

## Product manual

# Vandal-proof MSM switch

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|                                                                                                          |           |
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Changes that contribute to technical improvement are subject to alternations

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|                                                                              |               |            |                 |               |               |                |       |
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## 1 PRODUCT DESCRIPTION

Both, the housing and the actuator of the vandal-proof MSM switch are made of high-quality stainless steel. By applying this robust and weather-resistant material, the switch is particularly suitable for the use in harsh environments. The MSM is available with mounting diameters of 16, 19, 22 and 30 mm. Different types of contact cover a range of permissible switching voltages from 30 VDC to 250 VAC, switching currents are permissible from 0.1 to 10 Ampere. The MSM is equipped with flat-pin plugs to permit fast connection. The cables are plugged onto the micro switch which is subsequently plugged onto the previously screwed-in switch. Point and ring-illuminated versions are available for applications at night or as an optical status display.

## 2 TECHNICAL DATA AND DIMENSIONAL DRAWINGS

### 2.1 Technical Data

| <b>Micro Switch for Electrical Rating</b><br>(Protection Class IP 40) | 0.1 A<br>30 VDC | 5 A<br>125 VAC | 3 A<br>250 VAC | 10 A<br>250 VAC |
|-----------------------------------------------------------------------|-----------------|----------------|----------------|-----------------|
| <b>Electrical Data</b>                                                |                 |                |                |                 |
| Contact Material                                                      | gold            | silver         |                | silver          |
| Switching Voltage max. (VAC)<br>(VDC)                                 | 30              | 125 / 250      |                | 250             |
| Switching Current max. (A)                                            | 0.1             | 5 / 3          |                | 10              |
| Rated Braking Capacity (W)                                            | 3               | 1250           |                | 2500            |
| Lifetime <sup>1)</sup> (at Rated Braking Capacity)                    | 200,000         | 200,000        |                | 50,000          |
| Lifetime (160mA at 48VDC)                                             |                 | 1,500,000      |                |                 |
| Initial Contact Resistance, new (mΩ)                                  | < 50            | < 30           |                | < 30            |
| Insulation Resistance (IEC 512-2) (MΩ)                                | > 100           | > 100          |                | > 100           |
| Contact Bounce Time (ms)                                              | < 5             | < 5            |                | < 5             |

1) The electrical lifetime according to ENEC or UL approbation can vary, depending on the corresponding micro switch, under the lifetime indicated above. The type and license numbers for the individual micro switches can be found in "point 6 approvals".

| <b>Micro Switch for Electrical Rating</b><br>(Protection Class IP 67) | 0.1 A<br>250 VAC | 5 A<br>250 VAC | 10 A<br>250 VAC |
|-----------------------------------------------------------------------|------------------|----------------|-----------------|
| <b>Electrical Data</b>                                                |                  |                |                 |
| Switching Voltage max. (VAC)                                          | 250              | 250            | 250             |
| Switching Current max. (A)                                            | 0.1              | 5              | 10              |
| Rated Braking Capacity (W)                                            | 25               | 1500           | 2500            |
| Lifetime <sup>1)</sup> (at Rated Braking Capacity)                    | 50,000           | 50,000         | 10,000          |

➤ *Italically written types on request*

- 1) The electrical lifetime according to ENEC or UL approbation can vary, depending on the corresponding micro switch, under the lifetime indicated above. The type and license numbers for the individual micro switches can be found in "point 6 approvals".

|                                                                       |              |
|-----------------------------------------------------------------------|--------------|
| <b>Mechanical Data</b>                                                |              |
| Actuating Force (single-pole) (N)                                     | 4.5          |
| Actuating Travel<br>Mounting Diameter 16, 19, 22 mm (mm)              | 1.0          |
| Actuating Travel<br>Mounting Diameter 30 mm (mm)                      | 1.2          |
| Lifetime (Actuations)                                                 | 1,500,000    |
| Shock Resistance DIN EN 50102<br>Mounting Diameter 16 mm (IK)         | 06           |
| Shock Resistance DIN EN 50102<br>Mounting Diameter 19, 22, 30 mm (IK) | 07           |
| <b>Climatical Data</b>                                                |              |
| Operating/Storage Temperature (°C)                                    | - 25 to + 85 |
| Degree of Protection Front Side<br>mechanical* (IP)                   | 40           |
| Degree of Protection Front Side<br>Contact Area (IP)                  | 67           |
| Degree of Protection Rear Side<br>Contact Area (IP)                   | 40 / 67      |

|                                           |    |
|-------------------------------------------|----|
| <b>Ring Illumination</b>                  |    |
| Supply Voltage<br>Ring Illumination (VDC) | 24 |

➤ *Supply Voltage 5 V and 12 V are available. Other supply voltages on request*

*\*The degree of protection refers to the area of the movable actuator.*

| Changes that contribute to technical improvement are subject to alternations |               |            |                 |               |               |                |       |
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| <u>Point Illumination</u>                              | <b>Attention: Parts are delivered without series resistor.</b>                                     |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Characteristics <b>red LED</b><br>Point Illumination   | Forward Current max. 40 mA<br>Forward Voltage at 10 mA = 2.0 VDC<br>Forward Voltage max. = 2.5 VDC |
| Characteristics <b>green LED</b><br>Point Illumination | Forward Current max. 40 mA<br>Forward Voltage at 10 mA = 2.0 VDC<br>Forward Voltage max. = 2.5 VDC |
| Characteristics <b>blue LED</b><br>Point Illumination  | Forward Current max. 20 mA<br>Forward Voltage at 10 mA = 3.2 VDC<br>Forward Voltage max. = 3.7 VDC |

