mec switches

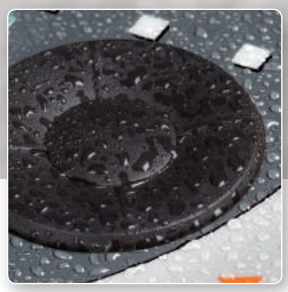
Switch Engineering Catalogue No. 7.2

switches









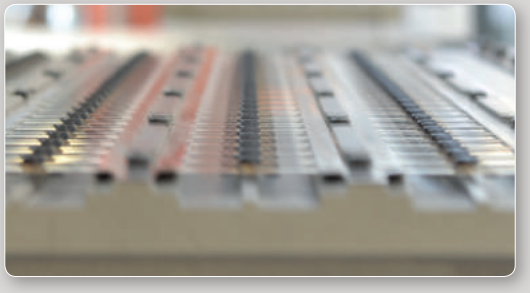
APEM.COM

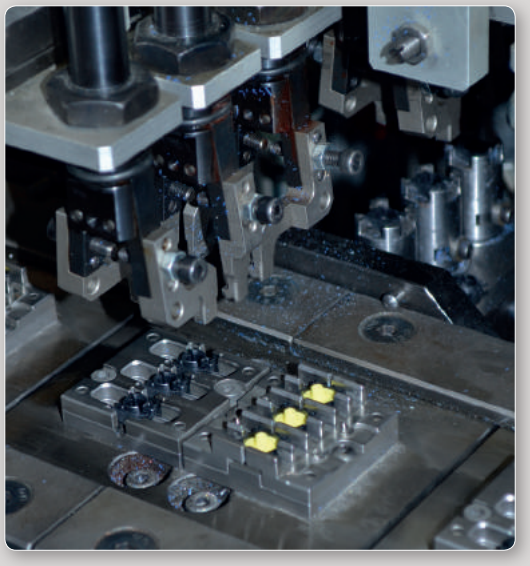
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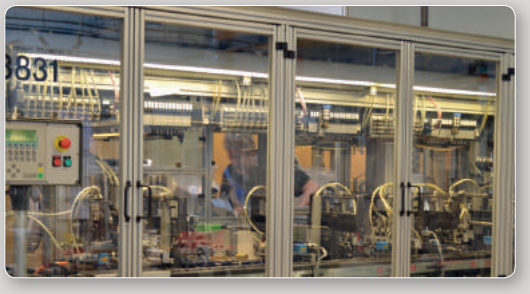
DANISH DESIGN

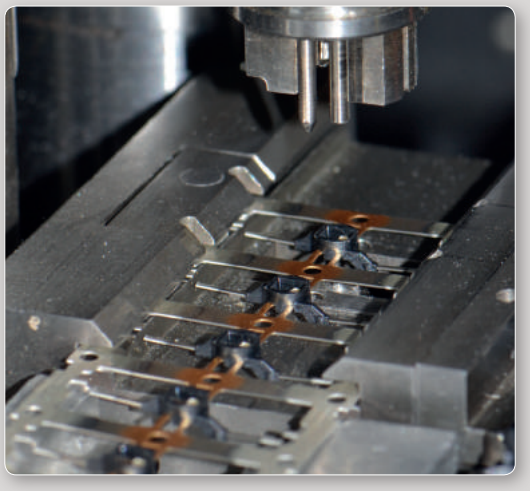
IN-HOUSE R&D AND PRODUCTION

IN-LINE QUALITY CONTROL









Since its foundation in 1938, MEC has been making state-of the-art electromechanical components.

Located in a suburb of Copenhagen, Denmark, MEC has earned a reputation as one of the leading European manufacturers of high performance tactile switches.

A wealth of know-how has been built up over the years for the benefit of innovative product development and custom solutions.

Despite the trend of outsourcing it has been MEC policy to maintain a high degree of vertical integration that enables us to react promptly to customer requests. 98% of all the parts used in MEC switches are produced in-house.

With 100% in-line inspection, tight tolerance on all parts and use of only quality materials we position ourselves to reach the highest achievable level within high performance tactile switches.

The vertical integration combined with a strong R&D facility enables us to provide custom designs from conception to completion.

To be part of a sustainable industrialised world environmental consciousness is crucial. At MEC we have substituted materials to more environmental-friendly alternatives and are recycling as much as possible. Legal authorities are auditing our environmental management system regularly and confirming that our goal is being reached. All MEC products are RoHS compatible.

MEC have a well established global distribution network that provides a presence in all parts of the world where electronic manufacturing takes place. Through close contact and continuous product training offered to our distributors we maintain a highly qualified and responsive global distribution network.

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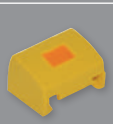
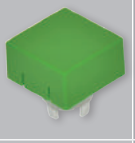
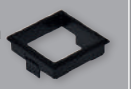
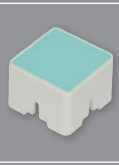
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Caps and accessories series

Selection guide

	NON-ILLUMINATED	NON-ILLUMINATED & ILLUMINATED			ILLUMINATED
ROUND	**1SS** Ø6.5mm h=8.0 - 22.5mm *for 5E 	**1JS** Ø9.6mm h=10.4mm 	**1DS** Ø9.6mm h=14.9mm 	**1GAS** Ø11mm h=12.5mm 	**1IS** Ø6.5mm h=10.4 - 22.5mm 
	varimec™ round Ø5.2; 7.8;11.6mm h=10.4-22.5mm *for 3E 	**1US** Ø10.6mm h=14.9mm 	**1ZCS** Ø14.3mm h=11.7mm 	**1GCS** Ø15mm h=12.5mm 	**1LS** Ø6.5mm h=12.0mm-22.5mm 
		1Z Ø29.5mm h=12.0mm 	**1ZW** Ø29.5mm h=12.3mm 	**aquamec** Ø10.6mm h from front panel=14.3mm h=24.2-27.2mm 	**1ES** Ø9.6mm h=14.9mm 
		10R/10RF Ø30mm h=12.6/11.0mm 	**10RM16** Ø30mm h=11.0mm 	**navimec** Ø34.25mm h=11.7/ 12.2mm 	**1FS** Ø9.6mm h=14.9mm 
SQUARE/RECTANGULAR	**1ZA** 18.65x10.1mm h=12.2mm 	**1PS** 12.5x6.5mm h=15.7mm 	**1XS** 7.4x9.4mm h=18.5mm 	**1QS** 12.5x6.5mm h=15.7mm 	**1RS** 12.5x6.5mm h=15.7mm 
	1M 25.0x10.1mm h=12.2mm 	**1A** 12.5x10.1mm h=12.2mm 	**1TS** 10.6x10.6mm h=14.9mm 	**1H** 12.5x10.1mm h=12.2mm 	**1C + 2C/2D** 15.1x15.1mm h=12.2mm 
	varimec™ square 5.2x5.2; 7.8x7.8; 11.6x11.6mm h=10.4-22.5mm *for 3E 	**1B + 2C/2D** 15.1x15.1mm h=12.2mm 	**1KS** 14.3x14.3mm h=19.1mm 	**2K** 17.75x17.75mm 	**1KBS** 14.3x14.3mm h=20.2mm 
	unimec™ 16300 6.0x12.3mm h=16.9mm 	**10Q** 22x22mm h=11.0mm 	**10QM16** 22x22mm h=11.0mm 		**1KCS** 14.3x14.3mm h=20.1mm 
	unimec™ 16700 14.9x14.9mm h=14.6mm 				**1YS** 15x15mm h=12.5mm *for 5E 
OTHER	**2SS** extender for 5G snap on caps h=5-10mm 	**1NS** Ø9.6/□4.9mm h=14.9mm	**1VS** 10.6x13.25mm h=14.9mm	**1ZB** 90o R=17.5mm h=12.2mm	
	1TW/1UW/1VW sealing for 1TS/1US/ /1VS	**1WAS** 6.5x12.5mm h=14.9mm	**1WDS** 8.0x15.2mm h=14.9mm	**1WPS** 6.5x12.5mm h=15.7mm	

Caps are for 5G if not otherwise specified

CAPS

MANY OPTIONS REGARDING:

SHAPE, SIZE, HEIGHT, COLOUR AND ILLUMINATON

SOLUTIONS:

NAVIMEC™, CONTROLMEC™, FOILMEC™, VARIMEC™, AQUAMEC™



MEC has a wide range of caps for the multimec® switch series. There are many cap series including navimec™, controlmec™ foilmec™ and aquamec™ for multimec® 5 series switches, and varimec™ that is still for the 3 series switches.

18 solid colours and 6 transparent colours

Overall height varies from 8.0 mm to 27.2 mm



ILLUMINATION

SINGLE- OR BI-COLOUR

MANY OPTIONS IN LED, CAP AND LENS COLOUR



5 LED colour options available: blue, green, yellow, white and red.

Bi-colour combination can be made with any two LED colours.

Illumination can be full, dot, rectangular or legend.







MEC cap range includes options for the front panel sealing. We have designed cap options for outdoor, dusty and humid applications - switch solutions that can endure a rough environment.



PANEL SEALED SOLUTIONS



CONTROLMEC™ 1ZW

PANEL SEALED 1TS/1US/1VS

PANEL SEALED 10R & 10Q SERIES

AQUAMEC™

CAPS FOR FOIL OVERLAY



FOILMEC™ + 1GAS/1GCS + 1JS

multimec®

Rocker-action pushbutton caps

5G + 1A/1H/1M/1ZA

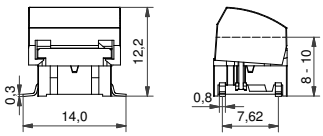


- Rectangular caps
- Rocker-action pushbutton cap
- 12.5 mm x 10.1 mm; 18.65 mm x 10.1 mm; 25.0 mm x 10.1 mm
- h =12.2 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1A/1H-13.0 x 10.5, 1M-25.7 x 10.5, 1ZA-19.4x10.5

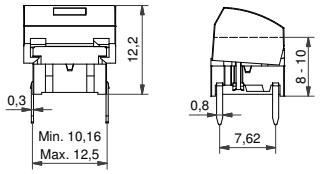
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

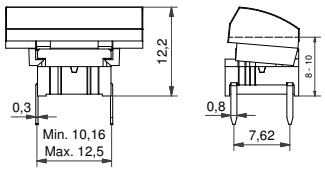
SMD w/LED + 1A



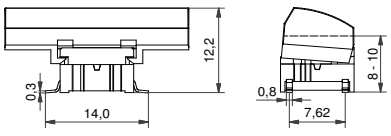
TH w/LED + 1H



TH + 1ZA



SMD + 1M



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code 1H	Lens 1H
5 G				+			
	TH9 through-hole	**20**	**02** blue		**1H**	**03** grey	**1** transparent
	SH9 surface mount	**35**	**22** green			**09** black	**2** green
		65	**42** yellow				**4** yellow
		Q*	**61** white		**1A**	Colour code 1A	**6** frosted white
			82 red			**16** frosted white	**8** red
			2242 green/yellow				
			8222 red/green				
			8242 red/yellow				

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap	Colour code 1A/1M	Colours 1ZA:
5 G			+			
	TH9 through-hole	**20**		**1A**	**00** blue	**03** grey
	SH9 surface mount	**20Q**			**02** green	**06** white
		35			**03** grey	**09** black
		65		**1ZA**	**04** yellow	**30** ultra blue
					**06** white	**40** dusty blue
					08 red	**42** aqua blue
				1M	**09** black	**50** metal dark blue
						**53** metal light grey
						57 metal dark grey
						58 metal bordeaux

Ordering example:
5GSH93582 + 1H098 with illumination OR 5GTH965 + 1ZA57 without illumination OR *5GTH92001Q (illuminated quiet version).
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Award winning design of rocker-action cap solution

5G + 1B/1C+2C/2D

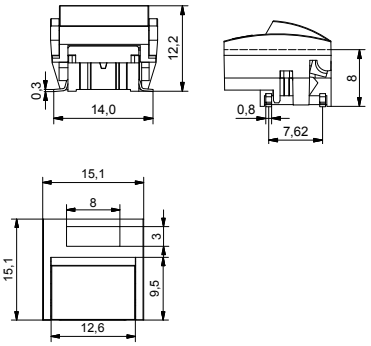
- Rectangular caps; square solution
- Rocker-action pushbutton cap
- 15.1 mm x 15.1 mm
- h =12.2 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap and bezel: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1B/1C+2C/2D-15.5 x 15.5



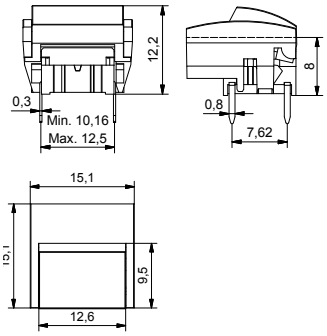
All dimensions in mm *Tolerances -/+0.2mm*

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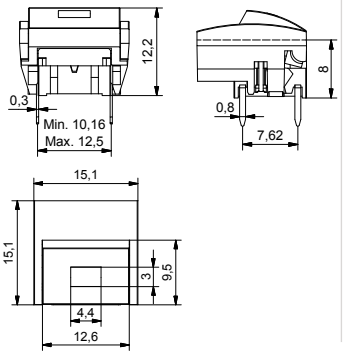
SMD 1B+2D



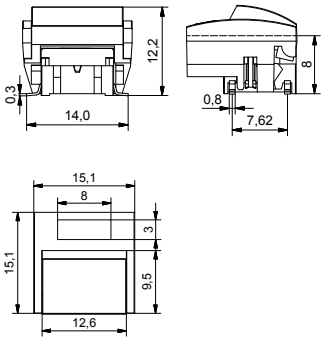
TH 1B+2C



TH w/LED 1C+2C



SMD w/LED 1B+2D



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap				Bezel		
5 G				+	1 C			+	2 C		
	TH9 through-hole **SH9** surface mount	**20** **35** **65** **Q***	**02** blue **22** green **42** yellow **61** white **82** red **2242** green/yellow **8222** red/green **8242** red/yellow		Solid colour	Colour code	Lens			Colour code	
					1 B				2 D		
					Trans-parent	Colour code				Colour code	Lens

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap			Bezel		OR			
5 G			+	1 B		+	2 C			2 D		
	TH9 through-hole **SH9** surface mount	**20** **20Q** **35** **65**		Solid colour	Colour code			Colour code			Colour code	Lens

COLOUR CODES

Transparent caps
16 frosted white

Solid caps 1B
00 blue
02 green
03 grey
04 yellow
06 white
08 red
09 black

Solid caps 1C
03 grey
08 red
09 black

Solid colours 2C & 2D:
00 blue
03 grey
06 white
08 red
09 black

Lenses
1 transparent
2 green
4 yellow
6 frosted white
8 red

Ordering example:
5GTH93561+1C031+2C09 with illumination OR 5GSH965+1B08+2D081 without illumination OR *5GSH92001Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Round cap with soft edges

5G + 1DS/1ES/1FS

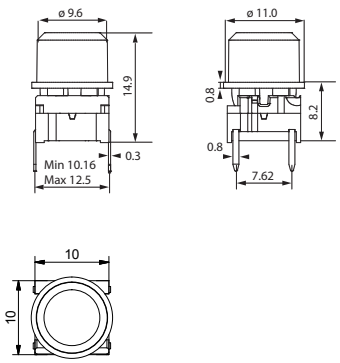


- Round caps
- Ø9.6 mm
- h =14.9 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap :-40/+85°C
- Panel cut-out: 1DS/1ES/1FS-Ø10.0

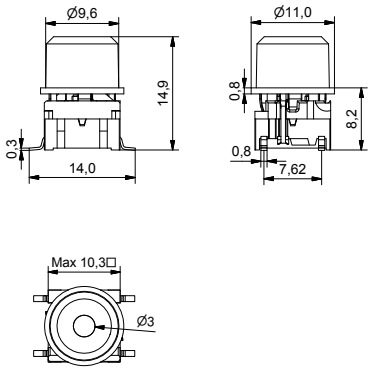
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

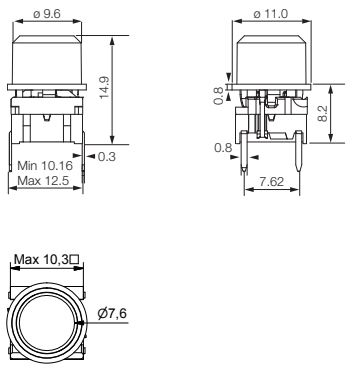
TH + 1DS



SMD w/LED + 1ES



TH w/LED + 1FS



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code	Lens
5 G				+			
	TH9 through-hole	**20**	**02** blue		**1ES**	**00** blue	**1** transparent
	SH9 surface mount	**35**	**22** green			**02** green	**2** green
		65	**42** yellow			**03** grey	**4** yellow
		Q*	**61** white			**04** yellow	**6** frosted white
			82 red			**06** white	**8** red
			2242 green/yellow			**08** red	
			8222 red/green			**09** black	
			8242 red/yellow		**1FS**		
					1DS	**11** transparent	
						16 frosted white	

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap	Colour code		
5 G			+				
	TH9 through-hole	**20**		**1DS**	**00** blue	**30** ultra blue	**50** metal dark blue
	SH9 surface mount	**20Q**			**02** green	**40** dusty blue	**53** metal light grey
		35			**03** grey	**42** aqua blue	**57** metal dark grey
		65			**04** yellow	**32** mint green	**58** metal bordeaux
					06 white	**33** tele grey	
					08 red	**34** melon	
					09 black	**38** noble red	

Ordering example:
5GTH935+1DS06 without illumination OR 5GSH96561+1FS096R13509 with illumination OR *5GSH92042Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Flat cap can be used with foil overlay

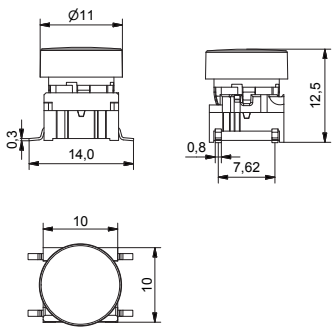
- Round caps
- Excellent option for foil overlay
- Ø11 mm; Ø15 mm
- h =12.5 mm
- Material: polyamide
- Temp. Range:
  - Solid cap: -40/+160°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1GAS/1GCS-Ø11.4; Ø15.4



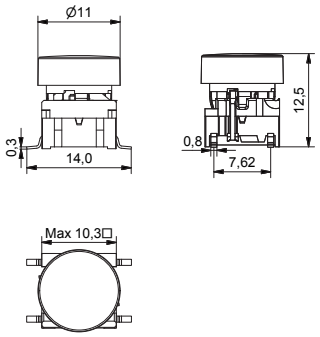
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

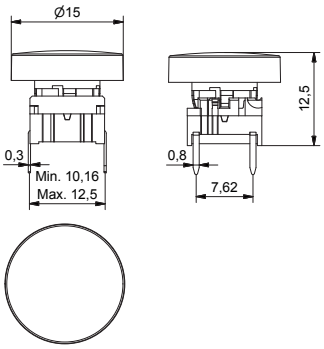
SMD + 1GAS



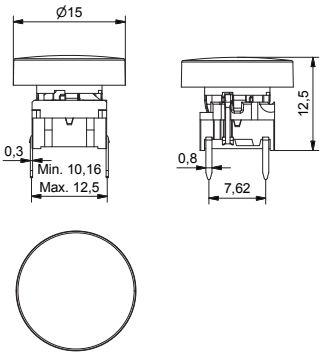
SMD w/LED + 1GAS



TH + 1GCS



TH w/LED + 1GCS



ILLUMINATED – HOW TO ORDER

Switch

5 G

Mounting

TH9 through-hole
SH9 surface mount

Actuation force

20
35
65
Q*

LED

02 blue
22 green
42 yellow
61 white
82 red
2242 green/yellow
8222 red/green
8242 red/yellow

+

Cap transparent colour

1GAS



1GCS



Colour code

11 transparent
16 frosted white

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch

5 G

Mounting

TH9 through-hole
SH9 surface mount

Actuation force

20
20Q
35
65

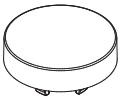
+

Cap solid colour

1GAS



1GCS



Colour code

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

Ordering example:
5GSH935 + 1GAS09 without illumination OR 5GTH96502 + 1GCS16 with illumination OR *5GTH92061Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Low cap, excellent for foil overlay

5G + 1JS



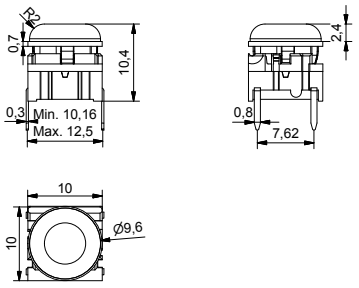
- Round cap
- Ø9.6 mm
- h =10.4 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1JS-Ø10.4

**Legends on the picture are custom*

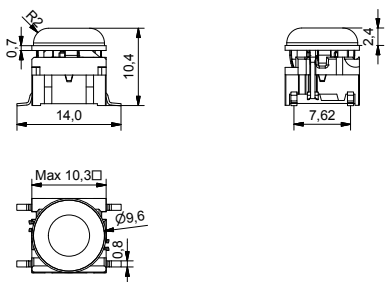
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

