

10 MILLION ACTUATIONS

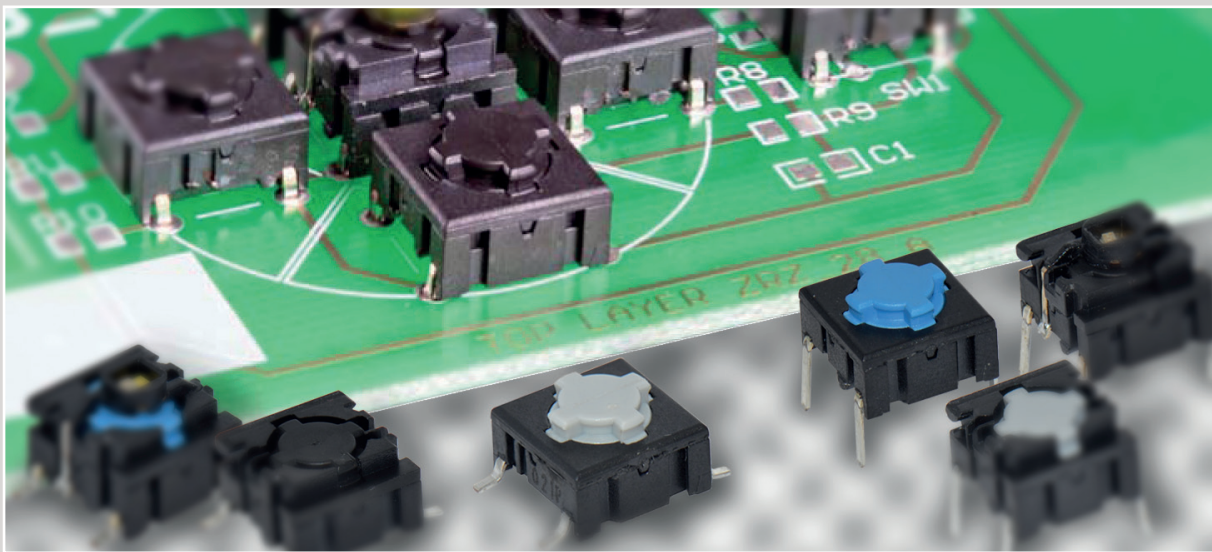
IP 67 SEALING

NORMALLY OPEN (NO) OR

NORMALLY CLOSED/NORMALLY OPEN (NC/NO)

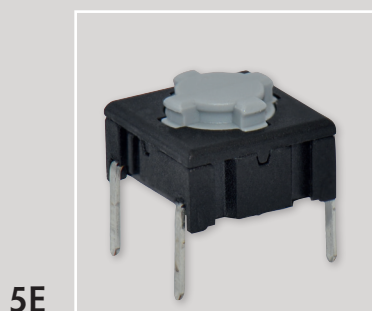
THROUGH-HOLE RIGHT ANGLE VERSION

QUIET CONTACT OPTION WITH 2.0N

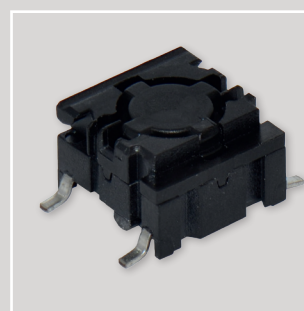


multimec® 5 series is the new generation of 3A, 3F, 4A and 4F switch. In principle the multimec® 5 series is very similar to the 3 series - it has the same pin layout, the same dimensions and the same electrical specifications.

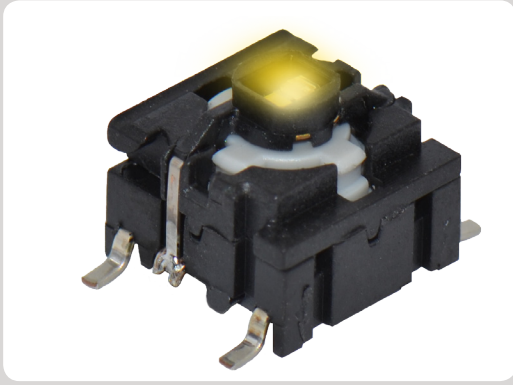
The four main updates are the cap retention system and actuator, three standard actuation forces, one temperature range and possibility of normally closed/normally open function.



