

### Basic module applies to all versions

#### Low temp.



15.500



15.501



15.502



15.551



15.552

#### High temp.

15.420  
H15.401  
E15.402  
F15.451  
I15.452  
J

#### Part no:



#### Temperature:

5: low temp.

4: high temp.

#### Switch function:

0: momentary

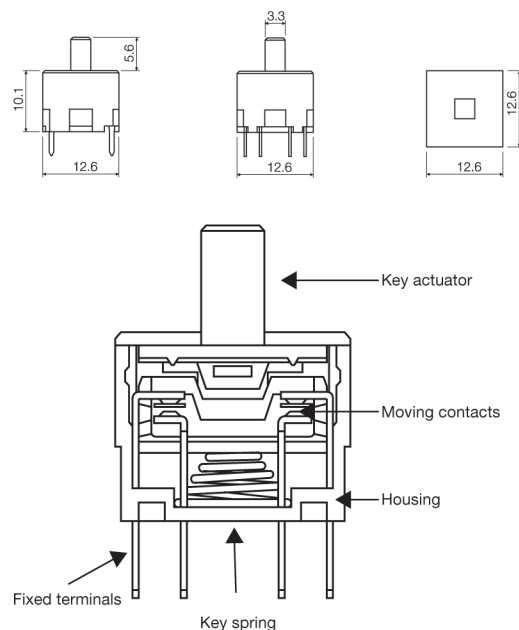
5: alternate

#### Terminal

1: silver

2: gold

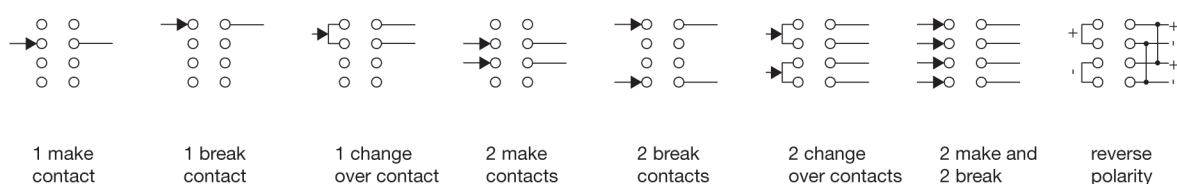
0: quiet version, silver



| PCB Mounting Hole Dimensions<br>Basic Switch | Circuit diagram<br>(topview)        | PCB Mounting Hole Dimensions<br>(w/Extender 16250) | Functional diagram              |
|----------------------------------------------|-------------------------------------|----------------------------------------------------|---------------------------------|
|                                              | <div>Without LED</div>              | <div>With LED 16920 and 16921</div>                | <div>With rect. LED 16922</div> |
|                                              | <div>With LED 16923 and 16924</div> | <div>With LED 16923 and 16924</div>                |                                 |