**Recommendation of series resistors for Point Illumination:**

| LED-Color | I <sub>D</sub><br>[mA] | I <sub>DMax</sub><br>[mA] | U <sub>V</sub><br>[V] | R <sub>V</sub><br>[Ω] | R <sub>V</sub> <sup>E24</sup><br>[Ω] | P <sub>V</sub><br>[W]** | U <sub>V</sub><br>[V] | R <sub>V</sub><br>[Ω] | R <sub>V</sub> <sup>E24</sup><br>[Ω] | P <sub>V</sub><br>[W]** | U <sub>V</sub><br>[V] | R <sub>V</sub><br>[Ω] | R <sub>V</sub> <sup>E24</sup><br>[Ω] | P <sub>V</sub><br>[W] |
|-----------|------------------------|---------------------------|-----------------------|-----------------------|--------------------------------------|-------------------------|-----------------------|-----------------------|--------------------------------------|-------------------------|-----------------------|-----------------------|--------------------------------------|-----------------------|
| red       | 10                     | ---                       | 5                     | 300                   | 300                                  | 0,03                    | 12                    | 1000                  | 1000                                 | 0,10                    | 24                    | 2200                  | 2200                                 | 0,22                  |
|           | ---                    | 40                        |                       | 63                    | 62                                   | 0,10                    |                       | 238                   | 240                                  | 0,38                    |                       | 538                   | 240                                  | 0,86                  |
|           | 10                     | ---                       |                       | 300                   | 300                                  | 0,03                    |                       | 1000                  | 1000                                 | 0,10                    |                       | 2200                  | 2200                                 | 0,22                  |
|           | ---                    | 40                        |                       | 63                    | 62                                   | 0,10                    |                       | 238                   | 240                                  | 0,38                    |                       | 538                   | 560                                  | 0,86                  |
| green     | 10                     | ---                       | 5                     | 180                   | 180                                  | 0,02                    | 12                    | 880                   | 910                                  | 0,09                    | 24                    | 2080                  | 2000                                 | 0,21                  |
|           | ---                    | 20                        |                       | 65                    | 68                                   | 0,03                    |                       | 415                   | 430                                  | 0,17                    |                       | 1015                  | 1000                                 | 0,41                  |
|           | 10                     | ---                       |                       | 300                   | 300                                  | 0,03                    |                       | 1000                  | 1000                                 | 0,10                    |                       | 2200                  | 2200                                 | 0,22                  |
|           | ---                    | 40                        |                       | 63                    | 62                                   | 0,10                    |                       | 238                   | 240                                  | 0,38                    |                       | 538                   | 560                                  | 0,86                  |
| blue      | 10                     | ---                       | 5                     | 180                   | 180                                  | 0,02                    | 12                    | 880                   | 910                                  | 0,09                    | 24                    | 2080                  | 2000                                 | 0,21                  |
|           | ---                    | 20                        |                       | 65                    | 68                                   | 0,03                    |                       | 415                   | 430                                  | 0,17                    |                       | 1015                  | 1000                                 | 0,41                  |
|           | 10                     | ---                       |                       | 300                   | 300                                  | 0,03                    |                       | 1000                  | 1000                                 | 0,10                    |                       | 2200                  | 2200                                 | 0,22                  |
|           | ---                    | 40                        |                       | 63                    | 62                                   | 0,10                    |                       | 238                   | 240                                  | 0,38                    |                       | 538                   | 560                                  | 0,86                  |

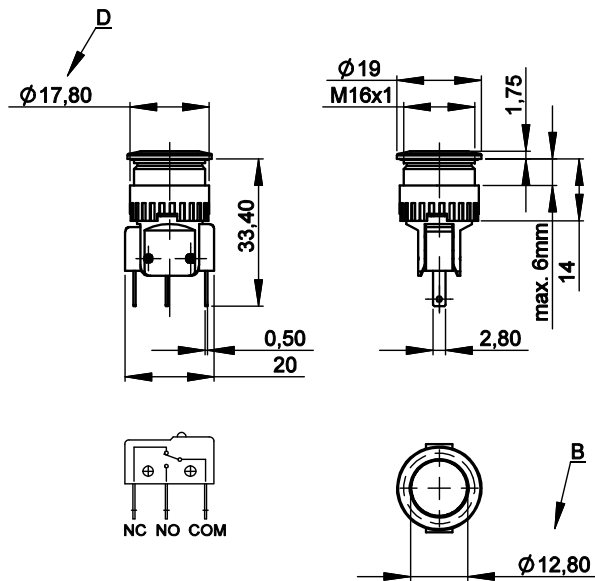
I<sub>D</sub> LED-Forward Current [10mA]  
I<sub>DMax</sub> LED-Forward Current max. [40mA/20mA]  
R<sub>V</sub> Series Resistor (calculated)  
R<sub>V</sub><sup>E24</sup> Series Resistor (regarding E24-Resistor series)  
P<sub>V</sub> Power dissipation concerning R<sub>V</sub> (calculated)

| <u>Material</u>                      |                 |
|--------------------------------------|-----------------|
| <b>Component</b>                     | <b>Material</b> |
| Housing                              | Stainless Steel |
| Actuator                             | Stainless Steel |
| Light Conductor (Point Illumination) | PC              |
| Illuminated Ring (Ring Illumination) | PA              |
| Gasket                               | NBR70           |
| Micro switch holder                  | PA              |

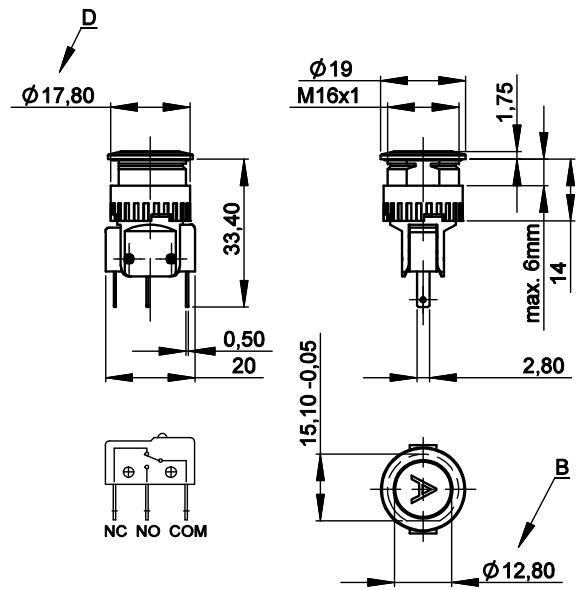
## 2.2 Component dimensions

### 2.2.1 Component dimensions MSM 16

#### MSM 16 ST



#### MSM 16 LE



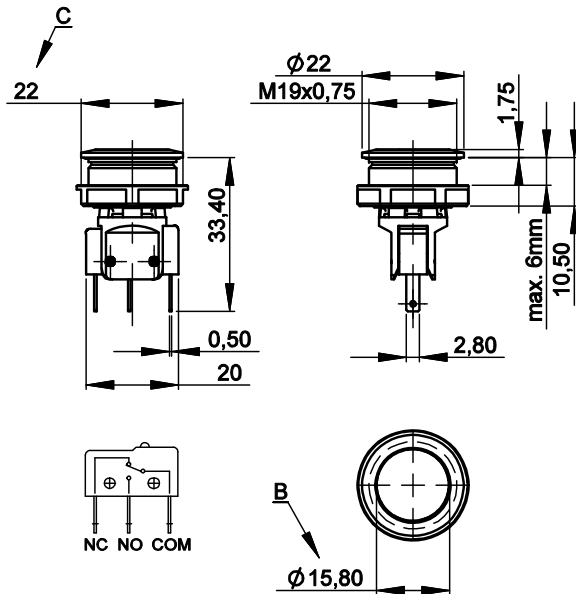
### Legend

- A = Illumination Area
- B = Actuating Area
- C = Width Across Flats
- D = Knurled Nut