5E



5G

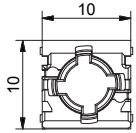
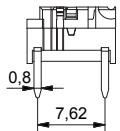
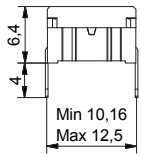


- Through-hole (TH) or surface mount (SMD)
- 50mA/24VDC
- Single pole/momentary
- 10,000,000 operations lifetime
- Temperature range:
 - Switch: -40/+160°C
 - LED: -40/+85°C
- IP 67 sealing
- Actuation force: 2.0N, 3.5N, 6.5N
- NO or NC/NO

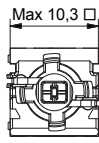
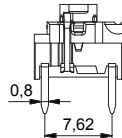
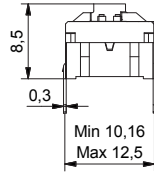
All dimensions in mm

THROUGH-HOLE (TH)

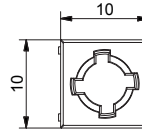
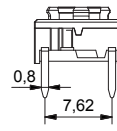
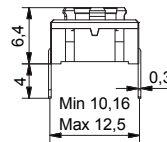
5G



5G illuminated

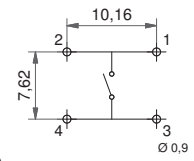


5E

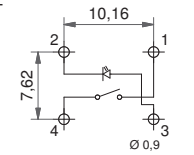


PCB LAYOUT

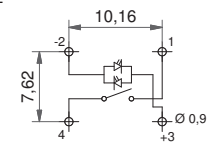
Non-illuminated



1 LED

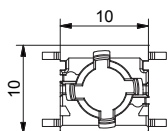
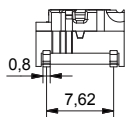
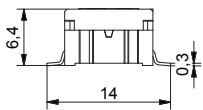


2 LED

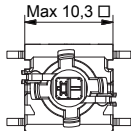
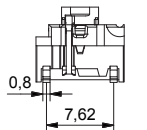
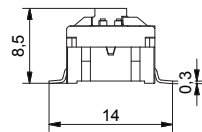


SURFACE MOUNT (SMD)

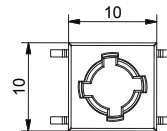
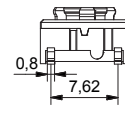
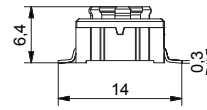
5G



5G illuminated

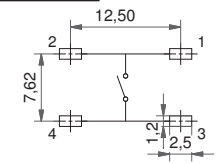


5E

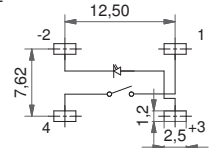


PCB LAYOUT

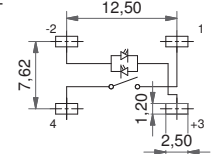
Non-illuminated



1 LED



2 LED

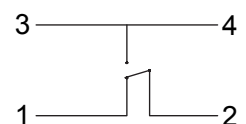


NORMALLY CLOSED/NORMALLY OPEN FUNCTION

NOT FOR SALE IN JAPAN

CIRCUIT DIAGRAM

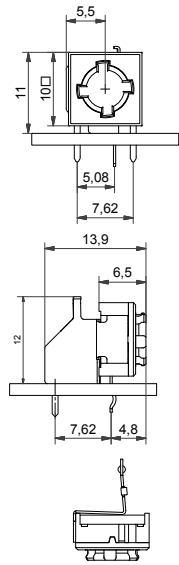
- Available for 5E and non-illuminated 5G in all standard actuation forces.
- Same PCB layout as the NO 5E and 5G
- Housing colour is **grey**