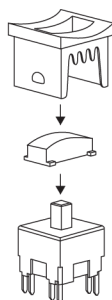
### Wiring Diagram

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

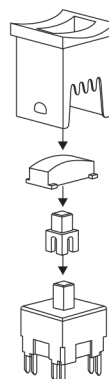


### How to assemble

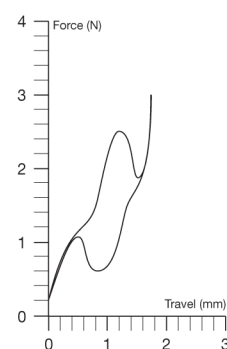
unimec™  
15XXX + 16300 +  
16310



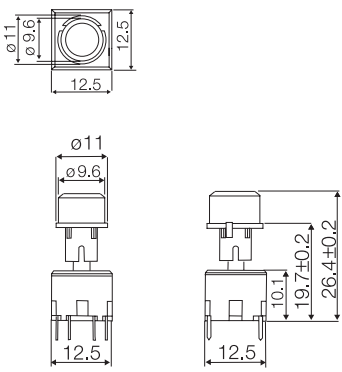
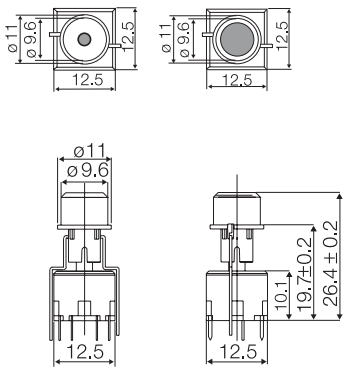
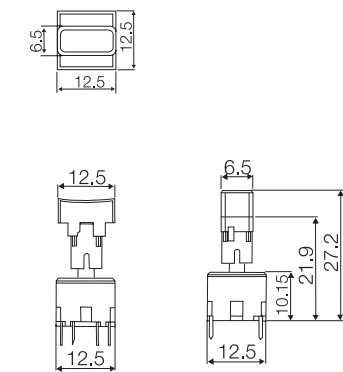
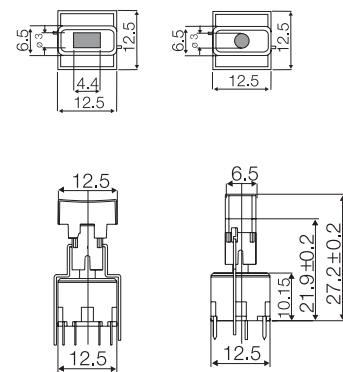
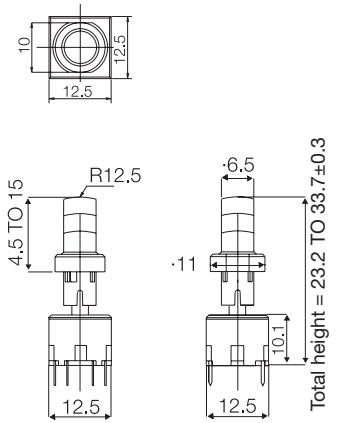
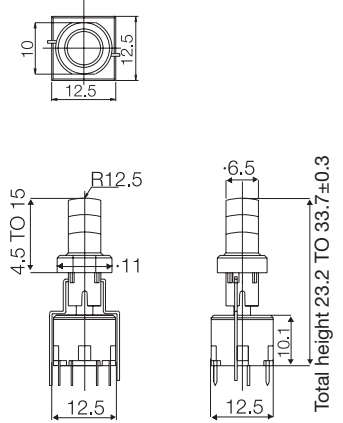
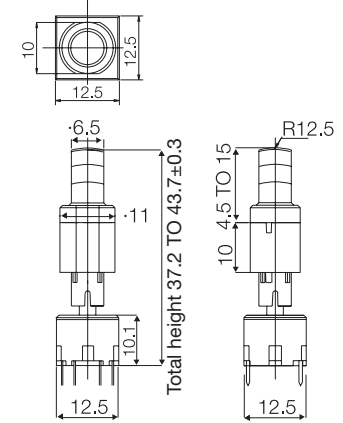
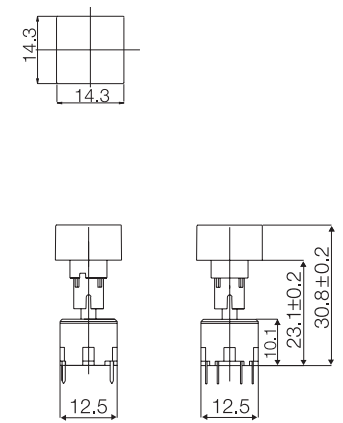
unimec™  
15XXX + 16270 +  
16300 + 16324



### Operating Force (Typical example)



### Selection guide

|                                                                                                                                                                 |                                                                                                                                                                           |                                                                                                                                                  |                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  A 16250 extender is needed when mounting multimec® keycaps on unimec™ switches |                                                                                                                                                                           |                                                                                                                                                  |                                                                                                                                                                                               |
| <b>Cap</b><br> 1D                                                              |  1E  1F |  1P                                                             |  1Q  1R                 |
| <b>Dimensions</b><br>                                                           |                                                                                          |                                                                |                                                                                                            |
| <b>LED</b>                                                                                                                                                      | <b>16923XX</b><br> 00 blue<br>20 green<br>40 yellow<br>80 red                           |                                                                                                                                                  | <b>16923XX</b><br> 00 blue<br>20 green<br>40 yellow<br>80 red                                             |
| <b>Cap</b><br> 1S                                                            |  1S illuminated                                                                        |  1S + 2S                                                     |  1K  1K illuminated |
| <b>Dimensions</b><br>                                                         |                                                                                        |                                                              |                                                                                                          |
| <b>LED</b>                                                                                                                                                      | <b>16923XX</b><br> 00 blue<br>20 green<br>40 yellow<br>80 red                          | <b>16923XX</b><br> 00 blue<br>20 green<br>40 yellow<br>80 red | <b>16924XX</b><br> 23 green<br>45 yellow<br>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.mec.dk](http://www.mec.dk) 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