TH + 1JS



SMD w/LED + 1JS



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap transparent	Colour code
5 G				+	1 J S	
	TH9 through-hole	**20**	**02** blue			**11** transparent
	SH9 surface mount	**35**	**22** green			**16** frosted white
		65	**42** yellow			
		Q*	**61** white			
			82 red			
			2242 green/yellow			
			8222 red/green			
			8242 red/yellow			

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap solid colour	Colour code
5 G			+	1 J S	
	TH9 through-hole	**20**			**00** blue
	SH9 surface mount	**20Q**			**02** green
		35			**03** grey
		65			**04** yellow
					06 white
					08 red
					09 black

Ordering example:
5GTH935+1JS08 without illumination OR 5GTH93501+1JS16 with illumination OR *5GTH92001Q (illuminated quiet version)

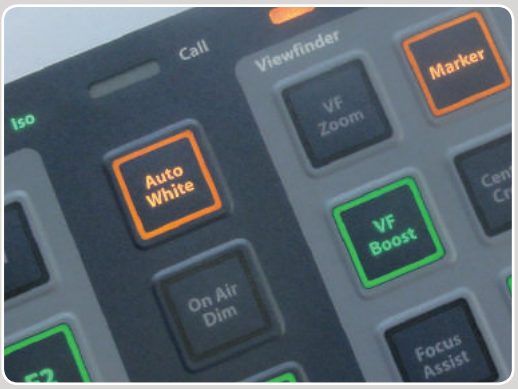
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Square cap with different top surface options

5G + 1KS/1KBS/1KCS+2K

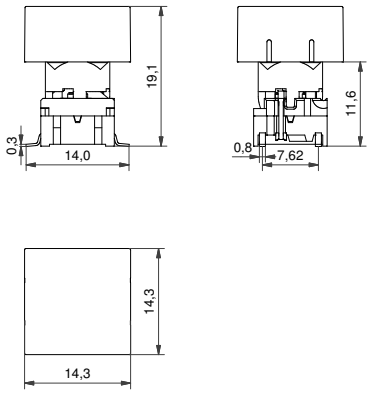
- Square caps
- Different top surfaces: flat, convex or concave
- 14.3 mm x 14.3 mm
- h =19.1 mm; 20.2 mm; 20.1 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1KS/1KBS/1KCS-14.7 x 14.7



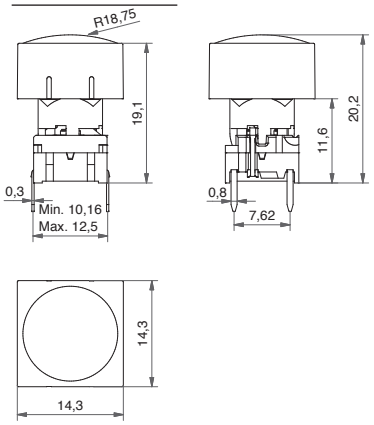
All dimensions in mm *Tolerances -/+0.2mm* *Custom solution*

DIMENSIONS

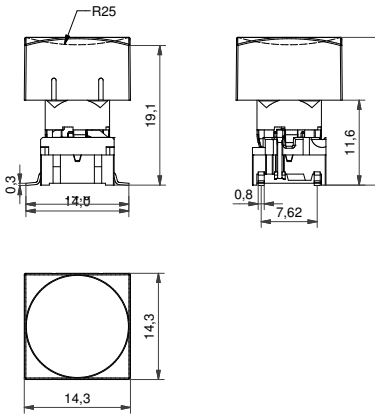
SMD w/LED + 1KS



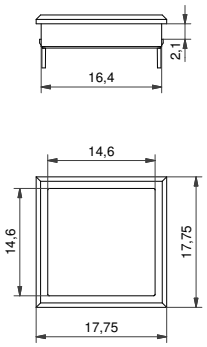
TH w/LED + 1KBS



SMD w/LED + 1KCS



Bezel (optional)



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap		Bezel
5 G				+	1 1 1 6	+	2 K

TH9 through-hole
SH9 surface mount

20
35
65
Q*

02 blue
22 green
42 yellow
61 white
82 red
2242 green/yellow
8222 red/green
8242 red/yellow

Frosted white lens and transparent lid

1KS



1KCS



1KBS



03 grey
06 white
08 red
09 black

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap		Bezel
5 G			+	1 K S 1 6	+	2 K

TH9 through-hole
SH9 surface mount

20
20Q
35
65

Frosted white lens

1KS

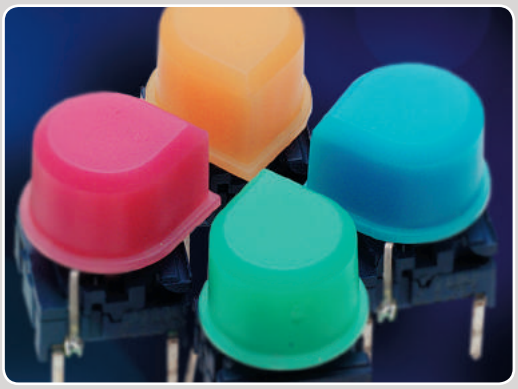


Colour code
00 blue
02 green
03 grey
04 yellow
06 white
08 red
09 black

03 grey
06 white
08 red
09 black

Ordering example:
5GTH93501+1KCS1116+2K09 with illumination OR 5GSH965+1KS0916+2K03 without illumination OR *5GTH92082Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®
Teardrop-shaped cap

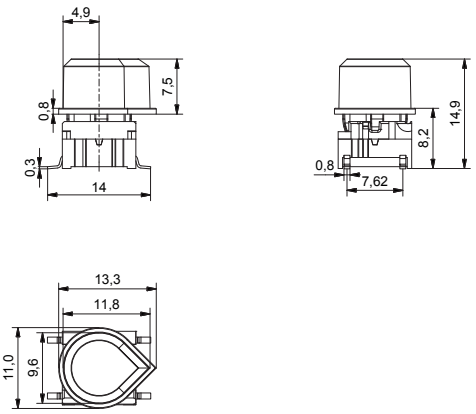


- Teardrop-shaped cap
- Ø9.6 mm; ☐ = 4.9 mm
- h =14.9 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1NS-Ø10.2/ ☐ = 5.1

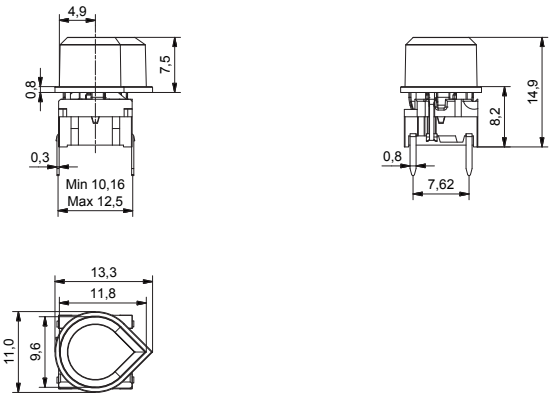
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

SMD + 1NS



TH w/LED + 1NS



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap transparent	Colour code
5 G				+	1 N S	
	TH9 through-hole	**20**	**02** blue			**16** frosted white
	SH9 surface mount	**35**	**22** green			
		65	**42** yellow			
		Q*	**61** white			
			82 red			
			2242 green/yellow			
			8222 red/green			
			8242 red/yellow			

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap	Colour code
5 G			+	1 N S	
	TH9 through-hole	**20**			**03** grey
	SH9 surface mount	**20Q**			**09** black
		35			
		65			

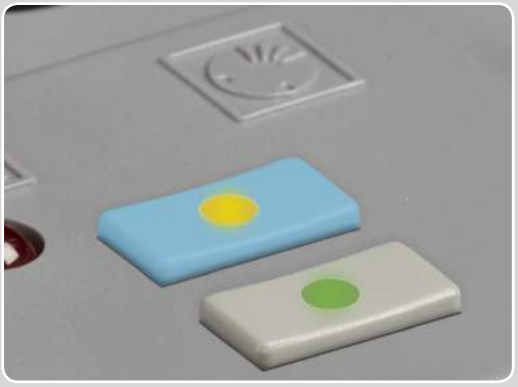
Ordering example:
5GSH965+1NS09 non-illuminated OR 5GTH93502+1NS16 with illumination OR *5GTH92082Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Concave rectangular caps

5E/5G + 1PS/1QS/1RS

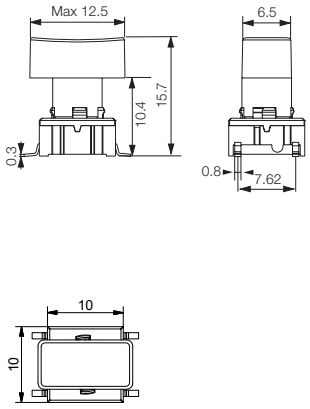
- Rectangular caps
- Concave top surface
- 12.5 mm x 6.5 mm
- h =15.7 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1PS/1QS/1RS-7.0 x 13.0, R max. 1.0



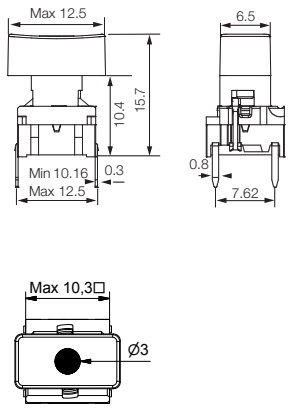
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

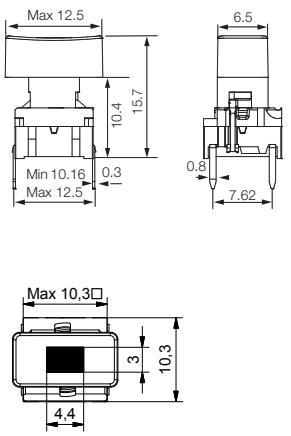
SMD (5E) + 1PS



TH w/LED (5G) + 1RS



TH w/LED (5G) + 1QS



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code	Lens
5 G				+			
	TH9 through-hole	**20**	**02** blue		**1QS**	**00** blue	**1** transparent
	SH9 surface mount	**35**	**22** green			**03** grey	**6** frosted white
		65	**42** yellow			**09** black	
		Q*	**61** white		**1RS**		
			82 red				
			2242 green/yellow				
			8222 red/green				
			8242 red/yellow				
					1PS	**11** transparent	
						16 frosted white	

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap	Colour code	
5 E			+			
5 G	**TH9** through-hole	**20**		**1PS**	**00** blue	**06** white
	SH9 surface mount	**20Q**			**02** green	**08** red
		35			**03** grey	**09** black
		65			**04** yellow	

Ordering example:
5GTH935+1PS08 without illumination OR 5GSH96542+1RS001 with illumination OR *5GSH92061Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Cap range with variable heights and illumination options

5E/5G + 1SS/1IS/1LS

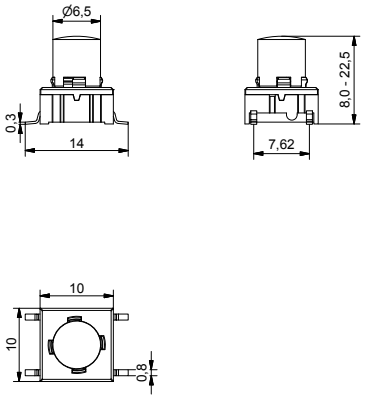


- Round caps
- 9 standard options in overall height
- Ø6.5 mm
- h =8-22.5 mm; 10.4-22.5 mm; 12-22.5 mm
- Material: polyamide
- Temp. Range:
  - Solid cap: -40/+160°C (1SS); -40/+65°C (1LS)
  - Transparent cap: -40/+85°C
- Panel cut-out: 1SS/1LS/1IS-Ø7.0

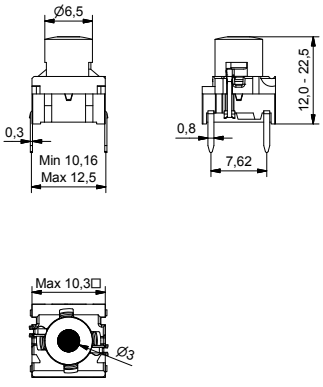
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

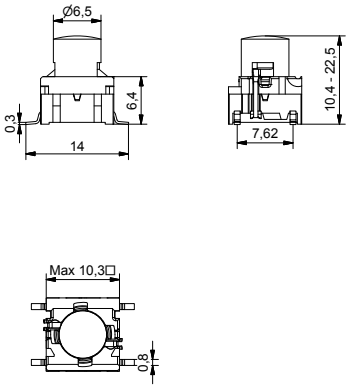
SMD (5E) + 1SS



TH w/LED (5G) + 1LS



SMD w/LED (5G) + 1IS



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code	Lens	Height 1LS
5 G				+				.
	TH9 through-hole	**20**	**02** blue		**1LS** with lens	**00** blue	**1** transparent	**12.0** **19.0**
	SH9 surface mount	**35**	**22** green			**02** green	**2** green	**15.0** **22.5**
		65	**42** yellow			**03** grey	**4** yellow	**16.0**
		Q*	**61** white			**04** yellow	**6** frosted white	Height 1IS
			82 red		**1IS** fully illuminated	**06** white	**8** red	**10.4** **16.0**
			2242 green/yellow			**08** red		**11.0** **19.0**
			8222 red/green			**09** black		**12.0** **22.5**
			8242 red/yellow			**11** transparent		**15.0**
						16 frosted white		

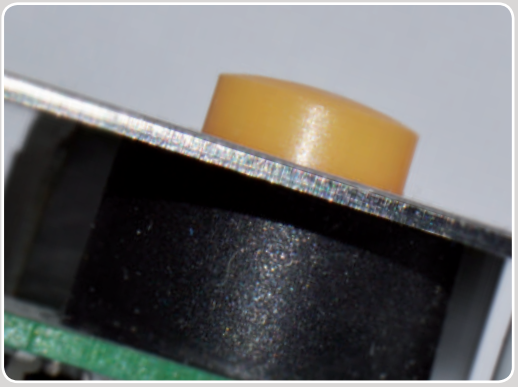
*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap	Colour code	Height	
5 E			+			.	
5 G	**TH9** through-hole	**20**		**1SS** solid colour	**00** blue	**08.0**	**16.0**
	SH9 surface mount	**20Q**			**02** green	**09.5**	**19.0**
		35			**03** grey	**10.4**	**22.5**
		65			**04** yellow	**11.0**	
					06 white	**12.0**	
					08 red	**15.0**	
					09 black		

Ordering example:
5ETH920+1SS04-09.5 without illumination OR 5GSH93542+1IS16-19.0 with illumination OR *5GTH9208222Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

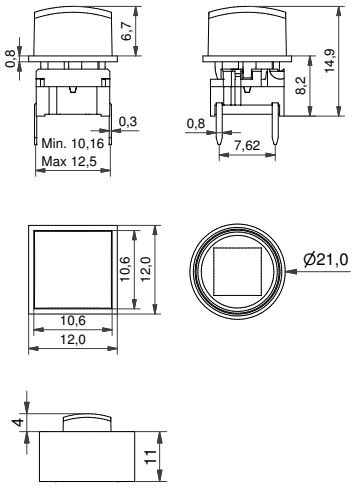
- Square, round and half-ellipse shaped caps
- Rounded top surface
- Option to have it panel sealed
  - IP65 = 5G+1TS+1TW
  - IP67 = 5G+1US+1UW
  - IP65 = 5G+1VS+1VW
- 10.6 mm x 10.6 mm; Ø10.6 mm; 10.6 mm x 13.25 mm
- h =14.9 mm
- Material: ABS/polycarbonate (cap); silicone rubber (sealing)
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
  - Panel cut-out: 1TS-11.0 x 11.0, 1US-Ø11.0, 1VS-11.0 x 13.65



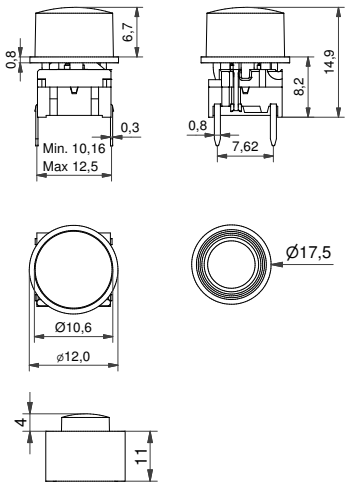
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

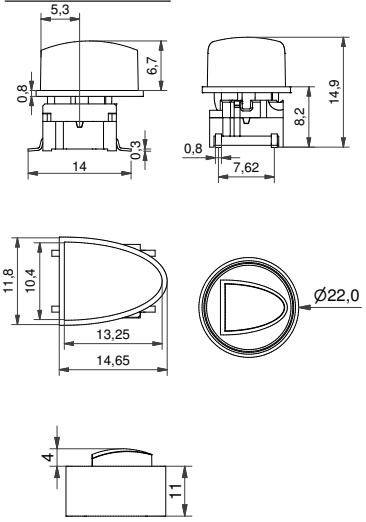
TH + 1TS+1TW



TH w/LED + 1US+1UW



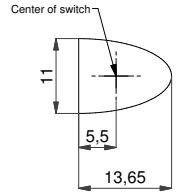
SMD + 1VS+1VW



PANEL CUT-OUT

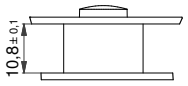
Recommended

1TS - 11x11 mm
1US - Ø11 mm
1VS



*mathematical shape of half-ellipse

Distance between PCB and front panel



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code		Sealing
5 G				+			+	
	TH9 through-hole	**20**	**02** blue		**1TS** **1VS**	**16** frosted white		**1TW** **1VW**
	SH9 surface mount	**35**	**22** green					
		65	**42** yellow					
		Q*	**61** white		**1US**			**1UW**
			82 red					
			2242 green/yellow					
			8222 red/green					
			8242 red/yellow					

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap	Colour code		Sealing
5 G			+			+	
	TH9 through-hole	**20**		**1TS** **1VS**	**00** blue		**1TW** **1VW**
	SH9 surface mount	**20Q**			**03** grey		
		35			**08** red		
		65		**1US**	**09** black		**1UW**

Ordering example:
5GSH935 + 1TS03 + 1TW without illumination OR 5GTH96542 + 1US16 + 1UW with illumination OR *5GTH92082Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Ellipse-shaped caps

5G + 1WAS/1WDS/1WPS

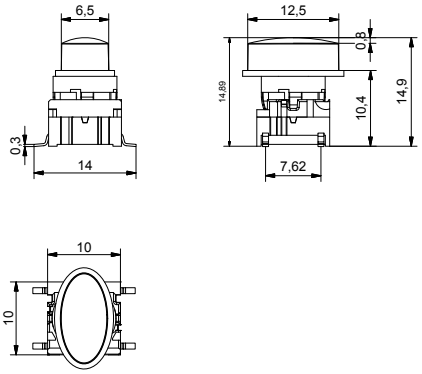


- Ellipse-shaped caps
- Convex or concave top surface
- 6.5 mm x 12.5 mm; 8.0 mm x 15.2 mm
- h =15.7 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1WAS/1WPS-12.9x6.9, 1WDS-15.6x8.4

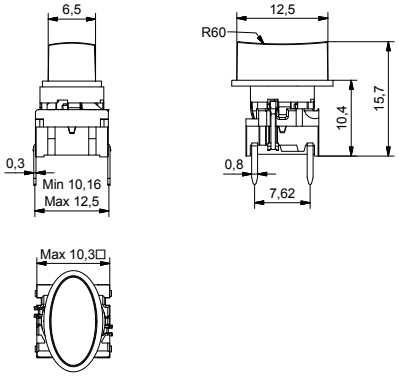
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

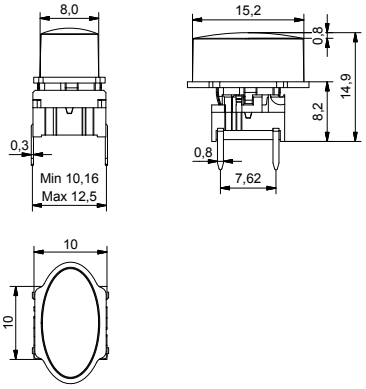
SMD + 1WAS



TH w/LED + 1WPS



TH + 1WDS



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code
5 G				+		
	TH9 through-hole **SH9** surface mount	**20** **35** **65** **Q***	**02** blue **22** green **42** yellow **61** white **82** red **2242** green/yellow **8222** red/green **8242** red/yellow		**1WAS**  **1WPS**  **1WDS** 	**16** frosted white

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap	Colour code
5 G			+		
	TH9 through-hole **SH9** surface mount	**20** **20Q** **35** **65**		**1WAS**  **1WPS**  **1WDS** 	**00** blue **03** grey **08** red **09** black **30** ultra blue **40** dusty blue **42** aqua blue **53** metal light grey **57** metal dark grey

