WERMA
SIGNALTECHNIK

Catalogue 2007

SIGNAL TOWERS

OPTICAL SIGNAL DEVICES

OPTICAL-AUDIBLE SIGNAL DEVICES

AUDIBLE SIGNAL DEVICES

EX SIGNAL DEVICES

High-Tech and professional craftsmanship

The WERMA name stands for high quality and one of the most comprehensive product ranges in the industry. This is based on sophisticated production techniques as well as the perfect combination of high-tech and professional craftsmanship.

From permanent, blinking and flashing lights in a range of colours and voltages, through LED technology, audible elements, AS interfaces and GSM communication to vocal elements and a variety of interfaces, over 1,000 different models are available. In order to cope with the detailed tasks associated with such diversity, WERMA has invested in an automated assembly line.

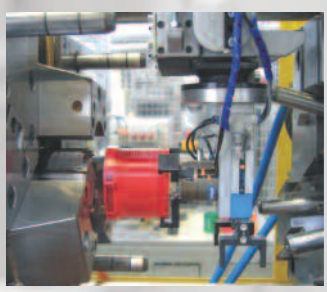
The new automated assembly line produces the domes for our signal towers fully automatically.

Investment in the future

In 2005 we laid the foundations for a flexible, process optimised and fully automatic production workflow. Our aim was the economical, high-quality assembly of the Kombi*SIGN* product range – flexible serial production down to a batch size of just one unit.

Quality from the conveyor belt

In order to reach this goal it was also necessary to integrate the material flow from the pre-fabrication stages. The clearly defined transfer of piece parts thus begins in our injection moulding department: The domes of our signal towers are automatically placed in special pallets (trays) for further processing.



Gentle removal of the injection moulded parts using a gripper arm.

Clearly defined storage of the injection moulded parts.

So called "transponders" on the magazines store the specific job specifications and the state of the processing. This enables the assembly line to clearly identify the parts for the further stages in the production process, without the danger of confusion.

The electronic components from our electronic production are also placed in trays and precisely labelled before they are transferred for further processing.
The new automatic assembly line bends the contact wires fully automatically and inserts them into the domes. The domes are then fully automatically combined with other components from stock.

Numerous controls ensure highest quality

Each individual production step is thoroughly monitored and controlled around the clock by intelligent systems. This ensures that only fault-free parts are processed in further stages of production.

At the end of the production process every end product is tested for its functionality. Numerous application-oriented tests in the company's own testing laboratories complete the quality assurance chain.

Checking the injection moulded parts with the assistance of a 3D coordinate measuring machine.

Shock resistance test: A weight falls from a precisely defined height onto the beacon

WERMA – a strong and reliable partner

With its investment programme, WERMA has taken a step into the future. We are in a position to quickly and reliably deliver all orders – from small batches to large orders – whilst continuing to maintain our incredible diversity and excellent quality.

As well as guaranteeing the highly economical production of our signal towers, we have also succeeded in strengthening our production site in Rietheim. This enables WERMA to respond quickly and flexibly to special requests from our customers and guarantees our reputation as a highly proficient and reliable partner for the future.

Pay us a virtual visit!

The Signal Devices Site on the Internet

www.werma.com

Further information about our new Website can be found on page 259.

WERMA SIGNALTECHNIK

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Where can I find ... ?

Customer satisfaction is our highest priority. Your wishes and requirements come first at all times and with this in mind we are constantly working on the improvement of our service and product range.

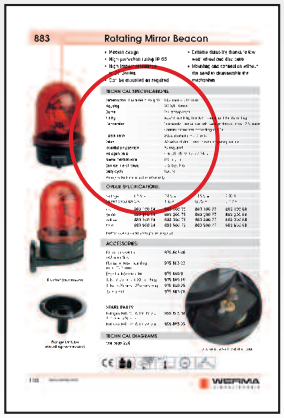
To help find your way through our extensive catalogue we have compiled a navigation guide.

In this way you can find everything you need in no time at all !

Technical data

The product specific technical data includes dimensions, fixing options, and connection possibilities.

This information can be found on the relevant product page in our catalogue under the heading "Technical Specifications".

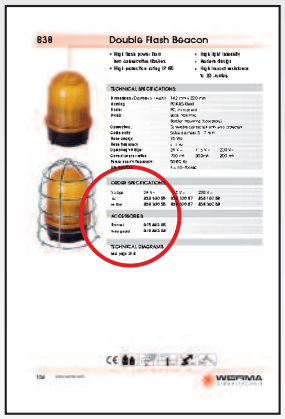


Order specifications

The order number of a product is to be found after the technical data on the relevant page. The order numbers for specific colours and voltages are listed here.

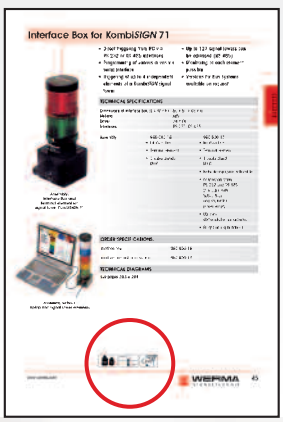
Accessories

Our extensive range of product accessories can be found either immediately on the relevant catalogue page or on the following page.



Weight, protection rating, temperature

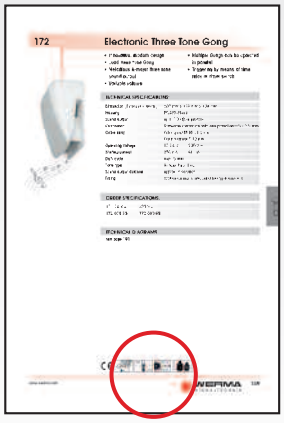
Important data relating to our products can be found on the relevant catalogue page in the form of pictograms. The key to these icons is to be found on page 254 of this catalogue.



WERMA SIGNALTECHNIK

Sound and light output

Information about the volume of our audible signal devices and the light output of our optical products can be obtained in the pictograms on the relevant product pages.
The key to these icons is on page 254 of the catalogue.



Technical diagrams

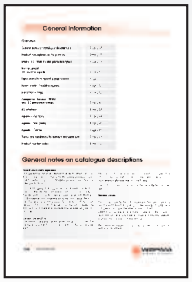
A detailed drawing of each product can be found under the heading "Technical Diagrams" (from page 196 onwards). The exact page number for the required drawing is given on the product page.

Technical Diagrams

General information

Basic information and explanations about our products and services can be found under the heading "General Information" (from page 254 onwards).

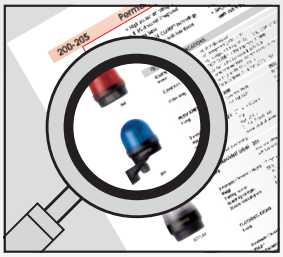
- Catalogue data
- Norms and marks of conformity
- Meaning of optical and audible signals
- Light output
- Sound output
- Protection ratings
- Sales network
- Many other interesting pieces of information



General Information

Looking for a specific product?

If you are looking for a specific product, the quickest way to find it is to look at our "Article Number Index" (pages 266 and 267) or our "Contents" (page 5).



New Products

640/840

Kombi*SIGN* 70 + 71 with customer specific coloured coatings

- Signal towers in customer specific colours
- Meets the demands of an increasing design orientation
- Simple ordering procedure
- Complete range of RAL colours available
- Kombi*SIGN* features continue to be available
- High protection rating IP 65 or 54

Page 46

Possibility of customer specific coloured coatings.
RAL

640/840

LED Flashing Light Element for Kombi*SIGN* 70 + 71

- Long life LED flashing light element for Kombi*SIGN* 70 + 71
- Shock-proof and vibration resistant
- Life duration up to 50,000 hrs
- Can be operated with PLC control system
- Low current consumption

Pages 36 + 42

829

LED Permanent/Blinking/Rotating Beacon with external triggering

- 3 light effects can be remotely selected
- New, innovative LEDs – now even brighter
- Positive and negative logic possible
- Life duration up to 50,000 hrs
- Electrically isolated signal inputs
- High protection rating IP 65

Page 106

829

Monitored LED Permanent Beacon

- Long life LED Permanent Beacon with built-in monitoring capability
- Life duration up to 50,000 hrs
- No additional external voltage required
- Two potential-free safety outputs for connection to control system
- High protection rating IP 65

Page 125

885 Rotating Mirror Beacon

product design award 2006

- Full rotating mirror functionality in compact form
- Award-winning design – winner of the "iF product design award 2006"
- Extremely quiet
- Can be mounted as required
- Mounting and connection without the need to disassemble the mechanism
- High protection rating IP 65

Page 116

450 LED/Buzzer Combination with acknowledgement function

- LED permanent light with additional continuous tone
- Silence the audible signal by lightly pressing the frontal area
- Potential-free output for transmission of the acknowledgement signal to the control unit
- Positive and negative logic possible
- Life duration up to 50,000 hrs

Play Sound www.werma.com

Page 147

714 Ex Multi-Tone Sounder

- Zone 0, 1 and 2
- 26 tones for a diverse range of applications
- For use with a Zener Barrier
- Adjustable sound output to 110 dB
- Direct external setting of two tones possible
- High protection rating IP 65

Play Sound www.werma.com

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Tech-Talk
By Experts
for Experts

Acoustics in Signal technology –

Audible signals are everywhere!

Audible signals warn, protect and guide us in the modern industrial world. They function where precaution, prudence and clarity are imperative, indicate emergencies and demand direct action. They are globally understood, irrespective of language, written or spoken.

Audible signals are deployed where an optical signal is insufficient or inappropriate. A wide range of products belong to this essential group of audible signal devices: The car horn, indispensable for driving in traffic, the buzzer of an egg timer, the school bell signalling break times and the siren on emergency vehicles.

Audible devices also enjoy a wide range of applications in industrial environments where they are deployed to indicate malfunctions or to provide a warning in dangerous situations. The basic signal is provided by one or more tones or a sequence of tones, and is to raise awareness and alert to a specific danger.

Types of audible signals

WERMA provides a wide range of audible signal devices for the most diverse fields of use:

- Sirens and multi-tone sirens
- Buzzers and installation buzzers
- Signal horns
- Three-tone gongs
- Alarm bells

Double safety with optical-audible signals

Under certain conditions, operational sites with a high or changing noise level require a coloured, optical stimulus in addition to the audible signal.

The combination of optical and audible signals leads to greater effectivity as both the eyes and ears are addressed by the sensory stimuli. The combination of an optical and an audible signal rules out the possibility of mistakes or the audible signal being overheard.

Types of sound generation used in signal technology

Electromechanical sound generation

Electromechanical signal horns from WERMA work according to the oscillating armature principle. This can also be described as a special form of Wagner's interrupter, whereby an electromagnetic oscillation generator produces mechanical oscillations.

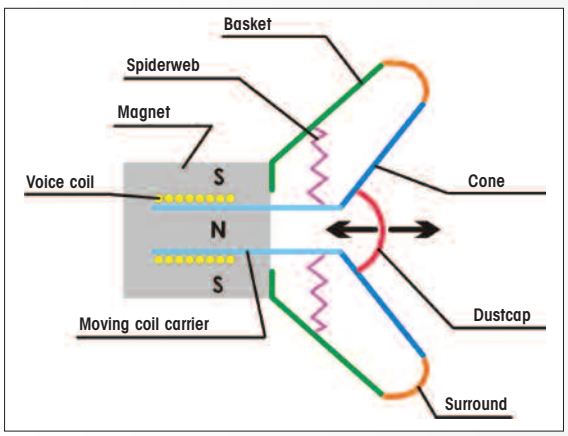
The oscillation generator is composed of a solid iron core with a field coil and a moving armature that is held at rest by a plate spring (membrane). When an electric current passes through the field coil, the armature is pulled i.e. pushed from its resting position. If the amperage or the direction of the current changes continually, the armature oscillates. This is achieved by means of an alternating current or an appropriately prepared direct current. The mechanical adjustment is such that the armature strikes the iron core, leading to a considerable amplification of the principle audible vibrations (structure-borne noise).

As opposed to the classical Wagner's interrupter where the oscillating element simultaneously controls the current flow (interrupter), producing considerable radio interference voltages, the oscillating armature operating with an alternating current does not produce any interference voltages. When operating with a constant current the suppressors can be integrated into the required driving circuits.

As a result of this operating principle such systems are resistant to extreme temperatures and humidity. The life duration is solely determined by the mechanical wear and tear of the parts.

Loudspeakers (electro-dynamic sound generation)

A loudspeaker converts an alternating electric current into sound waves. This occurs by means of the interaction between the electric current and a permanent magnet. The coil is positioned within the magnetic field of the permanent magnet. When an electric current is applied to the coil, the Lorentz force generated leads to a deflection of the coil, causing the membrane to vibrate.



As a result of the centering spider this proceeds in an up and down motion. It centres the coil and, together with the bead, ensures that it returns to the resting position.

With the use of the appropriate size of membrane and material, as well as different drives (coils and permanent magnets), loudspeakers can be optimised for a variety of different frequency ranges.

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By Experts
for Experts

Acoustics in Signal technology –

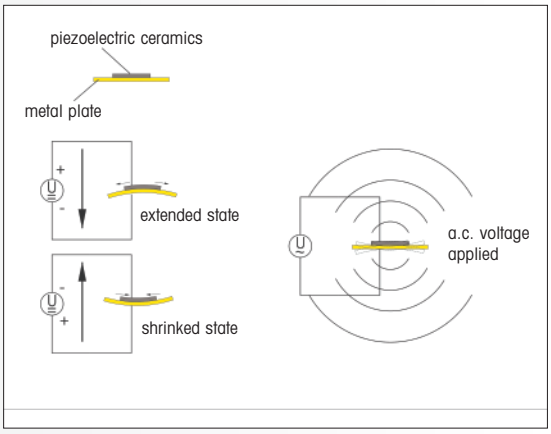
Acoustic capsule (electromagnetic sound generation)

The acoustic capsule belongs to the group of electromagnetic sound generators. This principle used to be used for telephone earpieces. Within the capsule a permanent magnet serves to pre-magnetize the armature which is connected to the membrane. This is made to oscillate and these oscillations are then converted into audible tones. The acoustic capsule is characterized by a relatively simple construction and a compact form and displays a high degree of effectivity.

Piezo disc

Piezoelectricity (also known as the piezoelectric effect, or for short: piezo effect) refers to the interaction of mechanical pressure (Greek piezein = to press) and electrical currents in solid bodies. It describes the phenomena whereby the deformation of certain materials leads to the generation of an electric charge at the surface (direct piezoelectric effect)

In a reverse process these materials (predominately crystals) deform when a voltage is applied. The deflection is relatively small so they need to be transmitted to a membrane, from where the oscillations excite air molecules which are then perceived as sound.



Audibility factor of audible signals devices

One of the most important properties of audible signals is their sound output and therefore their audibility factor. The signal must be able to be heard without disturbing those around it.

The audibility of an audible signal is dependent on a number of different factors:

- the sound output of the signal (in dB)
- the tone frequency (in Hz)
- the distance between signal device and recipient
- the noise level of the surrounding area
- other influences (for example air humidity, wind direction)

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Principle acoustic parameters

Sound output level

The sound output level L_p refers to the logarithmic relationship of the square of the sound output of an acoustic event to the square of the reference value p_0 = 20 µP. The result is given in decibels (abbreviation dB).

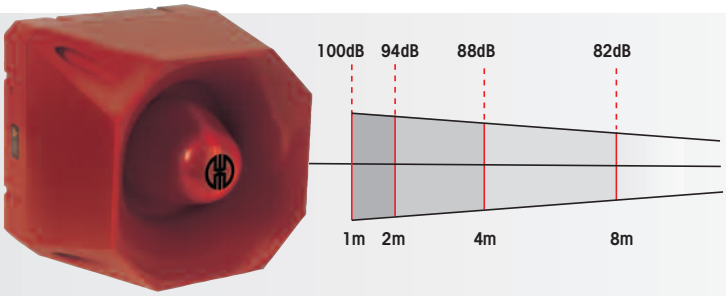
$$L_p = 10 \log_{10}\left(\frac{p_i^2}{p_o^2}\right) \text{dB} = 20 \log_{10}\left(\frac{p_i}{p_o}\right) \text{dB}$$

When indicating an absolute level (with reference to the standardized reference level p_0 the abbreviation "SPL" (sound pressure level) is added.

With intermediate to high levels and frequencies a sound output difference of 10 dB is heard approximately twice as loud. Differences of 3 dB are clearly audible. The perceived sound level is not just dependent on the sound output level, but also on the spectrum of the sound signal and its temporal progression. Single tones are perceived as being considerably louder than a broadband audible signal with the same sound output level. Audible signals with sharply changing levels are also perceived as being significantly louder than uniform audible signals with the same average level.

Weighting curves (A, B and C according to IEC/DIN 651) are the curves from weighting filters that are applied to the sound output signal. They are designed to reproduce a similar frequency response as that of the human ear for a specific sound level. However they are only able to achieve a rough approximation, the values obtained for the weighted sound output measurements do not exactly match those of the human ear.

Weighting levels are indicated by the corresponding letter of the frequency weighting, e.g. a C weighting sound output level is given in dB (C). In the field of technical acoustics the A weighting level is predominately employed. For this reason WERMA specifies levels in dB (A).



The sound output level is always dependent on the distance from the source of the sound. WERMA specifications are always based on a measuring distance of 1 m, unless otherwise stated.

In the case of point sound sources (generally applies for all sources radiating equally in all directions), the sound output level decreases by **6 dB with each doubling of the distance from the source**.

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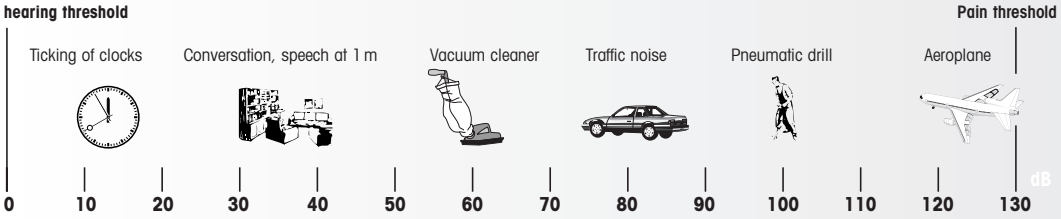
Acoustics in Signal technology –

Table of working range

Sound pressure level dB (A) \ Distance in m	1	2	3	5	10	20	30	50	100	200	300	500	1000
	120	114	110	106	100	94	90	86	80	74	70	66	60
	118	112	108	104	98	92	88	84	78	72	68	64	58
	116	110	106	102	96	90	86	82	76	70	66	62	56
	114	108	104	100	94	88	84	80	74	68	64	60	54
	112	106	102	98	92	86	82	78	72	66	62	58	52
	110	104	100	96	90	84	80	76	70	64	60	56	50
	108	102	98	94	88	82	78	74	68	62	58	54	48
	106	100	96	92	86	80	76	72	66	60	56	52	46
	104	98	94	90	84	78	74	70	64	58	54	50	44
	102	96	92	88	82	76	72	68	62	56	52	48	42
	100	94	90	86	80	74	70	66	60	54	50	46	40
	98	92	88	84	78	72	68	64	58	52	48	44	38
	96	90	86	82	76	70	66	62	56	50	46	42	
	94	88	84	80	74	68	64	60	54	48	44	40	
	92	86	82	78	72	66	62	58	52	46	42	38	
	90	84	80	76	70	64	60	56	50	44	40		
	85	79	75	71	65	59	55	51	45	39			
	80	74	70	66	60	54	50	46	40				
	75	69	65	61	55	49	45	41					
	70	64	60	56	50	44	40	36					
	65	59	55	51	45	39	35						

Examples of noise in everyday life



Tone frequency

Sound is a series of fluctuations in the air pressure at different amplitudes occurring at a specific rate per unit of time. This rate is termed frequency and is measured in the unit 1/s = 1Hz (Hertz). It is named after the German physicist Heinrich Rudolf Hertz. A tone is generated by an oscillation at a certain frequency. The musical tone A for example, has a frequency of 440 Hz. Noise is the term used to describe a number of overlapping tones.

The human ear is only capable of hearing tones within a certain frequency range. In the case of children this range is between 20 and 20,000 Hz. This sensitivity declines with increasing age: by the age of 50 the limit is approximately 12,000 Hz, and with advanced age this is often as low as 5,000 Hz.

The human ear hears tones of different frequencies at different relative strengths. The limit of audibility and the pain threshold are therefore dependent on the respective frequency. For this reason audible signal devices generally operate at a frequency between 500 and 3,000 Hz.

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a WERMA key competency

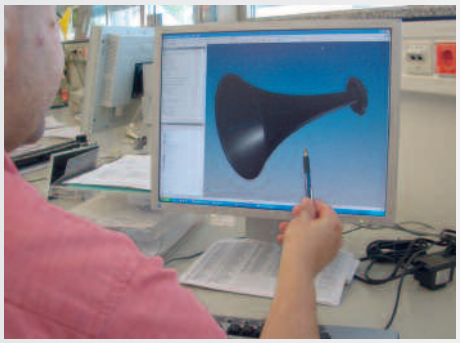
Environmental factors

In addition to the sound output level, the tone frequency and the distance to the signal device, environmental factors are also decisive for the quality of the signal. Wind, humidity or even rain all have an effect on audibility. A very important factor is the ambient noise level.

In industrial environments in particular, the ambient noise level produced by machines is often very high. Accordingly, the signal devices must produce a sufficiently high sound output in order to be heard **(rule of thumb: 15 dB louder than the ambient noise and in all cases louder than 65 dB)**.

WERMA has developed loud signal horns and sirens for this purpose. With fluctuating ambient noise levels, the use of a siren with a self regulating sound level is recommended – a patented invention from WERMA.

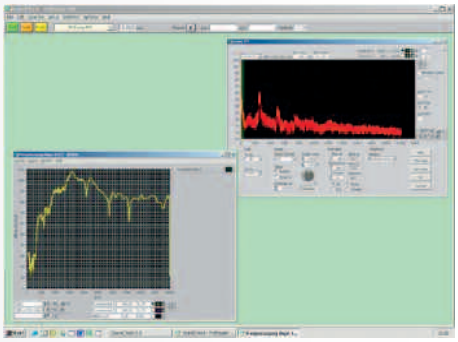
Research and development at WERMA



For over 50 years WERMA has been developing audible signal devices of the highest quality. Year for year we invest in research and development, enabling us to offer our customers innovative products employing state of the art technology.

Today our development team has a number of acoustic specialists in its ranks, equipped with the latest laboratory and test equipment.

WERMA places great importance on acoustic measuring technology and life duration testing facilities. Our products are only brought onto the market after they have passed the toughest of product tests.



The optimal sound generation and diffusion is achieved by means of extensive calculations, simulations and subsequent tests. For example, the horn dimensions of an audible signal device are precisely tailored to the required frequency.

Tech-Talk
By Experts
for Experts

Signal beacons with LED –

Signal beacons with LED – a good decision

Signal beacons are increasingly used in the fields of mechanical engineering and plant machinery to cover safety aspects. Thanks to their long life duration the use of light emitting diodes (LEDs) considerably reduces the failure level of the signal devices. In comparison to normal filament bulbs they offer a range of advantages which are of use to both the mechanical engineer and the end customer.

LEDs have a high level of shock absorbance and resistance against vibration and other mechanical forces. This resistance means that bulb testing circuits are no longer necessary - saving both the related planning and wiring costs. Furthermore the low current consumption of LEDs allows the signal devices to be operated by means of power pack or battery, thus considerably widening the range of possible applications.

Beacons with integrated LED strips

WERMA uses LEDs which are integrated into the beacon housing.
The advantages of this choice are clear:

☑ Long-lasting and maintenance-free

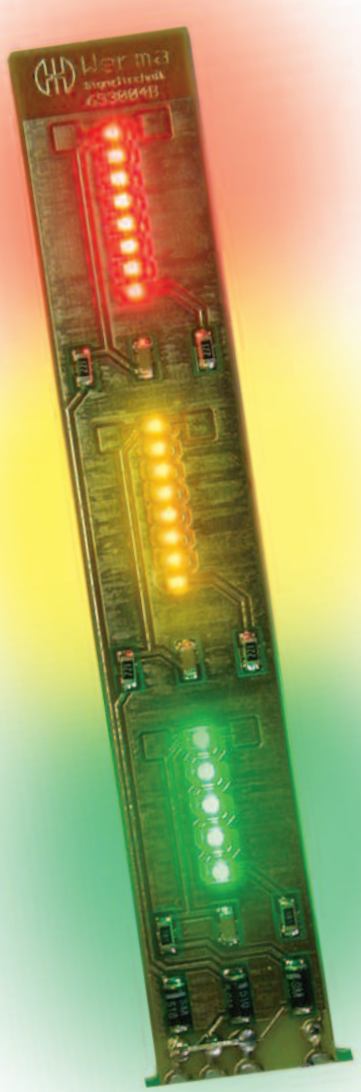
As the integrated LED solution requires no further housing (such as with a filament or LED bulb) there is less heat generated within the dome. The life duration of the beacon is therefore significantly increased in comparison to a LED bulb.
A protective switch prevents electricity peaks.

☑ Excellent signal visibility

Since the light passes through just one dome and not through an additional housing, as is the case with LED or filament bulbs, a much stronger light effect is created.
The LEDs shine in the same colour as the dome which further increases the light and colour intensity. Furthermore the colours are clearly recognisable even when the beacon is switched off.

☑ Simplified ordering process

The signal beacon or signal tower element with integrated LED is ordered with just one order number.



a WERMA key competency

Reliable LED production methods

There are a number of different processes which can be used to manufacture LEDs. WERMA uses SMD-LEDs, COB-LEDs and Super-Flux type LEDs in its signal beacons and signal tower elements.

Surface Mounted Device (SMD) Technology

SMD technology encompasses a process in which the LED Chip is mounted onto a ceramic or plastic circuit board and is then encapsulated. The electrical connection is realised by means of contact surfaces on the side of the board. Thanks to the form of the plastic body the optical properties of the LED can be modified and optimised to meet the beacon specification. Furthermore the arched surface functions as a lens and focuses the light beam in the direction of the axis.

Chip on Board (COB) Technology

The Chip-On-Board technology involves setting the individual LED Chips directly onto the gold-plated circuit board. The bonding to the antipole is achieved using a gold wire. Thanks to the direct mounting of the LED Chips onto the circuit board the thermal resistance of the LED is improved. This results in very good heat abduction which in turn ensures a longer life duration and higher light efficiency.

Super-Flux Technology

Super-Flux devices are characterised by their extremely high light output and are used when the signal device needs to emit a very bright light. This type of LED technology is used in the LED Obstruction Light 280 (see page 111).

Diverse range of light effects

The spectrum of light effects available in our LED signal tower elements or LED beacons spans from **Permanent light** to the more eye-catching **Blinking light** and encompasses both a **Rotating** effect and an **LED Flash**. This provides a more durable alternative to the Xenon flash. Thanks to this wide choice the urgency of required action can be defined not only by the colour but also by the type of light signal.

LED Bulb 956

Existing signal towers or beacons with filament bulbs can be upgraded with the LED bulbs to be found on page 126.

Tech-Talk
By Experts
for Experts

Light in Signalling technology –

Optical Signals in everyday life

The field of signalling technology offers us not only the possibility of audible signals, but also that of optical signals. These are to be found everywhere in everyday life; at traffic lights, in alarm systems or where obstructions arise. Countless uses can also be found in the industrial sector, above all in the signalisation of a machine operating status.

The generation of light – a summary of the possibilities

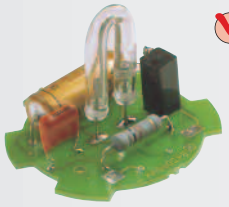
Light can be generated in various ways. Signalling technology mostly uses bulbs, halogen bulbs, electric discharge tubes and LEDs.

Bulbs

A tungsten filament is heated up to a high temperature, so radiating energy over a wide wavelength. This is perceived as light similar to sunlight. The tungsten filament evaporates with time. When the tungsten content falls below a certain level, the maximum life duration of the bulb is reached. As tungsten oxidises quickly and is destroyed when it comes into contact with air, the filament must be kept in a non-oxidising atmosphere such as vacuum. This leads us to the familiar light bulb with its sealed glass body.

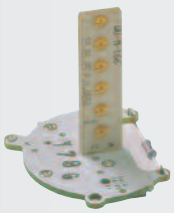
Halogen bulbs

These are bulbs wherein the tungsten filament is enclosed by a small amount of halogen. The resulting chemical reaction has the effect of lengthening the life of the tungsten and stabilising the light output throughout the entire life duration of the bulb.



Electric discharge tubes

Xenon flash tubes are widely used in signalling technology. They consist of a glass tube filled with the inert gas xenon. A sufficiently high voltage leads to a discharge of energy with a spark gap and a flash of high intensity.



LED

Light emitting diodes are constructed using certain semiconductors. Foreign atoms are built into the semiconductor with the purpose of optimising the conductibility. Half of the semiconductor (n-region) is doped with foreign atoms that contain one bonding electron more than the semiconductor atom. This surplus atom can move freely and increases conductibility. The other half (p-region) is doped with foreign atoms containing one electron less than the semiconductor. When the LED is switched on, these faults ("holes") fill up with free electrons (recombination). Energy in the form of radiant photons is hereby released. The energy and therefore the colour of the light emitted is determined by the material the semiconductor is made of; e.g. GaAsP (Gallium Arsenic Phosphide) results in red light.

LED – Beacons with many advantages

LEDs offer many advantages when compared with conventional light bulbs:

- Minute dimensions
- Low current consumption
- Low heat generation
- Extremely high life duration of up to 50,000 hours
- All major colours can be realised
- Vibration- and shock resistance
- Immediate illumination

Fundamental units of light magnitude

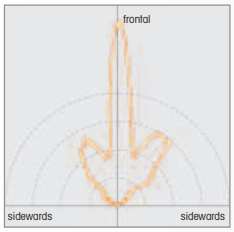
The fields of lighting and signalling technology differentiate between fundamental units to define light itself. The most important of these are the units Lumen, Candela and Lux.

Lumen (unit lm)

Light current is measured in Lumen; this is the unit for the entire visible light output of a light-emitting source. The light current is defined by the following formula known as the brightness characteristic:

Light current ϕ [in *lm*] = radiation capacity x brightness characteristic V(λ)

The brightness impression upon the human eye is based on a sensitivity curve V(λ) which reproduces the sensation felt by the eye in relation to the wavelength. The maximum point on this curve is at about 555 nm; we see best at this wavelength; V(555 nm) = 1.



Candela (unit cd)

In signalling technology only the part of the light current that is emitted in a certain direction is of importance. This light intensity is measured in Candela. It is defined by the light current of a lamp and the steradian measure $\frac{1}{4\pi\ \mathrm{sr}}$. sr stands for the steradian and is the unit for the dihedral angle. A complete sphere has a dihedral angle of 4π sr.

Light intensity [in *cd*] = light current ϕ x steradian measure

A complete sphere has a dihedral angle of $\Omega = 4\ \pi$ sr. sr stands for the steradian and is the unit for the dihedral angle.

Example: a household candle emitting a light intensity of 12,566 Lumen has a light intensity in relation to the steridian measure $\frac{12{,}566\ \mathrm{lm}}{4\pi\ \mathrm{sr}} \approx 1\mathrm{cd}$.
This explains the name: candela is the Latin word for candle.

Lux (unit lx)

Illumination density is an important unit in lighting installations. It is the measure of the brightness with which an area is illuminated. Whereas light intensity (in cd) is a property of a light source, illumination density is calculated in regard to the area to be illuminated.
Where the light current emitted is constant, the following formula is applicable:

Light density E [in lux] = $\frac{\text{Light current } \phi}{\text{Surface A}}$

Tech-Talk
By Experts
for Experts

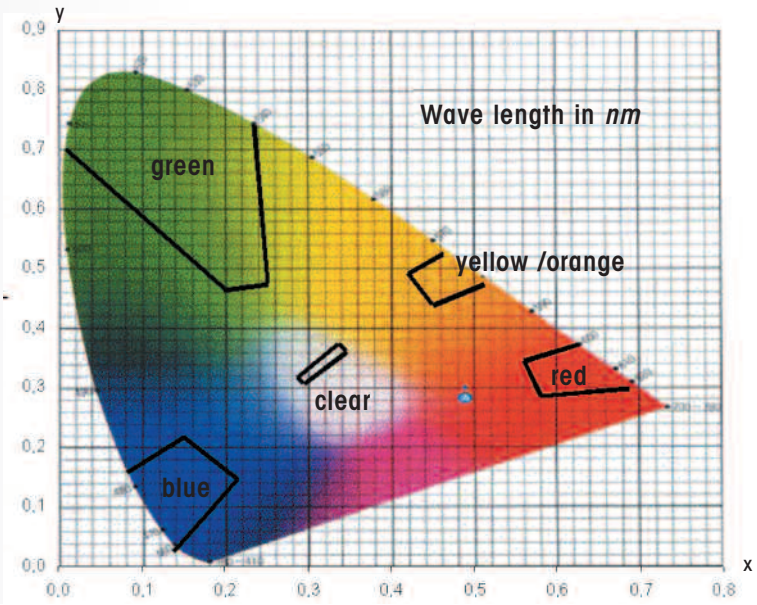
Light in Signalling technology –

Types of optical signal devices

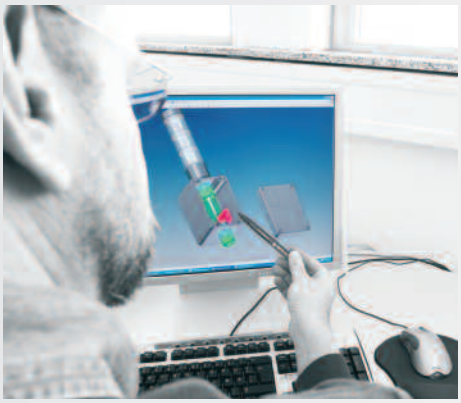
We differentiate between permanent, blinking and flashing beacons as well as beacons with rotating light. The appropriate signal type must be chosen to meet the needs of the specific application, whether as a warning, an informative signal or a simple piece of information

Signalling technology relies mainly on the colours green, red, yellow, blue and clear.

The following diagram shows the position of these colours in the spectrum:

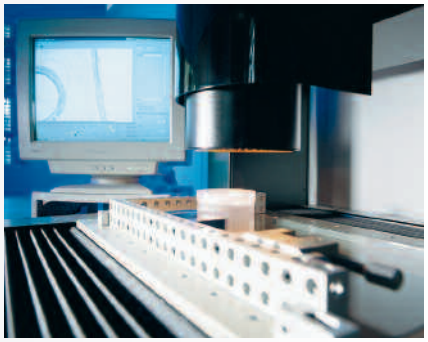


Experience and Know-How – the right combination



WERMA can look back on many years of experience and in-depth knowledge in the field of optical signals. Our technicians have been researching into the fundamental principles of light effusion for many years, and the fruits of their work flow into the conception and development of all new products.

Our guiding principle has always been to implement and realise the newest trends in technology. To achieve this goal we employ a large and competent team of R + D engineers and invest in the most modern testing facilities.



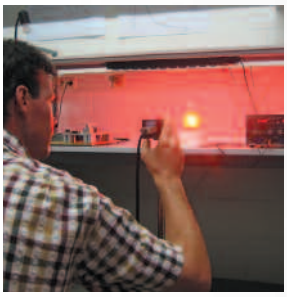
It is WERMA's declared goal to market only truly innovative products; with this in mind, we invest about 11% of overall expenditure in the development of new products, a strategy which will enable WERMA to carry on setting the standards in the field of optical signalling.

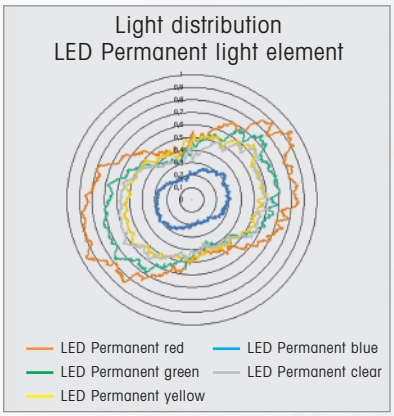
WERMA SIGNALTECHNIK

Research and development as the basis for innovation

The different types of optical signal devices call for an individually suited transparent housing, known as a dome.

The dome of a flashing beacon has, for example, an especially designed ribbing. The light is dispersed in such a way as if the whole dome is flashing. The dome of a rotating mirror beacon is by contrast completely smooth. The rotating light signal is not scattered here, but bundled to a point. The precise setting of the rotating mirror is of great importance, as the aim is to attain the greatest possible bundling of light.





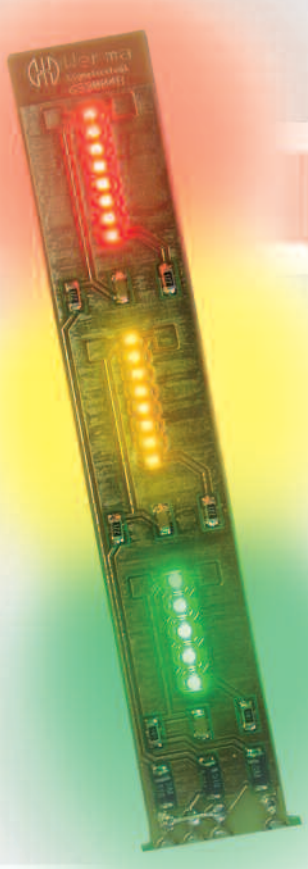
WERMA is able to make exact calculations regarding the positioning of the path of rays. The optical laboratory can measure all relevant units of light. Even the brightness curve of a flash can be analysed in nanoseconds.

Reliable LED technology

WERMA is a market leader in the use of LED technology parallel to conventional bulbs and halogen bulbs. The advantages are obvious: high life duration, low heat emission, and low current consumption. Even flashing light can be produced using LEDs.

WERMA uses different types of LEDs in its optical signal devices: Chip-on-Board (COB), SMD, and wired LEDs (e.g. Super-Flux).

- With the **COB method**, single LED chips are bonded onto a gold-plated printed circuit board.
- With **SMD LEDs** the chip itself is already encased in a housing and is set onto the printed circuit board with the other components on WERMA's own assembly line.
- **Super-Flux** models are characterised by their extreme light intensity and are used whenever a signal must be particularly bright.



Kombi*SIGN* 71
Page 34

Kompakt 36
Page 63

reddot design award
winner 2005

de*SIGN* 42
Page 60

Kombi*SIGN* 50
Page 52

Kombi*SIGN* 70
Page 40

Overview Signal Towers

Kompakt 71
Page 66

Kombi*SIGN*
Highlights
Page 46

Possibility of customer specific coloured coatings.
RAL

Kombi*SIGN*			
	Kombi*SIGN* 71	**Kombi*SIGN* 70**	**Kombi*SIGN* 50**
Permanent light	**641** Page 34	**840** Page 40	**846** Page 52
Blinking light	**642** Page 34	**841** Page 40	
Flashing light	**643** Page 34	**842** Page 40	
LED	**644** Page 34	**843** Page 40	**848** Page 52
Buzzer	**645** Page 34	**844** Page 40	**849** Page 52
Siren	**645** Page 34	**844** Page 40	
GSM Transmitter Element	**646** Page 48	**840** Page 48	
Siren element with self-adjusting sound output	**645** Page 49		
Interface Box	**960** Page 51		
Terminal Element with USB Interface	**640** Page 50	**840** Page 50	
AS-Interface-Element	**646** Page 47	**840** Page 47	**845** Page 57
Customer specific coloured coatings	NEW Page 46	NEW Page 46	
Accessories	Page 39	Page 45	Page 56
Accessories, Overview	Pages 58 + 59		

KOMPAKT			
	Kompakt 36	**Kompakt 71**	
2 tier	**693** Page 63	**697** Page 66	
3 tier	**693** Page 63	**697** Page 66	
KOMPAKT with USB Interface		**697** Page 66	

de*SIGN*			
	de*SIGN* 42		
2 tier	**694** Page 61		
3 tier	**694** Page 61		

The sounds of the audible Kombi*SIGN*-elements can be played from our website www.werma.com under the heading Signal Towers.

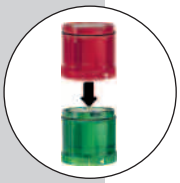
Play Sound www.werma.com

Signal Towers

Signal

Modular Signal Towers

- Modular system allows a completely free combination of optical and audible signal elements.
- Mechanical and electrical connection of the elements in the space of seconds using a bayonet connection system.
- Completely safe bulb changes (contact-voltage proof) without the need for tools.



Kombi*SIGN* 71

ø 70 mm

- Protection rating IP 65
- For use in extreme conditions

Page 34 onwards.

Kombi*SIGN* 70

ø 70 mm

- Protection rating IP 54
- For use in normal conditions

Page 40 onwards.

Kombi*SIGN* 50

ø 50 mm

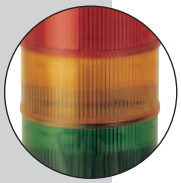
- Protection rating IP 54
- For use on smaller machines.

Page 52 onwards.

Towers

Completely pre-assembled Signal Towers

- Completely pre-assembled LED signal towers.
- The complete tower can be ordered using a single number, considerably simplifying the ordering process.
- Available in the most commonly used signal combinations.
- LED technology with a life duration of up to 70,000 hours. The replacement of elements or light bulbs is therefore no longer necessary.



de*SIGN* 42

ø 42 mm

- Protection rating IP 65
- 2 or 3 tier
- High-quality stainless steel housing

Page 60 onwards.

KOMPAKT 36

ø 36 mm

- Protection rating IP 65
- 2 or 3 tier
- Also available in plastic housing with aesthetic silver finish

Page 63 onwards.

KOMPAKT 71

ø 70 mm

- Protection rating IP 65
- 2 or 3 tier

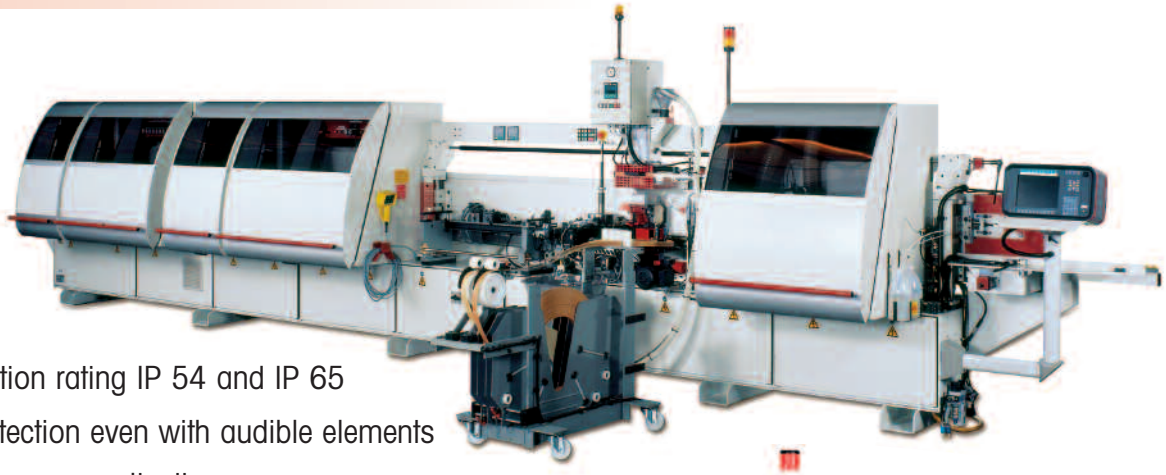
Page 66 onwards.

KombiSIGN Signal Towers –

The perfect combination to meet every need

- Signal elements in every common voltage
- Modular system allows combination as required
- Two different sizes
- Wide range of audible elements
- Widely used in the mechanical engineering industry
- Diverse and flexible solutions

The right size and protection rating for every application



- High protection rating IP 54 and IP 65
- High IP protection even with audible elements
- Suitable for every application

WERMA SIGNALTECHNIK

Simple operation thanks to bayonet mechanism

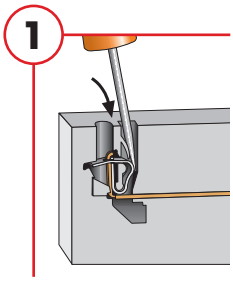
WERMA was the first signal beacon manufacturer to offer a bayonet mechanism allowing elements to be machanically and electrically connected within seconds.

- Simple mounting and removal of the elements
- New combinations at the twist of a hand
- Tool-free bulb change

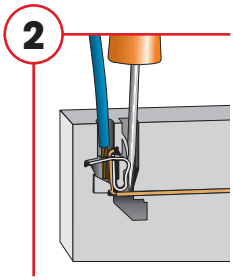
Housing with CAGE CLAMP® connection

Safe and efficient handling thanks to CAGE CLAMP® technology

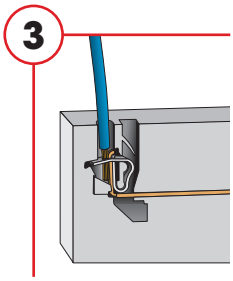
- Quick and easy wiring
- Firm hold of the wire



Insert screwdriver at a slight angle into opening as far as possible.



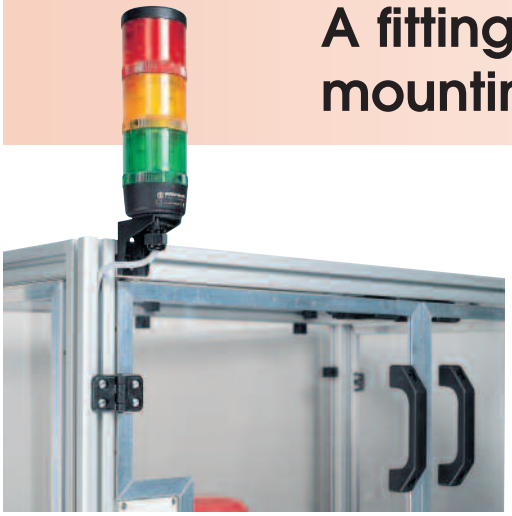
Open spring-loaded clamp with the help of the screwdriver and insert wire as far as possible.



Remove screwdriver– the wire is firmly clamped.

CAGE CLAMP® is a registered trademark of WAGO Kontakttechnik GmbH.

Signal Towers Kombi*SIGN* –

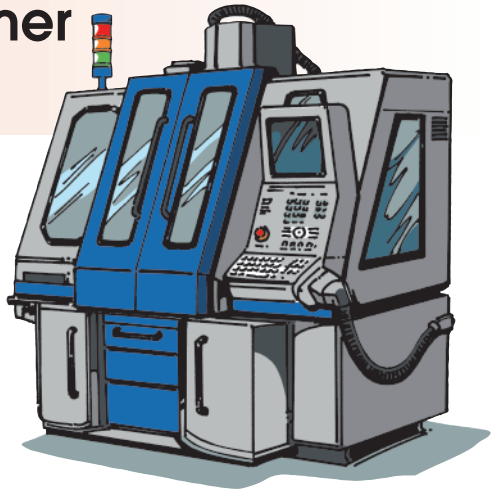


A fitting solution for every mounting requirement

The comprehensive range of accessories for Kombi*SIGN* signal towers offers solutions for the most diverse mounting needs and exceeds the industry standards in this respect. Besides the wide choice of brackets, bases and tubes WERMA also offers unique special solutions.

The tube with clamp, for example, offers the possibility of varying the height of the mounted Kombi*SIGN* signal tower. In addition, it allows the signal tower to be removed whilst remaining connected. This feature is particularly beneficial when the machinery including the signal tower has to be transported.

Kombi*SIGN* 70 + 71 with customer specific coloured coatings



Increased design orientation in machine construction
In nearly all branches and fields of business an increased trend towards design orientation is apparent – including machine construction. The design of a machine and its accessories conveys the manufacturer's quality statement to the customer. Form, colour and aesthetics are increasingly being borne in mind as purchase criteria. WERMA is actively involved in shaping this trend.

Unique opportunity and simple ordering procedure
You now have the possibility to order signal towers in the colour of your choice. The Kombi*SIGN* signal towers 70 and 71 from WERMA are designed to harmonise with the colour of the clients product design, guaranteeing a uniform appearance. To this end the terminal element, the cover and the fixing element (foot, tube or bracket) of the signal tower are coated in the desired colour.

All you need to do is to tell us the RAL colour you require. All colours of the RAL spectrum are available as standard. The Kombi*SIGN* features, such as the practical bayonet closure system for ease of handling and the modular construction continue to be available in the colour of your choice.

Order specifications see page 46.

WERMA SIGNALTECHNIK

LED Flashing Light Element for Kombi*SIGN* 70 + 71

Long life and maintenance free
An optimal light output using LEDs, no maintenance, low current consumption as well as resistance to shocks and vibration are the main features of the new LED flash. It is available in red, yellow, blue, green and clear at a rating of 24 V.

Excellent signal visibility
The new LED flash stands out from the traditional xenon flash due to its light intensity and an extremely long life duration of up to 50,000 hours. It is especially suited for battery and power pack applications due to its significantly lower current consumption.

Order specifications see page 36 and 42.

AS-Interface Element for Kombi*SIGN* 70 + 71

The new AS Interface Element is available with either Standard Slave or the new A/B technology. The Standard Slave models are, as specified by AS Interface specification 2.11, able to address up to 31 modules and trigger four tiers. The new A/B technology makes it possible to address unto 62 modules and trigger three tiers.

The new AS Interface element is available for the signal tower series Kombi*SIGN* 70 and 71 and is virtually resistant to wear and tear as it is constructed with semiconductor switches.

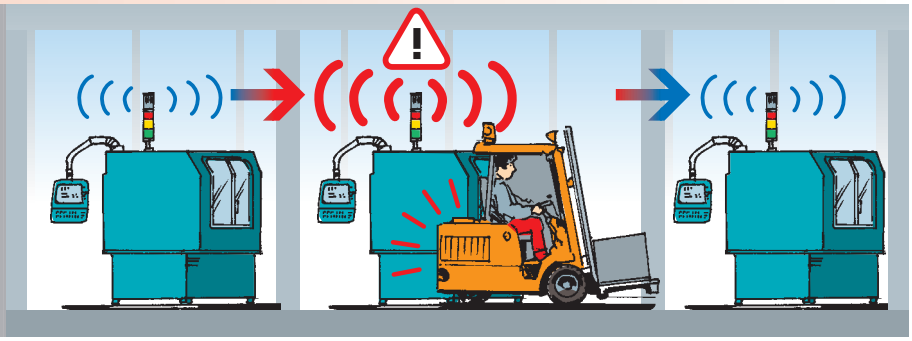
An LED provides a diagnosis facility for the communications and external auxiliary voltage. There is an addressing socket, protected from external influences, available in the element for parameterization.