|                                                 | RB<br>Low Temperature Versions                                      |                             | RA<br>High Temperature Versions                          |                             |
|-------------------------------------------------|---------------------------------------------------------------------|-----------------------------|----------------------------------------------------------|-----------------------------|
|                                                 | Silver                                                              | Gold                        | Silver                                                   | Gold                        |
| Electrical Specifications                       |                                                                     |                             |                                                          |                             |
| Contact resistance                              | Max. 100 m Ω (initially)                                            |                             | Max. 100 m Ω (initially)                                 |                             |
| Insulation resistance                           | >10 M Ω                                                             |                             | >10 M Ω                                                  |                             |
| Recommended load                                | Min. 0.5 mA                                                         | Min. 0.5μ A                 | Min. 0.5 mA                                              | Min. 0.5μ A                 |
|                                                 | Max. 250 mA - 120 V - 9W AC - 6W DC                                 |                             | Max. 250 mA - 120 V - 9W AC - 6W DC                      |                             |
| Max. current in non switching state             | 0.5 A                                                               |                             | 0.5 A                                                    |                             |
| Contact bounce                                  | Max. 10 ms                                                          |                             | Max. 10 ms                                               |                             |
| Dielectric strength between adjacent contacts   | 1000 V for 2 min.                                                   |                             | 1000 V for 2 min.                                        |                             |
| Insulation resistance between adjacent contacts | 5 X 10 <sup>13</sup> Ω                                              |                             | 5 X 10 <sup>13</sup> Ω                                   |                             |
| Capacitance between adjacent contacts           | 0.5 pF                                                              |                             | 0.5 pF                                                   |                             |
| Mechanical Specifications                       |                                                                     |                             |                                                          |                             |
| Standard actuation force (switch)               | typ 2.5N                                                            |                             | typ 2.5N                                                 |                             |
| Max. actuation force without cap                | 100N for 10 sec.                                                    |                             | 100N for 10 sec.                                         |                             |
| Key travel (switch)                             | 1.8 mm                                                              |                             | 1.8 mm                                                   |                             |
| Life time                                       | Momentary 1.500.000 cycles                                          |                             | Momentary >10.000.000 cycles                             |                             |
|                                                 | Alternate 500.000 cycles                                            |                             | Alternate 5.000.000 cycles                               |                             |
| Temperature Range                               |                                                                     |                             |                                                          |                             |
| Working temperature                             | Min. -40°C Max. +75°C                                               |                             | Min. -40°C Max. +160°C                                   |                             |
| Storage temperature                             | Min. -65°C Max. +85°C                                               |                             | 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                                                               |                             | +40°C                                                    |                             |
| Humidity                                        | 93% RH                                                              |                             | 93% RH                                                   |                             |
| Duration                                        | 56 Days                                                             |                             | 56 Days                                                  |                             |
| Sealing IEC 529                                 | IP-54                                                               |                             | IP-54                                                    |                             |
| Cleaning                                        | Standard methods such as water and soap (not immersed)              |                             | Standard methods such as water and soap (not immersed)   |                             |
| Material Specifications - Switches              |                                                                     |                             |                                                          |                             |
| Housing and actuator                            | Glass fiber filled Polycarbonate UL94V1                             |                             | LCP UL94V0                                               |                             |
| Switch spring                                   | Stainless steel                                                     |                             | Stainless steel                                          |                             |
| Key spring                                      | Stainless steel                                                     |                             | Stainless steel                                          |                             |
| Latch pin                                       | Stainless steel                                                     |                             | Stainless steel                                          |                             |
| Fixed contact                                   | SnCu + 2μNi + 3μAg                                                  | SnCu + 2μNi + 3μAu          | SnCu + 2μNi + 3μAg                                       | SnCu + 2μNi + 3μAu          |
| Moving contact                                  | Stainless steel + 3μAg                                              | Stainless steel + 3μAg+1μAu | Stainless steel +3μAg                                    | Stainless steel + 3μAg+1μAu |
| Terminals                                       |                                                                     |                             |                                                          |                             |
| Contact lubricant                               | SnCu + 2μNi + 3μSn100                                               |                             | SnCu + 2μNi + 3μSn100                                    |                             |
|                                                 | Special protective lubricant Klüber Barrierta I EL Fluid            |                             | Special protective lubricant Klüber Barrierta I EL Fluid |                             |
| Material Specifications - All Caps & Bezels     |                                                                     |                             |                                                          |                             |
|                                                 | ABS (standard) UL94HB                                               |                             | ABS (standard) UL94HB                                    |                             |
| Temperature limit                               | Max. +65°C                                                          |                             | Max. +65°C                                               |                             |
| Tampon Printing                                 |                                                                     |                             |                                                          |                             |
|                                                 | According to ISO Class: 1/ASTM Class.: 4B                           |                             | According to ISO Class: 1/ASTM Class.: 4B                |                             |

