

## General information

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### Signal Lamps with integral lamps/LEDs

The soldered lamps/LEDs without base cannot be replaced.

### Signal Lamps with lamp socket

An integral lamp socket allows replacement of lamps/LEDs of the appropriate type.

### Filament operating life

Operating life specifications refer to AC voltage operation. If operated with DC voltage, these values are reduced by 40%.

### Color and lenses

**transparent** = clear, grooved on inner surface for better light diffusion  
**opaque** = translucent but not clear

### Standard mounting dimensions

We recommend use of mounting hole diameters 16, 22 and 30 mm, as these comply with international standard recommendations and DIN standards.

### Limit values

The voltage specified as the limit value is the standard insulating voltage for the signal lamps. The permitted ambient temperatures are always specified in conjunction with the maximum power of the lamps used, and the signal lamp should be located outside of the space subject to increased temperature.

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### CE-Conformity

The CE-Conformity of the products of Chapter "Signal Lamps" can be divided into the following groups – corresponding to the Low-Voltage Directives 72/23/EWG:

#### All products with voltage > 50 V

For these components the Low-Voltage Directive 73/23/EWG applies.

#### All products with voltage < 50 V

No directive applies for these components.

#### EMC-Law

The components of this catalogue are within the meaning of the law concerning the electromagnetic conformity (= EMC-Law) "basic components as, for ex., switches, signal lamps or like" and, therefore, do not fall within the scope of the EMC-Law.

### Declaration of conformity

Declarations of conformity for all concerned products are available and can be delivered upon request. Please always state the exact order reference of the desired product.

### Marking

The marking will be corresponding to the Low-Voltage Directive 73/23/EWG resp. the Directive "CE-Marking 93/68/EWG" either on the packing or on the product itself.

## Lens colour suitability for illumination

Lens color transparent	Suitable for:		Lens colour opaque	Suitable for:	
	Filament lamps	Neon lamps		Filament lamps	Neon lamps
colourless	limited	good	white	limited	not suitable
red	good	good	red	good	not suitable
yellow	good	good	yellow	good	not suitable
green	good	limited*	green	limited	not suitable
blue	limited	limited*	blue	limited	not suitable

\*Neon glow lamps are well suitable

### Neon lamps

Neon lamps may glow on a short time after having been switched off, for example in combination with long wires.

To avoid this, a parallel resistor with 1,2 MΩ 1/4 W, can be used.

## Engraving and Hot Stamping

Custom-made legend inserts, photographic film inserts or customer-specific inserts. Standard font DIN 30 640, thin

type setting A or narrow-spaced semi-bold type E, however, with rounded ends of characters.

Type size* in mm	Line thickness in mm	Standard colour combinations	
		Lens colour	Legend
3	0,35	<b>transparent:</b>	
4	0,5	colourless and red	white
5	0,6	yellow, green, blue	white
6	0,7	<b>opaque:</b>	
8	0,8	black and dark grey	white
10	1	white, red, yellow, green	black
12,5	1,2	blue and light grey	black

\*The selected type size depends on text length and lens size.



## General data

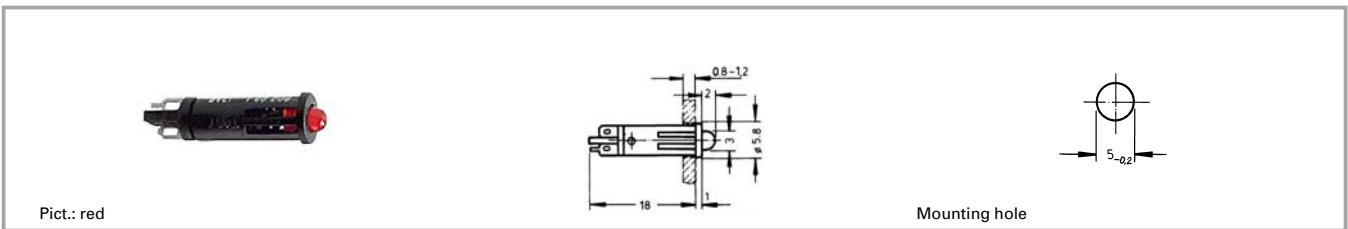
Signal lamps with integral LED, mounting hole diameter from 5 to 10 mm.  
The mm specification in the product name indicates the appropriate mounting hole diameter of the signal lamps.