A user-friendly sliding switch inside the module can be used to provide the power supply required for the signal towers from an external 24 V auxiliary voltage or via the integrated bus bypass. In case of an external supply, a 5 W incandescent bulb can be operated per signal tower tier; in case of an internal auxiliary voltage from the bus, a maximum of 200 mA can be provided for the signal elements.

Order specifications see page 47.

Signal Towers Kombi*SIGN* –

Siren Element with self-adjusting sound output



- World first
- Sound output is automatically adjusted to the background noise level
- Continual measuring of the ambient sound level
- Warning tone can be heard without being irritatingly loud
- No excessive noise exposure
- Perception of warning signal is maintained

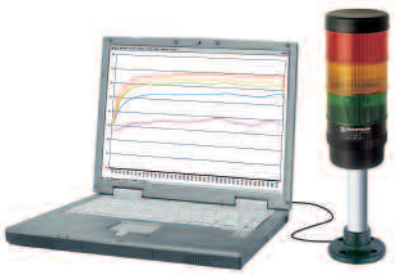
Varying background noise from machinery often complicates the application of audible signals. Optical signals, on the other hand, sometimes remain unnoticed if they are installed outside the machine operator's range of vision.

The Siren Element for the Kombi*SIGN* 71 Signal Tower with self-adjusting sound output offers new perspectives. By means of continuous noise level measurement, the alarm adjusts its sound output to the ambient noise level. It drowns out the ambient noise level by emitting a sound level which is well audible without being irritatingly loud.

Order specifications see page 49.

Terminal Element with USB Interface for Kombi*SIGN* 70 + 71 and Kompakt 71

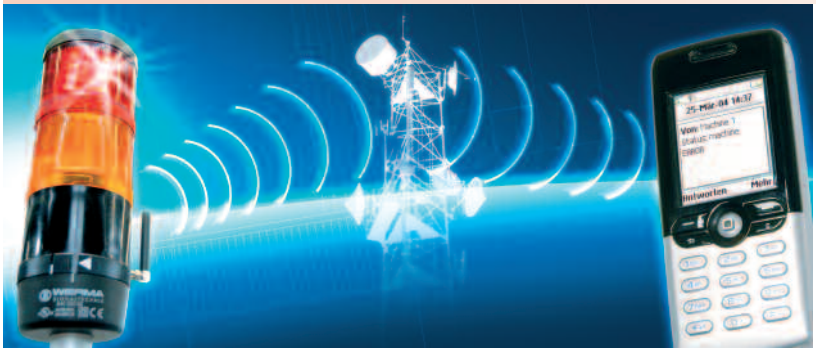
Many applications require the signalisation of the current operating status even when a PLC or control system is not available. The new terminal element with USB interface is easy to activate as it is triggered directly via a PC.



Neither a separate power supply nor additional hardware are necessary because the terminal element with USB interface is based on standardised interfaces. The element is available for both the Kombi*SIGN* 70 and 71 ranges. A fully assembled signal tower with integrated USB terminal element is also available for the LED tower Kompakt 71.
USB interfaces are often used in call centres, on automated check-out systems or for the monitoring of data at testing and measuring stations.

Order specifications see page 50.

The GSM Transmitter Element – THE innovation for our Kombi*SIGN* range



Machine downtime and the resulting cost-intensive production losses cost time, money and nerves.
Our latest development enables you to reduce machine downtime to a minimum and easily increase the productivity of your plant.

Order specifications see page 48.

- Unique Signal Tower solution
- Malfunction signalled by signal tower is transmitted via SMS or Call to a mobile phone
- Simple tool-free integration into existing signal tower
- Machine operator is kept informed about the operating status even when on the move
- Monitoring time can be used more effectively
- Lengthy production losses can be avoided
- Increase in productivity through reduction of machine downtime
- Also available for US frequencies

Our GSM Transmitter Element opens up completely new possibilities. Free yourself from your machinery and use monitoring time more effectively - even within your own plant. As long as your mobile is on, you will always be kept informed of the current operating status of your machinery on the road, at home or at the weekend!

Interface Box for convenient status signalisation of integrated systems

Many applications in the area of automatic control engineering require the signalisation of the current operating status. The commonly used control systems are often based around a PLC or PC. Many of these systems are nowadays equipped with one or more series interfaces. These are often not all in use. These interfaces can, with minimal effort, be used to signal various operating states.

The WERMA interface box is the perfect solution for such applications. The interface box also provides the possibility of an additional signalisation in integrated systems where the main computer is in a different location to the actors. This can be achieved without the need to reorganise the existing hardware.

Order specifications see page 51.

Kombi*SIGN* Signal Towers –

Kombi*SIGN* 50

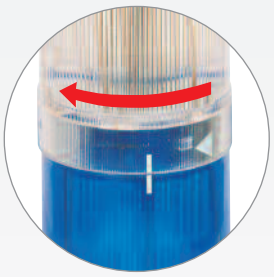
Protection rating IP 54

Slim design
modular signal tower system
with 50 mm diameter.

For use on
smaller machines.

Terminal element

Screwable
connection



Practical bayonet
fixing system.

Tool-free
bulb change.

Kombi*SIGN* 70

Protection rating IP 54

For use in normal
conditions.

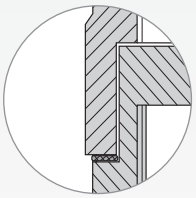
Series 840

Not compatible with
Kombi*SIGN* 71

Terminal element

Screwable
connection

Optically different to Kombi*SIGN* 71 due to:

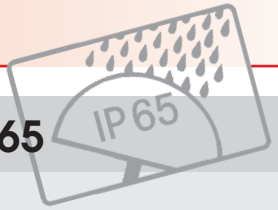


- Flat seal
- No phase on
  dome edge

- Conical
  terminal element

WERMA SIGNALTECHNIK

Kombi*SIGN* 71



Protection rating IP 65

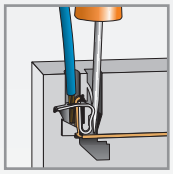
For use in extreme conditions.

Series 640

Not compatible with Kombi*SIGN* 70

Terminal element

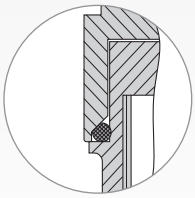
Either: improved screwable connection



see page 27

Or: terminal element with CAGE CLAMP® technology

Optically different to Kombi*SIGN* 70 due to:



- O-Ring seal
- Phase in inside of dome

- Cylindrical terminal element

CAGE CLAMP® is a registered trademark of WAGO Kontakttechnik GmbH.

Kombi*SIGN* 71 – combine the diversity!

Configurator

Terminal elements for base mounting

Improved screwable connection

Order no.
640 820 00

Terminal element with CAGE CLAMP® technology

Order no.
640 800 00

Contact box for cable exit at side

Order no.
975 840 01

Bracket for base mounting

Order no.
960 000 02

Bracket for 1-sided mounting

Order no.
975 840 85

Bracket for 2-sided mounting

Order no.
975 840 86

Audible element **645**

Permanent light **641** LED permanent,
Blinking light **642** blinking or
Flashing light **643** rotating light **644**

(max. 5 signal elements can be combined)

Improved screwable connection

Order no.
640 830 00

Terminal element with CAGE CLAMP® technology

Order no.
640 810 00

Terminal elements for tube mounting

Tube with clamp

Order no.
960 000 18

Base with integrated tube

Order no.
975 840 10

Tube ø 25 mm

	Order no.		Order no.
100 mm long	**975 845 10**	600 mm long	**975 840 60**
250 mm long	**975 840 25**	800 mm long	**975 840 80**
400 mm long	**975 840 40**	1000 mm long	**975 840 03**

Base for tube

Order no.
975 840 90

Base for tube

Order no.
975 840 91

Contact box for cable exit at side

Order no.
975 840 01

Contact box with magnetic base and cable exit at side

Order no.
975 840 04

Bracket for base mounting with concealed cable entry

Order no.
960 000 14

Bracket for tube mounting

Order no.
960 000 01

640 Signal Tower KombiSIGN 71

Bracket (accessory)

Base with tube (accessory)

- **High protection rating IP 65**
- **Signal tower system 70 mm ø with modular construction**
- **Improved illumination**
- **Flexible combination of optical and audible elements**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	Terminal element: 70 mm x 26.5 mm Light element: 70 mm x 65 mm Audible element: 70 mm x 72 mm
Housing:	Terminal element: PA fibreglass, high-impact Cap: PC
Dome:	PC, transparent Audible and ASI elements: PC
Fixing:	Base mounting Tube mounting, for tube ø 25 mm Bracket mounting
Socket:	Bayonet, B 15 d, for bulbs max. 7 W
Connection:	CAGE CLAMP® technology max. 2,5 mm² or screwable connection max. 2,5 mm² Contact protection according to VDE
Cable entry:	Cable diameter max. 14 mm
Element seal:	Pre-mounted with each module
Protection rating:	Light elements: IP 65 Audible elements: IP 65 (Order no. 645 830 55 = IP 40)
Number of modules possible:	max. 5 / max. 10 elements with 2-sided bracket
Permanent light element	12 - 240 V ≅ Bulb not included in assembly.
Blinking light element	24 V ≅ 115 V ≅ 230 V ≅ Bulb not included in assembly.
Starting current:	< 0.5 A
Flashing light element	24 V = 115 V ~ 230 V ~
Life duration:	4 x 10^6 flashes
Current consumption:	125 mA 20 mA 35 mA
reduced for AS-Interface:	80 mA
Starting current:	< 0.5 A at 24 V
LED Permanent light element	24 V ≅ 115 V ~ 230 V ~
Current consumption:	45 mA 25 mA 25 mA
Starting current:	< 0.5 A at 24 V
LED Blinking light element	24 V ≅ 115 V ~ 230 V ~
Current consumption:	25 mA 25 mA 25 mA
Starting current:	< 0.5 A at 24 V
Blink frequency:	c. 1 Hz c. 1 Hz c. 1 Hz
NEW **LED Flashing light element**	24 V =
Life duration:	50,000 hrs
Current consumption:	35 mA (red/yellow) 30 mA (green/clear/blue)
Starting current:	< 0,5 A at 24 V
LED Rotating light element	24 V ≅
Current consumption:	70 mA
Starting current:	< 0.5 A at 24 V
Rotation frequency:	c. 120 r.p.m.

ACCESSORIES:

see page 39

TECHNICAL DIAGRAMS

see page 214

CE cULus IP65 +50°C -20°C 105 dB 2 Ws

WERMA SIGNALTECHNIK

Signal Tower Kombi*SIGN* 71

IP 65

Terminal element with cap

ORDER SPECIFICATIONS TERMINAL ELEMENTS:

	CAGE CLAMP®	Screw connection
Terminal element for tube mounting including cap	**640 810 00**	**640 830 00**
Terminal element for bracket or base mounting including cap and seal	**640 800 00**	**640 820 00**
Terminal element with USB Interface (for tube mounting)	**640 840 00**	

Technical specifications and order specifications see page 50.

Permanent / Blinking / Flashing light element

ORDER SPECIFICATIONS OPTICAL ELEMENTS:

Permanent light	12-240 V
red	**641 100 00**
green	**641 200 00**
yellow	**641 300 00**
clear	**641 400 00**
blue	**641 500 00**

Bulb not included in assembly. Accessories see page 39.

Blinking light	24 V ≅	115 V ≅	230 V ≅
red	**642 100 75**	**642 100 77**	**642 100 78**
green	**642 200 75**	**642 200 77**	**642 200 78**
yellow	**642 300 75**	**642 300 77**	**642 300 78**
clear	**642 400 75**	**642 400 77**	**642 400 78**
blue	**642 500 75**	**642 500 77**	**642 500 78**

Compare the prices and advantages of an LED Blinking light

Bulb not included in assembly. Accessories see page 39.

Permanent light, clear with info

Flashing light	24 V = (ASI)	24 V =	115 V ~	230 V ~
red	**643 110 55**	**643 100 55**	**643 100 67**	**643 100 68**
green	**643 210 55**	**643 200 55**	**643 200 67**	**643 200 68**
yellow	**643 310 55**	**643 300 55**	**643 300 67**	**643 300 68**
clear	**643 410 55**	**643 400 55**	**643 400 67**	**643 400 68**
blue	**643 510 55**	**643 500 55**	**643 500 67**	**643 500 68**

Compare the prices and advantages of an LED Flashing light

LED Permanent light	24 V ≅	115 V ~	230 V ~
red	**644 100 75**	**644 100 67**	**644 100 68**
green	**644 200 75**	**644 200 67**	**644 200 68**
yellow	**644 300 75**	**644 300 67**	**644 300 68**
clear	**644 400 75**	**644 400 67**	**644 400 68**
blue	**644 500 75**	**644 500 67**	**644 500 68**

LED Blinking light	24 V ≅	115 V ~	230 V ~
red	**644 110 75**	**644 110 67**	**644 110 68**
green	**644 210 75**	**644 210 67**	**644 210 68**
yellow	**644 310 75**	**644 310 67**	**644 310 68**
clear	**644 410 75**	**644 410 67**	**644 410 68**
blue	**644 510 75**	**644 510 67**	**644 510 68**

Life duration up to 100,000 hrs

NEW

LED element

LED Flashing light	24 V =
red	**644 120 55**
green	**644 220 55**
yellow	**644 320 55**
clear	**644 420 55**
blue	**644 520 55**

LED Rotating light	24 V ≅
red	**644 130 75**
green	**644 230 75**
yellow	**644 330 75**
clear	**644 430 75**
blue	**644 530 75**

Further voltages on request.

640 Signal Tower Kombi*SIGN* 71

Audible element

Siren element with self-adjusting sound output

GSM Transmitter Element

ORDER SPECIFICATIONS AUDIBLE ELEMENTS:

Buzzer element 85 dB, 25 mA, IP 65, Continuous or pulse tone	24 V ≅ **645 800 75**	115 V ≅ **645 800 77**	230 V ~ **645 800 68**
Siren element 105 dB, 100 mA, IP 40 Continuous tone alternating	24 V = **645 830 55** no UL approval		
Multi-functional Siren 100 dB, IP 65, 8 different tones, adjustable sound output	24 V ≅ / 80 mA **645 820 75**	115 V ~ / 40 mA **645 820 67**	230 V ~ / 40 mA **645 820 68**
Multi-functional Siren, with external control 100 dB, 80 mA, IP 65, 7 diff. tones can be triggered externally, adjustable sound output	24 V = **645 850 55**		
Siren element with self-adjusting sound output	24 V = **645 810 55**		

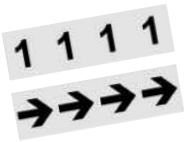
Technical specifications see page 49.

ORDER SPECIFICATIONS KOMBI*SIGN* HIGHLIGHTS:

GSM transmitter element for Kombi*SIGN* 71	24 V DC **646 700 55**	For US frequencies, 24 V DC **646 710 55**
AS-Interface element for Kombi*SIGN* 71	Standard Slave 24 V DC **646 830 55**	A/B-Slave 24 V DC **646 810 55**

Technical specifications see page 47.

Accessories for Signal Tower Kombi*SIGN* 71



ORDER SPECIFICATIONS:

Bulb BA 15d,
Total length max. 42 mm

12 V, 5 Watt	**955 840 34**	115 V, 5 Watt	**955 840 57**
24 V, 5 Watt	**955 840 35**	230 V, 5 Watt	**955 840 38**
30 V, 5 Watt	**955 840 32**		

LED bulb BA 15d, total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumption	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**
	for permanent light 641and blinking light 642	for permanent light 641	for permanent light 641

Indication board (for tube mounting) **960 000 05**
Technical specifications and order specifications see pages 56 and 58.

Info transparencies (to place inside optical elements)
Technical specifications and order specifications see page 59.

WERMA SIGNALTECHNIK

Accessories for Signal Tower Kombi*SIGN* 71

ORDER SPECIFICATIONS:

Contact box for cable exit at side, with mounting material	**975 840 01**
Contact box with magnetic base and cable exit at side	**975 840 04**
Bracket for tube mounting with cable gland	**960 000 01**
Bracket for surface mounting with cable gland	**960 000 02**
Bracket for base mounting with concealed cable entry, incl. rubber seals	**960 000 14**
Bracket for 1-sided mounting, incl. rubber seals	**975 840 85**
Bracket for 2-sided mounting, incl. rubber seals	**975 840 86**
Tube with clamp, ø 25 mm 250 mm long, with cable gland	**960 000 18**
Tube ø 25 mm, all anodized aluminium	
100 mm long	**975 845 10**
250 mm long	**975 840 25**
400 mm long	**975 840 40**
600 mm long	**975 840 60**
800 mm long	**975 840 80**
1000 mm long	**975 840 03**
Base for tube mounting ø 25 mm, plastic, incl. rubber seal	**975 840 90**
Base for tube mounting ø 25 mm, metal, incl. rubber seal	**975 840 91**
Base with integrated tube, ø 25 mm, 110 mm long, plastic, incl. rubber seal	**975 840 10**
Adapter for tube mounting ø 25 mm / 1/2″ NPT thread	**975 840 02**
Cable gland for surface mounting M 16 x 1.5	**960 000 04**

TECHNICAL DIAGRAMS

see page 215

Kombi*SIGN* 70 – combine the diversity!

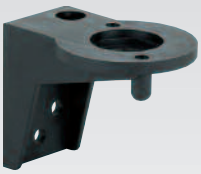
Configurator

Terminal element for base mounting

Order no.
840 085 00

Contact box for cable exit at side

Order no.
975 840 01



Bracket for base mounting

Order no.
960 000 02

Bracket for 1-sided mounting

Order no.
975 840 85

Bracket for 2-sided mounting

Order no.
975 840 86

Audible element **844**

Permanent light **840** LED permanent,
Blinking light **841** blinking or
Flashing light **842** rotating light **843**

(max. 5 signal elements can be combined)

Terminal element for tube mounting

Order no.
840 080 00

Tube with clamp

Order no.
960 000 18

Base with integrated tube

Order no.
975 840 10

Tube ø 25 mm

	Order no.		Order no.
100 mm long	**975 845 10**	600 mm long	**975 840 60**
250 mm long	**975 840 25**	800 mm long	**975 840 80**
400 mm long	**975 840 40**	1000 mm long	**975 840 03**

Base for tube

Order no.
975 840 90

Base for tube

Order no.
975 840 91

Contact box for cable exit at side

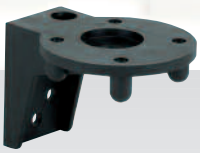
Order no.
975 840 01

Contact box with magnetic base and cable exit at side

Order no.
975 840 04

Bracket for base mounting with concealed cable entry

Order no.
960 000 14



Bracket for tube mounting

Order no.
960 000 01

840 Signal Tower KombiSIGN 70

Base with tube (accessory)

Bracket (accessory)

Tube mounting with Alu-tube

- **Signal tower system 70 mm ø with modular construction**
- **360° visibility**
- **Wide range of optical and audible elements**
- **Elements can be assembled as required**

TECHNICAL SPECIFICATIONS:

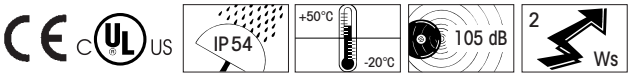
Dimensions (Diameter x Height):	Terminal element: 70 mm x 30 mm Light element: 70 mm x 65 mm Audible element: 70 mm x 72 mm		
Housing:	Terminal element: PA fibreglass, high-impact Cap: PC/ABS-Blend		
Dome:	PC, transparent Audible and ASI elements: PC/ABS-Blend		
Fixing:	Base mounting Tube mounting, for tube ø 25 mm Bracket mounting		
Socket:	Bayonet, B 15 d, for bulb max. 7 W		
Connection:	Screwable connection max. 2.5 mm² Contact protection according to VDE		
Cable entry:	Cable diameter max. 14 mm		
Element seal:	Pre-mounted with each module		
Protection rating:	Light elements: IP 54 Audible elements: IP 54 (Order no. 844 123 55 = IP 40)		
Number of modules possible:	max. 5 / with 2-sided bracket max. 10 elements		
Permanent light element	12 - 240 V ≅ Bulb not included in assembly		
Blinking light element Bulb not included in assembly Starting current:	24 V ≅ < 0.5 A	115 V ≅	230 V ≅
Flashing light element Flash frequency: Flash energy: Life duration: Current consumption: reduced for AS-Interface: Strarting current:	24 V = 1 Hz 2 Ws 4 x 10⁶ flashes 125 mA 80 mA < 0.5 A at 24 V	115 V ~ 1 Hz 2 Ws 20 mA	230 V ~ 1 Hz 2 Ws 35 mA
LED Permanent light element Current consumption: Starting current:	24 V ≅ 45 mA < 0.5 A at 24 V	115 V ~ 25 mA	230 V ~ 25 mA
LED Blinking light element Current consumption: Starting current: Blink frequency:	24 V ≅ 25 mA < 0.5 A at 24 V c. 1 Hz	115 V ~ 25 mA c. 1 Hz	230 V ~ 25 mA c. 1 Hz
NEW **LED Flashing light element** Life duration: Current consumption: Starting current:	24 V = 50,000 hrs 35 mA (red/yellow) < 0,5 A at 24 V	30 mA (green/clear/blue)	
LED Rotating light element Current consumption: Starting current: Rotation frequency:	24 V ≅ 70 mA < 0.5 A at 24 V c. 120 r.p.m.		

ACCESSORIES:

see page 45

TECHNICAL DIAGRAMS

see page 232



WERMA SIGNALTECHNIK

840 Signal Tower Kombi*SIGN* 70

IP54

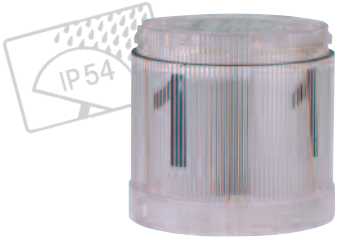
Terminal element with cap

ORDER SPECIFICATIONS TERMINAL ELEMENTS:

Terminal element for tube mounting	
including cap	**840 080 00**
Terminal element for bracket or base mounting	
including cap and rubber seal	**840 085 00**
Terminal element with	
USB Interface (for tube mounting)	**840 580 00**

Technical specifications and order specifications see page 50.

Permanent / Blinking / Flashing light element



Permanent light, clear with info

Life duration up to 100,000 hrs

LED element

ORDER SPECIFICATIONS OPTICAL ELEMENTS:

Permanent light	12-240 V
red	**840 100 00**
green	**840 200 00**
yellow	**840 300 00**
clear	**840 400 00**
blue	**840 500 00**

Bulb not included in assembly. Accessories see page 45.

Blinking light	24 V ≅	115 V ≅	230 V ≅
red	**841 100 55**	**841 100 67**	**841 100 68**
green	**841 200 55**	**841 200 67**	**841 200 68**
yellow	**841 300 55**	**841 300 67**	**841 300 68**
clear	**841 400 55**	**841 400 67**	**841 400 68**
blue	**841 500 55**	**841 500 67**	**841 500 68**

Compare the prices and advantages of an LED Blinking light

Bulb not included in assembly. Accessories see page 45.

Flashing light	24 V = (ASI)	24 V =	115 V ~	230 V ~
red	**842 110 55**	**842 100 55**	**842 100 67**	**842 100 68**
green	**842 210 55**	842 200 55	842 200 67	842 200 68
yellow	**842 310 55**	842 300 55	842 300 67	842 300 68
clear	**842 410 55**	842 400 55	842 400 67	842 400 68
blue	**842 510 55**	842 500 55	842 500 67	842 500 68

Compare the prices and advantages of an LED Flashing light

LED Permanent light	24 V ≅	115 V ~	230 V ~
red	**843 100 55**	**843 100 67**	**843 100 68**
green	**843 200 55**	**843 200 67**	**843 200 68**
yellow	**843 300 55**	**843 300 67**	**843 300 68**
clear	**843 400 55**	**843 400 67**	**843 400 68**
blue	**843 500 55**	**843 500 67**	**843 500 68**

LED Blinking light	24 V ≅	115 V ~	230 V ~
red	**843 110 55**	**843 110 67**	**843 110 68**
green	**843 210 55**	**843 210 67**	**843 210 68**
yellow	**843 310 55**	**843 310 67**	**843 310 68**
clear	**843 410 55**	**843 410 67**	**843 410 68**
blue	**843 510 55**	**843 510 67**	**843 510 68**

NEW

LED Flashing light	24 V =
red	**843 120 55**
green	**843 220 55**
yellow	**843 320 55**
clear	**843 420 55**
blue	**843 520 55**

Available from 1st Quarter 2007.

LED Rotating light	24 V ≅
red	**843 130 55**
green	**843 230 55**
yellow	**843 330 55**
clear	**843 430 55**
blue	**843 530 55**

Further voltages on request.

840 Signal Tower Kombi*SIGN* 70

Audible element
844 123 55

GSM Transmitter Element

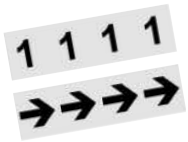
ORDER SPECIFICATIONS AUDIBLE ELEMENTS:

Buzzer element 85 dB, 25 mA, IP 54, Continuous or pulse tone	24 V ≅ **844 118 55**	115 V ≅ **844 118 67**	230 V ~ **844 118 68**
Siren element 105 dB, 100 mA, IP 40 Continuous tone alternating	24 V = **844 123 55** no UL / CSA approval		
Multi-functional Siren 100 dB, IP 54, 8 different tones, adjustable sound output	24 V ≅ / 80 mA **844 126 55**	115 V ~ / 40 mA **844 126 67**	230 V ~ / 40 mA **844 126 68**
Multi-functional Siren, **with external control** 100 dB, 80 mA, IP 54, 7 different tones can be triggered externally, adjustable sound output	24 V = **844 126 95**		

ORDER SPECIFICATIONS KOMBI*SIGN* HIGHLIGHTS:

GSM transmitter element **for Kombi*SIGN* 70** Technical specifications see page 48.	24 V DC **840 700 55**	For US frequencies, 24 V DC **840 710 55**
AS-Interface **element for** **Kombi*SIGN* 70** Technical specifications see page 47.	Standard Slave 24 V DC **840 830 55**	A/B-Slave 24 V DC **840 810 55**

840 Accessories for Signal Tower Kombi*SIGN* 70



ORDER SPECIFICATIONS:

Bulb BA 15d,
Total length max. 42 mm

12 V, 5 Watt	**955 840 34**	115 V, 5 Watt	**955 840 57**
24 V, 5 Watt	**955 840 35**	230 V, 5 Watt	**955 840 38**
30 V, 5 Watt	**955 840 32**		

LED bulb BA 15d, total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumption	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**
	for permanent light 840 and blinking light 841	for permanent light 840	for permanent light 840

Indication board (for tube mounting) **960 000 05**
Technical specifications and order specifications see pages 56 and 58.

Info transparencies (to place inside optical elements)
Technical specifications and order specifications see page 59.

WERMA SIGNALTECHNIK

Accessories for Signal Tower Kombi*SIGN* 70

ORDER SPECIFICATIONS:	
Contact box for cable exit at side, with mounting material	**975 840 01**
Contact box with magnetic base and cable exit at side	**975 840 04**
Bracket for tube mounting with cable gland	**960 000 01**
Bracket for surface mounting with cable gland	**960 000 02**
Bracket for base mounting with concealed cable entry, incl. rubber seals	**960 000 14**
Bracket for 1-sided mounting, incl. rubber seals	**975 840 85**
Bracket for 2-sided mounting, incl. rubber seals	**975 840 86**
Tube with clamp, ø 25 mm 250 mm long, with cable gland	**960 000 18**
Tube ø 25 mm, all anodized aluminium	
100 mm long	**975 845 10**
250 mm long	**975 840 25**
400 mm long	**975 840 40**
600 mm long	**975 840 60**
800 mm long	**975 840 80**
1000 mm long	**975 840 03**
Base for tube mounting ø 25 mm, plastic, incl. rubber seal	**975 840 90**
Base for tube mounting ø 25 mm, metal, incl. rubber seal	**975 840 91**
Base with integrated tube, ø 25 mm, 110 mm long, plastic, incl. rubber seal	**975 840 10**
Adapter for tube mounting ø 25 mm / 1/2″ NPT thread	**975 840 02**
Cable gland for surface mounting M 16 x 1.5	**960 000 04**

TECHNICAL DIAGRAMS

see page 233

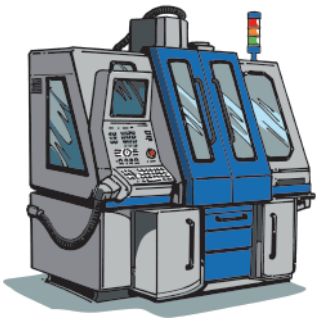
640/840 Kombi*SIGN* 70 + 71 with customer specific coloured coatings

NEW

- Signal towers in customer specific colours
- Meets the demands of an increasing design orientation
- Simple ordering procedure
- Complete range of RAL colours available
- Kombi*SIGN* features continue to be available
- High protection rating IP 65 or 54

TECHNICAL SPECIFICATIONS:

Dimensions Terminal Elements (Ø x Height):	Kombi*SIGN* 70: 70 mm x 30 mm Kombi*SIGN* 71: 70 mm x 26.5 mm
Housing Terminal Elements:	PA-GF, fibreglass, high-impact, Cap: PC
Connection:	Kombi*SIGN* 70: screwable connection max. 2.5 mm² Kombi*SIGN* 71: CAGE CLAMP® technology max. 2.5 mm² or screwable connection max. 2.5 mm² Contact protection according to VDE
Cable entry:	Cable diamter max. 14 mm
Protection rating:	Kombi*SIGN* 70: IP 54 Kombi*SIGN* 71: IP 65
Number of modules possible:	max. 5



The Signal Towers are designed to harmonise with the colour of the customer's product design, guaranteeing a uniform appearance.

ORDER SPECIFICATIONS TERMINAL ELEMENTS:

Please state the required RAL number

	CAGE CLAMP®	Screw connection
Order Specifications for Kombi*SIGN* 71:		
Terminal element for tube mounting, coated including cap	**640 710 00**	**640 730 00**
Terminal element for bracket or base mounting, coated including cap and seal	**640 700 00**	**640 720 00**
Order Specifications for Kombi*SIGN* 70:		
Terminal element for tube mounting, coated including cap		**Screw connection** **840 780 00**
Terminal element for bracket or base mounting, coated including cap and seal		**840 785 00**

ACCESSORIES FOR KOMBI*SIGN* 70 + 71:

Base with integrated tube, coated, Ø 25 mm, 110 mm long, plastic, incl. rubber seal	**960 000 24**
Bracket for 1-sided mounting, coated, incl. rubber seals	**960 000 22**

Minimum order quantity	10 pieces
Delivery time	by arrangement
Colour Finish:	matt or gloss

Please state the required RAL number and colour finish (matt or gloss) with each of your orders.
Slight colour deviations are possible.

The Kombi*SIGN* signal towers 70 and 71 can be coated in any colour within the RAL spectrum.

WERMA SIGNALTECHNIK

646/840 AS-Interface Element for Kombi*SIGN* 70+71

An LED displays the current status

- A light diode indicates current status
- 31 or 62 addresses
- Available with standard or new A/B technology
- Voltage supply switchable from internal bus supply to additional external voltage supply
- With addressing socket

The Kombi*SIGN* Signal Towers 70 and 71 with AS-Interface Element are capable of total communication: Through simple integration of an AS-Interface Element the actuators are connected to the networking system Actuator-Sensor-Interface – this considerably reduces complex wiring. The necessary power supply source (supply via bus or external) can be selected with a switch. This element is mounted as the first tier of the individual signal tower directly on top of the terminal element.
(Further Information see pages 29 and 258).

TECHNICAL SPECIFICATIONS:

	Standard Slave	A/B-Slave
Number of addresses	max. 31	max. 62
Number of signal elements	max. 4	max. 3
Type of signal elements	Permanent light elements	Permanent light elements
	Flashing light elements	Flashing light elements
	LED elements	LED elements
	Buzzer elements	Buzzer elements
	Siren elements	Siren elements
IO-Code	8	8
ID-Code	F	A
ID2-Code	–	E
Outputs	4 semiconductor relays	3 semiconductor relays

Power supply	
AS-Interface Element	via bus conduction
Operating voltage	18.5 V ... 31.6 V according to the AS Interface specification
Reverse battery protection	intergrated
Watchdog	integrated
Additional external voltage	24 V +/- 10% DC

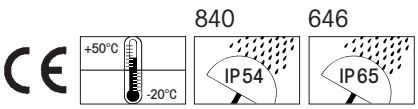
	With internal add. voltage	With external add. voltage
Current carrying cap. Σ Imax	200 mA	200 mA per signal element
Current consumption max	250 mA	75 mA
Voltage at signal element	18V - 31V	24V +/- 10%
Short circuit/overload protection	integrated	pre-fuse M 1.6 A

ORDER SPECIFICATIONS AS-INTERFACE ELEMENTS KOMBI*SIGN* 70 + 71:

AS-Interface Element	Kombi*SIGN* 70	Kombi*SIGN* 71
Standard Slave	**840 830 55**	**646 830 55**
A/B Slave	**840 810 55**	**646 810 55**

TECHNICAL DIAGRAMS

see pages 214 + 232



646/840 GSM Transmitter Element for Kombi*SIGN* 70 + 71

Patent Pending

- **Unique Signal Tower solution**
- **GSM transmitter element can be simply integrated into an existing signal tower**
- **Activation without the need for programming**
- **Malfunction signalled by signal tower is transmitted via SMS to a mobile phone**
- **No additional power supply needed**
- **Also available for US frequencies**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	70 mm x 65 mm
Housing:	PC
Current consumption:	50 mA
Max. current draw (momentary):	450 mA
Operating voltage:	24 V DC
GSM frequency:	900 or 1800 MHz (covers all common European mobile telephone networks)
US GSM frequency:	850 or 1900 MHz
Plug-in slot for SIM card:	integrated (SIM card is not included in assembly)
Antenna connection:	FME plug connector (bracket stub antenna included)

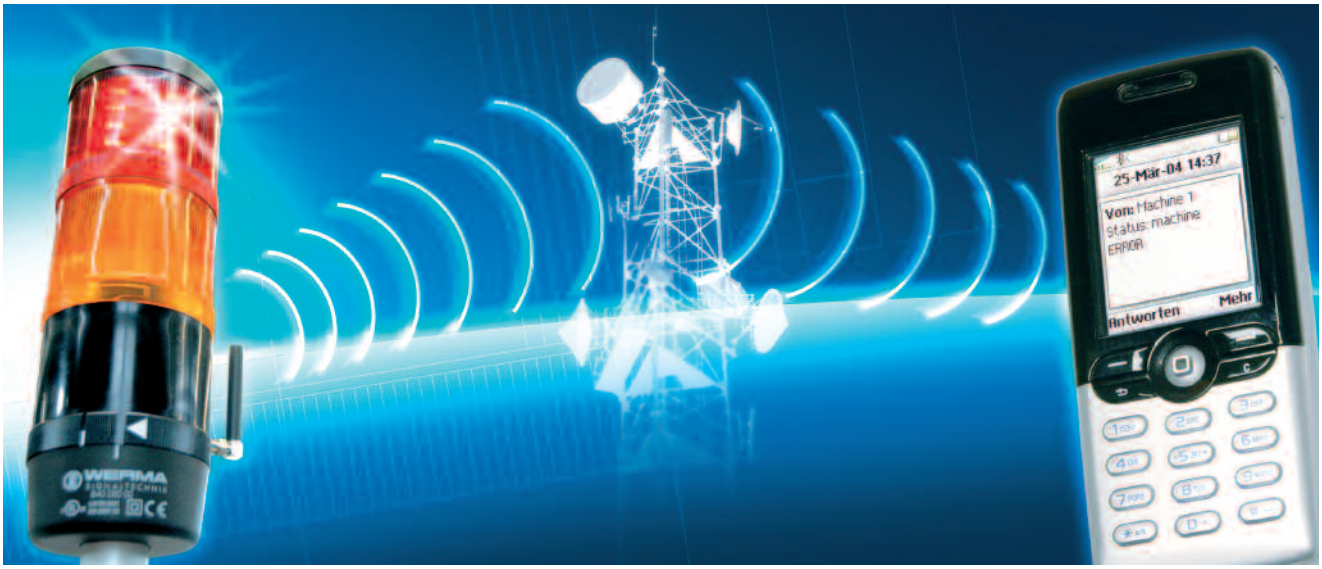
Also available for US frequencies

ORDER SPECIFICATIONS:

GSM Transmitter Element for Kombi*SIGN* 70+71		**GSM Transmitter Element for US frequencies**	
24 V DC for Kombi*SIGN* 70	24 V DC for Kombi*SIGN* 71	24 V DC Kombi*SIGN* 70	24 V DC Kombi*SIGN* 71
840 700 55	**646 700 55**	**840 710 55**	**646 710 55**

TECHNICAL DIAGRAMS

see pages 214 + 231



840 646

WERMA SIGNALTECHNIK

645 Siren Element with self-adjusting sound output for Kombi*SIGN* 71

- **World first**
- **Automatic sound output adjustment between 80 and 100 dB depending on background noise level**
- **Modular construction**
- **Ideal for applications with changing ambient sound levels**
- **High protection rating IP 65**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	71.5 mm x 110 mm
Housing:	PC
Current consumption:	< 150 mA
Starting current:	< 500 mA
Tone type:	Pulse tone
Tone frequency:	2.5 KHz
Operating voltage:	24 V DC
Sound output:	80 dB - max. 100 dB

ORDER SPECIFICATIONS:

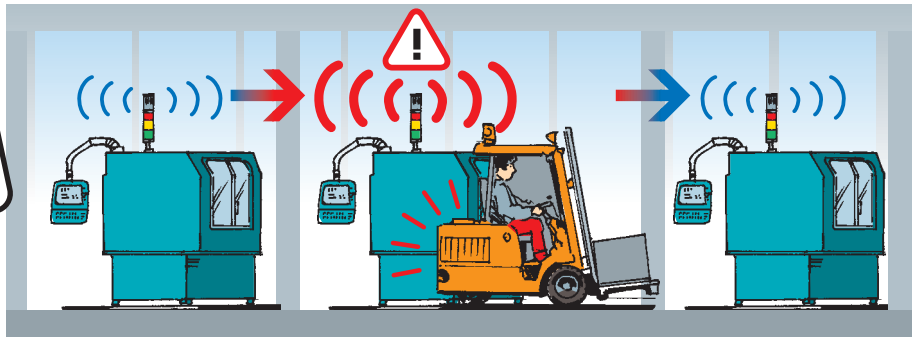
24 V =

645 810 55

TECHNICAL DIAGRAMS

see page 215

Loud enough
yet
not disturbing!



The siren element adjusts its sound output through continual measurement of the ambient noise level. The emitted tone is c. 5 dB louder than the background sound level. The warning signal can always be heard without being irritatingly loud for people in the sounder's vicinity.

640/840 Terminal Element with USB Interface for Kombi*SIGN* 70 + 71

- **Direct triggering of signal tower elements via USB Interface**
- **Easy activation**
- **Can be combined with up to 4 signal elements**
- **Assembly includes installation software and USB connection cable**
- **No additional power supply necessary**
- **No additional hardware needed**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	68.5 mm x 41 mm
Material:	PA-GF, shock resistant
Fixing:	Tube mounting
Connection:	USB-Bus Assembly includes installation software and USB connection cable (AWG 22), 2 m long Maximum permitted length of USB cable (min. AWG 22): 7 m
Current carrying capacity Imax:	100 mA

ORDER SPECIFICATIONS:

Kombi*SIGN* 70	Kombi*SIGN* 71
840 580 00	**640 840 00**

Assembly includes USB connecting cable

ACCESSORIES:

Base with integrated tube			**975 840 10**
Tube mounting with base for tube (metal) and tube ø 25 mm			**975 840 91**
100 mm long	**975 845 10**	250 mm long	**975 840 25**
400 mm long	**975 840 40**	600 mm long	**975 840 60**
800 mm long	**975 840 80**	1000 mm long	**975 840 03**

TECHNICAL DIAGRAMS

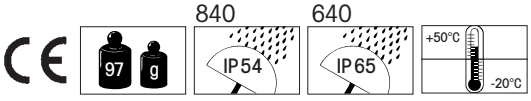
see pages 214 + 232

In many applications, it is necessary to indicate operating states or faults by means of an optical signal. A PLC or machine controller is not available in all areas; PCs are often also connected to control the machines.
The optimal solution for this is the terminal element with USB interface for Kombi*SIGN* 70, 71 and Kompakt 71.

This innovation in the field of signal towers is controlled directly from the PC and can therefore be put into operation easily and in an uncomplicated manner. Neither a separate power supply, nor additional hardware is required for this purpose, because the terminal element with USB interface is based on standard USB interface.

A USB interface is often used in call centres, automated cash register systems or even when monitoring measurement data at testing stations. The terminal element is available for the signal tower series Kombi*SIGN* 70 and 71. The LED signal tower Kompakt 71 offers the possibility to purchase a pre-assembled tower with integrated USB terminal element under just one single catalogue number (see page 66).

Base for tube (metal) and tube ø 25 mm (accessories)



WERMA SIGNALTECHNIK

Interface Box for Kombi*SIGN* 71

Assembly:
Interface Box and terminal element for signal tower Kombi*SIGN* 71

- **Direct triggering from PC via RS 232 or RS 485 interfaces**
- **Programming of various drives via serial interface**
- **Triggering of up to 4 independent elements of a Kombi*SIGN* signal tower**
- **Up to 127 signal towers can be adressed (RS 485)**
- **Monitoring of each element possible**
- **Versions for Bus systems available on request**

TECHNICAL SPECIFICATIONS:

Dimensions of interface box (L x W x H):	80 x 80 x 66 mm
Material:	ABS
Drive:	24 V DC
Interfaces:	RS 232, RS 485

Assembly:	**960 000 16**	**960 000 17**
	• Interface box	• Interface box
	• Terminal element	• Terminal element
	• 2 cable glands M16	• 1 cable gland M16
		• Network appliance with cable
		• Connection cable RS 232 and RS 485, 2 m cable with Sub-D 9-pin and socket for power supply
		• CD with demonstration programme
		• Programming handbook

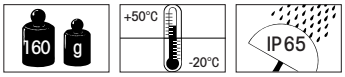
Assembly without laptop and signal tower elements

ORDER SPECIFICATIONS:

Interface box	**960 000 16**
Interface box incl. accessories	**960 000 17**

TECHNICAL DIAGRAMS

see pages 244



Kombi*SIGN* 50 – combine the diversity!

Configurator

Audible element **849**

Permanent light **846**
LED permanent,
or blinking light **848**

(max. 4 signal elements can be combined)

Terminal element for surface, tube, single hole and bracket mounting

Order no.
845 000 00

Bracket for wall mounting

Order no.
975 845 02

Base for surface mounting, incl. rubber seal

Order no.
975 845 01

Adapter for single hole mounting

Order no.
975 845 03

Tube ø 25 mm, all anodized aluminium

	Order no.
100 mm long	**975 845 10**
250 mm lang	**975 840 25**
400 mm lang	**975 840 40**
600 mm lang	**975 840 60**
800 mm lang	**975 840 80**
1000 mm lang	**975 840 03**

Base for tube mounting ø 25 mm, plastic, incl. rubber seal **975 840 90**

Base for tube mounting ø 25 mm, metal, incl. rubber seal **975 840 91**

Contact box for cable exit at side

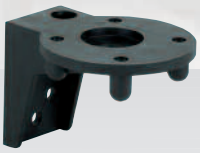
Order no.
975 840 01

Contact box with magnetic base and cable exit at side

Order no.
975 840 04

Bracket for base mounting with concealed cable entry

Order no.
960 000 14



Bracket for tube mounting

Order no.
960 000 01

WERMA SIGNALTECHNIK

845 Signal Tower KombiSIGN 50

Base with tube (accessory)

Bracket (accessory)

Base mounting (accessory)

- Signal tower system 50 mm ø with modular construction
- 360° visibility
- Choice of optical and audible elements
- Order of optical elements interchangeable as required
- Tool-free change of elements and bulbs

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	Terminal element: 52 mm x 16 mm Light element: 52 mm x 65 mm Audible element: 52 mm x 72 mm		
Housing:	Terminal element: PA fibreglass, high-impact Cap: PC		
Dome:	PC, transparent Audible and ASI: PC/ABS-Blend		
Fixing:	Base mounting Tube mounting, for tube ø 25 mm Single hole mounting Bracket mounting		
Socket:	Bayonet, B 15 d, for bulb max. 5 W		
Connection:	Screwable connection max. 2.5 mm^2 Contact protection according to VDE		
Cable entry:	Cable diameter max. 10.5 mm		
Protection rating:	Light elements: IP 54 Audible elements: IP 54		
Number of modules possible:	max. 4		
Permanent light element	12 - 240 V ≅ Bulb not included in assembly		
LED Permanent light element	24 V ≅	115 V ~	230 V ~
Current consumption:	45 mA	25 mA	25 mA
Starting current:	< 0.5 A at 24 V		
LED Blinking light element	24 V ≅	115 V ~	230 V ~
Current consumption:	25 mA	25 mA	25 mA
Starting current:	< 0.5 A at 24 V		
Blink frequency:	c. 1 Hz	c. 1 Hz	c. 1 Hz

ACCESSORIES:

see page 55

TECHNICAL DIAGRAMS

see page 235

845 Signal Tower Kombi*SIGN* 50

Permanent light element

LED element

Buzzer element

Terminal element with cap

ORDER SPECIFICATIONS OPTICAL ELEMENTS:

Permanent light	12-240 V		
red	**846 100 00**		
green	**846 200 00**		
yellow	**846 300 00**		
clear	**846 400 00**		
blue	**846 500 00**		
LED Permanent light	24 V ≅	115 V ~	230 V ~
red	**848 100 55**	**848 100 67**	**848 100 68**
green	**848 200 55**	**848 200 67**	**848 200 68**
yellow	**848 300 55**	**848 300 67**	**848 300 68**
clear	**848 400 55**	**848 400 67**	**848 400 68**
blue	**848 500 55**	**848 500 67**	**848 500 68**
LED Blinking light	24 V ≅	115 V ~	230 V ~
red	**848 110 75**	**848 110 67**	**848 110 68**
green	**848 210 75**	**848 210 67**	**848 210 68**
yellow	**848 310 75**	**848 310 67**	**848 310 68**
clear	**848 410 75**	**848 410 67**	**848 410 68**
blue	**848 510 75**	**848 510 67**	**848 510 68**

ORDER SPECIFICATIONS AUDIBLE ELEMENT:

Buzzer element	24 V ≅	115 V ≅	230 V ~
80 dB, max. 25 mA, IP 54, continuous or pulse tone, adjustable	**849 000 75**	**849 000 77**	**849 000 68**

ORDER SPECIFICATIONS TERMINAL ELEMENT:

Terminal element	**845 000 00**
for base mounting, tube mounting, single hole and bracket mounting, including cap	

TECHNICAL DIAGRAMS

see page 235

WERMA SIGNALTECHNIK

845 Accessories for Signal Tower Kombi*SIGN* 50

ORDER SPECIFICATIONS:

Contact box for cable exit at side, with mounting material — **975 840 01**

Contact box with magnetic base and cable exit at side — **975 840 04**

Bracket for tube mounting incl. cable gland — **960 000 01**

Bracket for base mounting with concealed cable entry, incl. rubber seals — **960 000 14**

Bracket for wall mounting — **975 845 02**

Tube ø 25 mm, all anodized aluminium

100 mm long	**975 845 10**
250 mm long	**975 840 25**
400 mm long	**975 840 40**
600 mm long	**975 840 60**
800 mm long	**975 840 80**
1000 mm long	**975 840 03**

Base for tube mounting ø 25 mm, plastic, incl. rubber seal — **975 840 90**

Base for tube mounting ø 25 mm, metal, incl. rubber seal — **975 840 91**

Base for surface mounting, incl. rubber seal — **975 845 01**

Adapter for single hole mounting — **975 845 03**

TECHNICAL DIAGRAMS

see page 235

845 Accessories for Signal Tower Kombi*SIGN* 50

ORDER SPECIFICATIONS:

Indication Board

- Indication Board for one to five modules
- Simple mounting onto signal tower tube
- Ample space for written information
- Simply break off unwanted segments

Dimensions of indication board (W x H):	153 x 345 mm
Surface area per section (W x H):	c. 140 x 50 mm
Material:	PMMA
Assembly:	Indication board (5 sections) incl. mounting material
Mounting:	Fixing only possible on 25 mm diameter tube
Indication board	**960 000 05**

LED bulb BA 15d,
Total length max. 42 mm

Voltage Current consumpt.	24 V ≅ < 45 mA	115 V ~ < 15 mA	230 V ~ < 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

Bulb BA 15d,
Total length max. 42 mm

12 V, 5 Watt	**955 840 34**
24 V, 5 Watt	**955 840 35**
30 V, 5 Watt	**955 840 32**
115 V, 5 Watt	**955 840 57**
230 V, 5 Watt	**955 840 38**

TECHNICAL DIAGRAMS

see page 242 + 243

WERMA SIGNALTECHNIK

845 AS-Interface Element for Kombi*SIGN* 50

The Kombi*SIGN* 50 Signal Tower with AS-Interface Element is capable of total communication: Through simple integration of an AS-Interface Element the actuators are connected to the networking system Actuator-Sensor-Interface – this considerably reduces complex wiring. This element is mounted as the first tier of the individual signal tower directly on top of the terminal element. (Further Information see page 258).

TECHNICAL SPECIFICATIONS:

	AS-Interface Element with additional external voltage
Number of signal elements	max. 4
Type of signal elements	Permanent light elements LED elements Buzzer elements
IO-Code	8
ID-Code	F
Power supply	via bus conduction
Operating voltage	18.5 V ... 31.6 V
Current consumption Imax	50 mA
Polarity reversal protection	integrated
Watchdog	integrated
Outputs	4, relays
On-load voltage	additional external voltage: 10 V...30 V = 10 V...230 V ~
Current carrying cap. Σ Imax	1.5 A
Short circuit/overload pro.	fuse M 1.6 A

ORDER SPECIFICATIONS AS-INTERFACE ELEMENT KOMBI*SIGN* 50:

AS-Interface Element with add. external voltage	**845 800 68**

TECHNICAL DIAGRAMS

see page 235

Overview of Kombi*SIGN* Accessories

Kombi*SIGN* 50

Order no.

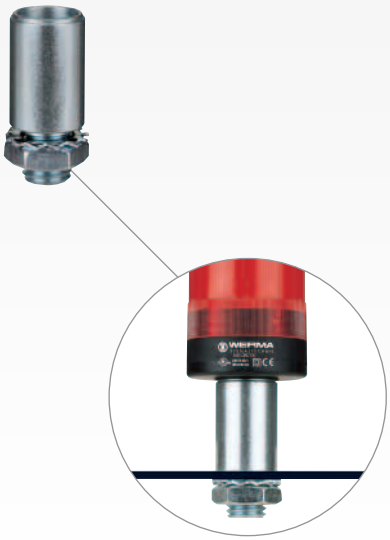
975 845 01 Base for surface mounting, incl. rubber seal

Order no.

