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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

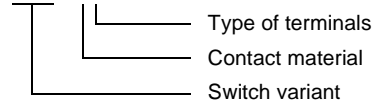
Perfect illumination of the different coloured lenses is assured by mid-grooved lamps T 1 3/4 (6-60 V). For supply voltages above 60 V, it is necessary to use a voltage reduction element (external series resistor, capacitor or transformer). Do not solder the terminals directly, because of the high surface temperature. Multi-LED mid-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



31-9XX.X

Example:

Type of terminals
Contact material
Switch variant

Lens

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

Specimen order

Indicator

- indicator, soldering terminal, 18 x 24 mm 31-040.005

Recommended accessories:

- 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 continuous 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

illuminated-/pushbutton	switching system	contacts	diode (1N 4007)	switching action	connection method	□			⌀			circuit drawing	technical drawing	mounting dimension	components layout	
						18 x 24 mm part no.	18 x 18 mm part no.	18 mm dia. part no.	18 x 24 mm part no.	18 x 18 mm part no.	18 mm dia. part no.					
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		
			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			
					mom	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.	 kg			
lens of plastic	concave	transparent/translucent	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/translucent	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			
			smoked	31-903.1	31-953.1	31-933.1	0,001			
			yellow	31-903.4	31-953.4	31-933.4	0,001			
			of plastic (not for film insert and LED)	concave	translucent/translucent	blue	31-902.6		31-952.6	
green	31-902.5	31-952.5					0,001			
orange	31-902.3	31-952.3					0,001			
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			
flat	translucent/translucent	blue		31-901.6	31-951.6	31-931.6	0,001			
		green		31-901.5	31-951.5	31-931.5	0,001			
		orange		31-901.3	31-951.3	31-931.3	0,001			
		red		31-901.2	31-951.2	31-931.2	0,001			
of plastic (not for film insert and illumination)	concave	opaque/translucent	black	31-902.0	31-952.0		0,001			
			grey	31-902.8	31-952.8		0,001			
	flat	opaque/translucent	black	31-901.0	31-951.0	31-931.0	0,001			
			grey	31-901.8	31-951.8	31-931.8	0,001			
			of plastic (not recommended for film insert)	concave	transparent/transparent	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
				flat	transparent/transparent	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	 kg	
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

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

[technical drawing as of page 51](#)



sprayproof cover

front protection IP 67

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



[technical drawing as of page 51](#), [mounting dimensions as of page 53](#)

protective guard

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

[technical drawing as of page 51](#)





blind plug

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

mounting dimensions as of page 53



at back

PCB plug-in base



	for	pin orientation	part no.	components layout		
PCB plug-in base 16.4 mm dia. x 9.8 mm high	Low Level switching element	axial	31-940	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	31-941	3	0,004	
17.8 mm dia. x 9.8 mm high	snap-action switching element 2.8 mm	axial	31-942	4	0,002	

components layouts as of page 54

cable shoe

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

insulation socket

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



terminal cover

for snap-action switching element


	part no.		
terminal cover	01-929	0,010	

for illumination

incandescent lamp

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

LED

	number of chips	voltage/current	colour	part no.	
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.	
capacitor use with 60 VAC/20 mA, 50 Hz lamp voltage	230 VAC/0.27 µF	02-917.0	0,004



Wire in accordance with local electrical safety regulations.

series resistor

for lamp voltage reduction


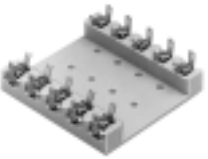
	value	part no.	
series resistor use with 60 VAC/20 mA, 50 Hz lamp voltage	110 V/2.7 kOhm	02-904.0	0,003
	125 V/3.3 kOhm	02-904.1	0,003
	145 V/4.7 kOhm	02-904.3	0,003
	230-240 V/10,0 kOhm	02-904.7	0,003





Wire in accordance with local electrical safety regulations.

terminal plate empty

for fitting with series resistors and capacitors



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

terminal plate with capacitor

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

Wire in accordance with local electrical safety regulations.



terminal plate with series resistor

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



Wire in accordance with local electrical safety regulations.

assembling



lens remover

	part no.		
lens remover	02-905	0,011	



lamp/LED remover

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

dressing tool

	part no.	 kg	
dressing tool for aligning buttons	01-906	0,030	

mounting tool

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

3

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 mm².
 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 mm²
 max. wire cross-section of stranded cable: 2 x 0.75 mm² or 1 x 1.0 mm²

