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### Series 31

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General Notes

The series 31 illuminated pushbuttons are equipped with snap-action or low-level switching elements.  
Besides the standard contacts (gold-plated silver) silver contacts for switching elements 2.8 mm plug-in terminals can be supplied on request.  
The front dimensions of these units are 18 x 24 mm or 18 mm dia.  
In addition to a number of illuminated pushbuttons, the customer can choose from a range of other units and accessories having the same front and mounting dimensions: indicators, flashers, buzzers, etc.  
(For keylock switches see series 51 or 61.)

Mounting

Mount from the front through the mounting hole.  
The universal terminals of the low-level switching elements permit mounting on printed circuit boards (PCB).  
These terminals are also suitable for dip soldering. For these terminals we can also supply a plug-in base which, when soldered on to the board, enables the switch to be plugged in. All rectangular switches, as well as the square and round keylock switches are secured against rotation.

Lenses

The flat or concave lenses, made of polymethyl methacrylate, are available in various colours, as well as translucent or transparent.

Marking

For engravings, hot stamping and film inserts, see under "Marking" on page 58.

Illumination

Perfect illumination of the different coloured lenses is assured by midget-grooved lamps T 1 3/4 (6-60 V).  
For supply voltages above 60 V, it is necessary to use a voltage reduction element (external series resistor, capacitor or transformer).  
Do not solder the terminals directly, because of the high surface temperature.  
Multi-LED midget-grooved lamps T 1 3/4 (6, 12, 24, 48 V) are available in the colours red, white, yellow and green.

Position Indication

When a switch with maintained action is actuated, the lens remains in the depressed position mechanically. The state of the switch is apparent at all times from the position of the lens.

Number structure

31-XXX.OXX

Type of terminals  
Contact material  
Switch variant

31-9XX.X

Lens

Example:

-Illuminated pushbutton, round, with momentary action; gold-plated silver contact;  
1 switching element  
31-131.025  
-Lens, red  
31-933.2

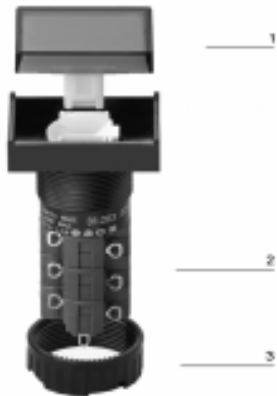
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Specimen order

<u>Indicator</u>	
- indicator, soldering terminal, 18 x 24 mm	31-040.005
<u>Recommended accessories:</u>	
- lens, blue, 18 x 24 mm	31-903-6
- LED, 1 chip, 24 VDC, white	10-2312.3139

All dimensions in mm.  
We reserve the right to modify technical data.

## illuminated-/pushbutton



- 1 lens
- 2 switch housing
- 3 fixing nut

buzzer



recommended accessories:

	operation voltage	front cap	connection method	18 x 24 mm part no.	circuit drawing	technical drawing	mounting dimension	
buzzer with continous and intermittent tone	10-26 VDC	plastic black	ST/ PT	31-801.002	1	1	1	0,015
	10-55 VAC/10-75 VDC	plastic black	ST	31-810.005	2	2	1	0,015

connection method: ST = soldering terminal; PT = plug-in terminal; PCB plug-in base page  
technical drawing as of page 51, mounting dimensions as of page 53, circuit drawing as of page 55

indicator



recommended accessories:

- lens → 41
- incandescent lamp → 44; LED → 45

	diode (1N 4007)	connection method	18 x 24 mm part no.	18 x 18 mm part no.	18 mm dia. part no.	circuit drawing	technical drawing	mounting dimension	components layout	
indicator	-	ST/ PT	31-040.002	31-050.002	31-030.002	3	3	1	-	0,004
		ST	31-040.005	31-050.005	31-030.005	4	3	1	-	0,004
		UT	31-041.006	31-051.006	31-031.006	3	5	1	1	0,005
	1	UT	31-701.006	31-703.006	31-741.006	5	4	1	1	0,006
	2	UT	31-702.006	31-704.006	31-742.006	6	4	1	1	0,006

connection method: ST = soldering terminal; PT = plug-in terminal; UT = universal terminal; PCB plug-in base page 43  
marking see page 58  
technical drawing as of page 51, mounting dimensions as of page 53, components layouts as of page 54, circuit drawing as of page 55




