

Product manual

Vandal-proof MSM switches

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1 Description

Both the housing and the actuator of the vandal-proof MSM switch are made of high-quality stainless steel. Use of this stable and weather-resistant material means that the switch is particularly suitable for use in harsh environments. The MSM is available with mounting diameters of 16, 19, 22 and 30mm. Different types of contact cover a permissible switching voltage range from 5 to 250 V AC, and 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, and this 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 Data and dimensional drawings

2.1 Technical data

Micro switch for electrical rating	0.1 A 30 V DC	5 A 125 VAC	3 A 250 VAC	10 A 250 V AC
Electrical data				
Contact material	Gold	Silver		Silver
Switching voltage max. (V)	30	250		250
Switching voltage min. (V)	3	5		5
Switching current max. (A)	0.1	3		10
Rated braking capacity (W)	3	1250		2500
Lifetime (rated braking capacity)	200,000	200,000		50,000
Lifetime (160 mA at 48 V DC)		1,500,000		
Initial contact resistance, new	< 50 mOhm	< 30 mOhm		< 30 mOhm
Initial contact resistance after 1 million cycles	< 150 mOhm	< 90 mOhm		< 90 mOhm
Insulation resistance (IEC 512-2)	> 100,000 kOhm	> 100,000 kOhm		> 100,000 kOhm
Contact bounce time	< 5 ms	< 5 ms		< 5 ms

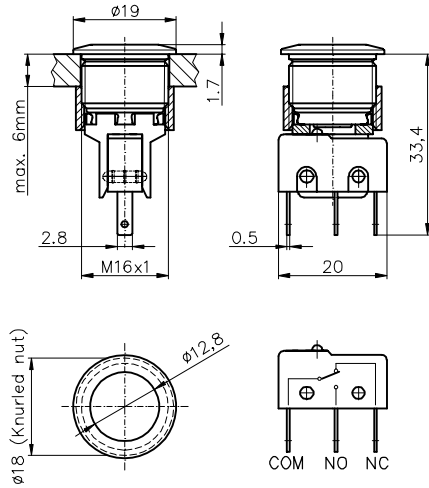
Changes that contribute to technical improvement are subject to alternations							
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Micro switch for electrical rating	0.1 A 30 V DC	5 A 125 VAC	3 A 250 VAC	10 A 250 V AC
Mechanical data				
Actuating force (N)	3.7	3.7	3.7	3.7
Actuating travel (mm)	0.8	0.8	0.8	0.8
Degree of protection (IP)	67	67	67	67
Shock resistance DIN EN 50102 (IK), mounting diameter 16	06	06	06	06
Shock resistance DIN EN 50102 (IK), mounting diameter 19; 22	07	07	07	07
Climatic data				
Operating/storage temp. (°C)	- 25 to + 85	- 25 to + 85	- 25 to + 85	- 25 to + 85
Illumination				
Supply voltage Ring illumination (V DC)	24	24	24	24
Characteristics red LED Point illumination	Forward current max. 40 mA Forward voltage at 10 mA = 1.6 V DC Forward voltage max. = 2.0 V DC	Forward current max. 40 mA Forward voltage at 10 mA = 1.6 V DC Forward voltage max. = 2.0 V DC	Forward current max. 40 mA Forward voltage at 10 mA = 1.6 V DC Forward voltage max. = 2.0 V DC	Forward current max. 40 mA Forward voltage at 10 mA = 1.6 V DC Forward voltage max. = 2.0 V DC
Characteristics green LED Point illumination	Forward current max. 40 mA Forward voltage at 10 mA = 2.0 V DC Forward voltage max. = 2.6 V DC	Forward current max. 40 mA Forward voltage at 10 mA = 2.0 V DC Forward voltage max. = 2.6 V DC	Forward current max. 40 mA Forward voltage at 10 mA = 2.0 V DC Forward voltage max. = 2.6 V DC	Forward current max. 40 mA Forward voltage at 10 mA = 2.0 V DC Forward voltage max. = 2.6 V DC
Characteristics blue LED Point illumination	Forward current max. 20 mA Forward voltage at 10 mA = 3.2 V DC Forward voltage max. = 3.7 V DC	Forward current max. 20 mA Forward voltage at 10 mA = 3.2 V DC Forward voltage max. = 3.7 V DC	Forward current max. 20 mA Forward voltage at 10 mA = 3.2 V DC Forward voltage max. = 3.7 V DC	Forward current max. 20 mA Forward voltage at 10 mA = 3.2 V DC Forward voltage max. = 3.7 V DC

