

10 MILLION ACTUATIONS

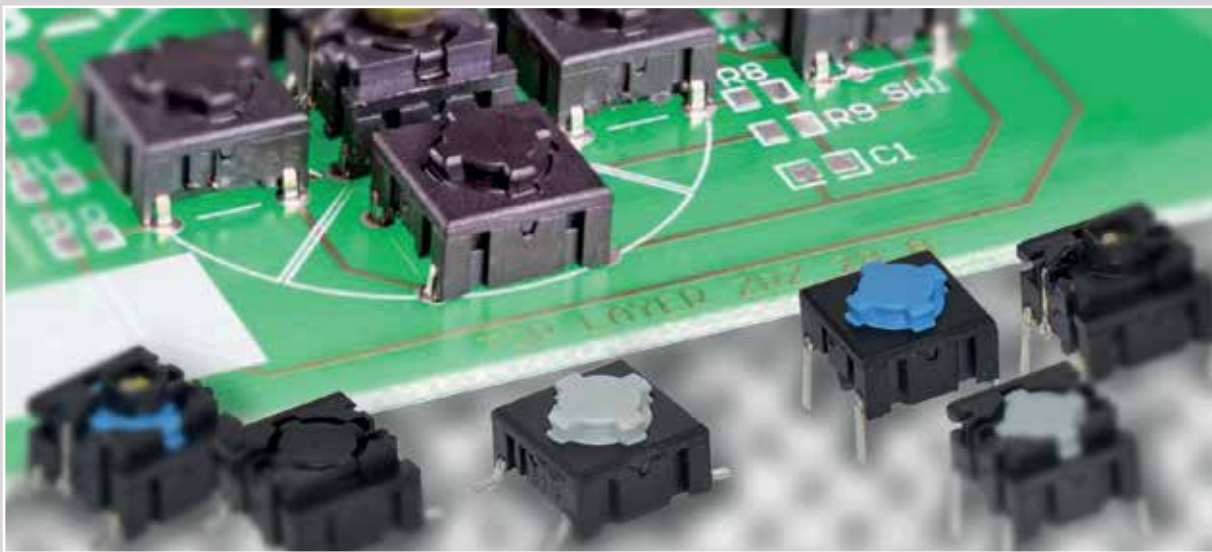
IP 67 SEALING

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



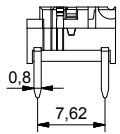
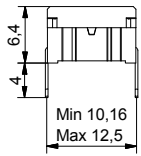
- Through-hole (TH) or surface mount (SMD)
- 50mA/24VDC
- Single pole/momentary
- 10,000,000 operations lifetime (NO function)
- Temperature range:
  - Switch: -40/+160°C
  - LED: -40/+85°C
- IP 67 sealing
- Actuation force: 2.0N, 3.5N, 6.5N
- NO or NC/NO

All dimensions in mm

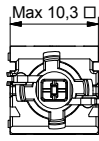
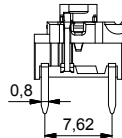
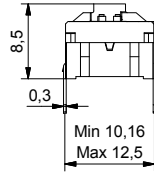
Tolerances +/-0.2mm

### THROUGH-HOLE (TH)

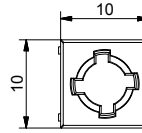
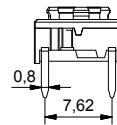
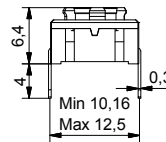
5G



5G illuminated

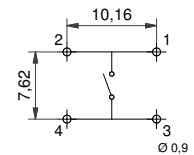


5E

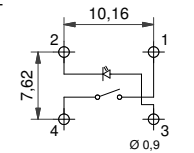


### PCB LAYOUT

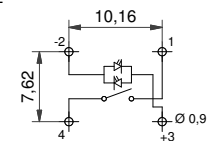
Non-illuminated



1 LED

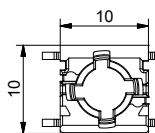
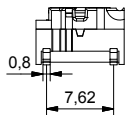
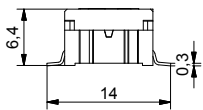