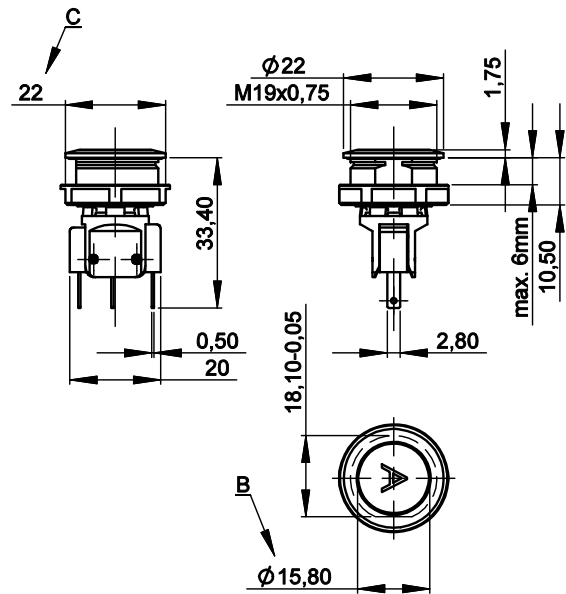
| Changes that contribute to technical improvement are subject to alternations |               |            |                 |               |               |                |       |
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## 2.2.2 Component dimensions MSM 19

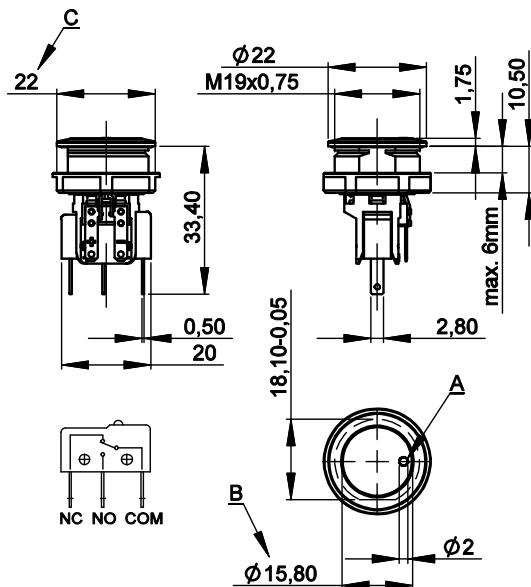
### MSM 19 ST



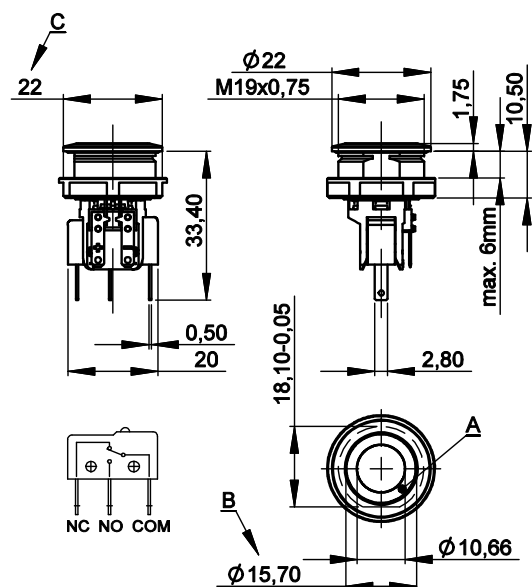
### MSM 19 LE



### MSM 19 PI



### MSM 19 RI



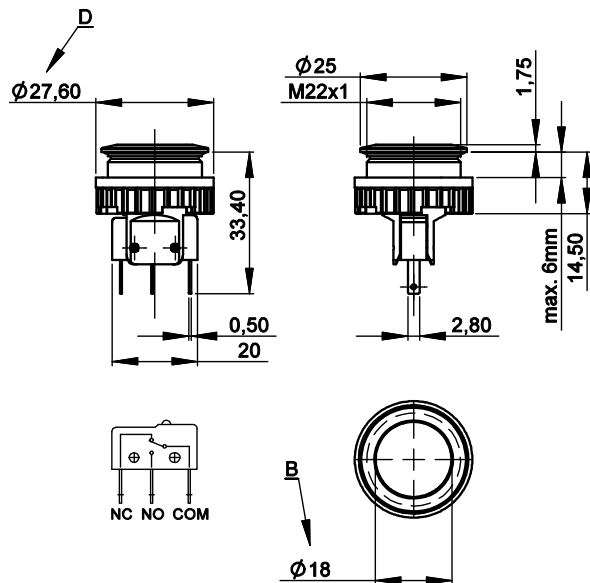
### Legend

- A = Illumination Area
- B = Actuating Area
- C = Width Across Flats
- D = Knurled Nut

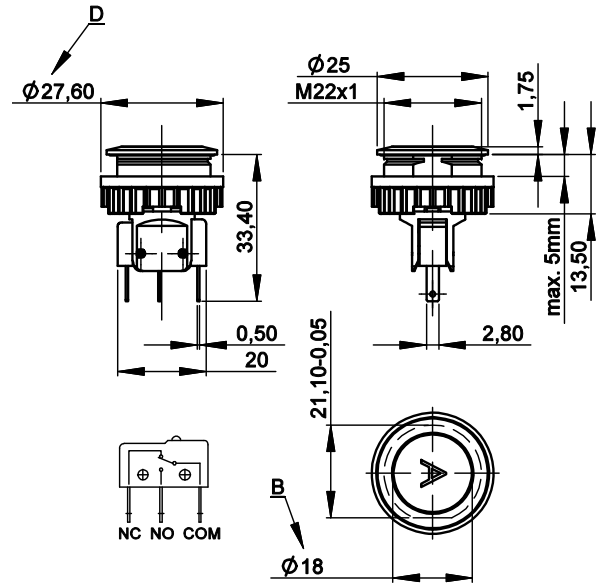
| Changes that contribute to technical improvement are subject to alternations |               |            |                 |               |               |                |       |
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### 2.2.3 Component dimensions MSM 22

