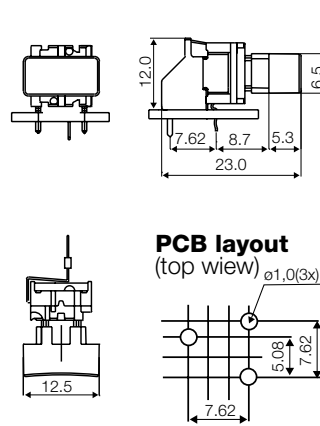
### Dimensions 1D



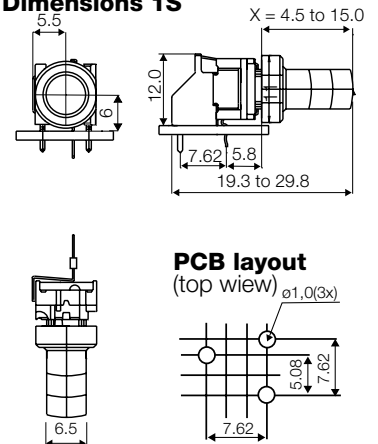
### Dimensions 1K






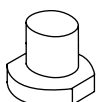
### Dimensions 1P



### Dimensions 1S



## HOW TO ORDER

|               |                       |                      |                     |                |   |                  |                      |                            |
|---------------|-----------------------|----------------------|---------------------|----------------|---|------------------|----------------------|----------------------------|
| <b>3 F</b>    | <b>T</b>              | <b>L 6</b>           | <b>R A S</b> +      | <b>1 D</b>     | <b>Cap</b>  | <b>00</b> blue   | <b>30</b> ultra blue | <b>50</b> metal dark blue  |
| <b>Switch</b> | <b>Mounting</b>       | <b>L 6</b> low temp. | Right angle support |                |  | <b>02</b> green  | <b>40</b> dusty blue | <b>53</b> metal light grey |
|               | <b>T</b> through-hole |                      |                     |                |   | <b>03</b> grey   | <b>42</b> aqua blue  | <b>57</b> metal dark grey  |
|               |                       |                      |                     |                |   | <b>04</b> yellow | <b>32</b> mint green | <b>58</b> metal bordeaux   |
|               |                       |                      |                     |                |   | <b>06</b> white  | <b>33</b> tele grey  |                            |
|               |                       |                      |                     |                |   | <b>08</b> red    | <b>34</b> melon      |                            |
|               |                       |                      |                     |                |   | <b>09</b> black  | <b>38</b> noble red  |                            |
|               |                       |                      |                     | <b>1 P</b>     | <b>Cap</b>  | <b>00</b> blue   |                      |                            |
|               |                       |                      |                     |                |  | <b>03</b> grey   |                      |                            |
|               |                       |                      |                     |                |   | <b>08</b> red    |                      |                            |
|               |                       |                      |                     |                |   | <b>09</b> black  |                      |                            |
|               |                       |                      |                     | <b>1 K</b>     | <b>Cap</b>  | <b>00</b> blue   | <b>2 K</b>           | <b>Bezel</b>               |
|               |                       |                      |                     |                |  | <b>02</b> green  |                      | <b>03</b> grey             |
|               |                       |                      |                     |                |   | <b>03</b> grey   |                      | <b>06</b> white            |
|               |                       |                      |                     |                |   | <b>04</b> yellow |                      | <b>08</b> red              |
|               |                       |                      |                     |                |   | <b>06</b> white  |                      | <b>09</b> black            |
|               |                       |                      |                     |                |   | <b>08</b> red    |                      |                            |
|               |                       |                      |                     |                |   | <b>09</b> black  |                      |                            |
|               |                       |                      |                     | <b>1 S 0 9</b> | <b>Cap black</b>  | <b>H</b>         | <b>X *</b>           |                            |
|               |                       |                      |                     |                |  | 16.0             | 8.5                  |                            |
|               |                       |                      |                     |                |   | 19.0             | 11.5                 |                            |
|               |                       |                      |                     |                |   | 22.5             | 15.0                 |                            |

### Standard versions:

3FTL6RAS, 3CTL6RAS,

\*Any cap height X from 8.5 to 15.0 mm is available. Please order 1S09-H, where H = X+7.5 mm  
Min. order Qty for custom heights is 2.000 pcs. A start-up charge will apply.  
3CTL6 also available as right angle switch 3CTL6RAS. Please see multimec basic switch modules.