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 I_{th2}

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 IC 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 mm²
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 IC
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

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

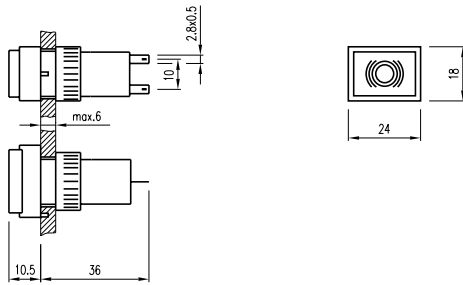
sound pressure

88 db (A) ± 8 at a distance of 0.1 m

technical drawing

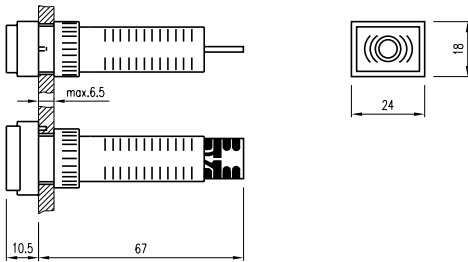
1 buzzer

page 39



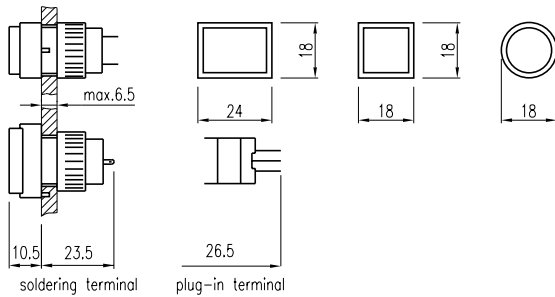
2 buzzer

page 39



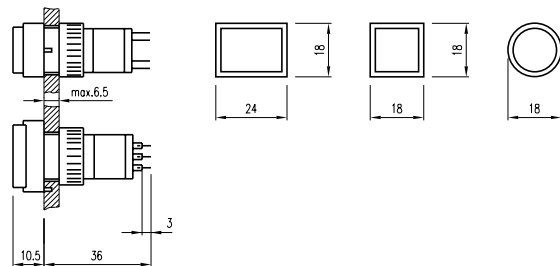
3 indicator

page 39



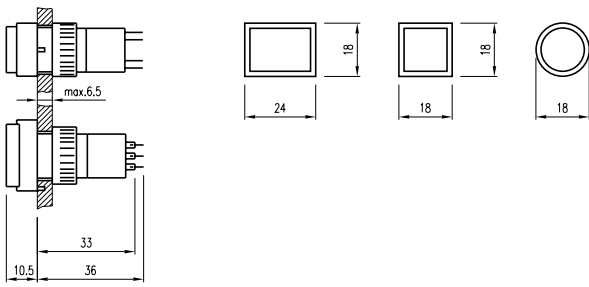
4 indicator

page 39



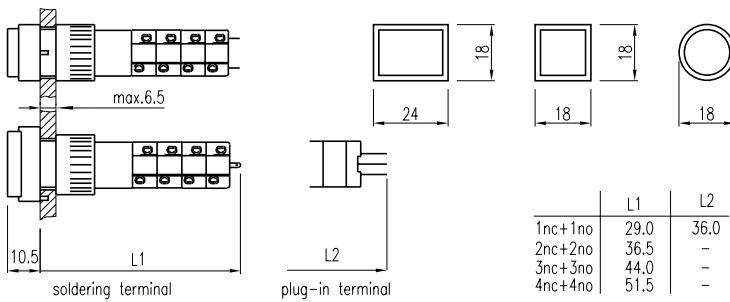
5 indicator, illuminated-/pushbutton

page 39, 40



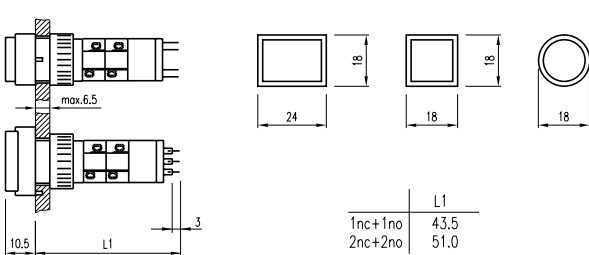
6 illuminated-/pushbutton

page 40



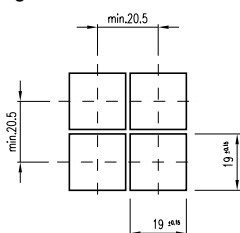
7 illuminated-/pushbutton

page 40



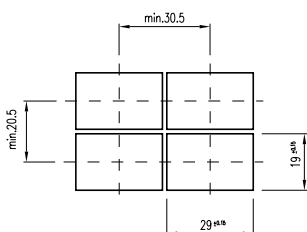
8 AML adaptor

page 41

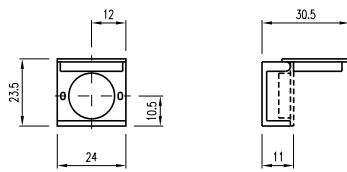


9 AML adaptor