Ordering example:
5GTH935+1WAS00 without illumination OR 5GSH96582+1WDS16 with illumination OR *5GSH92042Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Rectangular cap with soft edges

5G + 1XS

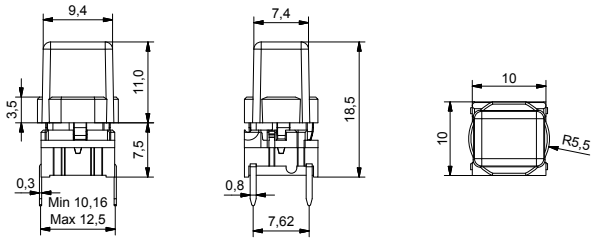
- Rectangular cap
- 7.4 mm x 9.4 mm
- h =18.5 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1XS-9.8 x 7.9



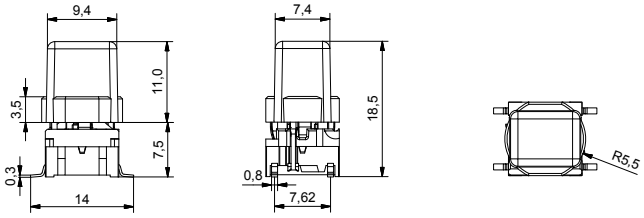
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

TH + 1XS



SMD w/LED + 1XS



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code
5 G				+	1 X S	
	TH9 through-hole	**20**	**02** blue			**11** transparent
	SH9 surface mount	**35**	**22** green			**16** frosted white
		65	**42** yellow			
		Q*	**61** white			
			82 red			
			2242 green/yellow			
			8222 red/green			
			8242 red/yellow			

NON-ILLUMINATED– HOW TO ORDER

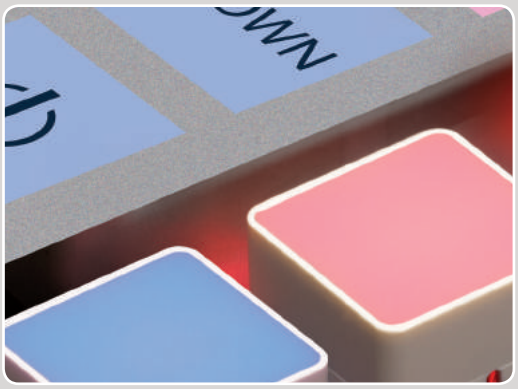
Switch	Mounting	Actuation force		Cap	Colour code
5 G			+	1 X S	
	TH9 through-hole	**20**			**00** blue
	SH9 surface moun	**20Q**			**02** green
		35			**03** grey
		65			**04** yellow
					06 white
					08 red
					09 black

Ordering example:
5GTH9352242+1XS16 with illumination OR 5GSH965+1XS02 non-illuminated OR *5GTH9208242Q (illuminated quiet version)
Please see colour codes, updates of products and changes of specifications on www.apem.com

foilmec™

Square cap for foil overlay

5E + 1YS

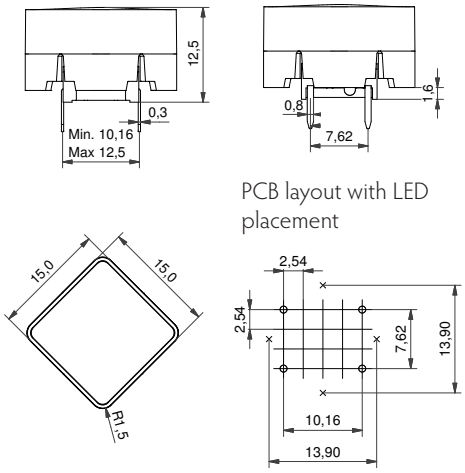


- Square cap
- Designed for foil overlay
- 15 mm x 15 mm
- h =12.5 mm
- Material: ABS/polycarbonate
- Temp. Range: -40/+65°C
- Panel cut-out: 1YS-16 x 16

All dimensions in mm *Tolerances -/+0.2mm*

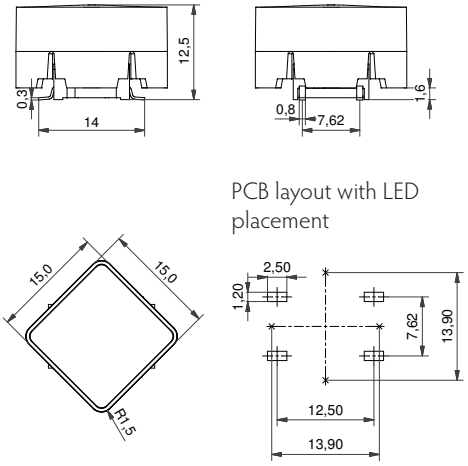
DIMENSIONS

TH + 1YS



PCB layout with LED placement

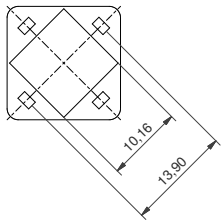
SMD + 1YS



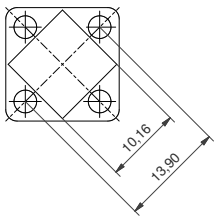
PCB layout with LED placement

RECOMMENDED PLACEMENT OF LEDS

SMD



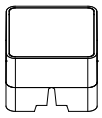
TH



LED Recommendation
SMD: 1206 - 0805 - 0603 - 0402
TH: 3 mm - Ø max 3.2 - Height max 6.5 mm

HOW TO ORDER

Switch	Mounting	Actuation force		Cap
5 E			+	1 Y S 0 6 1 6
	TH9 through-hole	**20**		**1YS0616** white cap with frosted white lens
	SH9 surface mount	**20Q**		
		35		
		65		

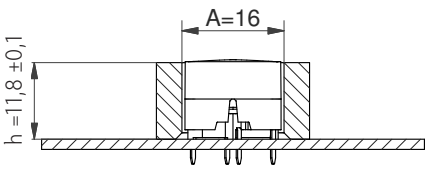


A: We recommend you to allocate enough space for travel of the foil and leave the area free from adhesive. Switch travel = 1 mm.

H: The height recommendation does not include the foil. We recommend embossing the foil to follow the curve of the keycap.

The best tactile feeling is obtained with a small pretravel.

The dimension H is based on an embossed foil. With a flat foil the dimension "H" will have to be adjusted, and enough area between the cap and front panel needs to be addressed to ensure foil flexibility.



Ordering example: 5ESH935+1YS0616
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Cap solution for navigating

navimec™ 5G + 1ZB/1ZCS

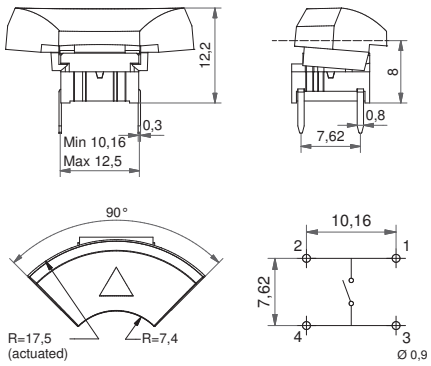
- Round solution
- Designed for navigating a display or controlling a unit
- 90° R=17.5 mm; Ø14.3 mm (Ø34.25 mm)
- h =12.2 mm; 11.7 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1ZB-R_1 7,1 R_2 17,5 – 17,75 90° 1ZCS-Ø14.7
- navimec™ panel cut-out: Ø35,0 - 35,5 Depending on application

All dimensions in mm *Tolerances -/+0.2mm*

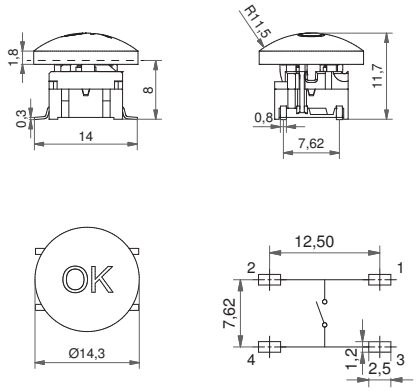


DIMENSIONS

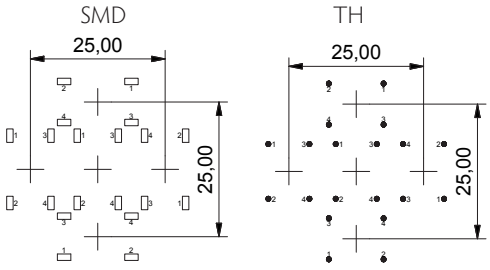
TH + 1ZB



SMD w/LED + 1ZCS



PCB layout for Navimec solution



We recommend using through-hole terminals for precise placing.

ILLUMINATED – HOW TO ORDER

Switch

5 G

Mounting

TH9 through-hole
(**SH9** surface mount)

Actuation force

20
35
65
Q*

LED

02 blue
22 green
42 yellow
61 white
82 red
2242 green/yellow
8222 red/green
8242 red/yellow

+

Cap

1 Z B 1 6

Frosted white with black hard paint and laser marking



1 Z C S 1 6



Legend code

DLMH136 ▲

LMH118 OK
LMH123 ⏻

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch

5 G

Mounting

TH9 through-hole
(**SH9** surface mount)

Actuation force

20
20Q
35
65

+

Cap

1 Z B



1 Z C S



Colour code

03 grey
06 white
09 *black*
30 ultra blue
40 dusty blue
42 aqua blue
50 metal dark blue
53 metal light grey
57 metal dark grey
58 metal bordeaux

Legend code**

pad printed legends

D136 ▲

038 RESET
105 ENTER
118 OK
119 SET
120 MENU
121 FUNC
122 HOME
123 ⏻

** White legends on black caps are standard, other options are available but considered custom products. See pages 34-35 or www.apem.com

Ordering example: 4x 5GTH93561+1ZB16DLMH13609 + 1x 5GTH93561+1ZCS16LMH12309 (with illumination) OR 4x 5GSH920+1ZB09 + 1x 5GSH920+1ZCS09 (without illumination) OR *5GTH92002Q (Illuminated quiet version)

Please see colour codes, updates of products and changes of specifications on www.apem.com

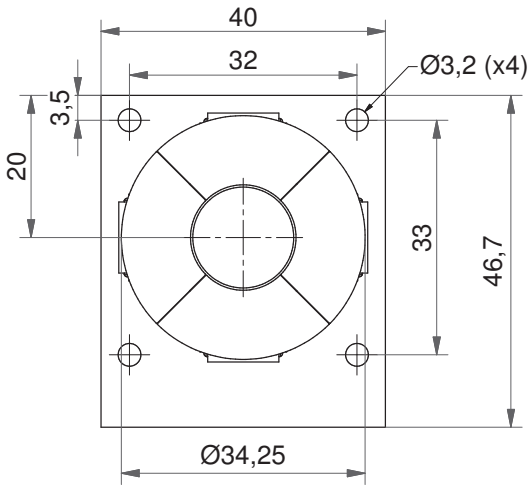


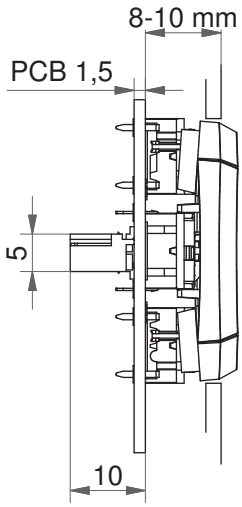
- Module should be attached to the front plate with bolts (bolts not supplied by MEC)
- Round solution
- Ø34.25 mm
- h =11.7 mm; 12.2 mm
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Recommended panel cut-out: Ø35,0 - 35,5 Depending on application

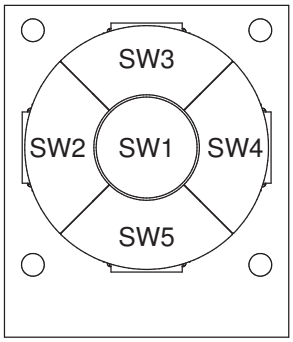
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

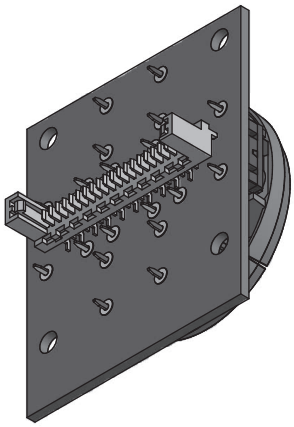
Navimec Module

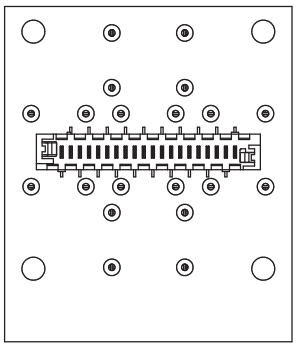






When the 1ZB is activated the diameter changes from 34,25 mm to 35,0 mm





HOW TO ORDER

navimec™ Module ordering options:
- navimec™ Module excl. keycaps
- navimec™ Module incl. keycaps
- navimec™ Module incl. keycaps with legends
- Illuminated navimec™ Module excl. keycaps
- Illuminated navimec™ Module incl. keycaps with legends

Part no. for a module:
navimec™ Module has many customisation options regarding actuation force, cap and LED colours and legends. Because of that "How to order" has been placed on page 43.

See previous page for information on switch and cap options.

SEE THE "HOW TO ORDER" GRAPH AS WELL AS CIRCUIT DIAGRAM AND CONNECTOR INFO ON PAGE 43

Ordering example:
95NA200913611806 (without illumination)
95NB350116LMH13612309 (with illumination)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Panel sealed solution for a control unit

controlmec™ 5E/5G + 1ZW

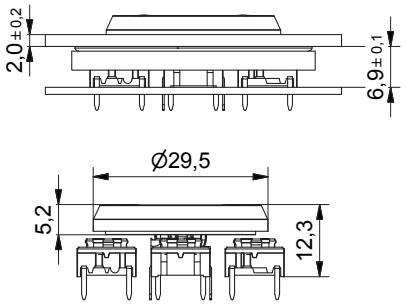
- Round cap
- Panel sealed solution, designed to control a unit or navigate a display
- Ø29.5 mm
- h =12.3 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1ZW-Ø30.3

All dimensions in mm *Tolerances -/+0.2mm*

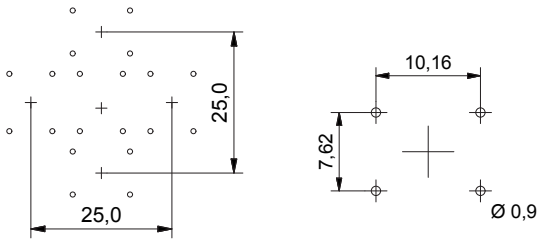


DIMENSIONS

TH + 1ZW

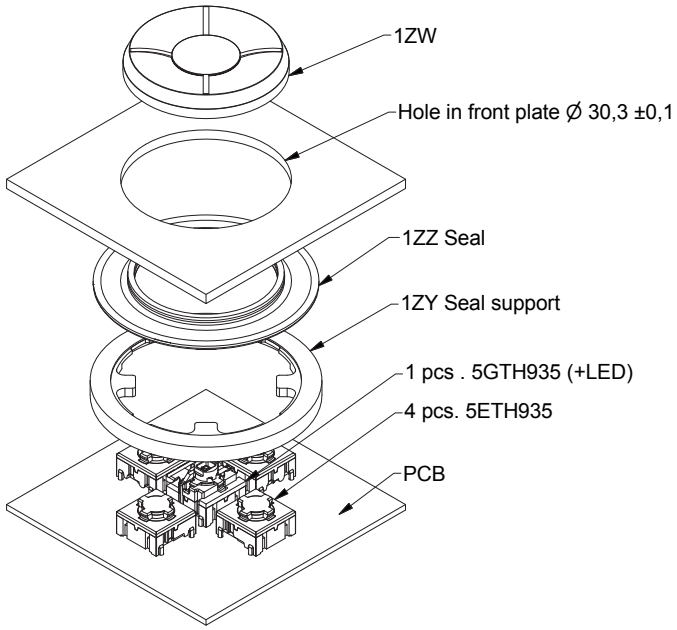


PCB layout



We recommend using through-hole terminals for precise placing.

MOUNTING EXAMPLE



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED (optional)		Cap	Colour code	Legend code
5 G				+			
	TH9 through-hole (**SH9** surface mount)	**35** **65**	**02** blue **22** green **42** yellow **61** white **82** red **2242** green/yellow **8222** red/green **8242** red/yellow		**1ZW**	**00** blue **03** grey **06** white **08** red **09** black **16** frosted white	**136** ▲ **118** OK **123** ⏻

Switch	Mounting	Actuation force		Seal	Seal support
5 E			+ **Panel seal**	1 Z Z	
	TH9 through-hole (**SH9** surface mount)	**35** **65**		**09** black	**1ZY**

Ordering example:
5GTH935+1ZW09+4x 5ETH935+1ZZ09+1ZY without illumination OR 5GTH96582+1ZW16LMH13611809+4x 5ETH965+1ZZ09+1ZY with illumination

Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Cap for a control unit

controlmec™ 5E/5G + 1Z

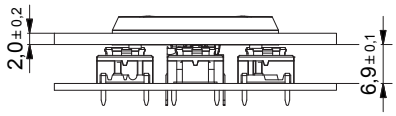


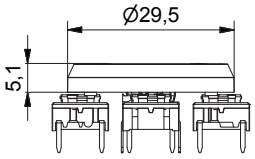
- Round cap
- Designed to control a unit or navigate in a display
- Ø29.5 mm
- h =12.0 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1Z-Ø30.3

All dimensions in mm *Tolerances -/+0.2mm*

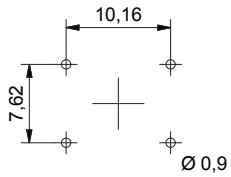
DIMENSIONS

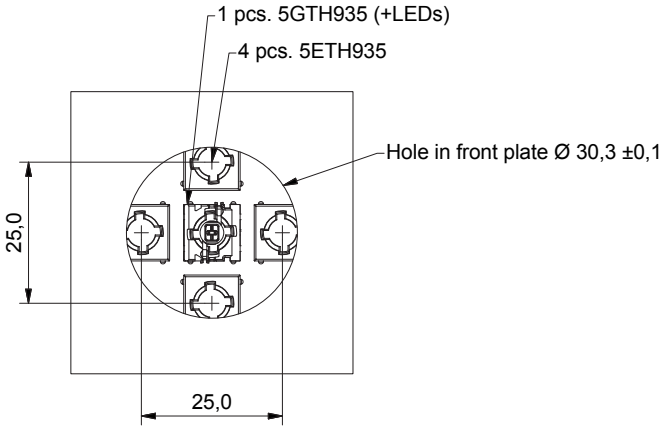
TH + 1Z

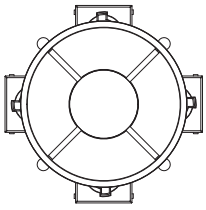


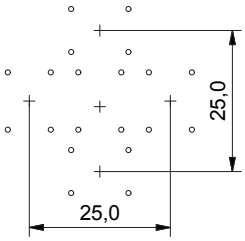


PCB layout









We recommend using through-hole terminals for precise placing.

ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED (optional)		Cap	Colour code	Legend code
5 G				+			
	TH9 through-hole	**35**	**02** blue		**1Z**	**00** blue	**136** ▲
	(**SH9** surface mount)	**65**	**22** green			**03** grey	
			42 yellow			**06** white	**118** OK
			61 white			**08** red	**123** ⏻
			82 red			**09** black	
			2242 green/yellow			**16** frosted white	
			8222 red/green				
			8242 red/yellow				

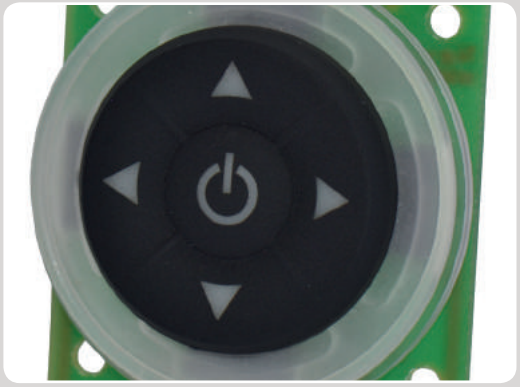
Switch	Mounting	Actuation force
5 E		
	TH9 through-hole	**35**
	(**SH9** surface mount)	**65**

Ordering example:
5GTH935+1Z03 +4x 5ETH935 without illumination OR 5GTH96561+1Z16LMH13611809 +4x 5ETH965 with illumination

Please see colour codes, updates of products and changes of specifications on www.apem.com

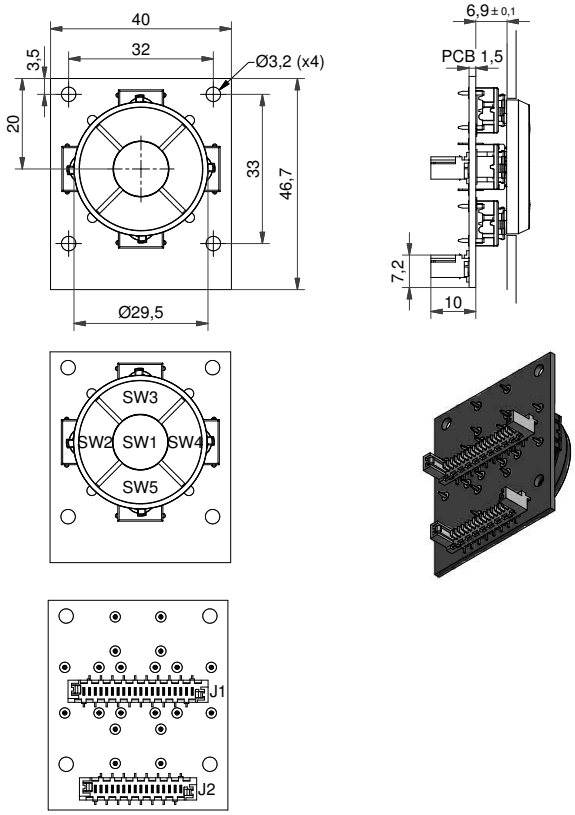
- Module should be attached to the front plate with bolts (bolts not supplied by MEC)
- Round cap
- Panel sealed or non-panel sealed solution
- Ø29.5 mm
- h =12.3 mm; 12.0 mm
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 1ZW/1Z module-Ø30.3

All dimensions in mm *Tolerances -/+0.2mm*

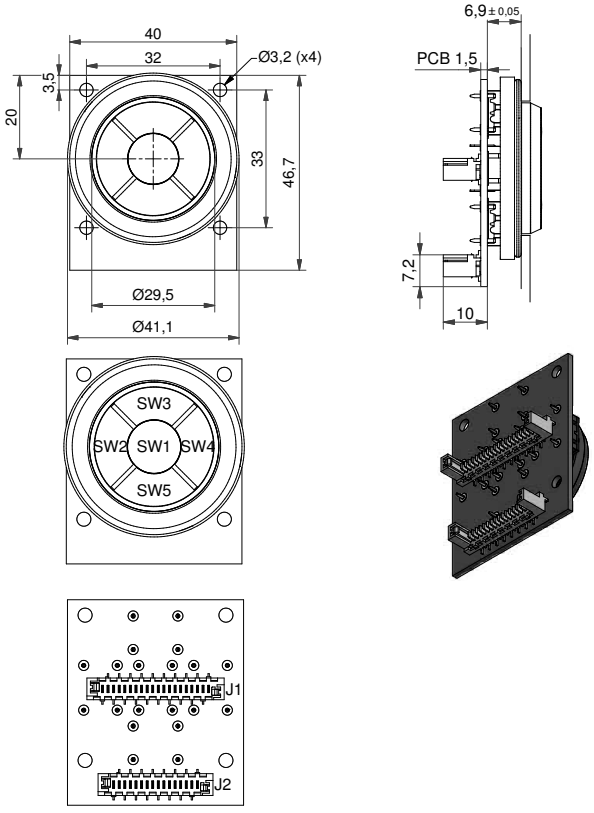


DIMENSIONS

1Z module



1ZW module



HOW TO ORDER

controlmec™ Module ordering options:

- controlmec™ Module excl. keycaps
- controlmec™ Module incl. keycaps
- controlmec™ Module incl. keycaps with legends
- illuminated controlmec™ Module excl. keycaps
- illuminated controlmec™ Module incl. keycaps with legends
- Sealed controlmec™ Module excl. keycaps
- Sealed controlmec™ Module incl. keycaps
- Sealed controlmec™ Module incl. keycaps with legends
- Sealed illuminated controlmec™ Module excl. keycaps
- Sealed illuminated controlmec™ Module incl. keycaps with legends

Part no. for a module:
controlmec™ Module has many customisation options regarding actuation force, cap and LED colours and legends. Because of that "How to order" has been placed on page 43.

See previous pages for information on switch and cap options.

SEE THE "HOW TO ORDER" GRAPH AS WELL AS CIRCUIT DIAGRAM AND CONNECTOR INFO ON PAGE 43

Ordering example: 95CA350913611806 (without illumination)
95CB358216LMH13612309 (with illumination)
95CC6509 (sealed without illumination)
95CD356116LMH13612309 (sealed with illumination)
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Large round cap with optional metal legend

5G+10R/10RF/10RM

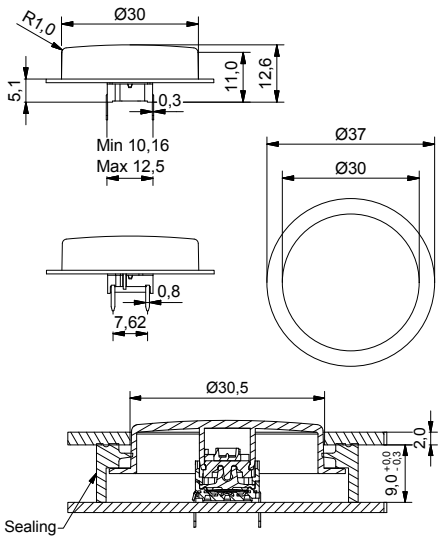


- Panel sealing option
- Round cap; Ø30 mm
- h =11 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 10R/10RF/10RM-Ø30.6
- Height of the spacer: 3.9mm
- Sealing IP67 (we recommend 6.5N switch)

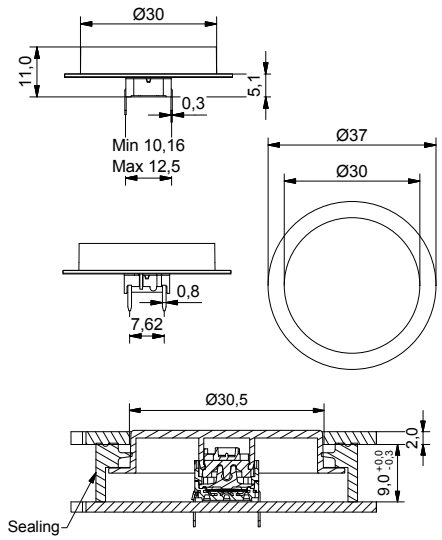
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

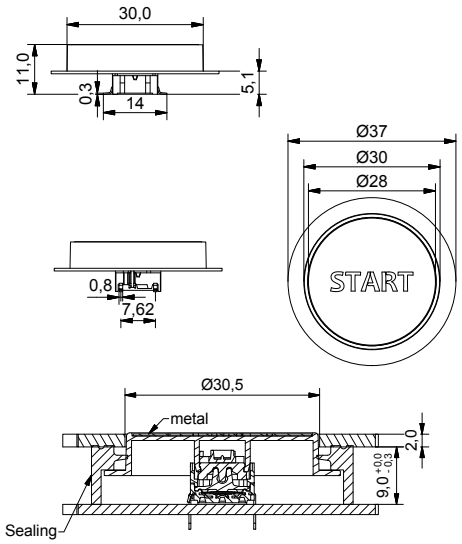
TH + 10R



TH + 10RF



SMD w/LED + 10RM



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code		Sealing		Spacer
5 G				+			+	1 0 R W	+	1 0 R Y
	TH9 through-hole	**20**	**02** blue		**10R**	**16** frosted white		optional		optional
	SH9 surface mount	**35**	**22** green							
		65	**42** yellow		**10RF**					
		Q*	**61** white							
			82 red		**10RM**					
			2242 green/yellow							
			8222 red/green							
			8242 red/yellow							

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

See pages 34-35 for metal legend.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap		Colour code		Sealing		Spacer
5 G			+				+	1 0 R W	+	1 0 R Y
	TH9 through-hole	**20**		**10R**	**10RF**	**00** blue	**06** white	optional		optional
	SH9 surface mount	**20Q**				**02** green	**08** red			
		35				**03** grey	**09** black			
		65				**04** yellow				

Ordering example:5GSH965+10R08+10RY non-illuminated with spacer OR 5GTH93502+10RM16031 with illumination OR 5GSH965+10RF0901806+10RW with sealing OR *5GTH92061Q (illuminated quiet version)

Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Large square cap with optional metal legend

5G + 10Q/10QM

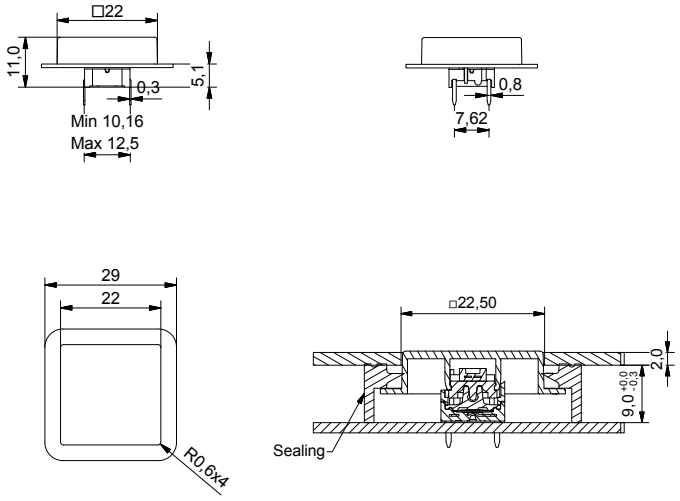
- Panel sealing option
- Square cap; 22 mm x 22 mm
- h = 11 mm
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C
- Panel cut-out: 10Q/10QM-22.5 x 22.5
- Height of the spacer: 3.9mm/5.1mm
- Sealing IP65 (we recommend 6.5N switch)



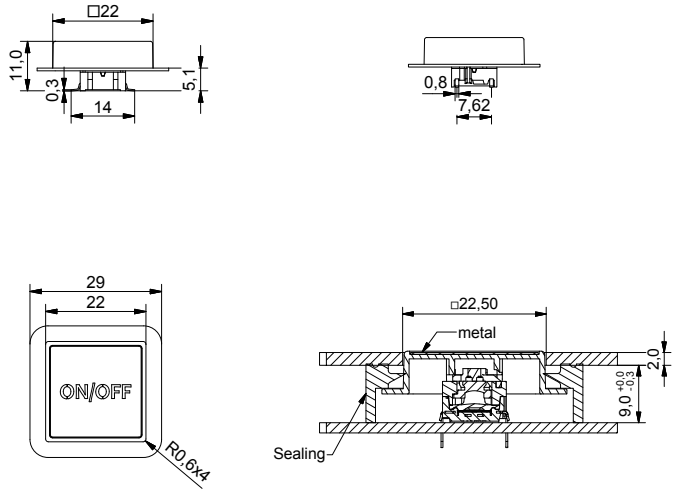
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

TH + 10Q



SMD w/LED + 10QM



ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Cap	Colour code		Sealing		Spacer
5 G				+			+	1 0 Q W	+	1 0 Q Y
	TH9 through-hole	**20**	**02** blue		**10Q**	**16** frosted white		optional		optional
	SH9 surface mount	**35**	**22** green							
		65	**42** yellow							
		Q*	**61** white		**10QM**					
			82 red							
			2242 green/yellow							
			8222 red/green							
			8242 red/yellow							

*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

See pages 34-35 for metal legend.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Cap	Colour code		Sealing		Spacer
5 G			+				+ 1 0 Q W	+	1 0 Q Y
	TH9 through-hole	**20**		**10Q**	**00** blue	**06** white	optional		optional
	SH9 surface mount	**20Q**			**02** green	**08** red			
		35			**03** grey	**09** black			
		65			**04** yellow				

Ordering example: 5GSH920+10Q00+10QY non-illuminated with spacer OR 5GTH93582+10QM16017 with illumination OR 5GSH965+10Q0910506+10QW with sealing OR *5GTH92001Q (illuminated quiet version)

Please see colour codes, updates of products and changes of specifications on www.apem.com

AUDIO – FOOT PEDAL



MEC part no: 5GTH935 + 1VS09

SECURITY PANEL



MEC part no: 5GSH920 + 1PS chromed

COFFEE MACHINE



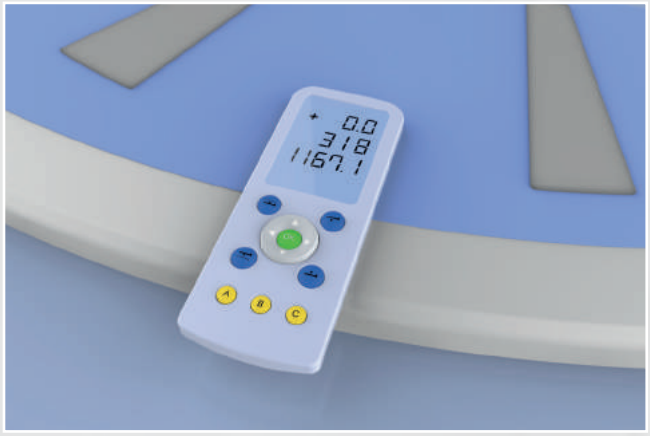
MEC part no: 5GTH965 + 1TS09 +1TS00

LEISURE - CASINO CHIP SORTER



MEC part no: navimec™, 5GTH935 + 1ZCS09

MEDICAL – REMOTE CONTROL FOR CT SCANNER



MEC part no: navimec™, 5GSH935 + 1ZCS30 + 1GAS04

AUDIO – TURNTABLE



MEC part no: navimec™, 5GSH935 + 1KS1116

AGRICULTURE – TRACTOR



MEC part no: 5GTH965 + 1JS00



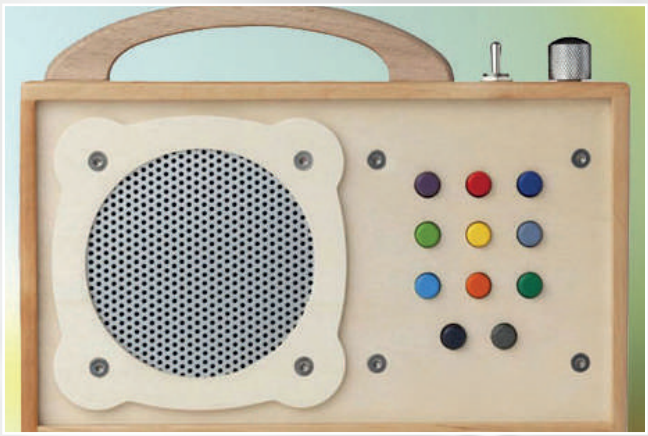
MEC part no: 5GTH965 + 1KS0016

MILITARY - NAVIGATION CHART SYSTEMS



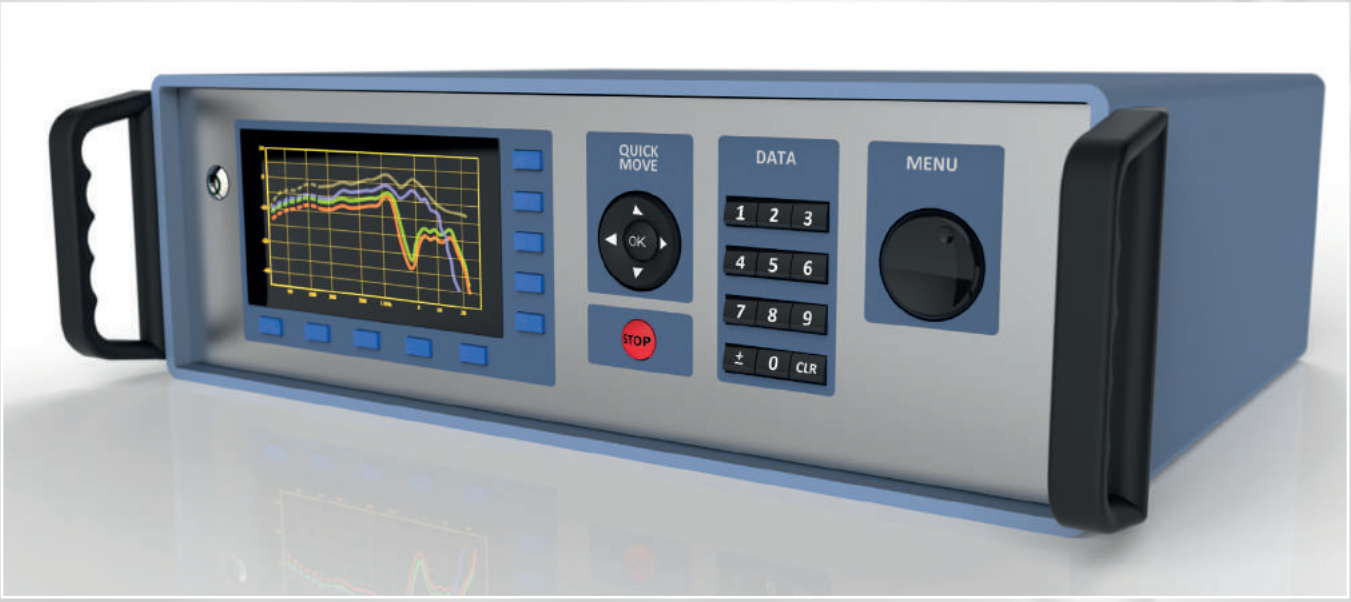
MEC part no: 5GSH935 + 1TS09 +1PS09

AUDIO – CHILDREN'S RADIO



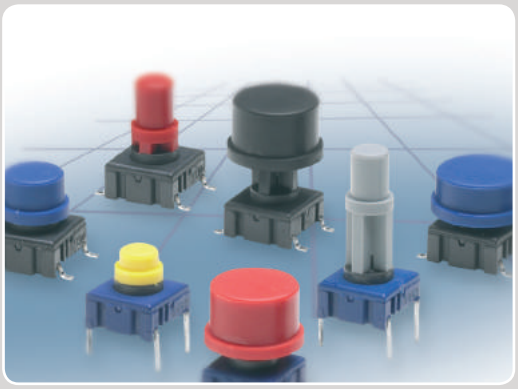
MEC part no: 5GSH935 + 1DS in many colours

INSTRUMENTATION – MEASUREMENT CONTROLLER



MEC part no: navimec™, 5GSH920 + 1ZCS08 + 1A09 + 1PS30

varimec™
variable height cap range

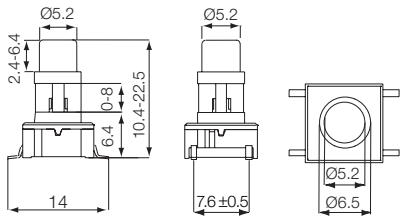


- Round caps
- 2400 options in the series
- Ø5.2 mm; Ø7.8 mm; Ø11.6 mm
- h =10.4-22.5 mm
- Material: polyamide
- Temp. Range:-40/+160°C

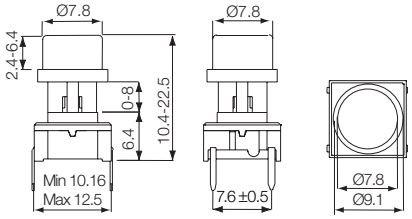
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

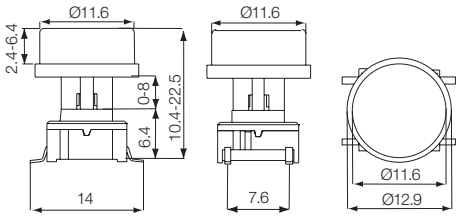
SMD+Round ø5.2

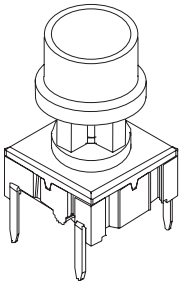


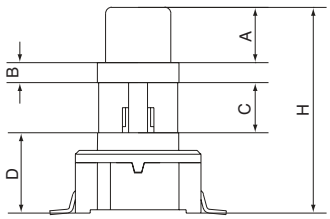
TH+Round ø7.8



SMD+Round ø11.6







The Concept

H= Overall heights from 10.4-22.5
A= Variable height from 2.4 to 6.4
H has to exceed A with min. 8.0
B= Fixed recess 1.6
D= Fixed switch 6.4
C= variable from 0-8.1
C=H-A-B-D
All measurements in mm

