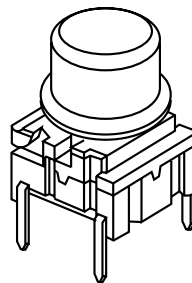


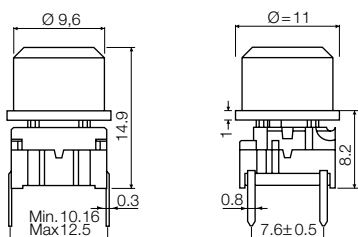
# multimec® 3F + 1D/1E/1F



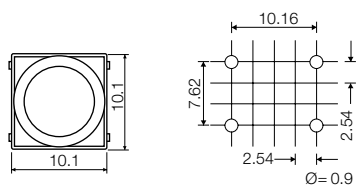
## Technical Data:

- 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

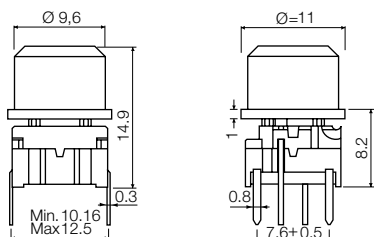
## Dimensions (through-hole)



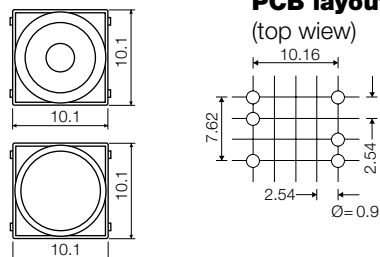
## PCB layout



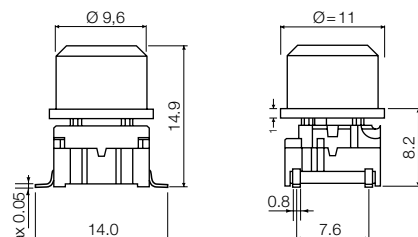
## Dimensions (w/LED)



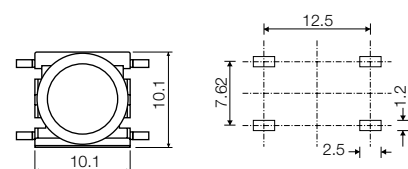
## PCB layout (top view)



## Dimensions (SMD)



## PCB layout



## HOW TO ORDER

**3 F**

**Switch**



**Mounting**

**T** through-hole

**S** surface mount



**L 6** low temp.

**H 9** high temp.

**+**

**1 D**

**Cap**



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

**30** ultra blue  
**40** dusty blue  
**42** aqua blue  
**32** mint green  
**33** tele grey  
**34** melon  
**38** noble red

**50** metal dark blue  
**53** metal light grey  
**57** metal dark grey  
**58** metal bordeaux

## Standard versions:

3FTL6  
3FTH9  
3FSH9  
3FSH9R

**3 F**

**Switch**



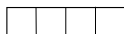
**Mounting**

**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

**+**



**Cap 1D**



**Cap 1E**



**Cap 1F**



**1 1**

transparent



**Lens**

## Standard versions:

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

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

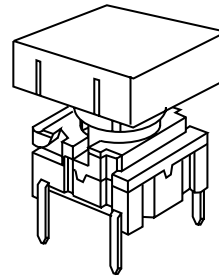
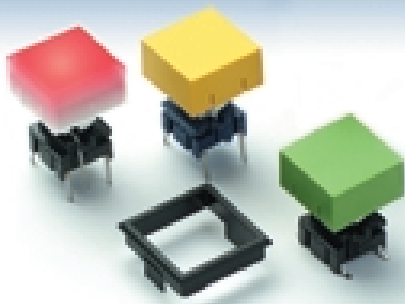
**1** transparent  
**2** green  
**4** yellow  
**8** red

**Ordering example:** 3FTL620 + 1E032

**mec** · Industriparken 23 · P.o. Box 26 · DK-2750 Ballerup · Denmark

Tel.: +45 44 97 33 66 · Fax: +45 44 68 15 14 · Web: [www.mec.dk](http://www.mec.dk) · E-mail: [danmec@mec.dk](mailto:danmec@mec.dk)

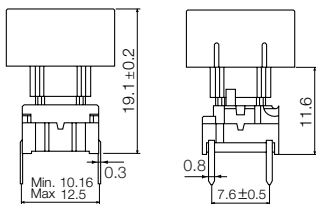
# multimec® 3F + 1K + 2K



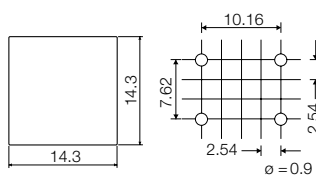
## Technical Data:

- 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

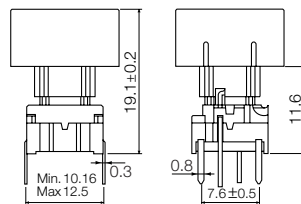
## Dimensions (through-hole)



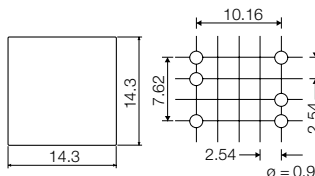
### PCB layout



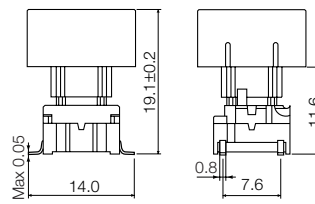
## Dimensions (w/LED)



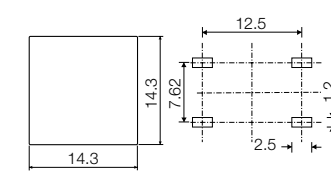
### PCB layout (top view)



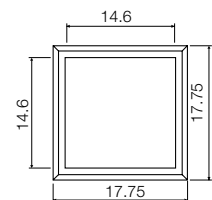
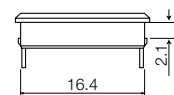
## Dimensions (SMD)



### PCB layout



## Dimensions (Bezel) (Optional)



## HOW TO ORDER

|               |                                                 |                                               |   |                                                                                          |   |                                                        |
|---------------|-------------------------------------------------|-----------------------------------------------|---|------------------------------------------------------------------------------------------|---|--------------------------------------------------------|
| <b>3 F</b>    | <b>Mounting</b>                                 | <b>L 6</b> low temp.<br><b>H 9</b> high temp. | + | <b>1 K 1 1 1 6</b>                                                                       | + | <b>2 K</b>                                             |
| <b>Switch</b> | <b>T</b> through-hole<br><b>S</b> surface mount |                                               |   | <b>Cap</b> 00 blue<br>02 green<br>03 grey<br>04 yellow<br>06 white<br>08 red<br>09 black |   | <b>Bezel</b> 03 grey<br>06 white<br>08 red<br>09 black |

## Standard versions:

3FTL6  
3FTH9  
3FSH9  
3FSH9R

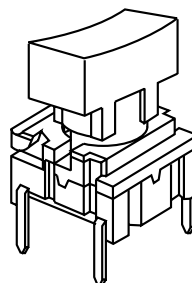
|               |                       |                                               |   |                        |   |                                                        |
|---------------|-----------------------|-----------------------------------------------|---|------------------------|---|--------------------------------------------------------|
| <b>3 F</b>    | <b>Mounting</b>       | <b>L 6</b> low temp.<br><b>H 9</b> high temp. | + | <b>1 K 1 1 1 6</b>     | + | <b>2 K</b>                                             |
| <b>Switch</b> | <b>T</b> through-hole |                                               |   | <b>Cap</b> transparent |   | <b>Bezel</b> 03 grey<br>06 white<br>08 red<br>09 black |

## Standard versions:

3FTL622  
3FTL644  
3FTL688

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

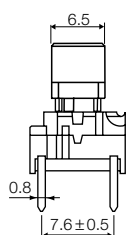
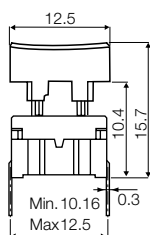
# multimec® 3F + 1P/1Q/1R



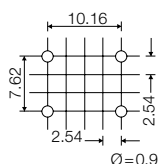
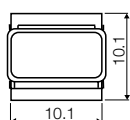
## Technical Data:

- 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

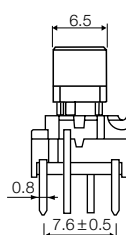
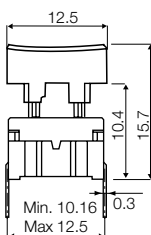
## Dimensions (through-hole)



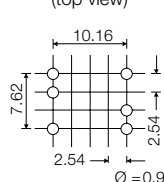
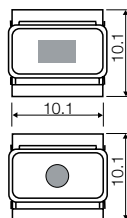
## PCB layout



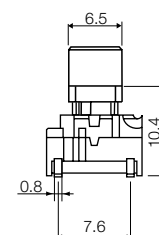
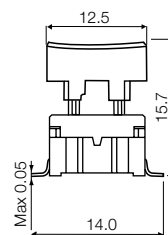
## Dimensions (w/LED)