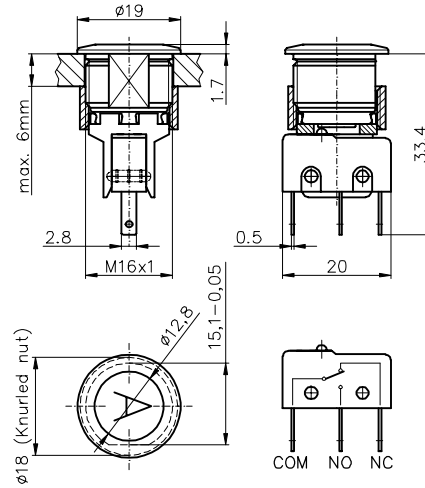
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2.2 Component dimensions

MSM16 ST

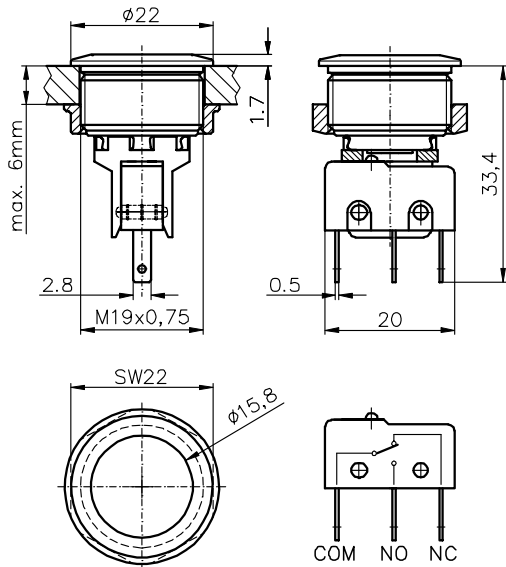


MSM16 LE

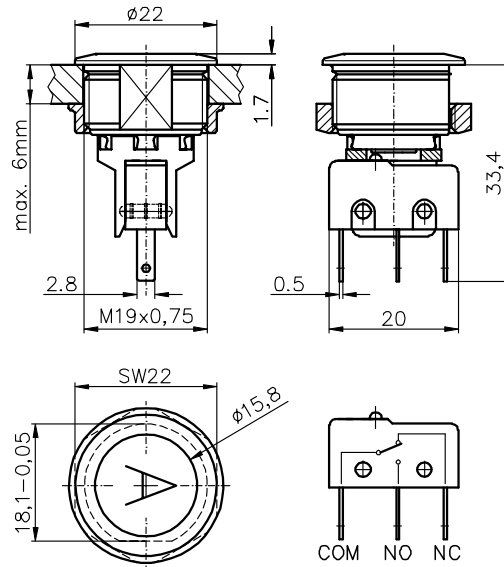


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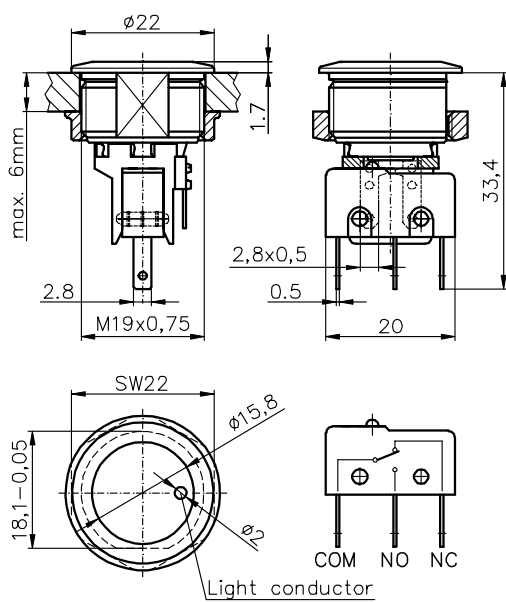
MSM19 ST