## illuminated-/pushbutton



### recommended accessories:

lens → 41

incandescent lamp → 44; LED → 45

	switching system	contacts	diode (1N 4007)	switching action	connection method	 18 x 24 mm part no.	 18 x 18 mm part no.	18 mm dia. part no.	circuit drawing	technical drawing	mounting dimension	components layout		
illuminated-/pushbutton	LL	1NC	-	main	UT	31-466.036	31-486.036	31-476.036	16	5	1	1	0,007	
				mom	UT	31-426.036	31-456.036	31-436.036	30	5	1	1	0,007	
		1NC + 1NO	-	main	UT	31-463.036	31-483.036	31-473.036	19	5	1	1	0,007	
				mom	UT	31-423.036	31-453.036	31-433.036	33	5	1	1	0,007	
		1NO	-	main	UT	31-465.036	31-485.036	31-475.036	18	5	1	1	0,007	
				mom	UT	31-425.036	31-455.036	31-435.036	32	5	1	1	0,007	
		2NC	-	main	UT	31-462.036	31-482.036	31-472.036	17	5	1	1	0,007	
				mom	UT	31-422.036	31-452.036	31-432.036	31	5	1	1	0,007	
		2NO	-	main	UT	31-461.036	31-481.036	31-471.036	20	5	1	1	0,007	
				mom	UT	31-421.036	31-451.036	31-431.036	34	5	1	1	0,007	
	SA	1NC + 1NO	-	main	ST/PT	31-261.022	31-281.022	31-271.022	12	6	1	-	0,006	
					ST	31-261.025	31-281.025	31-271.025	15	6	1	-	0,006	
				mom	ST/PT	31-121.022	31-151.022	31-131.022	26	6	1	-	0,006	
					ST	31-121.025	31-151.025	31-131.025	29	6	1	-	0,006	
			1	main	UT	31-713.029	31-717.029	31-747.029	13	7	1	1	0,008	
				mom	UT	31-705.029	31-709.029	31-743.029	27	7	1	1	0,008	
			2	main	UT	31-714.029	31-718.029	31-748.029	14	7	1	1	0,008	
				mom	UT	31-706.029	31-710.029	31-744.029	28	7	1	1	0,008	
			2NC + 2NO	-	main	ST	31-262.025	31-282.025	31-272.025	11	6	1	-	0,008
						ST	31-122.025	31-152.025	31-132.025	25	6	1	-	0,008
		1		main	UT	31-715.029	31-719.029	31-749.029	9	7	1	1	0,010	
				mom	UT	31-707.029	31-711.029	31-745.029	23	7	1	1	0,010	
		2		main	UT	31-716.029	31-720.029	31-750.029	10	7	1	1	0,010	
				mom	UT	31-708.029	31-712.029	31-746.029	24	7	1	1	0,010	
		3NC + 3NO	-	main	ST	31-263.025	31-283.025	31-273.025	8	6	1	-	0,010	
				mom	ST	31-123.025	31-153.025	31-133.025	22	6	1	-	0,010	
4NC + 4NO	-	main	ST	31-264.025	31-284.025	31-274.025	7	6	1	-	0,012			
		mom	ST	31-124.025	31-154.025	31-134.025	21	6	1	-	0,012			

switching system: LL = Low Level switching element, SA = snap-action switching element

switching action: main = maintained action, mom = momentary action

connection method: ST = soldering terminal; PT = plug-in terminal; UT = universal terminal; PCB plug-in base page 43

contacts: NC = normally closed, NO = normally open








power rating: Low Level switching element: 42 V/100 mA, snap-action switching element: 250 V/5 A

marking see page 58



technical drawing as of page 51. mounting dimensions as of page 53. components layouts as of page 54. circuit drawing as of page 55

## at front

## lens





	shape	lens/support	colour	 18 x 24 mm part no.	 18 x 18 mm part no.	18 mm dia. part no.		
lens of plastic	concave	transparent/trans- lucent	blue	31-904.6	31-954.6		0,001	
			colourless, clear	31-904.7	31-954.7		0,001	
			green	31-904.5	31-954.5		0,001	
			orange	31-904.3	31-954.3		0,001	
			red	31-904.2	31-954.2		0,001	
			yellow	31-904.4	31-954.4		0,001	
	flat	transparent/trans- lucent	blue	31-903.6	31-953.6	31-933.6	0,001	
			colourless, clear	31-903.7	31-953.7	31-933.7	0,001	
			green	31-903.5	31-953.5	31-933.5	0,001	
			orange	31-903.3	31-953.3	31-933.3	0,001	
			red	31-903.2	31-953.2	31-933.2	0,001	
of plastic (not for film insert and LED)	concave	translucent/trans- lucent	smoked	31-903.1	31-953.1	31-933.1	0,001	
			yellow	31-903.4	31-953.4	31-933.4	0,001	
			blue	31-902.6	31-952.6		0,001	
			green	31-902.5	31-952.5		0,001	
			orange	31-902.3	31-952.3		0,001	
	flat	translucent/trans- lucent	red	31-902.2	31-952.2		0,001	
			white	31-902.9	31-952.9		0,001	
			yellow	31-902.4	31-952.4		0,001	
			blue	31-901.6	31-951.6	31-931.6	0,001	
			green	31-901.5	31-951.5	31-931.5	0,001	
of plastic (not for film insert and illumination)	concave	opaque/translu- cent	orange	31-901.3	31-951.3	31-931.3	0,001	
			red	31-901.2	31-951.2	31-931.2	0,001	
	flat	opaque/translu- cent	white	31-901.9	31-951.9	31-931.9	0,001	
			yellow	31-901.4	31-951.4	31-931.4	0,001	
of plastic (not recommen- ded for film insert)	concave	transparent/trans- parent	black	31-902.0	31-952.0		0,001	
			grey	31-902.8	31-952.8		0,001	
			black	31-901.0	31-951.0	31-931.0	0,001	
			grey	31-901.8	31-951.8	31-931.8	0,001	
	flat	transparent/trans- parent	colourless, clear	31-906.7	31-956.7		0,001	
			green	31-906.5	31-956.5		0,001	
			red	31-906.2	31-956.2		0,001	
			yellow	31-906.4	31-956.4		0,001	
			colourless, clear	31-905.7	31-955.7	31-935.7	0,001	
			green	31-905.5	31-955.5	31-935.5	0,001	
			red	31-905.2	31-955.2	31-935.2	0,001	
			yellow	31-905.4	31-955.4	31-935.4	0,001	