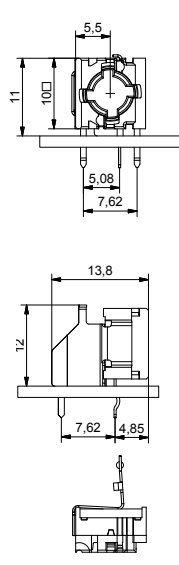
RIGHT ANGLE SWITCHES

PCB LAYOUT

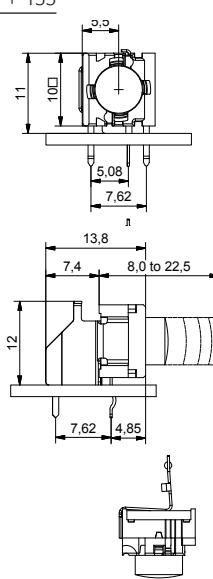
5E



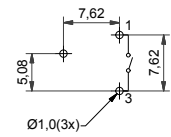
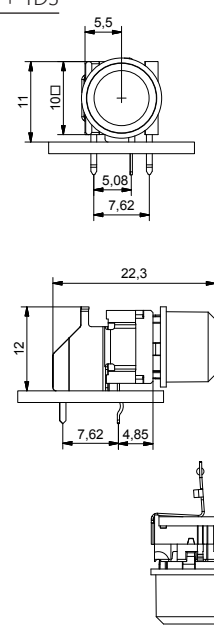
5G



5G + 1SS



5G + 1DS



multimec® 5 series has only normally open (NO) non-illuminated right angle switch.

ILLUMINATED – HOW TO ORDER

| Switch | Mounting | Actuation force | LED | Quiet (optional) |
|------------|--|--|--|--------------------------|
| 5 G | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> |
| | TH9 through-hole SH9 surface mount | 20 35 65 | 01 blue 22 green 42 yellow 61 white 82 red 2242 green/yellow 8222 red/green 8242 red/yellow | Q only for 2.0N |

NON-ILLUMINATED – HOW TO ORDER

| Switch | Mounting | Actuation force | RAS (optional) | or | NC/NO (optional) |
|------------|--|--|--|----|---|
| 5 E | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| | TH9 through-hole SH9 surface mount | 20 20Q 35 65 | RAS right angle switch | | NCNO normally closed/ normally open function |

| Switch | Mounting | Actuation force | RAS (optional) | or | NC/NO (optional) |
|------------|--|--|--|----|---|
| 5 G | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| | TH9 through-hole SH9 surface mount | 20 20Q 35 65 | RAS right angle switch | | NCNO normally closed/ normally open function |

Ordering example: 5ESH935 (non-illuminated), 5GTH9658222 (illuminated), 5GSH935NCNO (normally closed/normally open); 5ETH920RAS (right angle) 5ETH920Q or 5GSH92061Q (quiet versions)

Please see colour codes, updates of products and changes of specifications on www.mec.dk

RoHS Compatible

| | HIGH TEMPERATURE VERSIONS | | |
|---|--|--------------------|-------------------|
| | SILVER | GOLD | NC/NO |
| ELECTRICAL SPECIFICATIONS | | | |
| Contact resistance | <30m Ω - typ. 10m Ω | | |
| Insulation resistance | >10M Ω | | |
| Recommended load | 0.5-50mA 24VDC | 0.5μ-50mA 24VDC | |
| Contact bounce | <2mS - typically 0.5mS | | |
| MECHANICAL SPECIFICATIONS | | | |
| Standard actuation force (switch) | 2.0N, 3.5N, 6.5 N | | |
| Max. Actuation force without cap | 100N for 10 sec | | |
| Key travel (switch) | 1 mm | | |
| Life time (switch) | >10,000,000 cycles | | >1,000,000 cycles |
| TEMPERATURE RANGE | | | |
| Working temperature | Min -40°C Max +160°C | | |
| Storage temperature | Min -40°C Max +160°C | | |
| 5G with LED (working & storage temp) | Min -30°C Max +85°C | | |
| Soldering (through-hole switch) | IEC 68-2-20 8: | | |
| | 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. | | |
| SOLDERING (SMD) | JEDEC J-STD-020C | | |
| 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 - see usage guidelines | | |
| MATERIAL SPECIFICATIONS - SWITCHES | | | |
| Housing | PPS UL94V0 | | |
| Actuator | PPS UL94V0 | | |
| Sealing + spring | Silicone rubber | | |
| Contact spring | Stainless steel | | Stainless steel |
| | + 3μAg | | + 1μAu |
| Fixed contacts | SnCu + 2μNI + 3μAg | SnCu + 2μNI + 1μAu | |
| Terminals | SnCu + 2μNI + 3μSn100 | | |

