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Foilmec™ 1YS/1YAS

Square cap • for under overlay • illuminated





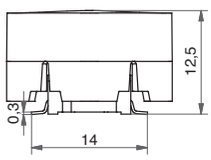
DISTINCTIVE FEATURES

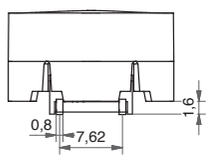
Square cap 15.0 x 15.0 mm
h=12.5 mm
Round corners, flat surface
With or without spot indicator illumination
Illumination with LEDs on PCB

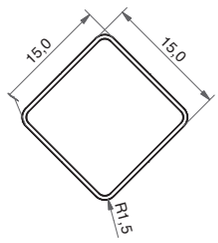
SWITCH SPECIFICATIONS : see Multimec™ 5 series.

5E+1YS - TH



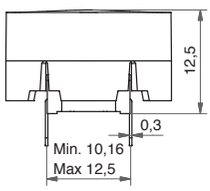


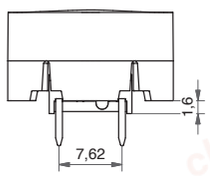


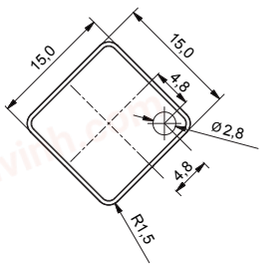


5E+1YAS - SMD









The company reserves the right to change specifications without notice. All tolerance if not otherwise specified ±0.2mm.

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Foilmec™ 1YS/1YAS

Square cap • for under overlay • illuminated

BUILD YOUR PART NUMBER

ILLUMINATED

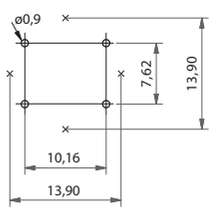
5E	____	____	____	____
SERIES	MOUNTING	ACTUATION FORCE	CAP	COLOR
	TH9 through-hole SH9 surface mount	20 2.0N 35 3.5N 65 6.5N	1YS 1YAS	0616 white cap with frosted white lens

NOTICE : Other versions : Please refer to www.apem.com for information on the 3E series version - 1Y/1YA

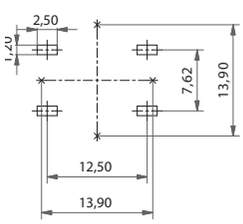
MOUNTING

- Panel cut-out : min. 16.0 x 16.0 mm
- Switch spacing AxB : min. 15.3 x 15.3 mm

PCB LAYOUT WITH LED PLACEMENT



5E+1YS/1YAS - TH



5E+1YS/1YAS - SMD

MATERIALS

- Cap : ABS UL94HB
- Lens : polycarbonate UL94HB

Legends

Available for Multimec caps

STANDARD LEGENDS

STANDARD LEGENDS										
LEGEND	1DS09_	1FS096R_	1ZB09D_ 1ZB16DLMH_	1ZCS_	1Z_ 1ZW_	10A_	10C_	10D_	10Q_ 10QM16_	10R_ & 10RF_ 10RM16_
0	000	000								
1	001	001								
2	002	002								
3	003	003								
4	004	004								
5	005	005								
6	006	006								
7	007	007								
8	008	008								
9	009	009								
#	107	107								
*	019	019								
←	033									
→	133									
↑	034									
↓	134									
↵	135	135								
+						054			054	054
-						059			059	059
▲			136		136	136				
⏻	123	123		123*	123		123	**123**	123	123
ON/OFF									017	017
STOP									018	018
START									031	031
RESET				038					038	038
CANCEL									048	048
ENTER									105	105
ESC				051						
ON						116				
OFF						117				
OK				118*	118		118	**118**	118	118
SET				119						
MENU				120						
FUNC				121						
HOME				122						

STANDARD OPTIONS

- 1DS: pad printed
- 1FS: reverse printed
- 1ZB: pad printed / laser marked
- 1ZCS: pad printed / *reverse printed / *laser marked
- 1Z & 1ZW: pad printed / laser marked
- 10A: pad printed / laser marked
- 10C: pad printed / laser marked
- 10D: UV printed / laser marked
- 10R(F) & 10Q: pad printed / reverse printed
- 10RM & 10QM: metal symbol