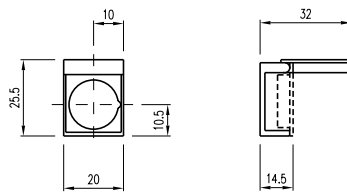
page 41



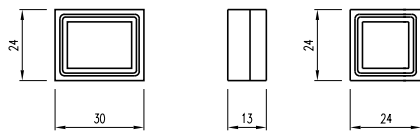
10 protective cover
page 42



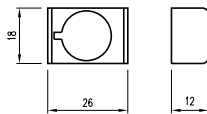
11 protective cover
page 42



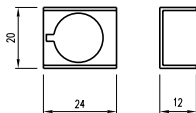
12 sprayproof cover
page 42



13 protective guard
page 42

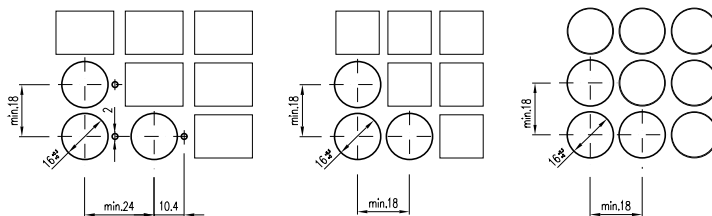


14 protective guard
page 42

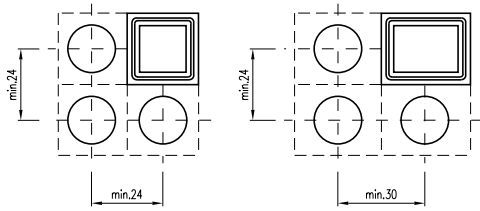


mounting dimension

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

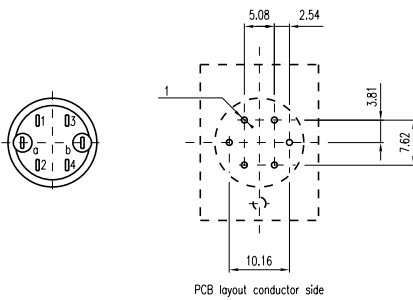


2 sprayproof cover page 42

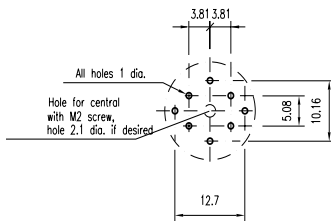


components layouts

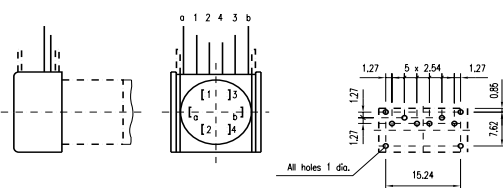
1 indicator, illuminated-/pushbutton page 39, 40



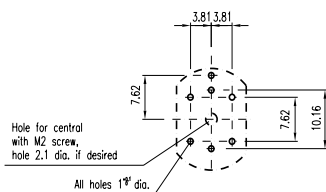
2 PCB plug-in base page 43



3 PCB plug-in base page 43



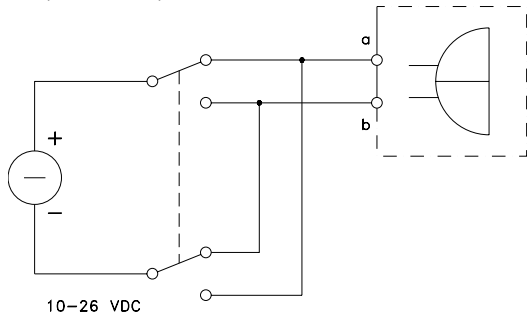
4 PCB plug-in base page 43



	circuit drawing
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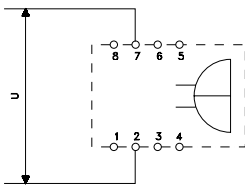
	circuit drawing
21	
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34	