## unimec™ LEDs

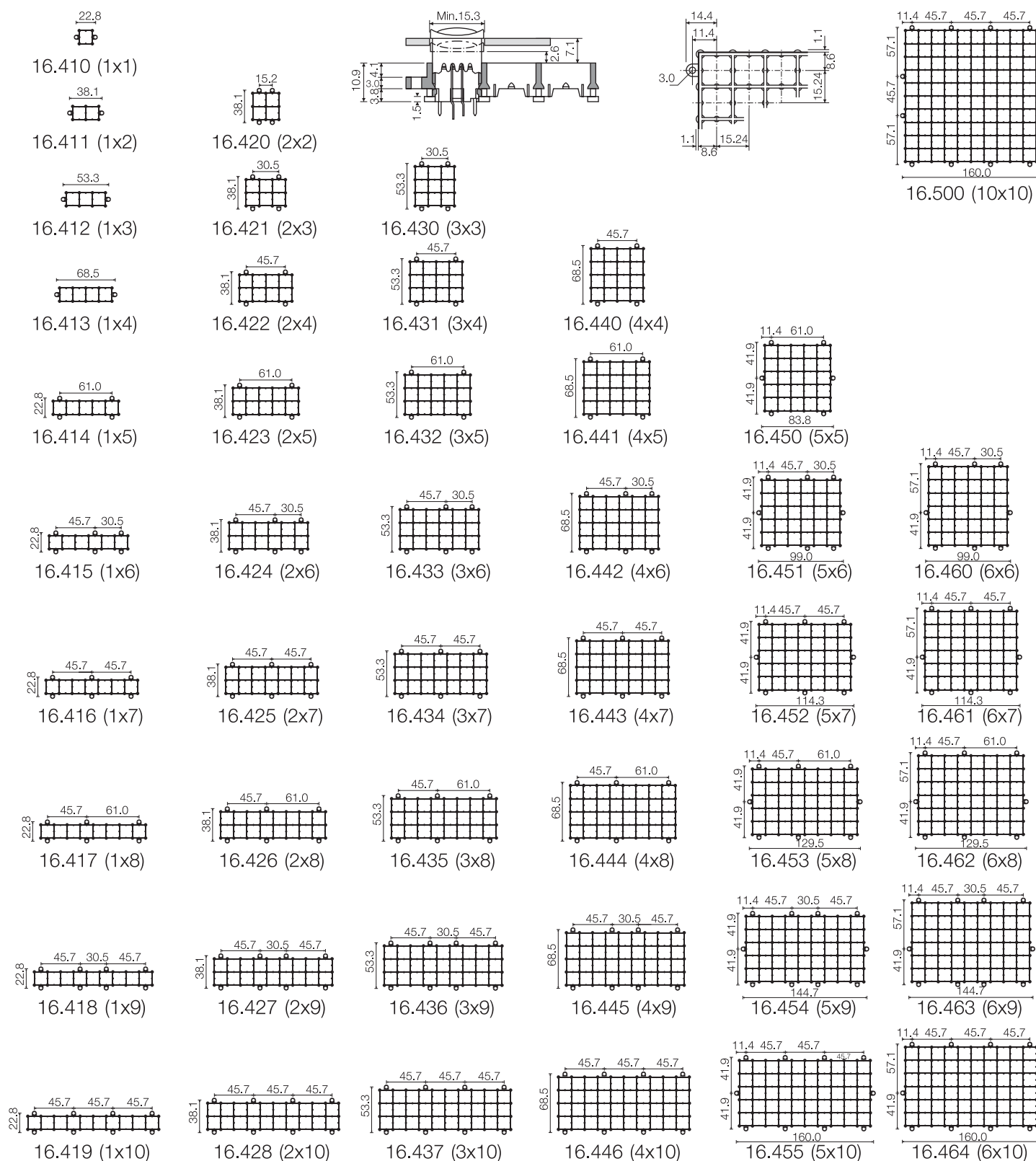
| Part Nos.                            |                                                          | 16920/16921          |     |     | 16922                |     |     | 16923                |      |      | 16924                |         |         |
|--------------------------------------|----------------------------------------------------------|----------------------|-----|-----|----------------------|-----|-----|----------------------|------|------|----------------------|---------|---------|
| Colour (G= Green, Y= Yellow, R= Red) |                                                          | G                    | Y   | R   | G                    | Y   | R   | G                    | Y    | R    | G                    | Y       | R       |
| Colour Codes                         |                                                          | 02                   | 04  | 08  | 02                   | 04  | 08  | 20                   | 40   | 80   | 23                   | 45      | 88      |
| Absolute Maximum Ratings             |                                                          | (Ta=25°C)            |     |     |                      |     |     |                      |      |      |                      |         |         |
| Power                                | mW                                                       | 100                  | 100 | 100 | 135                  | 135 | 135 | 70                   | 60   | 60   | 150                  | 130     | 300     |
| Current forward                      | mA                                                       | 30                   | 30  | 30  | 30                   | 30  | 30  | 20                   | 20   | 20   | 40                   | 40      | 90      |
| Forward peak current                 | mA                                                       | 50                   | 50  | 50  | 90                   | 90  | 90  | 60**                 | 60** | 60** | 500                  | 500     | 1000    |
| Voltage reverse                      | V                                                        | 5                    | 5   | 5   | 5                    | 5   | 5   | 3                    | 3    | 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  | 2.0  | 2.1*                 | 2.3***  | 2.4***  |
