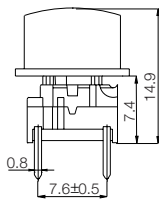
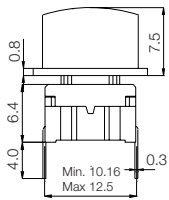


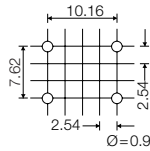
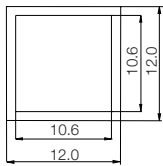
Technical Data:

- 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

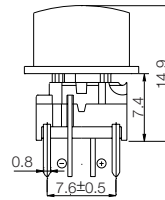
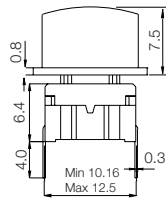
Dimensions (through-hole)



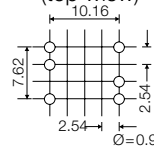
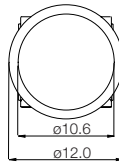
PCB layout



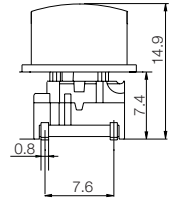
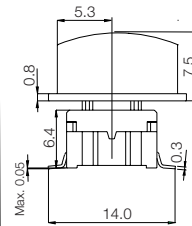
Dimensions (w/LED)



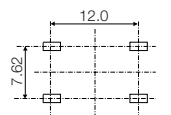
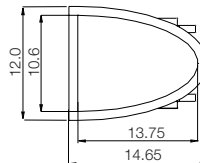
PCB layout (top view)



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.

+



Cap



1T



1U



1V



00 blue

03 grey

08 red

09 black

custom colours on request

Standard versions:

3FTL6
3FTH9
3FSH9
3FSH9R

3 F

Switch



Mounting

T through-hole



L 6 low temp.
H 9 high temp.

+



Cap



1T



1U



1V



1 6

transparent white

Standard versions:

3FTL622
3FTL644
3FTL688

Ordering example: 3FTL644 + 1V16

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

Tel.: +45 44 97 33 66 · Fax: +45 44 68 15 14 · E-mail: danmec@mec.dk · www.mec.dk.

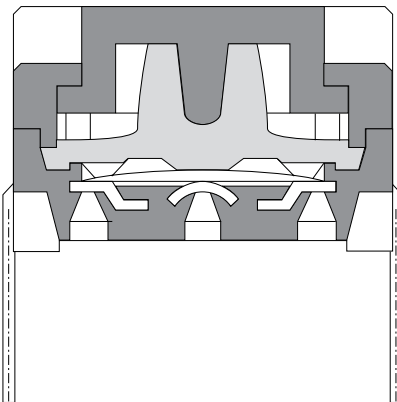
multimec® basic switch modules

| 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 3ATH9 | 3ATL600/20/40/80 | 3CTL6/3CTL9 3CTH9 | 3ETL9-H* 3ETH9-H* | 3FTL6 3FTH9 | 3FTL600/20/40/80/ 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 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 |

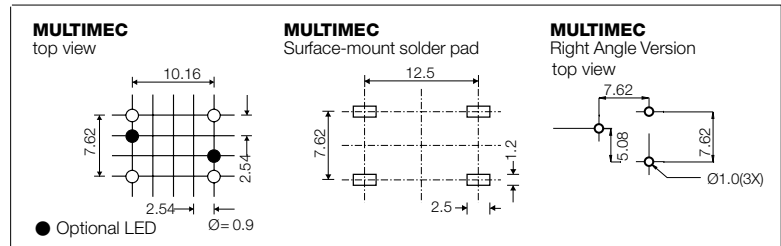
| Right Angle Versions | |
|----------------------|-----------------|
| 3C | 3F |
| | |
| 3CTL6RAS | 3FTL6RAS |
| | For 1D/1K/1P/1S |

multimec® Cross Section

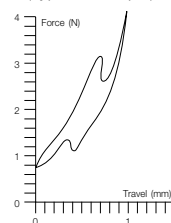


DIMENSIONS (mm) Unless otherwise specified, all tolerances ± 0.2

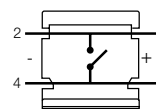
Recommended PCB layout



Operating Force
(Typical example)