Caps, Bezels & Legends – Material Specifications

| MATERIAL | PARTS | TEMP. LIMIT | UL RATING |
|------------------|---|-------------|-----------|
| ABS | 1A, 1B, 1C, 1DS, 1ES, 1FS, 1H, 1JS, 1KS, 1LS, 1M, 1NS, 1PS, 1QS, 1RS, 1TS, 1US, 1VS, 1WAS, 1WDS, 1WPS, 1XS, 1Z, 1ZA, 1ZB, 1ZCS, 1ZW, 2C, 2D, 2K, reflectors for 1KBS/1KCS and 1YS | Max. 65°C | UL94HB |
| Polycarbonate | All lenses (exc. frosted white) and transparent colour caps, lids for 1KBS/1KCS | Max. 85°C | UL94V1 |
| Polycarbonate | Frosted white (16) caps and lenses | Max. 85°C | UL94HB |
| PPS | 1GAS/1GCS | Max. 160°C | UL94V0 |
| Polyamide | 1SS, 2SS(the extender has no UL rating) | Max. 160°C | UL94V0 |
| Legends Adhesion | DS/EN ISO 2409 Class 1 & ASTM D3359 Class 4B | | |

LEDs specifications

5G switches

| Colour | | Blue | Green | Yellow | White | Red | High Intensity Green | |
|---|----------|---------------------|-------|--------|-------|------|----------------------|--|
| Colour Codes | | 01 | 22 | 42 | 61 | 82 | 29 | |
| ABSOLUTE MAXIMUM RATINGS (Ta=25°C) | | | | | | | | |
| Power | mW | 60 | 65 | 65 | 48 | 65 | 102.5 | |
| Current forward | mA | 20 | 25 | 25 | 15 | 25 | 25 | |
| Forward peak current | mA | 150 | 150 | 100 | 100 | 100 | 150 | |
| Voltage reverse | V | 5 | 12 | 12 | 5 | 12 | 5 | |
| Operating temperature | °C | -30/+85 | | | | | -40/+85 | |
| Storage temperature | °C | -30/+85 | | | | | -40/+85 | |
| Soldering temperature | °C | 245 for max. 10 sec | | | | | | |
| ELECTRICAL-OPTICAL CHARACTERISTICS (Ta=25°C) | | | | | | | | |
| Voltage forward | Typ. V | 3.35 | 2.2 | 2 | 3.05 | 2 | 3.3 | |
| | Max. V | 3.5 | 2.5 | 2.5 | 3.2 | 2.5 | 4.1 | |
| Current reverse (VR=5V) | µA | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 50 | |
| Wave length | nm | 470 | 570 | 588 | NA | 633 | 525 | |
| Spread | Δnm | NA | 30 | 16 | NA | 16 | 30 | |
| Spread angle | degree | 145 | 160 | 160 | 150 | 160 | 60 | |
| Luminous Intensity | Min. mcd | 30 | 28 | 112 | 71 | 112 | 500 | |
| | Typ. mcd | 35 | 70 | 150 | 224* | 150 | 1000 | |
| Optical intensity | Lm/w | 4 | 2.5 | | | | NA | |

*Max.mcd

3F switches

3FXXX (for 1E-1F-1N-1Q-1R-1S-1X)

3FXXX (for 1K-1T-1U-1V-1W-1WD)

