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Series 19

General Notes

The series contains indicators and illuminated pushbuttons with maintained and momentary action and one contact which may be normally closed or normally open (snap-action element for closing). The illuminated pushbuttons are fitted with snap-action or low-level switching systems.
The front dimensions are 9 x 9 mm or 9 mm dia.

Mounting

Mounting from the front through the mounting hole is assured even when the wiring has already been attached (mounting dimensions and spacing see page 233.)
The units are equipped with soldering/plug-in terminals.

Lenses

The flat lenses, made of polycarbonate, are obtainable in various colours. The transparent lens is available with translucent or transparent support.

Marking

A limited amount of marking can be provided.

Illumination

Perfect illumination of the different coloured lenses is assured by filament lamps bipin T1 longlife (6 - 24 V) or LED bi-pin T1. LED are available in the colours white, red, 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

19-XXX.0X5

- XXX: Contact material
- X: Switch variant

19-9XX.X	Lens
19-9XX.X	Other accessories
Example:	-Illuminated pushbutton; round, momentary action, gold-plated silver contact, soldering terminals 19-139.035
	-Lens, round, red 19-931.2

Specimen order

Indicator	
- indicator, 25mm, 9mm dia.	19-030.005
Recommended accessories:	
- lens, blue, 9mm dia.	19-931.6
- LED, 1 chip, white	10-2603.3179C

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

illuminated-/pushbutton

1 lens
2 switch housing
3 fixing nut

indicator


lens page 228
filament lamp page 229
LED page 229

	mounting depth	connection method	中 9 x 9 mm Typ-Nr.	9 mm dia. Typ-Nr.	circuit drawing	technical drawing	mounting dimensions	component layout	kg
indicator	25 mm	-	**19-050.005**	**19-030.005**	1	1	1	1	0,001
	33 mm	-	**19-051.005**	**19-031.005**	1	2	1	1	0,002

connection method : soldering-/plug-in terminal = -
circuit drawings from page 233, technical drawings from page 232, mounting dimensions from page 232, component layouts from page 233

illuminated-/pushbutton


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	switching system	contacts	switching action	connection method	中 9 x 9 mm Typ-Nr.	9 mm dia. Typ-Nr.	circuit drawing	technical drawing	mounting dimensions	component layout	kg
illuminated-/pushbutton	LL	1 NO Au	M	-	**19-451.035**	**19-431.035**	2	3	1	2	0,002
			MA	-	**19-481.035**	**19-471.035**	3	3	1	2	0,002
		1 NC Au	M	-	**19-452.035**	**19-432.035**	4	3	1	2	0,002
			MA	-	**19-482.035**	**19-472.035**	5	3	1	2	0,002
	SA	1 NO Ag	M	-	**19-159.015**	**19-139.015**	2	3	1	2	0,002
			MA	-	**19-289.015**	**19-279.015**	3	3	1	2	0,002
		1 NO Au	M	-	**19-159.035**	**19-139.035**	2	3	1	2	0,002
			MA	-	**19-289.035**	**19-279.035**	3	3	1	2	0,002

switching system : snap-action switching element = SA, low level switching element = LL
contacts
switching action : momentary action = M, maintained action = MA
connection method : soldering-/plug-in terminal = -
circuit drawings from page 233, technical drawings from page 232, mounting dimensions from page 232, component layouts from page 233

for illumination

Filament lamp

	voltage/current	part no.	kg
Filament lamp base T 1 Bi-Pin max. PIN length 5 mm	6 AC/DC/70mA	**10-1606.1309 (19-903.00)**	0,001
	12 AC/DC/25 mA	**10-1609.1199 (19-903.10)**	0,001
	24 AC/DC/20 mA	**10-1612.1179 (19-903.30)**	0,001