## AML adaptor

	front shape	part no.	technical drawing		
AML adaptor for American panel cutout	rectangular	31-949	9	0,002	
	square	31-948	8	0,002	

technical drawing as of page 51



## protective cover

	 18 x 24 mm part no.	 18 x 18 mm part no.	technical drawing		
<b>protective cover</b> hinged, transparent, cover to prevent accidental operation	<b>31-925</b>	<b>31-920</b>	10	0,002	

technical drawing as of page 51



## sprayproof cover

front protection IP 67

	front shape	material	part no.	technical drawing	mounting dimension		
<b>sprayproof cover</b> two-part	rectangular	made of silicone	<b>31-924.2</b>	12	2	0,003	
	square	made of PVC	<b>31-923</b>	12	2	0,003	

technical drawing as of page 51. mounting dimensions as of page 53





## protective guard

	construction	part no.	technical drawing		
<b>protective guard</b> matt chromium-plated	broad sides bent upwards	<b>01-927</b>	14	0,011	
	narrow ends bent upwards	<b>01-926</b>	13	0,011	

technical drawing as of page 51



## blind plug





					mounting dimension		
	colour	18 x 24 mm part no.	18 x 18 mm part no.	18 mm dia. part no.			
<b>blind plug</b>	black	<b>01-947.0</b>	<b>01-948.0</b>	<b>01-949.0</b>	1	0,001	

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mounting dimensions as of page 53



## at back

## PCB plug-in base



					components layout		
	for	pin orientation	part no.				
<b>PCB plug-in base</b> 16.4 mm dia. x 9.8 mm high	Low Level switching element	axial	<b>31-940</b>	2	0,002		
17,9 x 8,4 mm high With the extendable mounting the distance between PCB plug-in base and PCB can be varied up to 3mm.	Low Level switching element	right-angled	<b>31-941</b>	3	0,004		
17.8 mm dia. x 9.8 mm high	snap-action switching element 2.8 mm	axial	<b>31-942</b>	4	0,002		

components layouts as of page 54

## cable shoe

	connection method	part no.		
<b>cable shoe</b>	plug-in terminal 2.8 x 0.5 mm	<b>31-946</b>	0,001	
	universal terminal 2.0 x 0.5 mm	<b>31-945</b>	0,001	

## insulation socket

	part no.		
<b>insulation socket</b> for connector 31-945	<b>31-928</b>	0,001	
for connector 31-946	<b>31-929</b>	0,001	
for snap-action switching element 2.8 mm to cover the plug-in terminals	<b>01-928</b>	0,001	



## terminal cover

for snap-action switching element


	part no.		
<b>terminal cover</b>	<b>01-929</b>	0,010	

## for illumination

## incandescent lamp


	voltage/current	part no.		
<b>incandescent lamp</b> base MG T 1 3/4	6 AC/DC/125 mA	<b>10-1306.1349 (41-963.0)</b>	0,001	
	6.3 AC/DC/200 mA	<b>10-1307.1369 (31-963.0)</b>	0,001	
	12 AC/DC/75 mA	<b>10-1309.1309 (41-963.1)</b>	0,001	
	14 AC/DC/80 mA	<b>10-1310.1319 (31-963.1)</b>	0,001	
	18 AC/DC/40 mA	<b>10-1311.1249 (41-963.2)</b>	0,001	
	24 AC/DC/35 mA	<b>10-1312.1229 (41-963.3)</b>	0,001	
	28 AC/DC/30 mA	<b>10-1313.1209 (41-963.4)</b>	0,001	
	28 AC/DC/40 mA	<b>10-1313.1249 (31-963.2)</b>	0,001	
	36 AC/DC/20 mA	<b>10-1316.1179 (41-963.36)</b>	0,001	
	36 AC/DC/30 mA	<b>10-1316.1209 (31-963.5)</b>	0,001	
	48 AC/DC/20 mA	<b>10-1319.1179 (41-963.5)</b>	0,001	
	48 AC/DC/25 mA	<b>10-1319.1199 (31-963.3)</b>	0,001	
	60 AC/DC/20 mA	<b>10-1320.1179 (31-963.4)</b>	0,001	