975 845 02 Bracket for wall mounting

Order no.

975 845 03 Adapter for single hole mounting



Kombi*SIGN* 50, 70, 71

Order no.

975 840 01 Contact box for cable exit at side, with mounting material and seal, cable gland M 16 x 1,5

Order no.

975 840 04 Contact box with magnetic base and cable exit at side cable gland M 16 x 1,5

Order no.

960 000 01 Bracket for tube mounting, incl. cable gland M16 x 1.5

Order no.

960 000 14 Bracket for base mounting, with concealed cable entry, incl. rubber seals

LED bulb BA 15d
Total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumption	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

Bulb BA 15d,
Total length max. 42 mm

955 840 34	12 V, 5 Watt
955 840 35	24 V, 5 Watt
955 840 32	30 V, 5 Watt
955 840 57	115 V, 5 Watt
955 840 38	230 V, 5 Watt

Order no.
960 000 05

Indication board (for tube mounting)

TECHNICAL DIAGRAMS see pages 215 + 233 + 235

WERMA SIGNALTECHNIK

Overview of Kombi*SIGN* Accessories

Kombi*SIGN* 70, 71

Order no.
975 840 90 Base for tube mounting, ø 25 mm, plastic, incl. rubber seal

Order no.
975 840 91 Base for tube ø 25 mm, metal, incl. rubber seal

Order no.
Tube ø 25 mm, all anodized aluminium

975 845 10	100 mm long
975 840 25	250 mm long
975 840 40	400 mm long
975 840 60	600 mm long
975 840 80	800 mm long
975 840 03	1000 mm long

Order no. **960 000 18** Tube with clamp, ø 25 mm, 250 mm long, incl. cable gland

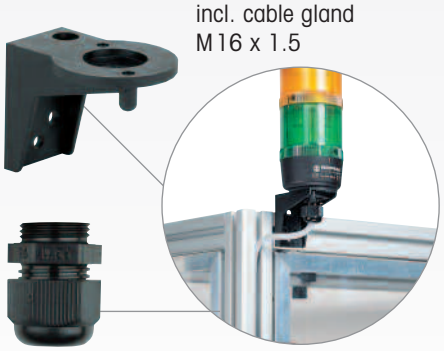
Order no.
975 840 85 Bracket for 1-sided mounting, incl. rubber seals

Order no.
975 840 86 Bracket for 2-sided mounting, incl. rubber seals

Order no.
975 840 10 Base with integrated tube, ø 25 mm, 110 mm long, plastic, incl. rubber seal

Order no.
975 840 02 Adapter for tube mounting ø 25 mm / 1/2" NPT thread

Order no.
960 000 02 Bracket for surface mounting incl. cable gland M16 x 1.5



Order no.
960 000 04 Cable gland for surface mounting, M16x1.5

Order no.

Info transparencies:

975 840 49	neutral
975 840 50	number "0"
975 840 51	number "1"
975 840 52	number "2"
975 840 53	number "3"

Order no.

975 840 54	number "4"
975 840 55	number "5"
975 840 56	number "6"
975 840 57	number "7"
975 840 58	number "8"
975 840 59	number "9"

Order no.

975 840 92	number "10"
975 840 62	arrow

TECHNICAL DIAGRAMS see pages 215 + 233

deSIGN 42

deSIGN 42 wins Red Dot Design Award 2005

The red dot award for superlative design quality expressed in form, function and innovation was presented to WERMA for the **deSIGN 42** – in the category Trade and Industry

The red dot design award is one of the most prestigious international design competitions. A jury of experts has conferred awards for outstanding contributions to industrial design, each setting new standards in its respective field, since 1955. The red dot is prized as one of the most desirable international trophies.

- LED Signal Tower in award-winning metal design
- Winner of the red dot design award for superlative design quality
- Clear domes ensure signalling effect even in direct sunlight
- LED Permanent light elements have a life duration of up to 50,000 hrs
- Three colour combinations
- Can be operated with a PLC control system

reddot design award
winner 2005

WERMA SIGNALTECHNIK

694 deSIGN 42

- High-quality stainless steel housing
- Award-winning design
- LED Permanent light with a life duration of up to 50,000 hrs
- Clear domes ensure signalling effect even in direct sunlight
- Can be operated with PLC control system
- Three colour combinations

reddot design award
winner 2005

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	2 tier: 42.4 x 220 mm 3 tier: 42.4 x 254 mm
Housing:	Stainless steel, brushed
Fixing:	Installation mounting for ø 22.5 mm (M 22 x 1.5 mm)
Connection:	cable, 2 m long, included in assembly
Operating voltage:	24 V DC
Current consumption:	40 mA per tier
Starting current:	< 500 mA can be triggered via PLC

ORDER SPECIFICATIONS:

Life duration up to 50,000 hrs

		Order no.	Connection
2 tier	red/green	**694 010 55**	cable
	red/yellow	**694 020 55**	cable
3 tier	red/yellow/green	**694 000 55**	cable

ACCESSORIES:

Surface housing single	**975 109 02**

TECHNICAL DIAGRAMS

see page 219

2 tier 3 tier

CE +50°C -20°C 600 g 650 g IP65 PLC

KOMPAKT

The Complete Signal Tower Solution

LED technology as a light source for signal towers has proven itself for WERMA a million times over. The advantages such as durability and reduced maintenance are well-known. Given a life duration of up to 70,000 hours it is no longer necessary to change elements or bulbs.

The Kompakt 36 is also available in a ready-to-use version with the widely used M12 plug. This feature allows the tower to be removed during transportation and easily remounted onto the machine with a simple hand movement.

On the basis of these clear, proven advantages WERMA presents the pre-assembled LED signal tower KOMPAKT.

It is available in the most common signal combinations and is an especially cost-effective LED solution from the WERMA signal tower programme.

Two sizes offer the fitting design for every application:

The Kompakt 36 with 36 mm diameter is specially intended for small pieces of equipment and machinery.

The Kompakt 71 covers the wide range of applications in the industrial sector thanks to its well-established 70 mm diameter.

Simplified ordering

As the KOMPAKT LED Signal Towers are already assembled the order process could not be more straightforward – the complete tower can be ordered with just one number.

High protection rating IP 65

The high-quality housing with high protection rating IP65 ensures that the KOMPAKT also withstands applications under rough conditions.

ORDER SPECIFICATIONS:

		Order no.
2 tier	red/green	693 010 55
	red/yellow	**693 020 55**
	red/green	693 510 55
	red/yellow	693 520 55
3 tier	red/yellow/green	693 000 55
	red/yellow/green	693 500 55

WERMA SIGNALTECHNIK

693 LED Signal Tower Kompakt 36

- Completely pre-assembled
- Three colour combinations
- LED Permanent light
- 36 mm diameter
- Life duration up to 50,000 hrs
- 24 V DC
- Can be operated with PLC control system
- Available with user-friendly plug connection

Base with tube (accessory)

Bracket (accessory)

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	2 tier: 36 x 113 mm 3 tier: 36 x 147 mm
Housing:	Housing parts PC
Fixing:	Surface mounting Tube mounting Bracket mounting
Connection:	cable, 2 m long, M 12 plug, 4 pin each with adapter M 25 / M 20 for fixing incl. rubber seal
Operating voltage:	24 V DC
Current consumption:	40 mA per tier
Starting current:	< 500 mA can be triggered via PLC

Life duration up to 50,000 hrs

ORDER SPECIFICATIONS:

		Order no.	Connection
2 tier	red/green	**693 010 55**	cable
	red/yellow	**693 020 55**	cable
	red/green	**693 510 55**	plug
	red/yellow	**693 520 55**	plug
3 tier	red/yellow/green	**693 000 55**	cable
	red/yellow/green	**693 500 55**	plug

ACCESSORIES:

Fixing bracket	**960 693 01**
To maintain IP 65 the cable gland 960 693 02 must be fitted to the cable version.	
Cable gland M 20 x 1.5 mm	**960 693 02**
Base with integrated tube M 25 x 1.5 mm incl. rubber seals	**960 693 03**
M 12 counter-plug with 5 m cable	**960 693 05**

TECHNICAL DIAGRAMS

see page 218

2 tier 3 tier

693 LED Signal Tower Kompakt 36 in silver finish

- Coloured Domes
- Plastic housing with aesthetic silver coating
- LED Permanent light elements with a life duration of up to 50,000 hrs
- 36 mm diameter
- Simplified ordering through pre-assembled tower
- Can be operated with PLC control system
- Available with user-friendly plug connection

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	2 tier: 36 x 113 mm 3 tier: 36 x 147 mm
Housing:	Housing parts PC
Fixing:	Surface mounting Tube mounting Bracket mounting
Connection:	Cable, 2 m long, M 12 plug, each with adapter M 25 / M 20 for fixing incl. rubber seal
Operating voltage:	24 V DC
Current consumption:	40 mA per tier
Starting current:	< 500 mA can be triggered via PLC

Life duration up to 50,000 hrs

Base with tube (accessory)

ORDER SECIFICATIONS:

		Order no.	Connection
2 tier	red/green	**693 050 55**	cable
	red/yellow	**693 060 55**	cable
	red/green	**693 550 55**	plug
	red/yellow	**693 560 55**	plug
3 tier	red/yellow/green	**693 040 55**	cable
	red/yellow/green	**693 540 55**	plug

ACCESSORIES:

Fixing bracket, black	**960 693 01**
To maintain IP 65 the cable gland 960 693 02 must be fitted to the cable version.	
Cable gland M 20 x 1.5 mm	**960 693 02**
Base with integrated tube M 25 x 1.5 mm incl. rubber seals, silver	**960 693 06**
M 12 counter-plug with 5 m cable	**960 693 05**

TECHNICAL DIAGRAMS

see page 218

2 tier 3 tier

WERMA SIGNALTECHNIK

693 LED Signal Tower Kompakt 36 in silver finish

- Clear domes ensure signal effect even in direct sunlight
- Plastic housing with aesthetic silver coating
- LED Permanent light elements with a life duration of up to 50,000 hrs
- 36 mm diameter
- Simplified ordering through pre-assembled tower
- Can be operated with PLC control system
- Available with user-friendly plug connection

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	2 tier: 36 x 113 mm 3 tier: 36 x 147 mm
Housing:	Housing parts PC
Fixing:	Surface mounting Tube mounting Bracket mounting
Connection:	Cable, 2 m long, M 12 plug, each with adapter M 25 / M 20 for fixing incl. rubber seal
Operating voltage:	24 V DC
Current consumption:	40 mA per tier
Starting current:	< 500 mA can be triggered via PLC

Life duration up to 50,000 hrs

Base with tube (accessory)

ORDER SECIFICATIONS:

		Order no.	Connection
2 tier	red/green	**693 080 55**	cable
	red/yellow	**693 090 55**	cable
	red/green	**693 580 55**	plug
	red/yellow	**693 590 55**	plug
3 tier	red/yellow/green	**693 070 55**	cable
	red/yellow/green	**693 570 55**	plug

ACCESSORIES:

Fixing bracket, black	**960 693 01**
To maintain IP 65 the cable gland 960 693 02 must be fitted to the cable version.	
Cable gland M 20 x 1.5 mm	**960 693 02**
Base with integrated tube M 25 x 1.5 mm incl. rubber seals, silver	**960 693 06**
M 12 counter-plug with 5 m cable	**960 693 05**

TECHNICAL DIAGRAMS

see page 218

697 LED Signal Tower Kompakt 71

- Completely pre-assembled
- Three colour combinations
- LED Permanent light
- 70 mm diameter
- Life duration up to 70,000 hrs
- 24 V DC
- Can be operated with PLC control system
- Also available with USB Interface

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	2 tier: 70 x 138 mm 3 tier: 70 x 172 mm
Housing:	Housing parts PC Terminal element: PA fibreglass, high-impact
Fixing:	Base / Bracket mounting Tube mounting
Connection:	Screwable connection max 2.5 mm² Contact protection according to VDE
Cable entry:	Cable diameter max. 14 mm
Operating voltage:	24 V DC
Current consumption:	40 mA per tier
Starting current:	< 500 mA can be triggered via PLC

Life duration up to 70,000 hrs

Base with tube (accessory)

ORDER SPECIFICATIONS:

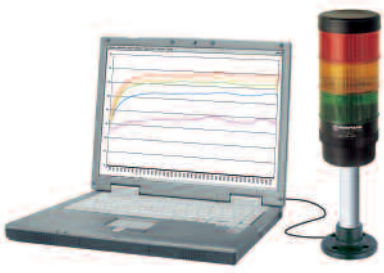
		Order no.	Mounting
2 tier	red/green	**697 010 55**	base / bracket mounting
	red/yellow	**697 020 55**	base / bracket mounting
	red/green	**697 410 55**	tube mounting
	red/yellow	**697 420 55**	tube mounting
3 tier	red/yellow/green	**697 000 55**	base / bracket mounting
	red/yellow/green	**697 400 55**	tube mounting

Kompakt 71 (3 tier) available on request with negative logic.

Kompakt
with USB Interface
Completely pre-assembled tower with integrated USB terminal element.
No additional voltage supply or hardware is required.

red/yellow/green	**697 430 53**	Tube mounting

Technical specifications and accessories see page 50.
Further information see page 30.



Kompakt with USB Interface
(Assembly without laptop and accessories)

TECHNICAL DIAGRAMS

see page 220

2 tier 3 tier

CE +50°C -20°C 170 g 200 g IP65 PLC

WERMA SIGNALTECHNIK

Accessories for Kompakt 71

ORDER SPECIFICATIONS:

Contact box for cable exit at side, with mounting material	**975 840 01**
Contact box with magnetic base and cable exit at side	**975 840 04**
Bracket for tube mounting incl. cable gland	**960 000 01**
Bracket for surface mounting, with cable gland	**960 000 02**
Bracket for base mounting, with concealed cable entry, incl. rubber seals	**960 000 14**
Bracket for 1-sided mounting, incl. rubber seals	**975 840 85**
Bracket for 2-sided mounting, incl. rubber seals	**975 840 86**
Tube with clamp ø 25 mm, 250 mm long, incl. cable gland	**960 000 18**
Tube ø 25 mm, all anodized aluminium	
100 mm long	**975 845 10**
250 mm long	**975 840 25**
400 mm long	**975 840 40**
600 mm long	**975 840 60**
800 mm long	**975 840 80**
1000 mm long	**975 840 03**
Base for tube mounting ø 25 mm, plastic, incl. rubber seal (not for 697 430 53)	**975 840 90**
Base for tube mounting ø 25 mm, metal, incl. rubber seal	**975 840 91**
Base with integrated tube, ø 25 mm, 110 mm long, plastic, incl. rubber seal	**975 840 10**
Adapter for tube mounting ø 25 mm / 1/2″ NPT thread	**975 840 02**
Cable gland for surface mounting M 16 x 1.5	**960 000 04**

TECHNICAL DIAGRAMS

see page 250

Optical Signal Devices –

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Overview Installation Beacons

	Installation Beacons	
LED Signal Beacons	**207** Page 76	**801** Page 80
	230 Page 72	**816** Page 82
	230 Economy Page 73	
	231 Page 74	
	231 Economy Page 74	
Permanent Beacons	**206** Page 76	**800** Page 80
	216 Page 78	**815** Page 82
Flashing Beacons	**208** Page 76	**802** Page 80
	232 Page 75	**817** Page 82
		898 Page 84
Bulbs	**LED Bulbs** Pages 126 + 127	**Bulb Overview** Pages 128 + 129

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Page 82

Further information about “Optical Signal Devices” can be found in the chapter “Tech-Talk” beginning on page 16.

Optical Signal Devices –

WERMA Installation signal beacons

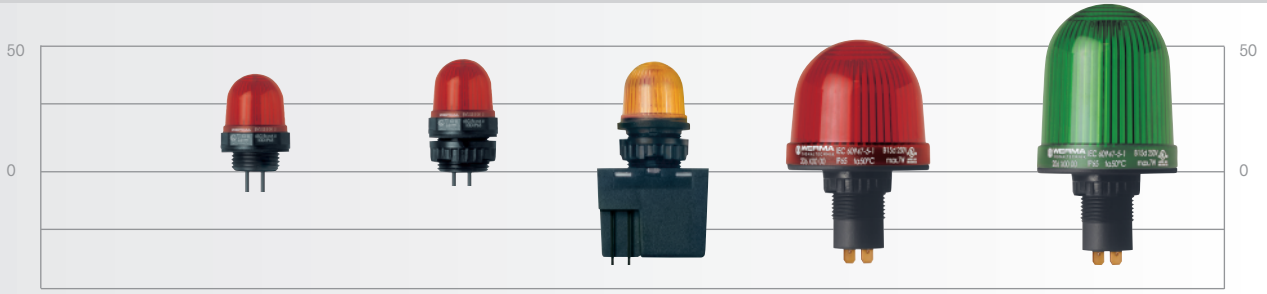
Installation signal beacons are designed for mounting in drill holes. A characteristic of this type of signal beacon is the rear fixture using a central nut.

Features

- Large variety of versions: Available as permanent, blinking, flashing or LED light beacons
- IP 65 for indoor and outdoor applications
- Modern design
- Beacons available in five colours
- Beacon diameter between 36 and 150 mm
- Available in three thread diameters

SIZES

COMPARISON OF WERMA INSTALLATION BEACONS



Series	230	231	232	206	216
Thread	M 20	M 22	M 22	M 22	M 22
Ø	28.7 mm	28.7 mm	29 mm	57 mm	57 mm
Height	38.5 mm	46 mm	43 mm	53 mm	69 mm

COMPARISON OF WERMA INSTALLATION BEACONS

Series	800	815	898
Thread	PG 29	PG 29	PG 29
Ø	58 mm	68 mm	150 mm
Height	85 mm	96.5 mm	134 mm

WERMA SIGNALTECHNIK

Variety of light signals

Installation signal beacons from WERMA assist in indicating process conditions, risks and imminent dangers in our modern production and information society, clearly and in good time.

The urgency of the required course of action can be indicated by the colour as well as the type and duration of the signal. As a basic principle, the colours red, yellow, green, blue and clear are employed. The available light signals using the installation signal beacons from WERMA range from a permanent light and a long life LED permanent light to an attention grabbing flashing light.

Permanent light and LED Permanent light

With the assistance of a permanent light or an LED permanent light the operator is made aware of a specific condition or is instructed to carry out a certain course of action. For safety reasons signal beacons are increasingly equipped with light emitting diodes. The failure of optical signal devices is significantly reduced as a result of the longer life duration of LEDs. Furthermore, LEDs offer a range of advantages compared to conventional light bulbs, for example lower current consumption, greater resistance to shocks, vibrations and other mechanical stress.

WERMA provides installation signal beacons with conventional bulbs as well as with long-life LED technology.

Flashing Light

The deployment of a flashing signal can generate even more attention than to a continuous light. The reason for this is to be found in the very short flash duration.

Inside each Xenon flashing beacon there is a capacitor which stores electrical energy. Within the space of a few milliseconds this energy is discharged within the flash tube, generating a very intense light impulse.

The life duration of a flash tube is heavily dependent on the respective load. The average life duration in permanent operation is 4 x 10^6 flashes.

230 LED Installation Beacon

- LED Permanent beacon with M 20 thread for applications such as position and cable operated switches
- Extremely high light intensity
- Modern Chip-On-Board technology
- Ideal for installation in limited space due to short thread
- High protection rating IP 65 for indoor and outdoor applications

TECHNICAL SPECIFICATIONS:

Housing:	PC/ABS-Blend
Dome:	PC, transparent
Connection:	2 wires, c. 115 mm long
Fixing:	Installation mounting for Ø 20.5 mm (M 20 x 1.5 mm)
Dimensions (Diameter x Height):	28.7 mm x 38.5 mm
Operating voltage:	24 V =, 115 V ~, 230 V ~
Starting current:	< 0.5 A at 24 V
Current consumption:	80 mA at 12 V 45 mA at 24 V 15 mA at 115 V 20 mA at 230 V

Seal included in assembly.

Life duration up to 100,000 hrs

The LED Installation Beacon 230 can for example be used in applications with cable operated switches...

ORDER SPECIFICATIONS:

	12 V =	24 V =	115 V ~	230 V ~
red	**230 100 54**	**230 100 55**	**230 100 67**	**230 100 68**
yellow	**230 300 54**	**230 300 55**	**230 300 67**	**230 300 68**
clear		**230 400 55**		

Further colours and voltages on request.

TECHNICAL DIAGRAMS

see page 207

...or position switch devices

Mainly sidewards illumination

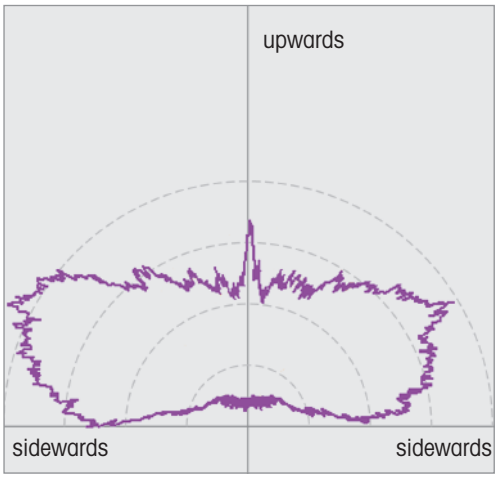


Illustration of the light distribution for the LED Installation Beacon 230

M 20 x 1.5 mm

Ex version now also available (page 184)

WERMA SIGNALTECHNIK

230 Economy LED Installation Beacon

View from above

- **Competitively priced LED beacon**
- **New LED technology with upward illumination**
- **LED Permanent Beacon with M 20 thread for the position and cable operated switches**
- **Ideal for installation in limited space due to short thread**
- **High protection rating IP 65 for indoor and outdoor applications**

TECHNICAL SPECIFICATIONS:

Housing:	PC/ABS-Blend
Dome:	PC, transparent
Connection:	2 wires, c. 115 mm long
Fixing:	Installation mounting for Ø 20.5 mm (M 20 x 1.5 mm)
Dimensions (Diameter x Height):	28.7 mm x 38.5 mm
Operating voltage:	24 V =
Starting current:	< 0.5 A
Current consumption:	30 mA

Life duration up to 100,000 hrs

Seal included in assembly.

ORDER SPECIFICATIONS:

	24 V =
red	**230 104 55**
yellow	**230 304 55**
clear	**230 404 55**

TECHNICAL DIAGRAMS

see page 207

Upward illumination

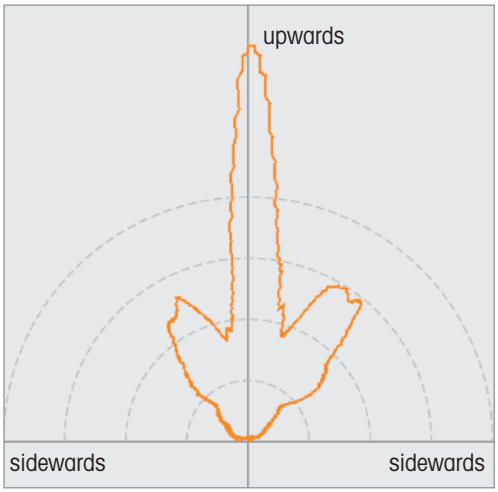


Illustration of the light distribution for the Economy LED Installation Beacon 230

M 20 x 1.5 mm

231 LED Installation Beacon

- LED Permanent Beacon with M 22 thread for the control panel/switch gear programme
- Extremely high light intensity
- Modern Chip-On-Board technology
- High protection rating IP 65 for indoor and outdoor applications

Mainly sidewards illumination

Housing:	PC/ABS-Blend
Dome:	PC, transparent
Connection:	2 wires, c. 105 mm long
Fixing:	Installation mounting for Ø 22.5 mm (M 22 x 1.5 mm)
Dimensions (Ø x Height):	28,7 mm x 46 mm
Operating voltage:	24 V =, 115 V ~, 230 V ~
Starting current:	< 0.5 A at 24 V
Current consumption:	80 mA at 12 V, 45 mA at 24 V, 15 mA at 115 V, 20 mA at 230 V

Life duration up to 100,000 hrs

Nut and seal included in assembly.

ORDER SPECIFICATIONS:

	12 V =	24 V =	115 V ~	230 V ~
red	**231 100 54**	**231 100 55**	**231 100 67**	**231 100 68**
green	**231 200 54**	**231 200 55**	**231 200 67**	**231 200 68**
yellow	**231 300 54**	**231 300 55**	**231 300 67**	**231 300 68**
clear	**231 400 54**	**231 400 55**	**231 400 67**	**231 400 68**
blue	**231 500 54**	**231 500 55**	**231 500 67**	**231 500 68**

TECHNICAL DIAGRAMS

see page 207

M 22 x 1.5 mm

Ex version now also available (page 185)

231 Economy LED Installation Beacon

- Competitively priced LED beacon
- New LED technology with upward illumination
- LED Permanent Beacon with M22 thread for the control panel/switch gear programme
- High protection rating IP 65 for indoor and outdoor applications

Housing:	PC/ABS-Blend
Dome:	PC, transparent
Connection:	2 wires, c. 105 mm long
Fixing:	Installation mounting for Ø 2.,5 mm (M 22 x 1.5 mm)
Dimesions (Diameter x Height):	28.7 mm x 46 mm
Operating voltage:	24 V =
Starting current:	< 0,5 A
Current consumption:	30 mA

Life duration up to 100,000 hrs

Nut and seal included in assembly. Technical details see page 73.

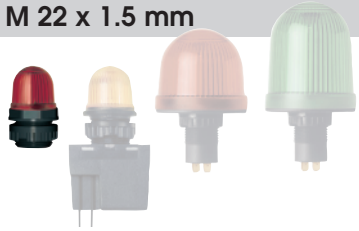
ORDER SPECIFICATIONS:

	24 V =
red	**231 104 55**
green	**231 204 55**
yellow	**231 304 55**
clear	**231 404 55**
blue	**231 504 55**

TECHNICAL DIAGRAMS

see page 207

M 22 x 1.5 mm



WERMA SIGNALTECHNIK

232 Installation Flashing Beacon

- Extremely bright Xenon Flash
- Multivoltage Flashing Beacon (20 - 72 V ≅)
- Simple installation by clicking the beacon onto the housing
- 22 mm installation diameter for the control panel/switch gear programme
- Weatherproof thanks to high protection rating IP 65

TECHNICAL SPECIFICATIONS:

Housing:	PC/ABS-Blend
Dome:	PC, transparent
Connection:	2 wires, c. 600 mm long
Fixing:	Installation mounting for Ø 22.5 mm (M 22 x 1.5 mm) with anti-twist device
Dimensions (Diameter x Height):	29 mm x 28 mm
Flash frequency:	1.5 Hz.
Flash energy:	1 Ws
Life duration:	4 x 10^6 flashes
Operating voltage:	24 V ≅ ,115 V ~ ,230 V ~
Starting current:	500 mA at 24 V ≅
Current consumption:	80 mA at 24 V ≅ 30 mA at 115 V ~ 20 mA at 230 V ~

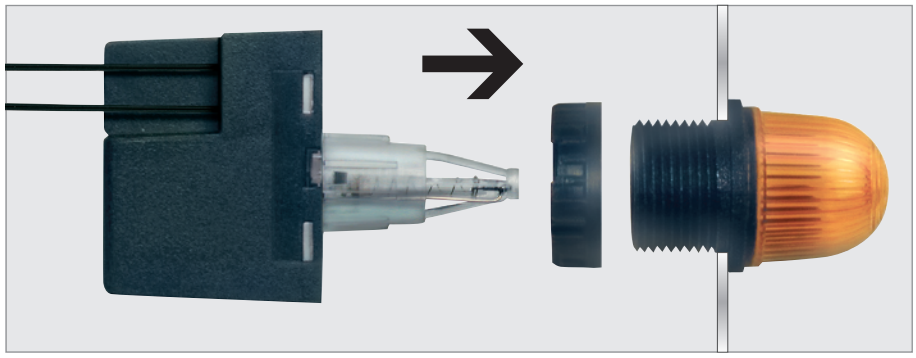
Nut and seal included in assembly.

ORDER SPECIFICATIONS:

	24 V ≅ (10 - 100 V =) (20 - 72 V ≈)	115 V ~	230 V ~
red	**232 100 55**	**232 100 67**	**232 100 68**
yellow	**232 300 55**	**232 300 67**	**232 300 68**

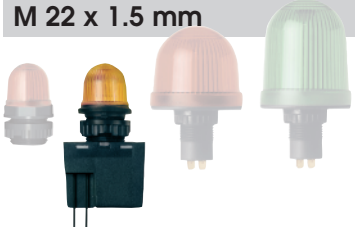
TECHNICAL DIAGRAMS

see page 207



Simple mounting thanks to click-on electronics module

M 22 x 1.5 mm



206/207/208 Installation Permanent/LED/Flashing

- High protection rating IP 65 – for use in outdoor applications
- Optimised illumination
- 360° visibility
- Simple connection by means of 6.3 mm spades
- Bulb change via removal of dome
- Suitable for use in the 22 mm standard control panel/switch gear programme

206

207/208

TECHNICAL SPECIFICATIONS:

Housing:	PA fibreglass, high-impact
Dome:	PC, transparent (206) PC, transparent; Ring: PC (207/208)
Connection:	Spades 6.3 x 0.8 mm Finger-proof model according to BGV A2, when used with insulated spades

Nut and seal included in assembly.

PERMANENT LIGHT	**206**
Fixing:	Installation mounting for Ø 22.5 mm (M 22 x 1.5 mm) with anti-twist device
Dimensions (Diameter x Height):	57 mm x 53 mm
Operating voltage:	max. 48 V
Bulb socket:	B 15 d 5 Watt max.
Bulb change:	via removal of dome

Bulb not included in assembly.

LED PERMANENT LIGHT	**207**
Fixing:	Installation mounting for Ø 22.5 mm (M 22 x 1.5 mm) with anti-twist device
Dimensions (Diameter x Height):	57 mm x 69 mm
Starting current:	< 0.5 A (at 24 V)
Operating voltage:	24 V ≅ ,115 V ~ , 230 V ~
Current consumption:	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V

Life duration up to 100,000 hrs

FLASHING LIGHT	**208**
Fixing:	Installation mounting for Ø 22.5 mm (M 22 x 1.5 mm) with anti-twist device
Dimensions (Diameter x Height):	57 mm x 69 mm
Flash frequency:	c. 0.75 Hz
Flash energy:	1 Ws
Life duration:	4 x 10^6 flashes
Operating voltage:	24 V = ,115 V ~ , 230 V ~
Current consumption:	100 mA at 24 V 25 mA at 115 V 30 mA at 230 V

M 22 x 1.5 mm

207/208 206 207 208

CE 45 g 55 g 75 g IP 65 +50°C -20°C 1 Ws c UL US

WERMA SIGNALTECHNIK

206/207/208 Installation Permanent/LED/Flashing

Bulb change via removal of dome
(LED bulb as accessory)

ORDER SPECIFICATIONS:

Permanent light	12-48 V		
red	**206 100 00**		
green	**206 200 00**		
yellow	**206 300 00**		
clear	**206 400 00**		
blue	**206 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**207 100 75**	**207 100 67**	**207 100 68**
green	**207 200 75**	**207 200 67**	**207 200 68**
yellow	**207 300 75**	**207 300 67**	**207 300 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**208 100 55**	**208 100 67**	**208 100 68**
yellow	**208 300 55**	**208 300 67**	**208 300 68**

Further colours and voltages on request.

ACCESSORIES:

Bulb BA 15d
Total length max. 42 mm

Voltage	12 V, 5 W	24 V, 5 W	30 V, 5 W
	955 840 34	**955 840 35**	**955 840 32**

LED bulb BA 15d **(only for permanent beacons 206)**
Total length max. 42 mm

Voltage	24 V ≅
Current consumpt.	< 45 mA
red	**956 100 75**
green	**956 200 75**
yellow	**956 300 75**
white	**956 400 75**
blue	**956 500 75**

TECHNICAL DIAGRAMS

see page 203 + 204

216 Installation Permanent Beacon

- High protection rating IP 65 – for use in outdoor applications
- Optimised illumination
- 360° visibility
- Simple connection by means of 6.3 mm spades
- Bulb change via removal of dome
- Suitable for use in the 22 mm standard control panel/switch gear programme

216

TECHNICAL SPECIFICATIONS:

Housing:	PA fibreglass, high-impact
Dome:	PC, transparent
Connection:	Spades 6.3 mm x 0.8 mm Finger-proof model according to BGV A2, when used with insulated spades
PERMANENT LIGHT	**216**
Fixing:	Installation mounting for Ø22.5 mm (M 22 x 1.5 mm) with anti-twist device
Dimensions (Diameter x Height):	57 mm x 69 mm
Operating voltage:	max. 48 V
Bulb socket:	B 15d, 7 Watt max.
Bulb change:	via removal of dome

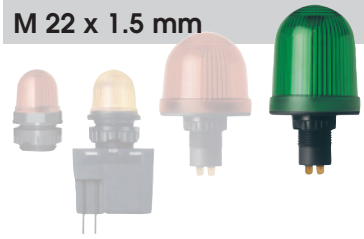
Nut and seal included in assembly. Bulb not included in assembly.

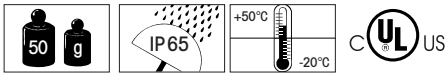
TECHNICAL DIAGRAMS

see page 205

Bulb change via removal of dome (LED bulb as accessory)

M 22 x 1.5 mm





WERMA SIGNALTECHNIK

216 Installation Permanent Beacon

ORDER SPECIFICATIONS:

Permanent light	12-48 V
red	**216 100 00**
green	**216 200 00**
yellow	**216 300 00**
clear	**216 400 00**
blue	**216 500 00**

ACCESSORIES:

Bulb BA 15d
Total length max. 52 mm

Voltage	12 V (7 W)	24 V (7 W)	30 V (5 W)
	955 015 34	**955 015 35**	**955 840 32**

LED bulb BA 15d
Total length max. 42 mm

Voltage	24 V ≅
Current consumpt.	< 45 mA
red	**956 100 75**
green	**956 200 75**
yellow	**956 300 75**
white	**956 400 75**
blue	**956 500 75**

800/801/802 Installation Permanent/LED/Flashing

- High protection rating IP 65
- With anti-twist device (as accessory)
- Small shape with low dome
- Available with tube adapter as free-standing beacon
- Tamper-proof – bulb change via rear access with bayonet mechanism

Tube adapter as accessory

Surface housing as accessory

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	58 mm x 85 mm
Housing:	PC/ABS-Blend Socket: PA fibreglass, high-impact
Dome:	PC, transparent
Fixing:	Installation mounting für ø 37 mm (PG 29)
Connection:	Screwable connection max. 2.5 mm² Pull relief, Contact protection according to VDE, flex radial or axial laid
PERMANENT LIGHT	**800**
Operating voltage:	max. 250 V
Bulb socket:	B 15 d, 7 Watt max.
Bulb change:	via rear access with bayonet mechanism
Bulb not included in assembly.	
LED PERMANENT LIGHT	**801**
Starting current:	< 0.5 A at 24 V
Operating voltage:	24 V ≅ ,115 V ~ , 230 V ~
Current consumption:	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V
FLASHING LIGHT	**802**
Flash frequency:	0.75 Hz
Flash energy:	1 Ws
Life duration:	4 x 10^6 flashes
Operating voltage:	24 V = ,115 V ~ , 230 V ~
Current consumption:	100 mA at 24 V 20 mA at 115 V 30 mA at 230 V

Life duration up to 100,000 hrs

PG 29

800 801 802

59 g | 69 g | 85 g | IP 65 | +50°C -20°C | 1 Ws

WERMA SIGNALTECHNIK

800/801/802 Installation Permanent/LED/Flashing

Bulb change via rear access with bayonet mechanism

ORDER SPECIFICATIONS:

Permanent light	12-240 V		
red	**800 100 00**		
green	**800 200 00**		
yellow	**800 300 00**		
clear	**800 400 00**		
blue	**800 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**801 100 75**	**801 100 67**	**801 100 68**
green	**801 200 75**	**801 200 67**	**801 200 68**
yellow	**801 300 75**	**801 300 67**	**801 300 68**
clear	**801 400 75**	**801 400 67**	**801 400 68**
blue	**801 500 75**	**801 500 67**	**801 500 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**802 100 55**	**802 100 67**	**802 100 68**
yellow	**802 300 55**	**802 300 67**	**802 300 68**
blue	**802 500 55**		

Further colours and voltages on request.

ACCESSORIES:

Bulb BA 15d, 5 W
Total length max. 42 mm

Voltages	12 V	24 V	30 V	115 V	230 V
	955 840 34	**955 840 35**	**955 840 32**	**955 840 57**	**955 840 38**

Tube adapter	**975 812 01**
Base with integrated tube, ø 25 mm, 110 mm long, plastic	**975 840 10**
Base for tube mounting	**975 840 90**
Base for surface mounting	**975 812 02**
Tube ø 25mm, all anodized aluminium	
100 mm long	**975 845 10**
250 mm long	**975 840 25**
400 mm long	**975 840 40**
Anti-twist device	**975 815 22**
Surface housing IP 65	
for 1 beacon	**975 815 03**
for 2 beacons	**975 815 07**
for 3 beacons	**975 815 08**

For further surface housings and detailed description see page 148.

TECHNICAL DIAGRAMS

see page 228

815/816/817 Installation Permanent/LED/Flashing

- Vandal-proof construction withstands every mechanical and natural challenge
- High protection rating IP 65
- High impact polycarbonate dome (up to 20 Joules)
- Tamper-proof – bulb change via rear access with bayonet mechanism

Tube adapter as accessory

Surface housing as accessory

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	68 mm x 96,5 mm
Housing:	PC/ABS-Blend Socket: PA fibreglass, high-impact
Dome:	PC transparent Shock resistance 20 Joules according to EN 50014
Fixing:	Installation mounting for ø 37 mm (PG 29)
Connection:	Screwable connection max. 2.5 mm² Pull relief, Contact protection according to VDE, flex radial or axial laid

PERMANENT LIGHT 815

Operating voltage:	max. 250 V
Bulb socket:	B 15d, 10 Watt max.
Bulb change:	via rear access with bayonet mechanism

Bulb not included in assembly.

LED VERSION 816

Life duration up to 100,000 hrs

Permanent light:	24 V ≅, 115 V ~, 230 V ~		
Blinking light:	24 V ≅, Blink frequency c. 1 Hz		
Rotating light:	24 V ≅, Rotating frequency c. 120 r.p.m.		
Current consumption:		24 V =	115 V ~ 230 V ~
	Permanent light	45 mA	25 mA 25 mA
	Blinking light	25 mA	
	Rotating light	70 mA	
Starting current:	< 0.5 A at 24 V		

FLASHING LIGHT 817

Flash frequency:	c. 1 Hz	
Flash energy:	2 Ws	
Life duration:	4 x 10^6 flashes	
Starting current:	< 0.5 A	at 24 V =
	< 0.5 A	at 115 V ~
	< 0.25 A	at 230 V ~
Operating voltage:	12 V =, 24 V =, 115 V ~, 230 V ~	
Current consumption:	< 195 mA	at 12 V =
	125 mA	at 24 V =
	20 mA	at 115 V ~
	35 mA	at 230 V ~

PG 29

c UL us CE

815 817 815 816/817

WERMA SIGNALTECHNIK

815/816/817 Installation Permanent/LED/Flashing

Vandal-proof construction

ORDER SPECIFICATIONS:

Permanent light	12 - 240 V			
red	**815 100 00**			
green	**815 200 00**			
yellow	**815 300 00**			
clear	**815 400 00**			
blue	**815 500 00**			
LED Permanent light		24 V ≅	115 V ~	230 V ~
red		**816 100 55**	**816 100 67**	**816 100 68**
green		**816 200 55**	**816 200 67**	**816 200 68**
yellow		**816 300 55**	**816 300 67**	**816 300 68**
clear		**816 400 55**	**816 400 67**	**816 400 68**
LED Blinking light		24 V ≅		
red		**816 110 55**		
yellow		**816 310 55**		
LED Rotating light		24 V ≅		
red		**816 130 55**		
yellow		**816 330 55**		
Flashing light	12 V =	24 V =	115 V ~	230 V ~
red	**817 100 54**	**817 100 55**	**817 100 67**	**817 100 68**
green	**817 200 54**	**817 200 55**	**817 200 67**	**817 200 68**
yellow	**817 300 54**	**817 300 55**	**817 300 67**	**817 300 68**
blue	**817 500 54**	**817 500 55**		**817 500 68**

Further colours and voltages on request.

ACCESSORIES:

Bulb BA 15d, 7 W
Total length max. 52 mm

Voltages	12 V	24 V	48 V	115 V	230 V
	955 015 34	**955 015 35**	**955 015 36**	**955 015 37**	**955 015 38**

Tube adapter	**975 812 01**
Base with integrated tube, ø 25 mm, 110 mm long, plastic	**975 840 10**
Base for surface mounting	**975 812 02**
Base for tube	**975 840 90**
Tube ø 25mm, all anodized aluminium	
100 mm long	**975 845 10**
250 mm long	**975 840 25**
400 mm long	**975 840 40**
Anti-twist device	**975 815 22**
Surface housing IP 65	
for 1 beacon	**975 815 03**
for 2 beacons	**975 815 07**
for 3 beacons	**975 815 08**

For further surface housings and detailed description see page 148.

MASSZEICHNUNGEN

siehe Seite 228

898 Installation Flashing Beacon

- Large installation beacon with considerable signal effect
- With anti-twist device
- Simple installation
- High protection rating IP 65

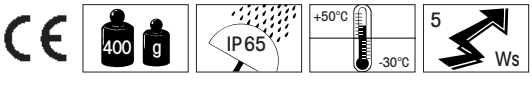
TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	150 mm x 134 mm
Housing:	ABS
Dome:	PC, transparent
Fixing:	Installation mounting for ø 37 mm (PG 29)
Connection:	Screwable connection max. 2.5 mm^2, pull relief, Cable exit radial or axial
Flash frequency:	c. 1 Hz
Flash energy:	5 Ws
Operating voltage:	24 V = / 250 mA 230 V ~ / 140 mA
Starting current:	at 24 V = < 0,5 A
Life duration:	4 x 10^6 flashes

TECHNICAL DIAGRAMS

see page 242

PG 29



WERMA SIGNALTECHNIK

898 Installation Flashing Beacon

898 with adhesive sticker (accessory)

ORDER SPECIFICATIONS:

Voltage	24 V =	230 V ~
red	**898 130 55**	**898 130 68**
green	**898 230 55**	
yellow	**898 330 55**	

Further colours and voltages on request.

ACCESSORIES:

ADHESIVE STICKERS:

→	**975 890 52**
STOP	**975 890 53**
START	**975 890 54**
ZUTRITT	**975 890 55**
KEIN ZUTRITT	**975 890 56**
BETRIEB	**975 890 57**
STÖRUNG	**975 890 58**
	**975 890 64**
	**975 890 65**

Optical Signal Devices

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NEW

product design award 2006

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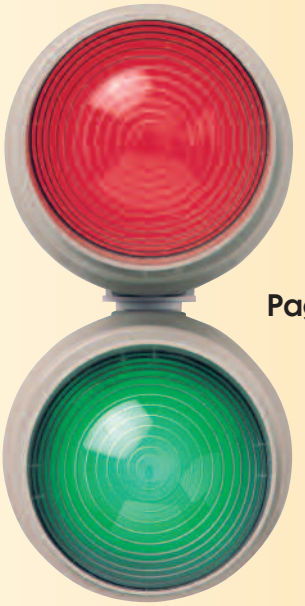
Page 118



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NEW

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Overview Free-standing Beacons

Page 112

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	Free-standing Beacons	
LED Signal Beacons	**201, 204** Page 90	**806** Page 102
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Permanent Beacons	**200, 203** Page 90	**805** Page 102
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Flashing Beacons	**202, 205** Page 90	**807** Page 102
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Double Flash Beacons		**838** Page 112
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Blinking Beacon		**827** Page 104
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Revolving Signal Beacons		**881** Page 115
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LED Obstruction Light	**280** Page 111	
LED Traffic Light		**890** Page 120
Traffic Light Signal Beacon		**890** Page 121
Monitorable LED Permanent Beacon		**806** Page 123
Monitored LED Permanent Beacon	NEW	**829** Page 125
Monitored Permanent Beacon		**826** Page 124
Bulbs	**LED Bulbs** Pages 126 + 127	**Bulb Overview** Pages 128 + 129

Further information about "Optical Signal Devices" can be found in the chapter "Tech-Talk" beginning on page 16.

Optical Signal Devices –

WERMA free-standing signal beacons

Free standing signal beacons, as opposed to the installation variety, are not designed for assembly in drill holes but for direct fixing to the respective object. The basic types of available fixings are base, bracket and tube mounting.

Features

- Base, bracket or tube mounting
- Large variety of versions:
  Available as permanent, blinking, flashing or LED light beacons
- Beacon diameter between 57 and 152 mm
- High protection rating IP 65
- Modern design

SIZES

COMPARISON OF WERMA FREE-STANDING BEACONS

Series	200	220	210	209	219
Ø	57 mm	75 mm	57 mm	57 mm	57 mm
Height	66 mm	80 mm	82 mm	87 mm	104 mm

COMPARISON OF WERMA FREE-STANDING BEACONS

Series	826	885	280	884
Ø	100 mm	90 mm	142 mm	142 mm
Height	138,5 mm	150 mm	216 mm	220 mm

WERMA SIGNALTECHNIK

Variety of light signals

Free standing signal beacons from WERMA assist in indicating process conditions, risks and imminent dangers in our modern production and information society, clearly and in good time. The urgency of the required course of action can be indicated by the colour as well as the type and duration of the signal. As a basic principle, the colours red, yellow, green, blue and clear are employed in the following variety of signals.

Permanent light and LED Permanent light

With the assistance of a permanent light or an LED permanent light the operator is made aware of a specific condition or is instructed to carry out a certain course of action.
WERMA provides free standing signal beacons with conventional lamp bulbs as well as with long-life LED technology.
.

Blinking light

A blinking signal enables additional information to be conveyed, making it clear that the indicated condition demands special attention and that immediate action needs to be taken. The appropriate light source inside the blinking beacon is turned on and off perodically, thus generating the clear visual warning. The blink frequency is generally between 1 and 2 Hz, i.e. the light turns on or off 1 to 2 times per second.

Flashing light

The deployment of a flashing signal can generate even more attention than a continuous light. The reason for this is to be found in the very short flash duration.
Inside each Xenon flashing beacon there is a capacitor which stores electrical energy. Within the space of a few milliseconds this energy is discharged within the flash tube, generating a very intense light impulse.
The average life duration of a Xenon flash in permanent operation is 4 x 10^6 flashes. WERMA also provides an alternative long life LED flash which has a significantly longer life duration of up to 50,000 hours with a considerably reduced power consumption.

Rotating mirror beacon

Inside each rotating mirror beacon is a halogen bulb, and a mirror to deflect the light in one direction. This generates a rotating light beam. The rotation rate is approx. 180 revolutions per minute.

Revolving signal beacon

The 3 Fresnel lenses inside the revolving signal beacon are positioned at an angle of 120°, focusing the light into 3 points. This optimises the visibility of the optical signal over a larger distance and ensures a strong signal effect even in poor visibility.

200-205 Permanent/LED/Flashing Beacon

- High protection rating IP 65
- B 15 d socket integrated in the base
- Safe CAGE CLAMP® technology
- Small shape with low dome
- Optimum illumination
- Available for base or bracket mounting
- Connection without the need to disassemble the product

200

203

201/202

204/205

TECHNICAL SPECIFICATIONS:

Housing:	PA-GF, high-impact
Dome:	PC, transparent (200, 203) PC, transparent; Ring: PC (201, 202, 204, 205)
Connection:	CAGE CLAMP® technology max 2.5mm²
	Contact protection according to VDE
Cable entry:	Cable diameter max. 10 mm (200 - 202)
	Cable diameter 3 - 6 mm (203 - 205)

PERMANENT LIGHT	**200**	**203**
Fixing:	Base mounting with flat seal	Bracket mounting incl. cable gland M 12 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 66 mm	57 mm x 92 mm
Weight:	50 g	55 g
Operating voltage:	max. 250 V	max. 250 V
Bulb socket:	B 15 d, 7 Watt max.	B 15 d, 7 Watt max.
Bulb change:	via removal of dome	via removal of dome

Bulb not included in assembly.

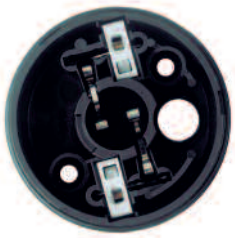
LED PERMANENT LIGHT	**201**	**204**
Fixing:	Base mounting with flat seal	Bracket mounting incl. cable gland M 12 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 82 mm	57 mm x 108 mm
Weight:	66 g	72 g
Starting current:	< 0,5 A at 24 V	< 0,5 A at 24 V
Operating voltage:	24 V ≅ ,115 V ~ ,230 V ~	24 V ≅ ,115 V ~ ,230 V ~
Current consumption:	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V

Life duration up to 100,000 hrs

FLASHING LIGHT	**202**	**205**
Fixing:	Base mounting with flat seal	Bracket mounting incl. cable gland M 12 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 82 mm	57 mm x 108 mm
Weight:	82 g	88 g
Flash frequency:	c. 0,75 Hz	c. 0,75 Hz
Flash energy:	1 Ws	1 Ws
Life duration:	4 x 10^6 flashes	4 x 10^6 flashes
Operating voltage:	24 V = ,115 V ~ ,230 V ~	24 V = ,115 V ~ ,230 V ~
Current consumption:	100 mA at 24 V 20 mA at 115 V 30 mA at 230 V	100 mA at 24 V 20 mA at 115 V 30 mA at 230 V

WERMA SIGNALTECHNIK

200-205 Permanent/LED/Flashing Beacon



Housing with
CAGE CLAMP® connection

ORDER SPECIFICATIONS:

Base mounting

Permanent light	12-240 V		
red	**200 100 00**		
green	**200 200 00**		
yellow	**200 300 00**		
clear	**200 400 00**		
blue	**200 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**201 100 75**	**201 100 67**	**201 100 68**
green	**201 200 75**	**201 200 67**	**201 200 68**
yellow	**201 300 75**	**201 300 67**	**201 300 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**202 100 55**	**202 100 67**	**202 100 68**
yellow	**202 300 55**	**202 300 67**	**202 300 68**

Bracket mounting

Permanent light	12-240 V		
red	**203 100 00**		
green	**203 200 00**		
yellow	**203 300 00**		
clear	**203 400 00**		
blue	**203 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**204 100 75**	**204 100 67**	**204 100 68**
green	**204 200 75**	**204 200 67**	**204 200 68**
yellow	**204 300 75**	**204 300 67**	**204 300 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**205 100 55**	**205 100 67**	**205 100 68**
yellow	**205 300 55**	**205 300 67**	**205 300 68**

Further colours and voltages on request.