|                                      | Max. V                                                   | 3.0                  | 3.0 | 3.0 | 3.0                  | 3.0 | 3.0 | 3.0                  | 3.0  | 3.0  | 2.5*                 | 2.5***  | 3.8***  |
| Current reverse                      | µA                                                       | 100                  | 100 | 100 | 100                  | 100 | 100 | 10                   | 10   | 10   | 10                   | 10      | 10      |
| Wave length                          | nm                                                       | 560                  | 590 | 660 | 565                  | 585 | 635 | 563                  | 585  | 650  | 570                  | 587     | 635     |
| Spread                               | Ønm                                                      | 10                   | 10  | 10  | 10                   | 10  | 10  | 40                   | 40   | 40   | 25                   | 45      | 45      |
| Spread angle                         | degree                                                   | 20                   | 20  | 20  | 45                   | 45  | 45  | 45                   | 45   | 45   | 80                   | 90      | 55      |
| Luminous Intensity                   | Min. mcd                                                 | 1                    | 1   | 0.8 | 1.5                  | 2.5 | 2.5 | 9.0                  | 5.6  | 5.6  | 71****               | 71****  | 100**** |
|                                      | Typ. mcd                                                 | 2                    | 3   | 1.6 | 2.5                  | 3.0 | 5.0 | 25                   | 16   | 16   | 112****              | 112**** | 160**** |
| Orientation                          | The longer pin is the anode, the shorter is the cathode. |                      |     |     |                      |     |     |                      |      |      |                      |         |         |

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

Specifications are subject to change without notice.

For updates of products and/or changes of specifications please see [www.mec.dk](http://www.mec.dk)