## LED

	number of chips	voltage/current	colour	part no.	SP kg	
LED base MG T1 3/4	1 chip	24 VDC/14 mA	white	10-2312.3139	0,001	
		28 VDC/14 mA	white	10-2313.3139	0,001	
	6 chips	6 VDC/45 mA	green	10-5306.3255 (31-968.05)	0,001	
			red	10-5306.3252 (31-968.02)	0,001	
			yellow	10-5306.3254 (31-968.04)	0,001	
		12 VDC/30 mA	green	10-5309.3205 (31-968.15)	0,001	
			red	10-5309.3202 (31-968.12)	0,001	
			yellow	10-5309.3204 (31-968.14)	0,001	
		24 VAC/DC/12.5 mA	green	10-5312.1115	0,001	
			red	10-5312.1112	0,001	
			yellow	10-5312.1114	0,001	
		24 VDC/14 mA	green	10-5312.3135 (31-968.25)	0,001	
			red	10-5312.3132 (31-968.22)	0,001	
			yellow	10-5312.3134. (31-968.24)	0,001	
		28 VAC/DC/12.5 mA	green	10-5313.1115	0,001	
			red	10-5313.1112	0,001	
			yellow	10-5313.1114	0,001	
		28 VDC/14 mA	green	10-5313.3135	0,001	
			red	10-5313.3132	0,001	
			yellow	10-5313.3134	0,001	
		48 VDC/12 mA	green	10-5319.3105 (31-968.45)	0,001	
			red	10-5319.3102 (31-968.42)	0,001	
			yellow	10-5319.3104 (31-968.44)	0,001	
	8 chips	6 VDC/48 mA	green	10-6306.3265	0,001	
			red	10-6306.3262	0,001	
			yellow	10-6306.3264	0,001	
		12 VDC/24 mA	green	10-6309.3185	0,001	
			red	10-6309.3182	0,001	
			yellow	10-6309.3184	0,001	
		24 VDC/12 mA	green	10-6312.3105	0,001	
			red	10-6312.3102	0,001	
			yellow	10-6312.3104	0,001	
		28 VDC/12 mA	green	10-6313.3105	0,001	
			red	10-6313.3102	0,001	
			yellow	10-6313.3104	0,001	

## capacitor


for lamp voltage reduction

	value	part no.	SP kg	
capacitor use with 60 VAC/20 mA, 50 Hz lamp voltage	230 VAC/0.27 $\mu$ F	02-917.0	0,004	

Wire in accordance with local electrical safety regulations.

## series resistor


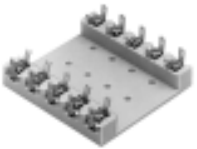
for lamp voltage reduction

	value	part no.	SP kg	
series resistor use with 60 VAC/20 mA, 50 Hz lamp voltage	110 V/2.7 kOhm	02-904.0	0,003	
	125 V/3.3 kOhm	02-904.1	0,003	
	145 V/4.7 kOhm	02-904.3	0,003	
	230-240 V/10,0 kOhm	02-904.7	0,003	



Wire in accordance with local electrical safety regulations.

**terminal plate empty**

for fitting with series resistors and capacitors



	no. of spaces	part no.		
<b>terminal plate empty</b>	5 spaces	<b>02-912.1</b>	0,025	
	10 spaces	<b>02-912.2</b>	0,045	
	15 spaces	<b>02-912.3</b>	0,090	
	20 spaces	<b>02-912.4</b>	0,095	

**terminal plate with capacitor**

	value	no. of components	part no.		
<b>terminal plate with capacitor</b> use with 60 VAC/20 mA lamp rating	0,27 $\mu$ F/230 VAC/60 VAC	5 spaces	<b>02-914.10</b>	0,045	
		10 spaces	<b>02-914.20</b>	0,090	
		15 spaces	<b>02-914.30</b>	0,135	
		20 spaces	<b>02-914.40</b>	0,180	


Wire in accordance with local electrical safety regulations.

**terminal plate with series resistor**



	value	no. of components	part no.		
<b>terminal plate with series resistor</b> use with 60 VAC/20 mA lamp rating	2.7 kOhm/110/60 V	5 spaces	<b>02-913.10</b>	0,040	
		10 spaces	<b>02-913.20</b>	0,075	
		15 spaces	<b>02-913.30</b>	0,115	
		20 spaces	<b>02-913.40</b>	0,155	
	3.3 kOhm/125/60 V	5 spaces	<b>02-913.11</b>	0,040	
		10 spaces	<b>02-913.21</b>	0,075	
		15 spaces	<b>02-913.31</b>	0,115	
		20 spaces	<b>02-913.41</b>	0,155	
	10 kOhm/230-240/60 V	5 spaces	<b>02-913.17</b>	0,040	
		10 spaces	<b>02-913.27</b>	0,075	
		15 spaces	<b>02-913.37</b>	0,115	
		20 spaces	<b>02-913.47</b>	0,155	

Wire in accordance with local electrical safety regulations.



