

## Product manual

# Vandal-proof switch MSM CS

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## 1 PRODUCT DESCRIPTION



The MSM CS metal switch from SCHURTER is equipped with an actuator made of highly durable ceramic. Ceramic is a new technology employed in the production of an electro-mechanical switch. The new switch provides novel features that open up entirely new areas of application. The actuator material of the MSM CS is resistant to scratches, abrasion, impact and chemicals.

The non-illuminated version has a translucent white actuating surface. Lettering is black and is applied directly onto the ceramic material. Due to the base material and the lettering process, the lettering is resistant to scratches and to common cleaning agents. In the case of switches designed with illumination, the actuator surface fully illuminates uniformly across the entire surface. Lettering and symbols

can also be applied. The standard black lettering provides a positive effect against the illuminated actuator, while negative lettering provides an inverse effect.

The MSM CS is extremely robust and meets vandal-proof demands due to the low profile of the front structure (1.7 mm), the IP 69K protection class and the high level of impact resistance. The switch is available in 19 mm and 22 mm mounting diameters. Different contact configurations are offered over a range of 30 VDC to 250 VAC for the admissible switching voltage; switching currents are permissible from 0.1 to 10 Amperes. The MSM CS is equipped with quick connect terminals to allow for fast connections. The wires are connected to the switching element which is subsequently snapped onto the switch housing.

## 2 TECHNICAL DATA AND DIMENSIONAL DRAWINGS

### 2.1 Technical Data

<b>Micro Switch for Electrical Rating</b> (Protection Class IP 40)	0.1 A 30 VDC	5 A 125 VAC	3 A 250 VAC	10 A 250 VAC
<b>Electrical Data</b>				
Contact Material	gold	silver		silver
Switching Voltage max. [VAC] [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

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> (Protection Class IP 40)		0.1 A 30 VDC	5 A 125 VAC	3 A 250 VAC	10 A 250 VAC
Insulation Resistance (IEC 512-2)	[MΩ]	> 100	> 100		> 100
Contact Bounce Time	[ms]	< 5	< 5		< 5

<b>Micro Switch for Electrical Rating</b> (Protection Class IP 67)		0.1 A 250 VAC	5 A 250 VAC	10 A 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

➤ *Italicly 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	[N]	4,5
Actuating Travel	[mm]	1.0
Lifetime	[Actuations]	1,500,000

<b>Climatical Data</b>		
Operating / Storage Temperature	[°C]	-25 to +85
Degree of Protection Front Side mechanical <sup>2)</sup>	[IP]	40
Degree of Protection Front Side Contact Area	[IP]	65
Degree of Protection Front Side Contact Area	[IP]	69K
Degree of Protection Rear Side Contact Area	[IP]	40 / 67

- 2) Degree of protection refers to the area of the movable actuator.

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<b><u>Overlay Illumination</u></b>		
Supply Voltage	[VDC]	24

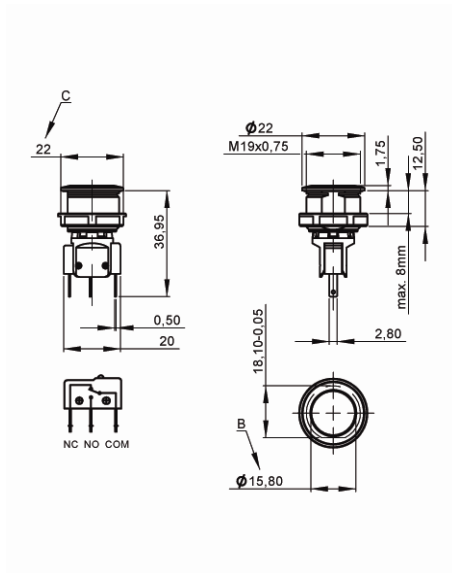
➤ Supply voltage 5V and 12V are available. Other supply voltages on request.