Circuit diagram



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

Existing and New Part Nos. for Lead Free, RoHS compatible and Proces compatible mec products

MULTIMEC

| Part No. | Part Name | Lead Free | RoHS Comp. | Proces Comp. | New Part No. Comments | Lead Free | RoHS Comp. | Proces Comp. | UL |
|-------------|-----------------------------------|-----------|------------|--------------|-----------------------|-----------|------------|--------------|----|
| 3ASH9 | Switch Surface Ag/High Temp | N | N | Y | RA3ASH9 | Y | Y | Y | V0 |
| 3AXXXG | All 3A Switches with Au | N | N | Y | RA3AXXXG | Y | Y | Y | V0 |
| 3AXXXQ | All 3A Quiet Switches | N | N | Y | RA3AXXXQ | Y | Y | Y | VO |
| 3ASH9R | All 3A Switches delivered on Tape | N | N | Y | RA3ASH9R | Y | Y | Y | V0 |
| 3ATH9 | Switch Th Ag/High Temp. | N | N | Y | RA3ATH9 | Y | Y | Y | V0 |
| 3ATL6 | Switch Th Ag/White But/Low Temp. | N | N | Y | RA3ATL6 | Y | Y | Y | V0 |
| 3ATL6 w/LED | Switch Th Ag/Low Temp w/LED | N | N | Y | RA3ATL6 w/LED | Y | Y | Y | V0 |
| 3CSH9 | Switch Surface Ag/High Temp. | N | N | Y | RA3CSH9 | Y | Y | Y | V0 |
| 3CXXXG | All 3C Switches with Au | N | N | Y | RA3CXXXG | Y | Y | Y | V0 |
| 3CXXXQ | All 3C Quiet Switches | N | N | Y | RA3CXXXQ | Y | Y | Y | V0 |
| 3CSH9R | All 3C Switches delivered on Tape | N | N | Y | RA3CSH9R | Y | Y | Y | V0 |
| 3CTH9 | Switch Th Ag/High Temp | N | N | Y | RA3CTH9 | Y | Y | Y | V0 |
| 3CTL6 | Switch Th/White But/Low Temp | N | N | Y | RA3CTL6 | Y | Y | Y | V0 |
| 3CTL6-2SL | Switch Low Temp. 2 Straight Legs | N | N | Y | RA3CTL6-2SL | Y | Y | Y | V0 |
| 3CTL6RAS | Right Angle Switch Low Temp. | N | N | Y | RA3CTL6RAS | Y | Y | Y | V0 |
| 3CTL9 | Switch Th Ag/Black But/Low Temp | N | N | Y | RA3CTL9 | Y | Y | Y | V0 |
| 3ESH9 | Switch Surface Ag High Temp. | N | N | Y | RA3ESH9 | Y | Y | Y | V0 |
| 3ESH9-XX.X | Switch Ag/High Temp./w Actuator | N | N | Y | RA3ESH9-XX.X | Y | Y | Y | V0 |
| 3EXXXG | All 3E Switches with Au | N | N | Y | RA3EXXXG | Y | Y | Y | V0 |
| 3EXXXQ | All 3E Quiet Switches | N | N | Y | RA3EXXXQ | Y | Y | Y | V0 |
| 3ESH9R | All 3E Switches delivered on Tape | N | N | Y | RA3ESH9R | Y | Y | Y | V0 |
| 3ETH9 | Switch Th Ag High Temp. | N | N | Y | RA3ETH9 | Y | Y | Y | V0 |