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## Signal lamps with integrated LED, 5 mm, protruding LED

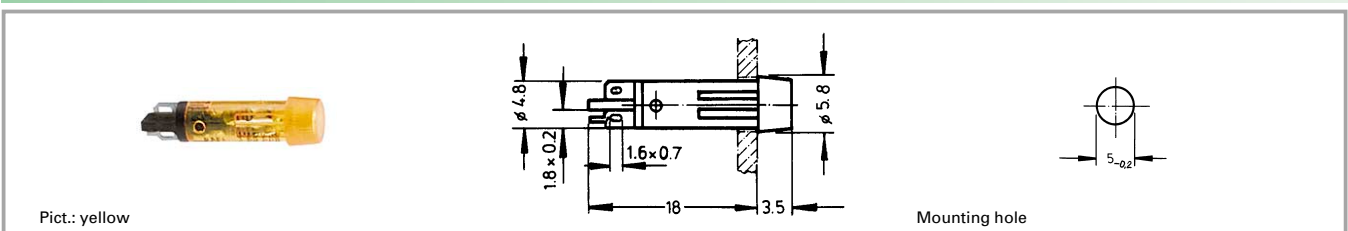


Integrated currency resistor	Operating voltage $U_B$	Forward current, $I_F$ at 25°C	Lamp	Colour of lens	Order no.
yes	24 - 28 V	8 - 12 mA	LED red	transparent red	<b>1.69.508.804/0000</b>
yes	24 - 28 V	8 - 12 mA	LED green	transparent green	<b>1.69.508.810/0000</b>
yes	24 - 28 V	8 - 12 mA	LED yellow	transparent yellow	<b>1.69.508.816/0000</b>

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Long terminal is anode.

## Signal lamps with integrated LED, 5 mm, round protruding lens

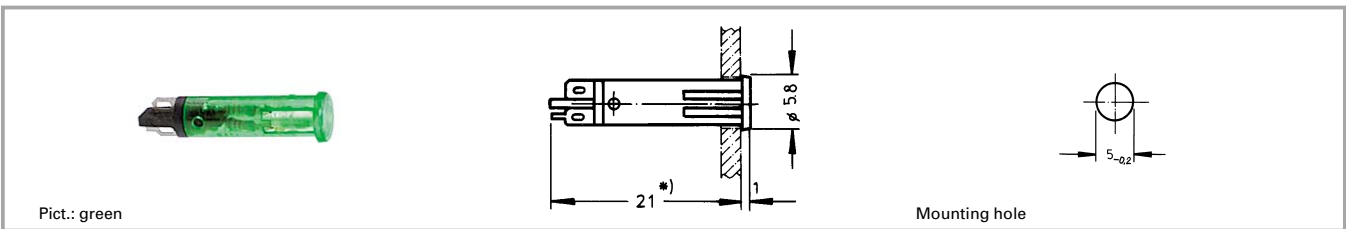


Integrated currency resistor	Operating voltage $U_B$	Forward current, $I_F$ at 25°C	Lamp	Colour of lens	Order no.
yes	24 - 28 V	8 - 12 mA	LED red	transparent red	1.69.508.834/1301
yes	24 - 28 V	8 - 12 mA	LED green	transparent green	1.69.508.840/1503
yes	24 - 28 V	8 - 12 mA	LED yellow	transparent yellow	1.69.508.846/1402
yes	24 - 28 V	8 - 12 mA	LED super bright red	transparent red	1.69.508.835/1300
yes	24 - 28 V	8 - 12 mA	LED super bright yellow	transparent yellow	1.69.508.847/1400

Technical data see page 3 - 6

Long terminal is anode.