2 LED

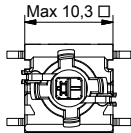
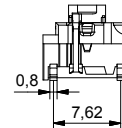
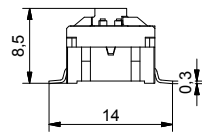


### SURFACE MOUNT (SMD)

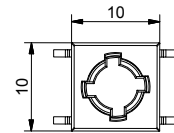
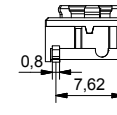
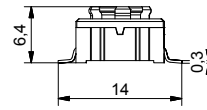
5G



5G illuminated

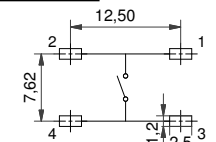


5E

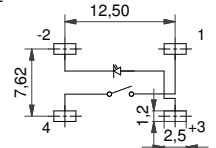


### PCB LAYOUT

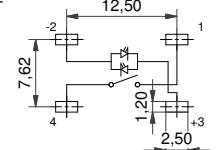
Non-illuminated



1 LED



2 LED



### NORMALLY CLOSED/NORMALLY OPEN FUNCTION

### NOT FOR SALE IN JAPAN

### CIRCUIT DIAGRAM

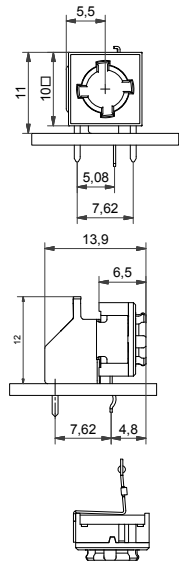
- Available for 5E and non-illuminated 5G in 3.5N actuation force.
- Same PCB layout as the NO 5E and 5G
- Housing colour is **grey**



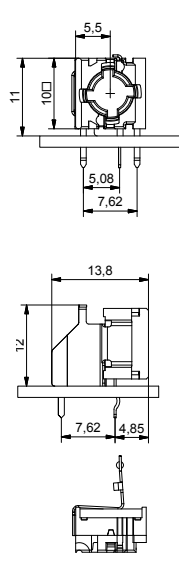
### RIGHT ANGLE SWITCHES

### PCB LAYOUT

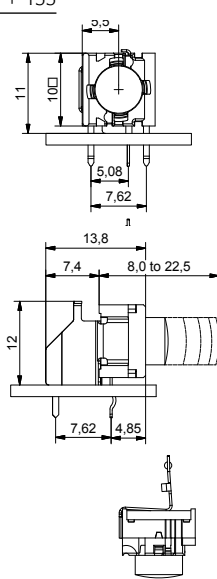
5E



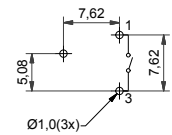
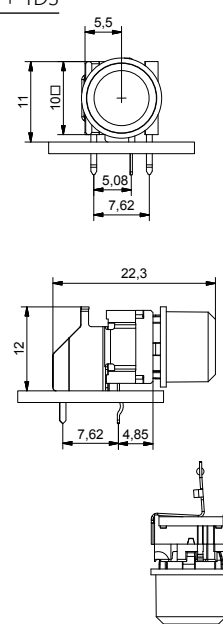
5G



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)
<b>5 G</b>	<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"/>
	<b>TH9</b> through-hole <b>SH9</b> surface mount	<b>20</b> <b>35</b> <b>65</b>	<b>01</b> blue <b>22</b> green <b>42</b> yellow <b>61</b> white <b>82</b> red <b>2242</b> green/yellow <b>8222</b> red/green <b>8242</b> red/yellow	<b>Q</b> only for 2.0N

### NON-ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	RAS (optional)	or	NC/NO (only for 3.5N)
<b>5 E</b>	<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"/>
	<b>TH9</b> through-hole <b>SH9</b> surface mount	<b>20</b> <b>20Q</b> <b>35</b> <b>65</b>	<b>RAS</b> right angle switch		<b>NCNO</b> normally closed/ normally open function