041213

1/4

| | | | | | | | | | |
|-------------|------------------------------------|---|---|---|---------------------------|---|---|---|----|
| 3ETH9-XX.X | Switch Th Ag/High Temp. w/Actuator | N | N | Y | RA3ETH9-XX.X | Y | Y | Y | V0 |
| 3ETL9 | Switch Th Ag/Low Temp. | N | N | Y | RA3ETL9 | Y | Y | Y | V0 |
| 3ETL9-XX.X | Switch Th Ag/Low Temp. w/Actuator | N | N | Y | RA3ETL9-XX.X | Y | Y | Y | V0 |
| 3FSH9 | Switch Surface Ag/High Temp. | N | N | Y | RA3FSH9 | Y | Y | Y | V0 |
| 3FXXXG | All 3F Switches with Au | N | N | Y | RA3FXXXG | Y | Y | Y | V0 |
| 3FXXXQ | All 3F Quiet Switches | N | N | Y | RA3FXXXQ | Y | Y | Y | V0 |
| 3FSH9R | All 3F Switches delivered on Tape | N | N | Y | RA3FSH9R | Y | Y | Y | V0 |
| 3FTH9 | Switch Th Ag/High Temp. | N | N | Y | RA3FTH9 | Y | Y | Y | V0 |
| 3FTH9 w/LED | Switch Th High Temp w/ LED | N | N | Y | RA3FTH9 w/LED | Y | Y | Y | V0 |
| 3FTL6 | Switch Th Ag/Low Temp. | N | N | Y | RA3FTL6 | Y | Y | Y | V0 |
| 3FTL6 w/LED | Switch Th Ag/Low Temp w/LED | N | N | Y | RA3FTL6 w/LED | Y | Y | Y | V0 |
| 3FTL6-2SL | Switch Low Temp. 2 Straight Legs | N | N | Y | RA3FTL6-2SL | Y | Y | Y | V0 |
| 3FTL6RAS | Right Angle Switch Low Temp. | N | N | Y | RA3FTL6RAS | Y | Y | Y | V0 |
| 1CXXXX | Leds for 1C or 1H Button | N | N | N | RA1CXXXX | Y | Y | Y | |
| 2BXXXX | Leds for 2B Bezel | N | N | N | RA2BXXXX | Y | Y | Y | |
| 3FXXXXX | Leds Bent for 3F | N | N | N | RA3FXXXXX | Y | Y | Y | |
| 1AXX | DI Buttons all colours for 3A | Y | Y | N | No change, pls see note 1 | | | | HB |
| 1BXX | DI Buttons f. Bezels all colours | Y | Y | N | No change, pls see note 1 | | | | HB |
| 1CXXX | DI Buttons w/Lens all colours | Y | Y | N | No change, pls see note 1 | | | | HB |
| 1DXX | Lk Buttons all colours | Y | Y | N | No change, pls see note 1 | | | | HB |
| 1EXXX | Lk Buttons w/Lens all colours | Y | Y | N | No change, pls see note 1 | | | | HB |
| 1FXXX | Lk Buttons w/Lens all colours | Y | Y | N | No change, pls see note 1 | | | | HB |
| 1GA09 | Cap black 11 | Y | Y | Y | No change | | | | V0 |
| 1GC09 | Cap black 15 | Y | Y | Y | No change | | | | V0 |
| 1HXXX | DI Buttons w/Lens all colours | Y | Y | N | No change, pls see note 1 | | | | HB |
| 1KXX | Lk Lid all colours | Y | Y | N | No change, pls see note 1 | | | | HB |
| 1KXX16 | Lid all colours/Lens/Reflector | Y | Y | N | No change, pls see note 1 | | | | HB |