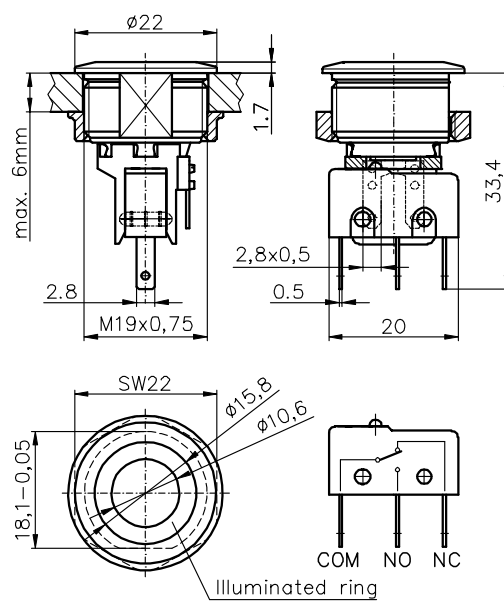
MSM19 LE



MSM19 PI

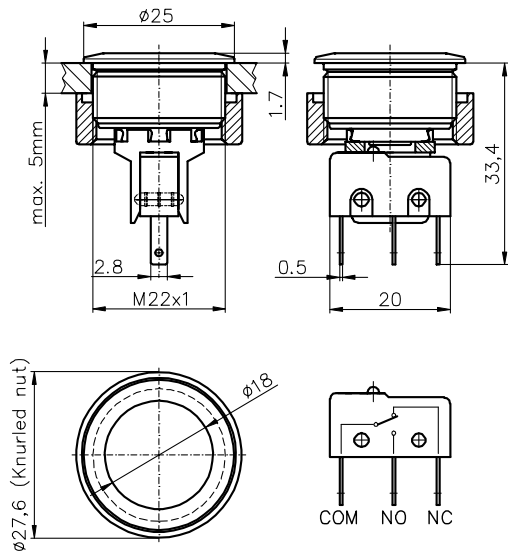


MSM19 RI

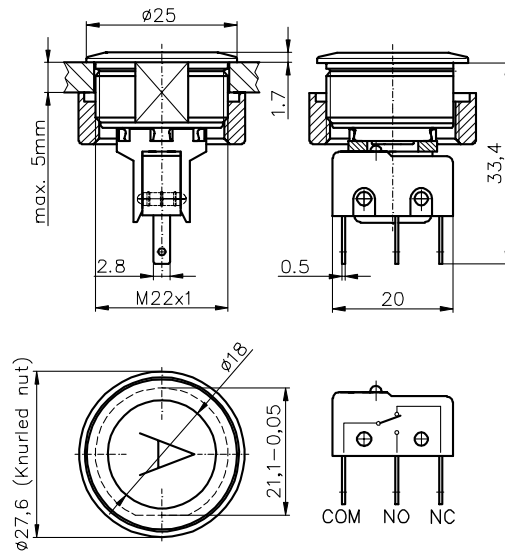


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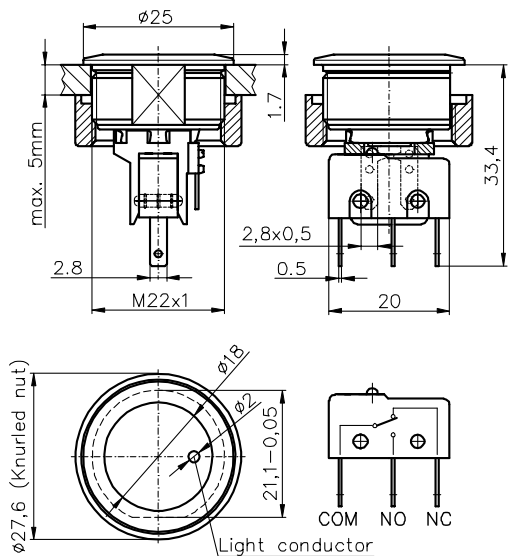