| Colour | | B | G | Y | W | R | G/Y | R/G | R/Y | G | Y | R | | |
|---|--|-------------------|------|------|----------|------|-------------------|---------|---------|-------------------|---------|-------------------|----------|--|
| Colour Codes | | 00 | 20 | 40 | 65 | 80 | 2040 | 8020 | 8040 | 24 | 46 | 87 | | |
| Absolute Maximum Ratings | (Ta=25°C) | | | | | | | | | | | | | |
| Power | mW | 105 | 70 | 60 | 120 | 60 | 120 | 100 | 120 | 60 | 60 | 120 | | |
| Current forward | mA | 30 | 20 | 20 | 25 | 20 | 25 | 30 | 25 | 25 | 25 | 50 | | |
| Forward peak current | mA | 200 | 60** | 60** | 100 | 60** | 150 | 120 | 150 | 60 | 60 | 200 | | |
| Voltage reverse | V | 5 | 3 | 3 | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | | |
| Operating temperature | °C | -25/+85 | | | -40/+85 | | -25/+85 | | -40/+85 | | -40/+85 | | -40/+85 | |
| Storage temperature | °C | -30/+100 | | | -40/+100 | | -30/+100 | | -40/+85 | | -40/+85 | | -40/+100 | |
| Soldering temperature | °C | 260 for max 5 sec | | | | | 260 for max 2 sec | | | 300 for max 3 sec | | 260 for max 5 sec | | |
| Electrical-Optical Characteristics (Ta=25°C) | | | | | | | | | | | | | | |
| Voltage forward | Typ. V | 2.1 | 2.1 | 2.1 | 3.8 | 2.0 | 2.1 | 2.0 | 2.1 | 2.0* | 2.0 | 2.0*** | | |
| | Max. V | 2.8 | 3.0 | 3.0 | 4.3 | 3.0 | 2.8 | 2.6 | 2.8 | 2.4* | 2.4 | 2.4*** | | |
| Current reverse (VR=5V) | µA | 2 | 10 | 10 | 50 | 10 | 2 | 2 | 2 | 10 | 10 | 10 | | |
| Wave length | nm | 460 | 563 | 585 | NA | 650 | 565/590 | 630/565 | 625/590 | 570 | 589 | 624/632 | | |
| Spread | Δnm | 40 | 40 | 40 | NA | 40 | 35 | 35 | 35 | 10 | NA | 20 | | |
| Spread angle | degree | 20 | 45 | 45 | 25 | 45 | 60 | 200 | 60 | 100 | 40 | 40 | | |
| Luminous Intensity | Min. mcd | 20 | 9.0 | 5.6 | 630 | 5.6 | 8 | 2.2 | 8 | 70**** | 630 | 400**** | | |
| | Typ. mcd | 25 | 25 | 16 | 1000 | 16 | 25 | 4.8 | 25 | 20**** | 1250 | 800**** | | |
| Orientation | The longer pin is the anode, the shorter is the cathode. For bicolour LEDs the anode for the first colour (ex. 2080) is the longer pin. | | | | | | | | | | | | | |

Pulse width 1ms Duty cycle 1:5, */F =50mA, **** Luminous Flux mlm

B=Blue, G=Green, Y=Yellow, R=Red, W=White

Specifications are subject to change without notice.

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

Tape & Reel

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

| | | | |
|----------------|----------|-------------------------|----------------------|
| Reel diameter: | Ø330mm | Tape and reel material: | antistatic or better |
| Tape width: | 24mm | Quantity per reel: | see list |
| Pitch: | see list | | |

3C/3E/5E/5G multimec® tape & reel

| Part No. | Ordering Code | Pitch | Quantity per reel |
|---|--------------------|-------|-------------------|
| 3CSH9 | 3CSH9R | 16 | 500 |
| 3ESH9 | 3ESH9R | 16 | 500 |
| 5ESH9XX | 5ESH9XXR | 16 | 500 |
| 5GSH9XX | 5GSH9XXR | 16 | 500 |
| 5XSH9XX1SSXX-08.0 | 5XSH9XXR1SSXX-08.0 | 20 | 250 |
| 5XSH9XX1SSXX-09.5 | 5XSH9XXR1SSXX-09.5 | 20 | 250 |
| 5XSH9XX1SSXX-10.4 | 5XSH9XXR1SSXX-10.4 | 20 | 250 |
| 5XSH9XX1SSXX-11.0 | 5XSH9XXR1SSXX-11.0 | 20 | 250 |
| 5XSH9XX1SSXX-12.0 | 5XSH9XXR1SSXX-12.0 | 20 | 250 |
| All varimec h <12.5; add R after part no. | | | 20 |