**assembling****lens remover**

	part no.		
<b>lens remover</b>	<b>02-905</b>	0,011	



**lamp/LED remover**

	part no.		
<b>lamp/LED remover</b>	<b>61-9740.0</b>	0,002	

## dressing tool

	part no.	 kg	
<b>dressing tool</b> for aligning buttons	<b>01-906</b>	0,030	

## mounting tool

	part no.	 kg	
<b>mounting tool</b> for tightening (or loosening) fixing nuts	<b>01-907</b>	0,020	

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## actuator with snap-action switching element

### switching system

Self-cleaning, double-break, snap action switching system. (with contact gap 2 x 0.5 mm).  
1 normally closed or 1 normally open contact per element.  
snap-action switching elements with soldering terminals at the sides: up to 4 switching element can be on a pushbutton (max. 4 normally closed and 4 normally open contacts).  
snap-action switching element with axial plug-in terminals 2,8 mm not stachable, only 1 switching element can be on a pushbutton.

### material

#### actuator case

polyetherimide, self-extinguishing

#### material of contacts

gold-plated silver

#### switching element

axial plug-in-/soldering terminal 2.8 mm:  
diallyl phthalate DAP, polyamide 66, polysulfone, heat-resistant and self-extinguishing  
soldering terminal: PA 6.6 Ultramid

### mechanical characteristics

#### actuating force

2-5.5 N, depending on the number of switching elements

#### actuating travel

3 mm

#### ambient air temperature

-25°C to +55°C

for indicators and illuminated pushbuttons mounted as a block , make sure the heat can escape freely  
(as per DIN IEC 68-)

#### connection method

snap-action switching element with tinned soldering terminals at the sides:  
max. wire diameter: 2 wires à 1.2 mm  
max. wire cross-section of stranded cable: 1x 1 mm<sup>2</sup>.  
snap-action switching element with axial plug-in terminals, which can also be used as soldering terminals:  
plug-in terminal: 2.8 x 0.5 mm  
soldering terminal:  
max. wire diameter: 1 wire of 1.5 mm<sup>2</sup>  
max. wire cross-section of stranded cable: 2 x 0.75 mm<sup>2</sup> or 1 x 1.0 mm<sup>2</sup>

#### degree of protection

front as per IEC 529:

IP 40

IP 67 with spray cover

#### mechanical life

momentary action 2 mio. cycles of operation

maintained action 1 mio. cycles of operation

#### rebound time

<= 5ms

#### resistance to climate

standard condition as per IEC 68-2-3 and 2-30

changing condition as per IEC 68-2-14 and 2-33

#### resistance to shock

(single impacts, semi-sinusoidal)

15 g for 11 ms as per IEC 512-4-3, IEC 68-2-27

#### resistance to vibration

(sinusoidal)

10 g at 0-2000 Hz, amplitude 1.5 mm as per IEC 512-4-4, IEC 68- 2-6

#### storage temperature

-40°C to + 85°C

(as per DIN IEC 68-)

### electrical characteristics

#### continuous thermal current Ith<sub>2</sub>

5 A

The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

#### electric strength

2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 512-2-11.

#### protection class

II

#### rated current

5 A

#### rated voltage

250 VAC/VDC

#### switch rating

250 VAC/5 A (cos φ 1)

250 VAC/3 A (cos φ 0.3)

switch rating AC, cos φ 0,7:

voltage	125 V	250 V
---------	-------	-------

current	3 A	2 A
---------	-----	-----

switch rating DC (inductive), L:R = 30 ms:

voltage	24 V	60 V	110 V	220 V
---------	------	------	-------	-------

current	2 A	0,7 A	0,2 A	0,1 A
---------	-----	-------	-------	-------

#### volume resistance

starting value (initial) <= 50 mΩ

### rules

IEC 1058 EN 61 058

### approvals

- SEV 250 VAC/5 A

- CSA 300 VAC

- UL

- VDE

### declaration of conformity

- CE

## actuator with Low Level switching element

### switching system

This low level switching element was designed for switching low powers in electronic circuits. The mechanism assures reliable switching of loads ranging from a few μA/μV up to 100 mA/42 VAC/ VDC.

Single-break momentary contact, as normally open or normally closed with 4 independent points of contact. 2 momentary contacts per switching element; combination of normally open and normally closed is possible.

Special features are the long life, extremely short rebound time and stable contact resistance.

## material

**actuator case**  
polyetherimide, self-extinguishing

**material of contacts**  
gold-plated

**switching element**  
polysulfone, heat-resistant and self-extinguishing

## mechanical characteristics

**actuating force**  
3-3.5 N

**actuating travel**  
3 mm

**ambient air temperature**  
-25°C to +55°C  
for indicators and illuminated pushbuttons mounted as a block ,  
make sure the heat can escape freely  
(as per DIN IEC 68-)

**connection method**  
The universal terminals permit these units to be mounted on printed  
circuit boards (PCB). These terminals can also be used as solder-  
ing or plug-in terminals.  
For these terminals we can also supply a plug-in base which, when  
soldered on to the board, enables the switch to be plugged in.  
soldering terminal:  
max. wire diameter: 2 wires à 0.8 mm  
max. wire cross-section of stranded cable: 1x 0.75 mm<sup>2</sup>  
plug-in terminal:  
2.0 x 0.5 mm