1. buzzer (31-801.002)

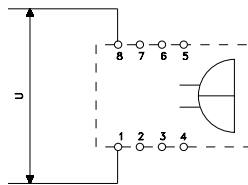


Depending on how the terminals are connected, the buzzer can operate with a continuous tone a(-) b(+) or with intermittent tone a(+) b(-)

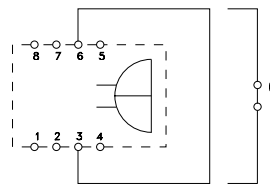
2. buzzer (31-810.005)



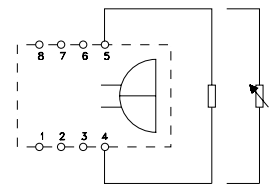
1. Supply voltage I
continuous tone
U = 10-35 VAC
U = 10-50 VDC



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



3. Intermittent tone
Interval apr. 3 Hz

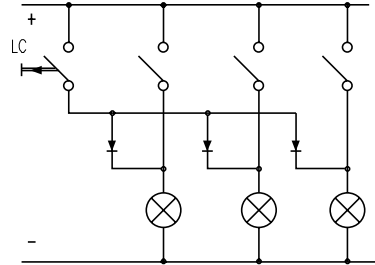


4. Volume control

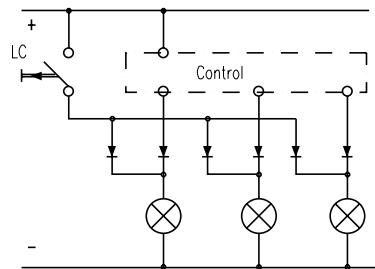
Indicators and illuminated pushbuttons with built-in diodes

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.

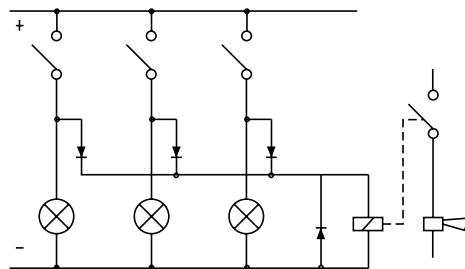
lamp check



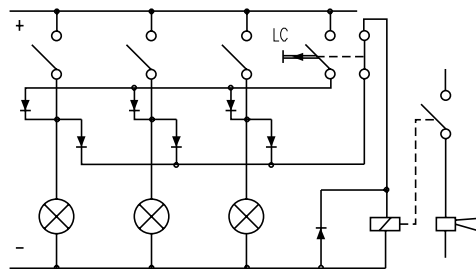
lamp check with blocking diodes



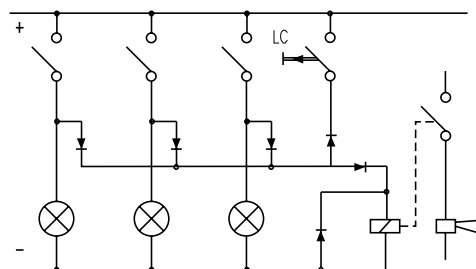
alarm circuit from fault annunciating system



lamp check and alarm circuit



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



LC = lamp check

3

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

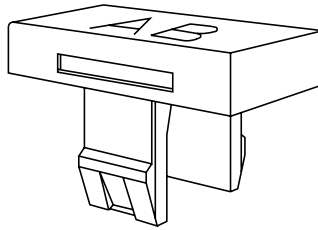
For large batches it is worth while to have the lettering produced by hot stamping.

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.

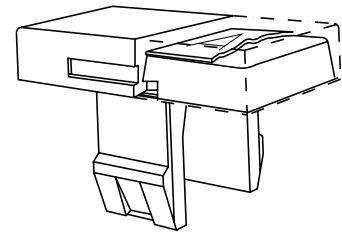
Film dimensions

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			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