Legends

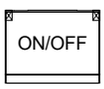
Available for Multimec caps

HOW TO ORDER

POSITIONING OF LEGENDS ON ROCKER-ACTION CAPS

When ordering legends for caps with hinge-type cap retention system, it is important to note the position of the cap. An extra letter (U, D, R or L) needs to be added to the part number to refer to the position of the hinges in relation to the legend. See samples:

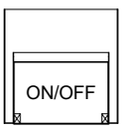
Rocker-action caps without a lens: 1A, 1B, 1M, 1ZA and 1ZB



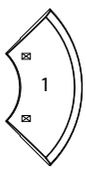
UP
1A09U01706



RIGHT
1ZB16RLMH11809



DOWN
1B09D01706

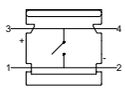


LEFT
1ZB09L00106

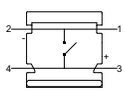
LEGEND ILLUMINATION

- **Option 1 - laser marked**: In case of laser marked legends an “LM” is added after the cap colour, before the legend code. We recommend using hard paint (additional “H”) for increased lifetime of the paint. E.g. 1ZB16DLMH13609
- **Option 2 - reverse printed**: In case of reverse printed caps an “R” is added after the cap colour, before the legend code. Especially relevant when standard legends have both negative and positive print options. E.g. 1FS096R00009
- **Option 3 - metal symbol:** Only available for 10RM and 10QM (therefore the “M”). E.g. 10RM16059

ORIENTATION OF THE SWITCH



UP



DOWN

STANDARD AND CUSTOM LEGENDS

- Standard are only certain legends on certain caps. See the table on the previous page.
- All standard pad-printed legends are white on black caps.
- All standard reverse-printed and laser marked legends are black on frosted white cap.

STANDARD LEGENDS

CAP	CAP COLOR	DIRECTION*	TYPE*	LEGEND	LEGEND COLOR*
1DS	00 Blue	D Down	UV UV printed	001 1	00 Blue
1FS	02 Green	U Up	LM Laser marked on soft paint	002 2	02 Green
...	03 Grey	R Right	LMH Laser marked on hard paint	003 3	03 Grey
	04 Yellow	L Left	R Reverse printed	... etc	04 Yellow
	06 White	*Only for hinge-type caps	*In case of illumination		06 White
	08 Red				08 Red
	09 Black				09 Black
	16 Frosted white				... Etc
	... Etc				*In case of reverse printed and laser marked legends the colour of the paint

Notice: The size of the legends listed may not correspond to the actual size.

If you decide to use one of the standard legends without any adjustments (without a new cliché or programming) on another cap than designated in the table, then there is no cliché or programming cost, for this to apply the cap has to be black and the print white.

For further information on legends please contact your local distributor or MEC.

Solid colors

Available for Multimec™ caps

	Colour / RAL Code	Blue / 5012	green / 6018	Grey / 7004	Yellow / 1023	White / 9010	Red / 3000	Black / 9004	Ultra blue / 5002	Mint green / 6029	Tele grey / 7046	Melon / 1028	Signal white / 9003	Noble red / 3002	Dusty blue / 5014	Aqua blue / 5021	Metal dark blue / No ral code	Metal light grey / No ral code	Metal dark grey / No ral code	Metal bordeaux / No ral code
CAP	CODE	00	02	03	04	06	08	09	30	32	33	34	36	38	40	42	50	53	57	58
1A		•	•	•	•	•	•	•												
1B		•	•	•	•	•	•	•												
1DS		•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•
1ES/1FS				•			•	•												
1GAS/1GCS		•	•	•	•	•	•	•												
1H				•				•												
1JS		•	•	•	•	•	•	•												
1KS		•	•	•	•	•	•	•												
1LS								•												
1M			•	•			•	•												
1NS				•				•												
1PS		•	•	•	•	•	•	•												
1QS		•		•				•												
1RS				•																
1SS		•	•	•	•	•	•	•												
1TS/1US/1VS		•		•			•	•												
1WAS/ 1WDS/1WPS				•				•												
1XS				•		•		•												
1ZA				•		•		•	•						•	•	•	•	•	•
1ZB				•		•		•	•						•	•	•	•	•	•
1ZCS				•		•	•	•	•						•	•	•	•	•	•
1Z/1ZW				•		•		•												
10A				•			•	•												
10C		•		•			•	•					•							
10D				•		•		•												
10R/10RF + 10Q		•	•	•	•	•	•	•												

The RAL Codes mentioned are the codes nearest to the solid colors in the multimec™ range.