<b><u>Material</u></b>	
<b>Component</b>	<b>Material</b>
Housing	Stainless Steel
Actuator	Ceramic (Zirconium Dioxide)
Sealing Ring	NBR70
Micro switch holder	PA

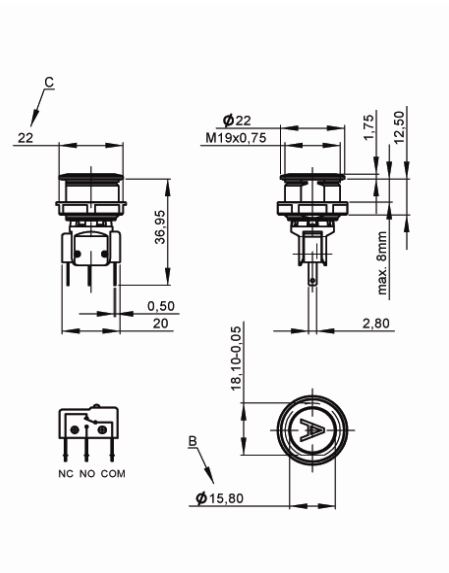
## 2.2 Component dimensions

### 2.2.1 Component dimensions MSM 19 CS

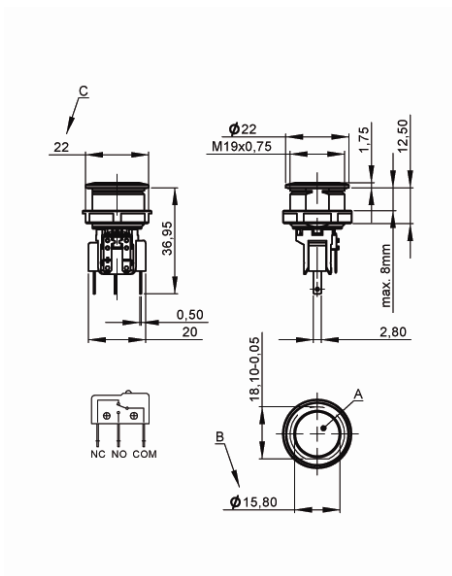
#### MSM 19 CS ST



#### MSM 19 CS LE



#### MSM 19 CS BL



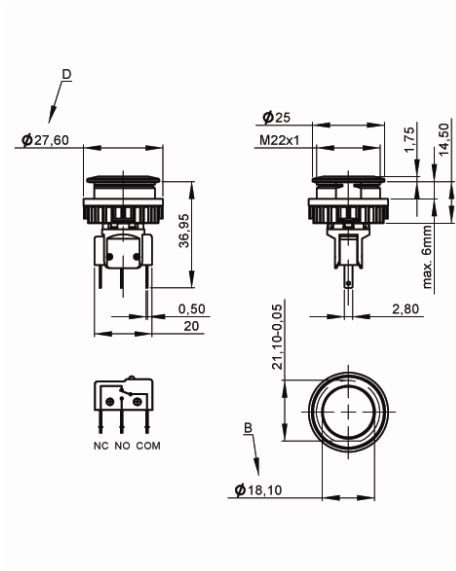
### Legend

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

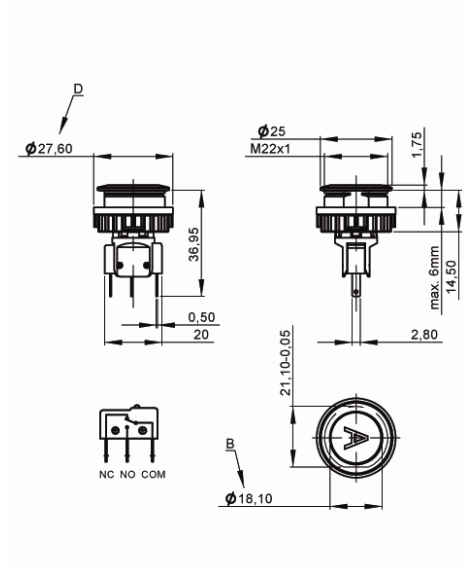
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## 2.2.2 Component dimensions MSM 22 CS