**degree of protection**  
front as per IEC 529:  
IP 40  
IP 67 with spray cover

**mechanical life**  
momentary action 5 mio. cycles of operation  
maintained action 1 mio. cycles of operation

**rebound time**  
Typ. < 100 µs

**resistance to climate**  
standard condition as per IEC 68-2-3 and 2-30  
changing condition as per IEC 68-2-14 and 2-33

**resistance to shock**  
(single impacts, semi-sinusoidal)  
15 g for 11 ms as per IEC 512-4-3, IEC 68-2-27

**storage temperature**  
-40°C to + 85°C  
(as per DIN IEC 68-)

## electrical characteristics

**electric strength**  
2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC  
512-2-11.

**protection class**  
II

**switch rating**  
10 µA/100 µV to 100 mA at 42 VAC/VDC

**volume resistance**  
starting value (initial) ≤ 50 mΩ

## rules

EN 61 058

## buzzer Part No. 31-810.005

## switching system

**buzzer system**  
electronic non-contacting buzzer  
with IC oscillator  
-contactless electronic buzzer  
- with IC-oscillator

## material

**alarm buzzer case**  
polyetherimides

**front bezel**  
polyamide

## mechanical characteristics

**connection method**  
soldering terminal

**degree of protection**  
IP 40 as per IEC 529

**operating temperature**  
-25°C to +55°C

**storage temperature**  
-40°C to +85°C  
(as per DIN IEC 68-)

## electrical characteristics

**frequency (tone)**  
ca. 2.8 kHz

**interval frequency**  
2 Hz

**operation voltage/current**  
typ. 10-55 VAC; 25 mA  
typ. 10-75 VDC; 15 mA

**sound pressure**  
88 dB (A) ± 8 at a distance of 0.1 m  
Volume variable with a 1 MΩ potentiometer or corresponding fixed  
resistor.

## buzzer Part No. 31-801.002

## switching system

**buzzer system**  
electronic non-contacting buzzer  
with IC oscillator

## material

**alarm buzzer case**  
polyetherimides

**front bezel**  
polyamide

## mechanical characteristics

**connection method**  
plug-in terminal 2.8 x 0.5 mm

3

**degree of protection**

IP 40 as per IEC 529

**operating temperature**

- 25°C to + 55°C

**storage temperature**

- 25°C to + 55°C  
(as per DIN IEC 68-)

