



# General Product Information

## Input Systems METAL LINE

### Various Designs and Materials

**Schurter offers a wide range of possible designs and materials** in order to create an ideal input system matching your individual requirements.

### SURFACE AND MATERIAL



**According to requirements** and fields of application the switches and keypads are available with various housing materials.

**The ideal material** for rough environments is high quality stainless steel\* with resistant surface. Especially for piezo switches, aluminium or flameproof unbreakable plastic versions are available.

**For the mechanical switches**, Schurter offers housings made of aluminium or diecasted zinc with nickel-plated surface in addition to stainless steel.

**For external applications** we certainly recommend resistant materials such as stainless steel or aluminum. An additional finish for the keypads is possible with a glass-bead coating.

\* Stainless steel surfaces may have slight differences in colour as a result of different batches of preliminary materials.

### COLOUR DESIGN



**The surfaces of the input systems** can be finished according to customer requirements.

Varnishing of switches and keypads in various signal colours is possible. Additional inscriptions are sealed by transparent lacquer. The aluminium housings of the switches can be delivered in various anodised colours. Colouring of the switches using powder coating is available on request.

### SHAPES AND SIZES



**With a wide variety of shapes and sizes** a broad range of standard solutions can be offered.

Keypads are available with round or rectangular actuators. The size of the switch surface is variable up to a diameter of 35 mm.

Piezo switches with a minimum mounting diameter of 16 mm can be adapted in shape and size to customer requirements. Adaptations for integration into individual layouts are also available at short notice.

### LETTERING



**Depending on the application and font**, there are various lettering possibilities.

Switches and PC keypads are laser-lettered as standard. For special applications, the lettering can also be etched or engraved with a coloured background.

PC keypads with German, British or U.S. layouts are usually laser-lettered. Further country-specific letterings are available on request ex works.

The following standards can be used for key letterings:

#### Standard Colour for Lettering

Stainless steel:	black, filled lettering
Alu natural:	grey, filled lettering
Alu anodised:	white, filled lettering
Plastics:	on request

Alu natural only after receipt of technical release statement of the customer.



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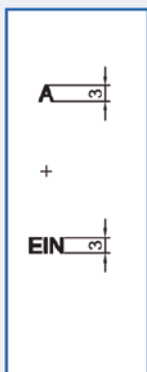
## Order Index Lettering

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

Symbols 053-060 and 067-072 only for MCS 19 Metallic, MCS 30 Ring Illuminated and MSM.

## Lettering PSE / MCS / MSM:

### PSE M16 INDICATOR



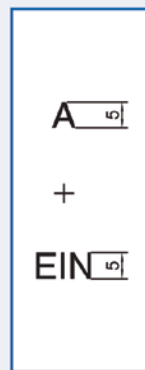
- Single characters: Helvetica normal DIN 1451-1E, Font size 3 mm
- Symbols (037-052): True Type symbol, Font size 3 mm
- Legends with max. 3 characters in a line: Helvetica normal DIN 1451-1E, Font size 3 mm

### PSE M16, M19, M24/27/30 RING ILLUMINATED



- Single characters: Helvetica normal DIN 1451-1E, Font size 5 mm
- Symbols (037-052): True Type symbol, Font size 5 mm
- Legends with max. 3 characters in a line: Helvetica normal DIN 1451-1E, Font size 3 mm

### PSE ET, M22 ILLUMINATED / NON-ILLUMINATED



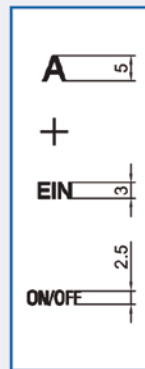
- Single characters: Helvetica normal DIN 1451-1E, Font size 5 mm
- Symbols (037-052): True Type symbol, Font size 5 mm
- Legends with max. 3 characters in a line: Helvetica normal DIN 1451-1E, Font size 5 mm

### MCS19 METALLIC, MCS30 RING ILLUMINATED



- Single characters: Helvetica normal DIN 1451-1E, Font size 5 mm
- Symbols (037-052): True Type symbol, Font size 5 mm
- Legends with max. 3 characters in a line: Helvetica condensed DIN 1451-3E, Font size 2,5 mm
- Legends with max. 6 characters in a line: Helvetica condensed DIN 1451-3E, Font size 2,5 mm

### MSM 16



- Single characters: Helvetica normal DIN 1451-1E, Font size 5 mm
- Symbols (037-052): True Type symbol, Font size 5 mm
- Legends with max. 3 characters in a line: Helvetica normal DIN 1451-1E, Font size 3 mm
- Legends with max. 6 characters in a line: Helvetica condensed DIN 1451-3E, Font size 2,5 mm