ACCESSORIES:

Bulb BA 15d, 5 W
Total length max. 42 mm

Voltage	12 V	24 V	30 V	115 V	230 V
	955 840 34	**955 840 35**	**955 840 32**	**955 840 57**	**955 840 38**

LED bulb BA 15d **(only for permanent beacons 200/203)**
Total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumpt.	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

TECHNICAL DIAGRAMS

see pages 202 + 203

209 Permanent/LED/Flashing Beacon

- High protection rating IP 65
- B 15 d socket integrated in the base
- Safe CAGE CLAMP® technology
- Small shape with low dome
- Optimum illumination
- Connection without the need to disassemble the product
- Tube mounting
- Single hole mounting possible with cable gland

TECHNICAL SPECIFICATIONS:

Housing:	PA fibreglass, high-impact
Dome:	PC, transparent Ring: PC
Connection:	CAGE CLAMP® technology max 2.5 mm² Contact protection according to VDE
Cable entry:	Cable diameter max. 11 mm

PERMANENT LIGHT	**209**
Fixing:	Tube mounting M 25 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 87 mm
Weight:	62 g
Operating voltage:	max. 250 V
Bulb socket:	B 15d, 7 Watt max.
Bulb change:	via removal of dome

Bulb not included in assembly.

LED PERMANENT LIGHT	**209**
Fixing:	Tube mounting M 25 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 104 mm
Weight:	78 g
Starting current:	< 0.5 A at 24 V
Operating voltage:	24 V ≅ ,115 V ~ ,230 V ~
Current consumption:	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V

Life duration up to 100,000 hrs

FLASHING LIGHT	**209**
Fixing:	Tube mounting M 25 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 104 mm
Weight:	94 g
Flash frequency:	c. 0.75 Hz
Flash energy:	1 Ws
Life duration:	4 x 10^6 flashes
Operating voltage:	24 V = ,115 V ~ ,230 V ~
Current consumption:	100 mA at 24 V 20 mA at 115 V 30 mA at 230 V

CE IP65 +50°C -20°C 1 Ws c UL US

WERMA SIGNALTECHNIK

209 Permanent/LED/Flashing Beacon

ORDER SPECIFICATIONS:

Permanent light	12-240 V		
red	**209 100 00**		
green	**209 200 00**		
yellow	**209 300 00**		
clear	**209 400 00**		
blue	**209 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**209 110 75**	**209 110 67**	**209 110 68**
green	**209 210 75**	**209 210 67**	**209 210 68**
yellow	**209 310 75**	**209 310 67**	**209 310 68**
clear	**209 410 75**	**209 410 67**	**209 410 68**
blue	**209 510 75**	**209 510 67**	**209 510 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**209 120 55**	**209 120 67**	**209 120 68**
yellow	**209 320 55**	**209 320 67**	**209 320 68**
clear	**209 420 55**	**209 420 67**	**209 420 68**
blue	**209 520 55**	**209 520 67**	**209 520 68**

ACCESSORIES:

Base with integrated tube M 25 x 1.5 mm	**975 209 01**
Cable gland M 25 x 1.5 mm	**975 209 02**

Bulb BA 15d, 5 W
Total length max. 42 mm

Voltage	12 V	24 V	30 V	115 V	230 V
	955 840 34	**955 840 35**	**955 840 32**	**955 840 57**	**955 840 38**

LED Bulb BA 15d **(only for permanent beacon 209)**
Total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumpt.	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

TECHNICAL DIAGRAMS

see page 204

210-215 Permanent/LED/Flashing Beacon

- High protection rating IP 65
- B 15 d socket integrated in the base
- Safe CAGE CLAMP® technology
- Small shape with high dome
- Optimum illumination
- Available for base or bracket mounting
- Connection without the need to disassemble the product

210

213

211/212

214/215

TECHNICAL SPECIFICATIONS:

Housing:	PA fibreglass, high-impact
Dome:	PC, transparent (210, 213) PC, transparent; Ring: PC (211, 212, 214, 215)
Connection:	CAGE CLAMP® technology max. 2.5mm² Contact protection according to VDE
Cable entry:	Canle diameter max. 10 mm (210 - 212) Cable diameter 3 - 6 mm (213 - 215)

PERMANENT LIGHT	**210**	**213**
Fixing:	Base mounting with flat seal	Bracket mounting, including cable gland M 12 x 1.5 mm
Dimensions(Diameter x Height):	57 mm x 82 mm	57 mm x 108 mm
Weight:	55 g	61 g
Operating voltage:	max. 250 V	max. 250 V
Bulb socket:	B 15 d, 10 Watt max.	B 15 d, 10 Watt max.
Bulb change:	via removal of dome	via removal of dome

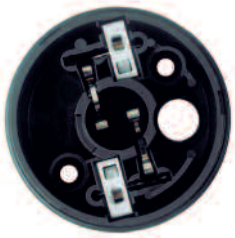
Bulbs not included in assembly.

LED PERMANENT LIGHT	**211**	**214**
Fixing :	Base mounting with flat seal	Bracket mounting, including cable gland M 12 x 1.5 mm
Dimensions(Diameter x Height):	57 mm x 98 mm	57 mm x 124 mm
Weight :	72 g	78 g
Starting current:	< 0.5 A at 24 V	< 0.5 A at 24 V
Operating voltage:	24 V ≅ ,115 V ~ ,230 V ~	24 V ≅ ,115 V ~ ,230 V ~
Current consumption:	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V

Life duration up to 100,000 hrs

FLASHING LIGHT	**212**	**215**
Fixing:	Base mounting with flat seal	Bracket mounting, including cable gland M 12 x 1.5 mm
Dimensions(Diameter x Height):	57 mm x 98 mm	57 mm x 124 mm
Weight :	88 g	94 g
Flash frequency:	c. 0.75 Hz	c. 0.75 Hz
Flash energy:	1 Ws	1 Ws
Life duration:	4 x 10^6 flashes	4 x 10^6 flashes
Operating voltage:	24 V = ,115 V ~ ,230 V ~	24 V = ,115 V ~ ,230 V ~
Current consumption:	100 mA at 24 V = 20 mA at 115 V ~ 30 mA at 230 V ~	100 mA at 24 V = 20 mA at 115 V ~ 30 mA at 230 V ~

210-215 Permanent/LED/Flashing Beacon



Housing with
CAGE CLAMP® connection

ORDER SPECIFICATIONS:

Base mounting	**210-212**		
Permanent light	12-240 V		
red	**210 100 00**		
green	**210 200 00**		
yellow	**210 300 00**		
clear	**210 400 00**		
blue	**210 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**211 100 75**	**211 100 67**	**211 100 68**
green	**211 200 75**	**211 200 67**	**211 200 68**
yellow	**211 300 75**	**211 300 67**	**211 300 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**212 100 55**	**212 100 67**	**212 100 68**
yellow	**212 300 55**	**212 300 67**	**212 300 68**
Bracket mounting	**213-215**		
Permanent light	12-240 V		
red	**213 100 00**		
green	**213 200 00**		
yellow	**213 300 00**		
clear	**213 400 00**		
blue	**213 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**214 100 75**	**214 100 67**	**214 100 68**
green	**214 200 75**	**214 200 67**	**214 200 68**
yellow	**214 300 75**	**214 300 67**	**214 300 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**215 100 55**	**215 100 67**	**215 100 68**
yellow	**215 300 55**	**215 300 67**	**215 300 68**

Further colours and voltages on request.

ACCESSORIES:

Bulb BA 15d, 7 W
Total length max. 52 mm

Voltage	12 V	24 V	48 V	115 V	230 V
	955 015 34	**955 015 35**	**955 015 36**	**955 015 37**	**955 015 38**

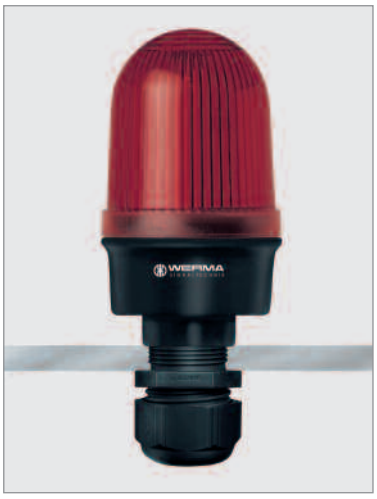
LED bulb BA 15d **(only for Permanent light beacons 210/213)**
Total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumpt.	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

TECHNICAL DIAGRAMS

see pages 204 + 205

219 Permanent/LED/Flashing Beacon



- High protection rating IP 65
- B 15 d socket integrated in the base
- Safe CAGE CLAMP® technology
- Small shape with high dome
- Optimum illumination
- Connection without the need to disassemble the product
- Tube mounting
- Single hole mounting possible with cable gland

ORDER SPECIFICATIONS:

Housing:	PA fibreglass, high-impact
Dome:	PC, transparent Ring: PC
Connection:	CAGE CLAMP® technology max 2.5mm² Contact protection according to VDE
Cable entry:	Cable diameter max. 11 mm

PERMANENT LIGHT	**219**
Fixing:	Tube mounting, M 25 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 104 mm
Weight:	67 g
Operating voltage:	max. 250 V
Bulb socket:	B 15d, 10 Watt max.
Bulb change:	via removal of dome

Bulbs not included in assembly.

LED PERMANENT LIGHT	**219**
Fixing:	Tube mounting, M 25 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 120 mm
Weight:	84 g
Starting current:	< 0,5 A at 24 V
Operating voltage:	24 V ≅ ,115 V ~ ,230 V ~
Current consumption:	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V

Life duration up to 100,000 hrs

FLASHING LIGHT	**219**
Fixing:	Tube mounting, M 25 x 1.5 mm
Dimensions (Diameter x Height):	57 mm x 120 mm
Weight:	100 g
Flash frequency:	c. 0.75 Hz
Flash energy:	1 Ws
Life duration:	4 x 10^6 flashes
Operating voltage:	24 V = ,115 V ~ ,230 V ~
Current consumption:	100 mA at 24 V = 20 mA at 115 V ~ 30 mA at 230 V ~

CE IP65 +50°C -20°C 1 Ws c UL US

WERMA SIGNALTECHNIK

219 Permanent/LED/Flashing Beacon

ORDER SPECIFICATIONS:

Permanent light	12-240 V		
red	**219 100 00**		
green	**219 200 00**		
yellow	**219 300 00**		
clear	**219 400 00**		
blue	**219 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**219 110 75**	**219 110 67**	**219 110 68**
green	**219 210 75**	**219 210 67**	**219 210 68**
yellow	**219 310 75**	**219 310 67**	**219 310 68**
clear	**219 410 75**	**219 410 67**	**219 410 68**
blue	**219 510 75**	**219 510 67**	**219 510 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**219 120 55**	**219 120 67**	**219 120 68**
yellow	**219 320 55**	**219 320 67**	**219 320 68**
clear	**219 420 55**	**219 420 67**	**219 420 68**
blue	**219 520 55**	**219 520 67**	**219 520 68**

ACCESSORIES:

Base with integrated tube M 25 x 1.5 mm	**975 209 01**
Cable gland, M 25 x 1.5 mm	**975 209 02**

Bulb BA 15d, 7 W
Total length max. 52 mm

Voltage	12 V	24 V	48 V	115 V	230 V
	955 015 34	**955 015 35**	**955 015 36**	**955 015 37**	**955 015 38**

LED bulb BA 15d **(only for Permanent light beacon)**
Total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumpt.	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

TECHNICAL DIAGRAMS

see page 206

850/851/852 Permanent Beacon

- **Available with grey or black housing**

850

851

852

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	56.5 mm x 88 mm
Housing:	ABS (85X XXX 38) PC/ABS-Blend (85X XXX 08)
Dome:	PC, transparent
Fixing:	850: Base mounting 851: Bracket mounting 852: Tube mounting M 25 x 1.5 mm
Socket:	B 15 d max. 7 Watt
Connection:	Screwable connection max. 1.5 mm² Contact protection according to VDE
Cable entry:	Cable diameter max. 8.5 mm (850) Cable diameter max. 7 - 10 mm (851) Cable diameter max. 10 mm (852)

Bulb not included in assembly.

ORDER SPECIFICATIONS:

Base mounting		12 - 250 V			12 - 250 V
Black housing	red	**850 100 08**	Grey housing	red	**850 100 38**
	green	**850 200 08**		green	**850 200 38**
	yellow	**850 300 08**		yellow	**850 300 38**
	clear	**850 400 08**		clear	**850 400 38**
Bracket mounting		12 - 250 V			12 - 250 V
Black housing	red	**851 100 08**	Grey housing	red	**851 100 38**
	green	**851 200 08**		green	**851 200 38**
	yellow	**851 300 08**		yellow	**851 300 38**
	clear	**851 400 08**		clear	**851 400 38**
Tube mounting		12 - 250 V			12 - 250 V
Black housing	red	**852 100 08**	Grey housing	red	**852 100 38**
	yellow	**852 300 08**		yellow	**852 300 38**

Further colours and voltages on request.

TECHNICAL DIAGRAMS

see page 237

Please also see the beacon series 209, 210, 213, 219 with additional advantages (see page 92 ff.)

- High protection rating IP 65
- B 15d socket integrated in the base
- Safe CAGE CLAMP® connection
- Optimum illumination
- Connection without product disassembly

850/851/852 Permanent Beacon

ACCESSORIES:

Base with tube thread M 25	**960 693 03**
Adapter M 25 / M 20 for fixing	**960 693 04**
Cable gland, M 25 x 1.5 mm	**975 209 02**

Bulb BA 15d, 7 W
Total length max. 52 mm

Voltage	12 V	24 V	48 V	115 V	230 V
	955 015 34	**955 015 35**	**955 015 36**	**955 015 37**	**955 015 38**

LED bulb BA 15d
Total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumption	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

Seal for 850 (required for IP 54)	**975 850 01**

TECHNICAL DIAGRAMS

see page 237

220-225 Permanent/LED/Flashing Beacon

- High protection rating IP 65
- B 15 d socket integrated in the base
- Safe CAGE CLAMP® technology
- Optimum illumination
- Available for base or bracket mounting
- Connection without the need to disassemble the product

220-222

223-225

TECHNICAL SPECIFICATIONS:

Housing:	PA fibreglass, high-impact
Dome:	PC, transparent Ring: PC/ABS-Blend
Connection:	CAGE CLAMP® technology max 2.5 mm² Contact protection according to VDE
Cable entry:	Cable diameter max. 10 mm (220 - 222) Cable diameter 3 - 6 mm (223 - 225)

PERMANENT LIGHT	**220**	**223**
Fixing:	Base mounting with flat seal	Bracket mounting, including cable gland M 12 x 1.5 mm
Dimensions(Diameter x Height):	75 mm x 80 mm	75 mm x 105 mm
Weight:	97 g	103 g
Operating voltage:	max. 250 V	max. 250 V
Bulb socket:	B 15 d, 10 Watt max.	B 15 d, 10 Watt max.
Bulb change:	via removal of dome	via removal of dome

Bulb not included in assembly.

LED PERMANENT LIGHT	**221**	**221**	**224**
Fixing:	Base mounting with flat seal		Bracket mounting, including cable gland M 12 x 1.5 mm
Dimensions(Diameter x Height):	75 mm x 80 mm		75 mm x 105 mm
Weight:	108 g		114 g
Starting current:	< 0.5 A at 24 V		< 0.5 A at 24 V
Operating voltage:	24 V ≅ ,115 V ~ , 230 V ~		24 V ≅ ,115 V ~ , 230 V ~
Current consumption:	45 mA at 24 V 25 mA at 115 V 25 mA at 230 V		45 mA at 24 V 25 mA at 115 V 25 mA at 230 V

Life duration up to 100,000 hrs

FLASHING LIGHT	**222**	**225**
Fixing:	Base mounting with flat seal	Bracket mounting, including cable gland M 12 x 1.5 mm
Dimensions(Diameter x Height):	75 mm x 80 mm	75 mm x 105 mm
Weight:	124 g	130 g
Flash frequency:	c. 0.75 Hz	c. 0.75 Hz
Flash energy:	1 Ws	1 Ws
Life duration:	4 x 10^6 flashes	4 x 10^6 flashes
Operating voltage:	24 V = ,115 V ~ , 230 V ~	24 V = ,115 V ~ , 230 V ~
Current consumption:	100 mA at 24 V 20 mA at 115 V 30 mA at 230 V	100 mA at 24 V 20 mA at 115 V 30 mA at 230 V

WERMA SIGNALTECHNIK

220-225 Permanent/LED/Flashing Beacon

Housing with
CAGE CLAMP® connection

ORDER SPECIFICATIONS:

Base mounting

Permanent light	12-240 V		
red	**220 100 00**		
green	**220 200 00**		
yellow	**220 300 00**		
clear	**220 400 00**		
blue	**220 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**221 100 75**	**221 100 67**	**221 100 68**
green	**221 200 75**	**221 200 67**	**221 200 68**
yellow	**221 300 75**	**221 300 67**	**221 300 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**222 100 55**	**222 100 67**	**222 100 68**
yellow	**222 300 55**	**222 300 67**	**222 300 68**

Bracket mounting

Permanent light	12-240 V		
red	**223 100 00**		
green	**223 200 00**		
yellow	**223 300 00**		
clear	**223 400 00**		
blue	**223 500 00**		
LED Permanent	24 V ≅	115 V ~	230 V ~
red	**224 100 75**	**224 100 67**	**224 100 68**
green	**224 200 75**	**224 200 67**	**224 200 68**
yellow	**224 300 75**	**224 300 67**	**224 300 68**
Flashing light	24 V =	115 V ~	230 V ~
red	**225 100 55**	**225 100 67**	**225 100 68**
yellow	**225 300 55**	**225 300 67**	**225 300 68**
blue	**225 500 55**	**225 500 67**	**225 500 68**

Further colours and voltages on request.

ACCESSORIES:

Bulb BA 15d, 7 W
Total length max. 52 mm

Voltage	12 V	24 V	48 V	115 V	230 V
	955 015 34	**955 015 35**	**955 015 36**	**955 015 37**	**955 015 38**

LED bulb BA 15d **(only for Permanent light beacon 220/223)**
Total length max. 42 mm

Voltage	24 V ≅	115 V ~	230 V ~
Current consumpt.	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

TECHNICAL DIAGRAMS

see page 206

805/806/807 Permanent/LED/Flashing Beacon

- **Modern design**
- **Multiple mounting options**
- **Bayonet mechanism enables tool free bulb change**

ORDER SPECIFICATIONS:

Dimensions (Diameter x Height):	75 mm x 108 mm
Housing:	PA fibreglass, high-impact
Dome:	PC, transparent
	Ring: PC/ABS-Blend
Fixing:	Base, bracket or tube mounting
Connection:	Screwable connection max. 2.5 mm²
	Contact protection according to VDE

PERMANENT LIGHT	**805**
Operating voltage:	max. 250 V
Bulb socket:	B 15d 10 Watt max.
Bulb change:	Bayonet mechanism
Bulb not included in assembly.	

LED VERSION	**806**
Permanent light:	24 V ≅
Blinking light:	24 V ≅
Blink frequency:	c. 1 Hz
Current consumption:	at 24 V =
	Permanent 45 mA, Blinking 25 mA
Starting current:	< 0,5 A at 24 V

Life duration up to 100,000 hrs

Base with tube as accessory

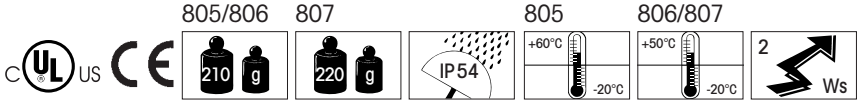
FLASHING LIGHT	**807**			
Flash frequency:	c. 1 Hz			
Flash energy:	2 Ws			
Life duration:	4 x 10^6 flashes			
Starting current:	at 24 V =	at 115 V ~	at 230 V ~	
	< 0.5 A	< 0.5 A	< 0.5 A	
Operating voltage:	12 V =			
	24 V =			
	115 V ~			
	230 V ~			
Current consumption:	at 12 V =	at 24 V =	at 115 V ~	at 230 V ~
	195 mA	125 mA	20 mA	35 mA

TECHNICAL DIAGRAMS

see pagee 227

Please also see the beacon series 220, 221, 222 with additional advantages (see page 100 ff.)

- High protection rating IP 65
- B 15d socket integrated in the base
- Safe CAGE CLAMP® connection
- Optimum illumination
- Connection without product disassembly



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805/806/807 Permanent/LED/Flashing Beacon

ORDER SPECIFICATIONS:

Permanent light		12-240 V		12-240 V
red	Tube mounting	**805 100 00**	Base-/bracket mounting	**805 105 00**
green		**805 200 00**		**805 205 00**
yellow		**805 300 00**		**805 305 00**
clear				**805 405 00**
LED Permanent light				24 V ≅
red			Base-/bracket mounting	**806 105 55**
green				**806 205 55**
yellow				**806 305 55**
LED Blinking light				24 V ≅
red			Base-/bracket mounting	**806 115 55**
yellow				**806 315 55**

Flashing light	24 V =	115 V ~	230 V ~
Tube mounting			
red	**807 100 55**	**807 100 67**	**807 100 68**
yellow	**807 300 55**	**807 300 67**	**807 300 68**
blue	**807 500 55**	**807 500 67**	**807 500 68**

Base, bracket mounting	12 V =	24 V =	115 V ~	230 V ~
red	**807 105 54**	**807 105 55**	**807 105 67**	**807 105 68**
yellow	**807 305 54**	**807 305 55**	**807 305 67**	**807 305 68**
blue	**807 505 54**	**807 505 55**	**807 505 67**	**807 505 68**

Further colours and voltages on request.

ACCESSORIES:

Bulb BA 15d, 5 W
Total length max. 42 mm

Voltage	12 V	24 V	30 V	115 V	230 V
	955 840 34	**955 840 35**	**955 840 32**	**955 840 57**	**955 840 38**

LED bulb BA 15d
Total length max. 42 mm (only for Permanent light 805)

Voltage	24 V ≅	115 V ~	230 V ~
Current consumption	< 45 mA	< 15 mA	< 15 mA
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

Base with integrated tube, ø 25 mm, 110 mm long	**975 840 10**
Bracket for 1-sided mounting	**975 840 85**
Bracket for 2-sided mounting	**975 840 86**
Wire guard for base mounting	**975 826 03**

For further accessories see page 45 ff., Signal Tower 840.

826/827/828 Permanent/Blinking/Flashing Beacon

- **Simple mounting**
- **Removal of the dome only possible with tools**
- **Modern design**
- **High protection rating IP 65 – suitable for indoor and outdoor use**

Bracket (accessory)

Tube with base (accessory)

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	100 mm x 138.5 mm
Housing:	PC/ABS-Blend
Dome:	PC; transparent
Fixing:	Base mounting, bracket mounting, tube mounting (Base 975 840 90 must be ordered twice for base mounting – once as socket for beacon and once as base)

PERMANENT LIGHT	**826**
Connection:	Screw free clamp mechanism max. 1.5 mm² Contact protection according to VDE
Cable entry:	Cable diameter 5 - 7 mm
Operating voltage:	max. 250 V for B 15 d
Bulb:	max. 15 W
Duty cycle:	100 % max. 15 W, 50 % max. 25 W
Socket:	B 15d

Bulb not included in assembly.

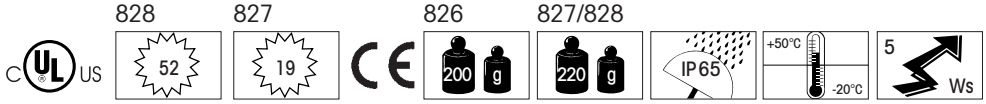
BLINKING LIGHT	**827**		
Connection:	Screwable connection with wire protection 0.5 mm² - 2.5 mm² Contact protection according to VDE		
Cable entry:	Cable diameter 5 - 7 mm		
Operating voltage:	24 V ≅, 115 V ~, 230 V ~		
Bulb:	max. 25 W		
Blink frequency:	1.5 Hz		
Starting current:	at 24 V ≅ 3 A	at 115 V ~ 600 mA	at 230 V ~ 350 mA
Socket:	B 15 d		

Bulb included in assembly.

FLASHING LIGHT	**828**			
Connection:	Screwable connection with wire protection 0.5 mm² - 2.5 mm² Contact protection according to VDE			
Cable entry:	Cable diameter 5 - 7 mm			
Flash frequency:	c. 1 Hz			
Flash energy:	5 Ws			
Life duration:	4 x 10^6 flashes			
Operating voltage:	12 V =	24 V =	115 V ~	230 V ~
Current consumption:	500 mA	300 mA	65 mA	150 mA

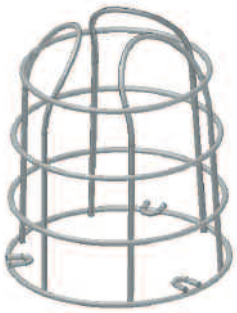
12 V: Safety contact is triggered by removal of dome.

FLASHING LIGHT WITH 2 FREQUENCIES	**828**
Connection:	Screwable connection with wire protection 0.5 mm² - 2.5 mm² Contact protection according to VDE
Cable entry:	Cable diameter 5 - 7 mm
Flash frequency:	0.5 Hz or 1.5 Hz can be set externally
Flash energy:	5 Ws
Life duration:	4 x 10^6 flashes
Operating voltage:	24 V =
Current consumption:	500 mA



WERMA SIGNALTECHNIK

826/827/828 Permanent/Blinking/Flashing Beacon



ORDER SPECIFICATIONS:

Permanent light B 15d		12 - 240 V		
red		**826 100 00**		
green		**826 200 00**		
yellow		**826 300 00**		
clear		**826 400 00**		
blue		**826 500 00**		
Blinking light B 15d		24 V ≅	115 V ~	230 V ≅
red		**827 100 75**	**827 100 77**	**827 100 78**
yellow		**827 300 75**	**827 300 77**	**827 300 78**
Flashing light	12 V =	24 V =	115 V ~	230 V ~
red	**828 100 54**	**828 100 55**	**828 100 67**	**828 100 68**
yellow	**828 300 54**	**828 300 55**	**828 300 67**	**828 300 68**
clear		**828 400 55**		**828 400 68**
Flashing light with 2 frequencies		24 V =		
red		**828 120 55**		
yellow		**828 320 55**		

Further colours and voltages on request.

ACCESSORIES:

Plastic bracket for wall mounting	**975 826 05**
Wire guard, galvanised, for base mounting	**975 826 03**
Tube ø 25 mm, all anodized aluminium, 100 mm long	**975 845 10**
Base for tube (must be ordered twice)	**975 840 90**

Bulb BA 15d for Permanent light 826, 15 W
Total length max. 45 mm

Voltage	24 V	230 V
	955 826 35	**955 826 38**

Bulb BA 15d for Blinking light 827, 25 W
Total length max. 55 mm

Voltage	24 V	115 V	230 V
	955 827 35	**955 827 37**	**955 827 38**

TECHNICAL DIAGRAMS

see page 229

829 LED Permanent/Blinking/Flashing/Rotating

- Multi-functional LED beacon
- Interchangeable light effects
- NEW • Version with external triggering and galvanically isolated signal inputs
- Easy to mount
- Life duration up to 50,000 hrs
- High protection rating IP 65 for indoor and outdoor applications

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	100 mm x 138.5 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Fixing:	Base mounting, bracket mounting, tube mounting (Base 975 840 90 must be ordered twice for base mounting – once as socket for beacon and once as base)
Connection:	Screwable connection with wire protection 0.5 mm² - 2.5 mm²
Cable entry:	Cable diameter 5 - 7 mm

LED PERMANENT/BLINKING LIGHT INTERCHANGEABLE LIGHT EFFECT

Blink frequency:	c. 1.5 Hz
Operating voltage:	24 V =
Current consumption:	≤ 150 mA

LED technology

LED PERMANENT LIGHT

Life duration up to 50,000 hrs

Operating voltage:	115 V ~	230 V ~
Current consumption:	≤ 30 mA	≤ 30 mA

NEW LED PERMANENT/BLINKING/ROTATING LIGHT WITH EXTERNAL TRIGGERING

Blink frequency:	c. 1.5 Hz
Rotating frequency:	c. 180 r.p.m.
Operating voltage:	24 V =
Current consumption:	≤ 300 mA

Further information see page 107.

Flashing Version with LED

LED flash enables use in safety relevant applications or with batteries/power packs

LED FLASHING LIGHT

Flash frequency:	c. 1.5 Hz	c. 1.5 Hz	c. 1.5 Hz
Operating voltage:	24 V =	115 V ~	230 V ~
Current consumption:	< 30 mA	< 30 mA	< 30 mA

829 X00	829 X10	829 X20
CE 200 g	220 g	200 g

IP65 +50°C -20°C

WERMA SIGNALTECHNIK

829 LED Permanent/Blinking/Flashing/Rotating

ORDER SPECIFICATIONS:

LED Permanent/Blinking light	24 V =	LED Permanent light 115 V ~	230 V ~
red	**829 100 55**	**829 130 67**	**829 130 68**
green	**829 200 55**	**829 230 67**	**829 230 68**
yellow	**829 300 55**	**829 330 67**	**829 330 68**
blue	**829 500 55**	**829 530 67**	**829 530 68**

NEW LED Permanent-/Blinking/Rotating with external triggering	24 V =
red	**829 150 55**
green	**829 250 55**
yellow	**829 350 55**
blue	**829 550 55**

LED Flashing light	24 V =	115 V ~	230 V ~
red	**829 120 55**	**829 120 67**	**829 120 68**
yellow	**829 320 55**	**829 320 67**	**829 320 68**
clear			**829 420 68**

ACCESSORIES:

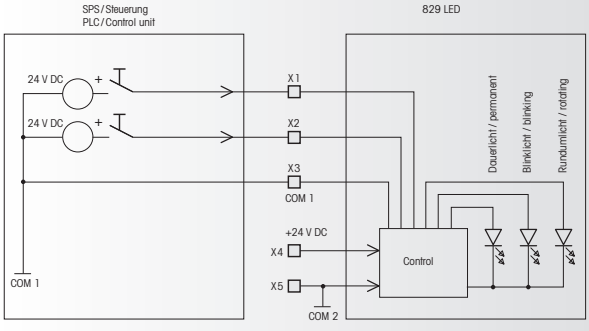
Plastic bracket for wall mounting	**975 826 05**
Wire guard, galvanised, for base mounting	**975 826 03**
Tube ø 25 mm, all anodized aluminium, 100 mm long.	**975 845 10**
Base for tube (must be ordered twice)	**975 840 90**

TECHNICAL DIAGRAMS

see page 229

Three different light effects with one and the same device.

NEW 829 with external triggering – Light effects set via control cables



Thanks to the external trigger function, the range of light effects offered by the new LED Beacon 829 can be set by means of electricially isolated, binary coded 24 V control cables. This guarantees a much greater level of resistance to electrical interference.

The machine operator can use the different signals to indicate various machine conditions – without having to make adjustments to the beacon itself. In addition the LED beacon 829 can be used in conjunction with both positive and a negative trigger logic.

870 Permanent Beacon

- **Functional design**
- **Suitable for indoor and outdoor use**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	108 mm x 133 mm
Housing:	ABS
Dome:	PC, transparent
Fixing:	Base mounting, Bracket mounting
Connection:	Screwable connection with wire protection max. 2.5 mm²
Cable entry:	Rubber squeeze grommet ø 5 - 7 mm
Socket:	E 14 max. 25 W
Duty cycle:	80 % (at 15 W, 100 %)

Bulb not included in assembly.

ORDER SPECIFICATIONS:

Voltage	12 - 240 V ≅
red	**870 152 00**
yellow	**870 352 00**

ACCESSORIES:

Bracket for wall mounting	**975 835 01**	Bulb E 14, 25 W, 24 V =	**955 025 35**
Wire guard	**975 830 00**	Bulb E 14, 25 W, 230 V ~	**955 025 38**

TECHNICAL DIAGRAMS

see page 238

830/835 Flashing Beacon

830

835

- **High flash power**
- **Suitable for indoor and outdoor use**

TECHNICAL SPECIFICATIONS:

Dimensions (ø x Height):	108 mm x 133 mm			
Housing:	ABS			
Dome:	PC, transparent			
Fixing:	830: Base mounting, 835: Bracket mounting (included in assembly)			
Connection:	Screwable connection with wire protection max. 2.5 mm²			
Cable entry:	Rubber squeeze grommet ø 5 - 7 mm			
Flash frequency:	c. 1 Hz			
Life duration:	4 x 10^6 flashes			
Operating voltage:	12 V =	24 V =	24 V ~	230 V ~
Current consumption:	350 mA	250 mA	500 mA	140 mA

ORDER SPECIFICATIONS:

Base mounting	12 V =	24 V =	230 V ~
red	**830 152 54**	**830 152 55**	**830 152 68**
green		**830 252 55**	**830 252 68**
yellow	**830 352 54**	**830 352 55**	**830 352 68**
green/clear		**830 752 55**	**830 752 68**
Bracket mounting			
red		**835 152 55**	**835 152 68**
yellow		**835 352 55**	**835 352 68**
green/clear		**835 752 55**	**835 752 68**

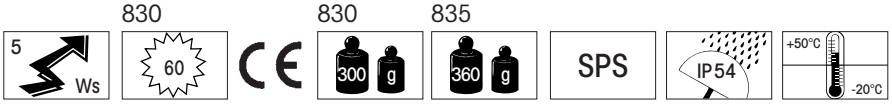
Further colours and voltages on request.

SPECIAL VERSIONS: For PLC control systems with reduced starting current
Green/clear dome for maritime use as specified by the Marine Liability Insurance Association

ACCESSORIES:

Wire guard for base and bracket mounting	**975 830 00**
Bracket for wall mounting for 830	**975 835 01**

TECHNICAL DIAGRAMS see page 230



WERMA SIGNALTECHNIK

280 LED Permanent Beacon

NEW Now also available in yellow.

- **Extremely high light intesity of more than 15 cd**
- **Modern design**
- **Life duration up to 50,000 hrs**
- **High protection rating IP 65 - suitable for indoor and outdoor use**
- **High impact resistance to 20 Joules**
- **DC multi-voltage version**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	142 mm x 220 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Fixing:	Base mounting, bracket mounting (accessory), tube mounting (accessory)
Connection:	Screwable conn. with wire protection max. 2.5 mm²
	Contact protection according to VDE
Cable entry:	Cable diameter 5-7 mm
Life duration:	up to 50,000 hrs
Duty cycle:	100 %

ORDER SPECIFICATIONS:

Voltage:	24 V = (12-50 V)	230 V ~
Current consumption:	12 V: 500 mA	50 mA
	50 V: 100 mA	
red	**280 100 55**	**280 100 68**
NEW yellow	**280 300 55**	**280 300 68**

ACCESSORIES:

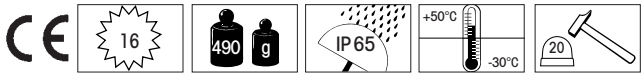
Plastic bracket for wall mounting	**975 883 06**
Flange for tube mounting max. 25.3 mm	**975 883 02**
Wire guard	**975 883 08**

TECHNICAL DIAGRAMS

see page 207

Plastic bracket, flange for tube mounting and wire guard (accessories)

Extremely high light output using unique LED technology.



Obstruction Light

Obstruction lighting is a means of ensuring flight safety by marking aviation obstacles with electrically operated beacons. High buildings, factory chimneys, towers, masts etc. above a certain height in the vicinity of airports and airfields must be equipped with obstruction lights.

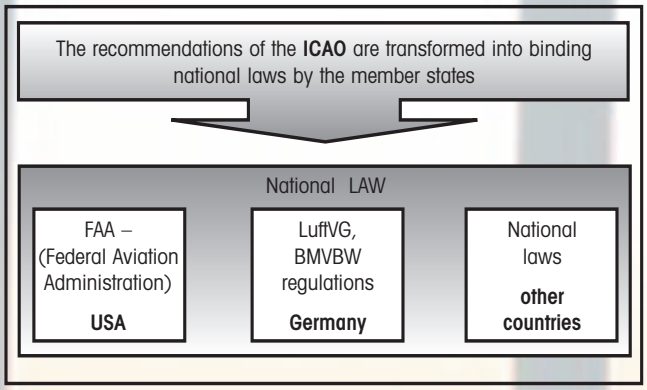
LEGAL SPECIFICATIONS

The method of marking obstacles to air traffic is laid down by diverse laws, regulations and recommendations.

The International Civil Aviation Organisation (ICAO) is a special organisation within the United Nations created to establish and develop universal regulations for safety, order and economic sense in international air traffic. The recommendations of the ICAO are not directly binding in the member states, but must be transformed by them into the appropriate national legal regulations.

In Germany the Ministry for Transport and Construction (BMVBW) issues the regulations regarding obstruction lighting on buildings.

The ICAO regulations regarding the methods of marking and lighting aviation obstacles can be found in ICAO Annex 14, Volume I, Chapter 6.



AREAS OF USE

Germany	Marking of aviation obstacles by night at any height providing the highest point of the obstacle can be marked.
ICAO	Marking of aviation obstacles up to 45 m by night.

LEGAL REQUIREMENTS FOR OBSTRUCTION LIGHTING IN GERMANY

- Light output at least 10 cd in a horizontal beam angle of -2° to 10°
- Light colour: aviation red
- The photometric requirements must be met to a full 360° around the obstruction light (omnidirectional obstruction light).

280 LED Obstruction Light

- **LED obstruction light, certified in accordance with German BMVBW regulations**
- **For use as "Low-intensity Obstruction Light, Type A" in accordance with ICAO Annex 14, Vol. 1, Chapter 6**
- **Extremely high light intensity of more than 15 cd**
- **High protection rating IP 65**
- **High impact resistance to 20 Joules**
- **DC multi-voltage version**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	142 mm x 220 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent, clear
Fixing:	Base, bracket, tube mounting
Connection:	Screwable conn. with wire protection max. 2.5 mm²
	Contact protection according to VDE
Cable entry:	Cable diameter 5-7 mm
Life duration:	up to 50,000 hrs
Duty cycle:	100 %

ORDER SPECIFICATIONS:

Voltage:	24 V = (12-50 V)	230 V ~
Current consumption:	12 V: 500 mA 50 V: 100 mA	50 mA
aviation red	**280 410 55**	**280 410 68**

ACCESSORIES:

Plastic bracket for wall mounting	**975 883 06**
Flange for tube mounting max. 25.3 mm	**975 883 02**
Wire guard	**975 883 08**

TECHNICAL DIAGRAMS:

see page 207

Plastic bracket, flange for tube mounting and wire guard (accessories)

Extremely high light output using unique LED technology.

838 Double Flash Beacon

- **High flash power from two consecutive flashes**
- **High protection rating IP 65**
- **High light intensity**
- **Modern design**
- **High impact resistance to 20 Joules**

Wire guard
(accessory)

Plastic bracket
(accessory)

Flange for tube mounting
(accessory)

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	142 mm x 220 mm		
Housing:	PC/ABS-Blend		
Dome:	PC, transparent		
Fixing:	Base mounting, Bracket mounting (accessory), Tube mounting (accessory)		
Connection:	Screwable connection with wire protection 0.5 - 2.5 mm²		
Cable entry:	Cable diameter 5 - 7 mm		
Flash energy:	15 Ws		
Flash frequency:	c. 1 Hz		
Operating voltage:	24 V =	115 V ~	230 V ~
Current consumption:	800 mA	300mA	200 mA
Power supply frequency:	50/60 Hz		
Life duration:	4 x 10^6 flashes		

ORDER SPECIFICATIONS:

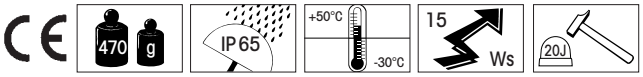
Voltage	24 V =	115 V ~	230 V ~
red	**838 100 55**	**838 100 67**	**838 100 68**
yellow	**838 300 55**	**838 300 67**	**838 300 68**

ACCESSORIES:

Plastic bracket for wall mounting	**975 883 06**
Flange for tube mounting max. 25.3 mm	**975 883 02**
Wire guard	**975 883 08**

TECHNICAL DIAGRAMS

see page 231



WERMA SIGNALTECHNIK

839 Double Flash Beacon

- **Robust aluminium housing including wire guard**
- **Saltwater-proof**
- **High flash power from two consectutive flashes**
- **High protection rating IP 65**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	152 mm x 188 mm	
Housing:	Black laquered aluminium with integral wire guard (steel)	
Dome:	PC, transparent	
Fixing:	Base mounting	
Connection:	Screwable connection with wire protection max. 2.5 mm²	
Cable entry:	Rubber squeeze grommet ø 5 - 7 mm	
Flash energy:	15 Ws	
Flash frequency:	c. 1 Hz	
Operating voltage:	24 V =	230 V ~
Current consumption:	800 mA	200 mA
Life duration:	4 x 10^6 flashes	

ORDER SPECIFICATIONS:

Voltage	24 V =	230 V ~
red	**839 152 55**	**839 152 68**
yellow	**839 352 55**	**839 352 68**

TECHNICAL DIAGRAMS

see page 231

880 Rotating Mirror Beacon

- **High intensity optical signal with halogen bulb**
- **"e" approval for automotive use (yellow, 24 V)**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	152 mm x 215 mm
Housing:	Thermoplastic with injected metal base
Dome:	Plexiglass (PMMA)
Fixing:	Base, bracket, tube mounting
Connection:	Screwable conn. with wir protection 0.5 - 1.5 mm²
Cable entry:	Cable diameter 5 - 8 mm
Mirror rotation rate:	c. 170 r.p.m.

Assembly incl. halogen bulb H1.

ORDER SPECIFICATIONS:

Voltage	24 V =	24 V ~	115 V ~	230 V ~
Current consumpt.	2.6 A	2.6 A	0.6 A	0.3 A
red	**880 152 55**	**880 152 65**	**880 152 67**	**880 152 68**
yellow	**880 352 55**	**880 352 65**	**880 352 67**	**880 352 68**

Further colours and voltages on request.

ACCESSORIES:

Flange for PG tube, max. 29.8 mm	**880 000 00**
Bracket for wall mounting	**975 881 01**

SPARE PARTS:

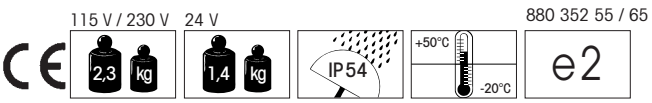
Bulb H 1 55 W for 115 V ~, 230 V ~	**955 880 34**
Bulb H 1 70 W for 24 V ≅	**955 880 35**

TECHNICAL DIAGRAMS

see page 238

Please also see Rotating Mirror Beacon 883 with additional advantages (see page 118)

- High protection rating IP 65
- Modern design
- High impact to 20 Joules
- Long life duration thanks to low wear wheel and disc drive
- Mounting and connection without the need to disassemble the mechanism



WERMA SIGNALTECHNIK

881 Rotating Mirror Beacon

- **Low-priced rotating mirror beacon with bulb included**
- **Suitable for indoor and outdoor use**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	150 mm x 204 mm
Housing:	ABS
Dome:	PC, transparent
Fixing:	Base mounting, bracket mounting, tube mounting
Connection:	Screwable connection 0.5 - 1.5 mm²
Cable entry:	Cable diameter 5 - 8 mm
Mirror rotating rate:	c. 170 r.p.m.

Bulb included in assembly.

ORDER SPECIFICATIONS:

Voltage	48 V ≅	115 V ~	230 V ~
Current consumpt.	1.0 A	0.6 A	0.3 A
red	**881 152 56**	**881 152 97**	**881 152 98**
yellow	**881 352 56**	**881 352 97**	**881 352 98**

ACCESSORIES:

Flange for tube, max. 29.8 mm	**880 000 00**
Bracket for wall mounting	**975 881 01**

SPARE PARTS:

Bulb E 14, 40 W

Voltage	48 V ≅	115 V ≅	230 V ≅
	955 880 66	**955 880 67**	**955 880 68**

TECHNICAL DIAGRAMS

see page 239

Rotating Mirror Beacon 885

Following last year's "red dot design award", 2006 has seen WERMA receiving yet another highly acclaimed international design prize: the new Rotating Mirror Beacon 885 has been awarded the "iF product design award 2006".

Award-winning: The Rotating Mirror Beacon 885

IF DESIGN AWARD – SYNONYMOUS WITH CURRENT DESIGN TRENDS

Since its establishment in 1953 the "iF design award" has been a consistent, renowned hallmark for "excellent" design. Up to 25 internationally recognised specialist jurors – designers and businessmen – engage in enthusiastic and critical discussion of the over 2,200 submitted products and concepts before selecting the award winners.

THE WINNING PRODUCT: THE ROTATING MIRROR BEACON 885

The award winning Rotating Mirror Beacon 885 is an ideal addition to the existing WERMA product range.
It stands out with its clear, no frills design and a new size.

When in operation the new rotating mirror beacon generates an extremely high signal effect due to the internal rotating mirror.

During the development of the Rotating Mirror Beacon great emphasis was placed on a stately design that was nevertheless both industry-compatible and functional. WERMA consciously designed the dome to enable a clear view of the fascinating technology in its interior - thus creating a successful interplay of appealing design and innovative technology.

product design award 2006

Comparative sizes of the Rotating Mirror Beacons 883 and 885

WERMA SIGNALTECHNIK

885 Rotating Mirror Beacon

NEW

product design award 2006

- **Full rotating mirror functionality in compact form**
- **Award-winning design – winner of the "iF product design award 2006"**
- **Extremely quiet**
- **Can be mounted as required**
- **Mounting and connection without the need to disassemble the mechanism**
- **High protection rating IP 65**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	90 mm x 150 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Fixing:	Base mounting, bracket mounting (accessory)
Connection:	Screwable connection with wire protection max. 2.5 mm² Contact protection according to VDE
Cable entry:	cable diameter 5-7 mm
Installation position:	As required
Halogen bulb:	G 6.35 20 W 12 V / 24 V
Mirror rotation rate:	180 r.p.m.
Service life of drive:	> 5,000 hrs
Duty cycle:	100 %

Halogen bulb included in assembly.

Wire guard (accessory)

Bracket (accessory)

ORDER SPECIFICATIONS:

Voltage	12 V =	24 V ≅	115 V ≅ / 230 V ≅
Current consumpt.	1.7 A	1.0 A	0.18 A / 0.09 A
red	**885 100 54**	**885 100 75**	**885 100 78**
green	**885 200 54**	**885 200 75**	**885 200 78**
yellow	**885 300 54**	**885 300 75**	**885 300 78**
blue	**885 500 54**	**885 500 75**	**885 500 78**

ACCESSORIES:

Plastic bracket for wall mounting	**975 826 05**
Wire guard	**975 826 03**

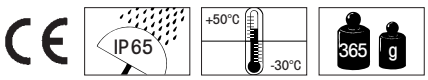
SPARE PARTS:

Halogen bulb 20 W for 12 V = 115 V ≅, 230 V ~	**955 885 24**
Halogen bulb 20 W for 24 V ≅	**955 885 25**

Available from 1st Quarter 2007.

TECHNICAL DIAGRAMS

see page 241



883 Rotating Mirror Beacon

- **Modern design**
- **High protection rating IP 65**
- **High impact resistance to 20 Joules**
- **Can be mounted as required**
- **Extreme durability thanks to low wear wheel and disc drive**
- **Mounting and connection without the need to disassemble the mechanism**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	142 mm x 220 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Fixing:	Base mounting, bracket mounting, tube mounting
Connection:	Screwable connection with wire protection max. 2.5 mm² Contact protection according to VDE
Cable entry:	cable diameter 5 - 7 mm
Drive:	Wheel and disc drive, motor in centre of gravity
Installation position:	As required
Halogen bulb:	G 6.35 35 W 12 V / 24 V
Mirror rotation rate:	180 r.p.m.
Service life of drive:	> 5,000 hrs
Duty cycle:	100 %

Halogen bulb included in assembly.

Bracket (accessory)

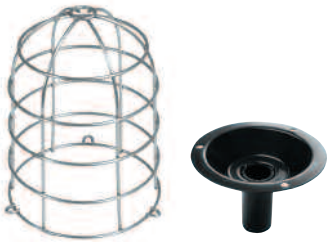
ORDER SPECIFICATIONS:

Voltage	12 V =	24 V ≅	115 V ≅	230 V ~
Current consumpt.	3 A	1.6 A	0.35 A	0.17 A
red	**883 100 54**	**883 100 75**	**883 100 77**	**883 100 68**
green	**883 200 54**	**883 200 75**	**883 200 77**	**883 200 68**
yellow	**883 300 54**	**883 300 75**	**883 300 77**	**883 300 68**
blue	**883 500 54**	**883 500 75**	**883 500 77**	**883 500 68**

Further colours and voltages on request.

ACCESSORIES:

Plastic bracket for wall mounting	**975 883 06**
Flange for tube mounting max. 25.3 mm	**975 883 02**
Base for tube mounting	**975 840 91**
Tube, ø 25 mm, 100 mm long	**975 845 10**
Tube, ø 25 mm , 250 mm long	**975 840 25**
Wire guard	**975 883 08**



Wire guard and flange for tube mounting (accessories)

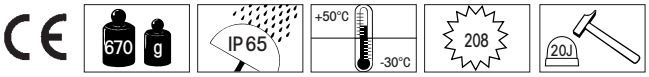
SPARE PARTS:

Halogen bulb 35 W for 12 V = 115 V ≅, 230 V ~	**955 883 34**
Halogen bulb 35 W for 24 V ≅	**955 883 35**

TECHNICAL DIAGRAMS

see page 239

Low wear wheel and disc drive



WERMA SIGNALTECHNIK

884 Revolving Signal Beacon

- **Greater signal effect particularly in poor conditions thanks to three light beams**
- **Low rotation rate**
- **Three Fresnel lenses effect light convergence and optimise visibility**
- **High impact resistance to 20 Joules**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	142 mm x 220 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Fixing:	Base mounting, bracket mounting, tube mounting
Connection:	Screwable connection with wire protection max. 2.5 mm² Contact protection according to VDE
Cable entry:	Cable diameter 5 - 7 mm
Drive:	Wheel and disc drive, motor in centre of gravity
Installation position:	As required
Halogen bulb:	G 6.35 35 W 12 V / 24 V
Mirror rotation rate:	60 r.p.m.
Service life of drive:	> 5,000 hrs
Duty cycle:	100 %

Halogen bulb included in assembly.

Bracket (accessory)

ORDER SPECIFICATIONS:

Voltage	24 V ≅	230 V ~
Current consumpt.	1.6 A	0.17 A
red	**884 100 75**	**884 100 68**
green	**884 200 75**	**884 200 68**
yellow	**884 300 75**	**884 300 68**
blue	**884 500 75**	**884 500 68**

Further colours and voltages on request.