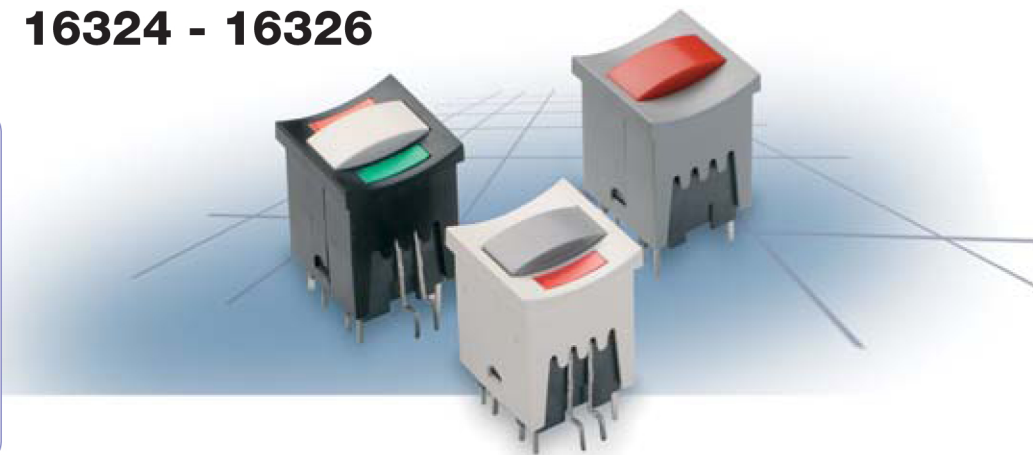
For all types of UNIMEC™ switches with bezels - 16310 - 16315 and 16324 - 16326



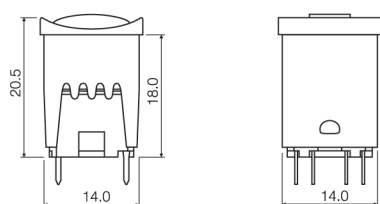
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### Technical Data

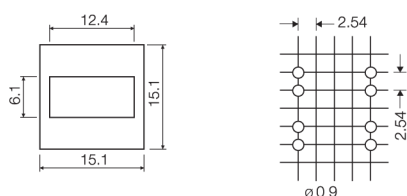
- Max. 250mA/120V/9W AC/6W DC
- 2 pole
- momentary or alternate
- 8 contact functions
- temperature range:
  - low temp: -40/+75°C
  - high temp: -40/+160°C
- through-hole version



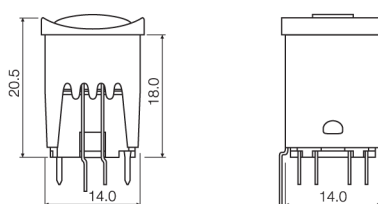
### Dimensions



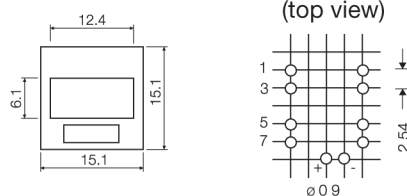
### PCB layout



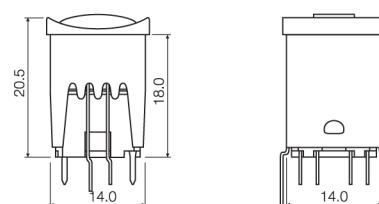
### Dimensions (w/LED)



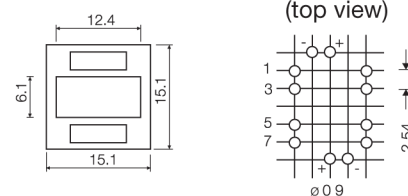
### PCB layout (top view)



### Dimensions (w/2 LEDs)



### PCB layout (top view)



### How to order



1 5

#### Switch

15501 mom. silver  
15551 alt. silver  
15502 mom. gold  
15552 alt. gold  
15500 silent silver  
15401 mom. silver high temp.  
15402 mom. gold high temp.  
15420 silent gold high temp.  
15451 alt. silver high temp.

+

1 6 2 7 0

#### Extender



#### Cap



00 blue  
01 brown  
02 green  
03 grey  
04 yellow  
05 golden  
06 white  
07 orange  
08 red  
09 black  
30 ultra blue  
40 dusty blue  
42 aqua blue  
32 mint green  
33 tele grey  
34 melon  
38 noble red  
50 metal dark blue  
53 metal light grey  
57 metal dark grey  
58 metal bordeaux