**electrical characteristics****frequency (tone)**

ca. 2.0 kHz

**interval frequency**

2 Hz

**operation voltage/current**

10-26 VDC; ≤ 30 mA

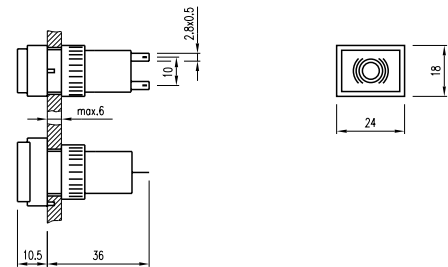
**sound pressure**

88 db (A) ± 8 at a distance of 0.1 m

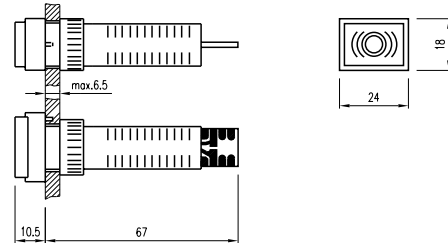


technical drawing

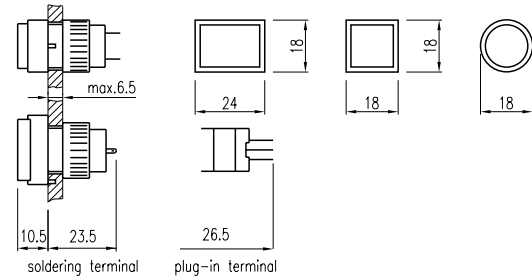
1 buzzer  
page 39



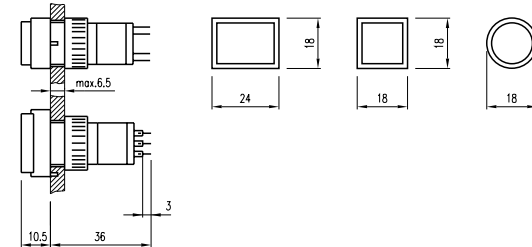
2 buzzer  
page 39



3 indicator  
page 39

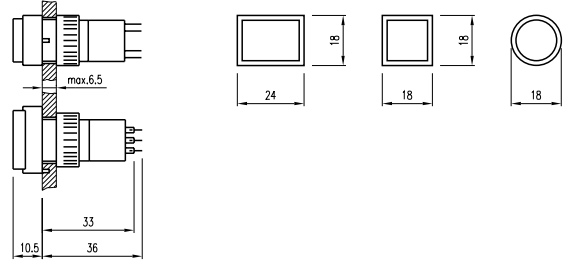


4 indicator  
page 39



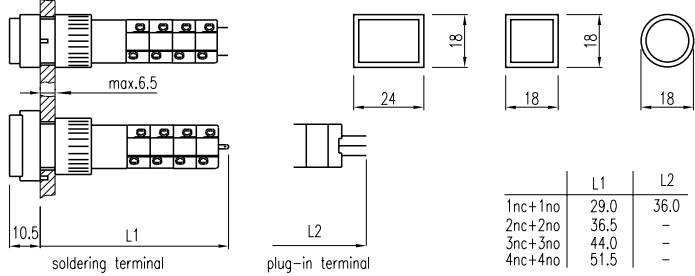
5 indicator, illuminated-/pushbutton

page 39, 40



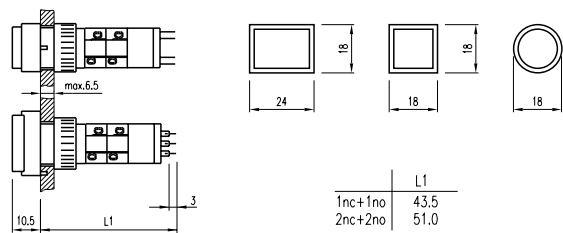
6 illuminated-/pushbutton

page 40



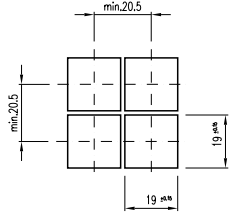
7 illuminated-/pushbutton

page 40



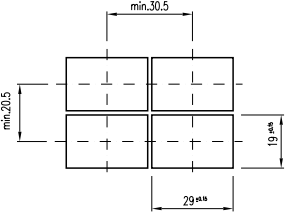
8 AML adaptor

page 41

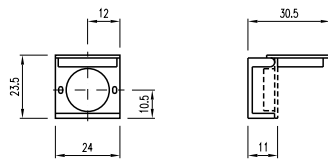


9 AML adaptor

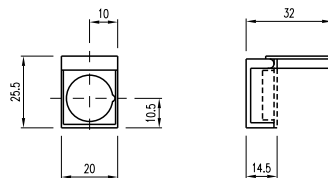
page 41



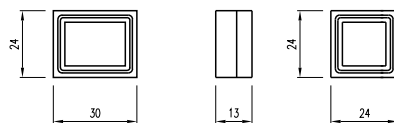
## 10 protective cover page 42



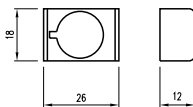
## 11 protective cover page 42



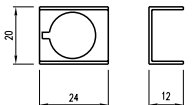
## 12 sprayproof cover page 42



## 13 protective guard page 42

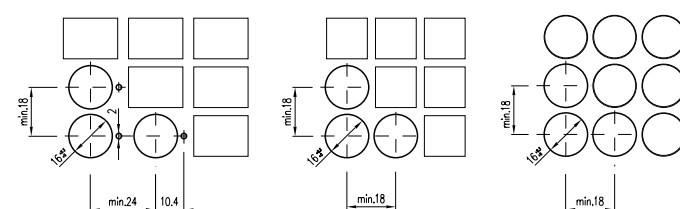


## 14 protective guard page 42



## mounting dimension

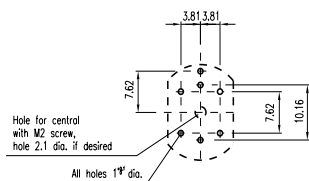
## 1 buzzer, indicator, illuminated-/pushbutton, blind plug page 39, 40, 43



## page 42



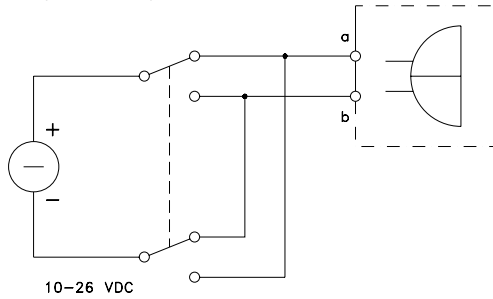
## page 39, 40



	circuit drawing
1	
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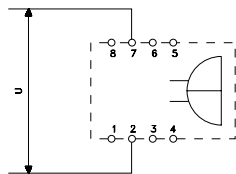
	circuit drawing
21	
22	
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29	
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31	
32	
33	
34	

1. buzzer (31-801.002)

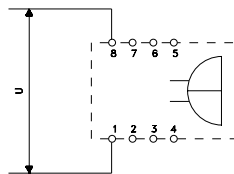


Depending on how the terminals are connected, the buzzer can operate with a continuous tone a(-) b(+) or with intermittent tone a(+) b(-)

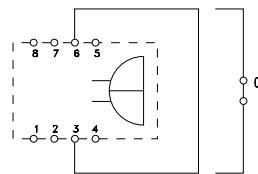
2. buzzer (31-810.005)



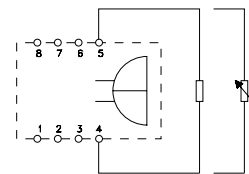
1. Supply voltage I  
continuous tone  
U = 10-35 VAC  
U = 10-50 VDC