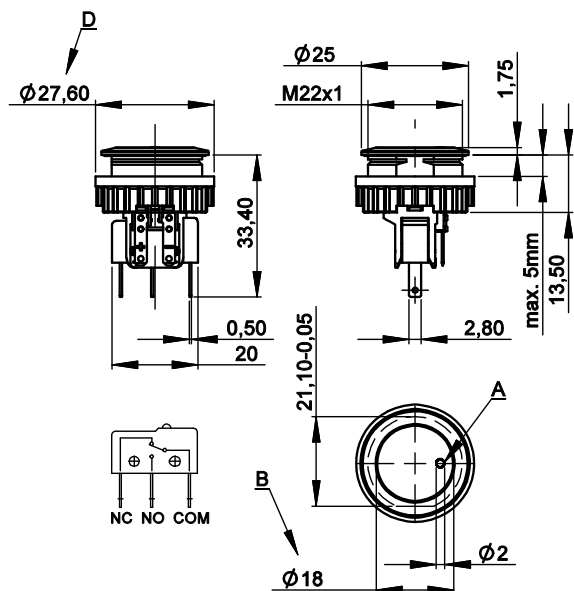
## MSM 22 ST



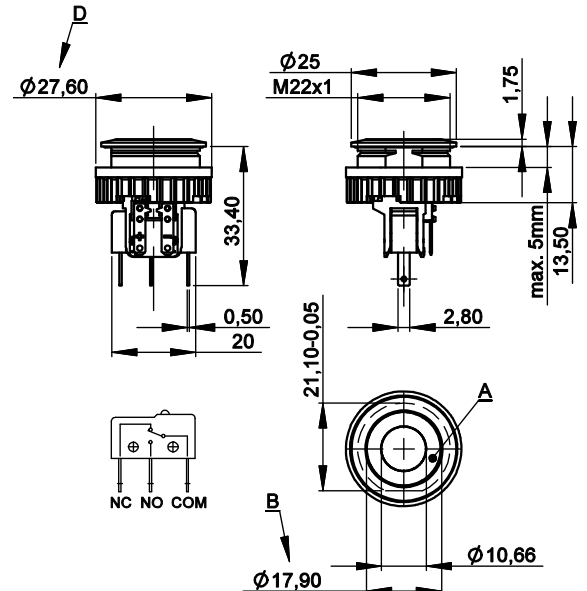
## MSM 22 LE



## MSM 22 PI



## MSM 22 RI



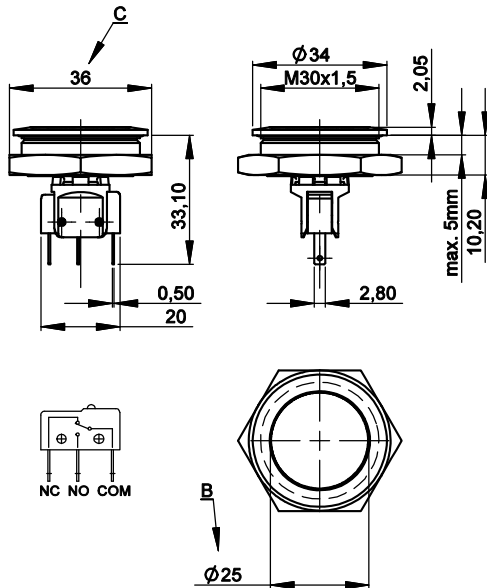
### Legend

- *A = Illumination Area*
- *B = Actuating Area*
- *C = Width Across Flats*
- *D = Knurled Nut*

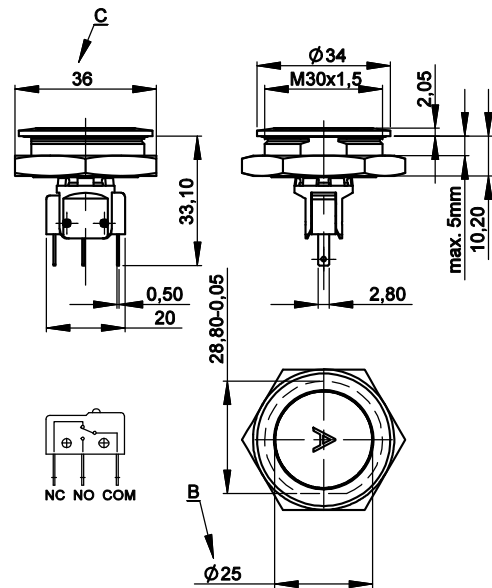
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## 2.2.4 Component dimensions MSM 30

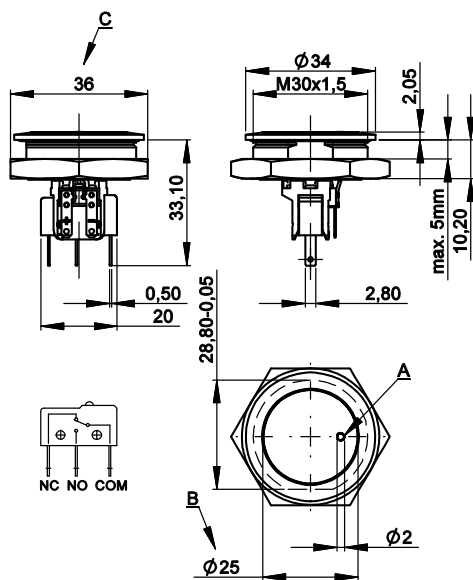
### MSM 30 ST



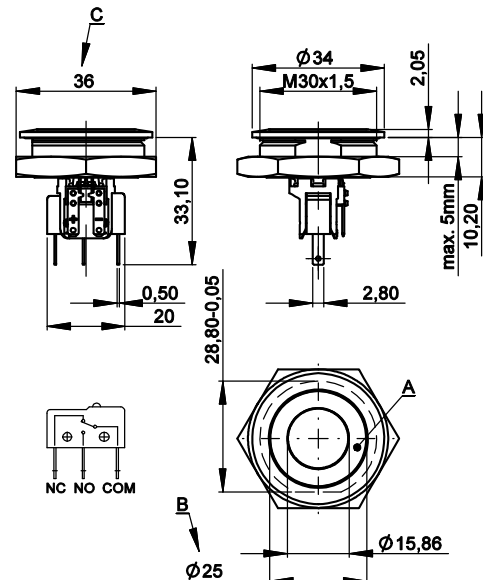
### MSM 30 LE



### MSM 30 PI



### MSM 30 RI



## Legend

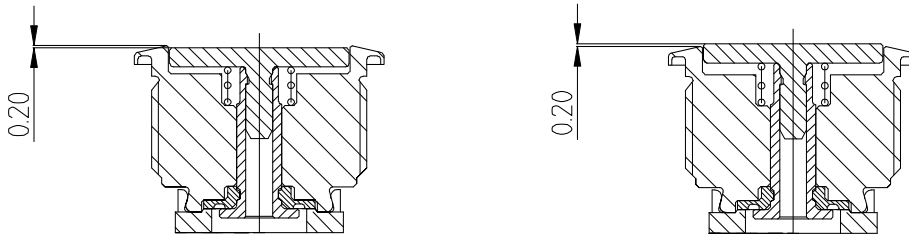
- A = Illumination Area
- B = Actuating Area
- C = Width Across Flats
- D = Knurled Nut

Changes that contribute to technical improvement are subject to alternations

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### 2.3 Actuator Tolerance Range



The mounting tolerance range of the actuator varies from 0.2 mm projection length and 0.2 mm short length to the housing edge. The slanting position of the actuator can range within this tolerance.