Cap & Bezel Specifications

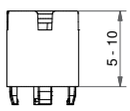
Multimec™ caps

ACCERSSORY SPECIFICATIONS			
MATERIAL	PARTS	TEMP. LIMIT	UL RATING
ABS	Solid color 1A, 1B, 1DS, 1ES, 1FS, 1H, 1JS, 1KS, 1LS, 1M, 1NS, 1PS, 1QS, 1RS, 1TS, 1US, 1VS, 1WAS, 1WDS, 1WPS, 1XS, 1Z, 1ZA, 1ZB, 1ZCS, 1ZW, 10A, 10C, 10Q, 10R, 10RF and AQCS Bezels 2C, 2D and 2K, reflectors for 1KBS, 1KCS, 1YS and 1YAS	Max 65 °C Max 149 °F	UL94HB
Polycarbonate	All lenses and transparent colour caps, lids for 1KBS & 1KCS	Max 85 °C Max 185 °F	UL94HB
Polyamide	1GAS, 1GCS, 1SS and 2SS	Max 160 °C Max 320 °F	UL94V2
Legends adhesion	DS/EN ISO 2409 Class 1 & ASTM D3359 Class 4B		

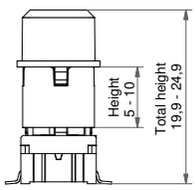
EXTENDERS



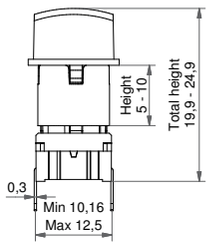
5 mm, 6 mm,
7 mm , 8 mm,
9 mm, 10 mm



2SS

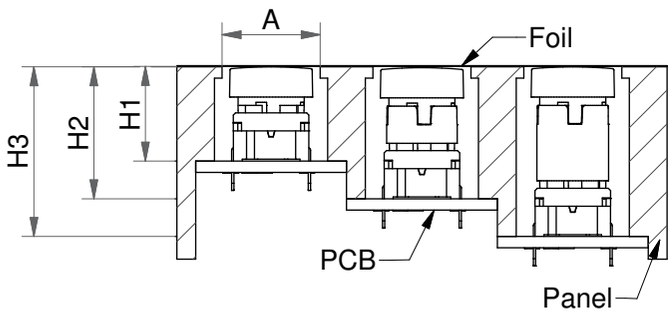


SMD + 2SS+1DS



TH+2SS+1TS

HOW TO USE 1GAS/1GCS + 2SS UNDER FOIL



- A=We recommend space for travel of the foil and leave the area free from adhesive.
- H=We recommend you to calculate this dimension from the top of the PCB to the inner top of the panel.

2SS CAN BE USED WITH ALL 5G-TYPE SNAP-ON CAPS

All 2SS extenders are stackable giving the possibility to match most overall heights.

CAP SERIES	ORIGINAL HEIGHT (H1)	HEIGHT WITH A SINGLE EXTENDER (H2;H3)
1DS/1ES/1FS	14.9	19.9-24.9
1GAS/1GCS	12.5	17.5-22.5
1KS/1KBS/1KCS	19.1 ; 20.2 ; 20.1	24.1; 25.2; 25.1-29.1; 30.2; 30.1
1NS	14.9	19.9-24.9
1TS/1US/1VS	14.9	19.9-24.9
1WAS/1WDS/1WPS	15.7	20.7-25.7
1XS	18.5	23.5-28.5
1ZCS	11.7	16.7-21.7
10C	13.7	18.7-23.7
10D	12.0	17.0-22.0