LED

	number of chips	voltage/current	colour	part no.	kg
LED base T 1 Bi-Pin max. PIN length 5 mm	4 chips	28 VDC/12 mA	yellow	**10-4613.3104B (11-968.34)**	0,001
			green	**10-4613.3105B (11-968.35)**	0,001
			orange	**10-4613.3103B (11-968.33)**	0,001
			red	**10-4613.3102B (11-968.32)**	0,001
base T 1 Bi-Pin max. PIN length 8 mm	1 chip	2.2 VDC/20 mA	yellow	**10-2602.3174C (19-943.04)**	0,001
			green	**10-2602.3175C (19-943.05)**	0,001
			red	**10-2602.3172C (19-943.02)**	0,001
		3.6 VDC/20 mA	white	**10-2603.3179C**	0,001

assembling

fixing nut

	part no.	kg
fixing nut 9 x 13 mm dia. only for sheet < 3 mm thick	**19-991**	0,001

dressing tool

	part no.	kg
dressing tool for aligning buttons	**19-906**	0,011

lens remover

	part no.	kg
lens remover	**19-910**	0,002

lamp remover

	part no.	kg
lamp remover	**11-906**	0,003

mounting tool

	part no.	kg
mounting tool for tightening (or loosening) fixing nuts starting torque fixing nut max. 20 Ncm	**19-905**	0,011

at front

lens

	shape	lens/support	colour	9 x 9 mm Typ-Nr.	9 mm dia. Typ-Nr.	kg
lens plastic	flat	transparent/translucent	blue	**19-951.6**	**19-931.6**	0,001
			yellow	**19-951.4**	**19-931.4**	0,001
			green	**19-951.5**	**19-931.5**	0,001
			red	**19-951.2**	**19-931.2**	0,001
			white	**19-951.9**	**19-931.9**	0,001
of plastic, opaque/translucent (not for film insert and illumination)	flat	opaque/translucent	grey	**19-951.8**	**19-931.8**	0,001
			black	**19-951.0**	**19-931.0**	0,001
plastic, transparent/transparent (not recommanded for film insert)	flat	transparent/transparent	blue	**19-952.6**	**19-932.6**	0,001
			colourless, clear	**19-952.7**	**19-932.7**	0,001
			yellow	**19-952.4**	**19-932.4**	0,001
			green	**19-952.5**	**19-932.5**	0,001
			red	**19-952.2**	**19-932.2**	0,001

blind plug

	colour	9 x 9 mm Typ-Nr.	9 mm dia. Typ-Nr.	kg
blind plug	black	**19-948.0**	**19-949.0**	0,001

at back

PCB plug-in base

	for	pin orientation	part no.	technical drawing	component layout	kg
PCB plug-in base	plug-in terminal	right-angled	**19-941**	5	4	0,001
		axial	**19-940**	4	3	0,001

technical drawings from page 232, component layouts from page 233

cable shoe

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

insulation socket

	part no.	kg
insulation socket for cable shoe 31-945	**31-928**	0,001

switching system

switching system
single-break, snap-action switching system.
1 normally open contact

material

material of contacts
gold plated silver, silver plated

switching element
polyetherimide PEI, self-extinguishing

actuator case
polyphenyleneoxid, self-extinguishing, colour black

mechanical characteristics

connection method
universal terminal:
max. wire diameter: 2 of 0.8 mm
max. wire cross-section of stranded cable: 1 x 0.75 mm&

plug-in terminal: 2.0 x 0.5 mm
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.

starting torque
for fixing nut max. 20 Ncm

actuating force
1.6 N

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

mechanical life
2 million operations

travel
2.8 mm ± 0.2 mm

degree of protection
front as per IEC 529: IP 40

ambient air temperature
without illumination - 25°C to + 65°C
with incandescent lamp - 25°C to + 45°C
with LED - 25°C to + 65°C
for indicators and illuminated pushbuttons mounted as a block, make sure the heat can escape freely
(as per DIN IEC 68-)

electrical characteristics

switch rating
silver plated
max.: 50 VAC/72 VDC, 0.8 A or 50 W
min.: 20V, 10 mA
gold plated
max.: 50 VAC/72 VDC, 100 mA or 5 W
min.: 100 µV, 50 µA

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

actuator with Low Level switching element

switching system

switching system
This low-level switching system was designed for switching low powers in electronic circuits. The switching system assures reliable switching of loads.
Single-break momentary contact, as normally open or normally closed with 4 independent points of contact.
Special features are the long life, extremely short rebound time and stable contact resistance.
1 normally open or 1 normally closed contact.