## Signal lamps with integrated LED, 5 mm, round flush lens



Integrated current resistor	Operating voltage $U_B$	Forward current, $I_F$ at 25°C	Lamp	Colour of lens	Order no.
no	according to series resistor 5 - 28 V	max. 20 mA	LED red	transparent red	1.69.508.861/1301
no	according to series resistor 5 - 28 V	max. 20 mA	LED green	transparent green	1.69.508.867/1503
no	according to series resistor 5 - 28 V	max. 20 mA	LED yellow	transparent yellow	1.69.508.873/1402
yes	24 - 28 V	8 - 12 mA	LED red	transparent red	<b>1.69.508.864/1301</b>
yes	24 - 28 V	8 - 12 mA	LED green	transparent green	<b>1.69.508.870/1503</b>
yes	24 - 28 V	8 - 12 mA	LED yellow	transparent yellow	<b>1.69.508.876/1402</b>
yes	24 - 28 V	8 - 12 mA	LED super bright red	transparent red	1.69.508.865/1300
yes	24 - 28 V	8 - 12 mA	LED super bright yellow	transparent yellow	1.69.508.877/1400

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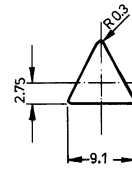
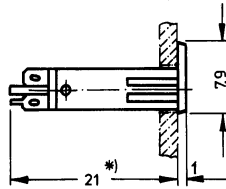
Long terminal is anode.

\* Without series resistor, mounting depth = 18 mm.

## Signal lamps with integrated LED, 5 mm, triangular flush lens



Pict.: red



Integrated current resistor	Operating voltage $U_B$	Forward current, $I_F$ at 25°C	Lamp	Colour of lens	Order no.
yes	24 - 28 V	8 - 12 mA	LED red	transparent red	1.69.508.934/1301
yes	24 - 28 V	8 - 12 mA	LED green	transparent green	1.69.508.940/1503
yes	24 - 28 V	8 - 12 mA	LED yellow	transparent yellow	1.69.508.946/1402
yes	24 - 28 V	8 - 12 mA	LED super bright red	transparent red	1.69.508.935/1300
yes	24 - 28 V	8 - 12 mA	LED super bright yellow	transparent yellow	1.69.508.947/1400

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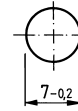
Long terminal is anode.

\* Without series resistor, mounting depth = 18 mm.

## Signal lamps with integrated LED, 7.0 mm



Pict.: yellow



Mounting hole

### Technical data

#### General information

Form of lens	round protruding
Colour of lens	see order block
Diameter of collar	8.5 mm

#### Dimensions

Overall height	5 mm
Mounting depth	27.5 mm
Mounting hole	7.0 mm

#### Mechanical design

Mounting	pressing into hole
Terminals	solder terminals
Lamp socket	no
Lamp	see order block

#### Electrical characteristics

Operating voltage	24 - 28 V
$U_B$	
Forward voltage	at 20 mA forward current
$U_F$ at 25°C	2.4 V
Reverse current	
$I_R$ at 25°C	3 V
Forward current,	
$I_F$	max. 20 mA
Reverse current	
$I_R$ at 25°C	100 $\mu$ A
Power dissipation	
$P_{tot}$ at 25°C	max. 120 mW
Light intensity	see order block