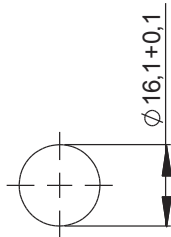
Changes that contribute to technical improvement are subject to alternations

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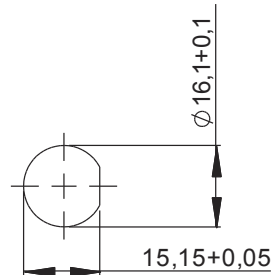
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## 2.4 Hole dimensions

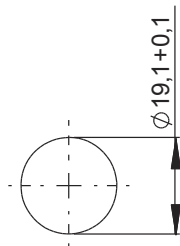
### MSM 16 ST



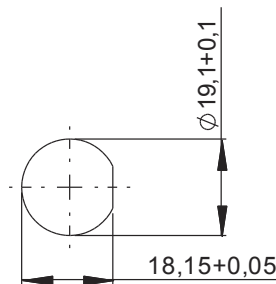
### MSM 16 LE



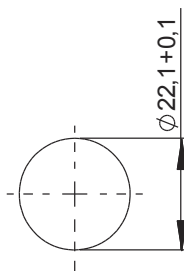
### MSM 19 ST / MSM 19 RI



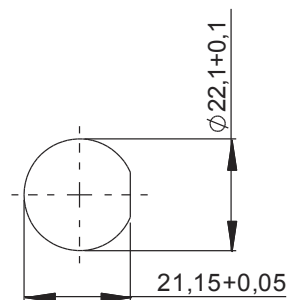
### MSM 19 LE / MSM 19 PI / *MSM 19 RI optional*



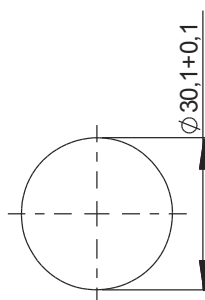
### MSM 22 ST / MSM 22 RI



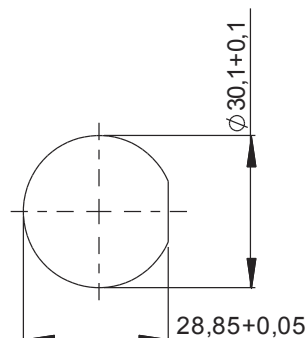
### MSM 22 LE / MSM 22 PI / *MSM 22 RI optional*



### MSM 30 ST / MSM 30 RI



### MSM 30 LE / MSM 30 PI / *MSM 30 RI optional*



| Changes that contribute to technical improvement are subject to alternations |               |            |                 |               |               |                |       |
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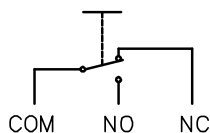
## 2.5 Starting Torque

|        | Plastic Nut max. (Nm) | Stainless Steel Nut * max. (Nm) |
|--------|-----------------------|---------------------------------|
| MSM 16 | 2                     | 10                              |
| MSM 19 | 4.5                   | 12                              |
| MSM 22 | 3.5                   | 16                              |
| MSM 30 | 8                     | 50                              |

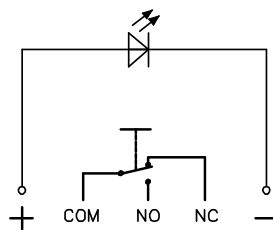
➤ \* on request

## 2.6 Switching Symbols

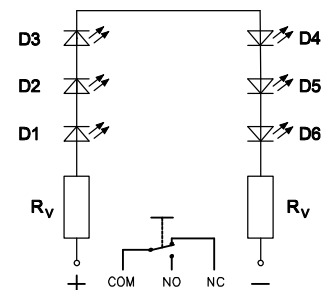
### MSM ST / MSM LE



### MSM PI



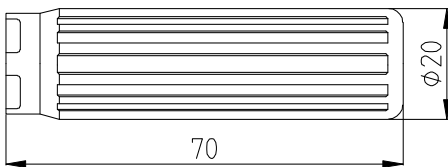
### MSM RI



## 2.7 Accessories

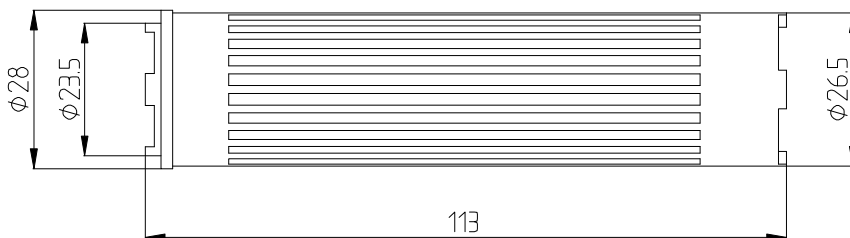
### MSM 16 Installation wrench

Order number: 0853.0622



### MSM 22 Installation wrench

Order number: 1141.1337



### 3 ORDER NUMBERS

#### 3.1 Order numbers MSM with stainless steel housing and micro switches of protection class IP40

| Mounting Diameter (mm)                                | Ø 16              | Ø 19                     | Ø 22                     |
|-------------------------------------------------------|-------------------|--------------------------|--------------------------|
| Electrical Rating max. 0.1 A / 30 VDC                 |                   |                          |                          |
| Standard                                              | 1241.6611.1110000 | 1241.6621.1110000        | 1241.6631.1110000        |
| With Lettering                                        | 1241.6612.1110XXX | 1241.6622.1110XXX        | 1241.6632.1110XXX        |
| Point Illumination red                                |                   | 1241.6623.1111000        | 1241.6633.1111000        |
| Point Illumination green                              |                   | 1241.6623.1112000        | 1241.6633.1112000        |
| <i>Point Illumination blue</i>                        |                   | <i>1241.6623.1114000</i> | <i>1241.6633.1114000</i> |
| Ring Illumination red                                 |                   | 1241.6624.1111000        | 1241.6634.1111000        |
| Ring Illumination green                               |                   | 1241.6624.1112000        | 1241.6634.1112000        |
| <i>Ring Illumination blue</i>                         |                   | <i>1241.6624.1114000</i> | <i>1241.6634.1114000</i> |
| Installation Wrench                                   | 0853.0622         |                          | 1141.1337                |
| Electrical Rating max. 5 A / 125 VAC or 3 A / 250 VAC |                   |                          |                          |
| Standard                                              | 1241.6611.1120000 | 1241.6621.1120000        | 1241.6631.1120000        |
| With Lettering                                        | 1241.6612.1120XXX | 1241.6622.1120XXX        | 1241.6632.1120XXX        |
| Point Illumination red                                |                   | 1241.6623.1121000        | 1241.6633.1121000        |
| Point Illumination green                              |                   | 1241.6623.1122000        | 1241.6633.1122000        |
| Point Illumination blue                               |                   | 1241.6623.1124000        | 1241.6633.1124000        |
| Ring Illumination red                                 |                   | 1241.6624.1121000        | 1241.6634.1121000        |
| Ring Illumination green                               |                   | 1241.6624.1122000        | 1241.6634.1122000        |
| Ring Illumination blue                                |                   | 1241.6624.1124000        | 1241.6634.1124000        |
| Installation Wrench                                   | 0853.0622         |                          | 1141.1337                |
| Electrical Rating max. 10 A / 250 VAC                 |                   |                          |                          |
| Standard                                              | 1241.6611.1130000 | 1241.6621.1130000        | 1241.6631.1130000        |
| With Lettering                                        | 1241.6612.1130XXX | 1241.6622.1130XXX        | 1241.6632.1130XXX        |
| Point Illumination red                                |                   | 1241.6623.1131000        | 1241.6633.1131000        |
| Point Illumination green                              |                   | 1241.6623.1132000        | 1241.6633.1132000        |
| <i>Point Illumination blue</i>                        |                   | <i>1241.6623.1134000</i> | <i>1241.6633.1134000</i> |
| Ring Illumination red                                 |                   | 1241.6624.1131000        | 1241.6634.1131000        |
| Ring Illumination green                               |                   | 1241.6624.1132000        | 1241.6634.1132000        |
| <i>Ring Illumination blue</i>                         |                   | <i>1241.6624.1134000</i> | <i>1241.6634.1134000</i> |
| Installation Wrench                                   | 0853.0622         |                          | 1141.1337                |