Switch	Mounting	Actuation force	RAS (optional)	or	NC/NO (only for 3.5N)
<b>5 G</b>	<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"/>
	<b>TH9</b> through-hole <b>SH9</b> surface mount	<b>20</b> <b>20Q</b> <b>35</b> <b>65</b>	<b>RAS</b> right angle switch		<b>NCNO</b> 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](http://www.mec.dk)

## RoHS Compatible

	HIGH TEMPERATURE VERSIONS		
	SILVER	GOLD	NC/NO
<b>ELECTRICAL SPECIFICATIONS</b>			
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		
<b>MECHANICAL SPECIFICATIONS</b>			
Standard actuation force (switch)	2.0N, 3.5N, 6.5 N		3.5N
Max. Actuation force without cap	115N for 60 sec	(according to MIL-PRF-22885H)	100N for 10 sec
Key travel (switch)	1 mm		
Life time (switch)	>10,000,000 cycles		>1,000,000 cycles
<b>TEMPERATURE RANGE</b>			
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.		
<b>SOLDERING (SMD)</b>	JEDEC J-STD-020C		
<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 - see usage guidelines		
<b>MATERIAL SPECIFICATIONS - SWITCHES</b>			
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 and transparent colour caps, lids for 1KBS/1KCS	Max. 85°C	UL94HB
Polyamide	1GAS/1GCS, 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	
<b>ABSOLUTE MAXIMUM RATINGS (Ta=25°C)</b>								
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						
<b>ELECTRICAL-OPTICAL CHARACTERISTICS (Ta=25°C)</b>								
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	
<b>Luminous Intensity</b>	Min. mcd	28.5	28	112	71	112	500	
	Typ. mcd	72*	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		
<b>Absolute Maximum Ratings</b>	(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	
<b>Electrical-Optical Characteristics (Ta=25°C)</b>														
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		
<b>Luminous Intensity</b>	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](http://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<sup>®</sup> 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.			20 250

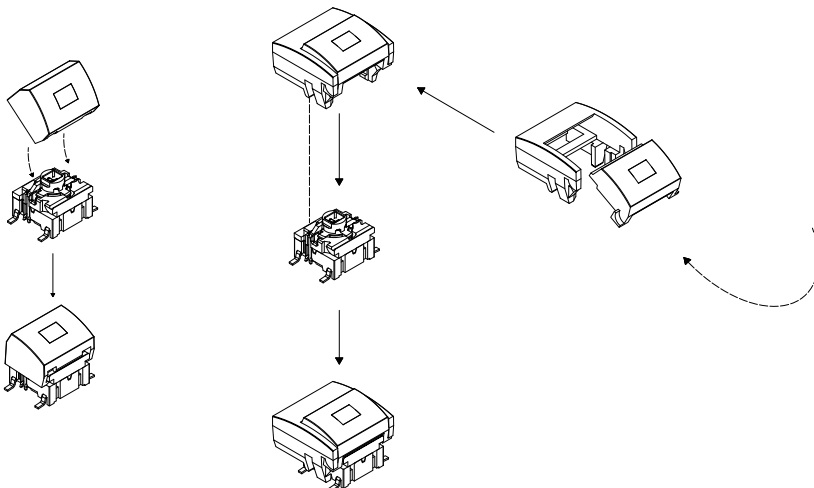
### illuminated 5G multimec<sup>®</sup> tape & reel