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Cap & Bezel Specifications

Multimec™ caps

HOW TO ORDER

EXTENDERS

SWITCH	MOUNTING	ACTUATION FORCE	LED (OPTIONAL)		CAP	EXTENDER 2SS HEIGHT
5G	TH9 Through-hole	20	02	blue	See the table on the previous page	05
	SH9 Surface mount	35	22	green		06
		65	42	yellow		07
			61	white		08
			82	red		09
			2242	green/yellow		10
			8222	red/green		
			8242	red/yellow		

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MEC-MULTIMEC5E-2108

Multimec™ 5E

High performance tactile switches • MIL-PRF-28855H



DISTINCTIVE FEATURES

Momentary switches with NO or NC/NO function
Sealed to IP67
Robust
Anti-rotation thanks to snap-on cap retetion system
3 standard actuation forces: 2.0, 3.5 and 6.5 N



ENVIRONMENTAL SPECIFICATIONS

- Sealing : IP67 according to IEC 60529
- Working and storage temperature : -40 °C/+160 °C (-40 °F to +320 °F)
- Soldering :
  - through-hole : IEC 60068-2-20 8
  - surface mount : JEDEC J-STD-020E

ELECTRICAL SPECIFICATIONS

- Recommended load :
  - Gold contacts : 0.5µ-50 mA 24 VDC
  - Silver contacts : 0.5-50 mA 24 VDC
- Contact resistance : <30 mΩ - typically 10 mΩ
- Insulation resistance : >10 MΩ
- Contact bounce : <2 mS - typically 0.5 mS

MECHANICAL SPECIFICATIONS

- Standard actuation force :
  - momentary NO : 2.0 N, 3.5 N, 6.5 N
  - quiet version : 2.0 N
  - NC/NO function : 3.5 N
- Max. actuation force :
  - momentary : 115 N for 60 sec (according to MIL-PRF-22885H)
  - NC/NO : 100 N for 10 sec
- Travel : 1 mm
- Lifetime :
  - NO : >10,000,000 cycles
  - NC/NO : >1,000,000 cycles

The company reserves the right to change specifications without notice.

MATERIALS

- Housing : PPS UL94V0
- Actuator : PPS UL94V0
- Sealing : Silicone rubber
- Contacts spring : Stainless steel
  Silver : +3 µAg
  Gold : +1 µAu
- Fixed contacts :
  Silver : SnCu + 2 µNI + 3 µAg
  Gold : SnCu + 2 µNI + 1 µAu
- Terminals : SnCu + 2 µNI + 3 µSn100

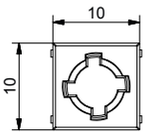
All tolerance if not otherwise specified ±0.2 mm.

Multimec™ 5E

High performance tactile switches •
MIL-PRF-28855H

5E

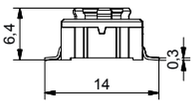


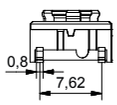


- SMD, TH or right angle TH
- NO or NC/NO

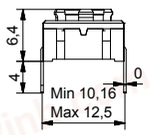
All tolerances unless otherwise noted : ± 0.2 mm

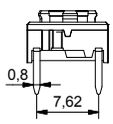
SMD



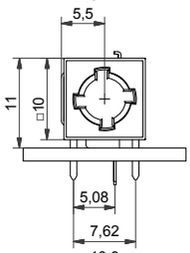


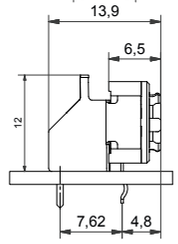
TH





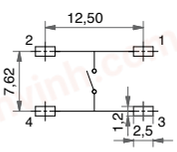
RAS



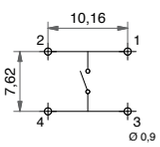


PCB LAYOUT & CIRCUIT DIAGRAM

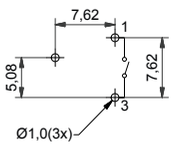
SMD



TH

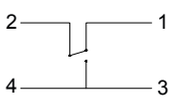


RAS



NC/NO function

*not for sale in Japan



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Multimec™ 5E

High performance tactile switches •
MIL-PRF-28855H

BUILD YOUR PART NUMBER

NON-ILLUMINATED

SERIES	MOUNTING	ACTUATION FORCE	OPTIONAL
5E	TH9 Through-hole SH9 Surface mount	20 2.0 N 35 3.5 N 65 6.5 N	Q Quiet contact (with 2.0 N only) RAS Right angle (with TH only) NCNO Normally closed/ normally open function (with 3.5 N only) R Tape & reel (with SMD only) G Gold contacts