ACCESSORIES:

Plastic bracket for wall mounting	**975 883 06**
Flange for tube mounting max. 25.3 mm	**975 883 02**
Base for tube mounting	**975 840 91**
Tube, ø 25 mm, 100 mm long	**975 845 10**
Tube, ø 25 mm, 250 mm long	**975 840 25**
Wire guard	**975 883 08**

SPARE PARTS:

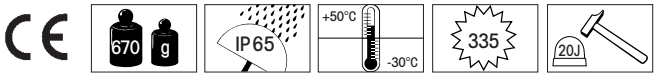
Halogen bulb 35 W for 230 V ~	**955 883 34**
Halogen bulb 35 W for 24 V ≅	**955 883 35**

Wire guard and flange for tube mounting (accessories)

3 Fresnel lenses are set at a 120° angle

TECHNICAL DIAGRAMS

see page 239



890 LED Beacon/LED Traffic Light

- **Traffic Light combination with maintenance-free LED technology**
- **Clear signalling effect even in direct sunlight**
- **High protection rating IP 65 for indoor and outdoor use**
- **Practical fixing bow**

LED Beacon

Traffic Light combination

Clear signalling effect even in direct sunlight thanks to transparent dome

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	150 mm x 147 mm
Housing:	ABS
Dome:	PC, transparent
Fixing:	Base mounting, fixing bow
Connection:	Screwable connection max. 1.5 mm²
Cable entry:	From top or bottom with cable gland M 20 x 1.5 mm or from the back with rubber grommet ø 6-12 mm

Life duration up to 50,000 hrs

ORDER SPECIFICATIONS:

Voltage	12-24 V =	115 V ~	230 V ~
Current consumpt.	< 200 mA	< 35 mA	< 35 mA
red	**890 120 55**	**890 120 67**	**890 120 68**
green	**890 220 55**	**890 220 67**	**890 220 68**
yellow	**890 320 55**	**890 320 67**	**890 320 68**

ACCESSORIES:

Connecting grommet	**975 890 25**
Fixing bow with mounting material for one beacon (incl. connecting grommet)	**975 890 19**
Fixing bow with mounting material for two beacons (incl. connecting grommet)	**975 890 21**
Fixing bow with mounting material for three beacons (incl. connecting grommet)	**975 890 22**

Fully assembled beacon on request.

TECHNICAL DIAGRAMS

see page 241

Please see also Permanent/Traffic Light Beacon 890

Existing Permanent/Traffic Light Beacons 890 (see page 121) can also be upgraded to LED technology using the LED bulb 956 with E27 socket.

CE 450 g IP65 +50°C -20°C

WERMA SIGNALTECHNIK

890 Permanent/Traffic Light Beacon

- Signal beacon for traffic light combinations
- High light intensity thanks to reflector (accessory)
- High protection rating IP 65 for indoor and outdoor use
- Also with two bulb sockets for uniform safety, even in the case of bulb failure
- Practical fixing bow for one, two or three signal beacons
- For underground car parks, entrances and car washes

890 with fixing bow (accessory)

890 with adhesive sticker (accessory)

Permanent beacon with two sockets

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	150 mm x 154 mm
Housing:	ABS
Dome:	PC, transparent
Socket:	E27 max. 25 W bei 890 X00 00 2 sockets E14 each with max. 15 W at 890 X10 00 with adhesive stickers E27 max. 15 W
Fixing:	Base mounting, fixing bow
Connection:	Screw-free clamp mechanism max. 1.5 mm² (890 X00 00) Screwable connection with wire protection max. 2.5 mm² (890 X10 00)
Cable entry:	From top or bottom with cable gland M 20 x 1.5 mm or from the back with rubber grommet ø 6-12 mm

Bulb not included in assembly.

ORDER SPECIFICATIONS:

Permanent light 12 - 240 V ≅		**Permanent light with two sockets** (incl. reflector)	12 - 240 V ≅
red	**890 100 00**	red	**890 110 00**
green	**890 200 00**	green	**890 210 00**
yellow	**890 300 00**	yellow	**890 310 00**
clear	**890 400 00**		
blue	**890 500 00**		

Further colours and voltages on request.

ACCESSORIES:

Additional reflector for 890 X00 00	**975 890 02**
Connecting grommet (always incl. with fixing bow)	**975 890 25**
Fixing bow with mounting material for one beacon (incl. connecting grommet)	**975 890 19**
Fixing bow with mounting material for two beacons (incl. connecting grommet)	**975 890 21**
Fixing bow with mounting material for three beacons (incl. connecting grommet)	**975 890 22**

Bulb E27, 24 V ≅ / 25 W	**955 890 55**	LED Bulb E27, 24 V ≅	**956 X20 75**
Bulb E27, 115 V ~ / 25 W	**955 890 67**	LED Bulb E27, 115 V ~	**956 X20 67**
Bulb E27, 230 V ≅ / 25 W	**955 890 68**	LED Bulb E27, 230 V ~	**956 X20 68**
Bulb E14, 230 V ≅ / 15 W	**955 890 38**	See page 127.	

ADHESIVE STICKERS:

→	**975 890 52**	BETRIEB	**975 890 57**
STOP	**975 890 53**	STÖRUNG	**975 890 58**
START	**975 890 54**	↯	**975 890 64**
KEIN ZUTRITT	**975 890 56**		
ZUTRITT	**975 890 55**		**975 890 65**

TECHNICAL DIAGRAMS

see page 241

895/897 Permanent/Double Flash Beacon

- Large signal beacons for powerful signal effectiveness
- High light intensity thanks to optimised lens
- High protection rating IP 65 for indoor and outdoor use
- With a multitude of symbols
- Double flash beacon 15 Ws

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	150 mm x 147 mm	
Housing:	ABS	
Dome:	PC, transparent	
Socket:	E27 max. 25 W 2 sockets E 14 each with max. 15 W with adhesive stickers E27 max. 15 W	
Fixing:	Base mounting	
Cable entry:	From top or bottom with cable gland M 20 x 1.5 mm or from the back with rubber grommet ø 6-12 mm	
Connection:	**895** Screw-free clamp mechanism max. 1.5 mm^2	**897** Screwable connection max. 2.5 mm^2
Flash frequency:	1 Hz	
Flash energy:	Double flash beacon 15 Ws	
Life duration:	4 x 10^6 flashes	

ORDER SPECIFICATIONS:

Permanent light	12 - 240 V ≅	**Permanent light with two sockets** 12 - 240 V ≅
red	**895 100 00**	**895 110 00**
green	**895 200 00**	
yellow	**895 300 00**	
clear	**895 400 00**	
blue	**895 500 00**	

Bulb not included in assembly.

Double flash light	24 V = / 800 mA	230 V ~ / 200 mA
red	**897 100 55**	**897 100 68**
yellow	**897 300 55**	**897 300 68**
clear		**897 400 68**

Further colours and voltages on request.

ACCESSORIES:

Additional reflector for 895	**975 890 02**
Connecting grommet (always incl. with fixing bow)	**975 890 25**
Fixing bow with mounting material for one beacon (incl. connecting grommet)	**975 890 19**
Fixing bow with mounting material for two beacons (incl. connecting grommet)	**975 890 21**
Fixing bow with mounting material for three beacons (incl. connecting grommet)	**975 890 22**

Bulb E27, 24 V ≅ / 25 W	**955 890 55**	LED Bulb E27, 24 V ≅	**956 X20 75**
Bulb E27, 115 V ~ / 25 W	**955 890 67**	LED Bulb E27, 115 V ~	**956 X20 67**
Bulb E27, 230 V ≅ / 25 W	**955 890 68**	LED Bulb E27, 230 V ~	**956 X20 68**
Bulb E14, 230 V ≅ / 15 W	**955 890 38**	See page 127.	

ADHESIVE STICKERS:

→	**975 890 52**	BETRIEB	**975 890 57**
STOP	**975 890 53**	STÖRUNG	**975 890 58**
START	**975 890 54**		**975 890 64**
KEIN ZUTRITT	**975 890 56**		
ZUTRITT	**975 890 55**		**975 890 65**
VERRIEGELT	**975 890 77**		

TECHNICAL DIAGRAMS

see page 242

WERMA SIGNALTECHNIK

806 Monitorable LED Permanent Beacon

TÜV Rheinland Gruppe — Bauart geprüft — Type approved

- TÜV certified LED Muting Beacon
- Current monitoring
- Life duration 100,000 hrs with LED Chip-On-Board technology
- Approved for muting use according to IEC 61496-1
- For use in laser technology according to EN 60825-1, restart warning, timed triggering, change of operating mode

Life duration up to 100,000 hrs

Bracket (accessory)

TECHNICAL SPECIFICATIONS:

Dimensions(Diameter x Height):	70 mm x 100 mm
Housing:	Terminal element: PA fibreglass, high-impact Cap: PC
Dome:	PC, transparent
Fixing:	Base mounting Bracket mounting
Connection:	CAGE CLAMP® technology max. 2.5 mm² Contact protection according to VDE
Cable entry:	Cable diameter max. 14 mm
Duty cycle:	100 %
Operating voltage:	24 V DC
Current consumption:	60 mA
Current consumption following failure of 3 of the 6 strips:	< 5 mA

ORDER SPECIFICATIONS:

Voltage	24 V =
yellow	**806 350 55**
clear	**806 450 55**

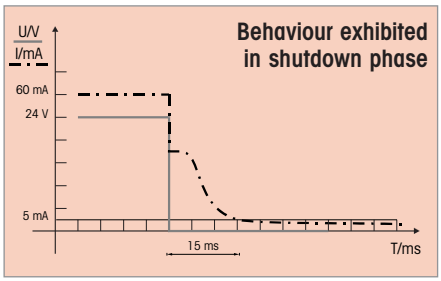
ACCESSORIES:

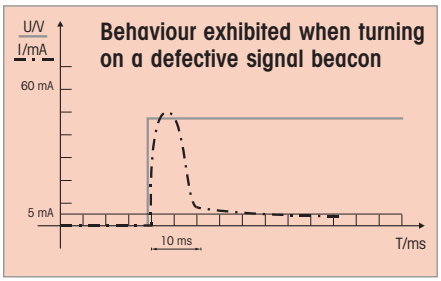
Bracket, including cable gland	**960 000 02**
Bracket for 1-sided mounting	**975 840 85**

see page 45

TECHNICAL DIAGRAMS

see page 227





What does Muting mean?

Muting is the temporary automatic overriding of a safety protection device by means of a control system within the normal operating cycle of a machine. This bridging of the safety protection must be visually displayed in order to prevent workers mistakenly entering a dangerous area.

It is therefore necessary that the signal beacon in such applications can be triggered by failsafe technology and the bulb function can be monitored.
The standard colour for muting signalisation is clear; yellow is however also permitted.

CE | 180 g | IP 65 | +55°C / -20°C | 0,6 | TÜV Rheinland Gruppe

826 Monitored Permanent Beacon

- **Built-in monitoring capability**
- **With TÜV approval**
- **Two potential-free safety outputs for connection to control system**
- **No additional external voltage required**
- **Approved for safety applications according to IEC 61496-1**
- **For use in laser technology according to EN 60825-1, restart warning, timed triggering, change of operating mode and robotics**

Bracket (accessory)

Tube with base (accessory)

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	100 mm x 138.5 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Fixing:	Base, bracket and tube mounting Base 975 840 90 must be ordered twice for base mounting – once as socket for beacon and once as base
Connection:	Screwable connection with wire protection max. 2.5 mm²
Cable entry:	Cable diameter 5-7 mm
Rated voltage:	24 V DC ± 10 %
Input power at 24 V DC:	7 W
Bulb BA 15d:	7 W / 24 V
Output current capability:	30 V DC / 100 mA
On state resistance of an output:	max. 25 Ω
Fuse for 7 W bulb:	500 mA quick action (IEC 60127-3/3)
Atmospheric humidity:	≤ 95 % without moisture condensation
Temperature range:	0 °C bis +50 °C
Response time,	
normal operation and with filament break:	1 ms to 5 ms
in fault cases with safety release:	< 300 ms (with short-circuit current ≥ 4 A)
Bulb included in assembly.	

ORDER SPECIFICATIONS:

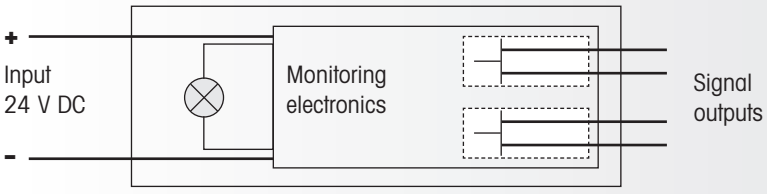
Voltage	24 V =
red	**826 110 55**
yellow	**826 310 55**
clear	**826 410 55**

ACCESSORIES:

see page 105

TECHNICAL DIAGRAMS

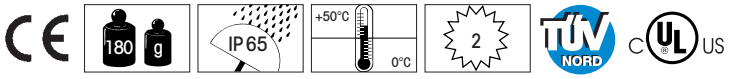
see page 229



Function

The device is equipped with a lamp monitor which signals the current flow of the incandescent lamp back to two electrically isolated, potential-free semiconductor outputs A and B (outputs closed). If the lamp has not been actuated, both outputs are open. In case of a fault and/or a lamp failure at least one output is opened.

Depending on the safety category, one or two outputs are to be used for a reliable lamp evaluation. In case of an incandescent filament short-circuit in the lamp, the integrated fuse is tripped. It must be replaced by a new fuse in accordance with the specifications after the lamp has been replaced by a lamp of equal wattage.



829 Monitored LED Permanent Beacon

NEW

NEW **Monitored Permanent Beacon with long life, maintenance-free LED technology**

Bracket (accessory)

- **Durable LED Permanent Beacon with built-in monitoring capability**
- **Life duration up to 50,000 hrs**
- **No additional external voltage required**
- **Two potential-free safety outputs for connection to control system**
- **High protection rating IP 65**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	100 mm x 138.5 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Fixing:	Base, bracket and tube mounting Base 975 840 90 must be ordered twice for base mounting – once as socket for beacon and once as base
Installation position:	vertical
Cable outlet:	downward
Current consumption:	≤ 145 mA
Duty cycle:	100 %
Connection:	Screwable connection with wire protection max. 2.5 mm²
Cable entry:	Cable diameter 5-7 mm
Rated voltage:	24 V DC
Input power at 24 V DC:	c. 3.5 W
Output current capability:	30 V DC / 100 mA
On state resistance of an output:	max. 25 Ω
Atmospheric humidity:	≤ 95 % without moisture condensation
Temperature range:	0 °C bis +50 °C
Response time, normal operation and with filament break:	1 ms to 5 ms
in fault cases with safety release:	< 1 s (with short-circuit current ≥ 1 A)

ORDER SPECIFICATIONS:

Voltage	24 V =
red	**829 170 55**
yellow	**829 370 55**
clear	**829 470 55**

Available from 1st Quarter 2007.

ACCESSORIES:

Bracket **975 826 05**

TECHNICAL DIAGRAMS

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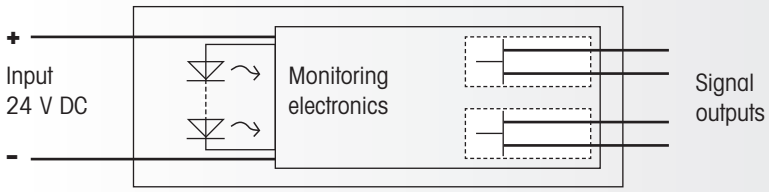


Function

The device is equipped with monitoring electronics which signal the current flow of the beacon back to two electrically isolated, potential-free semiconductor outputs A and B (outputs closed).

If the beacon has not been actuated, both outputs are open. In case of a fault at least one output is opened.

in preparation

956 LED Bulb with BA 15d socket

- Extremely long life duration
- Chip-On-Board technology
- To fit in WERMA Signal towers and signal devices with B 15 d socket
- Resistant against shock and vibration
- Frontal beam direction
- Optimised lens structure ensures ideal illumination

Suitable for use in Kombi*SIGN* 71

TECHNICAL SPECIFICATIONS:

Housing:	PA fibreglass, high-impact
Dome:	PC, transparent
Socket:	BA 15 d
Operating voltage:	24 V = 115 V ~ 230 V ~
Starting current:	< 0.5 A at 24 V
Current consumption:	24 V = < 45 mA 115 V ~ < 15 mA 230 V ~ < 15 mA
Life duration:	up to 50,000 hrs
For use with:	200, 203, 206, 209, 210, 213, 216, 219, 220, 223, 641, 805, 840, 846, 850, 851, 852

Life duration up to 50,000 hrs

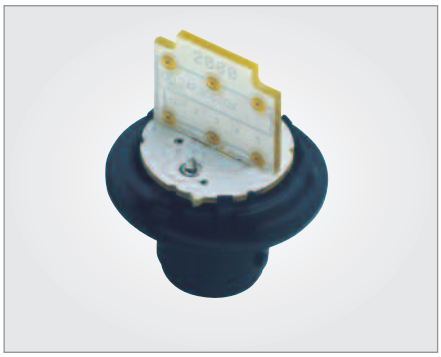
Slight deviatons in the form of the bulbs are possible.

ORDER SPECIFICATIONS:

Voltage	24 V =	115 V ~	230 V ~
red	**956 100 75**	**956 100 67**	**956 100 68**
green	**956 200 75**	**956 200 67**	**956 200 68**
yellow	**956 300 75**	**956 300 67**	**956 300 68**
white	**956 400 75**	**956 400 67**	**956 400 68**
blue	**956 500 75**	**956 500 67**	**956 500 68**

TECHNICAL DIAGRAMS

see page 242



Chip-On-Board technology

Manual grip facility

WERMA SIGNALTECHNIK

956 LED Bulb E27

- Extremely long life duration
- To fit in WERMA Permanent/ Traffic Light Beacon 890
- Resistant against shock and vibration

TECHNICAL SPECIFICATIONS:

Socket:	E27
Operating voltage:	24 V ≅ 115 V ~ 230 V ~
Starting current:	< 0,5 A at 24 V
Current consumption:	≤ 30 mA
For use with:	890, 895

Slight deviatons in the form of the bulbs are possible.

ORDER SPECIFICATIONS:

Voltage	24 V ≅	115 V ~	230 V ~
red	**956 120 75**	**956 120 67**	**956 120 68**
green	**956 220 75**	**956 220 67**	**956 220 68**
yellow	**956 320 75**	**956 320 67**	**956 320 68**

TECHNICAL DIAGRAMS

see page 242

Suitable for use in
WERMA Permanent/Traffic Light Beacons

Bulb Overview

	PART NO.	DESCRIPTION	TOTAL LENGTH (mm)	VOLTAGE	FOR USE WITH:								
	**955 840 34**	Bulb BA 15d 5 W	max. 42	12 V	200	203	209	641	800	805	840	845	
	955 840 35	Bulb BA 15d 5 W	max. 42	24 V	200	203	209	641	800	805	840	845	
	955 840 32	Bulb BA 15d 5 W	max. 42	30 V	200	203	209	641	800	805	840	845	
	955 840 57	Bulb BA 15d 5 W	max. 42	115 V	200	203	209	641	800	805	840	845	
	955 840 38	Bulb BA 15d 5 W	max. 42	230 V	200	203	209	641	800	805	840	845	
	**955 015 34**	Bulb BA 15d 7 W	52	12 V	210	213	219	220	480	580	815		850
	955 015 35	Bulb BA 15d 7 W	52	24 V	210	213	219	220	480	580	815	826	850
	955 015 36	Bulb BA 15d 7 W	52	48 V	210	213	219	220	480	580	815	monit.	850
	955 015 37	Bulb BA 15d 7 W	52	115 V	210	213	219	220	480	580	815		850
	955 015 38	Bulb BA 15d 7 W	52	230 V	210	213	219	220	480	580	815		850
	**955 826 35**	Bulb BA 15d 15 W	45	24 V	826								
	955 826 38	Bulb BA 15d 15 W	45	230 V	826								
	**955 827 35**	Bulb BA 15d 25 W	55	24 V	827								
	955 827 37	Bulb BA 15d 25 W	55	115 V	827								
	955 827 38	Bulb BA 15d 25 W	55	230 V	827								
	**955 890 38**	Bulb E 14 15 W	76	230 V	890	895							
	**955 025 35**	Bulb E 14 25 W	65	24 V	870								
	955 025 38	Bulb E 14 25 W	65	230 V	870								

Minimal differences in form are possible within the different bulb models.

Bulb Overview

	PART NO.	DESCRIPTION	TOTAL LENGTH (mm)	VOLTAGE	FOR USE WITH:					
	**955 880 66** **955 880 67** **955 880 68**	Bulb E 14 40 W Bulb E 14 40 W Bulb E 14 40 W	76 76 76	48 V 115 V 230 V	881 881 881					
	**955 890 55** **955 890 67** **955 890 68**	Bulb E 27 25 W Bulb E 27 25 W Bulb E 27 25 W	100 100 100	24 V 115 V 230 V	890 890 890	895 895 895				
	**955 883 34** **955 883 35**	Halogen bulb G 6.35 35 W Halogen bulb G 6.35 35 W	40 40	12 V 24 V	783 783	784 784	883 883	884 884		
	**955 885 24** **955 885 25**	Halogen bulb G 6.35 20 W Halogen bulb G 6.35 20 W	40 40	12 V 24 V	783 783	885 885				
	**955 880 34** **955 880 35**	Halogen bulb H 1 55 W Halogen bulb H 1 70 W	57	12 V 24 V	880 880					
	**956 x00 75** **956 x00 75** **956 x00 75** x see page 126	LED bulb BA 15d LED bulb BA 15d LED bulb BA 15d	42 42 42	24 V 115 V 230 V						
	**956 x20 75** **956 x20 75** **956 x20 75** x see page 127	LED bulb E27 LED bulb E27 LED bulb E27	65 65 65	24 V 115 V 230 V	890 890 890	895 895 895				

Minimal differences in form are possible within the different bulb models.

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NEW

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Overview Optical-Audible Signal Devices

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	Installation	Free-standing
LED/Buzzer Combination	**150** Page 146	**420** Page 132
NEW	**450** Page 147	**422** Page 136
LED/Multi-Tone Sounder Combination		**420** Page 133
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Flash/Buzzer Combination		**421** Page 134
		423 Page 138
Flash/Multi-Tone Sounder Combination		**421** Page 135
		423 Page 139
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LED/Horn Combination		**424** Page 140
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Light/Buzzer Combination	**115** Page 148	**480** Page 142
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Bulbs	**Bulb Overview** Pages 128 + 129	

Play Sound www.werma.com

The sounds of these products can be played from our website www.werma.com under the heading Optical-Audible Signal Devices.

Further information about the “Audible” theme can be found in the chapter “Tech-Talk” beginning on page 10.

420 LED/Buzzer Combination

- **Buzzer in combination with LED Permanent Beacon**
- **Long life duration up to 50,000 hrs**
- **Optical and audible signals can be triggered separately**
- **Continuous or pulse tone adjustable**
- **Easy to mount**
- **High protection rating IP 65**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	89 mm x 100 mm
Housing:	PC
Dome:	PC, transparent
Connection:	Screwable connection with wire protection max. 1.5 mm²
Cable entry:	Cable diameter max. 9 mm
Starting current:	< 0.5 A at 24 V
Current consumpt. LED + Buzzer:	< 60 mA at 24 V; < 40 mA at 115 and 230 V
Tone type:	Continuous or pulse tone, adjustable
Tone frequency:	2.3 kHz
Sound output:	92 dB
Fixing:	Surface mounting
Life duration:	50,000 hrs

Life duration up to 50,000 hrs

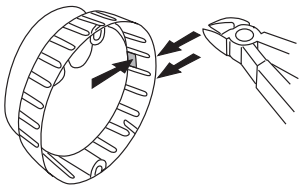
ORDER SPECIFICATIONS:

Voltage	24 V ≅	115 V ~	230 V ~
red	**420 110 75**	**420 110 67**	**420 110 68**
yellow	**420 310 75**	**420 310 67**	**420 310 68**

TECHNICAL DIAGRAMS

see page 208

Play Sound www.werma.com



Piece of rim can be broken out to allow for cable entry from the side.

WERMA SIGNALTECHNIK

420 LED/Multi-Tone Sounder Combination

- Multi-Tone Sounder in combination with LED Permanent Beacon
- High life duration of up to 50,000 hrs
- Optical and audible signals can be triggered separately
- Choice of 8 different tones
- Easy to mount
- Long protection rating IP 65
- Adjustable sound output

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	89 mm x 105 mm
Housing:	PC black
Dome:	PC, transparent
Connection:	Screwable connection with wire protection max. 1.5 mm²
Cable entry:	Cable diameter max. 9 mm
Sound output:	Max. 105 dB
Fixing:	Surface mounting
Life duration:	up to 50,000 hrs

Life duration up to 50,000 hrs

Mounting holes integrated into the product rim allow easy mounting without having to remove the dome.

TONE TYPES AND FREQUENCIES:

Tone No.	Tone type
1	Horn tone
2	Continuous tone (c. 2.3 KHz)
3	1 Hz tone (c. 2.3 KHz)
4	20 Hz whistle tone (c. 2.3 KHz)
5	800-970 Hz rising @ 1 Hz
6	2400-2850 Hz rising @ 7 Hz
7	1200-500 Hz falling @ 1 Hz
8	Alternating tone 800 Hz + 1200 Hz @ 1Hz

Play Sound www.werma.com

ORDER SPECIFICATIONS:

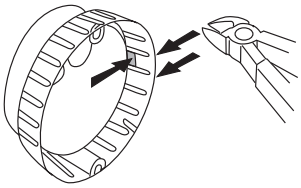
Voltage	24 V ≅
red	**420 120 75**
yellow	**420 320 75**

TECHNICAL DIAGRAMS

see page 208

421 Flash/Buzzer Combination

- **Buzzer in combination with Xenon Flash**
- **Optical and audible signal can be triggered separately**
- **Continuous or pulse tone adjustable**
- **Easy to mount**
- **High protection rating IP 65**



Piece of rim can be broken out to allow for cable entry from the side.

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	89 mm x 100 mm
Housing:	PC
Dome:	PC, transparent
Connection:	Screwable protection with wire protection max. 1.5 mm²
Cable entry:	Cable diameter max. 9 mm
Current cons. Flash + Buzzer:	< 150 mA at 24 V; < 40 mA at 115 V; < 60 mA at 230 V
Tone type:	Continuous or pulse tone, adjustable
Tone frequency:	2.3 kHz
Flash energy:	1 Ws
Flash frequency:	1 Hz
Sound output:	92 dB
Fixing:	Surface mounting
Life duration:	4 x 10^6 flashes

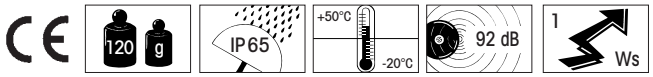
ORDER SPECIFICATIONS:

Voltage	24 V ≅	115 V ~	230 V ~
red	**421 110 75**	**421 110 67**	**421 110 68**
yellow	**421 310 75**	**421 310 67**	**421 310 68**

TECHNICAL DIAGRAMS

see page 209

Play Sound www.werma.com



WERMA SIGNALTECHNIK

421 Flash/Multi-Tone Sounder Combination

- Multi-Tone Sounder in combination with Xenon Flash
- Optical and audible signal can be triggered separately
- Choice of different 8 tones
- High protection rating IP 65
- Adjustable sound output
- Easy to mount

Mounting holes integrated into the product rim allow easy mounting without having to remove the dome.

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	89 mm x 105 mm
Housing:	PC black
Dome:	PC, transparent
Connection:	Screwable connection with wire protection max. 1.5 mm^2
Cable entry:	Cable diameter max. 9 mm
Flash energy:	1 Ws
Flash frequency:	1 Hz
Sound output:	Max. 105 dB
Fixing:	Surface mounting
Life duration:	4 x 10^6 flashes

TONE TYPES AND FREQUENCIES:

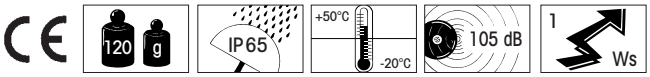
Tone No.	Tone type
1	Horn tone
2	Continuous tone (c. 2.3 KHz)
3	1 Hz tone (c. 2.3 KHz)
4	20 Hz whistle tone (c. 2.3 KHz)
5	800-970 Hz rising @ 1 Hz
6	2400-2850 Hz rising @ 7 Hz
7	1200-500 Hz falling @ 1 Hz
8	Alternating tone 800 Hz + 1200 Hz @ 1Hz

ORDER SPECIFICATIONS:

Voltage	24 V ≅
red	**421 120 75**
yellow	**421 320 75**

TECHNICAL DIAGRAMS

see page 209



422 LED/Buzzer Combination

- Buzzer in combination with LED Permanent Beacon
- Long life duration up to 50,000 hrs
- Integrated mounting bracket
- Optical and audible signal can be triggered separately
- Continuous or pulse tone adjustable
- High protection rating IP 65

TECHNICAL SPECIFICATIONS:

Dimensions (D x W x H):	91.5 mm x 82.5 mm x 120 mm
Housing:	PC/ABS-Blend; PC grey
Dome:	PC, transparent
Connection:	Screwable connection with wire protection max. 1.5 mm²
Cable entry:	Cable diameter max. 9 mm
Starting current:	< 0.5 A at 24 V
Current consumpt. LED + Buzzer:	< 60 mA at 24 V;
	< 40 mA at 115 V and 230 V
Tone type:	Continuous or pulse tone, adjustable
Tone frequency:	2.3 kHz
Sound output:	92 dB
Fixing:	Bracket mounting
Life duration:	50,000 hrs

Life duration up to 50,000 hrs

ORDER SPECIFICATIONS:

Voltage	24 V ≅	115 V ~	230 V ~
red	**422 110 75**	**422 110 67**	**422 110 68**
yellow	**422 310 75**	**422 310 67**	**422 310 68**

Play Sound www.werma.com

TECHNICAL DIAGRAMS

see page 209

CE 130 g IP65 +50°C -20°C 92 dB

422 LED/Multi-Tone Sounder Combination

- Multi-Tone Sounder in combination with LED Permanent Beacon
- Long life duration of up to 50,000 hrs
- Optical and audible signals can be triggered separately
- Integrated mounting bracket
- Choice of 8 different tones
- Easy to mount
- High protection rating IP 65
- Adjustable sound output

TECHNICAL SPECIFICATIONS:

Dimesions (D x W x H):	91.5 mm x 82.5 mm x 120 mm
Housing:	PC/ABS-Blend; PC grey
Dome:	PC, transparent
Connection:	Screwable connection with wire protection max. 1.5 mm²
Cable entry:	Cable diameter max. 9 mm
Sound output:	Max. 109 dB
Fixing:	Bracket mounting
Life duration:	50,000 hrs

Life duration up to 50,000 hrs

TONE TYPES AND FREQUENCIES:

Tone No.	Tone type
1	Horn tone
2	Continuous tone (c. 2.3 KHz)
3	1 Hz tone (c. 2.3 KHz)
4	20 Hz whistle tone (c. 2.3 KHz)
5	800-970 Hz rising @ 1 Hz
6	2400-2850 Hz rising @ 7 Hz
7	1200-500 Hz falling @ 1 Hz
8	Alternating tone 800 Hz + 1200 Hz @ 1Hz

ORDER SPECIFICATIONS:

Voltage	24 V ≅
red	**422 120 75**
yellow	**422 320 75**

TECHNICAL DIAGRAMS

see page 209

423 Flash/Buzzer Combination

- **Buzzer in combination with Xenon flash**
- **Optical and audible signal can be triggered separately**
- **Integrated mounting bracket**
- **Continuous or pulse tone adjustable**
- **High protection rating IP 65**

TECHNICAL SPECIFICATIONS:

Dimensions (D x W x H):	91.5 mm x 82.5 mm x 120 mm
Housing:	PC/ABS-Blend; PC grey
Dome:	PC, transparent
Connection:	Screwable conn. with wire protection max. 1.5 mm^2
Cable entry:	Cable diameter max. 9 mm
Current cons. Flash + Buzzer:	< 150 mA at 24 V;
	< 40 mA at 115 V;
	< 60 mA at 230 V
Tone type:	continuous or pulse tone, adjustable
Tone frequency:	2.3 kHz
Flash energy:	1 Ws
Flash frequency:	1 Hz
Sound output:	92 dB
Fixing:	Bracket mounting
Life duration:	4 x 10^6 flashes

ORDER SPECIFICATIONS:

Voltage	24 V ≅	115 V ~	230 V ~
red	**423 110 75**	**423 110 67**	**423 110 68**
yellow	**423 310 75**	**423 310 67**	**423 310 68**

Play Sound www.werma.com

TECHNICAL DIAGRAMS

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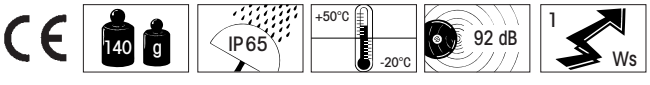

WERMA SIGNALTECHNIK

423 Flash/Multi-Tone Sounder Combination

- Multi-Tone Sounder in combination with Xenon Flash
- Optical and audible signal can be triggered separately
- Choice of different 8 tones
- Integrated mounting bracket
- High protection rating IP 65
- Adjustable sound output

TECHNICAL SPECIFICATIONS:

Dimensions (D x W x H):	91.5 mm x 82.5 mm x 120 mm
Housing:	PC/ABS-Blend; PC grey
Dome:	PC, transparent
Connection:	Screwable connection with wire protection max. 1.5 mm^2
Cable entry:	Cable diameter max. 9 mm
Flash energy:	1 Ws
Flash energy:	1 Hz
Sound output:	Max. 109 dB
Fixing:	Bracket mounting
Life duration:	4 x 10^6 flashes

TONE TYPES AND FREQUENCIES:

Tone No.	Tone type
1	Horn tone
2	Continuous tone (c. 2.3 KHz)
3	1 Hz tone (c. 2.3 KHz)
4	20 Hz whistle tone (c. 2.3 KHz)
5	800-970 Hz rising @ 1 Hz
6	2400-2850 Hz rising @ 7 Hz
7	1200-500 Hz falling @ 1 Hz
8	Alternating tone 800 Hz + 1200 Hz @ 1Hz

ORDER SPECIFICATIONS:

Voltage	24 V ≅
red	**423 120 75**
yellow	**423 320 75**

TECHNICAL DIAGRAMS

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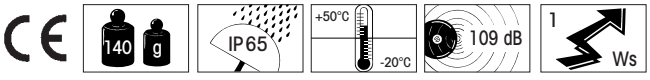

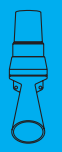

424 LED/Horn Combination

- Electronic Horn in combination with LED Permanent Beacon
- Horn with long life duration up to 5,000 hrs
- LED Permanent Beacon with long life duration up to 50,000 hrs
- Optical and audible signal can be triggered separately
- Integrated mounting bracket
- High protection rating IP 65

TECHNICAL SPECIFICATIONS:

Dimensions (D x W x H):	91.4 mm x 82.75 mm x 234.5 mm
Housing:	PC/ABS-Blend; PC grey
Dome:	PC, transparent
Conenction:	Screwable conn. with wire protection max. 1.5 mm²
Cable entry:	Cable diameter max. 9 mm
Sound output:	98 dB
Fixing:	Bracket mounting
Life duration:	50,000 hrs (LED Permanent light) 5,000 hrs (Horn)

Life duration up to 50,000 hrs

ORDER SPECIFICATIONS:

		NEW		NEW	
Voltage	24 V ≅		115 V ~		230 V ~
red	**424 120 75**		**424 120 67**		**424 120 68**
yellow	**424 320 75**		**424 320 67**		**424 320 68**

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TECHNICAL DIAGRAMS

see page 210

WERMA SIGNALTECHNIK

425 Flash/Horn Combination

- Electronic Horn in combination with Xenon Flash
- Horn with long life duration of up to 5,000 hrs
- Optical and audible signal can be triggered separately
- Integrated mounting bracket
- High protection rating IP 65

TECHNICAL SPECIFICATIONS:

Dimensions (D x W x H):	91.4 mm x 82.75 mm x 234.5 mm
Housing:	PC/ABS-Blend; PC grey
Dome:	PC, transparent
Connection:	Screwable conn. with wire protection max. 1.5 mm^2
Cable entry:	Cable diameter max. 9 mm
Flash energy:	1 Ws
Flash frequency:	1 Hz
Sound output:	98 dB
Fixing:	Bracket mounting
Life duration:	4 x 10^6 flashes (Xenon Flash) 5,000 hrs (Horn)

ORDER SPECIFICATIONS:

Voltage	24 V ≅	NEW 115 V ~	NEW 230 V ~
red	**425 120 75**	**425 120 67**	**425 120 68**
yellow	**425 320 75**	**425 320 67**	**425 320 68**

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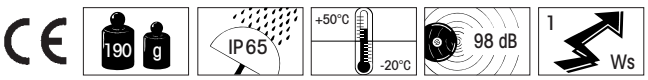
TECHNICAL DIAGRAMS

see page 210



480 Light/Buzzer Combination

- **Light / buzzer combination**
- **Light and sound can be triggered separately**

Please also see LED/Buzzer Combination 422 with add. advantages (page 136)

- High protection rating IP 65
- Buzzer in combination with LED Permanent
- Long life duration of up to 50,000 hrs
- Continuous and pulse tone adjustable

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	70 mm x 164 mm
Housing:	ABS
Dome:	PC, transparent
Socket:	B 15 d, max. 7 Watt
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable diameter max. 9 mm
Tone frequency:	c. 2400 Hz
Duty cycle:	100 %

Bulb included in assembly. Bulb Overview see pages 128 + 129.

ORDER SPECIFICATIONS:

Voltage	24 V ≅	230 V ~
Current consumption	320 mA	50 mA
red	**480 152 55**	**480 152 68**
yellow	**480 352 55**	**480 352 68**

Further colours and voltages on request.

TECHNICAL DIAGRAMS

see page 211

481 Flash/Buzzer Combination

- **Flash / buzzer combination**
- **Light and sound can be triggered separately**

Please also see Flash/Buzzer Combination 423 with add. advantages (page 138)

- High protection rating IP 65
- Buzzer in combination with Xenon Flash
- Continuous and pulse tone adjustable
- Easy to mount

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	70 mm x 157 mm
Housing:	ABS
Dome:	PC, transparent
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable diameter max. 9 mm
Tone frequency:	c. 2400 Hz
Flash frequency:	c. 1 Hz
Life duration:	4 x 10^6 flashes

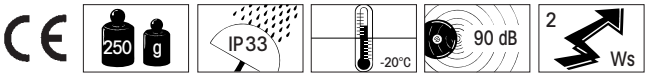
ORDER SPECIFICATIONS:

Voltage	24 V ≅	230 V ~
Current consumption	160 mA	30 mA
red	**481 152 55**	**481 152 68**
yellow	**481 352 55**	**481 352 68**

Further colours and voltages on request.

TECHNICAL DIAGRAMS

see page 212



WERMA SIGNALTECHNIK

580 Light/Horn Combination

- **Light / horn combination**
- **Light and sound can be triggered separately**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	70 mm x 256 mm
Housing:	ABS
Dome:	PC, transparent
Socket:	B 15 d, max. 7 Watt
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable diameter max. 9 mm
Duty cycle:	100 %

Bulb included in assembly. Bulb Overview see pages 128 + 129.

ORDER SPECIFICATIONS:

Voltage	24 V =	24 V ~	42 V ~	115 V ~	230 V ~
Current cons.	320 mA	320 mA	250 mA	75 mA	50 mA
red	**580 152 55**	**580 152 65**	**580 152 66**	**580 152 67**	**580 152 68**
yellow	**580 352 55**	**580 352 65**			**580 352 68**
clear	**580 452 55**				

Further colours and voltages on request.

TECHNICAL DIAGRAMS

see page 213

Please also see LED/Horn Combination 424 with add. advantages (page 140)

- High protection rating IP 65
- Horn in combination with LED Permanent
- Horn with a life duration of up to 5,000 hrs
- LED Permanent light with a life duration of up to 50,000 hrs

581 Flash/Horn Combination

- **Flash / horn combination**
- **Light and sound can be triggered separately**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	70 mm x 275 mm
Housing:	ABS
Dome:	PC, transparent
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable diameter max. 9 mm
Flash frequency:	c. 1 Hz
Life duration:	4 x 10⁶ flashes

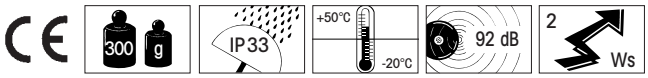
ORDER SPECIFICATIONS:

Voltage	12 V =	24 V =	230 V ~
Current consumption	300 mA	200 mA	30 mA
red		**581 152 55**	**581 152 68**
yellow	**581 352 54**	**581 352 55**	**581 352 68**

Further colours and voltages on request.

TECHNICAL DIAGRAMS

see page 213



Please also see Flash/Horn Combination 425 with add. advantages (page 141)

- High protection rating IP 65
- Horn in combination with Xenon Flash
- Horn with a life duration of up to 5,000 hrs
- Adjustable sound output

442 Flash/Multi-Tone Sounder Combination

- Multi-Tone Sounder in combination with Xenon Flash
- 4 different flash frequencies (24 V Version)
- 42 tones for a diverse range of applications
- Sound output adjustable up to 120 dB
- 3 Tones can be triggered externally
- Duration of signal phase adjustable
- Optical and audible signal can be triggered separately

TECHNICAL SPECIFICATIONS:

Dimensions (D x W x H):	155 mm x 168 mm x 212 mm
Housing:	PC/ABS-Blend
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable gland M 20 x 1.5 mm (not included in assembly)
Tone types and -frequencies:	adjustable via DIP switch

ORDER SPECIFICATIONS:

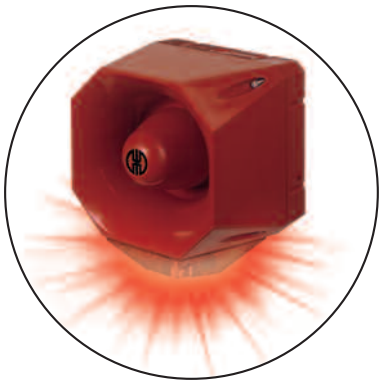
Voltage	18-30V DC		115/230V AC
Current consumpt.	620 mA		130 mA (115 V), max. 80 mA
Flash frequency	0.75 Hz/1 Hz	1.25 Hz/2 Hz	1 Hz (Flash can only be operated with 230 V)
Flash energy	3.5 Ws	2 Ws	2 Ws
Housing/Flash			
red/red	**442 010 55**		**442 010 68**
red/yellow	**442 030 55**		**442 030 68**
grey/red	**442 110 55**		**442 110 68**
grey/yellow	**442 130 55**		**442 130 68**

Please note: new order numbers

NEW Now also available with grey housing and yellow flash.

TECHNICAL DIAGRAMS

see page 211



Loud Multi-Tone Sounder in combination with a powerful Xenon Flash.

442 XX0 55 442 XX0 68

WERMA SIGNALTECHNIK

442 Flash/Multi-Tone Sounder Combination

The Flash/Multi-Tone Sounder Combination 442 offers a large choice of international signal tones for the widest spectrum of applications.

TONE TYPES AND FREQUENCIES:

Stage 1	Tone type	Frequency in Hz	Description	Use	Output (dBA)	Stage 3
A1	alternating	800/970	2 Hz (250 ms-250 ms)		120	A14
A2	rising	800/970	7 Hz (7/s)		120	A14
A3	rising	800/970	1 Hz (1/s)		120	A14
A4	continuous	2,850			111	A9
A5	rising	2,400-2,850	7 Hz		109	A4
A6	rising	2,400-2,850	1Hz		110	A4
A7	rising	500-1,200	3 sec., then 0.5 sec. OFF, then repeat	Slow Whoop Holland	119	A14
A8	falling	1,200-500	1 Hz	DIN/PFEER (PAPA)	119	A14
A9	alternating	2,400/2,850	2 Hz (250 ms-250 ms)		113	A4
A10	pulse	970	0,5 Hz (1 sec. ON / 1 sec. OFF)	PFEER Alarm	117	A14
A11	alternating	800/970	1 Hz (500 ms-500 ms)		118	A14
A12	pulse	2,850	0,5 Hz (1 sec. ON / 1 sec. OFF)		112	A4
A13	intermittent	970	0,8 Hz (250 ms ON / 1 sec. OFF)		117	A14
A14	continuous	970		PFEER - Toxic Gas	118	A8
A15	alternating	554/440	100 ms-400 ms	French Alarm Signal	115	A14
A16	pulse	660	3,3 Hz (150 ms ON / 150 ms. OFF)	Swedish Alarm Signal	114	A14
A17	pulse	660	0,28 Hz (1,8 sec. ON / 1,8 sec. OFF)	Swedish Alarm Signal	115	A14
A18	pulse	660	0,05 Hz (6,5 sec. ON / 13 sec. OFF)	Swedish Alarm Signal	115	A14
A19	continuous	660		Swedish Alarm Signal	116	A1
A20	alternating	554/440	0,5 Hz (1 sec. ON / 1 sec. OFF)	Swedish Alarm Signal	115	A19
A21	pulse	660	1 Hz (500 ms-500 ms)	Swedish Alarm Signal	115	A4
A22	pulse	2,850	4 Hz (150 ms ON / 100 ms OFF)		110	A4
A23	rising	800-970	50 Hz		117	A14
A24	rising	2,400-2,850	50 Hz		110	A4
A25	pulse	970	3x500 sec. pulse, 1,5 sec. silence, then repeat	ISO 8201 / US Temporal	118	A14
A26	pulse	2,850	3x500 sec. pulse, 1,5 sec. silence, then repeat	ISO 8201 / US Temporal	112	A4
A27	continuous	4,000			105	A6
A28	alternating	800/970	2 Hz (250 ms-250 ms)		118	A14
A29	alternating	990/650	2 Hz (250 ms-250 ms)		117	A14
A30	alternating	510/610	2 Hz (250 ms-250 ms)		116	A14
A31	rising	300-1,200	1 Hz		118	A14
A32	continuous	bell			117	A3
A33	continuous	bell	3x500 sec. pulse, 1,5 sec. silence, then repeat	Bell / US Temporal	117	A14
A34	alternating	1,000/2,000	1Hz (500 ms-500 ms)	Singapore	115	A4
A35	pulse	420	0,625 sec.	Australian Alarm Signal	118	A14
A36	rising	500-1200	rising 3,75 sec., then 0,25 sec. OFF	Australian Alarm Signal (Evacuation)	117	A14
A37	rising	1400-1600	rising 1 sec., falling 0,5 sec.	NF C 48-265	116	A14
A38	rising	500-1200	rising and falling over 3 sec.	Siren	117	A14
A39	pulse	720	0,7 sec. ON, 0,3 sec. OFF	German Industrial Alarm	118	A14
A40	rising	422-775	0,85 sec., 1 sec. silence, then repeat	NFPA Whoop	118	A14
A41	continuous	470		Horn (USA)	114	A3
A42	continuous	370		Air Horn (USA)	113	A3

150 LED/Buzzer Combination

- LED Permanent light
- Continuous tone can be additionally activated
- Simple connection by means of connector plug
- Life duration up to 50,000 hrs
- Low current consumption
- High protection rating IP 65

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	49.5 mm x 74 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Connection:	Connector plug with screwable connection max. 1.5 mm²
Starting current:	< 0.5 A
Current consumption:	< 50 mA at 24 V; < 20 mA at 115 and 230 V
Tone type:	Continuous
Tone frequency:	2.8 kHz
Duty cycle:	100 %
Life duration:	up to 50,000 hrs
Sound output:	80 dB
Fixing:	Installation mounting for ø 22.5 mm (M 22 x 1.5 mm) with anti-twist device

Nut and seal included in assembly.

ORDER SPECIFICATIONS:

Voltage	24 V =	115 V ≈	230 V ≈
red	**150 100 55**	**150 100 67**	**150 100 68**
yellow	**150 300 55**	**150 300 67**	**150 300 68**

TECHNICAL DIAGRAMS

see page 202

450 LED/Buzzer Combination with acknowledgement function

- **LED permanent light with additional continuous tone**
- **Silence the audible signal by lightly pressing the frontal area**
- **Life duration up to 50,000 hrs**
- **Potential-free output for transmission of the acknowledgement signal to the control unit**
- **Positive and negative logic possible**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	49.5 mm x 75 mm
Housing:	PC/ABS-Blend
Dome:	PC, transparent
Connection:	Screwable connection max. 0.5 mm²
Starting current:	< 0.5 A
Current consumption:	40 to 80 mA at 24 V
Signal input:	24 VC
Acknowledgement output:	Semiconductor-Relay U_{max} = 30 V, I_{max} = 100 mA, $R_{ON\ max}$ = 25 Ohm
Tone type:	Continuous
Tone frequency:	3 kHz
Duty cycle:	100 %
Life duration:	up to 50,000 hrs
Sound output:	80 dB
Fixing:	Installation mounting for Ø 22,5 mm (M 22 x 1.5 mm) with anti-twist device

Nut and seal included in assembly.

ORDER SPECIFICATIONS:

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Voltage	24 V =
red	**450 100 55**
yellow	**450 300 55**

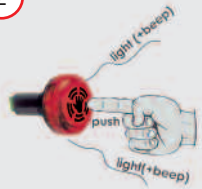
TECHNICAL DIAGRAMS

see page 211

1

The occurrence of a malfunction or an error is indicated by means of an optical-audible signal.

2



The audible signal can be turned off in seconds by lightly pressing the front of the product.

3

The acknowledgement signal is sent to the control unit via an electronic switch and the malfunction is now only indicated by the optical signal.

115 Light/Buzzer Combination

- **Piezo electronic buzzer with integrated warning light**
- **Suitable for installation in control panels**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	43 mm x 68.5 mm
Housing:	ABS
Dome:	PC, transparent
Fixing:	Installation mounting for ø 28 mm (M 28)
Connection:	Spades 6.3 x 0.8 mm
Audio frequency:	c. 2,400 Hz
Bulb included in assembly.	