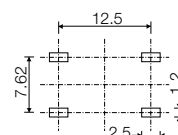
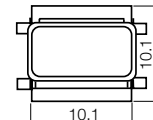
## PCB layout (top view)



## 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**

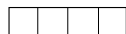


**Mounting**

**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**



**1R**



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

**1**

**Lens**

**1** transparent

## Standard versions:

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

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



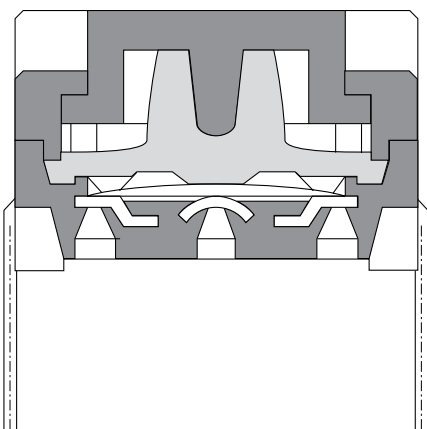
# multimec® basic switch modules

| Through-hole Version                                                                                                                             |                  |                      |                      |                                        |                                     |                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------|----------------------|----------------------------------------|-------------------------------------|---------------------------|
| 3A                                                                                                                                               |                  | 3C                   | 3E                   | 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 |

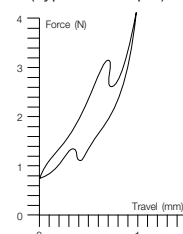
## multimec® Cross Section



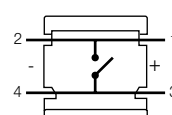
## Recommended PCB layout

|                                 |                                                 |                                                        |
|---------------------------------|-------------------------------------------------|--------------------------------------------------------|
| <b>MULTIMEC</b><br>top view<br> | <b>MULTIMEC</b><br>Surface-mount solder pad<br> | <b>MULTIMEC</b><br>Right Angle Version<br>top view<br> |
|---------------------------------|-------------------------------------------------|--------------------------------------------------------|

**Operating Force**  
(Typical example)



**Circuit diagram**



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

# multimec® technical specifications

|                                         | Low Temperature Versions                                            |                               | High Temperature Versions                                  |                              |
|-----------------------------------------|---------------------------------------------------------------------|-------------------------------|------------------------------------------------------------|------------------------------|
|                                         | Silver                                                              | Gold                          | Silver                                                     | Gold                         |
| Electrical Specifications               |                                                                     |                               |                                                            |                              |
| Contact resistance                      | <30 m Ω - typically 10m Ω                                           |                               |                                                            |                              |
| 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                                              |                               |                                                            |                              |
| Mechanical Specifications               |                                                                     |                               |                                                            |                              |
| 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                                                  |                               |                                                            |                              |
| Temperature Range                       |                                                                     |                               |                                                            |                              |
| 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 - 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.    |                              |
| Environmental Endurance IEC-68-2-3      |                                                                     |                               |                                                            |                              |
| Temperature                             | +40°C                                                               |                               |                                                            |                              |
| Humidity                                | 93% RH                                                              |                               |                                                            |                              |
| Duration                                | 56 Days                                                             |                               |                                                            |                              |
| Temperature Cycling IEC 68-2-14         |                                                                     |                               |                                                            |                              |
| 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                            |                               |                                                            |                              |
| Material Specifications - Switches      |                                                                     |                               |                                                            |                              |
| Housing                                 | PBT UL94VO                                                          |                               | PPS UL94VO                                                 |                              |
| Actuator                                | PBT UL94VO                                                          |                               | PPS UL94VO                                                 |                              |
| Sealing + spring                        | Silicone rubber                                                     |                               |                                                            |                              |
| Contact spring                          | Stainless steel + 3μAg                                              | Stainless steel + 3μAg + 1μAu | Stainless steel + 3μAg                                     | Stainless steel + 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         |
| Material Specifications - Caps & Bezels |                                                                     |                               |                                                            |                              |
| Material                                | Parts                                                               | Temp limit                    | UL rating                                                  |                              |
| 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                                                     |                              |
| Legends Adhesion                        |                                                                     |                               |                                                            |                              |
| ISO Class.: 1/ ASTM Class.: 4B          |                                                                     |                               |                                                            |                              |
| DIN EN ISO 2409                         |                                                                     |                               |                                                            |                              |

Specifications are subject to change without notice