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Series 31

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

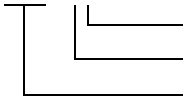
Perfect illumination of the different coloured lenses is assured by midget-grooved lamps T 1 3/4 (6-60 V).
For supply voltages above 60 V, it is necessary to use a voltage reduction element (external series resistor, capacitor or transformer).
Do not solder the terminals directly, because of the high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

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	kg
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	kg
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	kg
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
				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**		0,001	
			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	
			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 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

	18 x 24 mm part no.	18 x 18 mm part no.	technical drawing	kg	
protective cover hinged, transparent, cover to prevent accidental operation	**31-925**	**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	kg	
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	kg	
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

	colour	18 x 24 mm part no.	18 x 18 mm part no.	18 mm dia. part no.	mounting dimension	kg	
blind plug	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	kg	
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.	kg	
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.	kg	
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.	kg	
terminal cover	**01-929**	0,010	

for illumination

incandescent lamp

	voltage/current	part no.	kg	
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.	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.	kg	
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

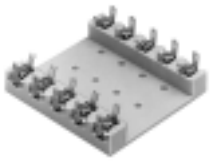
for lamp voltage reduction

	value	part no.	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.	kg	
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.	kg	
terminal plate with capacitor use with 60 VAC/20 mA lamp rating	0,27 µF/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.	kg	
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.	kg	
lens remover	**02-905**	0,011	

lamp/LED remover

	part no.	kg	
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	

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

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_2
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 soldering 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^2
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

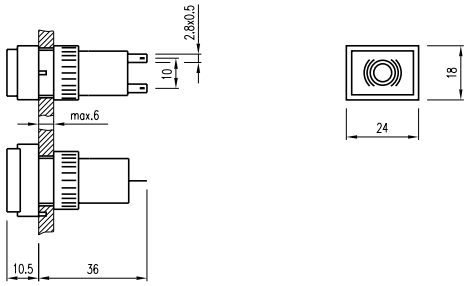
interval frequency
2 Hz

operation voltage/current
10-26 VDC; <= 30 mA

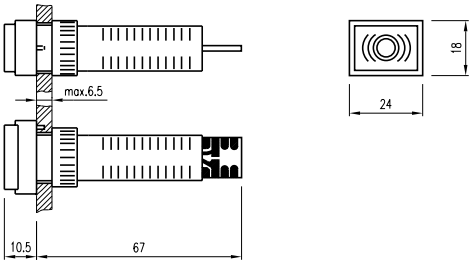
sound pressure
88 db (A) ± 8 at a distance of 0.1 m