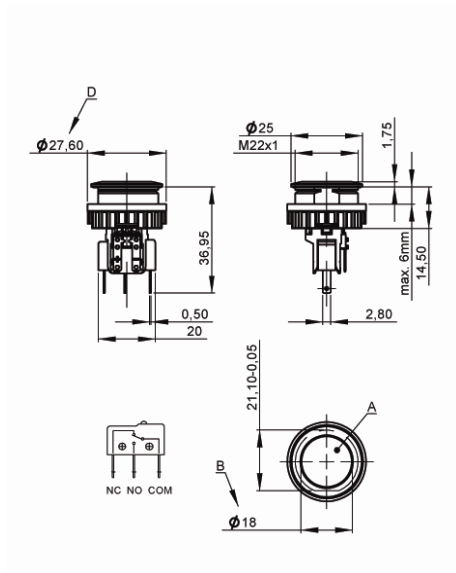
### MSM 22 CS ST



### MSM 22 CS LE



### MSM 22 CS BL

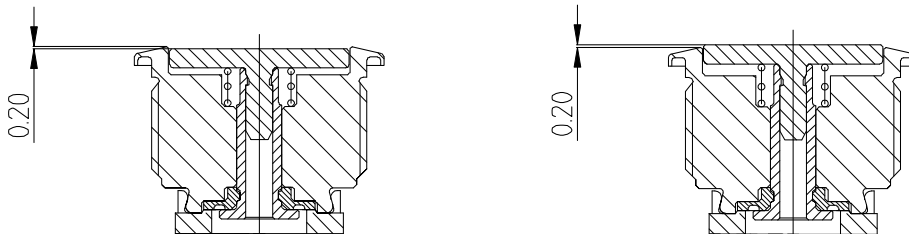


### Legend

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

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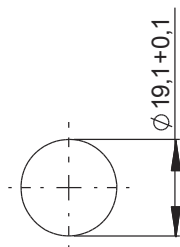
### 2.3 Actuator Tolerance Range



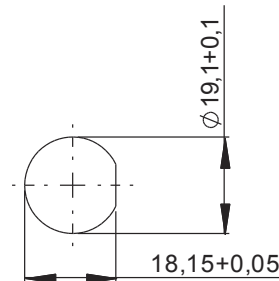
The mounting tolerance range of the actuator varies from 0.2 mm projection length and 0.2 mm short length to the housing edge. The slanting position of the actuator can range within this tolerance.

### 2.4 Hole dimensions

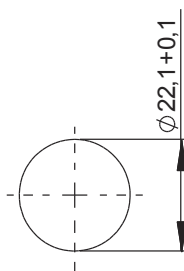
#### MSM 19 CS ST



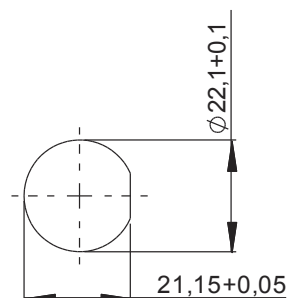
#### MSM 19 CS LE / MSM 19 CS BL



#### MSM 22 CS ST



#### MSM 22 CS LE / MSM 22 CS BL



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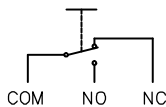
2.5 Starting Torque

	Plastic Nut max. (Nm)	Stainless Steel Nut * max. (Nm)
MSM 19 CS	4.5	12
MSM 22 CS	3.5	16

