

Product manual

Vandal-proof switch MSM CS

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1 PRODUCT DESCRIPTION

- housing is made of high-quality stainless steel and actuator is made of highly durable ceramic
- the actuator material is resistant to scratches, abrasion, impact and chemicals
- available in 19 mm and 22 mm mounting diameters
- permissible switching voltages from 30 VDC to 250 VAC, switching currents from 0.1 to 10 Ampere
- equipped with quick connect terminals to permit fast connection
- the non-illuminated version has a translucent white actuating surface, lettering is black and is applied directly onto the ceramic material
- switches with illumination: the actuator surface fully illuminates uniformly across the entire surface, the standard black lettering provides a positive effect against the illuminated actuator, while negative lettering provides an inverse effect

2 TECHNICAL DATA AND DIMENSIONAL DRAWINGS

2.1 Technical Data

Micro Switch for Electrical Rating (Protection Class IP 40)	0.1 A 30 VDC	5 A 125 VAC	3 A 250 VAC	10 A 250 VAC
Electrical Data				
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 ¹⁾ (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".

Micro Switch for Electrical Rating (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	> 100
Contact Bounce Time	[ms]	< 5	< 5	< 5	< 5

Micro Switch for Electrical Rating (Protection Class IP 67)		0.1 A 250 VAC	5 A 250 VAC	10 A 250 VAC
Electrical Data				
Switching Voltage max.	[VAC]	250	250	250
Switching Current max.	[A]	0.1	5	10
Rated Braking Capacity	[W]	25	1500	2500
Lifetime ¹⁾ (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".*

Mechanical Data		
Actuating Force	[N]	4,5
Actuating Travel	[mm]	1.0
Lifetime	[Actuations]	1,500,000

Climatical Data		
Operating / Storage Temperature	[°C]	-25 to +85
Degree of Protection Front Side mechanical ²⁾	[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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<u>Overlay Illumination</u>		
Supply Voltage	[VDC]	5/ 12/ 24