MSM22 ST



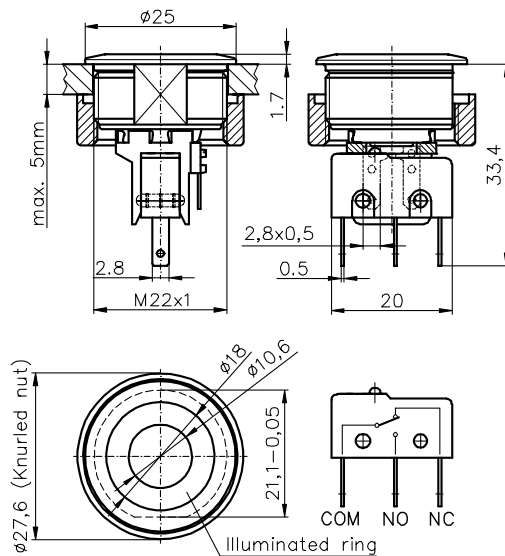
MSM22 LE



MSM22 PI

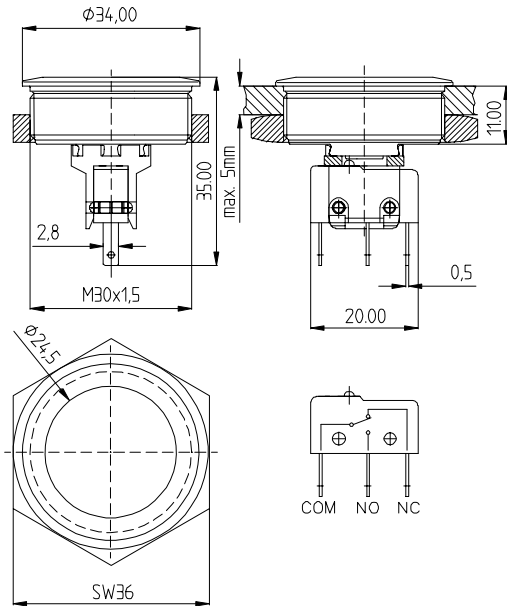


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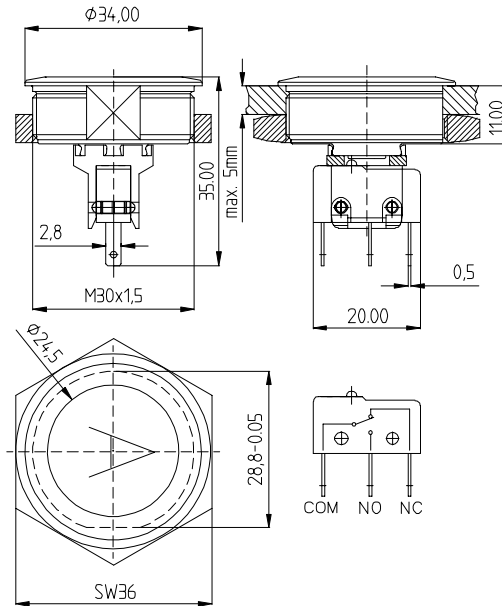