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

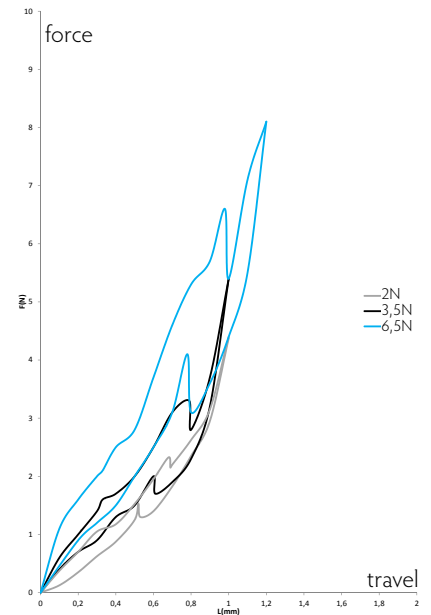
## How to assemble

multimec<sup>®</sup>  
5GS+1A/H

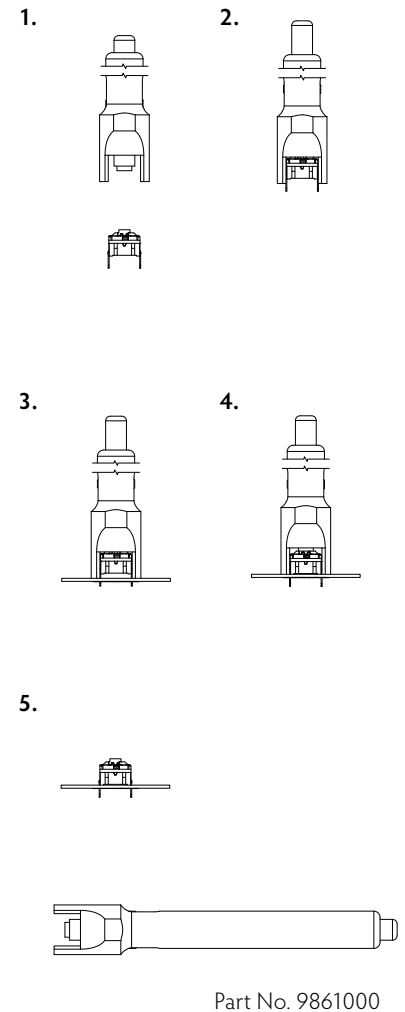
multimec<sup>®</sup>  
5GS+1B/C+2C/D



## Operating force (typical example)

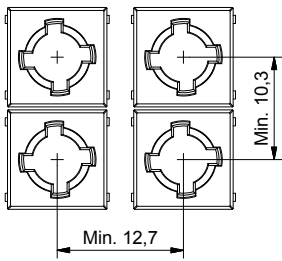


## Mounting tool for multimec<sup>®</sup> through-hole switches

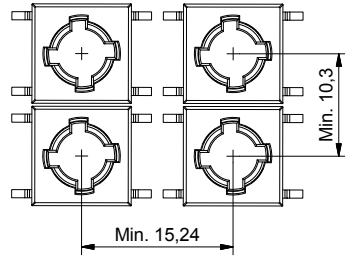


## Basic switch spacing

through-hole (TH)

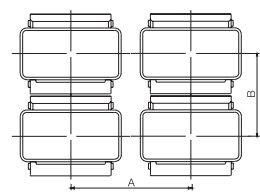


surface mount (SMD)

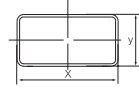


## Recommended switch/cap spacing

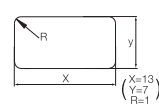
Switch spacing



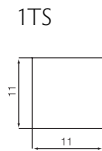
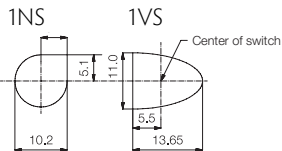
Cap dimensions



Panel cut-out

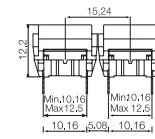


Panel cut-out

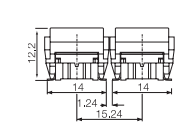


## Spacing examples

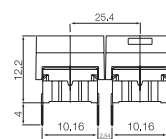
multimec  
5GT+1B/C+2C/D



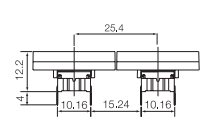
multimec  
5GS+1B/C+2C/D



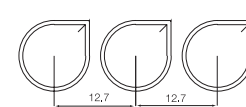
multimec  
5GT + 1A/H



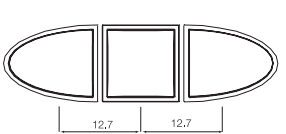
multimec  
5GT + 1M



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