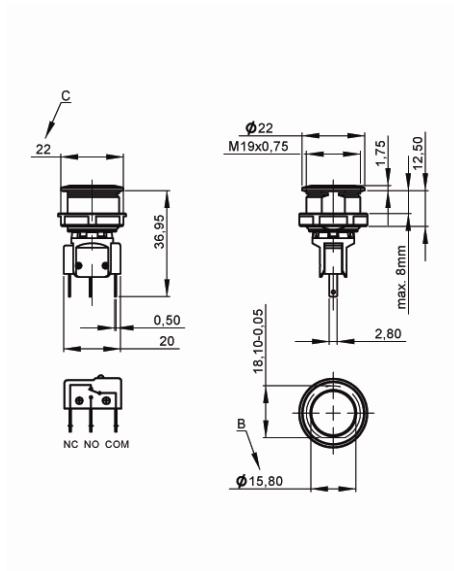
➤ *Other supply voltages on request.*

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

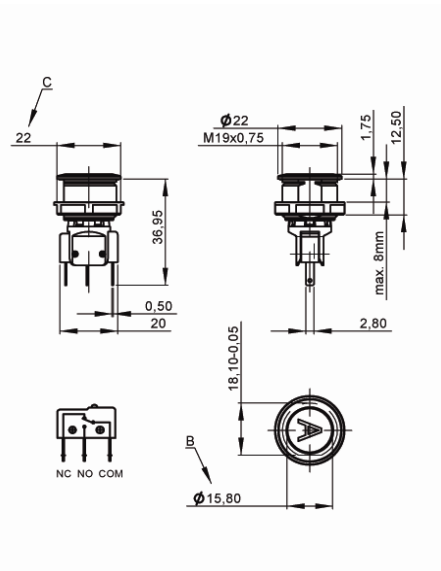
2.2 Component dimensions

2.2.1 Component dimensions MSM 19 CS

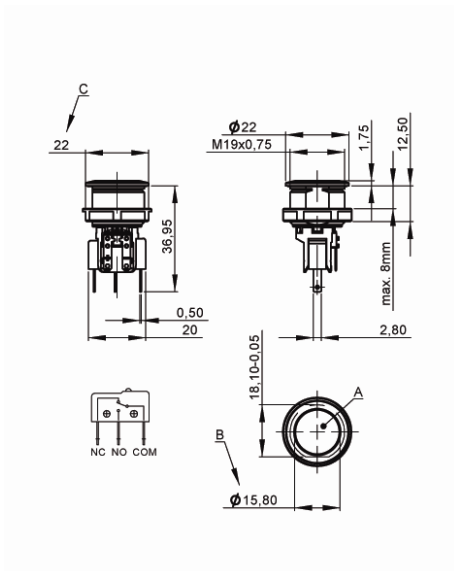
MSM 19 CS ST



MSM 19 CS LE



MSM 19 CS BL



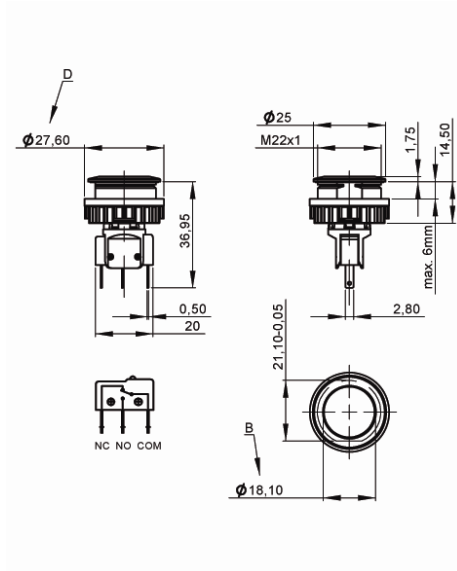
Legend

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

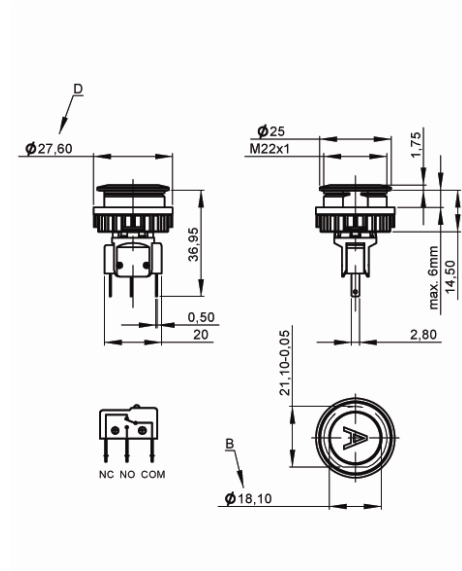
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2.2.2 Component dimensions MSM 22 CS

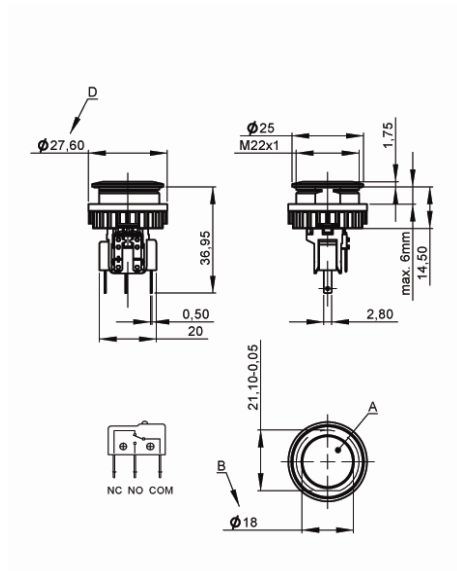
MSM 22 CS ST



MSM 22 CS LE



MSM 22 CS BL

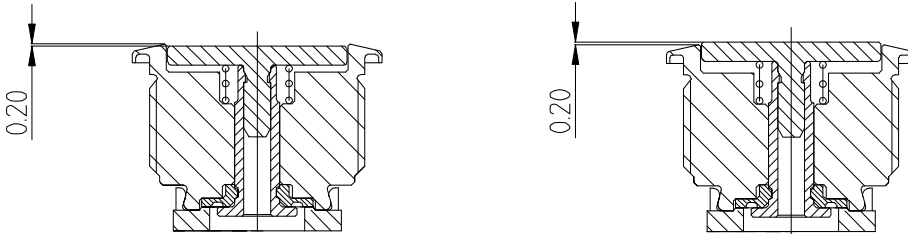


Legend

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

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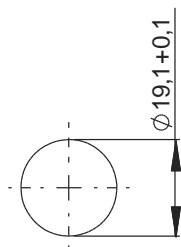
2.3 Actuator Tolerance Range



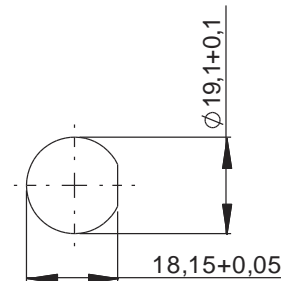
The mounting tolerance range of the actuator varies from 0.2 mm projection length and 0.2 mm short length to the housing edge. The slanting position of the actuator can range within this tolerance.