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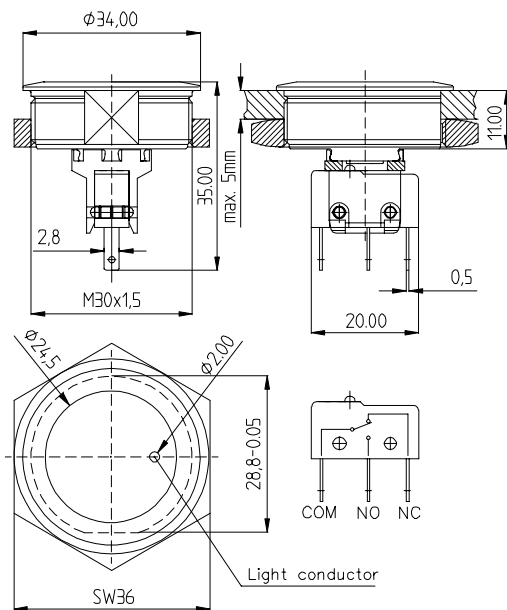
MSM30 ST



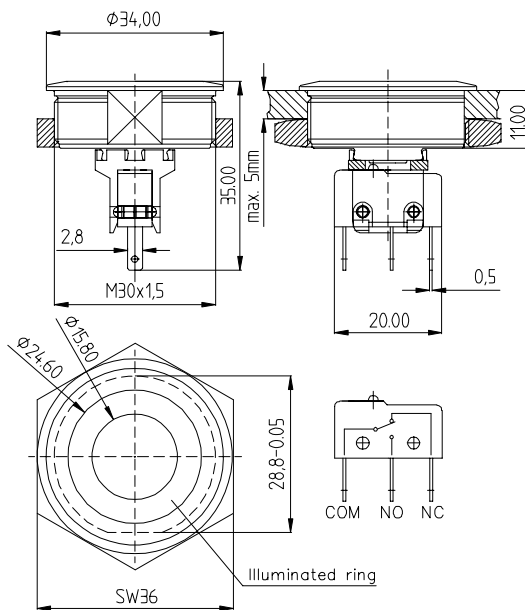
MSM30 LE



MSM30 PI



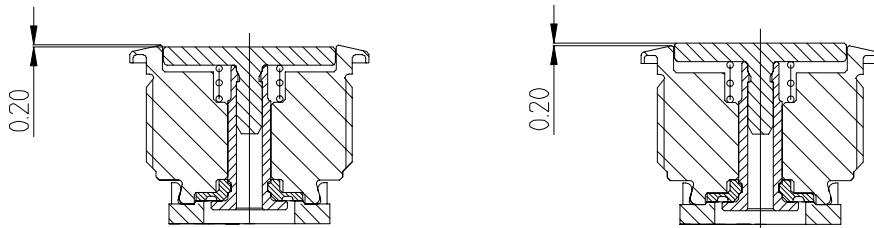
MSM30 RI



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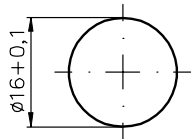
2.3 Actuator tolerance range



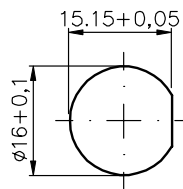
The mounting range tolerance of the actuator varies from 0.2mm projection length and 0.2mm short length to the housing edge. The slanting position of the actuator can range within this tolerance.