ABOUT THIS SERIES

Laser marking on the switch for identification : WWYS, WW=week, Y=year, S=suffix for the type of switch, e.g. P=2.0 N and silver contacts, S=3.5 N and silver contacts, E6.5 N and silver contacts

Caps : see www.apem.com for more information.

Multimec™ 5E

High performance tactile switches • MIL-PRF-28855H

TAPE & REEL

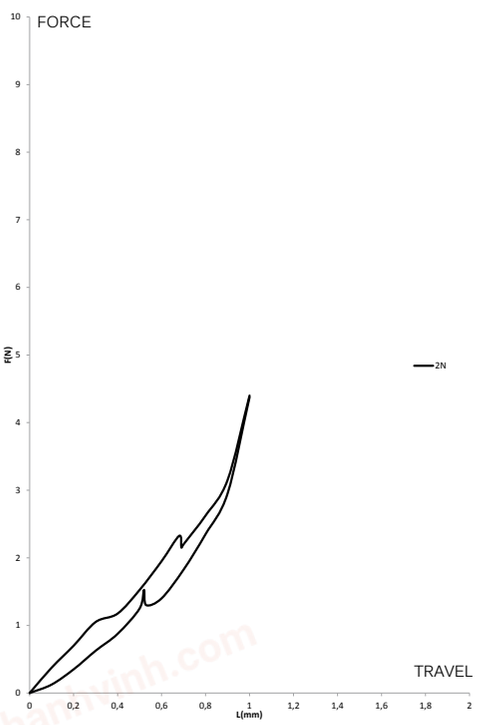
Tape and reel is available for the parts listed and has the following specifications

- Reel diameter: Ø330 mm
- Tape width: 24 mm
- Pitch: see list
- Tape and reel material: antistatic or better
- Quantity per reel: see list

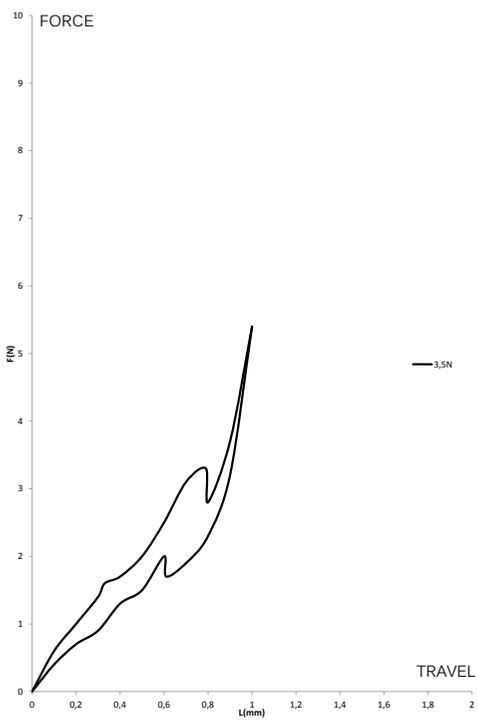
PART NO.	ORDERING CODE	PITCH	QUANTITY PER REEL
5ESH9XX	5ESH9XXR	16	500
5ESH9XX1SSXX-08.0	5ESH9XXR1SSXX-08.0	20	250
5ESH9XX1SSXX-09.5	5ESH9XXR1SSXX-09.5	20	250
5ESH9XX1SSXX-10.4	5ESH9XXR1SSXX-10.4	20	250
5ESH9XX1SSXX-11.0	5ESH9XXR1SSXX-11.0	20	250
5ESH9XX1SSXX-12.0	5ESH9XXR1SSXX-12.0	20	250