Please also see LED/Buzzer Combination 150 with add. advantages (page 146)

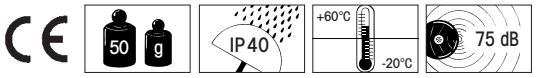
- High protection rating IP 65
- Long life duration of up to 50,000 hrs
- Continuous tone can be additionally activated
- Simple connection by means of connector plug

ORDER SPECIFICATIONS:

Voltage	24 V ≅
Current consumption:	220 mA
red	**115 168 15**
yellow	**115 368 15**

TECHNICAL DIAGRAMS

see page 199



975 Surface Housing for Combinations

- **Various combinations possible**
- **High protection rating IP 65**
- **Versatile range of applications thanks to cable exit at side**

TECHNICAL SPECIFICATIONS:

Dimensions (W x H x D):	single:	80,5 mm x 55 mm x 82 mm
	double:	160 mm x 55 mm x 78 mm
	triple:	240 mm x 60 mm x 80 mm
	quadruple:	340 mm x 55 mm x 150 mm
Housing:	ABS and PC/ABS-Blend	
Cable entry:	Cable gland M 16 x 1.5 mm for circular cable ø 5 - 10 mm	

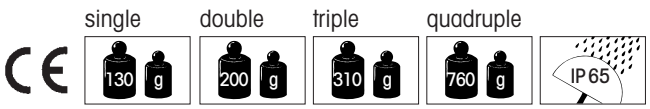
ORDER SPECIFICATIONS:

Single surface housing	**975 109 02**
Double surface housing for 1 beacon und 1 audibl element	**975 109 03**
Triple surface housing for 2 beacons und 1 audible element	**975 109 04**
Quadruple surface housing	**975 109 05**

Assembly comprises of only the surface housing. Beacons 800-802, 815-817 (page 76/78) and audible elements 109 and 110 (pages 146/147) have to be ordered additionally.

TECHNICAL DIAGRAMS

see page 246 + 247



WERMA SIGNALTECHNIK

Signal Tower with Audible Element

- **Signal Tower Kombi*SIGN* 50, 70 and 71 with audible signal device**
- **Sound output up to 105 dB**
- **Can be combined with all optical elements (see pages 36 + 42 + 53)**
- **Can be triggered separately**

Kombi*SIGN* 71

Kombi*SIGN* 50

TECHNICAL SPECIFICATIONS:

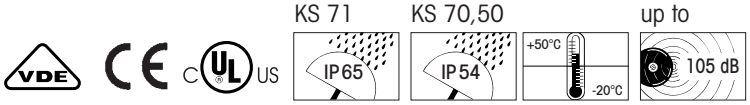
Dimensions (Diameter x Height):	See Kombi*SIGN* 50, 70 and 71
Housing:	Polyamid, high-impact, black
Dome:	Polycarbonate transparent
Fixing:	Base mounting Bracket mounting Tube mounting
Socket:	Bayonet, B 15 d for bulb max. 7 Watt
Connection:	Screwable connection M3
Seal:	Pre-mounted with each element
Protection rating:	IP 54 (Kombi*SIGN* 70, 50) IP 65 (Kombi*SIGN* 71) IP 40 (Order no. 844 123 55)
Number of modules possible:	Kombi*SIGN* 70 and 71: max. 5 with 2-sided bracket: max. 10 Kombi*SIGN* 50: max. 4 The audible element is to be mounted at the top of the signal tower.

ORDER SPECIFICATIONS:

See Kombi*SIGN* 50, 70 and 71

TECHNICAL DIAGRAMS

see pages 215 + 232 + 235



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Page 170

Page 162

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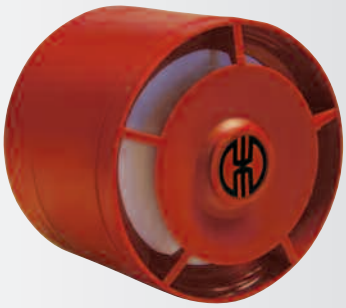

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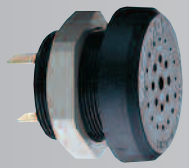
Page 165

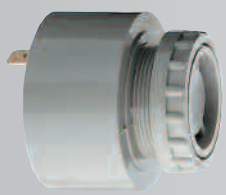
Overview Audible Signal Devices

Page 159

Page 171



Page 156



	Installation versions	Free-standing
Electronic Buzzers	**107** Page 154	**118 483** Page 157
	109 Page 154	**119 483** Page 157
	114 Page 156	
	118 Page 156	
	119 Page 156	
Electronic Siren		**123** Page 158
Electronic Multi-Tone Sounders	**110** Page 155	**126** Page 158
		129 Page 159
		140 Page 160
Multi-Tone Sounder		**142** Page 162
Electronic Three Tone Gongs		**170** Page 166
		172 Page 167
Electromechanical Installation Buzzers	**338** Page 164	
	382 Page 164	
Signal Horns		**482** Page 165
		570 Page 168
		571 Page 169
		572 Page 169
		573 Page 170
		582 Page 165
Alarm Bell		**914** Page 171

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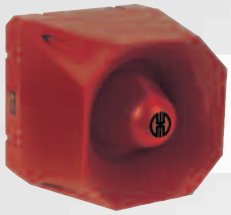
The sounds of these products can be played from our website www.werma.com under the heading Audible Signal Devices.

Further information about the "Audible" theme can be found in the chapter "Tech-Talk" beginning on page 10.

A Summary of Loud Signal Devices



142 Multi-Tone Sounder Page 162

120 dB

110 dB

570 Signal Horn Page 168

571 Signal Horn in corrosion-proof aluminium housing Page 169

105 dB

172 Electronic Three Tone Gong in innovative, modern design Page 167

170 Electronic Three Tone Gong Page 166

110 Electronic Installation Multi-Tone Sounder Page 155

100 dB

382 All-purpose Installation Buzzer Page 164

118/119 Electronic Installation Buzzer Page 156

118483/ 119483 Electronic Buzzer for wall mounting Page 157

90 dB

85 dB

109 Electronic Installation Buzzer for the 22.5 mm control panel programme Page 154

107 Electronic Installation Buzzer for the 22.5 mm control panel programme Page 154

80 dB

65-75 dB

Sound output in db

WERMA SIGNALTECHNIK

Further information about the "Audible" theme can be found in the chapter "Tech-Talk" beginning on page 10.

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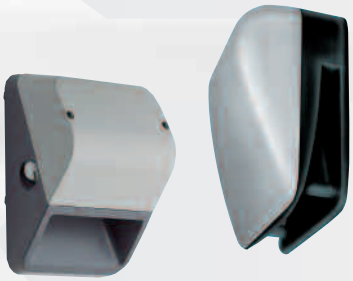
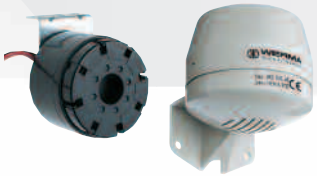
120 dB

110 dB

129	Electronic Multi-Tone Sounder	Page 159
140	Electronic Multi-Tone Sounder	Page 160

105 dB





123	Electronic Compact Siren	Page 158
126	Electronic Multi-Tone Sounder	Page 158
572	Signal Horn	Page 169
573	Signal Horn in innovative, modern design	Page 170

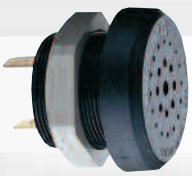
100 dB

914	Alarm Bell	Page 171

90 dB

582	Mini Horn with trumpet	Page 165
482	Mini Horn	Page 165

85 dB



114	Electronic Installation Buzzer for use in control panels	Page 156

80 dB

65-75 dB

338	AC Installation Buzzer for use in electrical appliances	Page 164

Sound output in db

107 Electronic Installation Buzzer

- **Signal device for the 22.5 mm control panel programme**
- **Low current consumption**
- **High protection rating IP 65**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Depth):	28.2 mm x 68.8 mm
Housing:	PA fibreglass, high-impact
Audio frequency:	c. 2,400 Hz / c. 3,200 Hz (12 V)
Tone type:	Continuous tone or pulse tone with approx. 1 Hz
Current consumption:	≤ 8 mA / ≤ 10 mA (12 V DC)
Fixing:	Installation mounting for ø 22.5 mm (M 22)
Connection:	Connector plug with screwable connection max. 1.5 mm²
Life duration:	> 5,000 hrs

ORDER SPECIFICATIONS:

Voltage	12 V =	24 V ≅	115 V ≅	230 V ~
Continuous tone	**107 000 54**	**107 000 75**	**107 000 77**	**107 000 68**
Pulse tone	**107 010 54**	**107 010 75**	**107 010 77**	**107 010 68**

(12 V = / **107 000 54** and **107 010 54** without CSA and UL approval)

TECHNICAL DIAGRAMS

see page 197

109 Electronic Installation Buzzer

- **Signal device for the 22.5 mm control panel programme**
- **High protection rating IP 65**

Surface housing (accessory)

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Depth):	52 mm x 67.1 mm
Housing:	PC/ABS-Blend; Cap: PC
Audio frequency:	c. 2,100 Hz
Tone type:	Continuous tone or pulse tone with approx. 1 Hz
Current consumption:	25 mA
Fixing:	Install. mounting for ø 22.5 mm (M 22) with anti-twist device
Connection:	Connector plug with screwable connection max. 1.5 mm²
Life duration:	> 5,000 hrs

ORDER SPECIFICATIONS:

Voltage	24 V ≅	115 V ≅	230 V ~
Continuous tone	**109 000 75**	**109 000 77**	**109 000 68**
Pulse tone	**109 010 75**	**109 010 77**	**109 010 68**

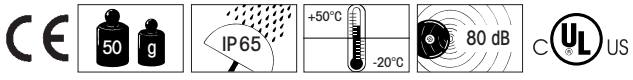
Life duration up to 5,000 hrs

ACCESSORIES:

Bracket with protective cap (IP54)	**975 109 01** (see picture on page 155)
Single surface housing	**975 109 02**
Double surface housing	**975 109 03**
Triple surface housing	**975 109 04**
Quadruple surface housing	**975 109 05**

TECHNICAL DIAGRAMS

see page 197



WERMA SIGNALTECHNIK

110 Electr. Installation Multi-Tone Sounder

- **Loud installation multi-tone sounder for the 22.5 mm control panel programme**
- **High protection rating IP 65**
- **Adjustable to 8 different tones**
- **Adjustable sound output**

Surface housing (accessory)

Bracket (accessory)

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Depth):	70 mm x 71.6 mm
Housing:	PC/ABS-Blend; Cap: PC
Sound output:	max. 100 dB (sound output is adjustable on rear side when mounted)
Tone type:	8 tones adjustable on rear side of the housing

Switch position 0	420 Hz	1,6 kHz	86 dB (A)
Switch position 1	1 Hz	1,6 kHz	86 dB (A)
Switch position 2	20 Hz	1,6 kHz	86 dB (A)
Switch position 3		1,6 kHz	88 dB (A)
Switch position 4	420 Hz	3,4 kHz	90 dB (A)
Switch position 5	1 Hz	3,4 kHz	100 dB (A)
Switch position 6	20 Hz	3,4 kHz	96 dB (A)
Switch position 7		3,4 kHz	100 dB (A)

Fixing:	Installation mounting for ø 22.5 mm (M 22) with anti-twist device
Connection:	Connector plug wtih screwable connection max. 1.5 mm²
Life duration:	> 5,000 hrs

ORDER SPECIFICATIONS:

Voltage	24 V ≅	115 V ~	230 V ~
Current consumption	80 mA	40 mA	40 mA
	110 000 75	**110 000 67**	**110 000 68**

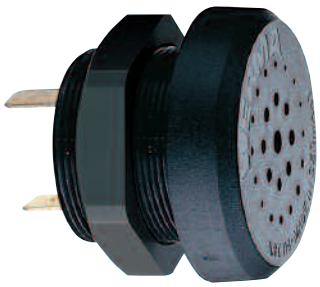
ACCESSORIES:

Bracket with protective cap (IP 54)	**975 109 01**
Surface housing IP 65 (single)	**975 109 02**
Surface housing IP 65 (double) for 1 beacon and 1 audible element	**975 109 03**
Surface housing IP 65 (triple) for 2 beacons and 1 audible element (see page 148)	**975 109 04**
Surface housing IP 65 (quadruple)	**975 109 05**

TECHNICAL DIAGRAMS

see page 197

114 Electronic Installation Buzzer



- **Installation buzzer for use in control panels**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Depth):	42 mm x 42 mm
Housing:	PC/ABS-Blend; Nut: PA fibreglass, high-impact
Connection:	Spades 6.3 x 0.8 mm Finger proof model according to BGV A2, when used with insulated spades
Audio frequency:	c. 2,400 Hz
Current consumption:	20 mA
Fixing:	Installation mounting for ø 30.5 mm (M 30)

ORDER SPECIFICATIONS:

24 V = (12-30 V)	230 V ~ (110-240 V)
114 068 15	**114 068 28**

TECHNICAL DIAGRAMS

see page 199

118/119 Electronic Installation Buzzer

- **Loud piezo signal device**
- **Low current consumption**
- **IP 43 with cap**
- **Type 118 continuous tone**
- **Type 119 continuous tone and pulse tone**

Cap

TECHNICAL SPECIFICATIONS:

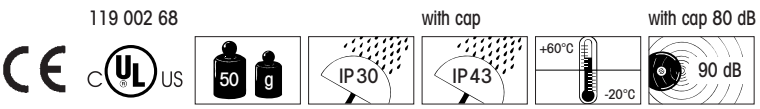
Dimensions (Diameter x Depth):	43 mm x 48 mm
Housing:	ABS; for UL versions: PC/ABS-Blend
Connection:	Spades 6.3 x 0.8 mm Finger proof model according to BGV A2, when used with insulated spades
Audio frequency:	c. 2,400 Hz
Current consumption:	20 mA
Tone type:	Type 118 Continuous tone Type 119 Continuous tone and pulse tone, c. 1Hz, adjustable via plug-in terminal
Fixing:	Installation mounting for ø 28 mm (M 28)

ORDER SPECIFICATIONS:

Voltage	12 V =	24 V ≅	48 V ≅	115 V ≅	230 V ~
Continuous tone	**118 068 14**	**118 068 15**	**118 068 26**	**118 068 27**	**118 068 28**
Continuous/pulse tone	–	**119 068 15**	**119 068 26**	**119 068 27**	**119 068 28**
Cap	**975 118 00**				**119 002 68**

TECHNICAL DIAGRAMS

see page 199



WERMA SIGNALTECHNIK

118 483/119 483 Electronic Buzzer

- **Loud buzzer for wall mounting**

- **Type 118 483 continuous tone**
- **Type 119 483 continuous and pulse tone**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Depth):	70 mm x 80 mm
Housing:	ABS
Connection:	Spades 6.3 x 0.8 mm, Finger proof model according to BGV A2, when used with insulated spades
Cable entry:	Cable diameter max. 9 mm
Audio frequency:	c. 2,400 Hz
Tone type:	Type 118 483 Continuous tone Type 119 483 Continuous tone and pulse tone, c. 1 Hz adjustable via plug-in terminal
Current consumption:	20 mA
Fixing:	Bracket mounting, Sound outlet facing downwards

ORDER SPECIFICATIONS:

Voltage	24 V ≅ (12-30 V)	230 V ~ (110-240 V)
Continuous tone	**118 483 15**	**118 483 28**
Continuous / pulse tone	**119 483 15**	**119 483 28**

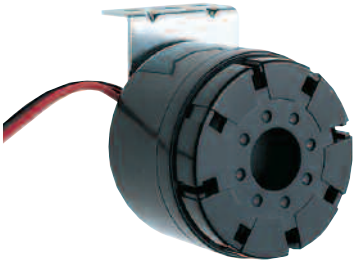
Further voltages on request.

TECHNICAL DIAGRAMS

see page 199

123 Electronic Siren

- **Loud compact siren**
- **Sound output 105 dB**



TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	54 mm x 66 mm	
Housing:	ABS	
Tone frequency:	2,500 - 3,500 Hz	
Tone type:	Continuous tone alternating ~~~~~~~~	
Connection:	2 wires, c. 450 mm long	
Fixing:	Metal bracket	
Operating voltage:	12 V =	24 V =
Current consumption:	150 mA	100 mA

ORDER SPECIFICATIONS:

Voltage	12 V =	24 V =
Current consumption	150 mA	100 mA
	123 100 54	**123 200 55**

TECHNICAL DIAGRAMS

see page 200

126 Electronic Multi-Tone Sounder

- **Suitable for PLC triggering**
- **4 different tones can be triggered externally**

TECHNICAL SPECIFICATIONS:

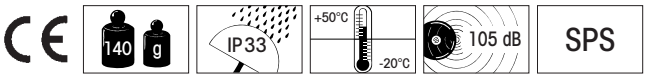
Dimensions (Diameter x Height):	70 mm x 80 mm	
Housing:	ABS	
Tone types and frequencies:	Continuous tone:	c. 2,700 Hz
	Continuous tone:	c. 530 Hz
	Bell:	c. 2,700 Hz (pulse 20 Hz)
	Pulse tone:	c. 2,700 Hz (pulse 1 Hz)
Connection:	Screwable connection with wire protection max. 2.5 mm²	
Cable entry:	Cable diameter max. 9 mm	
Current consumption:	80 mA	
Fixing:	Bracket mounting, sound outlet facing downwards	

ORDER SPECIFICATIONS:

Voltage	12 - 24 V =
	126 052 15

TECHNICAL DIAGRAMS

see page 200



WERMA SIGNALTECHNIK

129 Electronic Multi-Tone Sounder

- **Loud sounder in die-cast aluminium housing**
- **31 different tones available**

TECHNICAL SPECIFICATIONS:

Dimensions (Width x Height):	133 mm x 143 mm		
Housing:	Die-cast aluminium		
Connection:	Screwable connection max. 2.5 mm²		
Cable entry:	Cable gland M 20 x 1.5 mm		
	Cable diameter 8 -12 mm		
Operating voltage:	24 V =	115 V ~	230 V ~
Current consumption:	420 mA	120 mA	60 mA
Tone types and -frequencies:	adjustable via DIP switch		

ORDER SPECIFICATIONS:

Voltage	24 V =	115 V ~	230 V ~
Current consumption	420 mA	120 mA	60 mA
	129 052 55	**129 052 67**	**129 052 68**

TECHNICAL DIAGRAMS

see page 200

140 Electronic Multi-Tone Sounder

- **32 tones for a diverse range of applications**
- **Adjustable sound output to 110 dB**
- **High protection rating IP 54 or IP 65**
- **Direct external setting of two tones possible with low voltage version**
- **VdS approved (Low voltage version)**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	93 mm x 73 mm (IP 54)
	93 mm x 103 mm (IP 65)
Housing:	ABS
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable diameter max. 12 mm (IP 54)
	Cable gland M 20 x 1.5 mm (IP 65)
	Cable gland not included in assembly.
Operating voltage:	110 - 240 V ~ < 45 mA
Current consumption:	9 - 28 V = < 30 mA
Tone types and frequencies:	adjustable via DIP switch, see table on opposite page

ORDER SPECIFICATIONS:

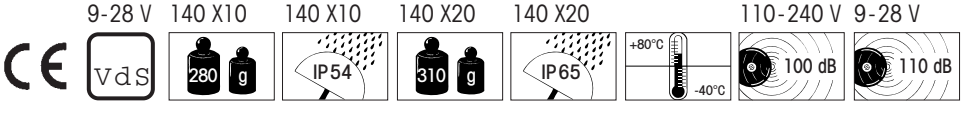
Muli-Tone Sounder IP 54		
Voltage	9 - 28 V =	110-240 ~
red	**140 110 55**	**140 110 68**
white	**140 910 55**	**140 910 68**

Muli-Tone Sounder IP 65		
Voltage	9 - 28 V =	110-240 ~
red	**140 120 55**	**140 120 68**
white	**140 920 55**	**140 920 68**

TECHNICAL DIAGRAMS

see page 201

9-28 V | 140 X10 | 140 X10 | 140 X20 | 140 X20 | 110-240 V | 9-28 V



WERMA SIGNALTECHNIK

140 Electronic Multi-Tone Sounder

The 140 Multi-Tone Sounder offers a large choice of international signal tones for the widest spectrum of applications.
The low voltage version allows two tones to be directly set externally.

TONE TYPES AND FREQUENCIES:

adjustable via DIP switch

Tone A No.	Tone type	Description	Sound output (dBA) (12 V)	(24 V)	Tone B (2. Tone type) Low voltage version
1	alternating 800/970 Hz in 2 Hz stroke	BS 5839-1: 2002	96	103	14
2	rising 800/970 Hz in 7 Hz stroke		93	100	14
3	rising 800/970 Hz in 1 Hz stroke	BS 5839-1: 2002, VDS tested	93	98	14
4	continuous 2,850 Hz		104	111	14
5	rising 2,400-2,850 Hz in 7 Hz stroke	VDS tested	99	105	4
6	rising 2,400-2,850 Hz in 1 Hz stroke		99	106	4
7	500-1,200 Hz rising in 3 sec., 0.5 sec OFF		93	100	14
8	falling 1,200-500 Hz in 1 Hz stroke	VDS tested; DIN 33404	90	95	14
9	alternating 2,400/2,850 Hz in 2 Hz stroke		102	109	4
10	pulse 970 Hz in 0.5 Hz stroke	Back-up-alarm BS 5839 Part 1 1988	92	100	14
11	alternating 800/970 Hz in 1 Hz stroke	BS5839 Part 1 1988	97	103	14
12	pulse 2,850 Hz in 0.5 Hz stroke		103	110	4
13	970 Hz pulse: 0.25 sec. ON / 1 sec. OFF		93	100	14
14	continuous 970 Hz	BS 5839-1: 2002	99	105	14
15	554 Hz/100 ms alternating 440 Hz/400 ms	French fire alarm signal	88	94	14
16	660 Hz pulse: 150 ms ON, 150 ms OFF	Swedish alarm signal	87	92	16
17	660 Hz pulse: 1.8 sec. ON, 1.8 sec. OFF	Swedish alarm signal	89	95	17
18	660 Hz pulse: 6.5 sec. ON, 13 sec. OFF	Swedish alarm signal	89	95	18
19	continuous 660 Hz	Swedish alarm signal	89	95	19
20	alternating 554/440 Hz in 0.5 Hz stroke		89	95	20
21	pulse 660 Hz in 1 Hz stroke	Swedish alarm signal	87	93	21
22	2,850 Hz pulse: 150 ms ON, 100 ms OFF	Pedestrian crossing GB	102	109	14
23	rising 800/970 Hz in 50 Hz stroke	Low frequency BS 5839 Part 1 1988	92	98	14
24	rising 2,400-2,850 Hz in 50 Hz stroke	High frequency	99	107	4
25	970 Hz pulse: 3 x 500 ms ON, 500 ms OFF, Pause 1.5 sec.	ISO 8201 Low frequency: Evacuation	97	103	26
26	2,850 Hz pulse: 3 x 500 ms ON, 500 ms OFF, Pause 1.5 sec.	ISO 8201 High frequency	102	109	25
27	continuous 4 kHz		90	98	27
28	alternating 800/970 Hz in 2 Hz stroke	FP 1063.1 - Telecoms/BS 5839-1: 2002	96	103	10
29	alternating 988/645 Hz in 2 Hz stroke		93	100	988 Hz cont. tone
30	alternating 510/610 Hz in 2 Hz stroke		92	97	510 Hz cont. tone
31	falling 1,200-300 Hz in 1 Hz stroke		91	97	31
32	alternating 510/610 Hz in 1 Hz stroke		90	98	510 Hz cont. tone

142 Electronic Multi-Tone Sounder

- Volume adjustable up to 120 dB
- 42 tones for a diverse range of applications
- 3 tones can be triggered externally
- Duration of signal phase adjustable
- High protection rating IP 66

TECHNICAL SPECIFICATIONS:

Dimensions (Depth x Width x Height):	155 x 168 x 168 mm
Housing:	PC/ABS-Blend
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable gland M 20 x 1.5 mm (not included in assembly)
Tone types and frequencies:	adjustable via DIP switch, see table on opposite page

ORDER SPECIFICATIONS:

Voltage	18-30 V DC	115/230 V AC
Current consumption	450 mA	130mA (115 V), 65 mA (230 V)
red	**142 000 55**	**142 000 68**
NEW grey	**142 100 55**	**142 100 68**

NEW **Now also available with a grey housing**

TECHNICAL DIAGRAMS

see page 201

142 X00 68 142 X00 55

WERMA SIGNALTECHNIK

142 Electronic Multi-Tone Sounder

The 142 Multi-Tone Sounder offers a large choice of international signal tones for the widest spectrum of applications.

TONE TYPES AND FREQUENCIES:

Stage 1	Tone type	Frequency in Hz	Description	Use	Output (dBA)	Stage 3
A1	alternating	800/970	2 Hz (250 ms-250 ms)		120	A14
A2	rising	800/970	7 Hz (7/s)		120	A14
A3	rising	800/970	1 Hz (1/s)		120	A14
A4	continuous	2,850			111	A9
A5	rising	2,400-2,850	7 Hz		109	A4
A6	rising	2,400-2,850	1 Hz		110	A4
A7	rising	500-1,200	3 sec., then 0.5 sec. OFF, then repeat	Slow Whoop Holland	119	A14
A8	falling	1,200-500	falling in 1 Hz stroke	DIN/PFEER (PAPA), DIN 33404-3, VDS-tested	119	A14
A9	alternating	2,400/2,850	2 Hz (250 ms-250 ms)		113	A4
A10	pulse	970	0.5 Hz (1 sec. ON / 1 sec. OFF)	PFEER Alarm	117	A14
A11	alternating	800/970	1 Hz (500 ms-500 ms)		118	A14
A12	pulse	2,850	0.5 Hz (1 sec. ON / 1 sec. OFF)		112	A4
A13	intermittent	970	0.8 Hz (250 ms ON / 1 sec. OFF)		117	A14
A14	continuous	970		PFEER - Toxic Gas	118	A8
A15	alternating	554/440	100 ms-400 ms	French Alarm Signal	115	A14
A16	pulse	660	3.3 Hz (150 ms ON / 150 ms. OFF)	Swedish Alarm Signal	114	A14
A17	pulse	660	0.28 Hz (1.8 sec. ON / 1,8 sec. OFF)	Swedish Alarm Signal	115	A14
A18	pulse	660	0.05 Hz (6.5 sec. ON / 13 sec. OFF)	Swedish Alarm Signal	115	A14
A19	continuous	660		Swedish Alarm Signal	116	A1
A20	alternating	554/440	0,5 Hz (1 sec. ON / 1 sec. OFF)	Swedish Alarm Signal	115	A19
A21	pulse	660	1 Hz (500 ms-500 ms)	Swedish Alarm Signal	115	A4
A22	pulse	2,850	4 Hz (150 ms ON / 100 ms OFF)		110	A4
A23	rising	800-970	50 Hz		117	A14
A24	rising	2,400-2,850	50 Hz		110	A4
A25	pulse	970	3x500 ms. pulse, 1.5 sec. silence, then repeat	ISO 8201 / US Temporal	118	A14
A26	pulse	2,850	3x500 ms. pulse, 1.5 sec. silence, then repeat	ISO 8201 / US Temporal	112	A4
A27	continuous	4,000			105	A6
A28	alternating	800/970	2 Hz (250 ms-250 ms)		118	A14
A29	alternating	990/650	2 Hz (250 ms-250 ms)		117	A14
A30	alternating	510/610	2 Hz (250 ms-250 ms)		116	A14
A31	rising	300-1,200	1 Hz		118	A14
A32	continuous	bell			117	A3
A33	continuous	bell	3x500 ms. pulse, 1.5 sec. silence, then repeat	Bell / US Temporal	117	A14
A34	alternating	1,000/2,000	1 Hz (500 ms-500 ms)	Singapore	115	A4
A35	pulse	420	0.625 sec.	Australian Alarm Signal	118	A14
A36	rising	500-1,200	rising 3.75 sec., then 0.25 sec. OFF	Australian Alarm Signal (Evacuation)	117	A14
A37	rising	1,400-1,600	rising 1 sec., falling 0.5 sec.	NF C 48-265	116	A14
A38	rising	500-1,200	rising and falling over 3 sec.	Siren	117	A14
A39	pulse	720	0.7 sec. ON, 0.3 sec. OFF	German Industrial Alarm	118	A14
A40	rising	422-775	0.85 sec., 1 sec. silence, then repeat	NFPA Whoop	118	A14
A41	continuous	470		Horn (USA)	114	A3
A42	continuous	370		Air Horn (USA)	113	A3

338 AC Installation Buzzer

338 373

338 323

- **AC buzzer for use in electrical appliances**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	23 mm x 30.5 mm
Audio frequency:	100 Hz
Mounting:	As required
Fixing:	M 3 or M 4 thread

ORDER SPECIFICATIONS:

230 V ~, ca. 75 dB, spades, fixing: M 3	**338 273 28**
230 V ~, ca. 75 dB, solder lugs for printed circuits, fixing: M 3	**338 323 28**
230 V ~, ca. 75 dB, spades 6.3 x 0.8 mm, fixing: M 3	**338 373 28**
230 V ~, ca. 75 dB, spades, 6.3 x 0.8 mm, fixing: M 4	**338 374 28**

Further voltages on request.

TECHNICAL DIAGRAMS

see page 208

382 Installation Buzzer

- **All-purpose installation buzzer**
- **Low current consumption**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Depth):	54.5 mm x 35.5 mm
Housing:	Steel, chromalised
Connection:	AC: 2 wires, 215 mm long
	DC: 2 wires, 50 mm long
	The housing of the DC version is current-carrying
Fixing:	M 3 thread

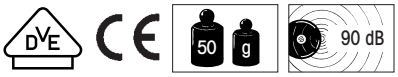
ORDER SPECIFICATIONS:

AC Version				
Voltage	6 V ~	12 V ~	24 V ~	230 V ~
Current consumpt.	–	–	–	15 mA
	–	–	–	**382 013 68**
DC Version				
Voltage	6 V ~		24 V ~	230 V ~
Current consumpt.	100 mA		70 mA	–
	382 013 53		**382 013 55**	–

Further voltages on request.

TECHNICAL DIAGRAMS

see page 208



WERMA SIGNALTECHNIK

482 Signal Horn

- **Loud small horn**
- **Also available with low current consumption for use as lift alarm**

TECHNICAL SPECIFICATIONS:

Dimensions (Diam. x Height):	70 mm x 80 mm
Housing:	ABS
Connection:	Screwable connection with wire protection, 1.0 – 1.5 mm² fine strand, 1.0 – 2.5 mm² single wire
Cable entry:	Cable diameter 9 mm
Fixing:	Bracket mounting, Sound outlet facing downwards

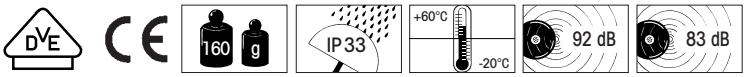
ORDER SPECIFICATIONS:

AC Version					
Voltage	12 V ~	24 V ~	42 V ~	115 V ~	230 V ~
Current consumpt.	330 mA	190 mA	75 mA	15 mA	15 mA
	482 052 64	**482 052 65**	**482 052 66**	**482 052 67**	**482 052 68**
DC Version					
Voltage	12 V ~	24 V ~			
Current consumpt.	150 mA	70 mA			
	482 052 54	**482 052 55**			
Lift Alarm					
Voltage	6 V ~	12 V ~			
Current consumpt.	80 mA	130 mA			
	482 347 13	**482 347 14**			

Further voltages on request.

TECHNICAL DIAGRAMS

see page 212



582 Signal Horn

- **Loud small horn with trumpet**
- **Suitable for indoor and outdoor mounting**

TECHNICAL SPECIFICATIONS:

Dimensions (Diam. x Height):	70 mm x 170 mm
Housing:	ABS
Connection:	Screwable connection with wire protection, 1.0 – 1.5 mm² fine strand, 1.0 – 2.5 mm² single wire
Cable entry:	Cable diameter 9 mm
Fixing:	Bracket mounting, Sound outlet facing downwards

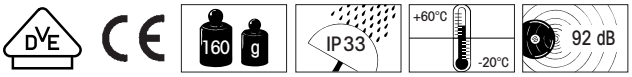
ORDER SPECIFICATIONS:

AC Version					
Voltage	12 V ~	24 V ~	42 V ~	115 V ~	230 V ~
Current consumpt.	330 mA	190 mA	75 mA	15 mA	15 mA
	582 052 64	**582 052 65**	**582 052 66**	**582 052 67**	**582 052 68**
DC Version					
Voltage	12 V ~	24 V ~			
Current consumpt.	150 mA	70 mA			
	582 052 54	**582 052 55**			

Further voltages available on request.

TECHNICAL DIAGRAMS

see page 213



170 Electronic Three Tone Gong

- **Loud three tone Gong**
- **Melodious A-major three tone sound output**
- **Variable volume**
- **Continuous operation possible**
- **Multiple Gongs can be operated in parallel**
- **Frequency set by manufacturer**
- **Triggering by means of time relay or timer switch**

TECHNICAL SPECIFICATIONS:

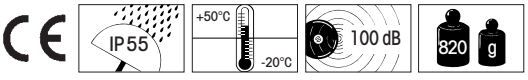
Dimensions (Diameter x Height):	148 mm x 356 mm
Housing:	ABS
Volume:	max. 100 dB (adjustable volume)
Connection:	Screwable connection max. 2.5 mm^2
Operating voltage:	24 V = 230 V ~
Current consumption:	200 mA 35 mA
Cable entry:	Rubber squeeze grommet 7 – 10 mm
Tone type:	A-major 3 tone
Sound output duration:	c. 8 seconds
Mounting:	Bracket mounting, Sound outlet facing downwards

ORDER SPECIFICATIONS:

Voltage	24 V =	230 V ~
	170 000 55	**170 000 68**

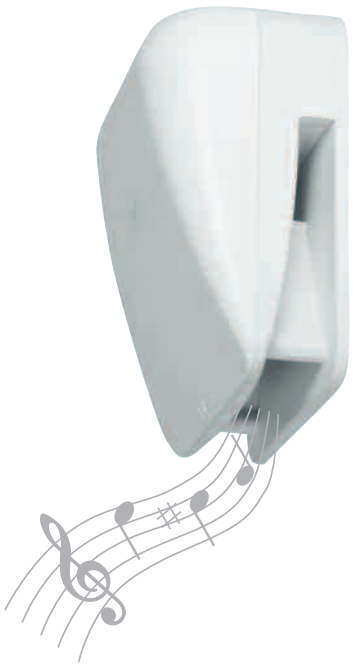
TECHNICAL DIAGRAMS

see page 202



WERMA SIGNALTECHNIK

172 Electronic Three Tone Gong



- **Innovative, modern design**
- **Loud three tone Gong**
- **Melodious A-major three tone sound output**
- **Variable volume**
- **Multiple Gongs can be operated in parallel**
- **Triggering by means of time relay or timer switch**

TECHNICAL SPECIFICATIONS:

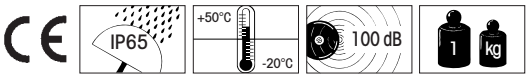
Dimension (Diameter x Height):	207 mm x 178 mm x 104 mm	
Housing:	PC/ABS-Blend	
Sound output:	max. 100 dB (adjustable volume)	
Connection:	Screwable connection with wire protection 0.5 - 2.5 mm^2	
Cable entry:	Cable gland M 16 x 1.5 mm	
	Cable diameter 5-10 mm	
Operating voltage:	12-24 V	230 V ~
Starting current:	250 mA	40 mA
Duty cycle:	max. 5 min	
Tone type:	A-major three tone	
Sound output duration :	approx. 8 seconds	
Fixing:	Wall mounting, sound outlet facing downwards	

ORDER SPECIFICATIONS:

Voltage	12 - 24 V ≅	230 V ~
	172 000 75	**172 000 68**

TECHNICAL DIAGRAMS

see page 202



570 Signal Horn

- **Very loud, large horn**
- **Suitable for indoor and outdoor mounting**
- **Continuous tone**
- **Pulse tone**

TECHNICAL SPECIFICATIONS:

Dimensions (Depth x Width x Height):	152 mm x 148 mm x 356 mm
Housing:	ABS
Connection:	Screwable connection max 2.5 mm²
Cable entry:	Rubber squeeze grommet ø 7-10 mm
Fixing:	Bracket mounting, Sound outlet facing downwards

ORDER SPECIFICATIONS:

Continuous tone (AC)				
Voltage	24 V ~ (50 Hz)	42 V ~ (50 Hz)	115 V ~ (50 Hz)	230 V ~ (50 Hz)
Current consumpt.	500 mA	250 mA	200 mA	70 mA
	570 052 65	**570 052 66**	**570 052 67**	**570 052 68**
Continuous tone (DC)				
Voltage	24 V ~	42/48 V ~ (50 Hz)	115 V ~ (50 Hz)	230 V ~ (50 Hz)
Current consumpt.	350 mA	–	70 mA	40 mA
	570 052 55	–	**570 052 57**	**570 052 58**
Pulse tone (AC)				
Voltage	230 V ~			
Current consumpt.	≤ 70 mA			
	570 100 68			

Further voltages on request.

TECHNICAL DIAGRAMS

see page 212

WERMA SIGNALTECHNIK

571 Signal Horn

- **Very loud, large horn**
- **Suitable for maritime applications**
- **Corrosion-proof aluminium housing**

TECHNICAL SPECIFICATIONS:

Dimensions (Depth x Width x Height):	142 mm x 132 mm x 340 mm
Housing:	Aluminium alloy, corrosion-proof
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable gland M 20 x 1.5 mm
	Cable diameter 10-12 mm
Fixing:	Bracket mounting, Sound outlet facing downwards

ORDER SPECIFICATIONS:

Voltage	24 V =	115 V ~ (50 Hz/60 Hz)	230 V ~
Current consumption	350 mA	200 mA	70 mA
	571 052 55	**571 052 67**	**571 052 68**

TECHNICAL DIAGRAMS

see page 212

572 Signal Horn

- **Loud, large horn**
- **High protection rating IP 65**

TECHNICAL SPECIFICATIONS:

Dimensions (Depth x Width x Height):	223 mm x 156 mm x 118 mm
Housing:	Aluminium, grey varnish
	Cap: ABS
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable gland at side, M 20 x 1.5 mm
	Cable diameter 10-12 mm
Mounting:	Sound outlet facing downwards

BESTELLDATEN:

Voltage	24 V =	115 V ~ (50 Hz/60 Hz)	230 V ~
Current consumption	350 mA	200 mA	70 mA
	572 000 55	**572 000 67**	**572 000 68**

Further voltages on request.

TECHNICAL DIAGRAMS

see page 212

573 Signal Horn

- **Loud horn with continuous tone**
- **Modern design**
- **Cable gland for pull relief**
- **Concealed fixing screws**
- **High protection rating IP 65 for indoor and outdoor applications**

TECHNICAL SPECIFICATIONS:

Dimensions (Depth x Width x Height):	207 mm x 178 mm x 104 mm
Fixing dimensions (Depth x Width):	160 mm x 130 mm
Housing:	PC/ABS-Blend
Sound output:	max. 105 dB (A) / 1 m
Connection:	Screwable connection max. 2.5 mm^2
Cable entry:	Cable gland M 16 x 1.5 mm Cable diameter 5-10 mm
Current consumption:	see order specifications
Fixing:	Wall mounting, sound outlet facing downwards

ORDER SPECIFICATIONS:

Voltage	24 V AC	24 V AC	42/48 V	24 V AC	24 V AC
Current consumpt.	350 mA	500 mA	250 mA	200 mA	70 mA
	50 Hz	50 Hz	50 Hz	50/60 Hz	50 Hz
	573 000 55	**573 000 65**	**573 000 66**	**573 000 67**	**573 000 68**

TECHNICAL DIAGRAMS

see page 213

WERMA SIGNALTECHNIK

914 Alarm Bell

- **Robust alarm bell**
- **High protection rating IP 66**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	167 mm x 76 mm
Housing:	Steel bell, epoxy dust enamelled
Connection:	Screwable connection max. 1.5 mm²
Cable entry:	Cable gland M 16 x 1.5 mm Cable diameter 5-10 mm

ORDER SPECIFICATIONS:

Voltage	24 V =	110 V ~	230 V ~
Current consumption	300 mA	90 mA	35 mA
	914 052 55	**914 052 67** (60 Hz)	**914 052 68** (50 Hz) **914 053 68** (60 Hz)

Further voltages on request

TECHNICAL DIAGRAMS

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at = 98 dB(A)
at ~ 100 dB(A)

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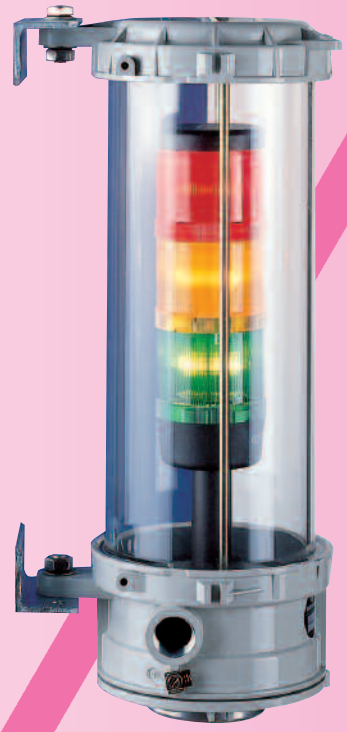

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Overview Ex Signal Devices

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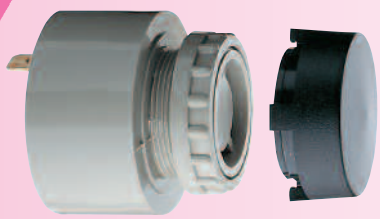
Ex Signal Devices		
	Installation versions	Free-standing versions
Ex Signal Tower		**740** Page 182
Ex LED Signal Tower		**741** Page 183
Ex Installation LED Beacons	**770** Page 184	
	771 Page 185	
Ex Rotating Mirror Beacon		**783** Page 186
Ex Revolving Signal Beacon		**784** Page 187
Ex Flashing Beacon		**720** Page 189
Ex Double Flash Beacon		**738** Page 188
Ex Electronic Installation Buzzer	**718** Page 190	
Ex Multi-Tone Sounder	NEW	**714** Page 192
Ex Loudspeaker		**710** Page 191
Ex Signal Horns		**750** Page 194
		761 Page 195
Bulbs	**Bulb Overview** Pages 128 + 129	
Regulations and Requirements for Ex Signal Devices	Page 174 ff.	



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The sounds of the audible Ex devices can be played from our website www.werma.com under the heading Ex Signal Devices.

Signal devices in areas with explosive hazard –

Avoidance of explosions – explosion protection

Three types of explosion protection can be defined:

EXPLOSION PROTECTION

Primary explosion protection entails preventing the formation of an explosive atmosphere by, for example adequate ventilation.

Secondary explosion protection measures come into effect when an explosive atmosphere still arises despite primary explosion protection: they entail the elimination of ignition source.

Tertiary explosion protection methods: these minimise the effects of an explosion by a pressure-resistant building construction or the controlled transference of the explosion pressure.

Legal basis

The member states of the European Community have set forth new EU directives in order to harmonise different European rulings. This means that national regulations come into line with the regulations within the European Community. The basis of this new legal system is the European Directive 94/9/EG dated 23.03.04. This directive defines the obligations of the manufacturer in the form of the demands made upon products manufactured encompassing electrical, and non-electrical devices as well as protection systems.

This directive is also known as the ATEX Directive in reference to its original working title "Atmosphère explosible". As it is anchored in Article 95 of the EU Agreement its usual title is ATEX 95.

All new production devices used in areas with explosion hazard must conform to the ATEX directive as from 01.07.03. All devices and machines installed before this date may still be used. The basic standards for the construction of electrical devices are set forth in the EU Standards of the European Norm Organisation.

Manufacturers' obligations

Safety in areas with explosive hazard can only be guaranteed through close co-operation between all those involved. Co-operation between manufacturer, installer, operator, tester and the relevant controlling body is essential. The **essential obligations** for the manufacturer of explosion – protected components are:

- The devices must be marked according to their field of use.
- The Conformity Assessment Procedure demands that all requirements for the awarding of the CE mark be fulfilled.
- Devices in category 1 and 2 are to be tested by a third party testing authority to ensure that all regulations are observed.
- This is to be confirmed by the Type Examination Certificate.
- The manufacturer must prove that he has an appropriate quality management system.

Areas liable to explosion: Zone definitions

Areas liable to explosion as defined by §2 of the ElexV are areas in which a dangerous explosive atmosphere could arise due to site and production-induced conditions. In order to judge the degree of protective measures required, the areas liable to explosion are classified by the operator into zones according to the probability of an explosive atmosphere arising.

Definitions of the zones acc. to §2 Para 4 of ELEXV (96)

AREAS LIABLE TO EXPLOSION CAUSED BY FLAMMABLE GASES:		
Zone 0:	**Zone 1**:	**Zone 2**:
Areas in which a dangerous explosive atmosphere consisting of a mixture of air and gas, vapours or mist **is present continually, over a longer period or on a frequent basis.**	Areas in which a dangerous explosive atmosphere consisting of gases, vapours or mist is to be expected **from time to time.**	Areas in which a dangerous explosive atmosphere consisting of gases, vapours or mist is not to be expected and where it does arise then in all probability only **rarely and for a short period of time.**

AREAS LIABLE TO EXPLOSION CAUSED BY FLAMMABLE DUST:		
Zone 20	**Zone 21**	**Zone 22**
Sectors in which a dangerous explosive atmosphere consisting of a mixture of dust and air exists and **is present continually, over a longer period or on a frequent basis.**	Sectors in which a dangerous explosive atmosphere consisting of a mixture of dust and air is to be expected from **time to time.**	Sectors in which a dangerous explosive atmosphere caused by clouds of dust is not to be expected and where it does actually arise then in all probability only **rarely and for a short period of time.**

Devices groups and categories

Electrical components for use in areas liable to explosion can be divided in two groups:

Group I: Electrical components in pit gas endangered mining areas.
Group II: Electrical components in other areas liable to explosion from gas or dust.

The device groups are further divided up into device categories according to the Ex Zone:

AREAS LIABLE TO EXPLOSION CAUSED BY FLAMMABLE DUST:							
Group I		**Group II**					
Category M		**Category 1**		**Category 2**		**Category 3**	
		G	D	G	D	G	D
1	2	(Gas)	(Dust)	(Gas)	(Dust)	(Gas)	(Dust)
		Zone 0	Zone 20	Zone 1	Zone 21	Zone 2	Zone 22

Signal devices in areas with explosive hazard –

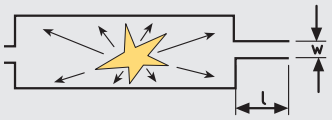
Specific construction regulations for explosion – protected components in gaseous or vaporous atmospheres in the category 2G

Specific construction regulations prevent electrical components in an explosion-endangered gas or vapour area from becoming a source of ignition. The so–called **protection type**s guarantee safety depending on the Ex zone even in the event of malfunction.

The general requirements for electrical components in gas explosion endangered areas are defined in the **IEC 60079-0, EN 60079-0** (formerly: EN 5001 4) Part 0: general requirements.

FLAME-PROOF ENCLOSURES “d“

IEC 60079-1, EN 60079-1 (previously: EN 50018)
Electrical apparatus for explosive gas atmospheres – Part 1: Flameproof enclosures 'd'.



If an explosion occurs inside a pressure resistant encapsulated housing it cannot break through this boundary.

INCREASED SAFETY “e“

IEC 60079-7, EN 60079-7 (previously: EN 50019)
Electrical apparatus for explosive gas atmospheres – Part 7: Increased safety 'e'.

Sparks and high temperatures are made impossible by increased safety measures.

INTRINSIC SAFETY “i“

IEC 60079-11, EN 50020
Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety "i".

The electric current in the circuit is kept so low that fiery sparks, arcing or temperatures cannot occur.

ENCAPSULATION “m“

IEC 60079-18, EN 60079-18 (previously: EN 50028)
Electrical apparatus for explosive gas atmospheres – Part 18: encapsulation 'm'.

Components which could ignite an explosive atmosphere are encapsulated in a casting compound to prevent the ignition of the surrounding atmosphere.

Specific construction regulations for explosion protected components in category 3G

Prevention of an explosive atmosphere igniting in normal working conditions and certain abnormal conditions.

This protection type is an economical compromise between the normal industrial standard and the high safety standards demanded of components in device category 2G.

NON-SPARKING “nA“

IEC 60079-15, EN 60079-15
Electrical apparatus for explosive gas atmospheres – Part 15: Construction, test and marking of type of protection 'n' electrical apparatus.

Sparks, arcing and hot surfaces are reliably prevented.

Specific construction regulations for explosion – endangered components in dust areas

The general requirements for electrical components in dust explosion endangered areas are defined in the IEC 61241-0, EN61241-0 – Electrical apparatus for use in the presence of combustable dust – Part 0: General requirements.
Protection type ”protected by enclosures” means that the housing surrounding the component is so well sealed that inflammable dust cannot penetrate inside. The surface temperature of the outer housing is limited. The minimum protection rating for Zones 20 and 21 is IP 6X (dustproof), and for Zone 22 IP 5X (dust protected).
The construction regulations are laid out in EN 50281-1-1, Electrical apparatus for use in the presence of combustible dust – Part 1-1: Electrical apparatus protected by enclosures – Construction and testing.

Explosion groups for gases and vapours

The inflammability and ignition penetration power of an explosive mix is a substance typical property. Explosive mixtures of air with inflammable gases or vapours are divided into explosion groups I and II.

- **Explosion group I** applies to pit gas and is only relevant in mining.
- In **explosion group II** the inflammability of the gases increases from IIA to IIB and IIC. These define different criteria e.g with protection type "d-pressure-resistant encapsulation (EN 60079-1)" the requisite slit types and dimensions, or, as in protection type "i- Intrinsic safety (EN 50020)", the maximum permissible electricity and current ratings. No further sub-division of explosion group II is made for other protection types.

EXPLOSION GROUP		INFLAMMABLE SUBSTANCE	INFLAMMABILITY
I		Methane	
II	A	Aceton, Petrol, Methanol, Propane, Toluene	relatively low
	B	Ethylene	
	C	Hydrogen, Acetylene	high

Temperature classification of gases and vapours

The ignition temperature of explosive gaseous and vaporous atmospheres is influenced by several different factors. These include size, type and consistence of the heated surface. The **IEC 60079-4** contains a **"Method of determining ignition temperature"** with which it is possible to calculate the lowest practically possible temperature with relative accuracy.

Gases and vapours are classified herein in temperature classes. Explosion-protected components are laid out in their surface temperature so that ignition cannot occur on the surface.

IGNITION TEMPERATURES AND TEMPERATURE CLASSES OF EXPLOSION-ENDANGERED GAS AND VAPOUR ATMOSPHERES

Temperature classes	Ignition temperature of the explosion-liable gas/ vapour atmosphere	Permissible surface temperature of the component
T1	≥ 450°C	≤ 450°C
T2	≥ 300 … ≤ 450°C	≤ 300°C
T3	≥ 200 … ≤ 300°C	≤ 200°C
T4	≥ 135 … ≤ 200°C	≤ 135°C
T5	≥ 100 … ≤ 135°C	≤ 100°C
T6	≥ 85 … ≤ 100°C	≤ 85°C

Signal devices in areas with explosive hazard –

Permissible surface temperature of electrical components in dust atmospheres

IEC 61241-2-1, EN 50281-2-1- Electrical apparatus for use in the presence of combustible dust – Part 2: Test methods – Section I: Methods for determining the minimum ignition temperature of dust.