2.4 Hole dimensions

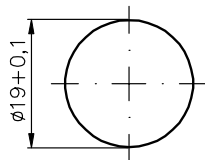
MSM16 ST



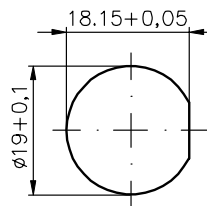
MSM16 LE



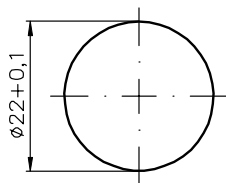
MSM19 ST / MSM19 RI



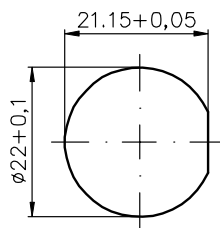
MSM19 LE/ MSM19 PI



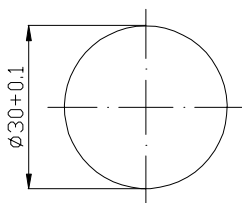
MSM22 ST / MSM22 RI



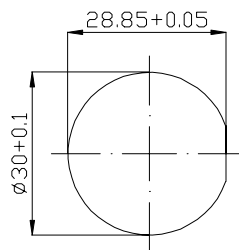
MSM22 LE/ MSM22 PI



MSM30 ST / MSM30 RI



MSM30 LE / MSM 30 PI

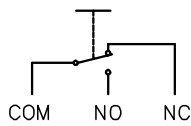


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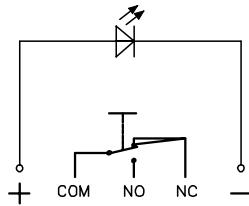
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2.5 Switching symbols

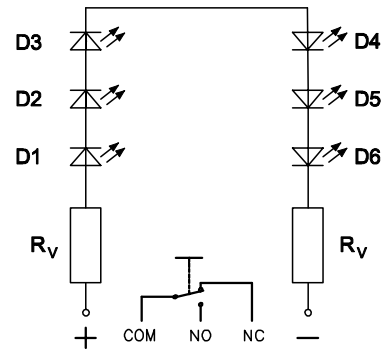
MSM ST / MSM LE



MSM PI



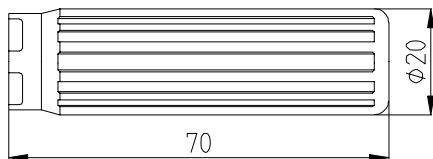
MSM RI



2.6 Accessories

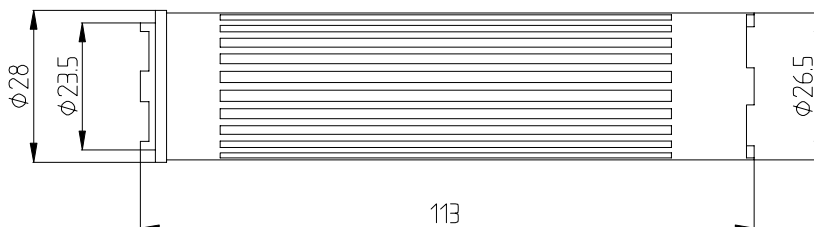
MSM 16 Installation wrench

Order Number: 0853.0622



MSM 22 Installation wrench

Order Number: 1141.1337



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3 Order Number

Mounting diameter (mm)	16	19	22
------------------------	----	----	----

Electrical rating max. 0.1 A / 30 V DC (SS-01)			
Standard	1241.6611.1110000	1241.6621.1110000	1241.6631.1110000
With lettering	1241.6612.1110000	1241.6622.1110000	1241.6632.1110000
Red point illumination		1241.6623.1111000	1241.6633.1111000
Green point illumination		1241.6623.1112000	1241.6633.1112000
<i>Blue point illumination</i>		<i>1241.6623.1114000</i>	<i>1241.6633.1114000</i>
Red ring illumination		1241.6624.1111000	1241.6634.1111000
Green ring illumination		1241.6624.1112000	1241.6634.1112000
<i>Blue ring illumination</i>		<i>1241.6624.1114000</i>	<i>1241.6634.1114000</i>
Installation wrench	0853.0622		1141.1337

Electrical rating max. 5 A / 125 V AC or 3 A / 250V AC(SS-5)			
Standard	1241.6611.1120000	1241.6621.1120000	1241.6631.1120000
With lettering	1241.6612.1120000	1241.6622.1120000	1241.6632.1120000
Red point illumination		1241.6623.1121000	1241.6633.1121000
Green point illumination		1241.6623.1122000	1241.6633.1122000
Blue point illumination		1241.6623.1124000	1241.6633.1124000
Red ring illumination		1241.6624.1121000	1241.6634.1121000
Green ring illumination		1241.6624.1122000	1241.6634.1124000
Blue ring illumination		1241.6624.1124000	1241.6634.1122000
Installation wrench	0853.0622		1141.1337