material

material of contacts
gold-plated

actuator case
polyphenyleneoxid, self-extinguishing, colour black

mechanical characteristics

connection method
universal terminal:
max. wire diameter: 2 of 0.8 mm
max. wire cross-section of stranded cable: 1 x 0.75 mm&

plug-in terminal: 2.0 x 0.5 mm
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.

starting torque
for fixing nut max. 20 Ncm

actuating force
1.8 N ± 0.3

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

mechanical life
5 million operations

rebound time
type. < 100 µs

travel
2.8 mm ± 0.2 mm

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

degree of protection
front as per IEC 529: IP 40

ambient air temperature
without illumination - 25°C to + 65°C
with incandescent lamp - 25°C to + 45°C
with LED - 25°C to + 65°C
for indicators and illuminated pushbuttons mounted as a block, make sure the heat can escape freely
(as per DIN IEC 68-)

electrical characteristics

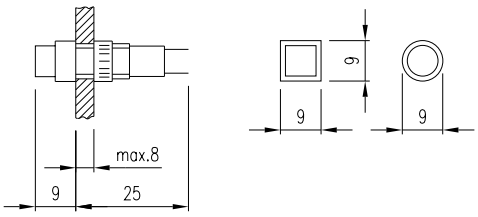
contact resistance
<= 50 mΩ starting value (initial) as per IEC 512-2, test 2b

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

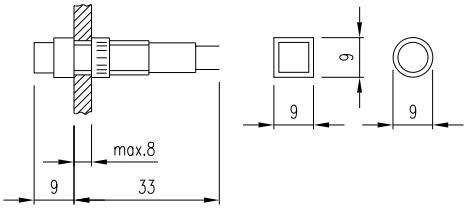
electric strength
2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IC 512-2-11.

technical drawings

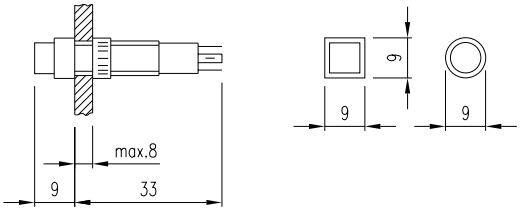
1 indicator



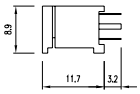
2 indicator



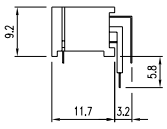
3 illuminated-/pushbutton



4 PCB plug-in base



5 PCB plug-in base



mounting dimensions

1 indicator, illuminated-/pushbutton

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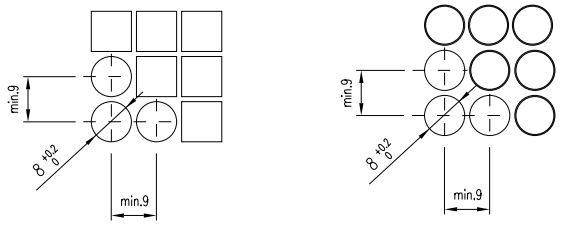
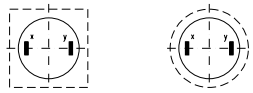
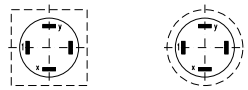


component layouts

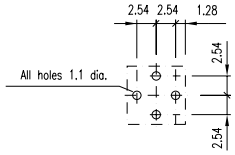
1 indicator



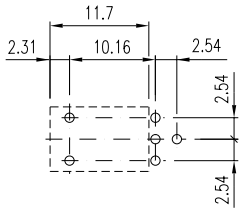
2 illuminated-/pushbutton



3 PCB plug-in base



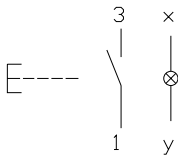
4 PCB plug-in base



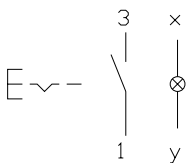
circuit drawings

1 indicator

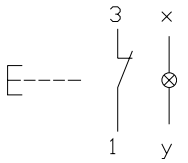
2 illuminated-/pushbutton



3 illuminated-/pushbutton



4 illuminated-/pushbutton



5 illuminated-/pushbutton