#### Other specifications

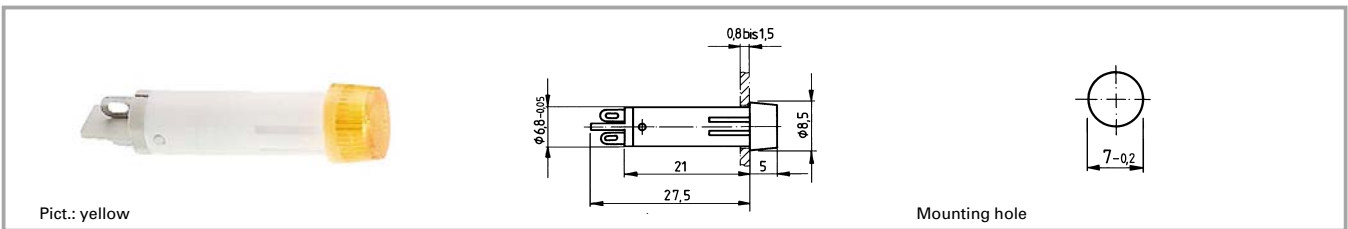
Degree of protection from front side	IP40
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Integr.  
LED



## Signal lamps with integrated LED, 7.0 mm, round protruding lens

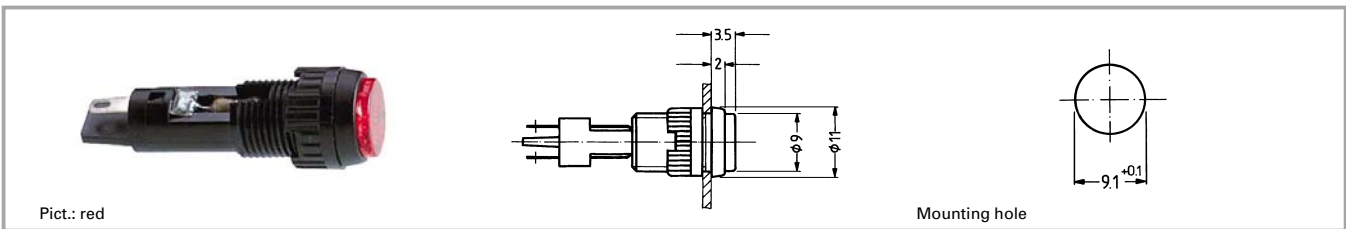


Operating voltage $U_B$	Forward current, $I_F$	Lamp	Colour of lens	Light intensity	Order no.
24 - 28 V	max. 20 mA	LED white	transparent colourless	400 mcd	<b>1.69.511.101/1000</b>
24 - 28 V	max. 20 mA	LED red	transparent red	200 mcd	<b>1.69.511.102/1300</b>
24 - 28 V	max. 20 mA	LED yellow	transparent yellow	200 mcd	<b>1.69.511.103/1400</b>
24 - 28 V	max. 20 mA	LED green	transparent green	1000 mcd	<b>1.69.511.104/1500</b>
24 - 28 V	max. 20 mA	LED blue	transparent blue	300 mcd	<b>1.69.511.105/1600</b>

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## Signal lamps with integrated LED, 9.1 mm, round lens



Operating voltage $U_B$	Light intensity at 20 mA	Lamp	Colour of lens	Order no.
24 - 28 V	200 mcd	LED super bright red	transparent red	<b>1.02.157.105/1300</b>
24 - 28 V	1000 mcd	LED super bright green	transparent green	<b>1.02.157.110/1500</b>
24 - 28 V	200 mcd	LED super bright yellow	transparent yellow	<b>1.02.157.115/1400</b>
24 - 28 V	300 mcd	LED super bright blue	transparent blue	1.02.157.120/1600
24 - 28 V	400 mcd	LED super bright white	transparent colourless	1.02.157.125/1000