- *Italicly written types on request*
- XXX for standard lettering see chapter [3.4 Lettering](#)
- At a minimum order quantity of 100 pieces the ring illuminated Version with Lettering is available on request

|                                                       |                          |
|-------------------------------------------------------|--------------------------|
| Mounting Diameter (mm)                                | Ø 30                     |
| Electrical Rating max. 0.1 A / 30 VDC                 |                          |
| Standard                                              | 1241.6661.1110000        |
| With Lettering                                        | 1241.6662.1110XXX        |
| Point Illumination red                                | 1241.6663.1111000        |
| Point Illumination green                              | 1241.6663.1112000        |
| <i>Point Illumination blue</i>                        | <i>1241.6663.1114000</i> |
| Ring Illumination red                                 | 1241.6664.1111000        |
| Ring Illumination green                               | 1241.6664.1112000        |
| <i>Ring Illumination blue</i>                         | <i>1241.6664.1114000</i> |
| Electrical Rating max. 5 A / 125 VAC or 3 A / 250 VAC |                          |
| Standard                                              | 1241.6661.1120000        |
| With Lettering                                        | 1241.6662.1120XXX        |
| Point Illumination red                                | 1241.6663.1121000        |
| Point Illumination green                              | 1241.6663.1122000        |
| <i>Point Illumination blue</i>                        | <i>1241.6663.1124000</i> |
| Ring Illumination red                                 | 1241.6664.1121000        |
| Ring Illumination green                               | 1241.6664.1122000        |
| <i>Ring Illumination blue</i>                         | <i>1241.6664.1124000</i> |
| Electrical Rating max. 10 A / 250 VAC                 |                          |
| Standard                                              | 1241.6661.1130000        |
| With Lettering                                        | 1241.6662.1130XXX        |
| Point Illumination red                                | 1241.6663.1131000        |
| Point Illumination green                              | 1241.6663.1132000        |
| <i>Point Illumination blue</i>                        | <i>1241.6663.1134000</i> |
| Ring Illumination red                                 | 1241.6664.1131000        |
| Ring Illumination green                               | 1241.6664.1132000        |
| <i>Ring Illumination blue</i>                         | <i>1241.6664.1134000</i> |

- *Italicly written types on request*
- *XXX for standard lettering see chapter [3.4 Lettering](#)*
- *At a minimum order quantity of 100 pieces the ring illuminated Version with Lettering is available on request*

### 3.2 Order numbers MSM with stainless steel housing and micro switches of protection class IP 67

| Mounting Diameter (mm)             | Ø 19              | Ø 22              |
|------------------------------------|-------------------|-------------------|
| Electrical Rating max. 5A / 250VAC |                   |                   |
| Standard                           | 1241.6621.1180000 | 1241.6631.1180000 |
| Ring Illumination red              | 1241.6624.1181000 | 1241.6634.1181000 |

Combinations with micro switches of the protection class IP 67 are available for following types on request:

- Standard
- With Lettering
- Point Illumination red / green / blue
- Ring Illumination red / green / blue

For other types of the MSM product family, please visit:

[http://www.schurter.de/wwwsc/con\\_pg70.asp?language\\_id=10](http://www.schurter.de/wwwsc/con_pg70.asp?language_id=10)

### 3.3 Order numbers MSM with aluminium housing anodised and micro switches of protection class IP 40

| Mounting Diameter (mm)              | Ø 19              | Ø 22              |
|-------------------------------------|-------------------|-------------------|
| Electrical Rating max. 5A / 250VAC  |                   |                   |
| Standard, housing red               | 1241.6622.3120000 | 1241.6632.3120000 |
| Standard, housing green             | 1241.6622.5120000 | 1241.6632.5121000 |
| With Lettering „AUS“, housing red   | 1241.6622.3120062 | 1241.6632.3120062 |
| With Lettering „EIN“, housing green | 1241.6622.5121061 | 1241.6632.5121061 |
| With Lettering “OFF“, housing red   | 1241.6622.3120066 | 1241.6632.3120066 |
| With Lettering "ON“, housing green  | 1241.6622.5121065 | 1241.6632.5121065 |

For other types of the MSM product family, please visit:

[http://www.schurter.de/wwwsc/con\\_pg70.asp?language\\_id=10](http://www.schurter.de/wwwsc/con_pg70.asp?language_id=10)

### 3.4 Lettering

The last three digits in the order number define the lettering.

|         |                      |
|---------|----------------------|
| 000     | No Lettering         |
| 001-074 | Standard Lettering   |
| 101-    | Customized Lettering |