OPERATING FORCE

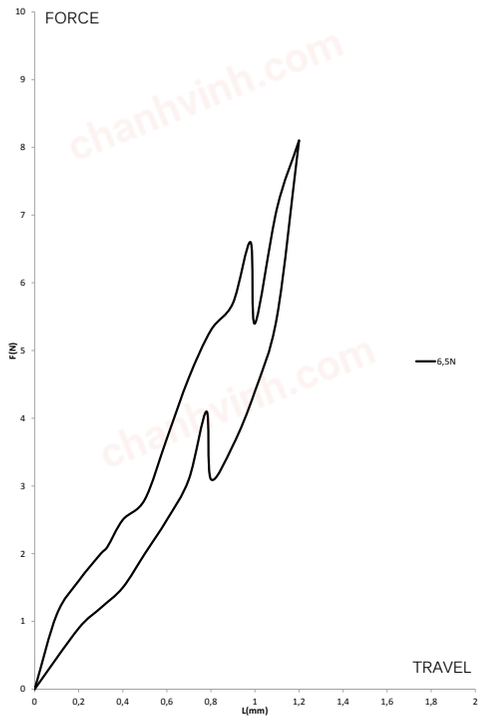
2.0 N



3.5 N



6.5 N

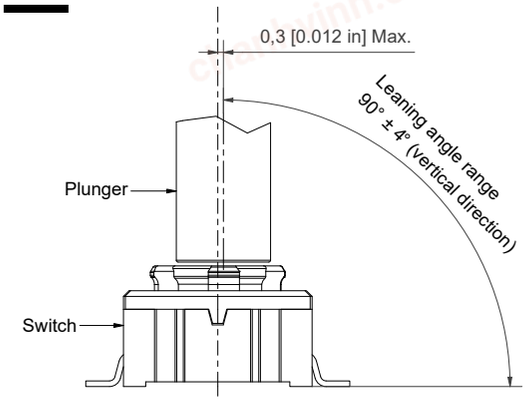


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Multimec™ 5E

High performance tactile switches •
MIL-PRF-28855H

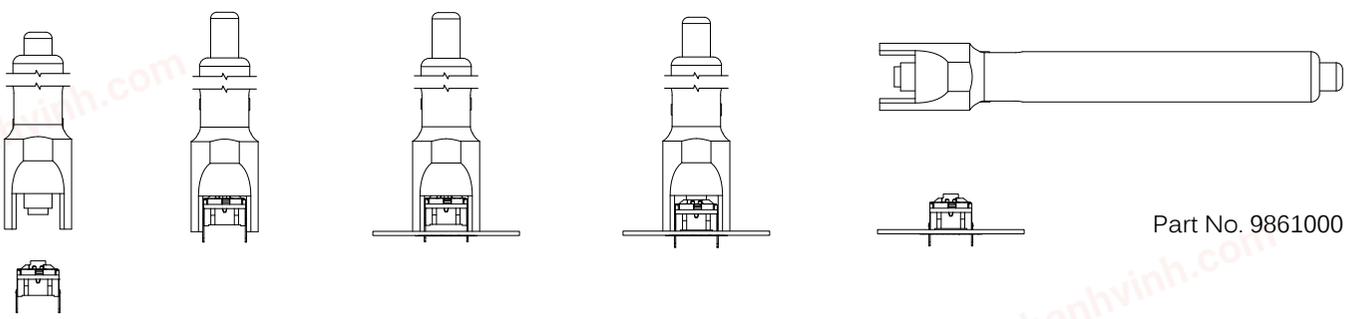
RECOMMENDED OPERATING CONDITIONS



For the optimal performance of the switch use the recommended operating conditions.