+

1 6 3 2 4

#### Bezel



01 brown  
03 grey  
06 white  
09 black



1 5

#### Switch

+

1 6 2 7 0

#### Extender



+

1 6 3 0 0

#### Cap



+

1 6 3 2 7

#### 16325



#### 16326



+

1 6 3 2 7

#### Lens



+

1 6 9 2 2

#### LED



02 green  
04 yellow  
08 red

02 green  
04 yellow  
08 red

Lens 16327  
2 required

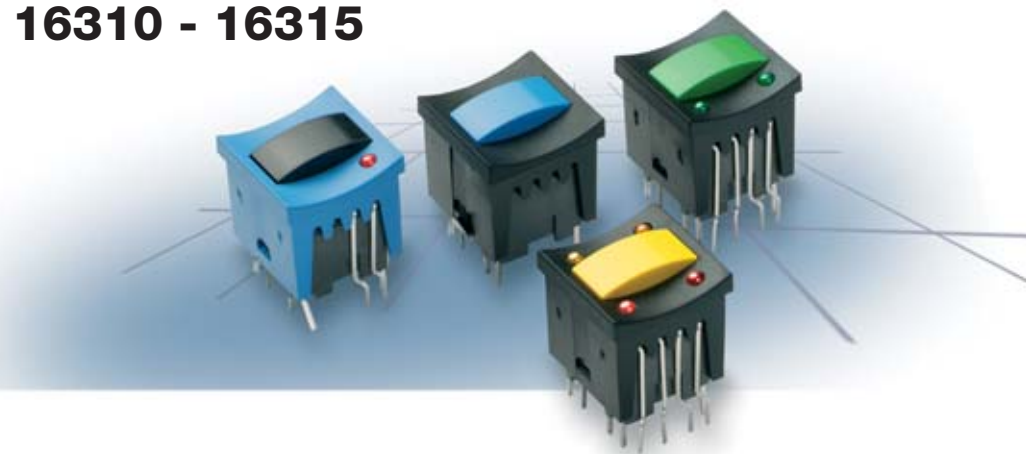
LED 16922  
2 required

Ordering example: 15501 + 16270 + 1630008 + 1632509 + 1632708 + 1692208

For updates of products and/or changes of specifications please see [www.mec.dk](http://www.mec.dk)

### Technical Data

- Max. 250mA/120V/9W AC/6W DC
- 2 pole
- momentary or alternate
- 8 contact functions
- temperature range:  
low temp: -40/+75°C  
high temp: -40/+160°C
- through-hole version



| Dimensions (through-hole) | Dimensions (w/LED) | Dimensions (w/LED) | Dimensions (w/4 LEDs) |
|---------------------------|--------------------|--------------------|-----------------------|
| <br>                      | <br>               | <br>               | <br>                  |

### How to order

|                                                                                                                                                                                                                                                                                                                                     |   |                                                                                                                                                                                                                             |   |                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>1 5</b><br><b>Switch</b><br><b>15501</b> mom. silver<br><b>15551</b> alt. silver<br><b>15502</b> mom. gold<br><b>15552</b> alt. gold<br><b>15500</b> silent silver<br><b>15401</b> mom. silver high temp.<br><b>15402</b> mom. gold high temp.<br><b>15420</b> silent gold high temp.<br><b>15451</b> alt. silver high temp. | + | <b>1 6 3 0 0</b><br><b>Cap</b><br><b>00</b> blue<br><b>01</b> brown<br><b>02</b> green<br><b>03</b> grey<br><b>04</b> yellow<br><b>05</b> golden<br><b>06</b> white<br><b>07</b> orange<br><b>08</b> red<br><b>09</b> black | + | <b>1 6 3 1 0</b><br><b>Bezel</b><br><b>00</b> blue<br><b>01</b> brown<br><b>02</b> green<br><b>03</b> grey<br><b>04</b> yellow<br><b>05</b> golden<br><b>06</b> white<br><b>07</b> orange<br><b>08</b> red<br><b>09</b> black | <b>For 16300 and 16310 only</b><br><b>30</b> ultra blue<br><b>40</b> dusty blue<br><b>42</b> aqua blue<br><b>32</b> mint green<br><b>33</b> tele grey<br><b>34</b> melon<br><b>38</b> noble red<br><b>50</b> metal dark blue<br><b>53</b> metal light grey<br><b>57</b> metal dark grey<br><b>58</b> metal bordeaux |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                 |   |                                    |   |                                                                                                      |   |                                                                                                  |   |                                                                                                  |                                                                                                                              |
|---------------------------------|---|------------------------------------|---|------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <br><b>1 5</b><br><b>Switch</b> | + | <b>1 6 3 0 0</b><br><b>Cap</b><br> | + | <b>Bezel 16311</b><br><br><b>Bezel 16312</b><br><br><b>Bezel 16314</b><br><br><b>Bezel 16315</b><br> | + | <b>1 6 9 2 1</b><br><b>LED 16921</b><br><br><b>02</b> green<br><b>04</b> yellow<br><b>08</b> red | + | <b>1 6 9 2 0</b><br><b>LED 16920</b><br><br><b>02</b> green<br><b>04</b> yellow<br><b>08</b> red | <b>LED 16920</b> 1 required<br><b>LED 16921</b> 1 required<br><br><b>LED 16920</b> 2 required<br><b>LED 16921</b> 2 required |
|---------------------------------|---|------------------------------------|---|------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|