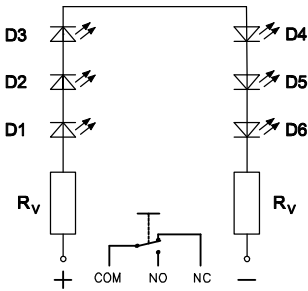
*\* on request*

2.6 Switching Symbols

MSM CS ST / MSM CS LE



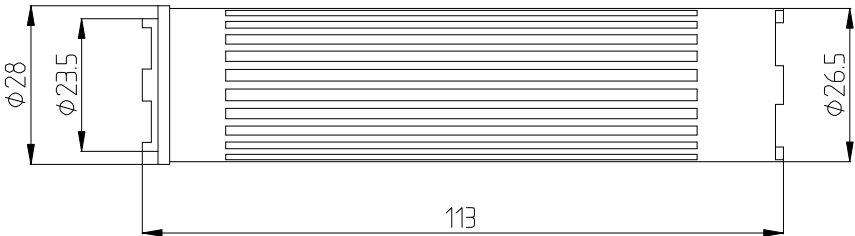
MSM CS BL



2.7 Accessories

MSM 22 CS Installation wrench

Order number: 1141.1337





### 3 ORDER NUMBERS

#### 3.1 Order numbers MSM CS with micro switches of protection class IP40

Mounting Diameter (mm)	Ø 19	Ø 22
------------------------	------	------

Electrical Rating max. 0.1 A / 30 VDC		
Standard	1241.7021.1110000	1241.7031.1110000
Lettered	1241.7022.1110XXX	1241.7032.1110XXX
Backlighted red	1241.7026.1111000	1241.7036.1111000
Backlighted green	1241.7026.1112000	1241.7036.1112000
Backlighted blue	1241.7026.1114000	1241.7036.1114000
Installation Wrench		1141.1337

Electrical Rating max. 5 A / 125 VAC or 3 A / 250 VAC		
Standard	1241.7021.1120000	1241.7031.1120000
Lettered	1241.7022.1120XXX	1241.7032.1120XXX
Backlighted red	1241.7026.1121000	1241.7036.1121000
Backlighted green	1241.7026.1122000	1241.7036.1122000
Backlighted blue	1241.7026.1124000	1241.7036.1124000
Installation Wrench		1141.1337

Electrical Rating max. 10 A / 250 VAC		
Standard	1241.7021.1130000	1241.7031.1130000
Lettered	1241.7022.1130XXX	1241.7032.1130XXX
Backlighted red	1241.7026.1131000	1241.7036.1131000
Backlighted green	1241.7026.1132000	1241.7036.1132000
Backlighted blue	1241.7026.1134000	1241.7036.1134000
Installation Wrench		1141.1337

➤ XXX for standard lettering see chapter [3.3 Lettering](#)

### 3.2 Order numbers MSM CS with micro switches of protection class IP 67

Mounting Diameter (mm)	Ø 19	Ø 22
Electrical Rating max. 5A / 250VAC		
Standard	1241.7021.1180000	1241.7031.1180000
Lettered	1241.7022.1180XXX	1241.7032.1180XXX
Backlighted red	1241.7026.1181000	1241.7036.1181000
Backlighted green	1241.7026.1182000	1241.7036.1182000
Backlighted blue	1241.7026.1184000	1241.7036.1184000
Installation Wrench		1141.1337

- Other supply voltages on request
- XXX for standard lettering see chapter [3.3 Lettering](#)

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

<http://www.schurter.com/pg70>

### 3.3 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

1241.7026.1120XXX  
 Basic Version  
 Symbols **001-074**

#### Ordering Indices for Lettering

001= <b>A</b>	016= <b>P</b>	031= <b>4</b>	046= $\updownarrow$	061= <b>EIN</b>
002= <b>B</b>	017= <b>Q</b>	032= <b>5</b>	047= $\rightarrow$	062= <b>AUS</b>
003= <b>C</b>	018= <b>R</b>	033= <b>6</b>	048= $\leftarrow$	063= <b>AUF</b>
004= <b>D</b>	019= <b>S</b>	034= <b>7</b>	049= $\downarrow$	064= <b>AB</b>
005= <b>E</b>	020= <b>T</b>	035= <b>8</b>	050= $\uparrow$	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= $\sqrt{\quad}$	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>x</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= $\text{⏻}$
015= <b>O</b>	030= <b>3</b>	045= <b>↔</b>	060= <b>LINE</b>	