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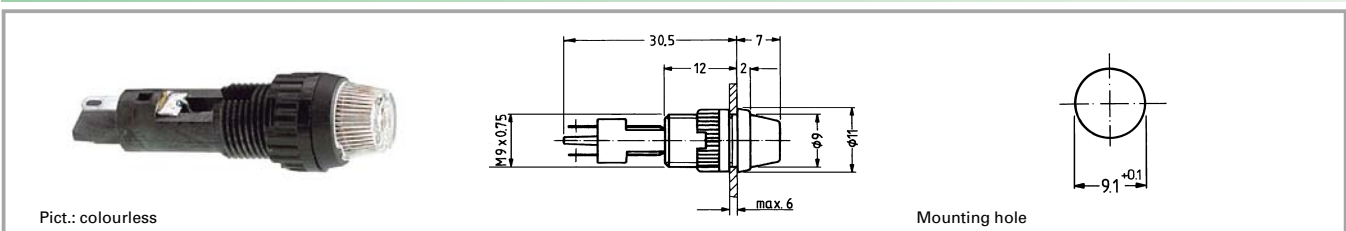
**Accessories:**

Fixing spanner M 9, M 10: **5.58.002.025/0105**

With integrated series resistor. Other voltages on request.

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## Signal lamps with integrated LED, 9.1 mm, round protruding lens



Operating voltage $U_B$	Light intensity at 20 mA	Lamp	Colour of lens	Order no.
24 - 28 V	200 mcd	LED super bright red	transparent red	<b>1.02.157.505/1300</b>
24 - 28 V	1000 mcd	LED super bright green	transparent green	1.02.157.510/1500
24 - 28 V	200 mcd	LED super bright yellow	transparent yellow	<b>1.02.157.515/1400</b>
24 - 28 V	300 mcd	LED super bright blue	transparent blue	1.02.157.520/1600
24 - 28 V	400 mcd	LED super bright white	transparent colourless	1.02.157.525/1000

Technical data see page 3 - 12

**Accessories:**

Fixing spanner M 9, M 10: **5.58.002.025/0105**

With integrated series resistor. Other voltages on request.

Integr.  
LED

## Signal lamps with integrated LED, 10 mm



### Technical data

#### General information

Form of lens	see order block
Colour of LED / lens	see order block
Diameter of collar	12.5 mm

#### Dimensions

Overall height	see order block
Mounting depth	30.5 mm
Mounting hole	10 mm

#### Mechanical design

Mounting	pressing into hole
Terminals	quick connector 2.8 x 0.8 tin-plated
Lamp socket	no
Lamp	see order block

#### Electrical characteristics

Operating voltage	
$U_B$	see order block
Forward voltage	
$U_F$ at 25°C	at 20 mA forward current 2.4 V
Reverse voltage	
$U_R$ at 25°C	3 V
Forward current,	
$I_F$	see order block
Reverse current	
$I_R$ at 25°C	100 µA
Power dissipation	
$P_{tot}$ at 25°C	max. 120 mW
Light intensity	see order block
Protecting diode	see order block

#### Other specifications

Degree of protection from front side	IP40
Weight	2,44 g

**Operating voltage  $U_B$ :** DC voltage from 6 - 28 V

A suitable series resistor is installed in the unit; the version without resistor must be fitted with an external one. A version with an additional protective diode is available to protect the LED against any voltage peaks.

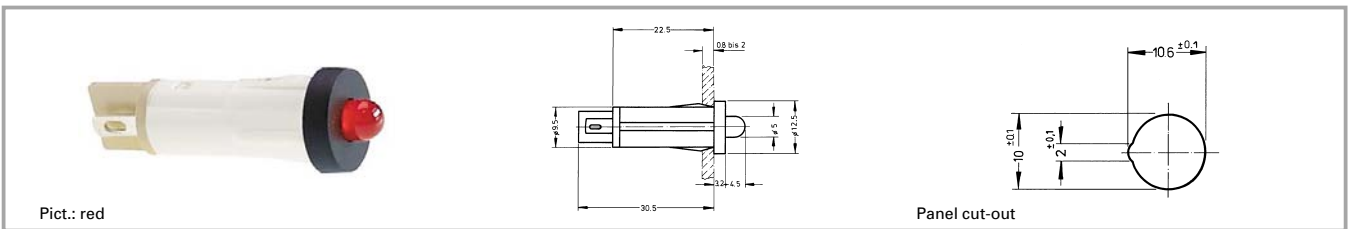
External resistor:  $R_V = (U_B - U_F) : I_F$