#### Example for ordering with lettering

1241.6611.1120XXX  
 Basic Version  
 Symbols **001-074**

#### Ordering Indices for Lettering

|               |               |               |                    |                    |
|---------------|---------------|---------------|--------------------|--------------------|
| 001= <b>A</b> | 016= <b>P</b> | 031= <b>4</b> | 046= <b>↕</b>      | 061= <b>EIN</b>    |
| 002= <b>B</b> | 017= <b>Q</b> | 032= <b>5</b> | 047= <b>→</b>      | 062= <b>AUS</b>    |
| 003= <b>C</b> | 018= <b>R</b> | 033= <b>6</b> | 048= <b>←</b>      | 063= <b>AUF</b>    |
| 004= <b>D</b> | 019= <b>S</b> | 034= <b>7</b> | 049= <b>↓</b>      | 064= <b>AB</b>     |
| 005= <b>E</b> | 020= <b>T</b> | 035= <b>8</b> | 050= <b>↑</b>      | 065= <b>ON</b>     |
| 006= <b>F</b> | 021= <b>U</b> | 036= <b>9</b> | 051= <b>%</b>      | 066= <b>OFF</b>    |
| 007= <b>G</b> | 022= <b>V</b> | 037= <b>+</b> | 052= <b>√</b>      | 067= <b>UP</b>     |
| 008= <b>H</b> | 023= <b>W</b> | 038= <b>–</b> | 053= <b>CTRL</b>   | 068= <b>DOWN</b>   |
| 009= <b>I</b> | 024= <b>X</b> | 039= <b>.</b> | 054= <b>RETURN</b> | 069= <b>HIGH</b>   |
| 010= <b>J</b> | 025= <b>Y</b> | 040= <b>×</b> | 055= <b>SHIFT</b>  | 070= <b>LOW</b>    |
| 011= <b>K</b> | 026= <b>Z</b> | 041= <b>÷</b> | 056= <b>LOCK</b>   | 071= <b>ON/OFF</b> |
| 012= <b>L</b> | 027= <b>0</b> | 042= <b>*</b> | 057= <b>STOP</b>   | 072= <b>START</b>  |
| 013= <b>M</b> | 028= <b>1</b> | 043= <b>=</b> | 058= <b>ENTER</b>  | 073= <b>RESET</b>  |
| 014= <b>N</b> | 029= <b>2</b> | 044= <b>#</b> | 059= <b>BACK</b>   | 074= <b>⏻</b>      |
| 015= <b>O</b> | 030= <b>3</b> | 045= <b>↔</b> | 060= <b>LINE</b>   |                    |

## Lettering Size

### **MSM 16 LE:**

|                                   |                                                     |
|-----------------------------------|-----------------------------------------------------|
| <b>Single characters:</b>         | height 5 mm, font: Helvetica normal DIN1451-1E      |
| <b>Text, max. 3 characters</b>    | height 3 mm, font: Helvetica normal DIN1451-1E      |
| <b>Text, max. 6 characters:</b>   | height 2.5 mm, font: Helvetica condensed DIN1451-3E |
| <b>Symbols (indices 037-052):</b> | capitals height 5 mm, font: True Type, Symbol       |

### **MSM 19 LE / MSM 19 PI :**

|                                   |                                                     |
|-----------------------------------|-----------------------------------------------------|
| <b>Single characters:</b>         | height 8 mm, font: Helvetica normal DIN1451-1E      |
| <b>Text, max. 3 characters</b>    | height 3 mm, font: Helvetica normal DIN1451-1E      |
| <b>Text, max. 6 characters:</b>   | height 2.5 mm, font: Helvetica condensed DIN1451-3E |
| <b>Symbols (indices 037-052):</b> | capitals height 8 mm, font: True Type, Symbol       |

### **MSM 22 LE / MSM 22 PI :**

|                                   |                                                     |
|-----------------------------------|-----------------------------------------------------|
| <b>Single characters:</b>         | height 8 mm, font: Helvetica normal DIN1451-1E      |
| <b>Text, max. 3 characters</b>    | height 3 mm, font: Helvetica normal DIN1451-1E      |
| <b>Text, max. 6 characters:</b>   | height 2.5 mm, font: Helvetica condensed DIN1451-3E |
| <b>Symbols (indices 037-052):</b> | capitals height 8 mm, font: True Type, Symbol       |

### **MSM 30 LE / MSM 30 PI :**

|                                   |                                                     |
|-----------------------------------|-----------------------------------------------------|
| <b>Single characters:</b>         | height 12 mm, font: Helvetica normal DIN1451-1E     |
| <b>Text, max. 3 characters:</b>   | height 7 mm, font: Helvetica normal DIN1451-1E      |
| <b>Text, max. 6 characters:</b>   | height 3.5 mm, font: Helvetica condensed DIN1451-3E |
| <b>Symbols (indices 037-052):</b> | capitals height 12 mm, font: True Type, Symbol      |

### **MSM 19 RI \* / MSM 22 RI \*:**

|                                   |                                                       |
|-----------------------------------|-------------------------------------------------------|
| <b>Single characters:</b>         | <i>height 5 mm, font: Helvetica normal DIN1451-1E</i> |
| <b>Text, max. 3 characters</b>    | <i>height 3 mm, font: Helvetica normal DIN1451-1E</i> |
| <b>Symbols (indices 037-052):</b> | <i>capitals height 5 mm, font: True Type, Symbol</i>  |

### **MSM 30 RI \*:**

|                                   |                                                            |
|-----------------------------------|------------------------------------------------------------|
| <b>Single characters:</b>         | <i>height 8 mm, font: Helvetica normal DIN1451-1E</i>      |
| <b>Text, max. 3 characters</b>    | <i>height 3 mm, font: Helvetica normal DIN1451-1E</i>      |
| <b>Text, max. 6 characters:</b>   | <i>height 2.5 mm, font: Helvetica condensed DIN1451-3E</i> |
| <b>Symbols (indices 037-052):</b> | <i>capitals height 8 mm, font: True Type, Symbol</i>       |

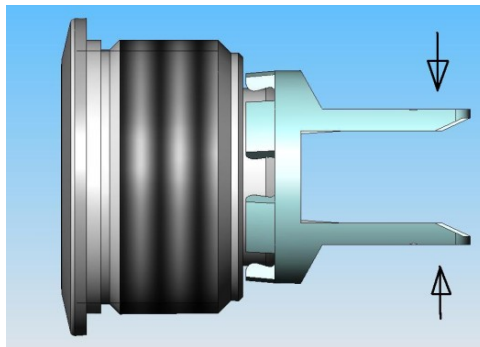
- *\* At a minimum order quantity of 100 pieces the ring illuminated Version with Lettering is available on request*

| Changes that contribute to technical improvement are subject to alternations |               |            |                 |               |               |                |       |
|------------------------------------------------------------------------------|---------------|------------|-----------------|---------------|---------------|----------------|-------|
| Seite                                                                        | Erstelldatum: | Ersteller: | Änderungsdatum: | Geändert von: | Änderungs-Nr. | Datenblatt Nr. | Index |
| 18 of 22                                                                     | 05.11.2004    | Ullmer     | 25.03.2010      | Schillak      | 10177         | 105.9502       | n     |