HOW TO ORDER

Switch

3 E S H

3 E T H

Shape and size

A 5.2 Round
E 7.8 Round
K 11.6 Round

Colour code

60 blue
63 grey
64 yellow
68 red
69 black

Overall height H

A 10.4
B 11.0
C 12.0
D 12.5
E 13.0
F 14.0
G 15.0
H 16.0
J 19.0
K 22.5

Height above recess A

A 2.4
B 3.0
C 3.5
D 4.0
E 4.5
F 5.0
G 5.6
H 6.4

Tape*

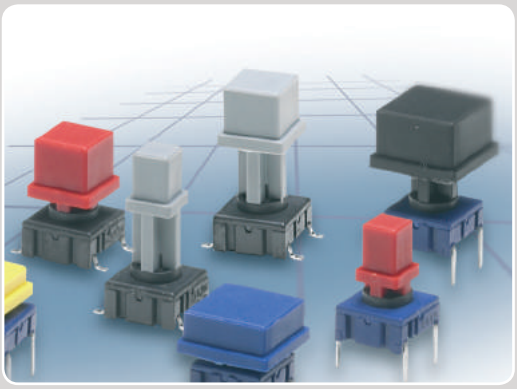
R

Ordering example:
Examples switch and cap: 3ETHE64CC = Switch 3ETH, 7.8 round cap, yellow, overall height 12.0, height above recess 3.5, (height under recess 0.5).
Example caap alone: 3E-E63FF = Cap, 7.8 round, grey, overall height with switch 14.0, height above recess 5.0, (height under recess 1.0).
Min. order is 2.000 pcs. per shape, size and heights for parts mentioned above.
For heights not mentioned in the list a start-up fee will apply.
*Only overall height up to 12.5mm can be supplied on tape.
Please see colour codes, updates of products and changes of specifications on www.apem.com

varimec™

variable height cap range

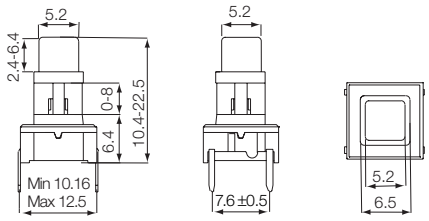
- Square caps
- 2400 options in the series
- 5.2 mm x 5.2 mm; 7.8 mm x 7.8 mm; 11.6 mm x 11.6 mm
- h =10.4-22.5 mm
- Material: polyamide
- Temp. Range:-40/+160°C



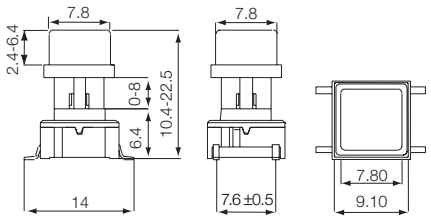
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

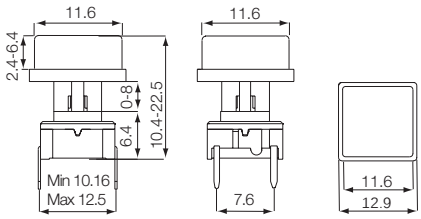
TH+Square 5.2

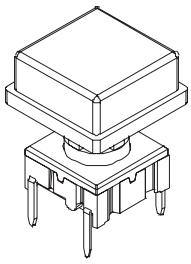


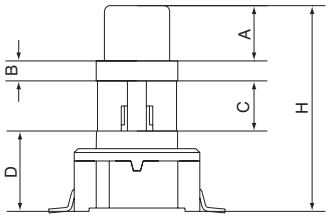
SMD+Square 7.8



TH+Square 11.6







The Concept

H= Overall heights from 10.4-22.5
A= Variable height from 2.4 to 6.4
H has to exceed A with min. 8.0
B= Fixed recess 1.6
D= Fixed switch 6.4
C= variable from 0-8.1
C=H-A-B-D
All measurements in mm

HOW TO ORDER

Switch

3 E S H

3 E T H

Shape and size

B 5.2 Square
F 7.8 Square
L 11.6 Square

Colour code

60 blue
63 grey
64 yellow
68 red
69 black

Overall height H

A 10.4
B 11.0
C 12.0
D 12.5
E 13.0
F 14.0
G 15.0
H 16.0
J 19.0
K 22.5

Height above recess A

A 2.4
B 3.0
C 3.5
D 4.0
E 4.5
F 5.0
G 5.6
H 6.4

Tape*

R

Ordering example:
Examples switch and cap: 3ESHB60AA = Switch 3ESH, 5.2 square cap, blue, overall height 10.4, height above recess 2.4, (height under recess 0).
Example caap alone: 3E-E63FF = Cap, 7.8 square, grey, overall height with switch 14.0, height above recess 5.0, (height under recess 1.0).
Min. order is 2.000 pcs. per shape, size and heights for parts mentioned above.
For heights not mentioned in the list a start-up fee will apply.
*Only overall height up to 12.5mm can be supplied on tape.
Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

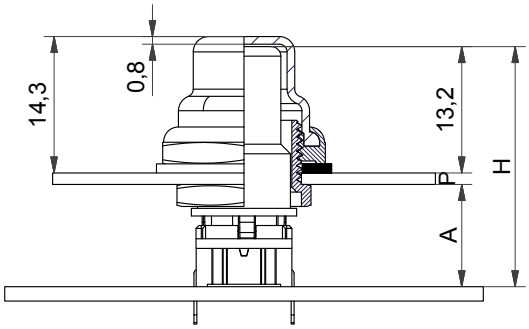
Panel sealed round solution

5G + aquamec™



- Round cap
- Solution panel sealed to IP 67
- Ø10.6 mm
- h =24.2-27.2 mm (h from front panel=14.3 mm)
- Material: ABS/polycarbonate
- Temp. Range:
  - Solid cap: -40/+65°C
  - Transparent cap: -40/+85°C

All dimensions in mm *Tolerances -/+0.2mm*



H=A+P+13.2

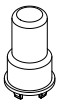
this leaves nominel 0.3 mm clearance between the top of the cap and the inner side of the sealing boot to accomplish assembly tolerances. A can be chosen between 10-13 mm, we recommend 10 mm to reduce building height and optimise cap guidance.

A	P	CAP	H	BUSHING
10.0	1.0	AQCSxx-24.2	24.2	AQN-0.5
10.0	2.0	AQCSxx-25.2	25.2	AQN-0.5
10.0	3.0	AQCSxx-26.2	26.2	AQN-2.5
10.0	4.0	AQCSxx-27.2	27.2	AQN-2.5

Cap is available in black (09) or transparent (11).
The dimension H is the overall height of the switch+cap.
Bushing AQN-0.5 accepts panel thickness (P) 0.5-2.5 mm.
Bushing AQN-2.5 accepts panel thickness (P) 2.5-4.0 mm.

ILLUMINATED – HOW TO ORDER

Switch	Mounting	Actuation force	LED		Bushing		Cap		Overall height (H)		Sealing boot
5 G				+	A Q N - .	+	A Q C S	-	.	+	A Q B 0 1
	TH9 through-hole	**20**	**02** blue		**0.5**		**11** transparent		**24.2**		incl. sealing
		35	**22** green		**2.5**				**25.2**		**11** transparent
		65	**42** yellow						**26.2**		
	SH9 surface mount	**Q***	**61** white						**27.2**		
			82 red								
			2242 green/yellow								
			8222 red/green								
			8242 red/yellow								







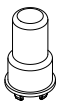


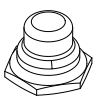
*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

NON-ILLUMINATED– HOW TO ORDER

Switch	Mounting	Actuation force		Bushing		Cap		Overall height (H)		Sealing boot
5 G			+	A Q N - .	+	A Q C S	-	.	+	A Q B 0 1
	TH9 through-hole	**20**		**0.5**		**09** black		**24.2**		incl. sealing
		20Q		**2.5**				**25.2**		**09** black
		35						**26.2**		
	SH9 surface mount	**65**						**27.2**		









Ordering example: 5GTH93522+AQN-0.5+AQCS11-24.2+AQB0111 with illumination OR 5GSH965+AQN-2.5+AQCS09-27.2+AQB0109 non-illuminated, *5GSH92082Q (illuminated quiet version)

Please see colour codes, updates of products and changes of specifications on www.apem.com

multimec®

Extender for 5G cap range

5G + Extender 2SS

- Designed for 5G cap retention system
- Stackable, giving the possibility to match most overall heights
- h =5-10 mm
- Material: Nylon
- Temp. Range:
  - Switch: -40/+160°C
  - LED: -30/+85°C
  - Solid keycap: -40/+65°C
  - Transparent keycap: -40/+85°C

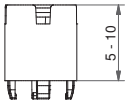


All dimensions in mm *Tolerances -/+0.2mm*

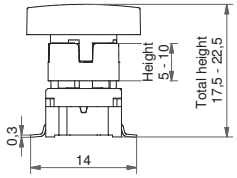
DIMENSIONS

2SS

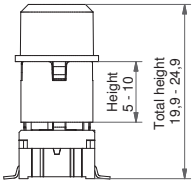
5 mm, 6 mm, 7 mm, 8 mm, 9 mm, 10 mm



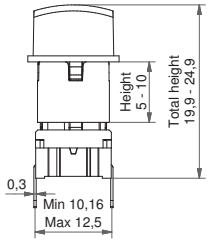
SMD + 2SS+1GCS



SMD + 2SS+1DS



TH + 2SS+1TS



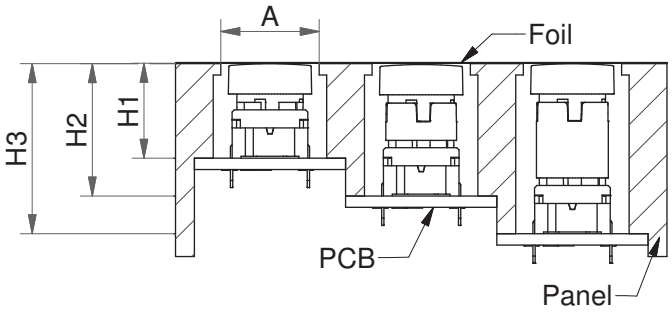
HOW TO ORDER

Switch	Mounting	Actuation force	LED (optional)		Cap	Extender 2SS height
5 G				+		2 S S 0 9 - . 0
	TH9 through-hole	**20**	**02** blue		See the table below	**05.0**
	SH9 surface mount	**35**	**22** green			**06.0**
		65	**42** yellow			**07.0**
		Q*	**61** white			**08.0**
			82 red			**09.0**
			2242 green/yellow			**10.0**
			8222 red/green			
			8242 red/yellow			



*For an illuminated quiet 2.0N switch add Q to the end of the switch part number.

How to use 1GAS/1GCS + 2SS under foil



A=We recommend you to allocate enough 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 with a small pretention 0.1-0.2mm

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	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

Ordering example: 5GTH935+1GAS09+2SS09-06.0 OR *5GSH920Q or 5GTH92082Q (quiet version)

Please see colour codes, updates of products and changes of specifications on www.apem.com

Legends

Avaliable for Multimec caps

standard legends

LEGEND	1B09U_ 1B09D_	1DS09_	1FS096R_	1ZB09D_ 1ZB16DLMH_	1ZCS_	10R_ & 10RF_ 10RM16_	10Q_ 10QM16_
0	000	000	000				
1	001	001	001				
2	002	002	002				
3	003	003	003				
4	004	004	004				
5	005	005	005				
6	006	006	006				
7	007	007	007				
8	008	008	008				
9	009	009	009				
#		107	107				
✱		019	019				
→		033					
←		133					
↑		034					
↓		134					
↵		135	135				
+						054	054
-						059	059
▲				136*			
⏻		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	105
ESC					051		
OK					118*	118	118
SET					119		
MENU					120		
FUNC					121		
HOME					122		

STANDARD OPTIONS

1B
pad printed

1DS
pad printed

1FS
reverse printed

1ZB
pad printed
*laser marked

1ZCS
pad printed
*reverse printed
*laser marked

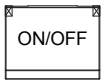
10R(F) & 10Q_
pad printed
reverse printed

10RM & 10QM
metal symbol

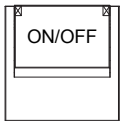
Ordering example: 1FS096R12309; 1ZB09D13606; 1ZCS16LMH11809
Please see colour codes, updates of products and changes of specifications on www.apem.com

Legends

Avaliable for Multimec caps



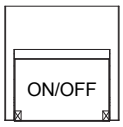
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1A09U01706



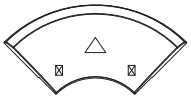
UP
1B09U01706



DOWN
1A09D01706



DOWN
1B09D01706



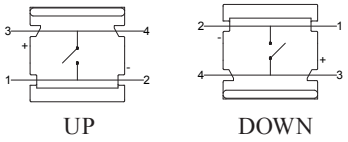
DOWN
1ZB09D13606

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 or D) needs to be added to the part number to refer to the position of the hinges in relation to the legend. See samples to the left.

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

Orientation of the switch:



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 has both negative and positive print option. E.g. 1FS096R00009

Option 3: METAL SYMBOL
Only available for 10RM and 10QM (therefore the "M"). E.g. 10RM16059

STANDARD AND CUSTOM LEGENDS - HOW TO ORDER

STANDARD 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.

Cap	Cap colour	Direction*	Type*	Legend	Legend colour*
1B **1DS** ... etc	**00** blue **02** green **03** grey **04** yellow **06** white **08** red **09** black **16** frosted white ... etc	**D** down **U** up *only for hinge-type caps	**LM** laser marked on soft paint **LMH** laser marked on hard paint **R** reverse printed *in case of illumination	**001** 1 **002** 2 **003** 3 ... etc	**00** blue **02** green **03** grey **04** yellow **06** white **08** red **09** black ... etc *in case of laser marked legends the colour of the soft or hard paint

NOTE:

- 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) on another cap than designated in the table, then there is no start-up cost, for this to apply the cap has to be black and the print white.
- Standard legend colours are white paint on a black cap and black paint on a frosted white cap. Other colour combinations are handled as custom.
- For further information on legends please contact your local distributor or MEC.

PLEASE FIND THE FULL LIST OF AVAILABLE LEGENDS ON MEC WEBSITE www.apem.com

Ordering example: 1ZW0913611806; 1B06U13508; 10R16R10509
Please see colour codes, updates of products and changes of specifications on www.apem.com

Switch series

Selection guide

	MOMENTARY	LATCHING	QUIET	KEY FEATURES
2.5N actuation force	**1540x** >10M operations -40/+160°C silver or gold contacts 	**1545x** 5M operations -40/+160°C silver or gold contacts 	**15420** >10M operations -40/+160°C gold contacts 	**unimec:** through-hole double pole 8 contact functions 1.8mm travel
	STANDARD	**STANDARD**	**ILLUMINATED**	**KEY FEATURES**
3.5N (3 series) actuation force	**3CTH9** through-hole -40/+160°C 	**3ETH9** through-hole -40/+160°C 	**3FTH9xxRAS** through-hole 	**Multimec 3 series:** momentary/ single pole >10 million operations IP 67 1 mm travel
	3CSH9 surface mount -40/+160°C 	**3ESH9** surface mount -40/+160°C 		
2.0N actuation force	**5ETH920** through-hole quiet version RAS version 	**5GTH920** through-hole quiet version RAS version 	**5GTH920xx** through-hole quiet version 	**Multimec 5 series:** momentary/ single pole >10 million operations IP 67 – 1mm travel Temp. range: -40/+160°C
	5ESH920 surface mount quiet version 	**5GSH920** surface mount quiet version 	**5GSH920xx** surface mount quiet version 	**Function**: normally open (NO) or normally closed/normally open (NC/NO)
3.5N actuation force	**5ETH935** through-hole RAS version NO or NC/NO 	**5GTH935** through-hole RAS version NO or NC/NO 	**5GTH935xx** through-hole 	**LED colours:** 01 blue - 22 green - 42 yellow 61 white - 82 red - 8222 red/ green - 2242 green/yellow 8242 red/yellow
	5ESH935 surface mount NO or NC/NO 	**5GSH935** surface mount NO or NC/NO 	**5GSH935xx** surface mount 	**RAS**: right angle version only available with through-hole(TH) normally open (NO) switch
6.5N actuation force	**5ETH965** through-hole RAS version 	**5GTH965** through-hole RAS version 	**5GTH965xx** through-hole 	
	5ESH965 surface mount 	**5GSH965** surface mount 	**5GSH965xx** surface mount 	

10 MILLION ACTUATIONS

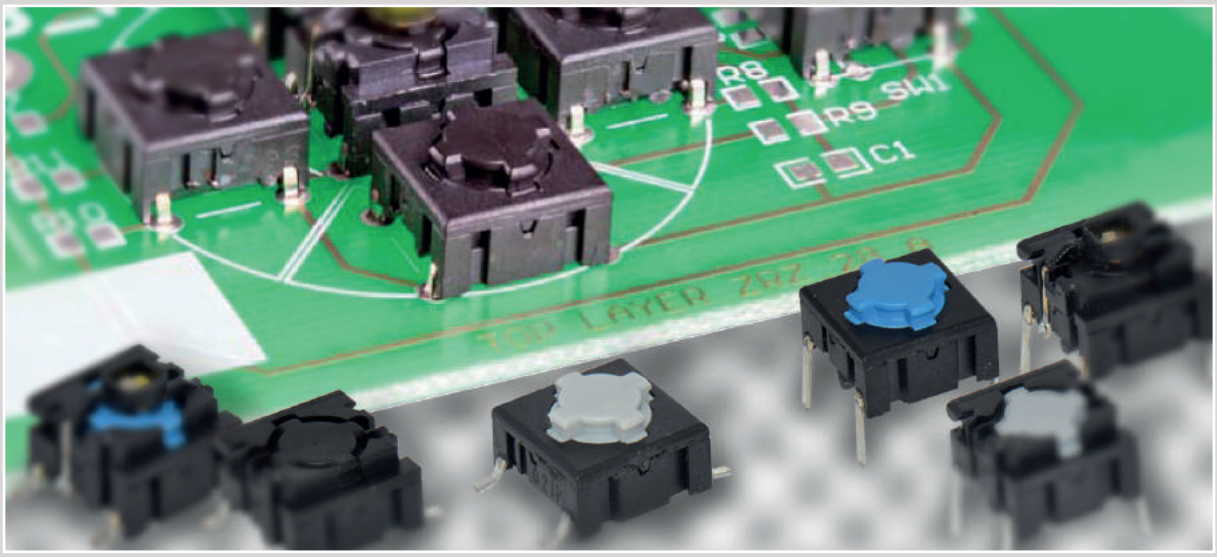
IP 67 SEALING

NORMALLY OPEN (NO) OR

NORMALLY CLOSED/NORMALLY OPEN (NC/NO)

THROUGH-HOLE RIGHT ANGLE VERSION

QUIET CONTACT OPTION WITH 2.0N

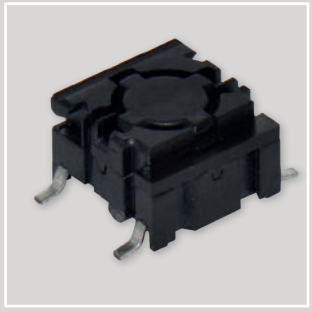


multimec® 5 series is the new generation of 3A, 3F, 4A and 4F switch. In principle the multimec® 5 series is very similar to the 3 series - it has the same pin layout, the same dimensions and the same electrical specifications.