Recommended ratings of external resistors:

- for 6 - 7 V = 330 Ω 0.25 W
- for 12 - 16 V = 680 Ω 0.5 W
- for 24 - 28 V = 1500 Ω 1 W

# Signal lamps with integrated LED

## Signal lamps with integrated LED, 10 mm, protruding LED



Integrated currency resistor	Protecting diode	Operating voltage $U_B$	Forward current, $I_F$	Colour of LED / lens	Light intensity	Order no.
no	yes	according to series resistor 6 - 28 V	max. 20 mA	red	1000 mcd	1.69.525.051/0000
no	yes	according to series resistor 6 - 28 V	max. 20 mA	green	1000 mcd	1.69.525.056/0000
no	yes	according to series resistor 6 - 28 V	max. 20 mA	yellow	200 mcd	1.69.525.061/0000
no	no	according to series resistor 6 - 28 V	max. 20 mA	red	200 mcd	1.69.525.001/0000
no	no	according to series resistor 6 - 28 V	max. 20 mA	green	1000 mcd	1.69.525.006/0000
no	no	according to series resistor 6 - 28 V	max. 20 mA	yellow	200 mcd	1.69.525.011/0000
yes	yes	24 - 28 V	15 - 20 mA	red	200 mcd	<b>1.69.525.054/0000</b>
yes	yes	24 - 28 V	13 - 18.5 mA	green	1000 mcd	<b>1.69.525.059/0000</b>
yes	yes	24 - 28 V	13 - 18.5 mA	yellow	200 mcd	<b>1.69.525.064/0000</b>
yes	no	24 - 28 V	15 - 20 mA	red	200 mcd	<b>1.69.525.004/0000</b>
yes	no	24 - 28 V	13 - 18.5 mA	green	1000 mcd	<b>1.69.525.009/0000</b>
yes	no	24 - 28 V	13 - 18.5 mA	yellow	200 mcd	<b>1.69.525.014/0000</b>

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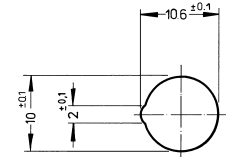
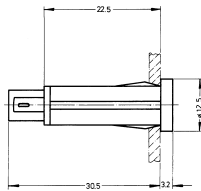
Integr.  
LED

# Signal lamps with integrated LED

## Signal lamps with integrated LED, 10 mm, round lens



Pict.: green



Panel cut-out

Integrated current resistor	Protecting diode	Operating voltage $U_B$	Forward current, $I_F$	Colour of LED / lens	Light intensity	Order no.
yes	yes	24 - 28 V	15 - 20 mA	red / red	200 mcd	1.69.525.255/1300
yes	yes	24 - 28 V	13 - 18.5 mA	green / green	1000 mcd	1.69.525.260/1500
yes	yes	24 - 28 V	13 - 18.5 mA	yellow / yellow	200 mcd	1.69.525.265/1400
yes	yes	24 - 28 V		blue / blue	300 mcd	1.69.525.266/1600
yes	yes	24 - 28 V		colourless / white	400 mcd	1.69.525.271/1000
yes	no	24 - 28 V	15 - 20 mA	red / red	200 mcd	1.69.525.205/1300
yes	no	24 - 28 V	13 - 18.5 mA	green / green	1000 mcd	1.69.525.210/1500
yes	no	24 - 28 V	13 - 18.5 mA	yellow / yellow	200 mcd	1.69.525.215/1400
yes	no	24 - 28 V		blue / blue	300 mcd	1.69.525.216/1600
yes	no	24 - 28 V		colourless / white	400 mcd	1.69.525.221/1000

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Integr.  
LED