Electrical rating max. 5 A / 125 V AC (SS-5)			
Standard	1241.6611.1130000	1241.6621.1130000	1241.6631.1130000
With lettering	1241.6612.1130000	1241.6622.1130000	1241.6632.1130000
Red point illumination		1241.6623.1131000	1241.6633.1131000
Green point illumination		1241.6623.1132000	1241.6633.1132000
<i>Blue point illumination</i>		<i>1241.6623.1134000</i>	<i>1241.6633.11342000</i>
Red ring illumination		1241.6624.1131000	1241.6634.1131000
Green ring illumination		1241.6624.1132000	1241.6634.1132000
<i>Blue ring illumination</i>		<i>1241.6624.1134000</i>	<i>1241.6634.1134000</i>
Installation wrench	0853.0622		1141.1337

Part numbers with italic type on request

Mounting diameter (mm)	Ø 30
------------------------	------

Electrical rating max. 0.1 A / 30 V DC (SS-01)	
Standard	1241.6661.1110000
With lettering	1241.6662.1110000
Red point illumination	1241.6663.1111000
Green point illumination	1241.6663.1112000
<i>Blue point illumination</i>	<i>1241.6663.1114000</i>
Red ring illumination	1241.6664.1111000
Green ring illumination	1241.6664.1112000
<i>Blue ring illumination</i>	<i>1241.6664.1114000</i>

Electrical rating max. 5 A / 125 V AC or 3 A / 250V AC(SS-5)	
Standard	1241.6661.1120000
With lettering	1241.6662.1120000
Red point illumination	1241.6663.1121000
Green point illumination	1241.6663.1122000
<i>Blue point illumination</i>	<i>1241.6663.1124000</i>
Red ring illumination	1241.6664.1121000
Green ring illumination	1241.6664.1122000
<i>Blue ring illumination</i>	<i>1241.6664.1124000</i>

Electrical rating max. 5 A / 125 V AC (SS-5)	
Standard	1241.6661.1130000
With lettering	1241.6662.1130000
Red point illumination	1241.6663.1131000
Green point illumination	1241.6663.1132000
<i>Blue point illumination</i>	<i>1241.6663.1134000</i>
Red ring illumination	1241.6664.1131000
Green ring illumination	1241.6664.1132000
<i>Blue ring illumination</i>	<i>1241.6664.1134000</i>

Part numbers with italic type on request

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3.1 Lettering

The last three digits in the Order No. define the lettering.

000 No lettering
001-072 Standard lettering
101- Customized lettering

Example for ordering an lettering

1241.6611.1120XXX
Basic version
Symbols **001-072**

Ordering indices for lettering

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

Lettering size

MSM16 LE:

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

MSM19 LE / MSM 19 PI:

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

MSM22 LE / MSM22 PI:

Single characters: height 8 mm, font: Helvetica normal DIN1451-1E
Text, max. 3 characters: height 5 mm, font: Helvetica normal DIN1451-1E
Text, max. 6 characters: height 2.5 mm, font: Helvetica condensed DIN1451-3E
Symbols (indices 037-052): capitals height 8 mm, font: True Type, Symbol

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MSM30 LE / MSM30 PI:

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

4 PACKAGING

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



The switch MSM30 with a mounting diameter of 30mm will be individually packed in bags with 10 pieces in a box.