technical drawing

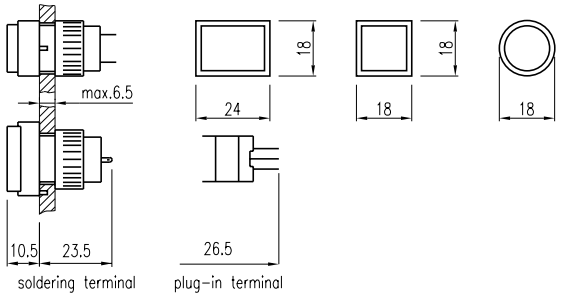
1 buzzer
page 39



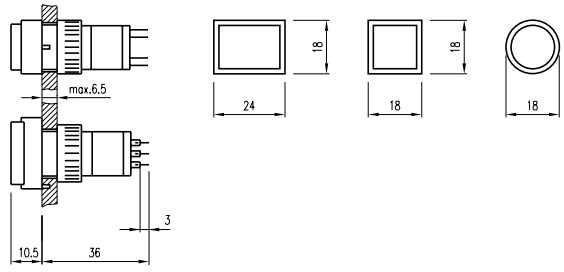
2 buzzer
page 39



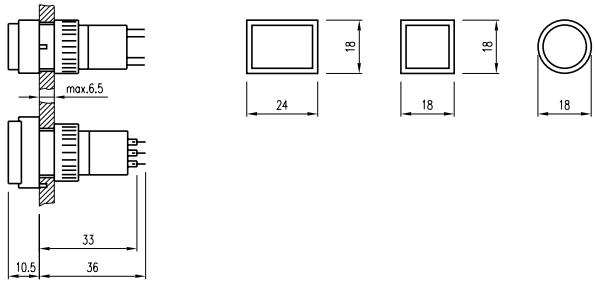
3 indicator
page 39



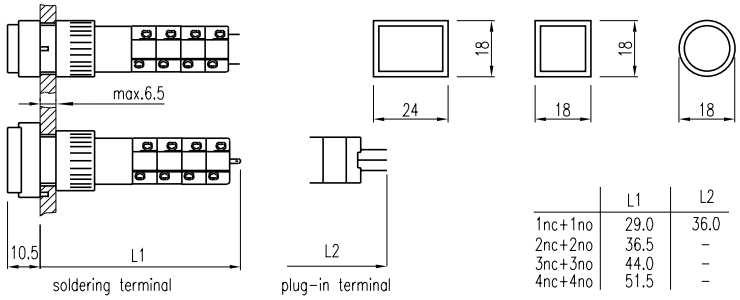
4 indicator
page 39



5 indicator, illuminated-/pushbutton
page 39, 40

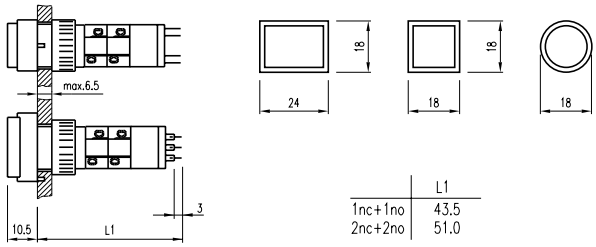


6 illuminated-/pushbutton
page 40



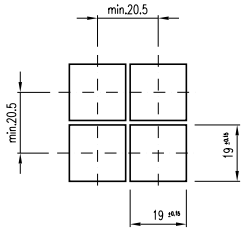
	L1	L2
1nc+1no	29.0	36.0
2nc+2no	36.5	–
3nc+3no	44.0	–
4nc+4no	51.5	–