### MSM 19 NON-ILLUMINATED / POINT ILLUMINATED



- Single characters: Helvetica normal DIN 1451-1E, Font size 8 mm
- Symbols (037-052): True Type symbol, Font size 8 mm
- Legends with max. 3 characters in a line: Helvetica normal DIN 1451-1E, Font size 3 mm
- Legends with max. 6 characters in a line: Helvetica condensed DIN 1451-3E, Font size 2,5 mm



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## MSM 22 NON-ILLUMINATED / POINT ILLUMINATED



- Single characters: Helvetica normal DIN 1451-1E, Font size 8 mm
- Symbols (037-052): True Type symbol, Font size 8 mm
- Legends with max. 3 characters in a line: Helvetica normal DIN 1451-1E, Font size 5 mm
- Legends with max. 6 characters in a line: Helvetica condensed DIN 1451-3E, Font size 2,5 mm

## MSM 30 NON-ILLUMINATED / POINT ILLUMINATED



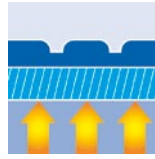
- Single characters: Helvetica normal DIN 1451-1E, Font size 12 mm
- Symbols (037-052): True Type symbol, Font size 12 mm
- Legends with max. 3 characters in a line: Helvetica normal DIN 1451-1E, Font size 7 mm
- Legends with max. 6 characters in a line: Helvetica condensed DIN 1451-3E, Font size 3,5 mm

## INTEGRATION AS SYSTEM SOLUTION



According to customer requirements, Schurter also offers complete function units. The switches or keypads are individually installed in the specific front panel. Schurter additionally offers completely assembled system solutions for integration of further components and electronic modules. An example is the desktop version for Metallic Panel keypads: the input system is installed in a desktop housing with integral trackball for mouse control.

## HEATING



For applications in cold climatic environments, the Metallic Panel keypads can be additionally provided with a heating overlay. For this

reason, the keypad is still pleasant to use even at frosty temperatures and the freezing of the switches is prevented.

## LIGHTING TECHNOLOGY

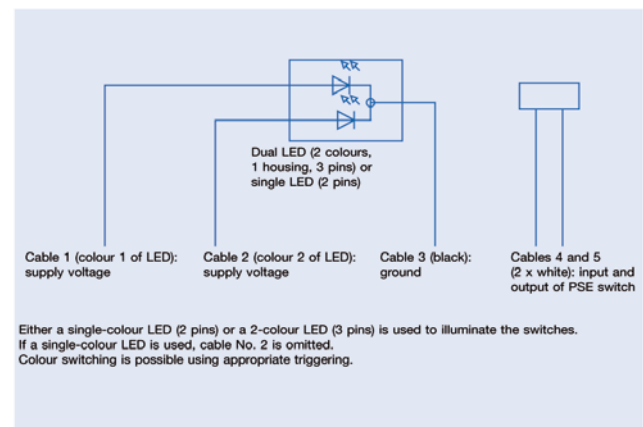


### 1. Point Illumination

Schurter offers the standard colours red, green, yellow, blue as well as bi-coloured red/green for the point illumination of the switches. Point illuminations in other colours are available on request.

### Data of standard LEDs:

Colour	Forward Current $I_F$ [mA]	Forward Voltage $U_F$ [V]
red	40	2,0 (IF=10mA)
green	40	2,0 (IF=10mA)
yellow	40	2,0 (IF=10mA)
blue	20	2,0 (IF=10mA)
red/green (piezo switches)	20	2,0 (IF=10mA)
red/green (switches with stroke)	25	2,0 / 2,2 (IF=20mA)





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Characteristics for connection:

Point Illumination		Attention: Parts are delivered without series resistor.													
Characteristics <b>red</b> LED Point Illumination		Forward Current max. 40 mA Forward Voltage at 10 mA = 2.0 VDC Forward Voltage max. = 2.5 VDC													
Characteristics <b>green</b> LED Point Illumination		Forward Current max. 40 mA Forward Voltage at 10 mA = 2.0 VDC Forward Voltage max. = 2.5 VDC													
Characteristics <b>blue</b> LED Point Illumination		Forward Current max. 20 mA Forward Voltage at 10 mA = 3.2 VDC Forward Voltage max. = 3.7 VDC													
<b>Recommendation of series resistors for Point Illumination:</b>															
LED-Color	$I_D$ [mA]	$I_{DMmax}$ [mA]	$U_V$ [V]	$R_V$ [Ω]	$R_V^{E24}$ [Ω]	$P_V$ [W]	$U_V$ [V]	$R_V$ [Ω]	$R_V^{E24}$ [Ω]	$P_V$ [W]	$U_V$ [V]	$R_V$ [Ω]	$R_V^{E24}$ [Ω]	$P_V$ [W]	
red	10	40	2.0	300	300	0,03	1000	2000	0,10	2200	2200	0,22	538	240	0,86
green	10	40	2.0	300	300	0,03	1000	2000	0,10	2200	2200	0,22	538	240	0,86
blue	10	20	3.2	180	180	0,02	880	920	0,09	2080	2000	0,21	1015	1000	0,41