5 QUALIFICATION TESTS

IP degree of protection IEC/DIN/EN/ 60529


IP 67

IK protection class DIN EN 50102

16 mm diam.: IK 06
19; 22; 30 mm diam.: IK 07

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5 ROHS COMPLIANT

		 Mounting diameter (mm)		
Rating max. 0.1 A / 30 V DC (SS-01)		Ø 16	Ø 19	Ø 22 *
Standard	compliant	1241.6611.1110000	1241.6621.1110000	1241.6631.1110000
With lettering	compliant	1241.6612.1110000	1241.6622.1110000	1241.6632.1110000
Red point illumination	pending		1241.6623.1111000	1241.6633.1111000
Green point illumination	pending		1241.6623.1112000	1241.6633.1112000
Blue point illumination	pending		1241.6623.1114000	1241.6633.1114000
Red ring illumination	pending		1241.6624.1111000	1241.6634.1111000
Green ring illumination	compliant		1241.6624.1112000	1241.6634.1112000
Blue ring illumination	pending		1241.6624.1114000	1241.6634.1114000
Rating max. 5 A / 125 V AC (SS-5)		Ø 16	Ø 19	Ø 22 *
Standard	compliant	1241.6611.1120000	1241.6621.1120000	1241.6631.1120000
With lettering	compliant	1241.6612.1120000	1241.6622.1120000	1241.6632.1120000
Red point illumination	pending		1241.6623.1121000	1241.6633.1121000
Green point illumination	pending		1241.6623.1122000	1241.6633.1122000
Blue point illumination	pending		1241.6623.1124000	1241.6633.1124000
Red ring illumination	pending		1241.6624.1121000	1241.6634.1121000
Green ring illumination	compliant		1241.6624.1122000	1241.6634.1122000
Blue ring illumination	pending		1241.6624.1124000	1241.6634.1124000
Rating max. 10A / 250 V AC (SS-10)		Ø 16	Ø 19	Ø 22 *
Standard	compliant	1241.6611.1130000	1241.6621.1130000	1241.6631.1130000
With lettering	compliant	1241.6612.1130000	1241.6622.1130000	1241.6632.1130000
Red point illumination	pending		1241.6623.1131000	1241.6633.1131000
Green point illumination	pending		1241.6623.1132000	1241.6633.1132000
Blue point illumination	pending		1241.6623.1134000	1241.6633.1134000
Red ring illumination	pending		1241.6624.1131000	1241.6634.1131000
Green ring illumination	compliant		1241.6624.1132000	1241.6634.1132000
Blue ring illumination	pending		1241.6624.1134000	1241.6634.1134000

* RoHS Compliant for the nuts available by 2006

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		Mounting diameter (mm)
Rating max. 0.1 A / 30 V DC (SS-01)		Ø 30
Standard	compliant	1241.6661.1110000
With lettering	compliant	1241.6662.1110000
Red point illumination	compliant	1241.6663.1111000
Green point illumination	compliant	1241.6663.1112000
Blue point illumination	compliant	1241.6663.1114000
Red ring illumination	compliant	1241.6664.1111000
Green ring illumination	compliant	1241.6664.1112000
Blue ring illumination	compliant	1241.6664.1114000
Rating max. 5 A / 125 V AC (SS-5)		Ø 30
Standard	compliant	1241.6661.1120000
With lettering	compliant	1241.6662.1120000
Red point illumination	compliant	1241.6663.1121000
Green point illumination	compliant	1241.6663.1122000
Blue point illumination	compliant	1241.6663.1124000
Red ring illumination	compliant	1241.6664.1121000
Green ring illumination	compliant	1241.6664.1122000
Blue ring illumination	compliant	1241.6664.1124000
Rating max. 10A / 250 V AC (SS-10)		Ø 30
Standard	compliant	1241.6661.1130000
With lettering	compliant	1241.6662.1130000
Red point illumination	compliant	1241.6663.1131000
Green point illumination	compliant	1241.6663.1132000
Blue point illumination	compliant	1241.6663.1134000
Red ring illumination	compliant	1241.6664.1131000
Green ring illumination	compliant	1241.6664.1132000
Blue ring illumination	compliant	1241.6664.1134000