041213

2/4

| | | | | | | | | |
|------------|--------------------------------------|---|---|---|---------------------------|--|--|----|
| 1KXX1 | Lens Milky White For 1K Button | Y | Y | N | No change, pls see note 1 | | | HB |
| 1KXXX6 | Reflector For 1K Button White | Y | Y | N | No change, pls see note 1 | | | HB |
| 1MXX | DI Button Double Width all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1NXX | Teardrop Buttons all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1PXX | Gf Buttons all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1QXXX | 1P But. W/Square Hole, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1RXXX | 1P Button w/Round Hole, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1S09-XX.X | Lk Button Black, all heights | Y | Y | Y | No change | | | V0 |
| 1S11-XX.X | Lk Button Transparent, all heights | Y | Y | N | No change, pls see note 2 | | | V1 |
| 1TXX | Sq. Button, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1UXX | Round Button, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1VXX | Arrow Button, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1X XX | Rectangular Button, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1ZAXX | DL Button, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1ZBXX | Curved Button, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 1ZCXX | Round Button, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 3E-XX.X | Actuator f. 3E Switch, all heights | Y | Y | Y | No change | | | V0 |
| 3E-AXXXX | Varimec cap 5.2 Round, all heights | Y | Y | Y | No change | | | V0 |
| 3E-BXXXX | Varimec cap 5.2 Square, all heights | Y | Y | Y | No change | | | V0 |
| 3E-EXXXX | Varimec cap 7.8 Round, all heights | Y | Y | Y | No change | | | V0 |
| 3E-FXXXX | Varimec cap 7.8 Square, all heights | Y | Y | Y | No change | | | V0 |
| 3E-KXXXX | Varimec cap 11.6 Round, all heights | Y | Y | Y | No change | | | V0 |
| 3E-LXXXX | Varimec cap 11.6 Square, all heights | Y | Y | Y | No change | | | V0 |
| AQB01XX | Sealing Boot (incl. Sea.ring) | Y | Y | Y | No change | | | |
| AQB0111 | Sealing Boot Trans. (incl. Sea.ring) | Y | Y | Y | No change | | | |
| AQC09-XX.X | Cap Black, all overall heights | Y | Y | Y | No change | | | V0 |
| AQC11-XX.X | Cap Trans. all overall heights | Y | Y | N | No change, pls see note 2 | | | V1 |

| | | | | | | | | |
|------------|---------------------------------------|---|---|---|---------------------------|--|--|----|
| AQN-X.X | Bushing, all heights | Y | Y | Y | No change | | | |
| 1CXXX | Lens f. 1C/1H/1Q Buttons, all colours | Y | Y | N | No change, pls see note 2 | | | V1 |
| 1EXXX | Lens f. 1E Buttons, all colours | Y | Y | N | No change, pls see note 2 | | | V1 |
| 1FXXX | Lens f. 1F Buttons, all colours | Y | Y | N | No change, pls see note 2 | | | V1 |
| 1RXX1 | Round Transparent Lens For 1R | Y | Y | N | No change, pls see note 2 | | | V1 |
| 2AXX | DI Bezel, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 2BXXX | Bezel/Lens, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 2BXXX | Lens f. 2B Bezel, all colours | Y | Y | N | No change, pls see note 2 | | | V1 |
| 2KXX | Lk Bezel f. 1K, all colours | Y | Y | N | No change, pls see note 1 | | | HB |
| 2RAS | Right Angle Support. | Y | Y | Y | No change | | | |
| 2S09-XX.X | Extender, Black Pps, all heights | Y | Y | Y | No change | | | V0 |
| 1A09DXXXX | Button 1A Down/all legends | Y | Y | N | No change, pls see note 1 | | | HB |
| 1A09UXXX | Button 1A Up/all legends | Y | Y | N | No change, pls see note 1 | | | HB |
| 1B09DXXXX | Button 1b Down/0 | Y | Y | N | No change, pls see note 1 | | | HB |
| 1B09UXXX | Button 1B Up/all legends | Y | Y | N | No change, pls see note 1 | | | HB |
| 1D09XXX | Round Button/all legends | Y | Y | N | No change, pls see note 1 | | | HB |
| 1F096XXX | 1F Button/Inverse legends | Y | Y | N | No change, pls see note 1 | | | HB |
| 1ZB09DXXXX | Button 1ZB09 Down / all legends | Y | Y | N | No change, pls see note 1 | | | HB |
| 1ZC09XXX | Button 1ZC09 / all legends | Y | Y | N | No change, pls see note 1 | | | HB |

Note 1: Complies with RoHS, however plastic material limited to 65°C.
Accessories must be mounted after soldering.

Note 2: Complies with RoHS, however plastic material is limited to 85°C,
so excessive proces heat must be avoided.

041213

041213