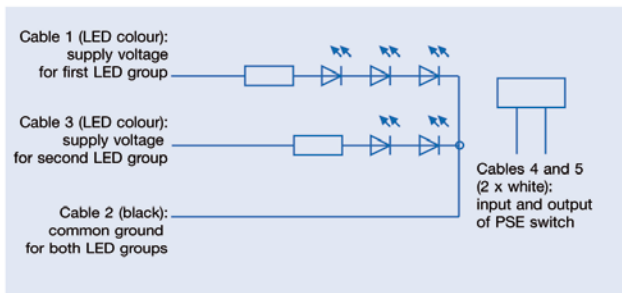
$I_D$  LED-Forward Current [10mA]  
 $I_{DMmax}$  LED-Forward Current max. [40mA/20mA]  
 $R_V$  Series Resistor (calculated)  
 $R_V^{E24}$  Series Resistor (regarding E24-Resistor series)  
 $P_V$  Power dissipation concerning  $R_V$  (calculated)

valid for switch types: MSM, MSM DP, MSM LA and MCS 19

## 2. Ring Illumination

This design is homogeneous and available in red, green, yellow, blue and bi-coloured red/green as standard colours. Ring illuminations in other colours are also possible.

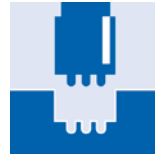
Data of standard LEDs:	
Colour	Current $I_F$ [mA]
red	20
green	20
yellow	20
blue	20



Characteristics for connection:

Supply Voltage: 24 VDC

## CONNECTING TECHNOLOGY AND SWITCHING OPTIONS



### 1. Decoder

The **Metallic Panel keypads** are designed with an XY matrix. The PC keypads are available with a corresponding keypad decoder and can therefore be used as standard in German, British and U.S. versions. Further country-specific programming can be realised according to customer requirements ex works.

### 2. Interfaces

Depending on the version, AT PS/2 or USB connections are available as ports with mini-DIN or USB connectors.

### 3. Connecting Technology

Depending on the design, the switches are available with quick connect terminals, flexible wires, pins or clip for pins. Plug-compatible adapters are available for the MCS 19 to achieve rational wiring of components.

### 4. Switching Options

**High capacity with the Schurter Power Card:** the small design of the piezo switches only allows the switching of small signals or powers in general. With the Schurter Power Card, which is connected directly to the piezo switches, large powers can also be switched. The relays on the Schurter Power Card allow higher voltages, currents and powers to be used and significantly extend the range of applications of the piezo switches.

**Increased ease of use** is offered for the piezo switches by the prolonged signal version from Schurter. Piezo switches usually have a short closing pulse which depends on the activating force, duration and speed. For the piezo switches with prolonged signal, the signal is passed on for the duration in which the switch is pressed (max. 50 seconds).

**Protection against pyroelectric effects** for the piezo switches with prolonged signal is provided by a specially developed circuit which compensates any pyroelectric effects resulting from the occurrence of large changes in temperature. The switches with integral temperature compensation are of course tested for functional safety by using specific individual tests.



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## PROTECTION AGAINST EXTERNAL MECHANICAL USE



The input systems of the Schurter Metal Line are protected against external mechanical use. The degree of protection is stated in IK values according to DIN EN 50102.

<b>IK 01</b>	 150 g 10 cm	<b>Impact energy:</b> 0.15 J
<b>IK 02</b>	 200 g 10 cm	<b>Impact energy:</b> 0.20 J
<b>IK 03</b>	 250 g 15 cm	<b>Impact energy:</b> 0.35 J
<b>IK 04</b>	 250 g 20 cm	<b>Impact energy:</b> 0.50 J
<b>IK 05</b>	 350 g 20 cm	<b>Impact energy:</b> 0.70 J
<b>IK 06</b>	 250 g 40 cm	<b>Impact energy:</b> 1 J
<b>IK 07</b>	 0.5 kg 40 cm	<b>Impact energy:</b> 2 J
<b>IK 08</b>	 1.25 kg 40 cm	<b>Impact energy:</b> 5 J
<b>IK 09</b>	 2.5 kg 40 cm	<b>Impact energy:</b> 10 J
<b>IK 10</b>	 5 kg 40 cm	<b>Impact energy:</b> 20 J