7 illuminated-/pushbutton
page 40

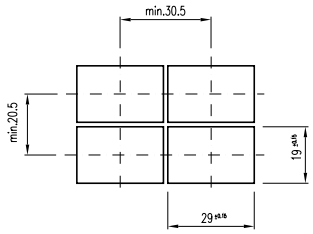


	L1
1nc+1no	43.5
2nc+2no	51.0

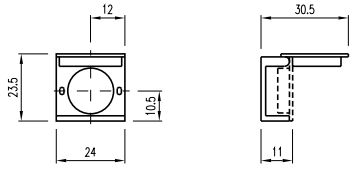
8 AML adaptor
page 41



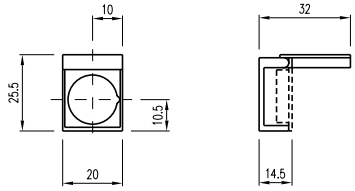
9 AML adaptor
page 41



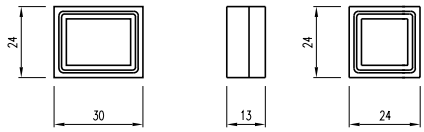
10 protective cover
page 42



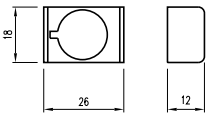
11 protective cover
page 42



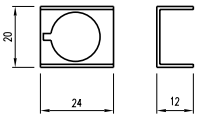
12 sprayproof cover
page 42



13 protective guard
page 42

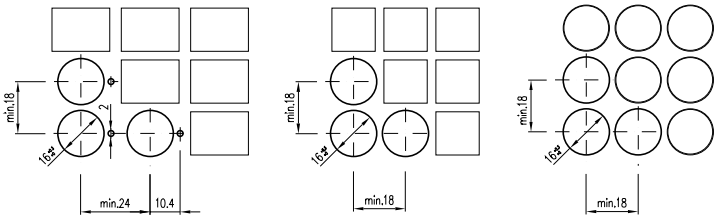


14 protective guard
page 42

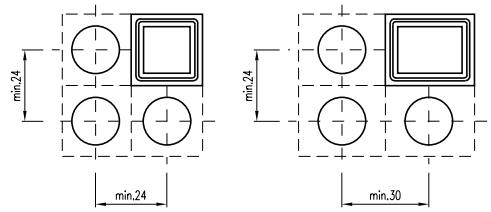


mounting dimension

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

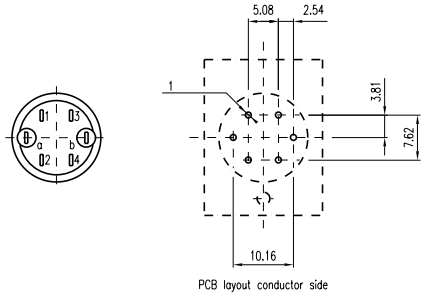


2 sprayproof cover
page 42

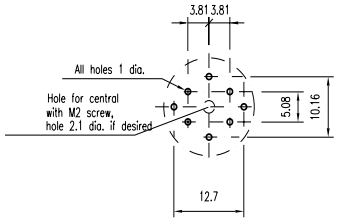


components layouts

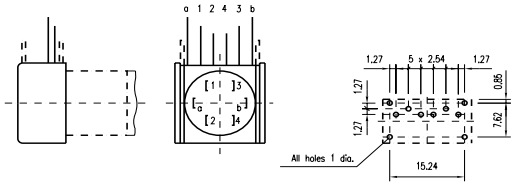
1 indicator, illuminated-/pushbutton
page 39, 40



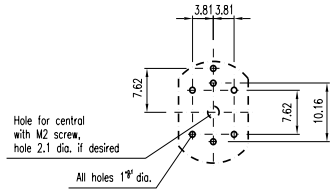
2 PCB plug-in base
page 43



3 PCB plug-in base
page 43



4 PCB plug-in base
page 43



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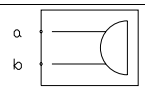
1	
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3	
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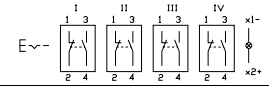
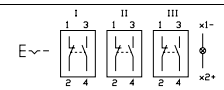
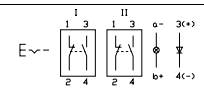
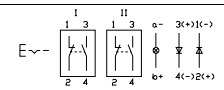
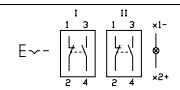
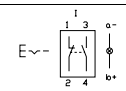
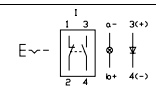
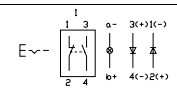
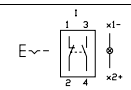
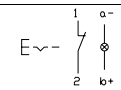
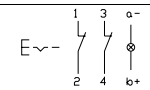
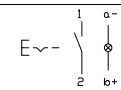
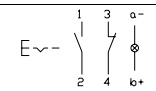
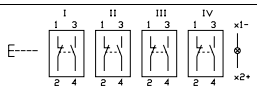
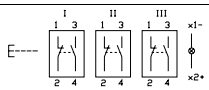
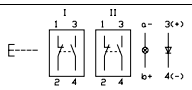
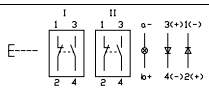
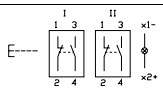
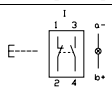
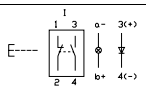
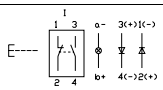
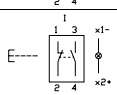
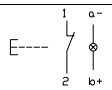
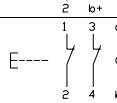
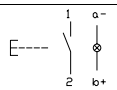
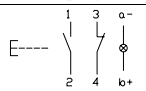
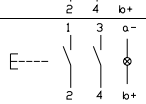
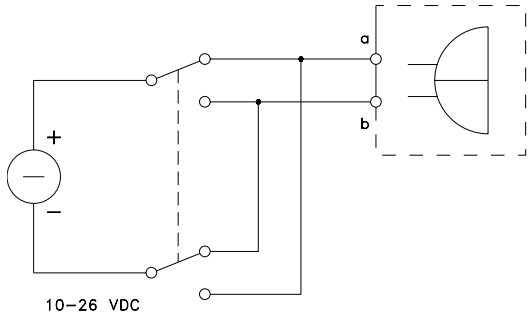
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

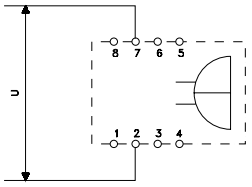
	circuit drawing
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	

1. buzzer (31-801.002)

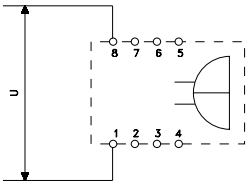


Depending on how the terminals are connected, the buzzer can operate with a continuous tone a(-) b(+) or with intermittent tone a(+) b(-)