MOUNTING

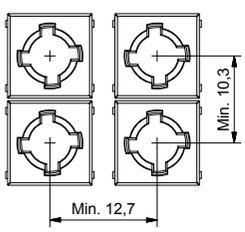
MOUNTING TOOLS FOR MULTIMEC™ THROUGH-HOLE SWITCHES



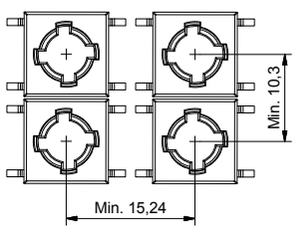
Part No. 9861000

1 2 3 4 5

SPACE REQUIREMENT - MATRIX MOUNTING



Through-hole (TH)



Surface mount (SMD)

CAP SERIES	RECOMMENDED MIN.SWITCH SPACING AxB	NOMINAL CAP DIMENSION WxH	RECOMMENDED MIN. PANEL CUT-CUT
1PS	12.7x10.3	6.5x12.5	7.0x13.0, R max. 1.0
1SS	12.7x10.3	Ø6.5	Ø7.0
1YS/1YAS	15.3x15.3	15.0x15.0	16.0x16.0
1Z/1ZW	35.5x35.5; 41.6x41.6	Ø29.5	Ø30.3
10A+10AWY	22.0x40.0	R=5.3; 10.6x28.0	R=5.5; 11.0x28.4

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USAGE GUIDELINES

HOW TO GET THE BEST RESULTS WITH MEC SWITCHES ?

These guidelines are offered to users of MEC Switches as an aid to ensure successful and reliable switch operation. Please see the technical specifications for details on operating and storage temperatures and soldering guidelines to make sure you select the best switch for your application. When reflow soldering is taking place, MEC strongly recommend that the temperature profile is analyzed and compared with the temperature rating of the switch. It is also important to monitor the accumulated heat buildup from both the pre-heat zones and the solder zone.

Most standard accessories for multimec™ 5 series switches are made from ABS plastic with a maximum operating temperature of 65 °C. It is strongly recommended that accessories are mounted after soldering of the switch. If this is not possible care must be taken not to overheat the accessories during the soldering process. The 1SS caps are, however, made of high temperature materials and will meet the same temperature specifications as the switches. For accessories made from other plastic materials please see multimec™ 5 series cap & bezel specifications.

MOUNTING AND DISMOUNTING

If switches are to be mounted in rows it is essential that the recommendations regarding spacing are followed. PC board thickness should be 1.4 ±0.2 mm and terminal hole diameter should be 0.9 mm.

All multimec™ 5 series caps are easily snapped onto the switch modules and can be changed at a later time.

A mounting tool is available for through hole multimec™ 5 series switches.

SOLDERING AND CLEANING MULTIMEC™ SERIES

Multimec™ 5 series switches are fully sealed to IP67 specifications to minimize solder flux and aqueous based cleaning solutions from entering the switch and contaminating the contacts. The switches can be placed on the PC board with other components and reflow soldered. Multimec™ 5 series offers a high level of sealing, however, with aqueous solvent solutions care must be taken to avoid the worst case situation with water jets, complete immersion into a liquid with a temperature below the board or surface tension reducing additives.

Recommended cleaning methods are demineralized water. Any surface tension reducing agents, such as soap, must not be used as they risk causing a potential leakage of the switch.

SOLDERING - THROUGH HOLE VERSIONS

Hand soldering: max. 350 °C for max. 3 sec

Wave soldering: heat built up in the switch during pre-heating and soldering must not exceed the maximum operating temperature of the switch. Peak temperature must not exceed 260 °C, and soldering time is max 10 sec. (IEC 600-68-2-20 8)

SOLDERING - SURFACE MOUNT VERSIONS

For all methods - infrared, convection and vapor phase. The upper limit 240 °C/40 sec must be observed. The soldering temperature profile must have moderate temperature gradients. (JEDEC J-STD-020E)

ROHS COMPLIANCE

As of 1 July 2006 MEC has completed the conversion to RoHS compliance. For more info please see our homepage www.apem.com

TEMPERATURE LIMITS:

Switch	160 °C
Accessories	65/85/160 °C

PACKAGING

Multimec™ 5 series switches are packed in rigid tubes of 50 pieces each.

A box contains 1.000 pcs.

The surface mount versions of multimec™ 5E series switches with a height up to 12.5 mm can also be delivered on tape/reel.
Each reel contains 250/500 pcs.

Right angle switches are packed into trays.
Each tray contains 100 pcs.