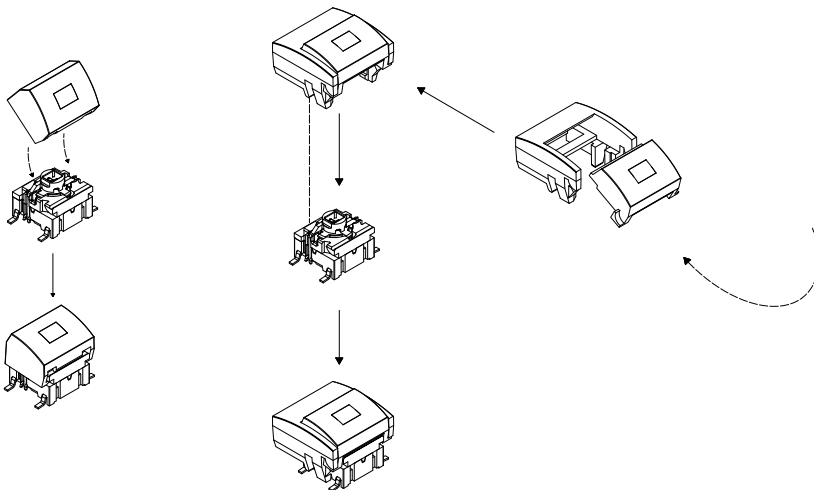
illuminated 5G multimec® tape & reel

| Part No. | Ordering Code | Pitch | Quantity per reel |
|-------------|---------------|-------|-------------------|
| 5GSH9XX01 | 5GSH9XX01R | 20 | 250 |
| 5GSH9XX22 | 5GSH9XX22R | 20 | 250 |
| 5GSH9XX42 | 5GSH9XX42R | 20 | 250 |
| 5GSH9XX61 | 5GSH9XX61R | 20 | 250 |
| 5GSH9XX82 | 5GSH9XX82R | 20 | 250 |
| 5GSH9XX2242 | 5GSH9XX2242R | 20 | 250 |
| 5GSH9XX8222 | 5GSH9XX8222R | 20 | 250 |
| 5GSH9XX8242 | 5GSH9XX8242R | 20 | 250 |

How to assemble

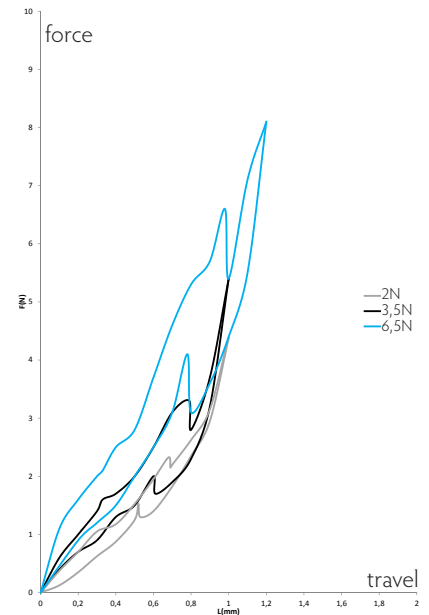
multimec®
5GS+1A/H

multimec®
5GS+1B/C+2C/D

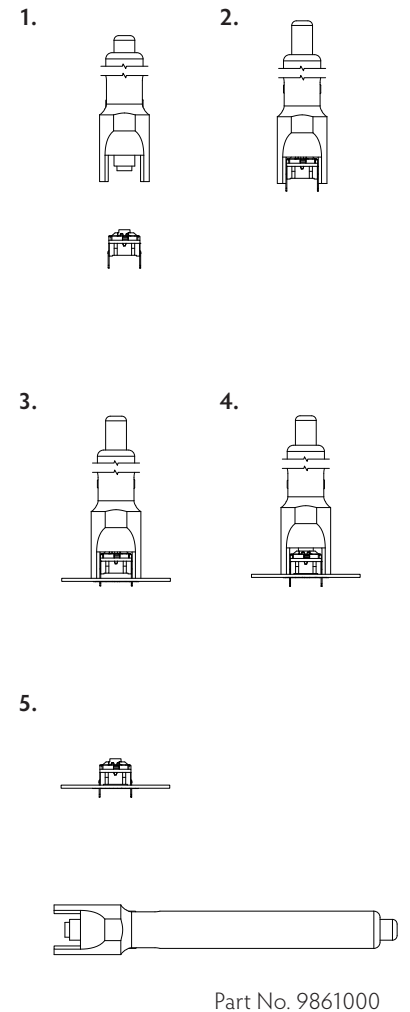


Operating force

(typical example)

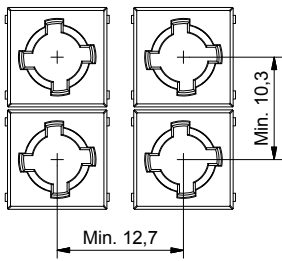


Mounting tool for multimec® through-hole switches

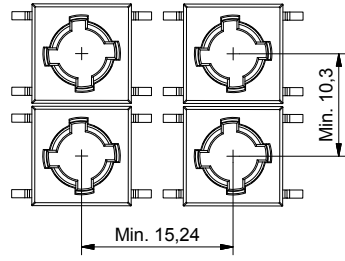


Basic switch spacing

through-hole (TH)