Different values are to be expected depending on whether the dust is in the form of a gathered layer (Value A) or as an active cloud (Value B). The permissible surface temperature for component parts exposed to dust is calculated as such: 75K is deducted from value A and 2/3 of value B calculated. The smaller of the two values is the highest permissible surface temperature.

A classification in explosion groups and temperature classes cannot be defined: these must always be evaluated specifically for the type of dust present.

EXAMPLES OF IGNITION TEMPERATURES FOR SOME DIFFERENT DUST TYPES

Solid matter	**Value A** Ignition temp. according to EN 50281-2-1 layer (°C)	**Value B** Ignition temp. according to EN 50281-2-1 cloud (°C)	Permissable surface temperature (°C) Smallest value of calculation (A-75K) and 2/3*B									
			450..	300..	280..	260..	230..	215..	200..	180..	165..	160..
			<300	<280	<260	<230	<215	<200	<180	<165	<160	<135
Examples of natural products												
Cotton	350	560			275							
Lignite	225	380										150
Grain	290	420						215				
Milk powder	340	440			265							
Examples of chemical-technical products												
Soot	385	620	310									
Polyvinylchloride	380	530	305									
Sulphur	280	280							185			
Examples of metal dust												
Iron	300	310						206				
Magnesium	410	610	335									

Minimum product marking of explosion-protected components

The Directive 94 / 9 / EG (ATEX 95) section II defines an **unequivocal marking** for components in explosion-protected areas. This must include the following points:

- Name and address of the manufacturer
- Description of series and type
- Series number where applicable
- Details referring to the explosion protection type (examples):

GAS	CE	0102	Ex	II	2 G	EEx	me	II	T5
DUST	CE	0102	Ex	II	2 D		IP65		175°C
	1	2	3	4	5	6	7	8	9

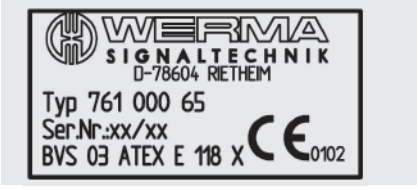
1	CE conformity marking
2	The number of the named authority monitoring production
3	Ex-Hexagon taken from the old regulations for explosive atmospheres (76/117/EWG,82/130/EWG)
4	Device group, e.g. II
5	Device category, e.g. 2G or 2D
6	Symbols to show that one or more norms from norm series EN 60079 (formerly EN 50014ff.) or IEC/EN 61241) have been used. E = built acc. to European norm EX = Explosion protected component
7	Abbreviation of the protection type. All these used in the component must be named after the main ignition protection type, in the case of dust (protection through housing) additionally the IP rating. e.g. "me ": Main ignition protection type "m", secondary type "e".
8	Explosion group, eg II
9	Temperature class eg T5 . In the case of dust (electrical apparatus protected by enclosures) the maximum surface temperature must be given.

Components for Zones 2 and 22 may not bear the ATEX mark in their device classification or display the number of a monitoring authority.

The details of the authority responsible for the testing of the component for the relevant norms must also be stated:

BVS	03	ATEX	E 118	X
3RD PARTY TESTING AUTHORITY	YEAR OF TESTING	ACC. TO DIRECTIVE 94/4/EG	CONSECUTIVE NO. OF CERTIFICATE	SPECIAL CONDITIONS

An example of product marking on an explosion-protected electrical component :



"Zone I : Only to be wiped with a damp cloth". The minimal marking is augmented by recommendations vital for safe use. The certificate of conformity is to be provided with every device as well as the compulsory marking. The manufacturer hereby confirms conformity with the relevant norms and clearly states upon which EU standards the CE mark is based. An instruction and mounting leaflet is to be provided with every device. These documents should be filed safely by the user for future reference.

Signal devices in areas with explosive hazard –

NORTH AMERICAN DANGER CATEGORIES IN ACCORDANCE WITH NEC 500 – typical dangerous substances

Flammable material	Example	Class	Group
Gases, vapours	Acetylene	Class I	Group A
	Hydrogen	Class I	Group B
	Ethylene	Class I	Group C
	Propane	Class I	Group D
Dusts	Metal dust	Class II	Group E
	Coal dust	Class II	Group F
	Grain dust	Class II	Group G
Fibres, flyings	Paper, wood and cotton	Class III	no further group

CLASSIFICATION OF THE EXPLOSION ENDANGERED AREAS

Flammable material	Temporary behaviour of the explosive atmosphere	Classification of the explosion endangered areas			Marking of the electrical equipment according to CENELEC (ATEX)	
		CENELEC / IEC (ATEX)	US NEC 505	US NEC 500	Device group	Device category
Gases, vapours	Are continuously present, for long periods or frequently	Zone 0	Class I Zone 0	Class I Division 1	II	1G
	Are likely to occur	Zone 1	Class I Zone 1		II	2G or 1G
	Are unlikely to occur and if they do they have to be expected only rarely and only for a moment.	Zone 2	Class I Zone 2	Class I Division 2	II	3G or 2G or 1G
Dusts	Are continuously present, for long periods or frequently	Zone 20	-	Class II Division 1	II	1D
	Are likely to occur	Zone 21	-		II	2D or 1D
	Are unlikely to occur and if they do they have to be expected only rarely and only for a moment.	Zone 22 conductive dusts	-	Class II Division 2	II	2D or 1D
		Zone 22 – non conductive dusts	-	Class II Division 2	II	3D or 2D or 1D
Pit gas (methane)	-	Mining	-	Mining	I	M1 or M2

CENELEC	CE	0102	⟨Ex⟩
NEC 500			
NEC 505			
IEC			

	II	2G		
Class I			Division 1	Group A,B,C,D
Class I				Zone 1

NOTIFIED BODY

Notified Body	Country	No.
PTB	Germany	0102
Exam BBG	Germany	0158
DOS	Germany	0297
PSA	Germany	0588
BAM	Germany	0589
IBExU	Germany	0837
INERIS	France	0080
LCIE	France	0081
KEMA	Netherlands	0344
SP	Sweden	0402
LOM	Spain	0588
EECS (BASEEFA)	UK	0800

International Markings

Explosion Group for gases and vapours according to CENELEC / IEC / NEC 505

Explosion Group	Inflammable substance	Inflammability
I	Methane	(Pit gas – non-defined)
IIA	Aceton, Petrol, Methanol, Propane, Toluene	Relatively low
IIB	Town gas, Ethylene	
IIC	Hydrogen, Acetylene	high

Temperature Classes and permissible surface temperature of the components

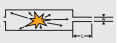
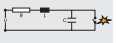
Maximum surface temperature [°C]	NEC 500	IEC	CENELEC
450	T1	T1	T1
300	T2	T2	T2
280	T2A	-	-
260	T2B	-	-
230	T2C	-	-
215	T2D	-	-
200	T3	T3	T3
180	T3A	-	-
165	T3B	-	-
160	T3C	-	-
135	T4	T4	T4
120	T4A	-	-
100	T5	T5	T5
85	T6	T6	T6

Classification of gases and dusts in accordance with CENELEC /IEC / NEC 505 - Examples

Temperature class	T1	T2	T3	T4	T5	T6
Explosion group						
I	Methane	-	-	-	-	-
IIA	Ammonia Methane Ethane Propane	Ethyl alcohol Cyclohexane n-Butane n-Hexane	Petrol Diesel	Ethanal Ethyl aether	-	-
IIB	Town gas	Ethylene	Hydrosulfide Ethylene glykol	-	-	-
IIC	Hydrogen	Acetylene	-	-	-	Coal disulfide

EEx	de	IIC	T6
			T6
AEx	de	IIC	T6
Ex	de	IIC	T6

PROTECTION TYPES

	General Requirements	Flame-Proof Enclosures	Increased Safety	Intrinsic Safety	Pressurized	Encapsulation	Oil Immersion	Sand Encapsulation	Protection Type "n"	Protection by Enclosure
Symbol									" n "	
Marking	-	d	e	i	p	m	o	q	n	IP protection rating and surface temp.
Protection concept	-	Transmission of an explosion to the outside is excluded	Avoidance of sparks and temperatures	Energy limitation of sparks and temperatures	Ex atmosphere is kept apart from ignition source	Ex atmosphere is kept apart from ignition source	Ex atmosphere is kept apart from ignition source	Ex atmosphere is kept apart from ignition source	Different protection concepts for zone 2/22	Ex atmosphere is kept apart from ignition source
Zone	-	1/2	1/2	0/1/2	1/2	1/2	1/2	1/2	2/22	20/21/22
IEC	60079-0	60079-1	60079-7	60079-11	60079-2	60079-18	60079-6	60079-5	60079-15	61241-1
CENELEC	EN 60079-0 (previously: EN 50014)	EN 60079-1 (previously: EN 50014)	EN 60079-7 (previously: EN 50019)	EN 50020	EN 60079-2 (previously: EN 50016)	EN 60079-18 (previously: EN 50028)	EN 50015	EN 50017	EN 60079-15 (previously: EN 50021)	EN 50281-1-1
FM/UL	-	FM 3600 UL 2279	FM 3600 UL 2279	FM 3610 UL 2279	FM 3620 NFPA 496	UL 2279	UL 2279	UL 2279	-	-

740 Ex Signal Tower

- **Zone 1 and 2, Zone 21 and 22**
- **Signal tower Kombi*SIGN* in flame-proof enclosure**
- **Available with up to 3 light elements**
- **Also available as LED version**

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	155 mm x 425 mm
Housing:	Aluminium, glass
Connection:	Screwable connection max. 2.5 mm² Contact protection according to VDE incl. approved pressure resistant cable gland NPT 3/4"
Explosion protection:	Ⓔx II 2G EEx d II C T6 Ⓔx II 2D Ex IP66 85°C
Approval:	L.C.I.E. 97 EX 6012
	Technical speifications of signal tower see type 840 (page 42).

ORDER SPECIFICATIONS:

Voltage	12-230 V Bulb	24 V ≅ LED
Current consumption	–	45 mA per tier
Starting current	–	< 0.5 A
red / green	**740 210 00**	**740 210 55**
red / yellow / green	**740 231 00**	**740 231 55**

Life duration up to 100,000 hrs

ACCESSORIES:

Bulb BA 15d, 5 W, 24 V	Bulb BA 15d, 5 W, 230 V
955 840 35	**955 840 38**

TECHNICAL DIAGRAMS

see page 223

WERMA SIGNALTECHNIK

741 Ex LED Signal Tower

- **Zone 1 and 2**
- **Competitively priced Ex LED Signal Tower**
- **No additional zener barrier required**
- **Combination of encapsulation "m" and intrinsic safety "ib" with connection area "e"**

TECHNICAL SPECIFICATIONS:

Dimensions of the Zener Barrier (L x B x H):	75 mm x 77 mm x 110 mm	
Dimensions total:	2 tier (L x B x H):	75 mm x 77 mm x 228 mm
	3 tier (L x B x H):	75 mm x 77 mm x 262 mm
Housing:	Polyester	
Connection:	Screwable connection max. 2.5 mm² incl. approved cable gland "e"	
Explosion protection:	Ⓔx II 2G EEx me [ib] IIC T6	
Approval:	PTB 06 ATEX 2005	

ORDER SPECIFICATIONS:

Voltage	24 V =
Current consumption	< 90 mA
red / green	**741 110 55**
red / yellow	**741 120 55**
red / yellow / green	**741 130 55**

Life duration up to 100,000 hrs

TECHNICAL DIAGRAMS

see page 224

2 tier 3 tier

690 g | 710 g | IP65 | +50°C -20°C

770 Ex LED Installation Beacon

- Ex LED Permanent Beacon with M 20 thread
- Suitable for use in gas and dust explosion endangered areas (Zone 2 and 22)
- Extremely high light intensity
- Modern Chip-On-Board technology
- Ideal for installation in limited space due to short thread

TECHNICAL SPECIFICATIONS:

Housing:	PC, black
Dome:	PC, transparent
Connection:	2 wires, c. 115 mm long
Fixing:	Installation mounting for Ø 20.5 mm (M 20 x 1.5 mm)
Dimensions (Diameter x Height):	28.7 mm x 38.5 mm
Operating voltage:	24 V =
Starting current:	< 0.5 A at 24 V
Current consumption:	< 45 mA at 24 V
Explosion protection:	⟨Ex⟩ II 3G Ex nA II (fulfills T4, when temperature at place of operation lies between -20 and +50 °C)
	⟨Ex⟩ II 3D IP65 (fulfills T 75 °C, when temperature at place of operation lies between -20 and +50 °C)
Approval:	BVS 05 E 041 U

Seal included in assembly.

ORDER SPECIFICATIONS:

Voltage	24 V =
red	**770 100 55**
green	**770 200 55**
yellow	**770 300 55**
clear	**770 400 55**

TECHNICAL DIAGRAMS

see page 225

Mainly sidewards illumination

WERMA SIGNALTECHNIK

771 Ex LED Installation Beacon

Mainly sidewards illumination

- **Ex LED Permanent Beacon with M 22 thread for the control panel programme**
- **Suitable for use in gas and dust explosion endangered areas (Zone 2 and 22)**
- **Extremely high light intensity**
- **Modern Chip-On-Board technology**

TECHNICAL SPECIFICATIONS:

Housing:	PC, black
Dome:	PC, transparent
Connection:	2 wires, c. 115 mm long
Fixing:	Installation mounting for Ø 22.5 mm (M 22 x 1.5 mm)
Dimensions (Diameter x Height):	28.7 mm x 38.5 mm
Operating voltage:	24 V =
Starting current:	< 0.5 A at 24 V
Current consumption:	< 45 mA at 24 V
Explosion protection:	Ⓔx II 3G Ex nA II (fulfills T4, when temperature at place of operation lies between -20 and +50 °C)
	Ⓔx II 3D IP65 (fulfills T 75 °C, when temperature at place of operation lies between -20 and +50 °C)
Approval:	BVS 05 E 041 U

Seal included in assembly.

ORDER SPECIFICATIONS:

Voltage	24 V =
red	**771 100 55**
green	**771 200 55**
yellow	**771 300 55**
clear	**771 400 55**

TECHNICAL DIAGRAMS

see page 225

783 Ex Rotating Mirror Beacon

- Suitable for use in gas and dust explosion endangered areas (Zone 1 and 2, Zone 21 and 22)
- Flame-proof enclosure "d" with "e" connection area
- High life duration thanks to low wear wheel and disc drive
- Can be mounted as required

Wire guard (Accessory)

Clamp for tube mounting (Accessory)

Mounting plate (Accessory)

Bracket (Accessory)

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	195 mm x 305 mm
Housing:	Aluminium
Dome:	Reinforced borosilicate glass
Mounting Plate:	VA stainless steel
Connection:	Screwable connection max. 2.5 mm²
Cable gland:	Cable gland M 20 x 1.5 mm Cable diameter 5 - 13 mm
Connection area:	Increased Safety "e"
Drive:	Wheel and disc drive, motor in centre of gravity
Installation position:	As required
Mirror rotation rate:	180 r.p.m.
Service life of drive:	> 5,000 hrs
Duty cycle:	100 %
Fixing:	Base mounting, Bracket mounting, Tube mounting
Explosion protection:	Ⓔx II 2G Ex de IIC T3–T4 (depending on version) Ⓔx II 2D Ex tD A21 IP 66 T 105 °C – T 150 °C (depending on version)
Approval :	PTB 06 ATEX 1039

Halogen bulb included in assembly. Bulb overview see pages 128 + 129.

ORDER SPECIFICATIONS:

Voltage	24 V ≅	24 V ≅	115 V ≅	230 V ~	230 V ~
Halogen bulb	20 W	35 W	35 W	20 W	35 W
Current consumption	900 mA	1.6 A	350 mA	110 mA	170 mA
Temperature Class (gas)	T4	T3	T3	T4	T3
Surface Temperature (dust)	105°C	150°C	150°C	105°C	150°C
red	**783 110 75**	**783 100 75**	**783 100 77**	**783 110 68**	**783 100 68**
yellow	**783 310 75**	**783 300 75**	**783 300 77**	**783 310 68**	**783 300 68**

ACCESSORIES:

Wire guard	**975 783 01**
Mounting plate	**975 783 02**
Clamp for tube mounting 1¼"	**975 783 03**
Clamp for tube mounting 1½"	**975 783 04**
Clamp for tube mounting 2"	**975 783 05**
Bracket	**975 783 06**

SPARE PARTS:

Halogen bulb W für 24 V ≅	**955 885 25**
Halogen bulb 20 W for 230 V ~	**955 885 24**
Halogen bulb 35 W for 24 V ≅	**955 883 35**
Halogen bulb 35 W for 115 V ~, 230 V ~	**955 883 34**

TECHNICAL DIAGRAMS

see page 226

WERMA SIGNALTECHNIK

784 Ex Revolving Signal Beacon

- Suitable for use in gas and dust explosion endangered areas (Zone 1 and 2, Zone 21 and 22)
- 3 Fresnel lenses effect light convergence and optimise visibility
- Flame-proof enclosure "d" with "e" connection area
- Low rotation rate and high life duration thanks to low wear wheel and disc drive
- Can be mounted as required

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	195 mm x 305 mm
Housing:	Aluminium
Dome:	Reinforced borosilicate glass
Mounting Plate:	VA stainless steel
Connection:	Screwable connection max. 2.5 mm²
Cable gland:	Cable gland M 20 x 1.5 mm Cable diameter 5 - 13 mm
Connection area:	Increased Safety "e"
Drive:	Wheel and disc drive, motor in centre of gravity
Installation position:	as required
Halogen bulb:	GY 6.35 35 W 12 V / 24 V
Lens rotation rate:	60 r.p.m.
Service life of drive:	> 5,000 hrs
Duty cycle:	100 %
Fixing:	Base mounting, Bracket mounting, Tube mounting
Explosion protection:	Ⓔx II 2G Ex de IIC T4 Ⓔx II 2D Ex tD A21 IP 66 T 105 °C
Approval :	PTB 06 ATEX 1039

Halogen bulb included in assembly. Bulb overview see pages 128 + 129.

Wire guard (Accessory)

ORDER SPECIFICATIONS:

Voltage	24 V ≅	115 V ≅	230 V ~
Current consumpt.	1.6 A	350 mA	170 mA
red	**784 100 75**	**784 100 77**	**784 100 68**
yellow	**784 300 75**	**784 300 77**	**784 300 68**

Clamp for tube mounting (Accessory)

ACCESSORIES:

Wire guard	**975 783 01**
Mounting plate	**975 783 02**
Clamp for tube mounting 1¼"	**975 783 03**
Clamp for tube mounting 1½"	**975 783 04**
Clamp for tube mounting 2"	**975 783 05**
Bracket	**975 783 06**

Mounting plate (Accessory)

SPARE PARTS:

Halogen bulb 35 W for 115 V ≅, 230 V ~	**955 883 34**
Halogen bulb 35 W for 24 V	**955 883 35**

TECHNICAL DIAGRAMS

see page 226

Bracket (Accessory)

738 Ex Double Flash Beacon

- Suitable for use in gas and dust explosion endangered areas (Zone 1 and 2, Zone 21 and 22)
- Flame-proof enclosure "d" with "e" connection area
- High flash power from two consecutive flashes
- Can be mounted as required

Wire guard (Accessory)

Clamp for tube mounting (Accessory)

Mounting plate (Accessory)

Bracket (Accessory)

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	195 mm x 305 mm
Housing:	Aluminium
Dome:	Reinforced borosilicate glass
Mounting Plate:	VA stainless steel
Connection:	Screwable connection max. 2.5 mm^2
Cable gland:	Cable gland M 20 x 1.5 mm Cable diameter 5 - 13 mm
Connection area:	Increased Safety "e"
Installation position:	as required
Flash energy:	15 Ws
Flash frequency::	1 Hz
Life duration:	4 x 10^6 flashes
Fixing:	Base mounting, Bracket mounting, Tube mounting
Explosion protection:	Ⓔx II 2G Ex de IIC T5 Ⓔx II 2D Ex tD A21 IP 66 T 85 °C – T 90 °C (depending on the voltage)
Approval:	PTB 06 ATEX 1039

ORDER SPECIFICATIONS:

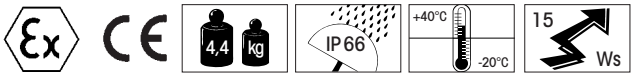
Voltage	24 V =	115 V ~	230 V ~
Current consumpt.	700 mA	300 mA	200 mA
Surface			
Temp. (dust)	85 °C	90 °C	85 °C
red	**738 100 55**	**738 100 67**	**738 100 68**
yellow	**738 300 55**	**738 300 67**	**738 300 68**

ACCESSORIES:

Wire guard	**975 783 01**
Mounting plate	**975 783 02**
Clamp for tube mounting 1 1/4"	**975 783 03**
Clamp for tube mounting 1 1/2"	**975 783 04**
Clamp for tube mounting 2"	**975 783 05**
Bracket	**975 783 06**

TECHNICAL DIAGRAMS

see page 222



WERMA SIGNALTECHNIK

720 Ex Flashing Beacon

- Zone 1 and 2
- Compact flashing beacon
- Versatile use

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Height):	110 mm x 243 mm
Housing:	Aluminium
Dome:	Reinforced borosilicate glass
Wire guard:	Rust-proof steel, powder-coated
Connection:	Screwable 1.5 mm^2 fine-strand, 2.5 mm^2 single-wire
Cable entry:	Cable gland M 20 x 1.5 mm
	Cable diameter 6-9 mm
Current consumption:	at 24 V: 1A
	at 230 V: 200mA
Life duration:	5 x 10^6 flashes
Explosion protection:	Ⓔx II 2G EEx de IIC T6
Approval:	PTB 01 ATEX 1057
Fixing:	Bracket mounting, installation mounting
Flash frequency:	1 Hz

ORDER SPECIFICATIONS:

Voltage	24 V =	230 V ~
red	**720 101 55**	**720 101 68**
yellow	**720 301 55**	**720 301 68**

TECHNICAL DIAGRAMS

see page 221

718 Ex Electronic Installation Buzzer

- Zone 1 and 2
- Intrinsically safe Ex installation buzzer
- For use with a Zener Barrier
- IP 43 with cap
- Low current consumption
- Continuous tone

Cap

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Depth):	43 mm x 48 mm			
Housing:	ABS			
Connection:	Spades 6.3 x 0.8 mm			
Audio frequency:	c. 2,400 Hz			
Duty cycle:	100 %			
Explosion protection:	Ⓔx II 2G EEx ib IIC T4 / T5 / T6			
Approval:	DMT 98 ATEX E 005 X			
Maximum values of the Zener barrier:	Ui: 40 V = , Ii: 660 mA			
Minimum values of the Zener barrier:	for 24 V = 15 V = / 20 mA			
Maximum Input Power Pi:	Temp.-classes	Max. surrounding temperature + 40°C	+ 50°C	+ 60°C
	T4	Pi = 1.3 W	Pi = 1.2 W	Pi = 1.0 W
	T5	Pi = 0.82 W	Pi = 0.66 W	Pi = 0.52 W
	T6	Pi = 0.6 W	Pi = 0.45 W	Pi = 0.3 W

ORDER SPECIFICATIONS:

Voltage	24 V =
Current consumption	20 mA
	718 000 55

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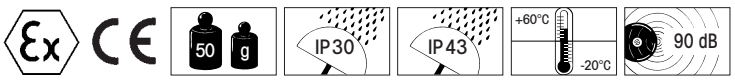
ACCESSORIES:

PC/ABS-Blend Cap (IP 43)	**975 118 00**
Zener Barrier	**975 714 01**

TECHNICAL DIAGRAMS

see page 221

mit Abdeckk.



WERMA SIGNALTECHNIK

710 Ex Loudspeaker

- Zone 1 and 2
- Sound output up to 119 dB (A)
- Connection area "e"
- UV-resistant
- Protected against corrosion

TECHNICAL SPECIFICATIONS:

Dimensions (Depth x Width):	287 mm x 219 mm
Housing:	Plastic (anti-static), UV-resistant, black
Fixing bow, lid screw:	Stainless steel V4A (ASTM 316), rust-free
Cable entry:	Cable gland M 20 x 1.5 mm Cable diameter 6 - 13 mm
Connection:	up to 2.5 mm^2 (AWG14) solid up to 4 mm^2 stranded
Connection area:	Increased safety "e"
Input-output:	max. 500 W, parallel connection of up to 20 loudspeakers
Connection voltage:	100 V
Max. Power 70 Hz - 15000 Hz:	25 W
Power levels via code terminals:	25 W; 12.5 W; 8 W; 4 W; 2 W; 1 W
SPL 25 W/1m:	c. 119 dB (A)
SPL 1 W/1 m:	c. 107 dB (A)
Transmission range:	280 - max. 10,000 Hz
Transmission range according to IEC 60268:	330 - 6,500 Hz
Distortion factor 1 W/ 1 kHz:	≤ 4%
Distortion factor 10 W/ 1 kHz:	≤ 5%
Opening angle 1 kHz - 6 dB:	130°
Opening angle 4 kHz - 6 dB:	40°
Fixing:	Wall mounting
Explosion protection:	Ⓔx II 2 G EEx dem IIC T5
Approval:	PTB 04 ATEX 1110

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ORDER SPECIFICATIONS:

Voltage	100 V ~
	710 000 00

TECHNICAL DIAGRAMS

see page 220

714 Ex Multi-Tone Sounder

- Zone 0, 1 and 2
- 26 tones for a diverse range of applications
- For use with a Zener Barrier
- Adjustable sound output to 103 dB
- High protection rating IP 65
- Direct external setting of two tones possible

NEW

TECHNICAL SPECIFICATIONS:

Dimensions (Diameter x Depth):	93 mm x 103 mm
Housing:	ABS
Connection:	Screwable connection max. 2.5 mm²
Cable entry:	Cable diameter max. 12 mm
Duty cycle:	100%
Operating voltage:	24 V DC
Current consumption:	14 mA
Tone types and frequencies:	adjustable via DIP switch, see see table on right-hand page
Fixing:	Wall mounting, base mounting
Installation position:	Sound outlet must not face upwards
Explosion protection:	Ⓔx II 1G EEx ia IIC T4
Approval:	Baseefa 06 ATEX 0161

ORDER SPECIFICATIONS:

Voltage	24 V =
	714 000 55

ACCESSORIES:

Zener Barrier	**975 714 01**

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TECHNICAL DIAGRAMS

see page 221

Ex CE 300 g IP 65 +55°C -20°C 103 dB

WERMA SIGNALTECHNIK

714 Ex Multi-Tone Sounder

The 714 Ex Multi-Tone Sounder offers a large choice of international signal tones for the widest spectrum of applications.

TONE TYPES AND FREQUENCIES

adjustable via DIP switch

Tone A No.	Tone type
1	Alternating 800/970 Hz in 2 Hz stroke
2	Rising 800/970 Hz in 7 Hz stroke
3	Rising 800/970 Hz in 1 Hz stroke
4	Continuous 2,850 Hz
5	Rising 2,400-2,850 Hz in 7 Hz stroke
6	Rising 2,400-2,850 Hz in 1 Hz stroke
7	500-1,200 Hz rising in 3 sec., 0.5 sec OFF
8	Falling 1,200-500 Hz in 1 Hz stroke
9	Alternating 2,400/2,850 Hz in 2 Hz stroke
10	Pulse 970 Hz in 0.5 Hz stroke
11	Alternating 800/970 Hz in 1 Hz stroke
12	Pulse 2,850 Hz in 0.5 Hz stroke
13	970 Hz pulse: 0.25 sec. ON / 1 sec. OFF
14	Continuous 970 Hz
15	554 Hz/100 ms alternating 440 Hz/400 ms
16	660 Hz pulse: 150 ms ON, 150 ms OFF
17	660 Hz pulse: 1.8 sec. ON, 1.8 sec OFF
18	660 Hz pulse: 6.5 sec. ON, 13 sec OFF
19	Continuous 660 Hz
20	Alternating 554/440 Hz in 0.5 Hz stroke
21	Pulse 660 Hz in 1Hz stroke
22	2,850 Hz pulse: 150 ms ON / 100 ms OFF
23	Rising 800/970 Hz in 50 Hz stroke
24	Rising 2,400-2,850 Hz in 50 Hz stroke
25	970 Hz pulse: 3 x 500 ms ON, 500 ms OFF, 1.5 sec. pause
26	2,850 Hz pulse: 3 x 500 ms ON, 500 ms OFF, 1.5 sec. pause

750 Ex Signal Horn

- Zone 1 and 2
- Signal horn for Ex protected areas
- Fully encapsulated
- Silicone free

TECHNICAL SPECIFICATIONS:

Dimensions (D x W x H):	152 mm x 148 mm x 356 mm
Housing:	PC / ABS-Blend
Connection:	Cable 3 m, 2 x 0.75 mm²
Fixing:	Bracket mounting, sound outlet facing downwards
Explosion protection	Ⓔx II 2G EEx m II T5
Approval:	BVS 03 ATEX E 118X

ORDER SPECIFICATIONS:

Voltage	24 V =	24 V ~	48 V ~	115 V ~		230 V ~
Voltage range	21.6 V ... 26.4 V	21.6 V ... 26.4 V	37.8 V ... 52.8 V	102.5 V ... 126.5 V (50 Hz)	108 V ... 131 V (60 Hz)	208 V ... 250 V
Current consumpt.	350 mA	450 mA	220 mA	205 mA		70 mA
	750 000 55	**750 000 65**	**750 000 66**	**750 000 67**		**750 000 68**

TECHNICAL DIAGRAMS

see page 225

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WERMA SIGNALTECHNIK

761 Ex Signal Horn

- Zone 1 and 2, Zone 21 and 22
- Loud horn with continuous tone
- Modern design
- Cable gland
- Connection area "e"
- Concealed fixing screws
- IP 65 for indoor and outdoor applications
- Flexible mounting possibilities
- Suitable for use in areas liable to explosion caused by both gas or dust without the need for additional accessories

TECHNICAL SPECIFICATIONS:

Dimensions (D x W x H):	207 mm x 178 mm x 104 mm
Fixing dimensions (D x W):	160 mm x 130 mm
Housing:	PC
Connection:	CAGE CLAMP® max. 2.5 mm²
Cable entry:	Cable gland M 16 x 1.5 mm Cable diameter 6.5 – 9.5 mm
Fixing:	Wall mounting, Surface mounting
Explosion protection:	⟨Ex⟩ II 2G EEx me II T5, ⟨Ex⟩ II 2D IP65 T70°
Approval:	BVS 03 ATEX E 118X

ORDER SPECIFICATIONS:

Voltage	24 V =	24 V ~	48 V ~	115 V ~		230 V ~
Voltage range	21.6 V ... 26.4 V	21.6 V ... 26.4 V	37.8 V ... 52.8 V	102.5 V ... 126.5 V (50 Hz)	108 V ... 131 V (60 Hz)	208 V ... 250 V
Current consumpt.	350 mA	450 mA	220 mA	205 mA		70 mA
	761 000 55	**761 000 65**	**761 000 66**	**761 000 67**		**761 000 68**

TECHNICAL DIAGRAMS

see page 225

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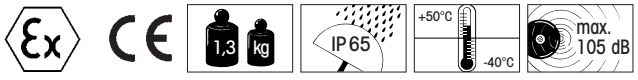
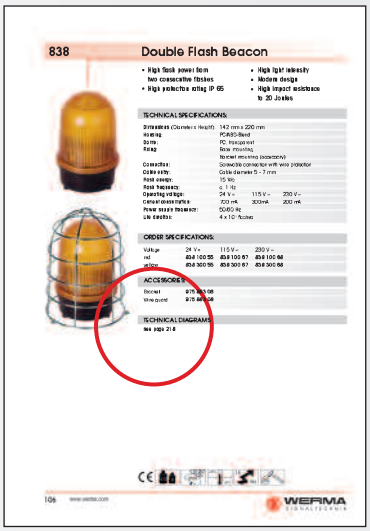


Technical Diagrams

Reference on the product page

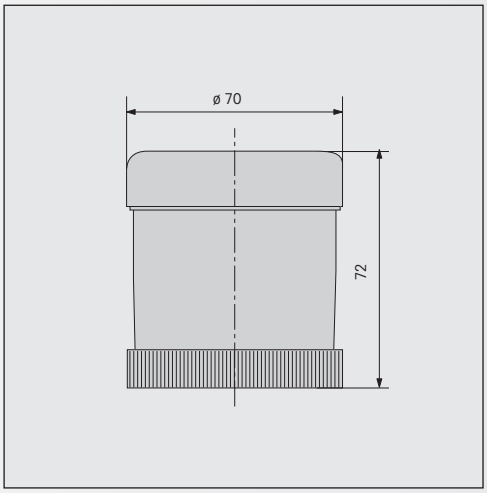
To help you find the technical diagram more quickly we have included a page reference for the corresponding diagram on the relevant product page.



Layout of the technical diagrams

The technical diagrams are to be found on the following pages in ascending order according to the product number. This number can be found above the drawing.

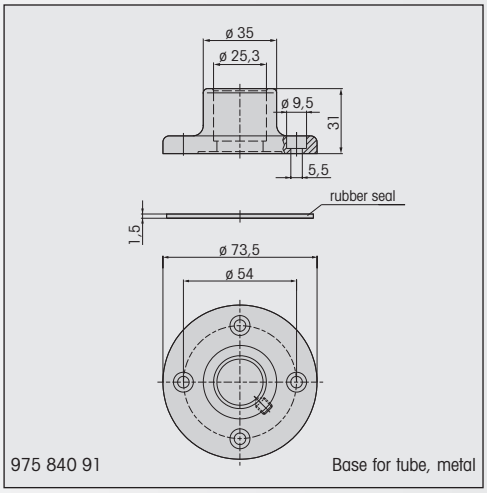
645 Siren element, self-adjusting



Technical diagrams of the accessories

The precise order number and the product description of the accessory part can be found underneath the technical diagram.

640 Accessories

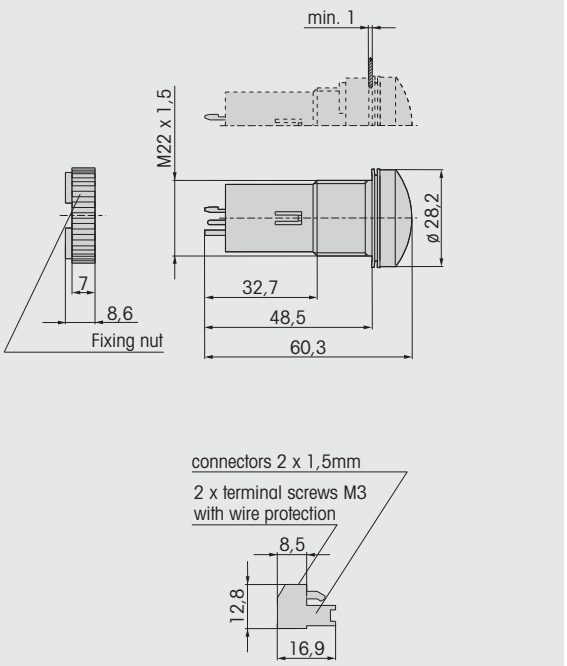


975 840 91 Base for tube, metal

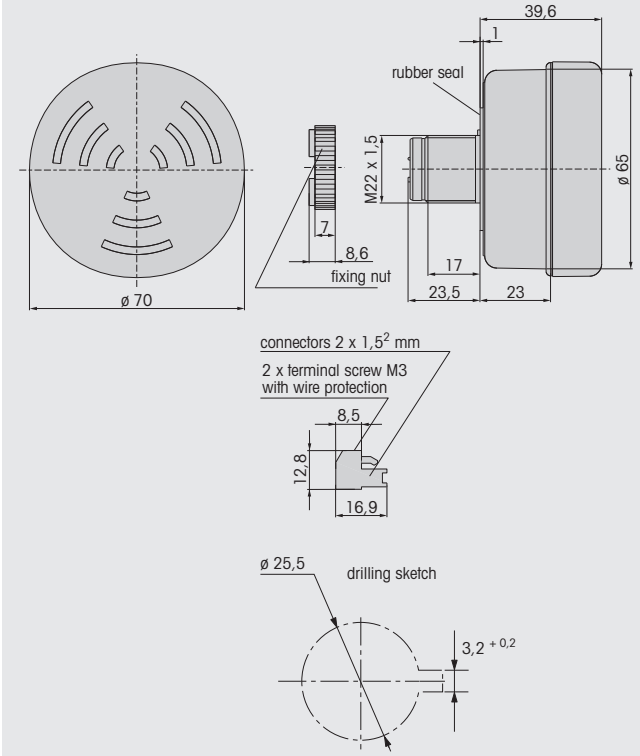
WERMA SIGNALTECHNIK

Technical Diagrams

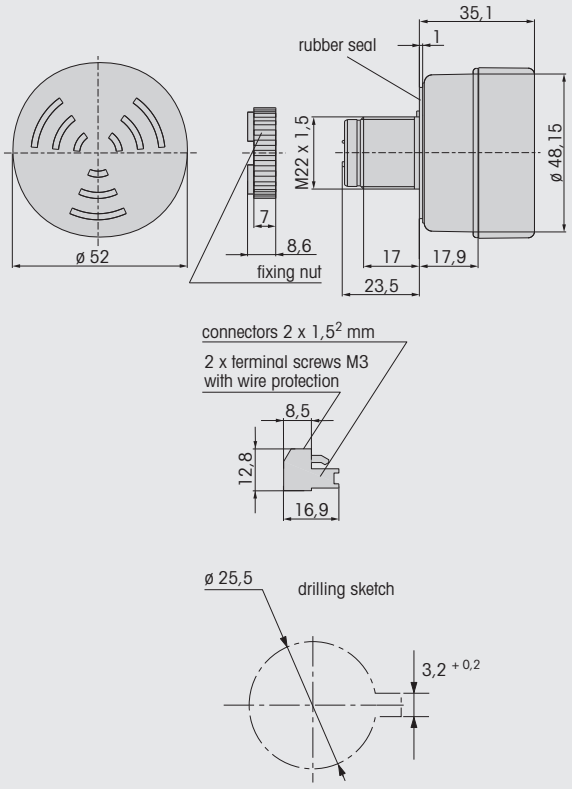
107 Electronic Installation Buzzer



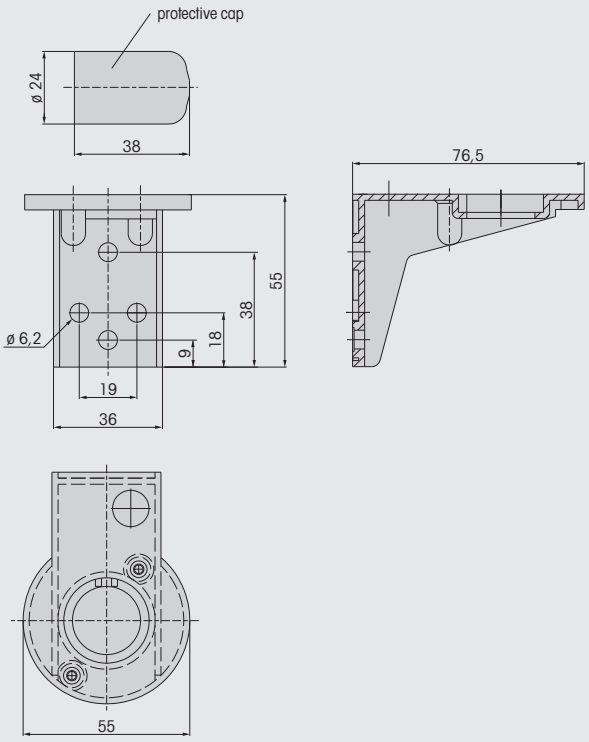
110 Electronic Installation Buzzer



109 Electronic Installation Buzzer



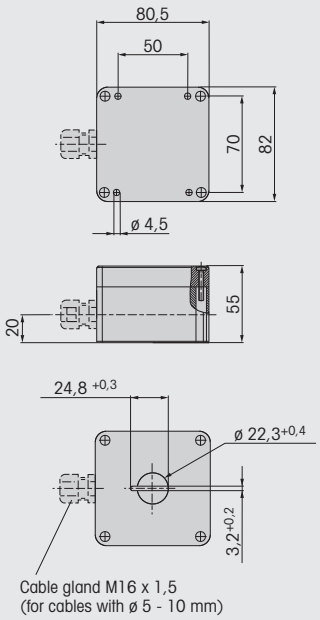
109/110 Accessories



975 109 01 Bracket

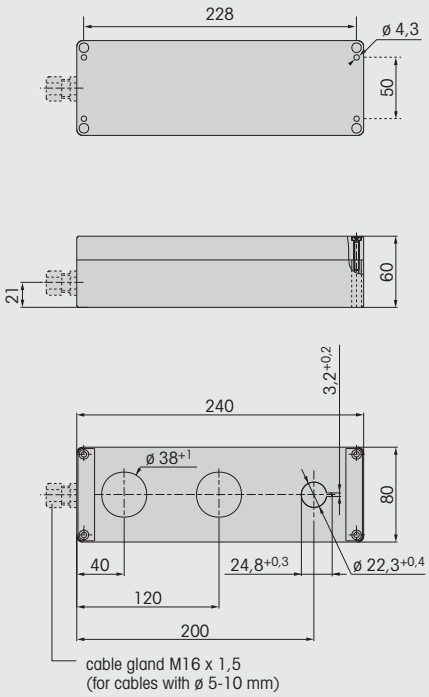
Technical Diagrams

109/110 Accessories

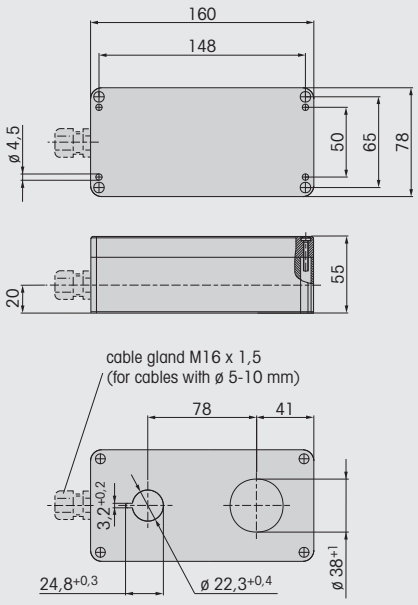


975 109 02 Surface housing single

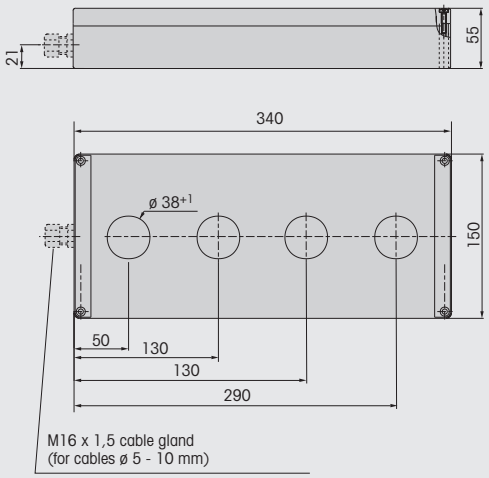
109/110 Accessories



975 109 04 Surface housing triple



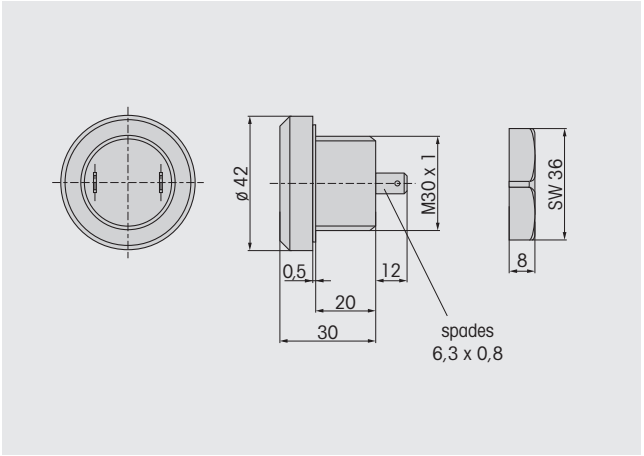
975 109 03 Surface housing double



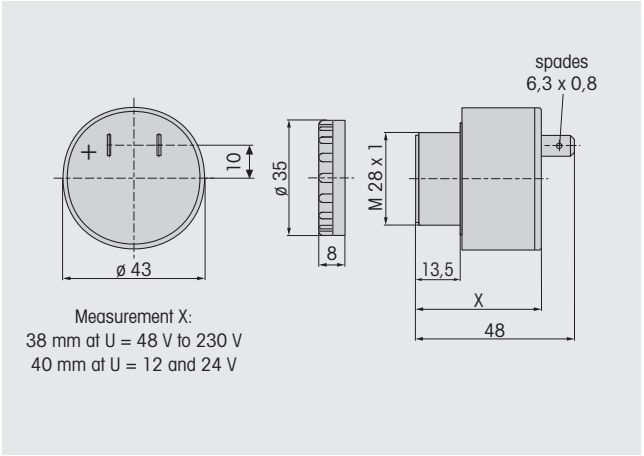
975 109 05 Surface housing quadruple

Technical Diagrams

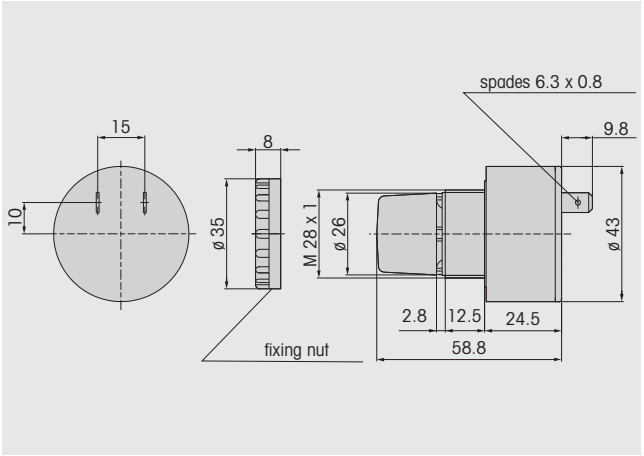
114 Electronic Installation Buzzer



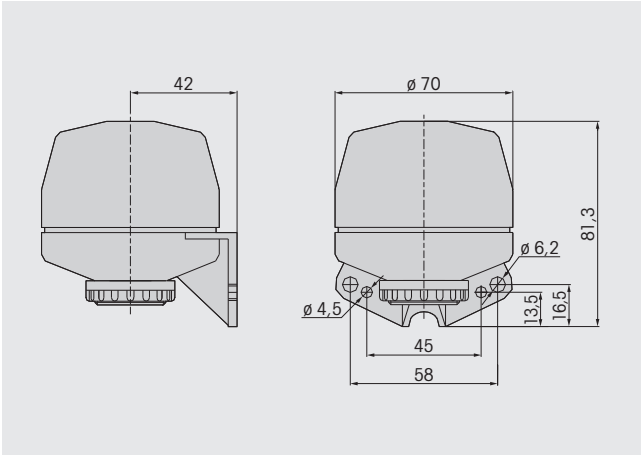
118/119 Electronic Installation Buzzer



115 Buzzer/Light Combination

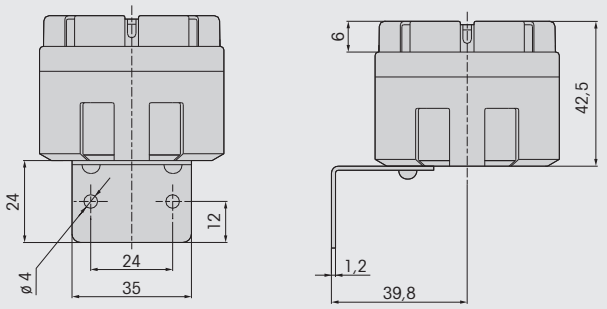


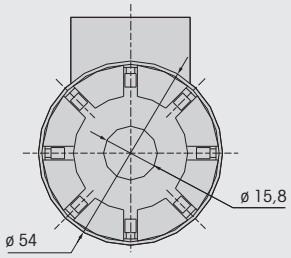
118 483/119 483 Electronic Buzzer



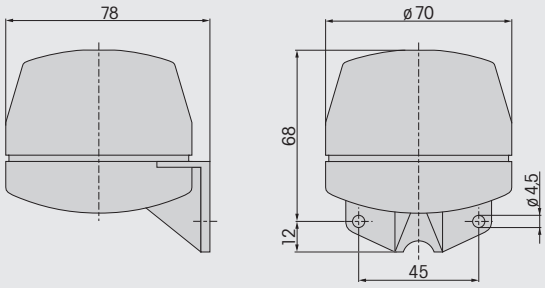
Technical Diagrams

123 Electronic Siren

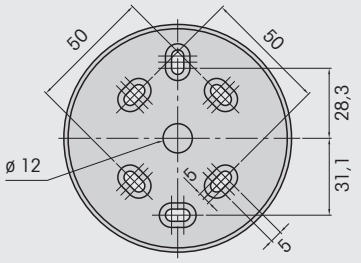


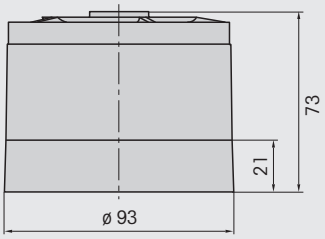


126 Electronic Multi-Tone Sounder

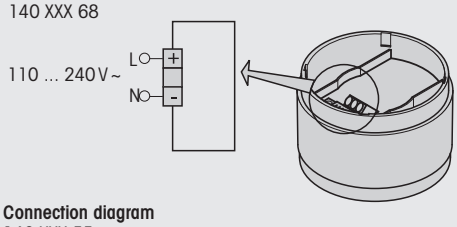


140 X10 Electronic Multi-Tone Sounder

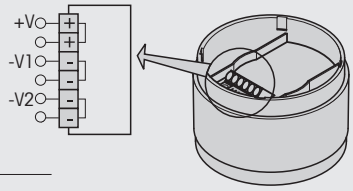




Connection diagram
140 XXX 68

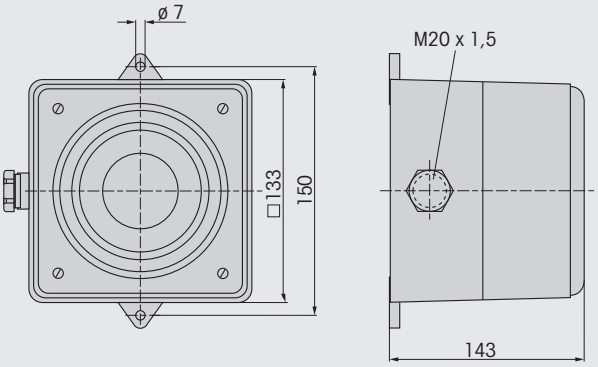


Connection diagram
140 XXX 55



	Tone
-V1	A
-V2	B

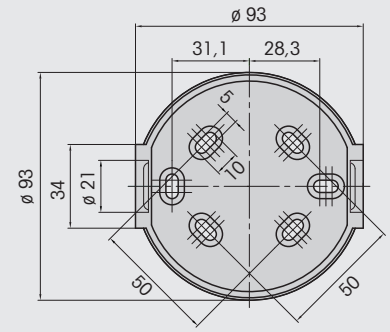
129 Electronic Multi-Tone Sounder

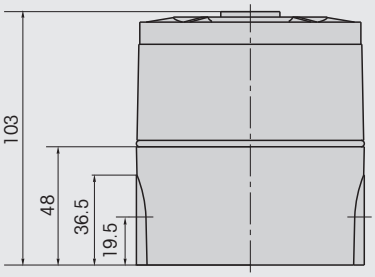


WERMA SIGNALTECHNIK

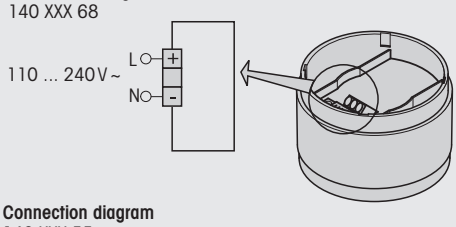
Technical Diagrams

140 X20 Electronic Multi-Tone Sounder

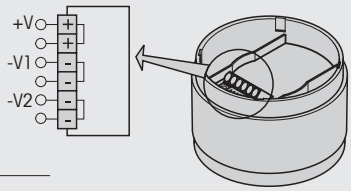




Connection diagram
140 XXX 68

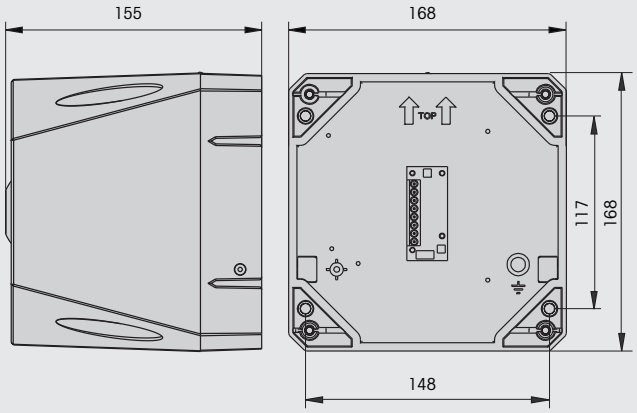


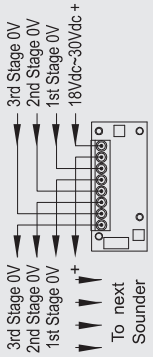
Connection diagram
140 XXX 55



	Tone
-V1	A
-V2	B

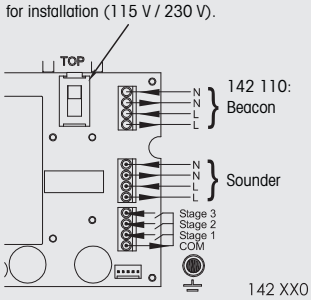
142 Multi-Tone Sounder





142 000 55

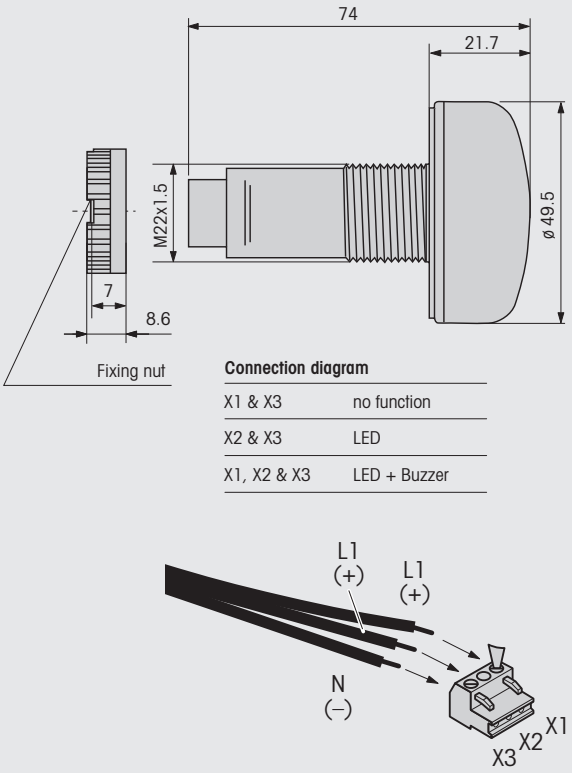
Set switch to correct requirement for installation (115 V / 230 V).