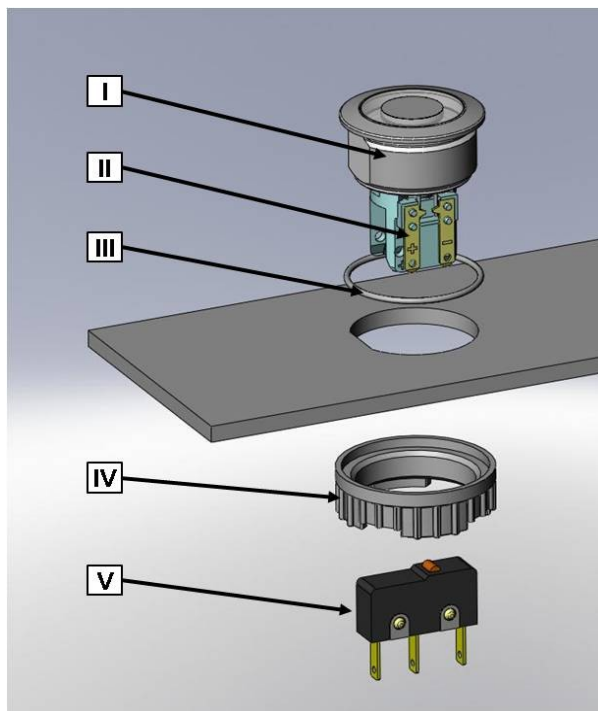
## 4 ASSEMBLY

### 4.1 General Instruction

- During assembly, the protruding bars of the holder should not be pressed together.



### 4.2 Installation



#### Installation instruction

- Place the Gasket accurately on the actuator housing. Then mount the actuator housing assembly into the panel.
- Tighten the screw Nut with the torque instructions according to [Chapter 2.5](#)
- Clasp the micro switch into the micro switch holder of the actuator housing.

#### Installation information:

- The power supply and the configuration of the flat pin terminals has to be installed correctly for the illumination and micro switch function.
- Insulate the terminals as required
- Installation instructions according to VDE-standard DIN VDE 0100-100 or alternatively IEC 60354 standard

#### Legend

- I = Housing
- II = Flat pin terminals (illumination)
- III = Gasket
- IV = Screw Nut
- V = Micro Switch element

Changes that contribute to technical improvement are subject to alternations

| Seite    | Erstelldatum: | Ersteller: | Änderungsdatum: | Geändert von: | Änderungs-Nr. | Datenblatt Nr. | Index |
|----------|---------------|------------|-----------------|---------------|---------------|----------------|-------|
| 19 of 22 | 05.11.2004    | Ullmer     | 25.03.2010      | Schillak      | 10177         | 105.9502       | n     |

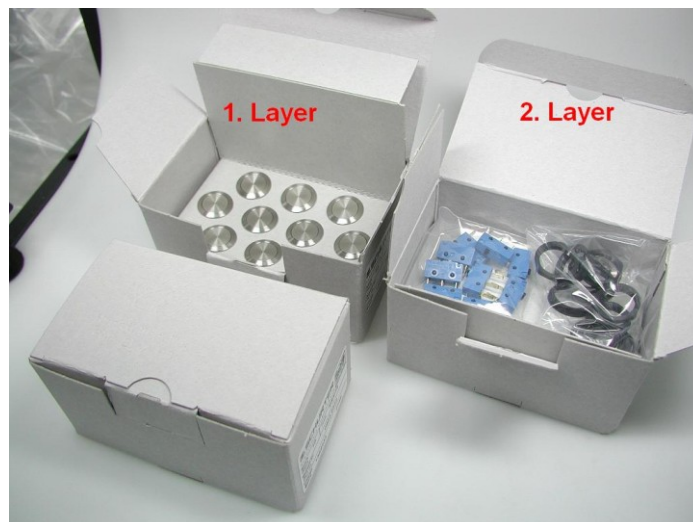
Print date: 25/03/2010 09:46:00

## 5 PACKAGING

### MSM Switch

|        |                            |                              |
|--------|----------------------------|------------------------------|
| MSM 16 |                            | 10 pieces per box with inlay |
| MSM 19 |                            | 10 pieces per box with inlay |
| MSM 22 |                            | 10 pieces per box with inlay |
| MSM 30 | 1 piece in air cushion bag | 10 pieces per box            |

The nuts with gaskets and corresponding micro switches are packed separately and enclosed in the box.



## 6 QUALIFICATION TEST

### 6.1 IP Protection Class

|                                       |       |
|---------------------------------------|-------|
| IP Protection Class IEC/DIN/EN/ 60529 | IP 67 |
|---------------------------------------|-------|

### 6.2 IK Protection Class

Tested Centrally

|                                                                     |       |
|---------------------------------------------------------------------|-------|
| IK Protection Class DIN EN 50102<br>Mounting Diameter 16 mm         | IK 06 |
| IK Protection Class DIN EN 50102<br>Mounting Diameter 19, 22, 30 mm | IK 07 |

### 6.3 ESD Protection

ESD-Test according to DIN 61000-4-2:

|                       |        |                     |
|-----------------------|--------|---------------------|
| 4kV Contact Discharge | MSM ST | Ø 16; 19; 22; 30 mm |
| 4kV Contact Discharge | MSM LE | Ø 16; 19; 22; 30 mm |

### 6.4 Salt Spray Test

Salt spray test according to DIN 50021- SS  
24h, 48h and 96h residence time

The surface of the stainless steel material is covered with a molecular-passive layer. Only under very unfavourable conditions it is possible, that iron and rust molecules as well as base metals penetrate the passive layer as foreign substances (pollutions) and initiate the rust process.

The smoothness of the actuator was not affected. After the residence time the tested samples were cleaned under running water and all rust spots could be removed.

## 7 APPROVALS

The listed approvals only refer to the micro switch and not to the complete switch.

### Micro switch:

| Type      | Licence number | ENEC<br>VDE / KEMA | UL 1054<br>CSA C22.2 NO55 |
|-----------|----------------|--------------------|---------------------------|
| 1050.1151 | 097550         | DIN EN 61058       | E41791                    |
| 1050.1102 | 097550         | DIN EN 61058       | E41791                    |
| 1050.1103 | 097550         | DIN EN 61058       | E41791                    |
| SS-01 T   | 40008425       | DIN EN 61058       | E41515                    |
| SS-5 T    | 129246         | DIN EN 61058       | E41515                    |
| SS-10 T   | 125256         | DIN EN 61058       | E41515                    |
| DC3GL1AA  | 2089323.01     | DIN EN 61058       | E23301                    |
| DC1GL1AA  | 2089323.01     | DIN EN 61058       | E23301                    |
| DC2GL1AA  | 2089323.01     | DIN EN 61058       | E23301                    |

## 8 COMPLIANTS

All articles are ROHS-compliant and in compliance to the Low Voltage Directive (2006/95/EC).