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

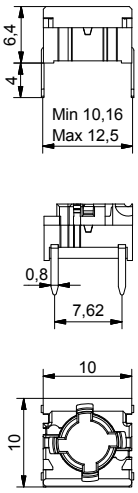


- Through-hole (TH) or surface mount (SMD)
- 50mA/24VDC
- Single pole/momentary
- 10,000,000 operations lifetime (NO function)
- Temperature range:
  - Switch: -40/+160°C
  - LED: -40/+85°C
- IP 67 sealing
- Actuation force: 2.0N, 3.5N, 6.5N
- NO or NC/NO

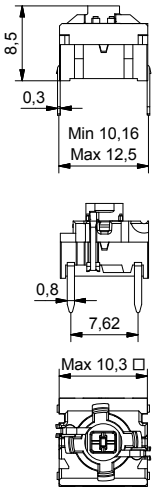
All dimensions in mm *Tolerances -/+0.2mm*

THROUGH-HOLE (TH)

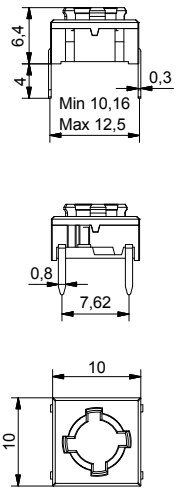
5G



5G illuminated

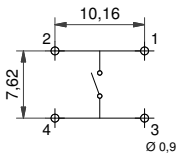


5E

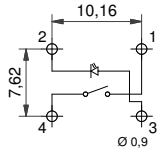


PCB LAYOUT

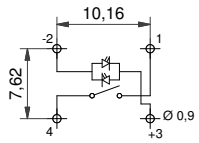
Non-illuminated



1 LED

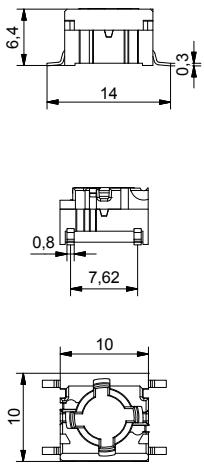


2 LED

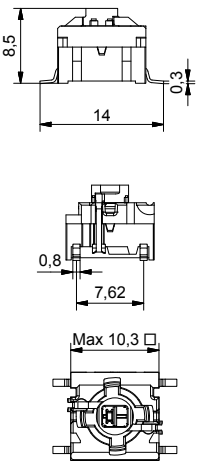


SURFACE MOUNT (SMD)

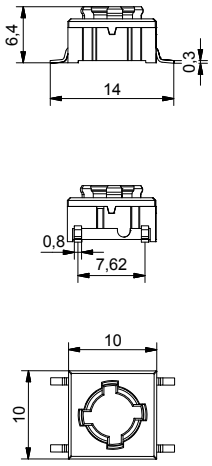
5G



5G illuminated

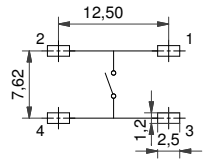


5E

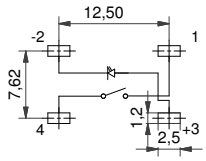


PCB LAYOUT

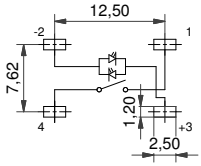
Non-illuminated



1 LED



2 LED

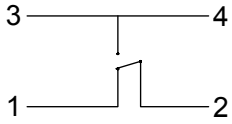


NORMALLY CLOSED/NORMALLY OPEN FUNCTION

NOT FOR SALE IN JAPAN

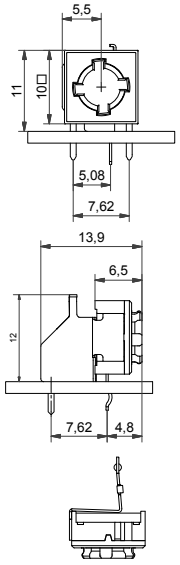
- Available for 5E and non-illuminated 5G in 3.5N actuation force.
- Same PCB layout as the NO 5E and 5G
- Housing colour is **grey**

CIRCUIT DIAGRAM

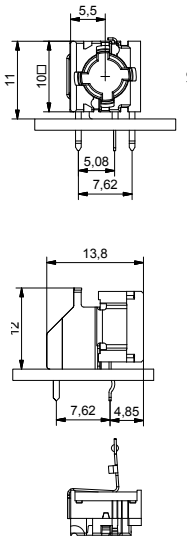


RIGHT ANGLE SWITCHES

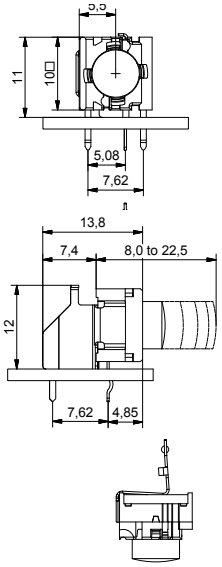
5E



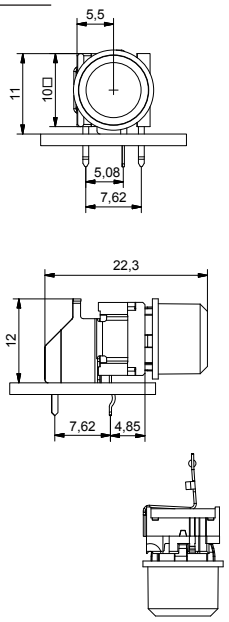
5G



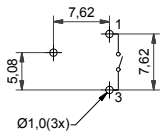
5G + 1SS



5G + 1DS



PCB LAYOUT



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					
	TH9 through-hole	**20**	**02** blue	**82** red	**Q**
	SH9 surface mount	**35**	**22** green	**2242** green/yellow	only for 2.0N
		65	**42** yellow	**8222** red/green	
			61 white	**8242** red/yellow	

NON-ILLUMINATED– HOW TO ORDER

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

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

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.apem.com

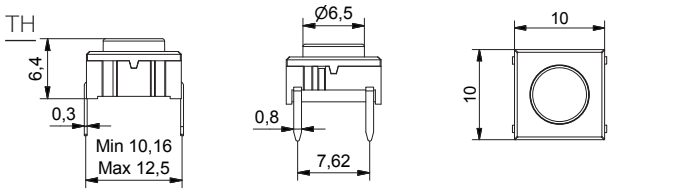


- Through-hole (TH) or surface mount (SMD)
- 50mA/24VDC
- Single pole/momentary
- 10,000,000 operations lifetime
- Temperature range:
  - High temp: -40/+160C
- IP 67 sealing
- Actuation force: 3.5N
- Most caps in the catalogue have a version for mounting on 3F switch as well. Contact MEC for further information.

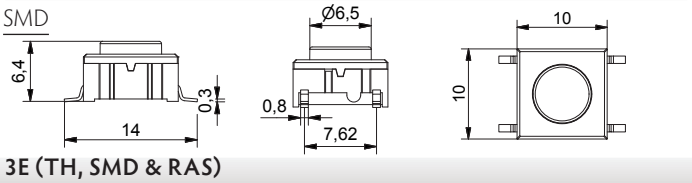
All dimensions in mm *Tolerances -/+0.2mm*

3C (TH, SMD & RAS)

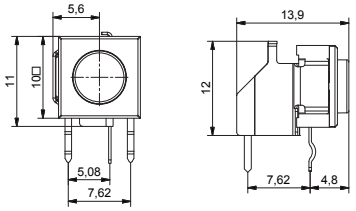
TH



SMD

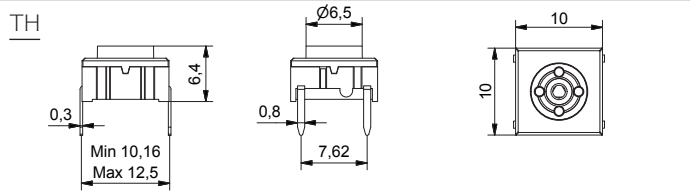


RAS

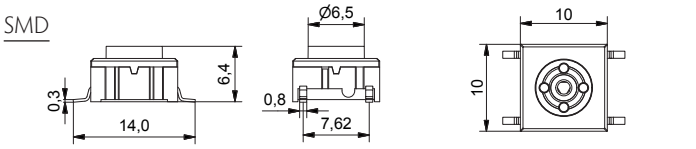


3E (TH, SMD & RAS)

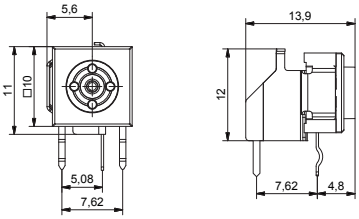
TH



SMD

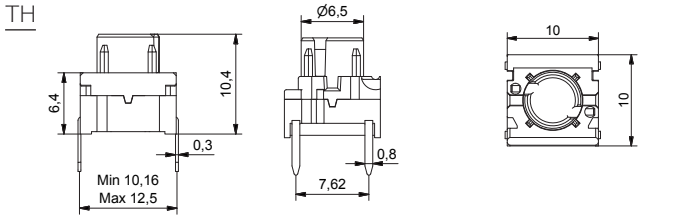


RAS

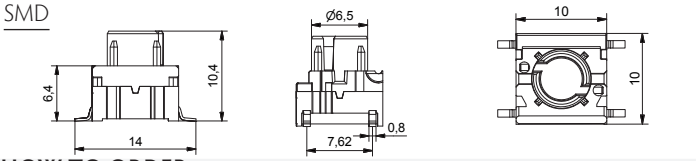


3F (TH, SMD & RAS W/LED)

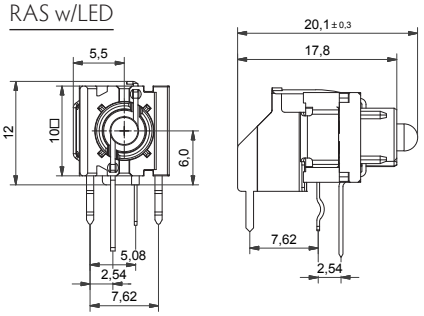
TH



SMD

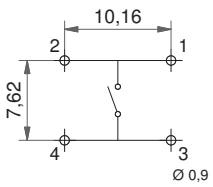


RAS w/LED

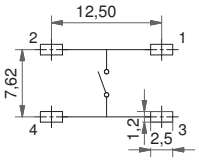


PCB LAYOUT

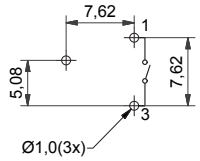
Through-hole



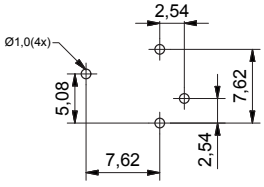
Surface mount



Through-hole RAS



Through-hole illuminated RAS



HOW TO ORDER

Switch

3C	
3E	
3F	

Mounting

T	through-hole
S	surface mount

Temperature range

H9	high temp.

LED (onyl for 3F)

00 blue	**60** white	**8020** red/ green
20 green	**80** red	
40 yellow	**2040** green/ yellow	**8040** red/ yellow

Right angle support

RAS optional

3FTH9RAS with LED can be used with the 3 series keycaps: 1D, 1E, 1F, 1K, 1N, 1Q, 1R, 1S, 1T, 1U, 1V, 1WA, 1WD, 1WP, 1X. Ask further information on caps from MEC.

Ordering example: 3CTH9, 3ESH9, 3FTH9RAS *Please see colour codes, updates of products and changes of specifications on www.apem.com*

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		
Pitch:	see list	Quantity per reel:	see list

3C/3E/5E/5G multimec®tape & reel

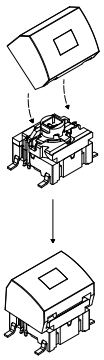
Part No.	Ordering Code	Pitch	Quantity per reel
3CSH9	3CSH9R	16	500
3ESH9	3ESH9R	16	500
5ESH9XX	5ESH9XXR	16	500
5GSH9XX	5GSH9XXR	16	500
5XSH9XX1SSXX-08.0	5XSH9XXR1SSXX-08.0	20	250
5XSH9XX1SSXX-09.5	5XSH9XXR1SSXX-09.5	20	250
5XSH9XX1SSXX-10.4	5XSH9XXR1SSXX-10.4	20	250
5XSH9XX1SSXX-11.0	5XSH9XXR1SSXX-11.0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

illuminated 5G multimec®tape & reel

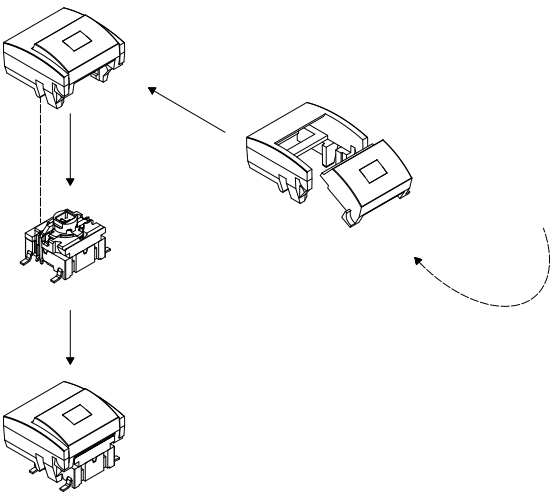
Part No.	Ordering Code	Pitch	Quantity per reel
5GSH9XX02	5GSH9XX02R	20	250
5GSH9XX22	5GSH9XX22R	20	250
5GSH9XX42	5GSH9XX42R	20	250
5GSH9XX61	5GSH9XX61R	20	250
5GSH9XX82	5GSH9XX82R	20	250
5GSH9XX2242	5GSH9XX2242R	20	250
5GSH9XX8222	5GSH9XX8222R	20	250
5GSH9XX8242	5GSH9XX8242R	20	250

How to assemble

multimec®
5GS+1A/H

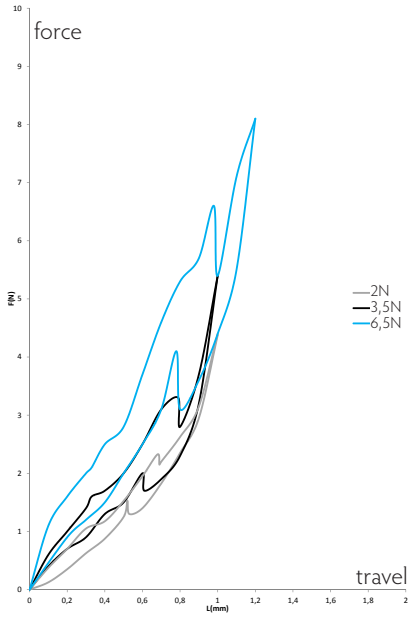


multimec®
5GS+1B/C+2C/D

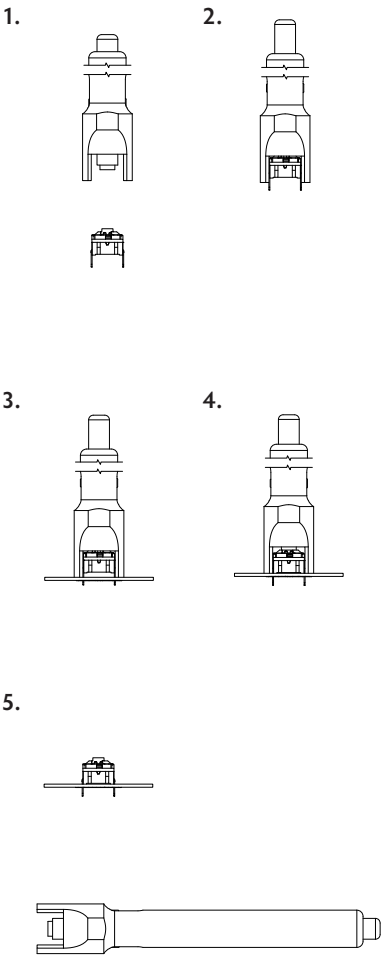


Operating force

(typical example)



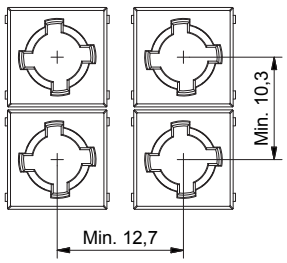
Mounting tool for multimec® through-hole switches



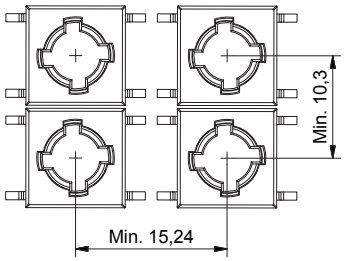
Part No. 9861000

Basic switch spacing

through-hole (TH)

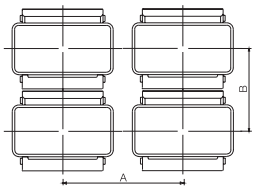


surface mount (SMD)

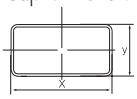


Recommended switch/cap spacing

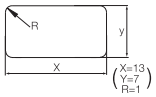
Switch spacing



Cap dimensions

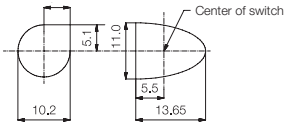


Panel cut-out

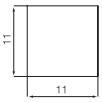


Panel cut-out

1NS 1VS

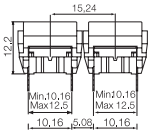


1TS

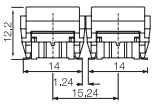


Spacing examples

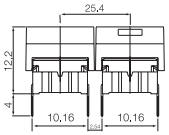
multimec
5GT+1B/C+2C/D



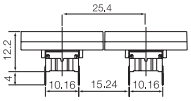
multimec
5GS+1B/C+2C/D



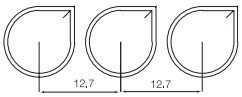
multimec
5GT + 1A/H



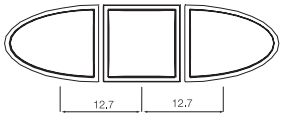
multimec
5GT + 1M



multimec
1NS + 1NS + 1NS

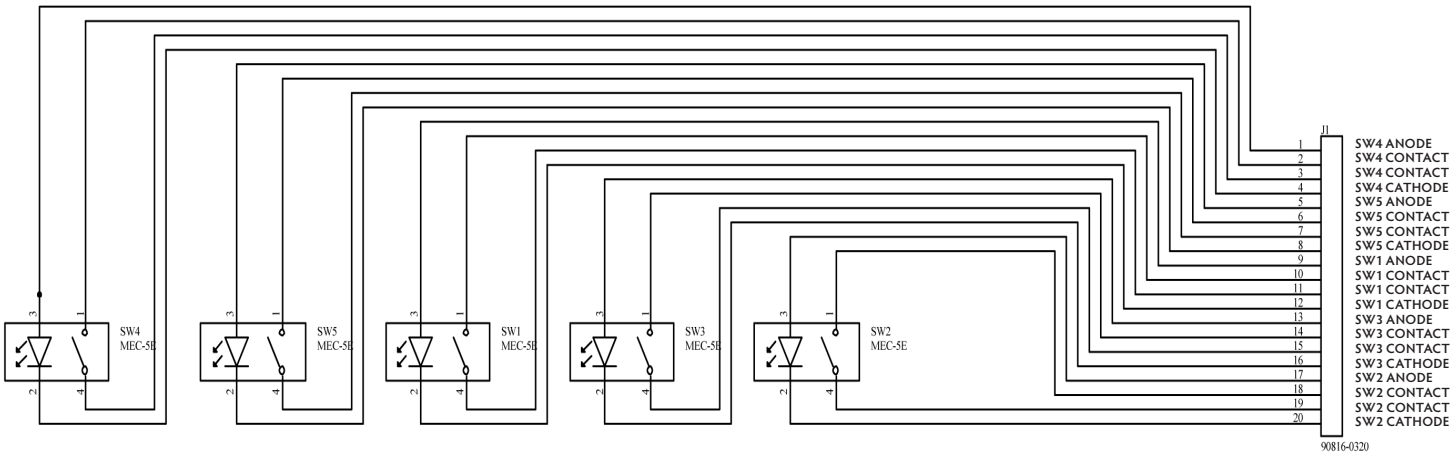


multimec
1VS + 1TS+ 1VS

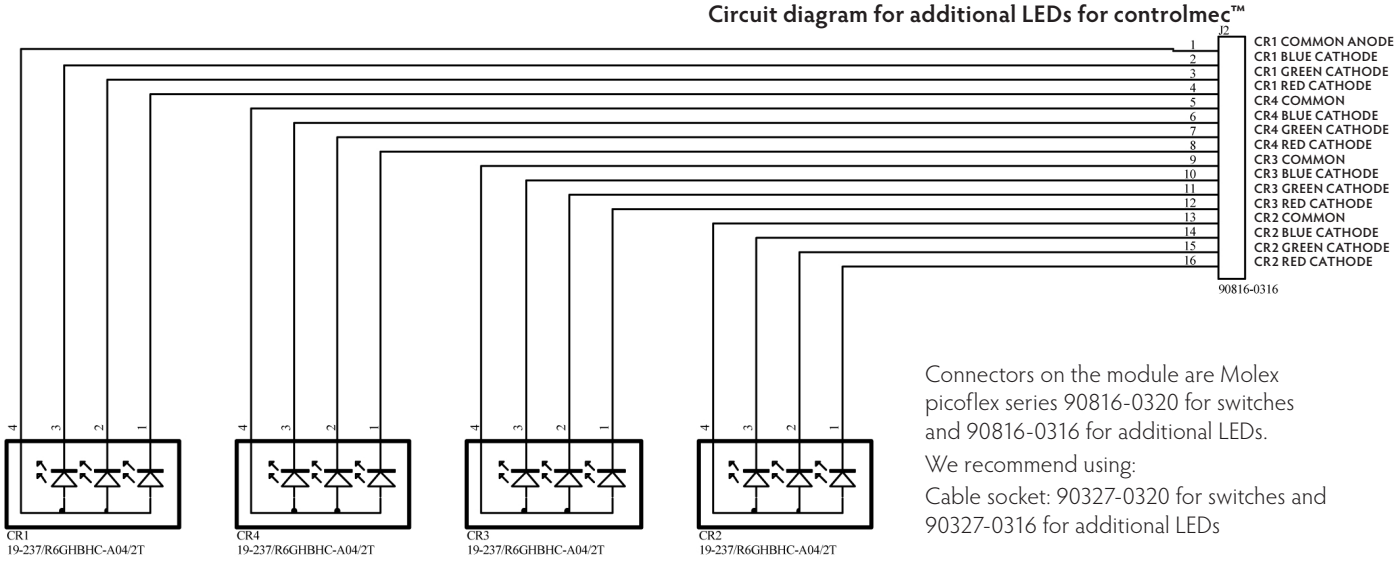


Cap series	Recommended min. switch spacing AxB	Nominal cap dimension WxH	Recommended min. panel cut-out
1A/1H	12.7x10.16	12.6x10.1	13.0x10.5
1B/1C+2C/2D	15.24x15.24	15.1x15.1	15.5x15.5
1DS/1ES/1FS	12.7x12.7	ø9.6	ø10.0
1GAS	12.7x11.14	ø11	ø11.4
1GCS	15.14x15.14	ø15	ø15.4
1JS	12.7x12.7	ø9.6	ø10.4
1KS/1KBS/1KCS	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	22.5x22.5

Circuit diagram for switches



Circuit diagram for additional LEDs for controlmec™



Connectors on the module are Molex picoflex series 90816-0320 for switches and 90816-0316 for additional LEDs.