2.4 Hole dimensions

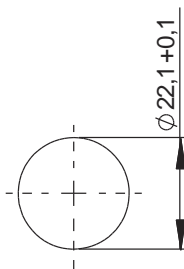
MSM 19 CS ST



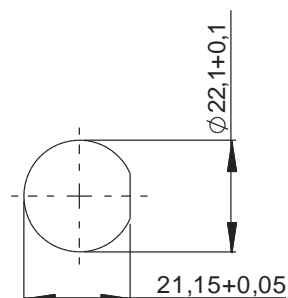
MSM 19 CS LE / MSM 19 CS BL



MSM 22 CS ST



MSM 22 CS LE / MSM 22 CS BL



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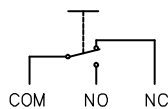
2.5 Starting Torque

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

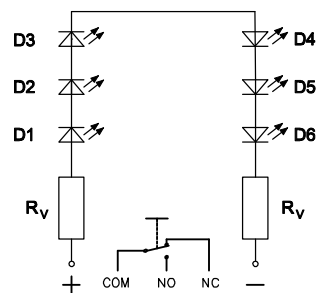
* on request

2.6 Switching Symbols

MSM CS ST / MSM CS LE



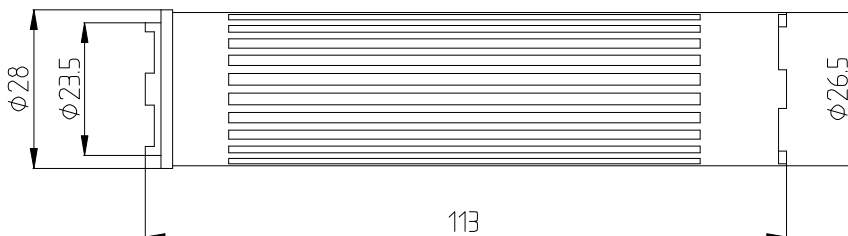
MSM CS BL



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 [3.5 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 [3.5 Lettering](#)*

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

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

3.3 Order numbers MSM CS module actuator element

The backlighted version is available for supply voltages 5, 12 and 24 VDC, a resistor is integrated.
This part has to be ordered together with the accessory module switch contact (see 3.4).

Mounting Diameter (mm)	Ø 19	Ø 22
Standard	0865.7120	0865.7121
Lettered	0865.7120	0865.7121
Backlighted red 24 VDC	0865.7093.1	0865.7094.1
Backlighted green 24 VDC	0865.7093.2	0865.7094.2
Backlighted yellow 24 VDC	0865.7093.3	0865.7094.3
Backlighted blue 24 VDC	0865.7093.4	0865.7094.4
Backlighted white 24 VDC	0865.7093.5	0865.7094.5
Backlighted red 12 VDC	0865.7128.1	0865.7130.1
Backlighted green 12 VDC	0865.7128.2	0865.7130.2
Backlighted yellow 12 VDC	0865.7128.3	0865.7130.3
Backlighted blue 12 VDC	0865.7128.4	0865.7130.4
Backlighted white 12 VDC	0865.7128.5	0865.7130.5
Backlighted red 5 VDC	0865.7127.1	0865.7129.1
Backlighted green 5 VDC	0865.7127.2	0865.7129.2
Backlighted yellow 5 VDC	0865.7127.3	0865.7129.3
Backlighted blue 5 VDC	0865.7127.4	0865.7129.4
Backlighted white 5 VDC	0865.7127.5	0865.7129.5

3.4 Order numbers MSM CS module micro switch

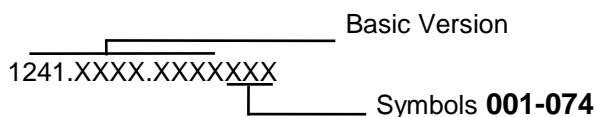
Micro switches	0,1 A @ 30 VDC IP40	5 A @ 125 VAC 3 A @ 250 VAC IP40	10 A @ 250 VAC IP40	5 A @ 250 VAC IP67
	0865.9851	0865.9852	0865.9853	0865.9891

3.5 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



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	073= RESET
014= N	029= 2	044= #	059= BACK	074=
015= O	030= 3	045= ↔	060= LINE	

Lettering Colour of Laser Lettering

<u>Material</u>	<u>Lettering Colour</u>
Ceramic	black Filled letters

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Lettering Size

MSM 19 CS LE / BL:

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

MSM 22 CS LE / BL:

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

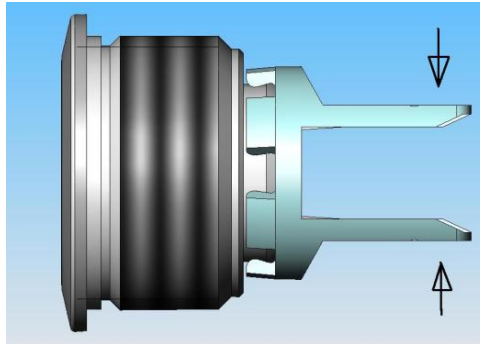
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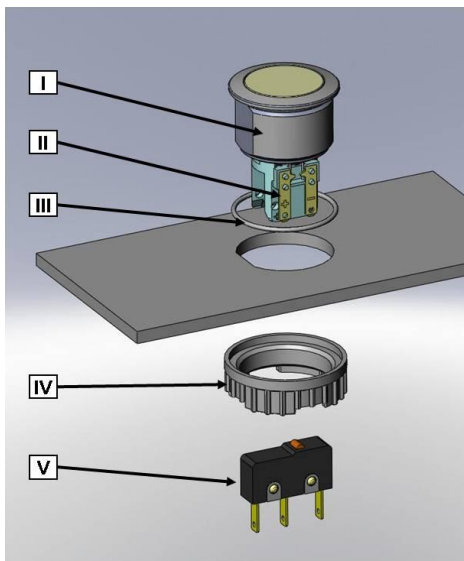
4 ASSEMBLY

4.1 General Instruction

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



4.2 Installation



Installation instruction

1. Place the gasket accurately on the actuator housing. Then mount the actuator housing assembly into the panel.
2. Tighten the screw nut according to the torque instructions [Chapter 2.5](#)
3. Clasp the module switching contact into the micro switch holder of the actuator housing.

Installation information:

1. The power supply and the configuration of the flat pin terminals have to be installed correctly for the illumination and micro switch function.
2. Insulate the terminals as required. Fully insulated plug-in sleeves are recommended.
3. Installation instructions according to VDE-standard DIN VDE 0100-100 or alternatively IEC 60354 standard. During assembly please mind that there is no tensile or pressure load on the connection of the MSM CS through the cable connection. A corresponding wire lead, running of cables and strain relief has to be arranged.

Legend

- I = Housing
- II = Flat Pin Terminals (illumination)
- III = Gasket
- IV = Module Switching Contact
- 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.



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MSM CS module actuator element

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

The nuts with sealing rings are packed separately and enclosed in the box.



MSM module micro switch

The switch contact is packed in bags with 10 pieces.



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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.

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7 APPROVALS

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

Micro switch:

Electrical Rating of Switch	Micro Switch IP Protection Class	Micro Switch Type	Manufacturer	Testing Laboratory	Licence Number
0,1 A, 30 VDC	IP 40	SS-01 T	Omron Corporation	VDE, ENEC	40008425
				UL / CSA	E41515
				TÜV Rheinland	
5 A, 125 VAC / 3 A, 250 VAC	IP 40	SS-5 T	Omron Corporation	VDE, ENEC	129246
				UL / CSA	E41515
				TÜV Rheinland	
10 A, 250 VAC	IP 40	SS-10 T	Omron Corporation	VDE, ENEC	125256
				UL / CSA	E41515
				TÜV Rheinland	
0,1 A, 30 VDC	IP 40	1050.1151	Marquardt GmbH	VDE, ENEC	097550
				UL / CSA	E41791
5 A, 125 VAC / 3 A, 250 VAC	IP 40	1050.1102	Marquardt GmbH	VDE, ENEC	097550
				UL / CSA	E41791
10 A, 250 VAC	IP 40	1050.1103	Marquardt GmbH	VDE, ENEC	097550
				UL / CSA	E41791
0,1 A, 30 VDC	IP 67	DC3GL1AA	Cherry GmbH / ZF Friedrichshafen (pending)	KEMA, ENEC	2089323.01
				UL / CSA	E23301
5 A, 125 VAC / 3 A, 250 VAC	IP 67	DC1GL1AA	Cherry GmbH / ZF Friedrichshafen (pending)	KEMA, ENEC	2089323.01
				UL / CSA	E23301
10 A, 250 VAC	IP 67	DC2GL1AA	Cherry GmbH / ZF Friedrichshafen (pending)	KEMA, ENEC	2089323.01
				UL / CSA	E23301
		for all types		DIN EN	61058-1
				UL	1054

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8 COMPLIANTS

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



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