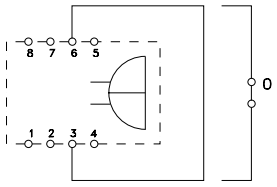
2. buzzer (31-810.005)



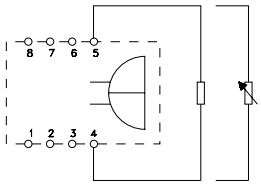
1. Supply voltage I
continuous tone
U = 10–35 VAC
U = 10–50 VDC



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



3. Intermittent tone
Interval apr. 3 Hz

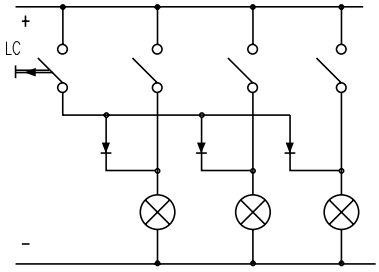


4. Volume control

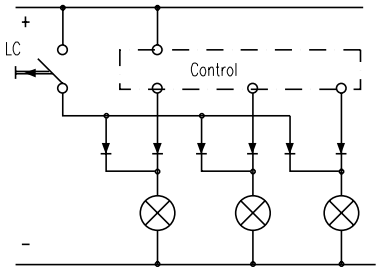
Indicators and illuminated pushbuttons with built-in diodes

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.

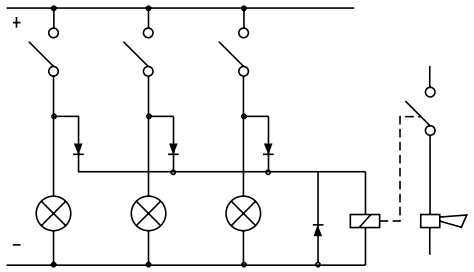
lamp check



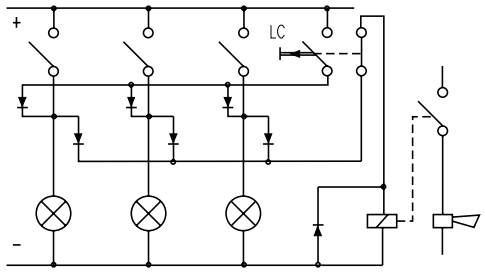
lamp check with blocking diodes



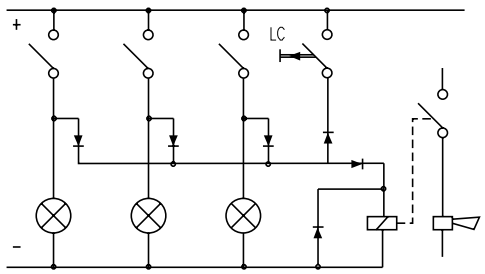
alarm circuit from fault annunciating system



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

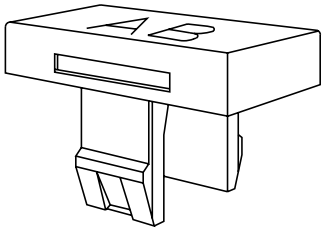
For large batches it is worth while to have the lettering produced by hot stamping.

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.

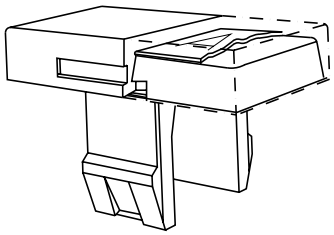
Film dimensions

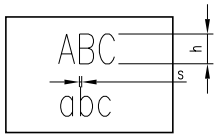
max. 12,7 x 18,7 mm
12,7 x 12,7 mm
12,8 mm

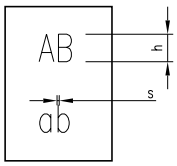
Film thickness 0,2 mm

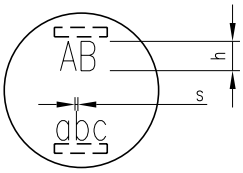
Important!

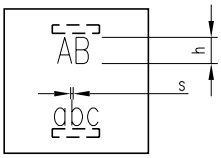
Before engraving, check the position of the illuminated pushbuttons or indicator.











Height of letters mm	Thickness of letters mm	Horizontal mounting			Vertical mounting								
		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