**Ordering example:** 3FTL6RAS + 1K0016 + 2K03

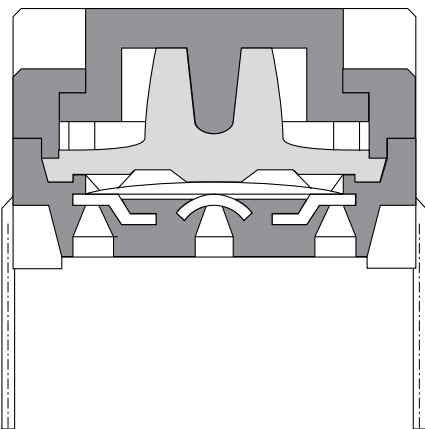
# multimec® basic switch modules

| Through-hole Version   |                  |                      |                      |  |                                     |                           |
|--|------------------|----------------------|----------------------|--|-------------------------------------|---------------------------|
| 3A   | 3C               | 3E                   | 3F                   | 3F                                     | 3F                                  | 3F                        |
| For 1A/1B/1M   | w/LED for 1C/1H  |                      |                      | For 1D/1K/1N/1P/1S/1T/1U/1V/1X/1GA/1GC | w/LED for 1E/1F/1N/1Q/1R/1S/1X      | w/LED for 1K1116/1T/1U/1V |
|  |                  |                      |                      |  |                                     |                           |
| Standard Versions  |                  |                      |                      |  |                                     |                           |
| 3ATL6<br>3ATH9   | 3ATL600/20/40/80 | 3CTL6/3CTL9<br>3CTH9 | 3ETL9-H*<br>3ETH9-H* | 3FTL6<br>3FTH9                         | 3FTL600/20/40/80/<br>2040/8020/8040 | 3FTL623/44/88             |
| * 3E available in 6 standard heights: 08.0, 09.5, 10.4, 11.0, 12.0, 15.0 mm<br>Other heights between 08.0 and 15.0 mm are available upon request |                  |                      |                      |  |                                     |                           |
| Specials: Gold contacts, quiet version and actuation force other than 3.0N   |                  |                      |                      |  |                                     |                           |

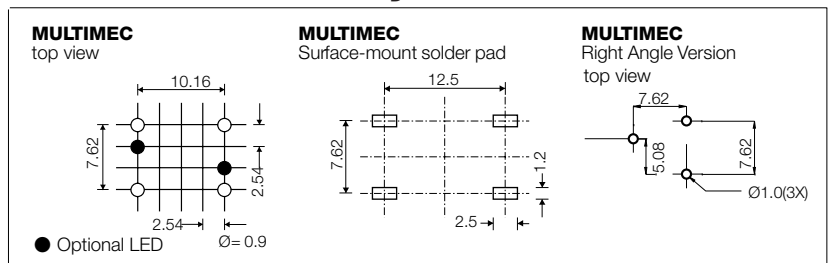
| Surface Mount Versions |              |              |  |
|------------------------|--------------|--------------|--|
| 3A                     | 3C           | 3E           | 3F                                     |
|                        |              |              |  |
| 3ASH9/3ASH9R           | 3CSH9/3CSH9R | 3ESH9/3ESH9R | 3FSH9 / 3FSH9R                         |
| For 1A/1B/1M           |              |              | For 1D/1K/1N/1P/1S/1T/1U/1V/1X/1GA/1GC |

| Right Angle Versions |                 |
|----------------------|-----------------|
| 3C                   | 3F              |
|                      |                 |
| 3CTL6RAS             | 3FTL6RAS        |
|                      | For 1D/1K/1P/1S |

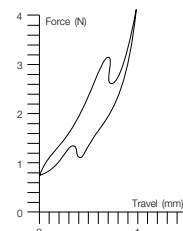
## multimec® Cross Section



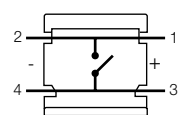
## Recommended PCB layout



Operating Force (Typical example)