We recommend using:

Cable socket: 90327-0320 for switches and 90327-0316 for additional LEDs

HOW TO ORDER - MODULES

Module

9 5

Cap

C controlmec module
N navimec module
Q 10Q module
R 10R module

Type

A non-illuminated
B illuminated

Sealed controlmec module:

C non-illuminated
D illuminated

Actuation force

20 2.0N**
35 3.5N
65 6.5N

LED*

02 blue
22 green
42 yellow
61 white
82 red
2242 green/yellow
8222 red/green
8242 red/yellow

Cap colour

09 black
16 frosted white

Legend type*

(nothing) pad printed
LMH hard paint laser marked
M Metal

Legend on the edges*

136 ▲

Legend in the centre*

118 OK
123 ⏻
***Find more options on apem.com*

Legend colour*

06 white
09 black

*optional, ** 2.0N actuation force not recommended for controlmec*

Ordering example:
95CB358216LMH13611809 - illuminated non-sealed controlmec
95CC650913612306 - non-illuminated panel sealed controlmec
95NB358216LMH13611809 - illuminated Navimec module
95QB200116M118 - illuminated 10Q module
95RA350912306 - non-illuminated 10R module
Please see colour codes, updates of products and changes of specifications on www.apem.com

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		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
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 60068-2-20 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-020E		
ENVIRONMETAL 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 and transparent colour caps, lids for 1KBS/1KCS	Max. 85°C	UL94HB
Polyamide	1GAS/1GCS, 1SS, 2SS	Max. 160°C	UL94V2
Legends Adhesion	DS/EN ISO 2409 Class 1 & ASTM D3359 Class 4B		

RoHS Compatible

	HIGH TEMPERATURE VERSIONS	
	SILVER	GOLD
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)	3.5N typ	
Max. Actuation force without cap	100N for 10 sec	
Key travel (switch)	1 mm	
Life time (switch)	>10,000,000	
Temperature Range		
Working temperature	Min -40°C Max +160°C	
Storage temperature	Min -40°C Max +160°C	
Soldering IEC 60068-2-20 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.	
ENVIRONMETAL 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 – Material Specifications

MATERIAL	PARTS	TEMP. LIMIT	UL RATING
Polyamide	Actuators for varimec™	Max 160°C	UL94V2

LEDs specifications

5G switches

Colour		Blue	Green	Yellow	White	Red	High Intensity Green
Colour Codes		02	22	42	61	82	29
ABSOLUTE MAXIMUM RATINGS (Ta=25°C)							
Power	mW	95	75	60	48	65	102.5
Current forward	mA	25	30	25	15	25	25
Forward peak current	mA	100	80	60	100	100	150
Voltage reverse	V	5	5	5	NA	12	5
Operating temperature	°C	-40/+85	-55/+85	-40/+85	-40/+85	-30/+85	-40/+85
Storage temperature	°C	-40/+90	-55/+85	-40/+90	-40/+85	-40/+85	-40/+85
Soldering temperature	°C	245 for max. 10 sec					
ELECTRICAL-OPTICAL CHARACTERISTICS (Ta=25°C)							
Voltage forward	Typ. V	3.3	2	1.75**	2.85	2	3.3
	Max. V	3.7	2.4	2.35	3.1	2.5	4.1
Current reverse (VR=5V)	Max. µA	50	100	10	NA	100	50
Wave length	nm	470	571	591	NA	633	525
Spread	Δnm	25	NA	15	NA	16	30
Spread angle	degree	120	130	120	150	160	60
Luminous Intensity	Min. mcd	45	18	28.5	71	28	500
	Typ. mcd	112*	35	72*	224*	180*	1000
Optical intensity	Lm/w	NA	NA	NA	36	7	NA

*Max.mcd **Min. V

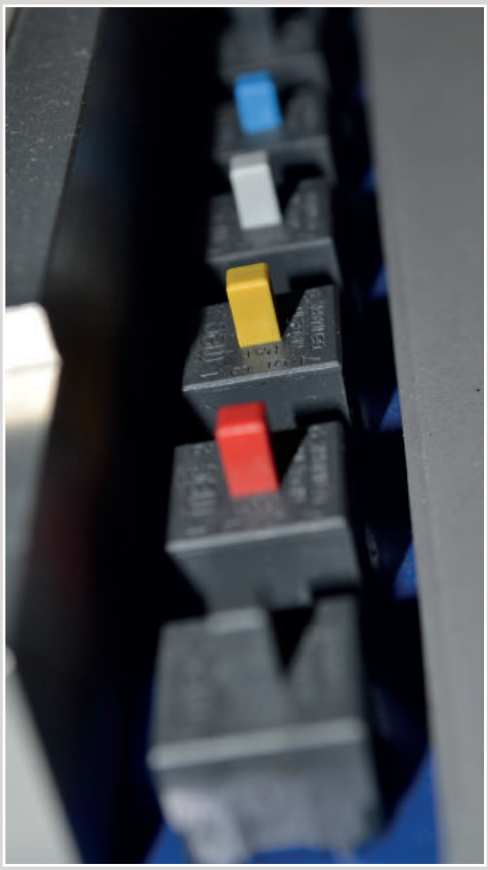
3F switches		**3FXXX (for 1E-1F-1N-1Q-1R-1S-1X)**								**3FXXX (for 1K-1T-1U-1V-1W-1WD)**		
Colour		**B**	**G**	**Y**	**W**	**R**	**G/Y**	**R/G**	**R/Y**	**G**	**Y**	**R**
Colour Codes		00	20	40	65	80	2040	8020	8040	24	46	87
Absolute Maximum Ratings	(Ta=25°C)											
Power	mW	105	70	60	120	60	120	100	120	60	60	120
Current forward	mA	30	20	20	25	20	25	30	25	25	25	50
Forward peak current	mA	150	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	-40/+85			-40/+85	-25/+85	-40/+85	-55/+100	-40/+85	-40/+85	-40/+85	-40/+85
Storage temperature	°C	-40/+85			-40/+100	-30/+100	-40/+85	-55/+100	-40/+85	-40/+85	-40/+100	-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	3.8	2.1	2.1	3.8	2.0	2.1	2.0	2.1	2.0*	2.0	2.0***
	Max. V	4.5	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	10	10	10	50	10	2	2	2	10	10	10
Wave length	nm	466	563	585	NA	650	565/590	630/565	625/590	570	589	624/632
Spread	Δnm	60	40	40	NA	40	35	35	35	10	NA	20
Spread angle	degree	60	45	45	25	45	60	200	60	100	40	40
Luminous Intensity	Min. mcd	18	9.0	5.6	630	5.6	8	2.2	8	70****	630	400****
	Typ. mcd	50	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.

2 POLE SWITCH

MOMENTARY AND LATCHING FUNCTION

ADJUSTABLE TO MULTIMEC®CAP RANGE





unimec™ product range has high temperature switches with square- or rectangular-shaped cap solutions.

unimec™ switches have 8 contact function options making it very flexible and suitable for any application.

Redundancy coming from the number of poles makes it an excellent choice where safety is a concern.

unimec™

Square solution with optional rectangular lenses

16324 - 16326

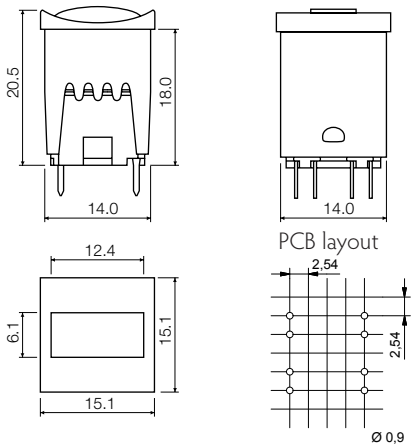


- Square solution
- 15.1mm x 15.1mm
- h=20.5 mm
- Material: ABS
- Temp. Range: -40/+65°C

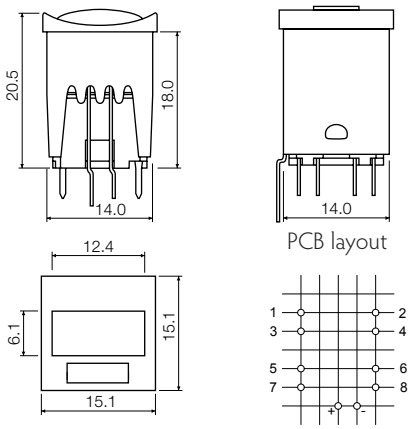
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

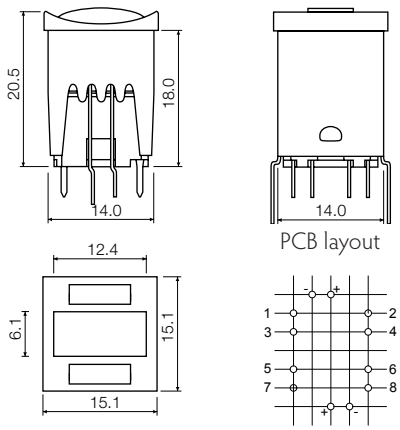
(TH) + 16324



(TH w/LED) + 16325



(TH 2 w/LED) + 16326



NON-ILLUMINATED– HOW TO ORDER

Switch

1	5	4		

15401 mom. silver
15402 mom. gold
15420 silent gold
15451 lat. silver
15452 lat. gold

\+

Extender

1	6	2	7	0



\+

Cap

1	6	3	0	0		

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

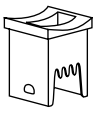


\+

Bezel

1	6	3	2	4		

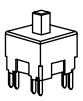
03 grey
09 black



ILLUMINATED – HOW TO ORDER

Switch

1	5	4		



\+

Extender

1	6	2	7	0



\+

Cap

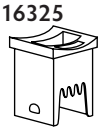
1	6	3	0	0		



\+

Bezel

16325



16326



\+

Lens

1	6	3	2	7		

02 green
04 yellow
08 red

Lens **16327**
2 required



\+

LED

1	6	9	2	2		

02 green
04 yellow
08 red

LED **16922**
2 required



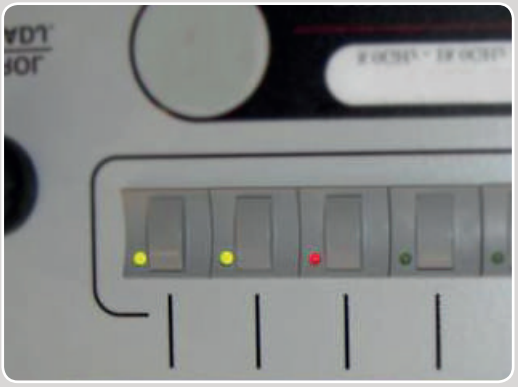
Ordering example: 15451+16270+1630004+1632403 (non-illuminated) OR 15401+16270+1630008+1632509+1632708+1692208 (illuminated)
Please see colour codes, updates of products and changes of specifications on www.apem.com

unimec™

Square solution with optional round LEDs

16310-16315

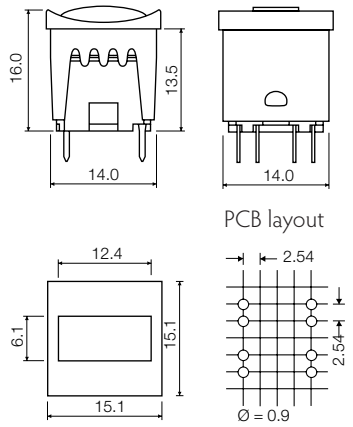
- Square solution
- 15.1mm x 15.1mm
- h=16.0 mm
- Material: ABS
- Temp. Range: -40/+65°C



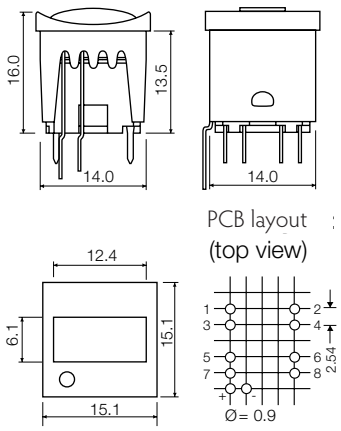
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

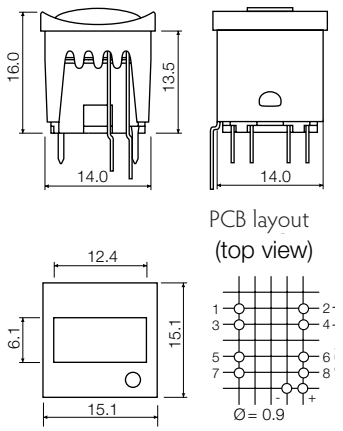
(TH) + 16310



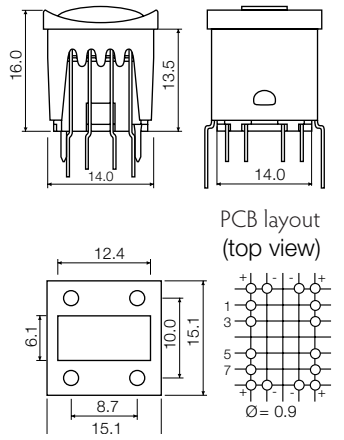
(TH w/LED) + 16311



(TH w/LED) + 16312



(TH w/4 LED) + 16315



NON-ILLUMINATED– HOW TO ORDER

Switch

1	5	4		

15401 mom. silver
15402 mom. gold.
15420 silent gold
15451 lat. silver
15452 lat. gold

\+ Cap

1	6	3	0	0		

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



\+ Bezel

1	6	3	1	0		

03 grey
08 red
09 black

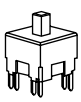


Additional colours for 16310 only:
00 blue
02 green
04 yellow
06 white

ILLUMINATED – HOW TO ORDER

Switch

1	5	4		



\+ Cap

1	6	3	0	0		



\+ Bezel

16311



16312



16314



16315



\+ LED

1	6	9	2	1		

02 green **04** yellow **08** red

\+

1	6	9	2	0		

02 green **04** yellow **08** red

\+ LED **16920** 1 required LED **16921** 1 required



\+ LED **16920** 2 required LED **16921** 2 required

Ordering example: 15400+1630002+1631002 (non-illuminated) OR 15401+1630003+1631408+1692008+1692108 (illuminated)
Please see colour codes, updates of products and changes of specifications on www.apem.com

unimec™

Different caps for unimec™ switches

16300/16700/16800

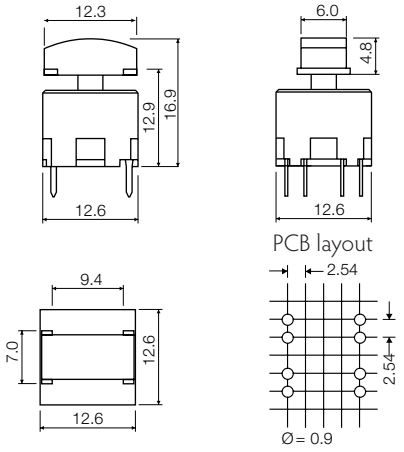


- Square and rectangular caps
- 6mm x 12.3mm; 14.9mm x 14.9mm; 15.1mm x 15.1mm
- h=16.9mm; 14.6mm; 14.5mm
- Material: ABS
- Temp. Range: -40/+65°C

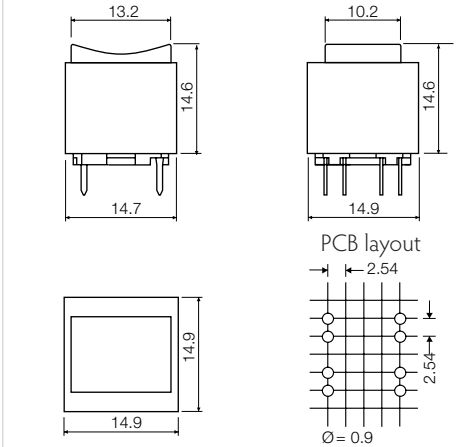
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS

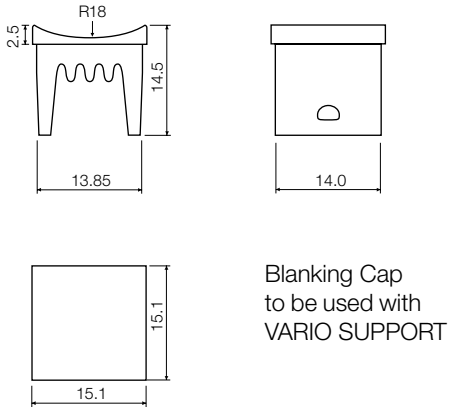
(TH) + 16300



(TH) + 16700



(TH) + 16800



Blanking Cap
to be used with
VARIO SUPPORT

NON-ILLUMINATED– HOW TO ORDER

Switch

1	5	4		

15401 mom. silver
15402 mom. gold.
15420 silent gold
15451 lat. silver.
15452 lat. gold

\+

Cap and color code

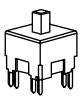
1	6	3	0	0		



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

Switch

1	5	4		



\+

Cap

1	6	7	0	0		



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

Ordering example: 15451+1630003 OR 15401+1670008
Please see colour codes, updates of products and changes of specifications on www.apem.com



Standard legends are marked with red.

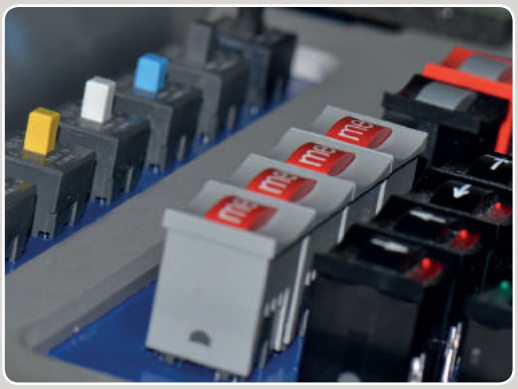
All standard legends are white on black caps.

The size of the legends listed may not correspond to the actual size. Please ask your local distributor, if you do not find what you need on the list. New legends may have been added after this catalogue was printed.

Custom legends and other colour combinations are available, please contact your local distributor.

Available Legends

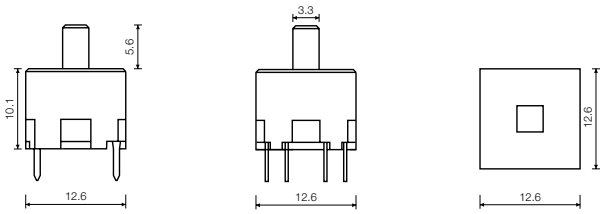
	Part no.			Part no.			Part no.	
LEGEND	18_	18_	LEGEND	18_	18_	LEGEND	18_	18_
0	000	200	A	010	210	ON/OFF	017	217
1	001	201	B	011	211	STOP	018	218
2	002	202	C	012	212	START	031	231
3	003	203	D	013	213	CLEAR	036	236
4	004	204	E	014	214	LOAD	037	237
5	005	205	F	015	215	RESET	038	238
6	006	206	G	063	263	CR	043	243
7	007	207	H	064	264	MANUAL	044	244
8	008	208	I	065	265	END	047	247
9	009	209	J	066	266	CANCEL	048	248
10	020	220	K	067	267	CTRL	050	250
11	021	221	L	068	268	ESC	051	251
12	022	222	M	069	269	DSP	053	253
13	023	223	N	070	270	ENTER	105	305
14	024	224	P	072	272	SHIFT	106	306
15	025	225	S	075	275	ON	116	316
16	026	226	T	076	276	OFF	117	317
			U	077	277			
			V	078	278			
			W	079	279			
			#	107	207			
			*	019	219			
			⌑	016	216			
			→	033	233			
			←	133	233			
			↑	034	234			
			↓	134	234			
			↵	135	235			
			↑↓	115	215			
			⟷	041	241			
			+	054	254			
			−	059	259			
			•	056	256			
			:	055	255			



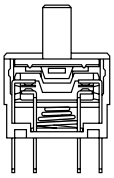
- Max. 250mA/120V/9W AC/6W DC
- 2 pole
- Momentary or latching
- 8 contact functions
- Temperature range:
  High temp: -40/+160°C
- Through-hole version (TH)

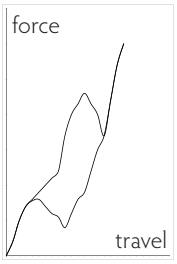
All dimensions in mm *Tolerances -/+0.2mm*

DIMENSIONS THROUGH-HOLE



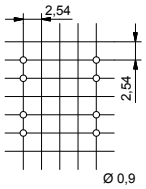
OPERATING FORCE (TYPICAL EXAMPLE)



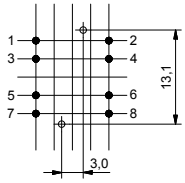


PCB MOUNTING HOLE DIMENSIONS

Basic switch

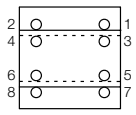


w/Extender 16250



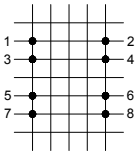
With LED
16923 and 16924

FUNCTIONAL DIAGRAM

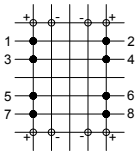


—— up
- - down

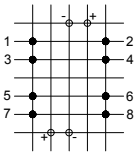
CIRCUIT DIAGRAM



Without LED



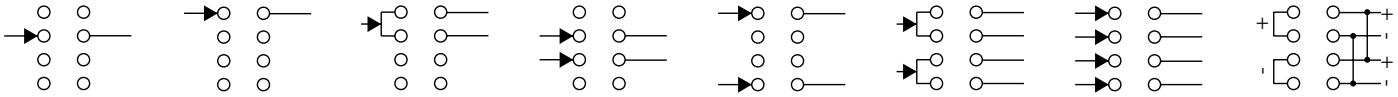
With round LED
16920 and 16921



With rect. LED
16922

WIRING DIAGRAM

Select the contact function you require - and design your PC board accordingly



1 make contact | 1 break contact | 1 change over contact | 2 make contact | 2 break contact | 2 change over contact | 2 make and 2 break | reverse polarity

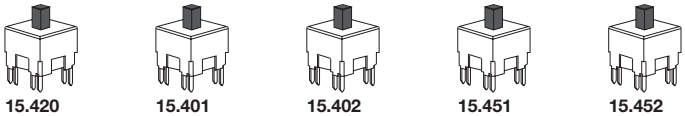
HOW TO ORDER

Part no: 1 5 4 _ _

Switch function:
0 momentary
5 latching

Terminal:
1 silver
2 gold
0 quiet version

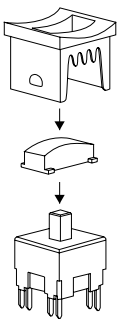
High temp.