2. Supply voltage II  
Continuous tone  
U = 35-55 VAC  
U = 35-75 VDC



3. Intermittent tone  
Interval apr. 3 Hz

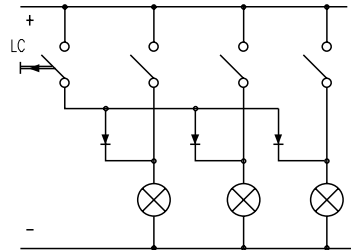


4. Volume control

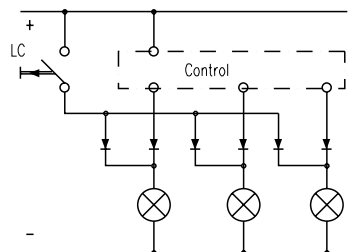
## Indicators and illuminated pushbuttons with built-in diodes

With indicators and illuminated pushbuttons equipped with diodes, the user is able to perform a lamp check or wire an alarm circuit simply with a considerable saving of space.

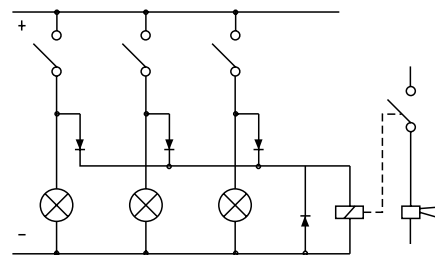
lamp check



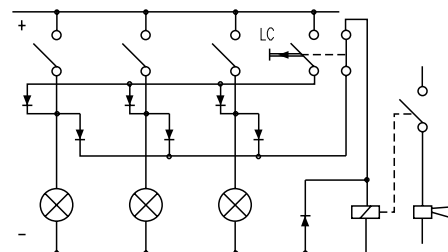
lamp check with blocking diodes



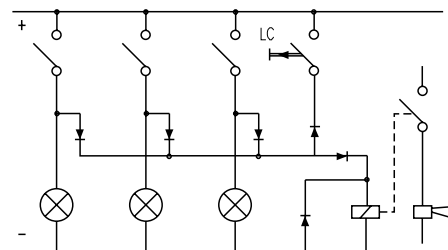
alarm circuit from fault  
annunciating system



lamp check and alarm circuit



lamp check and alarm circuit with  
only one diode and AC voltage



LC = lamp check

## 1. Engraving

### Typefaces

In addition to the most commonly used world languages (see DIN 1451) with close spacing, the following typefaces are available: Scandinavian, Slavian, Greek, Russian.

### Coloured filling of engraving

Specify whether engraving should be on the diffuser, or on the lens.  
Specify the infill colour, character height and the text or symbol orientation.

### Symbols

A list of the symbols available can be supplied on request.

## 2. Hot stamping

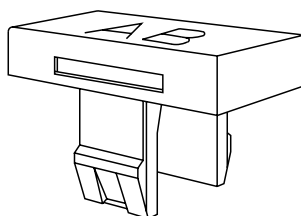
For large batches it is worth while to have the lettering produced by hot stamping.

### Typefaces

For letters and figures, typefaces with 2,5 mm, 3 mm and 4 mm are available.

### Symbols

A list of the symbols available can be supplied on request.



## 3. Film inserts

Instead of using engraving, the lenses can be fitted with transparent film inserts.

For this purpose, though, it is advisable to use transparent lenses. When a smoked lens is used, the lettering does not become visible until the lamp lights.

To insert the film, the feet of the lens support have to be pushed together far enough to enable the lens to be lifted off easily.

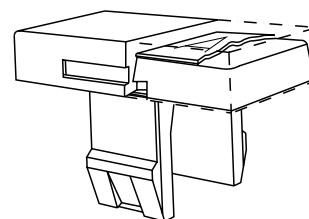
### Film dimensions

max. 12,7 x 18,7 mm  
12,7 x 12,7 mm  
12,8 mm

### Film thickness 0,2 mm

### Important!

Before engraving, check the position of the illuminated pushbuttons or indicator.



Height of letters mm	Thickness of letters mm	Horizontal mounting			Vertical mounting			Circular mounting			Square mounting		
		Number of lines	Number of letters per line	Number of letters per line	Number of lines	Number of letters per line	Number of letters per line	Number of lines	Number of letters per line	Number of letters per line	Number of lines	Number of letters per line	Number of letters per line
h	s		(caps)	(small)		(caps)	(small)		(caps)	(small)		(caps)	(small)
2,5	0,4	4	11	12	5	7-8	8	3	6	6	4	7-8	8
3	0,4	3	9-10	10-11	4	6-7	7	2	5	6	3	6-7	7
4	0,5	2	7	7-8	3	4-5	5	2	3	4	2	4-5	5
5	0,5	2	5-6	6	2	3-4	4	1	2	3	2	3-4	4
6	0,6	1	4-5	5	2	3	3-4	1	2	2	1	3	3-4