Ordering example: 15501 + 1630003 + 1631408 + 1692008 + 1692108

For updates of products and/or changes of specifications please see [www.mec.dk](http://www.mec.dk)

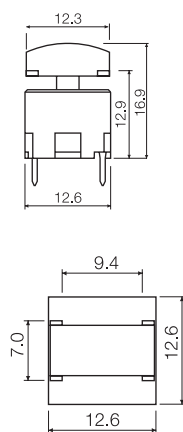


### Technical Data

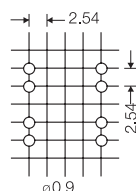
- Max. 250mA/120V/9W AC/6W DC
- 2 pole
- momentary or alternate
- 8 contact functions
- temperature range:
  - low temp: -40/+75°C
  - high temp: -40/+160°C
- through-hole version



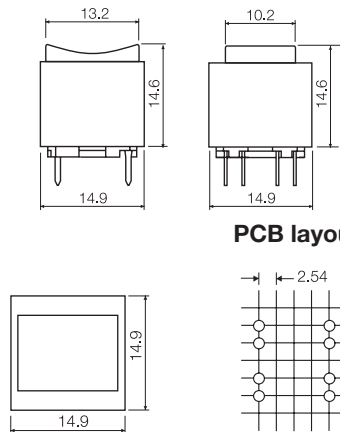
### Dimensions 16300



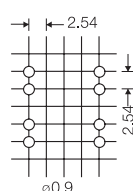
### PCB layout



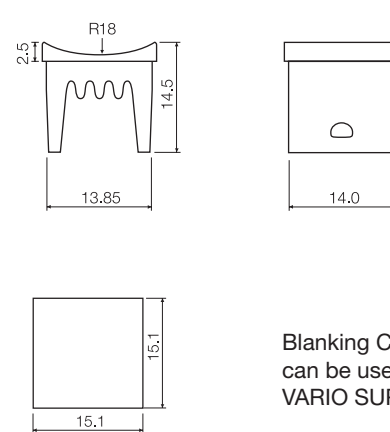
### Dimensions 16700



### PCB layout



### Dimensions 16800



Blanking Cap  
can be used with  
VARIO SUPPORT

### How to order



1 5

+

1 6 3 0 0

### Cap



### Switch

15501 mom. silver  
 15551 alt. silver  
 15502 mom. gold  
 15552 alt. gold  
 15500 silent silver  
 15401 mom. silver high temp.  
 15402 mom. gold high temp.  
 15420 silent gold high temp.  
 15451 alt. silver high temp.

00 blue  
 01 brown  
 02 green  
 03 grey  
 04 yellow  
 05 golden  
 06 white  
 07 orange  
 08 red  
 09 black

30 ultra blue  
 40 dusty blue  
 42 aqua blue  
 32 mint green  
 33 tele grey  
 34 melon  
 38 noble red

50 metal dark blue  
 53 metal light grey  
 57 metal dark grey  
 58 metal bordeaux



1 5

+

1 6 7 0 0

### Cap



### Switch

00 blue  
 02 green  
 03 grey  
 04 yellow

06 white  
 08 red  
 09 black

1 6 8 0 0

### Blanking Cap



00 blue  
 01 brown  
 02 green  
 03 grey  
 04 yellow  
 05 golden

06 white  
 07 orange  
 08 red  
 09 black

11 transparent  
 12 transparent green  
 14 transparent yellow  
 18 transparent red

Ordering example: 15551 + 1670009

For updates of products and/or changes of specifications please see [www.mec.dk](http://www.mec.dk)