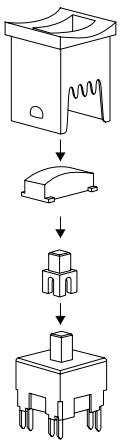
15.420 **H** | **15.401** **E** | **15.402** **F** | **15.451** **I** | **15.452** **J**

HOW TO ASSEMBLE

unimec™
15XXX+16300 +16310

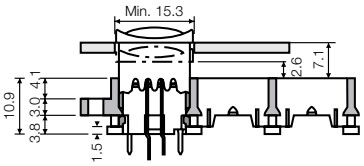


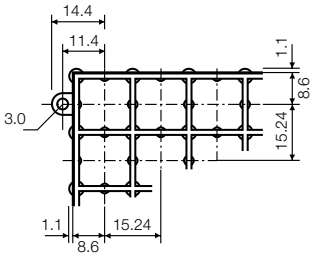
unimec™
15XXX+16270
+16300 +16324



For all types of unimec™ switches with bezels - 16310 - 16315 and 16324 - 16326.

More options available as custom.





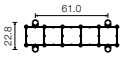




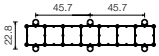
16.410 (1x1)



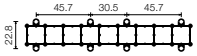
16.412 (1x3)



16.414 (1x5)



16.416 (1x7)



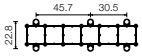
16.418 (1x9)



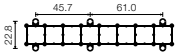
16.411 (1x2)



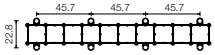
16.413 (1x4)



16.415 (1x6)



16.417 (1x8)



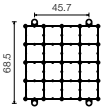
16.419 (1x10)



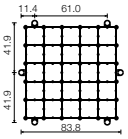
16.420 (2x2)



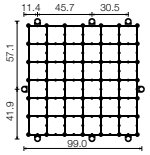
16.430 (3x3)



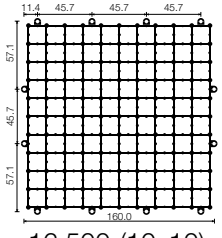
16.440 (4x4)



16.450 (5x5)



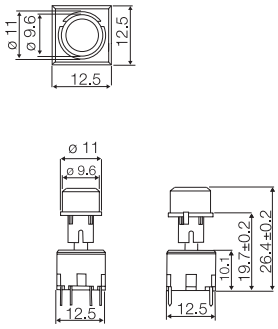
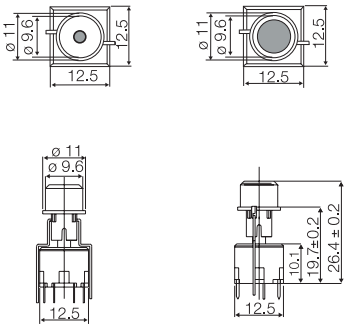
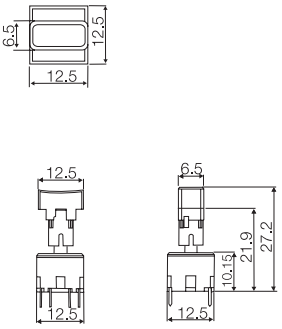
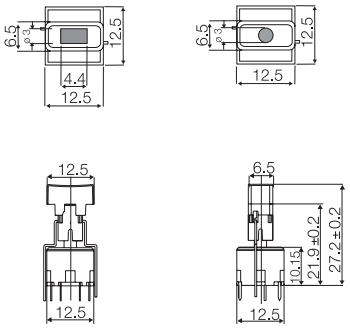
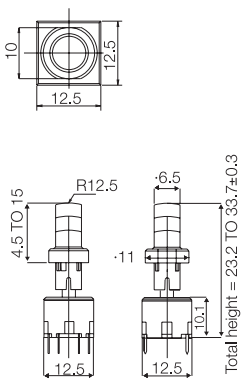
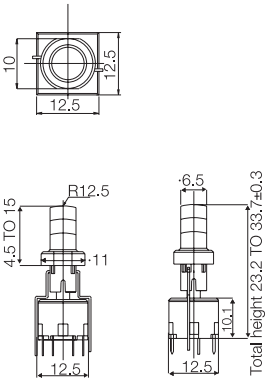
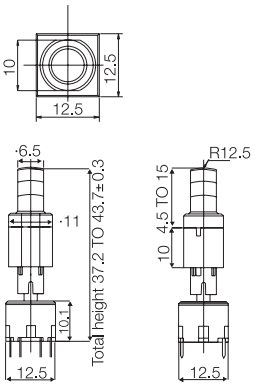
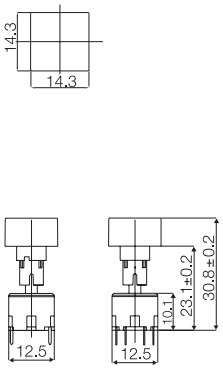
16.460 (6x6)



16.500 (10x10)

Selection guide

A 16250 extender is needed when mounting multimec® on unimec™ switches

Cap	**1D**	**1E** **1F**	**1P**	**1Q** **1R**
Dimensions				
LED		**16923XX** **00** blue **20** green **40** yellow **65** white **80** red		**16923XX** **00** blue **20** green **40** yellow **65** white **80** red
Cap	**1S**	**1S** illuminated	**1S** + **2S**	**1K** **1K** illuminated
Dimensions				
LED		**16923XX** **00** blue **20** green **40** yellow **65** white **80** red		**16923XX** **00** blue **20** green **40** yellow **65** white **80** red	**16924XX** **23** green **45** yellow **88** red

For specific dimensions, color codes, how to order and other information please refer to the pages with the keycaps on multimec® switches. For technical information on the unimec™ basic switches please see technical specifications or go to our website www.apem.com where you will find a page for each option. The multimec® keycaps 1N, 1T, 1U, 1V, 1WA, 1WD, 1WP and 1X can also be used on unimec™ switches. Please ask for technical drawings on dimensions.

RoHS Compatible

		RA High Temperature Versions	
		Silver	**Gold**
Electrical Specifications			
Contact resistance		Max. 100 m Ω (initially)	
Insulation resistance		>10 M Ω	
Recommended load		Min. 0.5 mA	Min. 0.5µ A
		Max. 250 mA – 120 V – 9W AC – 6W DC	
Max. Current in non switching state		0.5 A	
Contact bounce		Max. 10 ms	
Dielectric strength between adjacent contacts		1000 V for 2 min.	
Insulation resistance between adjacent contacts		5 X 10^{13} Ω	
Capacitance between adjacent contacts		0.5 pF	
Mechanical Specifications			
Standard actuation force (switch)		Typ 2.5N	
Max. Actuation force without cap		100N for 10 sec.	
Key travel (switch)		1.8 mm	
Lifetime	Momentary	>10.000.000 cycles	
	Latching	5.000.000 cycles	
Temperature range			
Working temperature		Min. -40°C Max. +160°C	
Storage temperature		Min. -65°C Max. +160°C	
Soldering IEC 68-2-20		Wave – max 260°C for max. 10 sec., please refer to usage guidelines	
		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	
Sealing IEC 529		IP-54	
Cleaning		Standard methods such as water and soap (not immersed)	
Material Specifications – Switches			
Housing and actuator		LCP UL94V0	
Switch spring		Stainless steel	
Key spring		Stainless steel	
Latch pin		Stainless steel	
Fixed contact		SnCu+2µNi+3µAg	SnCu+2µNi+3µAu
Moving contact		Stainless steel +3µAg	Stainless steel +3µAg+1µAu
Terminals		SnCu+2µNi+3µSn100	
Contact lubricant		Special protective lubricant Klüber Barrierta I EL Fluid	
Material Specifications – All Caps & Bezels		ABS (standard) UL94HB	
Temperature limit		Max. +65°C	
Tampon Printing		According to ISO Class: 1/ASTM Class:4B	

unimec™ LEDs

Part Nos.		**16920/16921**			**16922**			**16923**					**16924**		
Colour (G=green, Y=yellow, R=red)		**G**	**Y**	**R**	**G**	**Y**	**R**	**B**	**G**	**Y**	**W**	**R**	**G**	**Y**	**R**
Colour Codes		02	04	08	02	04	08	00	20	40	65	80	23	45	88
Absolute Maximum Ratings (Ta=25°C)															
Power	mW	100	100	100	135	135	135	105	70	60	120	60	150	130	300
Current forward	mA	30	30	30	30	30	30	30	20	20	25	20	40	40	90
Forward peak current	mA	50	50	50	90	90	90	200	60**	60**	100	60**	500	500	1000
Voltage reverse	V	5	5	5	5	5	5	5	3	3	5	3	12	12	5
Operating temperature	°C	-25 - +100			-55 - +100			-25 - +85					-55 - +100		
Storage temperature	°C	-25 - +100			-55 - +100			-30 - +100					-55 - +100		
Soldering temperature	°C	+245 for max. 3 sec			+300 for max. 3 sec			+260 for max. 5 sec					+300 for max. 3 sec		
Electrical-Optical Characteristics (Ta=25°C)															
Voltage forward	Typ. V	2.0	2.0	2.0	2.1	2.2	2.3	2.1	2.1	2.1	3.8	2.0	2.1*	2.3***	2.4***
	Max. V	3.0	3.0	3.0	3.0	3.0	3.0	2.8	3.0	3.0	4.3	3.0	2.5*	2.5***	3.8***
Current reverse	µA	100	100	100	100	100	100	2	10	10	50	10	10	10	10
Wave length	nm	560	590	660	565	585	635	460	563	585	NA	650	570	587	635
Spread	Ønm	10	10	10	10	10	10	40	40	40	NA	40	25	45	45
Spread angle	Degree	20	20	20	45	45	45	20	45	45	25	45	80	90	55
Luminous Intensity	Min. mcd	1	1	0.8	1.5	2.5	2.5	20	9.0	5.6	630	5.6	71****	71****	100****
	Typ. mcd	2	3	1.6	2.5	3.0	5.0	25	25	16	1000	16	112****	112****	160****
Orientation	The longer pin is the anode, the shorter is the cathode.														

*/F=20mA, **Pulse width 1ms Duty cycle 1:5, ***/F=50mA, ****Luminous Flux mlm

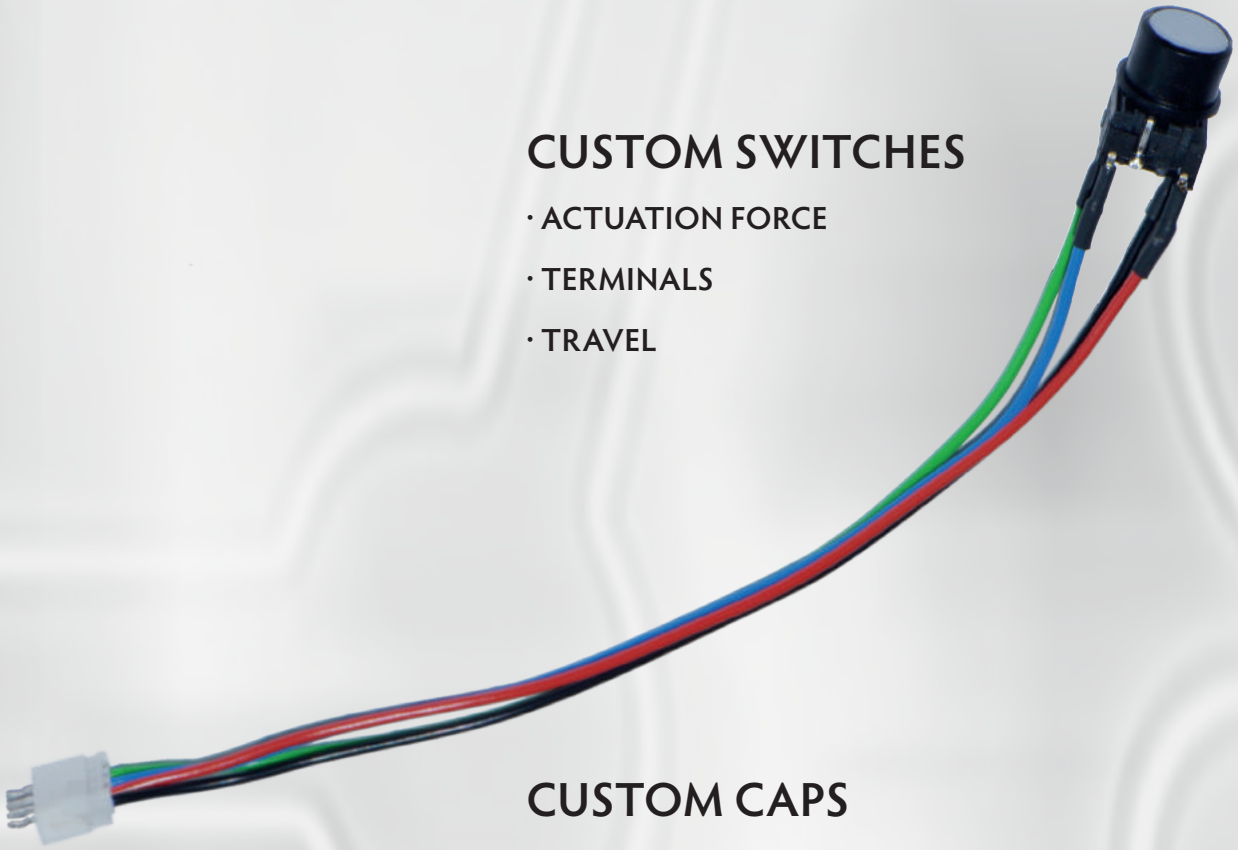
WE WELCOME ANY CUSTOM REQUIREMENT

The wide range of MEC standard products is well known world wide, but also many custom solutions have been created. Equipped with the latest CAD solutions with 3D facilities and optical simulation software our experienced MEC team can provide you custom designs from conception to completion. Our R&D engineers generate computer animated solutions, rapid prototypes and manage the whole industrialisation process.







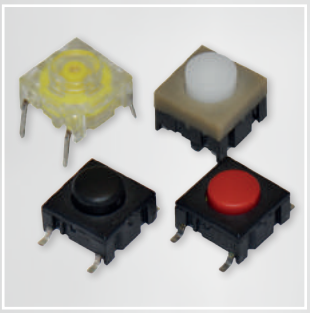


CUSTOM SWITCHES

- ACTUATION FORCE
- TERMINALS
- TRAVEL

CUSTOM CAPS

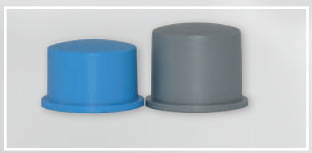
- DESIGN
  - SHAPE
  - SIZE
- COLOUR
- LEGENDS

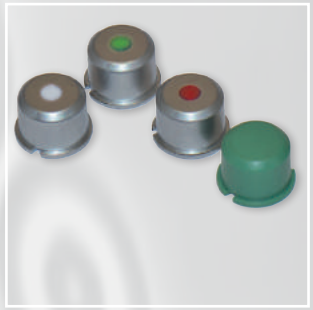












multimec®

Solid colours

No.	00	02	03	04	06	08	09
Colour	blue	green	grey	yellow	white	red	black
RAL Code	5012	6018	7004	1023	9010	3000	9004

No.	30	32	33	34	38	40	42
Colour	ultra blue	mint green	tele grey	melon	noble red	dusty blue	aqua blue
RAL Code	5002	6029	7046	1028	3002	5014	5021

Metallic Colours

No.	50	53	57	58
Colour	dark blue	light grey	dark grey	bordeaux
RAL Code	No Ral Code	No Ral Code	No Ral Code	No Ral Code

CODE / CAP		00	02	03	04	06	08	09	30	32	33	34	38	40	42	50	53	57	58
1A		•	•	•	•	•	•	•											
1B		•	•	•	•	•	•	•											
1C				•			•	•											
1DS		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
1ES/1FS		•	•	•	•	•	•	•											
1GAS/1GCS		•	•	•	•	•	•	•											
1H				•				•											
1JS		•	•	•	•	•	•	•											
1KS		•	•	•	•	•	•	•											
1M		•	•	•	•	•	•	•											
1NS				•				•											
1PS		•	•	•	•	•	•	•											
1QS/1RS		•		•				•											
1SS/1LS		•	•	•	•	•	•	•											
1TS/1US/1VS		•		•			•	•											
1WAS/1WDS/1WPS		•		•			•	•	•					•	•		•	•	
1XS		•	•	•	•	•	•	•											
1ZA				•		•		•	•					•	•	•	•	•	•
1ZB				•		•		•	•					•	•	•	•	•	•
1ZCS				•		•	•	•	•					•	•	•	•	•	•
1Z/1ZW		•		•		•	•	•											
10R/10RF + 10Q		•	•	•	•	•	•	•											

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

For product updates and/or changes of specifications please see www.apem.com

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.

Temperature
Both unimec™ and multimec® switches are produced in low and high temperature versions. 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 wave soldering is taking place, MEC strongly recommend that the temperature profile is analysed and compared with the temperature rating of the switch. In case of doubt always select the high temperature versions unimec™ 154XX, and multimec® 5XXH9XX. It is also important to monitor the accumulated heat build up from both the pre-heat zones and the solder zone.

Most standard accessories for both unimec™ and multimec® 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, 1GAS/1GCS and Varimec™ caps are, however, made of high temperature materials and will meet the same temperature specifications as the high temperature switches.

For accessories made from other plastic materials please see multimec® and unimec™ technical specifications.

LEDs have their own temperature specifications. When fitted in a high temperature switch the LED will determine the max. operating temperature, i.e. 5GTH93524 has an upper temperature limit of 85°C! This also applies with 3F switches.

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 0.9mm.

All unimec™ and multimec® caps and bezels are easily snapped onto the switch modules and can be changed at a later time with the exception of the unimec 16.700 cap. The same applies to the 3E caps. Once these caps are installed they are not designed to be removed. To do so may cause damage to the switch and the PC board if not done very carefully. If the 16.300 or 16.700 cap must be removed from a unimec™ alternate action switch, make sure that the switch actuator is in the released, upper position before attempting to remove the cap. This will prevent possible damage to the internal latching pin.

Care must be taken when inserting the 3FT switch and LED assembly into the PC board. Do not press direct on the LED. This will force the LED down into the actuator and risks to cause the switch contacts to remain in the closed position. To correct the fault, the LED must be raised slightly and centered in the actuator to assure unrestricted movement of the actuator. A mounting tool is available for multimec® switches.

Soldering and Cleaning unimec™
Most assembly and field problems experienced by users of unsealed switches are caused by the contamination of the contacts during soldering and cleaning.

Contact contamination may be recognised by an increase in contact resistance and possible intermittent operation of the switch, especially in low power applications. Care must be taken not to submerge the switch in cleaning agents or spray the switch during cleaning. The switch must be protected at all times to prevent contamination by flux or cleaning liquids.

For unimec™ alternate versions we recommend to leave the actuator in the released upper position during soldering. This makes the switch more resistent to overheating.

Soldering and Cleaning multimec®
multimec® switches are fully sealed to IP67 specifications to prevent 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 wave soldered. multimec® 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., this applies for both low temperature and high temperature versions.

Wave soldering: heat built up in the switch during pre-heating and soldering must not exceed the maximum operating temperature of the switch. If, for some reason, a high pre-heating temperature is required, MEC recommend the high temperature switches. In any case peak temperature must not exceed 260°C, and soldering time is max 10 sec.

Soldering - Surface Mount Versions
For all methods - infrared, convection and vapour phase. The upper limit 260°C/30 sec must be observed. The soldering temperature profile must have moderate temperature gradients.

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:

Low temperature switch	115°C
High temperature switch	160°C
LEDs	85/100°C
Accessories	65/85/160°C

Packaging
unimec™ and multimec® switches are packed in rigid tubes of 50 pieces each.

A box contains 1.000 pcs.

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

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Please visit our website www.apem.com
for news and product updates

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