## Lettering Size

### **MSM 19 CS LE / BL:**

<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

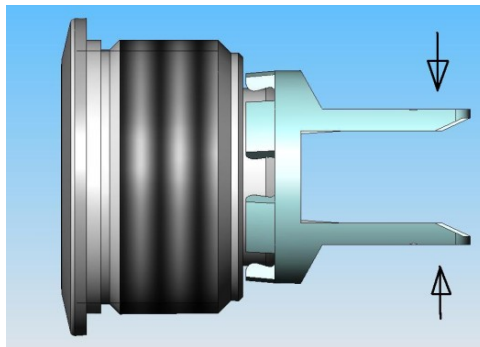
### **MSM 22 CS LE / BL:**

<b>Single characters:</b>	height 8 mm, font: Helvetica normal DIN1451-1E
<b>Text, max. 3 characters</b>	height 5 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

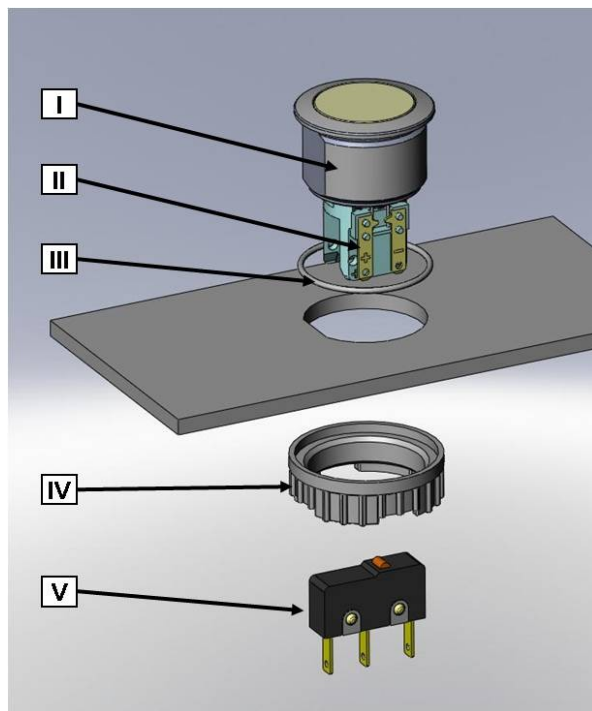
## 4 ASSEMBLY

### 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 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

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## 5 PACKAGING

### MSM CS Switch

MSM 19 CS	10 pieces per box with inlay
MSM 22 CS	10 pieces per box with inlay

The nuts with sealing rings 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 65
IP Protection Class DIN 40050	IP 69K

### 6.2 IK Protection Class

Tested Centrally

IK Protection Class DIN EN 50102	IK 07
----------------------------------	-------

### 6.3 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	Manufacturer	Licence number	ENEC VDE / KEMA	UL 1054 CSA C22.2 NO55
1050.1151	Marquardt GmbH	097550	DIN EN 61058	E41791
1050.1102	Marquardt GmbH	097550	DIN EN 61058	E41791
1050.1103	Marquardt GmbH	097550	DIN EN 61058	E41791
SS-01 T	Omron Corporation	40008425	DIN EN 61058	E41515
SS-5 T	Omron Corporation	129246	DIN EN 61058	E41515
SS-10 T	Omron Corporation	125256	DIN EN 61058	E41515
DC3GL1AA	ZF Electronics GmbH	2089323.01	DIN EN 61058	E23301
DC1GL1AA	ZF Electronics GmbH	2089323.01	DIN EN 61058	E23301
DC2GL1AA	ZF Electronics GmbH	2089323.01	DIN EN 61058	E23301

## 8 COMPLIANTS

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