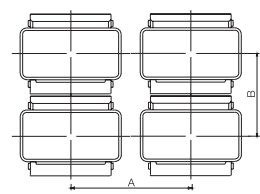


surface mount (SMD)



Recommended switch/cap spacing

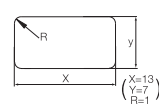
Switch spacing



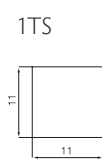
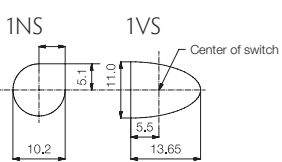
Cap dimensions



Panel cut-out

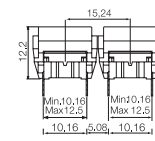


Panel cut-out

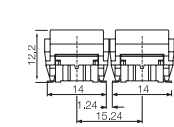


Spacing examples

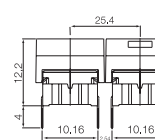
multimec
5GT+1B/C+2C/D



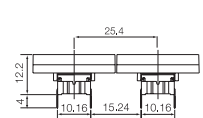
multimec
5GS+1B/C+2C/D



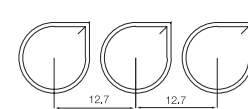
multimec
5GT + 1A/H



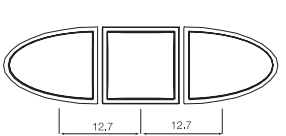
multimec
5GT + 1M



multimec
1NS + 1NS + 1NS



multimec
1VS + 1TS+ 1VS



| Cap series | Recommended min. switch spacing AxB | Nominal cap dimension WxH | Recommended min. panel cut-out |
|---------------|--|------------------------------|-----------------------------------|
| 1A/1H | 12.7x10.16 | 12.6x10.1 | 13.0x10.5 |
| 1B/1C+2C/2D | 15.24x15.24 | 15.1x15.1 | 15.5x15.5 |
| 1DS/1ES/1FS | 12.7x12.7 | ø9.6 | ø10.0 |
| 1GAS | 12.7x11.14 | ø11 | ø11.4 |
| 1GCS | 15.14x15.14 | ø15 | ø15.4 |
| 1JS | 12.7x12.7 | ø9.6 | ø10.4 |
| 1KS/1KBS/1KCS | 15.24x15.24 | 14.3x14.3 | 14.7x14.7 |
| 1M | 25.4x10.16 | 25.0x10. | 25.7x10.5 |
| 1NS | 12.7x12.7 | ø9.8/□4.9 | ø10.2/□5.1 |
| 1PS/1QS/1RS | 15.24x10.16 | 6.5x12.5 | 7.0x13.0, R max. 1.0 |
| 1SS/1IS/1LS | 12.7x12.7 | ø6.5 | ø7.0 |
| 1TS | 12.7x12.7 | 10.6x10.6 | 11.0x11.0 |
| 1US | 12.7x12.7 | ø10.6 | ø11.0 |
| 1VS | 12.7x12.7 | 10.6x13.25 | 11.0x13.65 |
| 1WAS/1WPS | 12.7x10.3 | 12.5x6.5 | 12.9x6.9 |
| 1WDS | 15.34x10.3 | 15.2x8.0 | 15.6x8.4 |
| 1XS | 12.7x12.7 | 9.4x7.4 | 9.8x7.9 |
| 1YS | 17x17 | 15x15 | 16x16 |
| 1ZA | 18.84x10.3 | 18.7x10.1 | 19.4x10.5 |
| 1ZB | 24.34x12.1 | R1=7.4; R2=17.5 90° | R1=7.1; R2=17.5-17.75 90° |
| 1ZCS | 14.44x14.44 | ø14.3 | ø14.7 |
| 1Z/1ZW | 35.5x35.5; 41.6x41.6 | ø29.5 | ø30.3 |
| 10R/10RF/10RM | 40.5x40.5 | ø30.0 | ø30.6 |
| 10Q/10QM | 32.5x32.5 | 22x22 | 22.5x2.5 |

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