Circuit diagram



DIMENSIONS (mm) Unless otherwise specified, all tolerances  $\pm 0.2$

|  | Low Temperature Versions  |                                  | High Temperature Versions                                     |                                  |
|--|---|----------------------------------|---|----------------------------------|
|  | Silver  | Gold                             | Silver  | Gold                             |
| <b>Electrical Specifications</b>                   |   |                                  |   |                                  |
| Contact resistance                                 | <30 mΩ - typically 10mΩ   |                                  |   |                                  |
| Insulation resistance                              | >10M Ω  |                                  |   |                                  |
| Recommended load                                   | 0.5-50mA 24VDC  | 0.5μ-50mA 24VDC                  | 0.5-50mA 24VDC  | 0.5μ-50mA 24VDC                  |
| Contact bounce                                     | <2mS - typically 0.5mS  |                                  |   |                                  |
| <b>Mechanical Specifications</b>                   |   |                                  |   |                                  |
| Standard actuation force (switch)                  | 3.0N typ.   |                                  |   |                                  |
| Max. actuation force without cap                   | 100N for 10 sec.  |                                  |   |                                  |
| Key travel (switch)                                | 1 mm  |                                  |   |                                  |
| Life time (switch)                                 | >10.000.000 cycles  |                                  |   |                                  |
| <b>Temperature Range</b>                           |   |                                  |   |                                  |
| Working temperature                                | Min. -40°C Max. +115°C  |                                  | Min. -40°C Max. +160°C  |                                  |
| Storage temperature                                | Min. -40°C Max. +115°C  |                                  | Min. -40°C Max. +160°C  |                                  |
| Soldering IEC 68-2-20                              | Wave -max. 260°C for max. 10 sec., please refer to usage guidelines |                                  | Infrared, vapour phase, wave<br>- max. 260°C for max. 30 sec. |                                  |
|  | Soldering iron - max. 350°C for max. 3 sec. Flux tight.             |                                  | Soldering iron - max. 350°C for max. 3 sec. Flux tight.       |                                  |
| <b>Environmental Endurance IEC-68-2-3</b>          |   |                                  |   |                                  |
| Temperature  | +40°C   |                                  |   |                                  |
| Humidity   | 93% RH  |                                  |   |                                  |
| Duration   | 56 Days   |                                  |   |                                  |
| <b>Temperature Cycling IEC 68-2-14</b>             |   |                                  |   |                                  |
| Temperature limit                                  | Min. -55°C - Max. +85°C   |                                  |   |                                  |
| Number of cycles                                   | 200   |                                  |   |                                  |
| Exposure time at each temperature                  | 10 min.   |                                  |   |                                  |
| Recovery time before measurements                  | 16 hrs.   |                                  |   |                                  |
| Sealing IEC 529                                    | IP-67   |                                  |   |                                  |
| Cleaning   | Standard methods such as freon and water                            |                                  |   |                                  |
| <b>Material Specifications - Switches</b>          |   |                                  |   |                                  |
| Housing  | PBT UL94VO  |                                  | PPS UL94VO  |                                  |
| Actuator   | PBT UL94VO  |                                  | PPS UL94VO  |                                  |
| Sealing + spring                                   | Silicone rubber   |                                  |   |                                  |
| Contact spring                                     | Stainless steel<br>+ 3μAg   | Stainless steel<br>+ 3μAg + 1μAu | Stainless steel<br>+ 3μAg                                     | Stainless steel<br>+ 3μAg + 1μAu |
| Fixed Contacts                                     | SnCu + 2μNi + 3μAg  | SnCu + 2μNi + 3μAg + 1μAu        | SnCu + 2μNi + 3μAg  | SnCu + 2μNi + 3μAg + 1μAu        |
| Terminals  | SnCu + 2μNi + 3μSnPb  | SnCu + 2μNi + 3μSnPb             | SnCu + 2μNi + 3μSnPb  | SnCu + 2μNi + 3μSnPb             |
| <b>Material Specifications - Caps &amp; Bezels</b> |   |                                  |   |                                  |
| <b>Material</b>                                    | <b>Parts</b>  | <b>Temp limit</b>                | <b>UL rating</b>  |                                  |
| ABS Standard                                       | Standard parts except the below mentioned                           | Max 65°C                         | UL94HB  |                                  |
| Polycarbonate                                      | All lenses  | Max. 85°C                        | UL94V1  |                                  |
| LCP  | Actuator of 3E  | Max. 160°C                       | UL94VO  |                                  |
| PPS  | 1S, 2S  | Max. 160°C                       | UL94VO  |                                  |
| Polyamide  | Actuator of Varimec , 1GA/ 1GC                                      | Max. 160°C                       | UL94VO  |                                  |
| <b>Legends Adhesion</b>                            | ISO Class.: 1/ ASTM Class.: 4B<br>DIN EN ISO 2409                   |                                  |   |                                  |

Specifications are subject to change without notice