142 XX0 68

Technical Diagrams

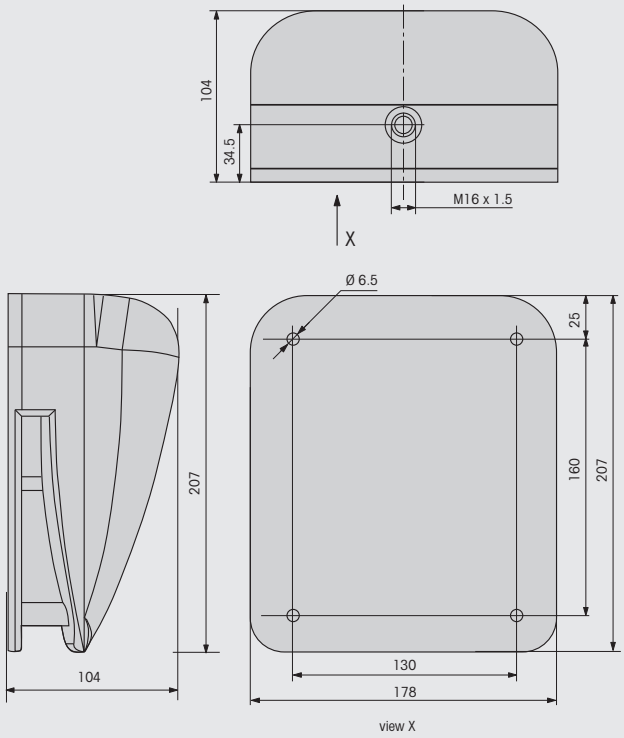
150 LED/Buzzer Combination



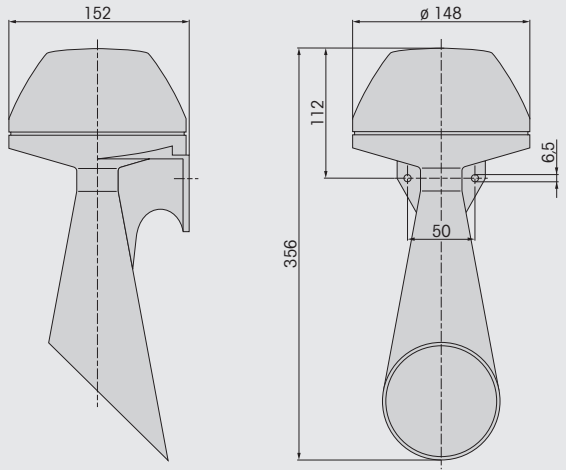
Connection diagram

X1 & X3	no function
X2 & X3	LED
X1, X2 & X3	LED + Buzzer

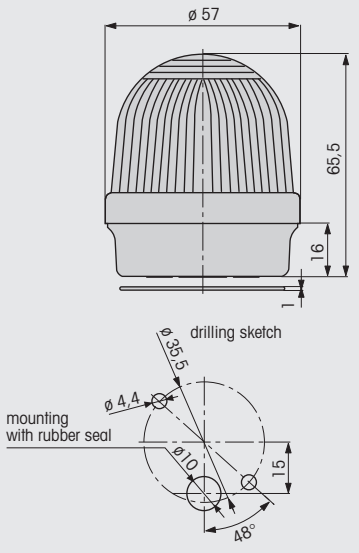
172 Electronic Three Tone Gong



170 Electronic Three Tone Gong



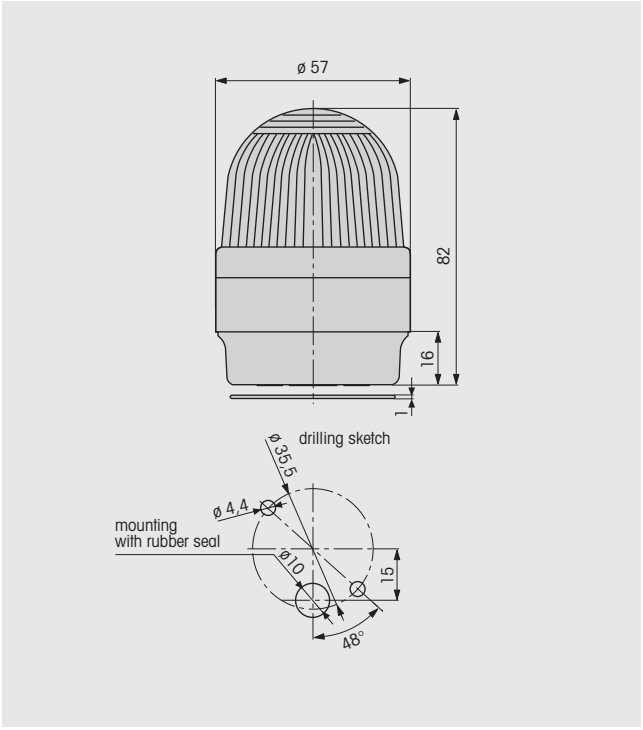
200 Permanent/LED/Flashing Beacon



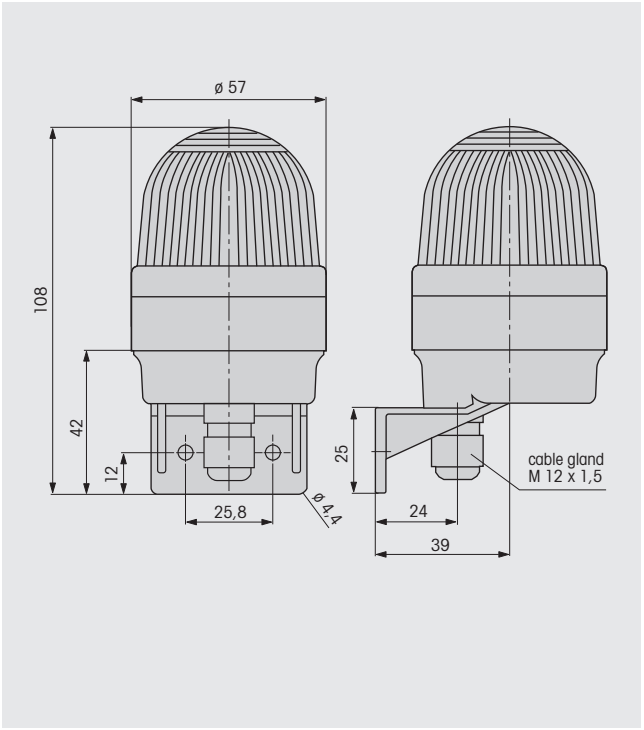
WERMA SIGNALTECHNIK

Technical Diagrams

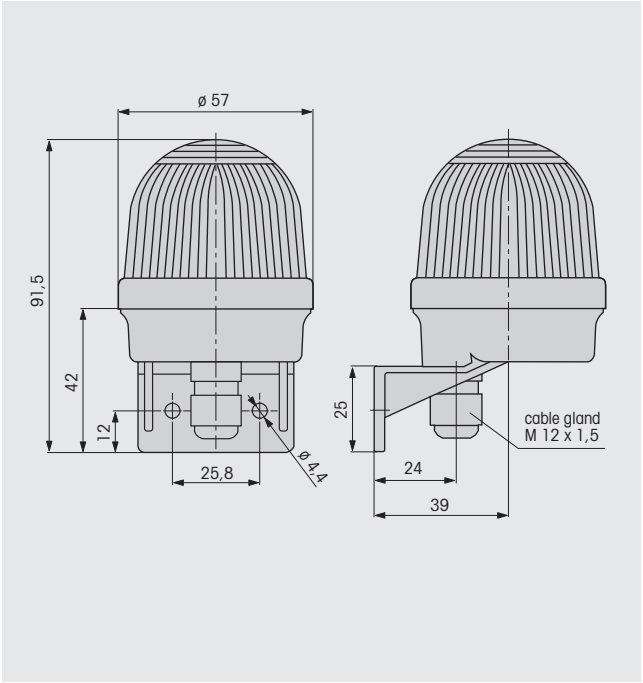
201/202 LED/Flashing Beacon



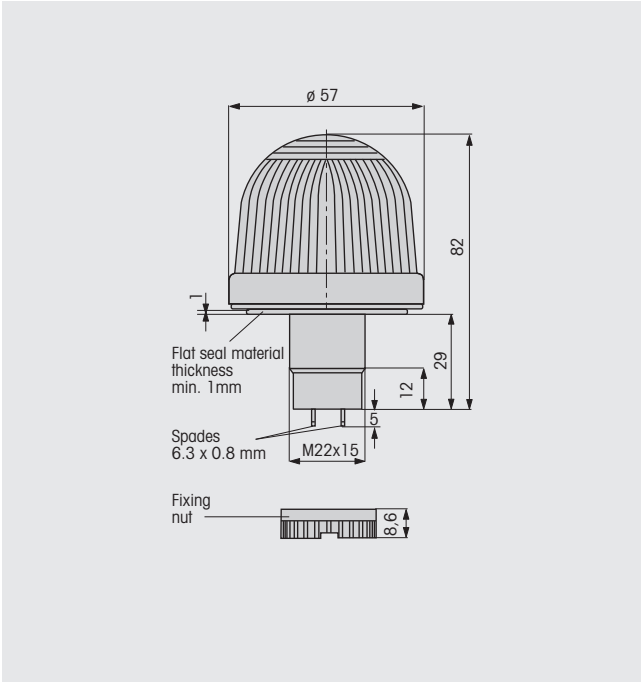
204/205 LED/Flashing Beacon



203 Permanent Beacon

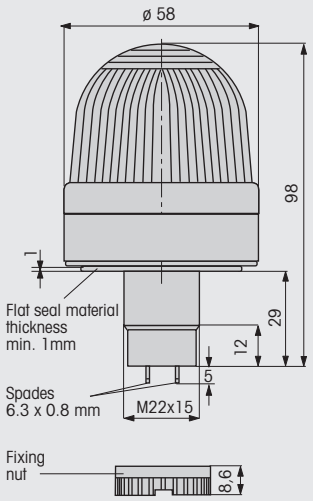


206 Permanent Beacon

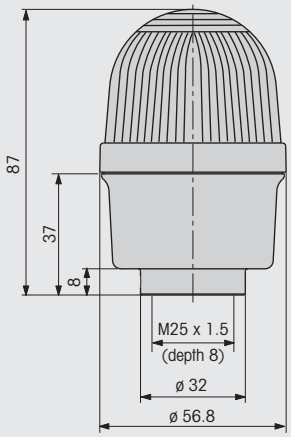


Technical Diagrams

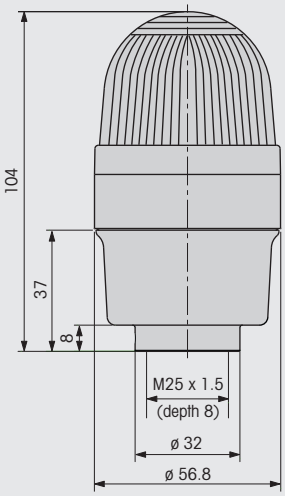
207/208 **LED/Flashing Beacon**



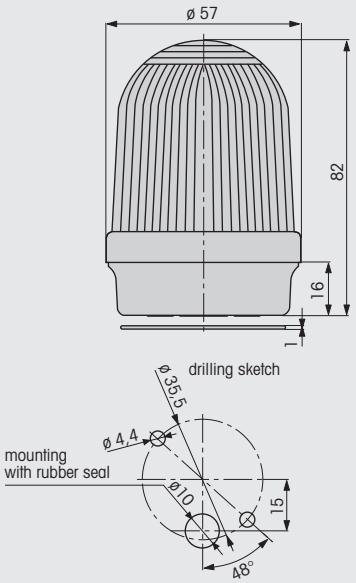
209 **Permanent Beacon**



209 **LED/Flashing Beacon**

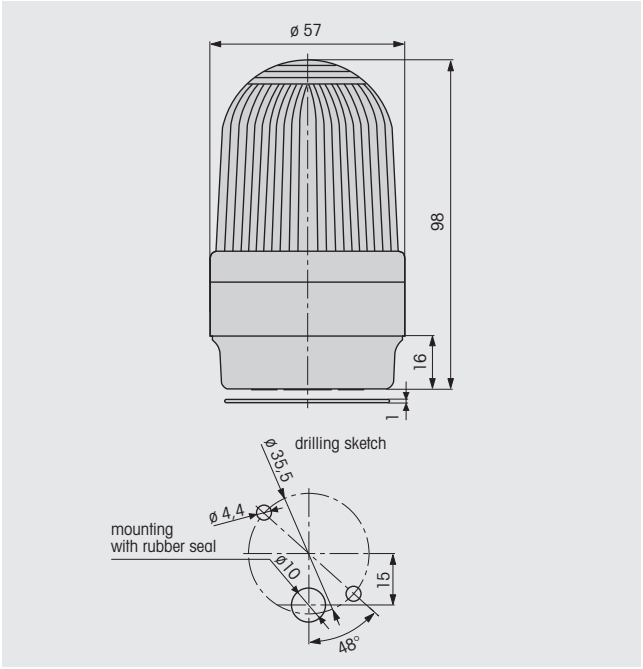


210 **Permanent Beacon**

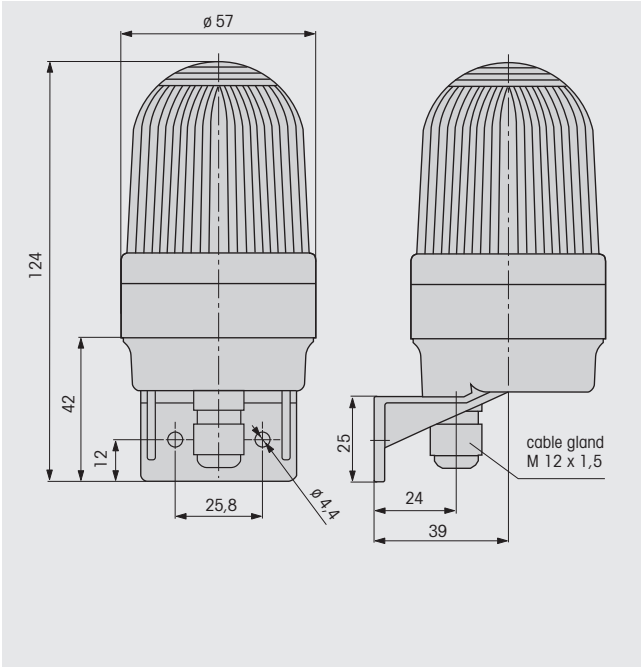


Technical Diagrams

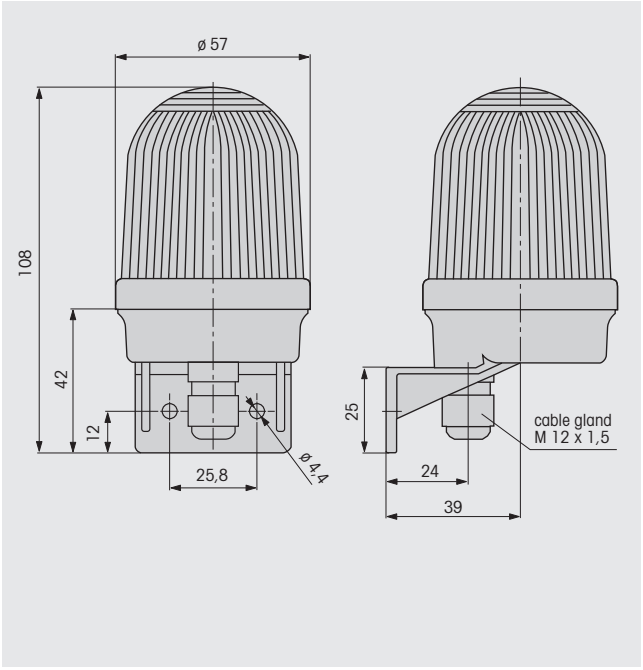
211/212 LED/Flashing Beacon



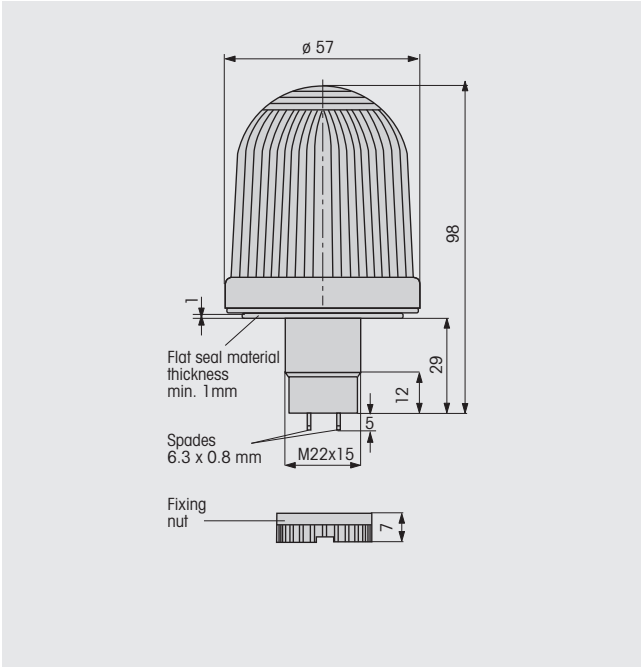
214/215 LED/Flashing Beacon



213 Permanent Beacon

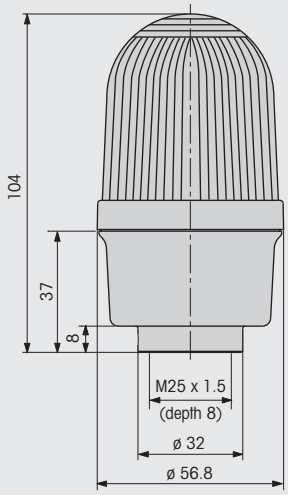


216 Permanent Beacon

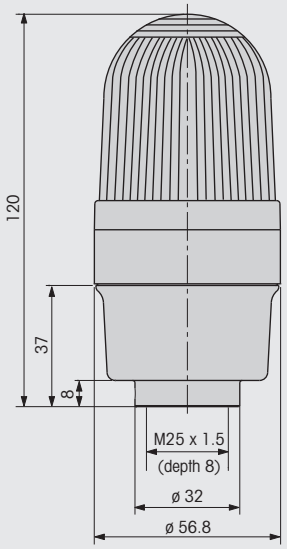


Technical Diagrams

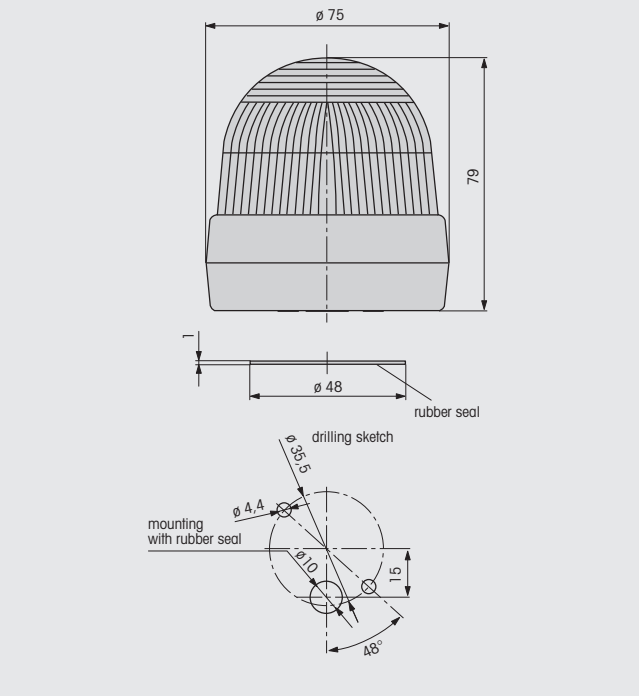
219 Permanent Beacon



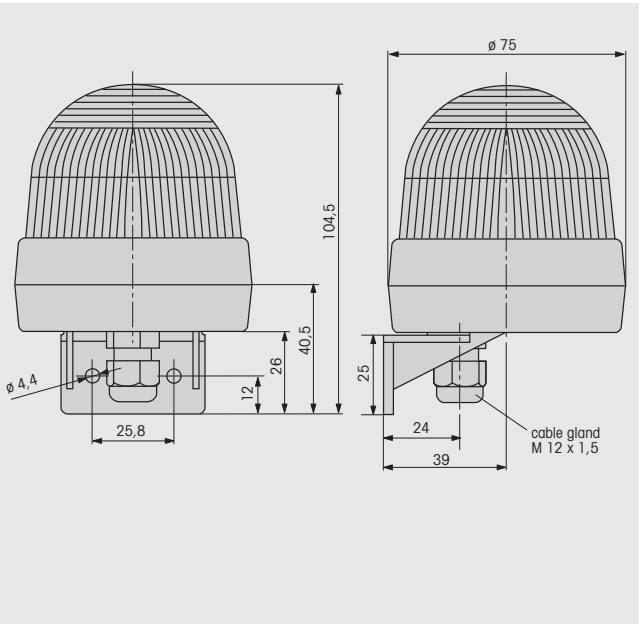
219 LED/Flashing Beacon



220/221/222 Permanent/LED/Flashing Beacon

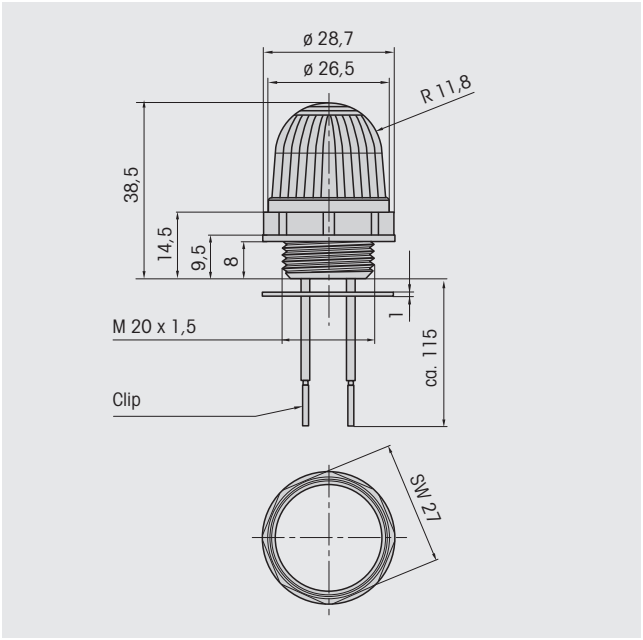


223/224/225 Permanent/LED/Flashing Beacon

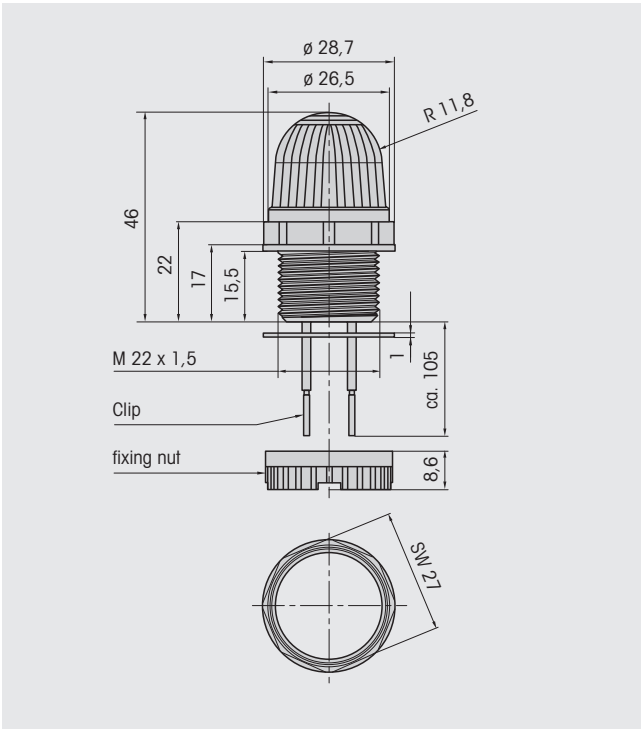


Technical Diagrams

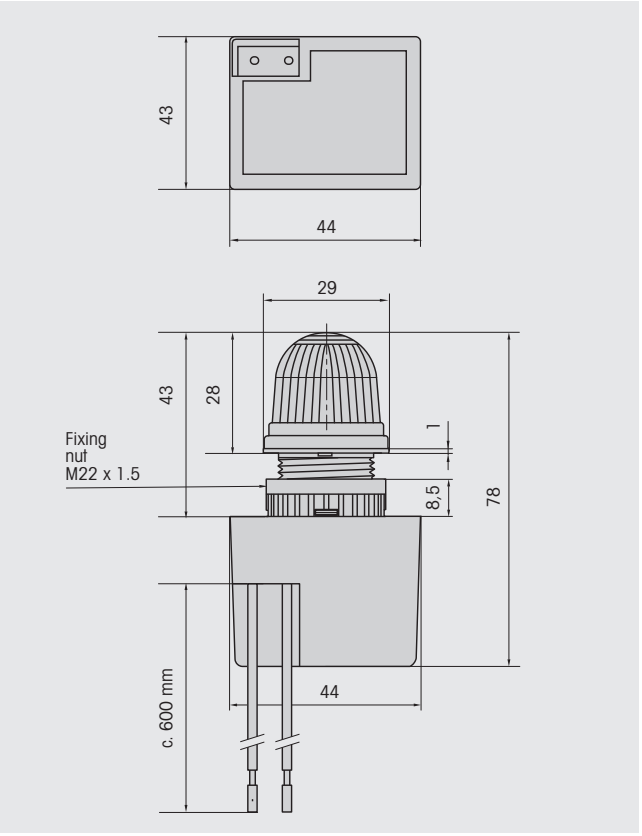
230 LED Installation Beacon
230 LED Installation Beacon Economy



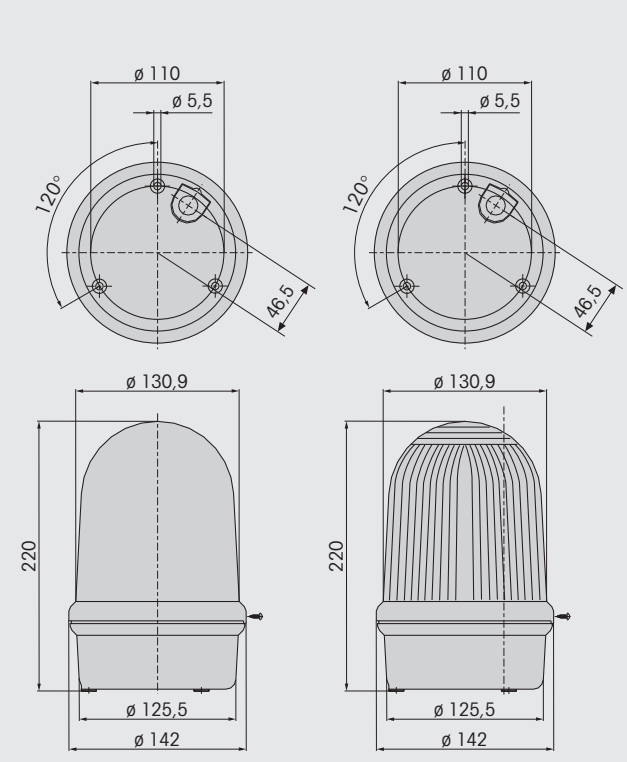
231 LED Installation Beacon
231 LED Installation Beacon Economy



232 Installation Flashing Beacon



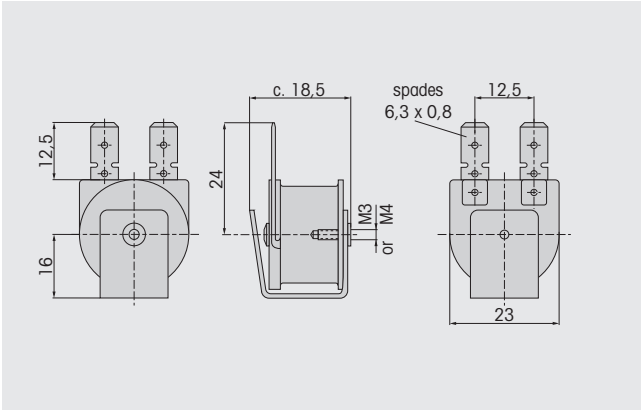
280 LED Obstruction Light
LED Permanent Beacon



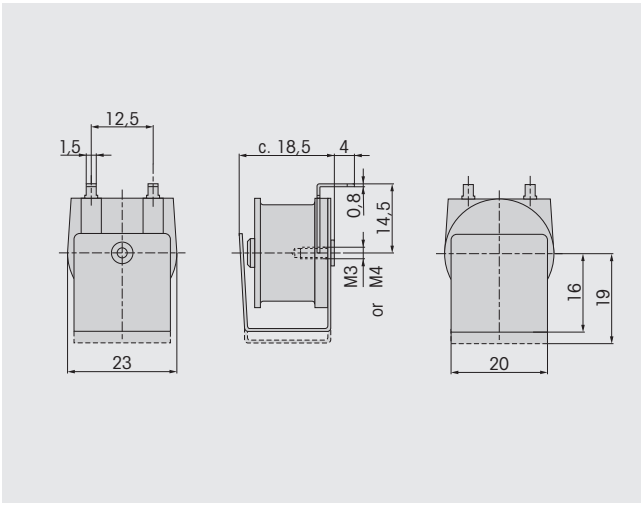
LED Obstruction light LED Permanent Beacon

Technical Diagrams

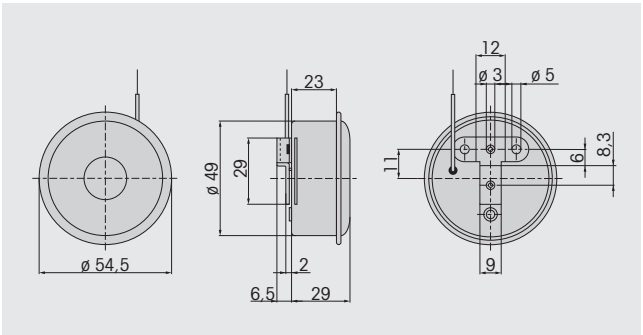
338 373 AC Installation Buzzer



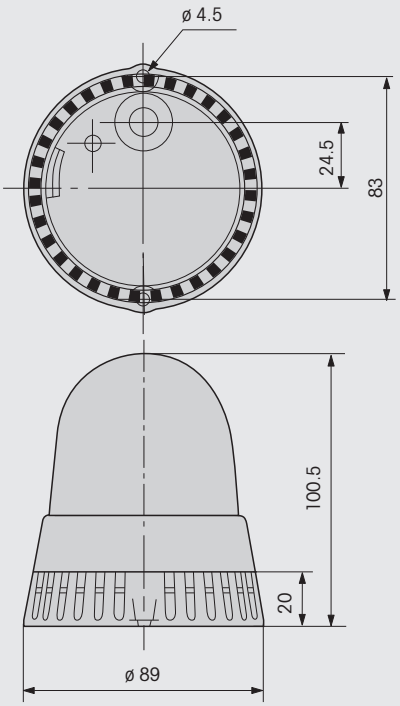
338 323 AC Installation Buzzer



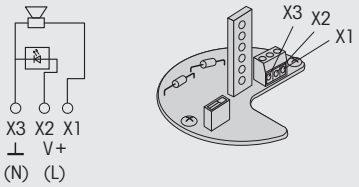
382 Installation Buzzer



420 LED/Buzzer Combination
LED/Multi-Tone Sounder Combination

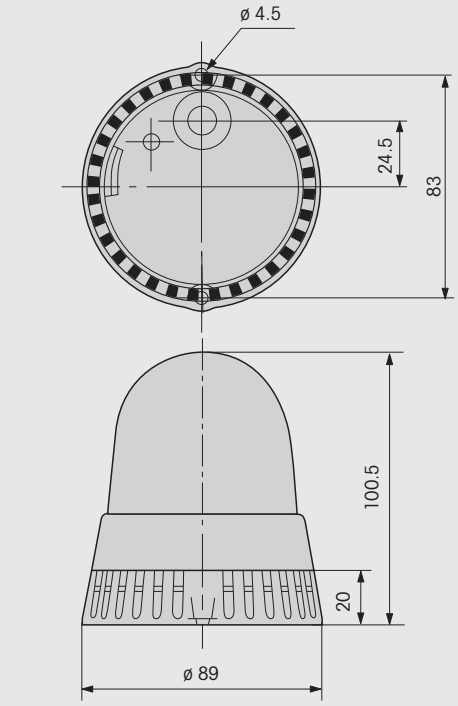


Connection diagram

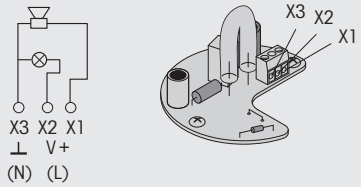


Technical Diagrams

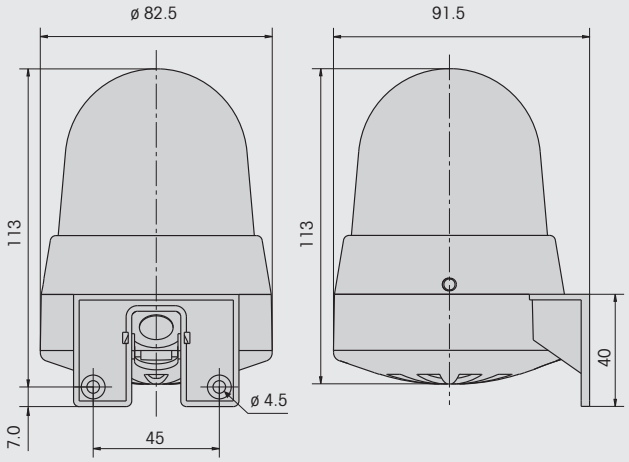
421 Flash/Buzzer Combination
Flash/Multi-Tone Sounder Combination



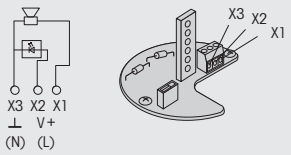
Connection diagram



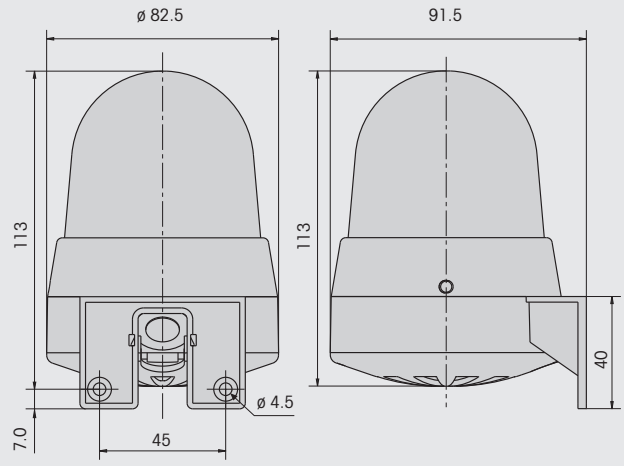
422 LED/Buzzer Combination
LED/Multi-Tone Sounder Combination



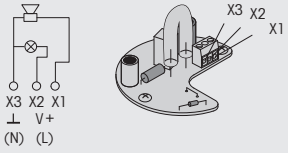
Connection diagram



423 Flash/Buzzer Combination
Flash/Multi-Tone Sounder Combination

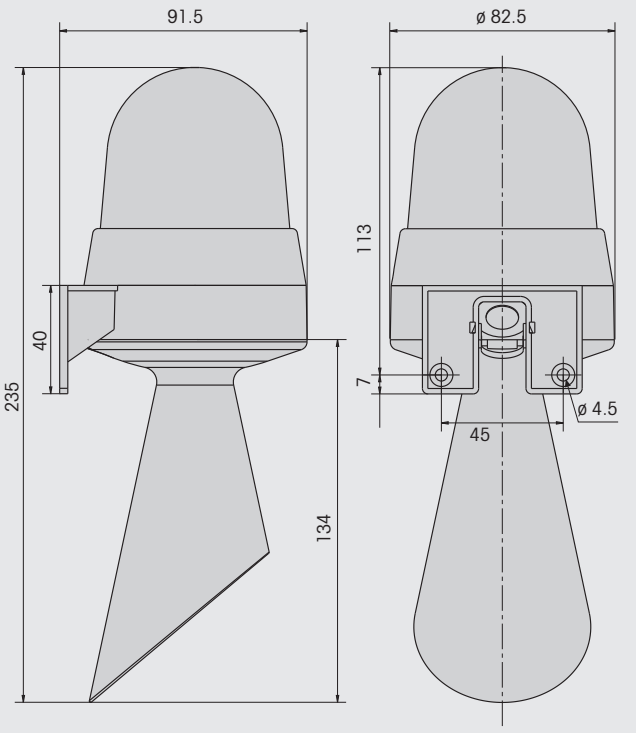


Connection diagram

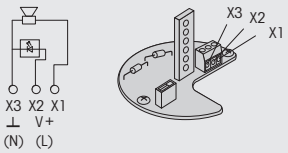


Technical Diagrams

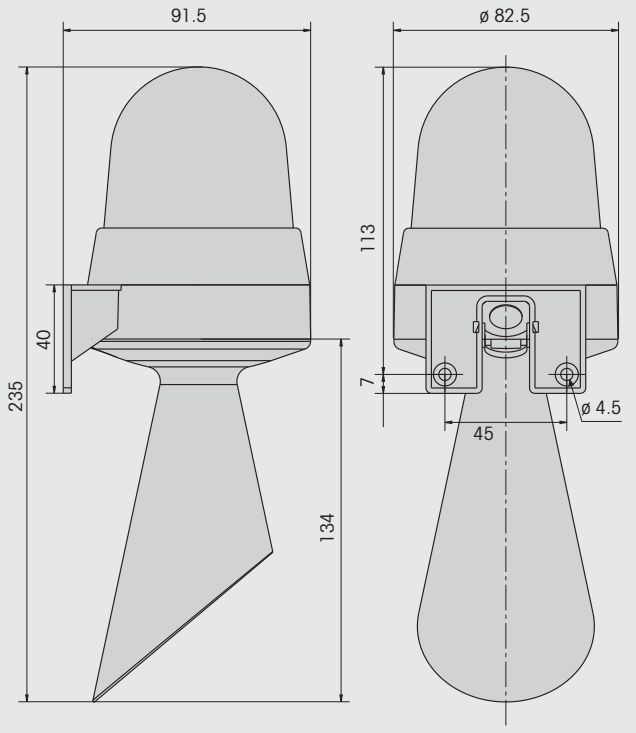
424 LED/Signal Horn Combination



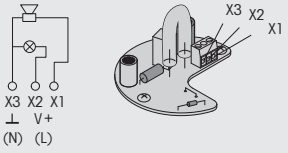
Connection diagram



425 Flash/Signal Horn Combination

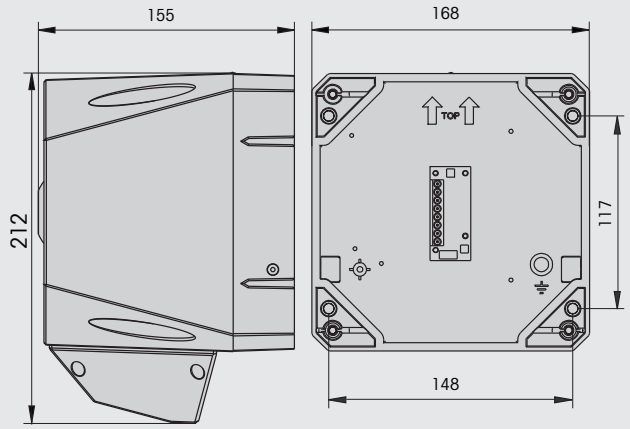


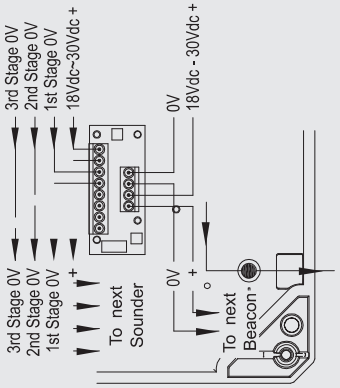
Connection diagram



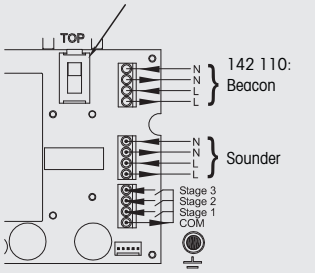
Technical Diagrams

442 Flash/Multi-Tone Sounder Combination

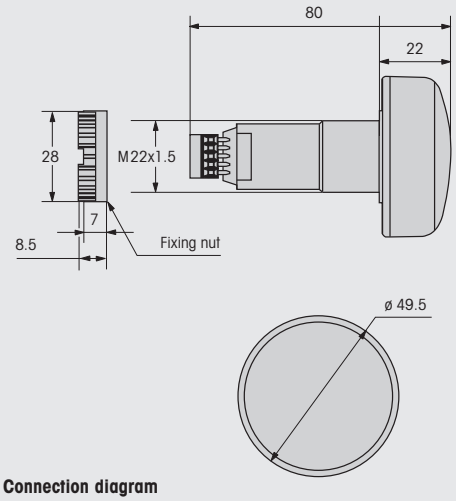




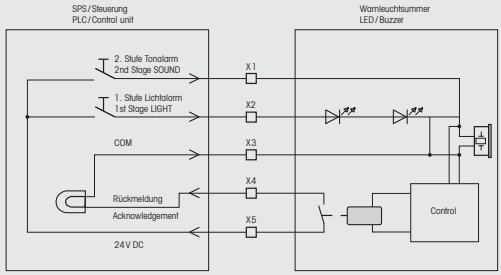
Set switch to correct requirement for installation (115 V / 230 V).



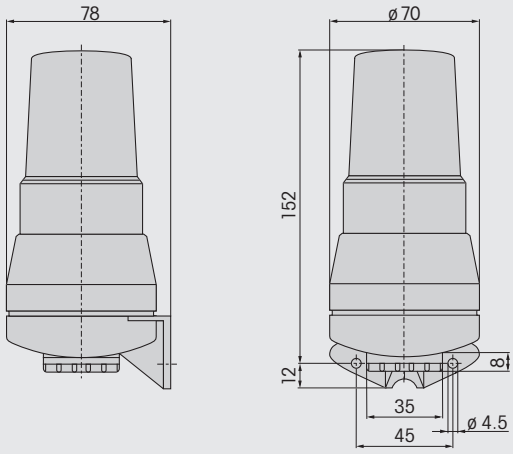
450 LED/Buzzer Combination with acknowledgement function



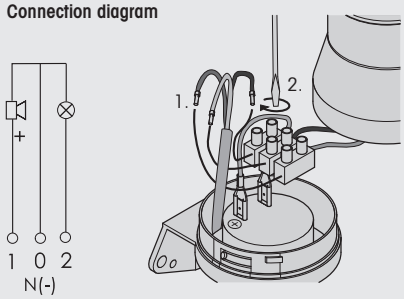
Connection diagram



480 Light/Buzzer Combination

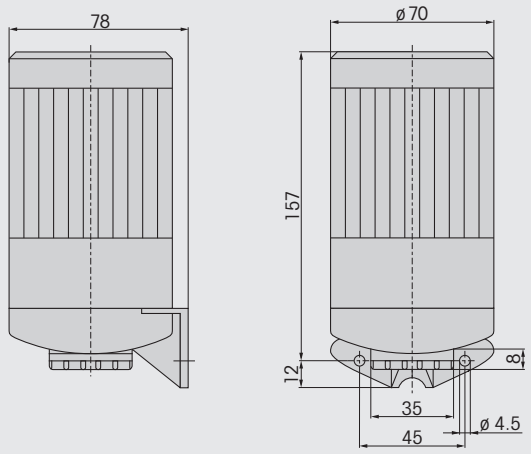


Connection diagram

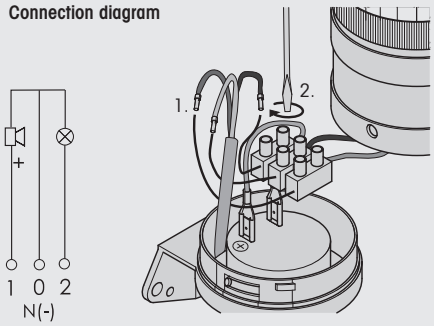


Technical Diagrams

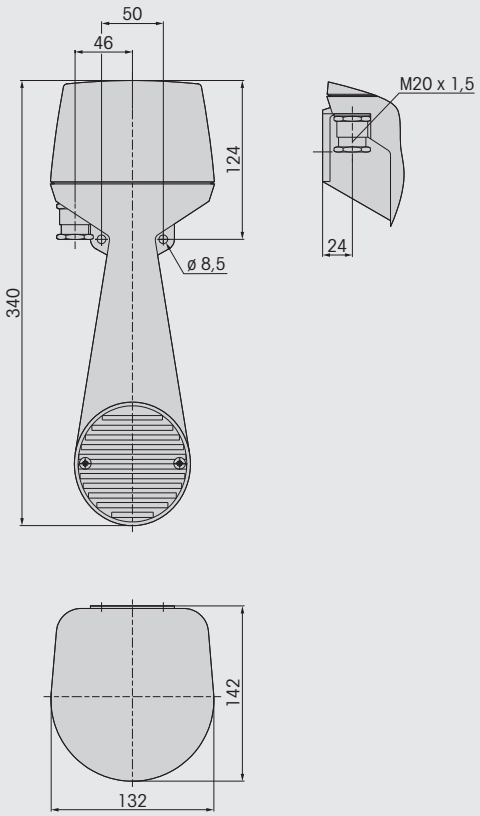
481 Flash/Buzzer Combination



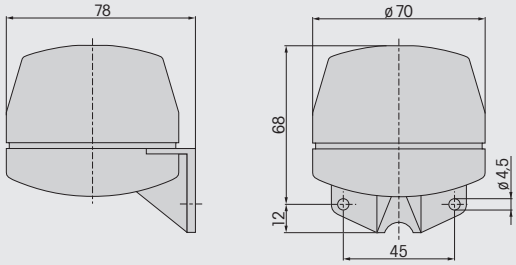
Connection diagram



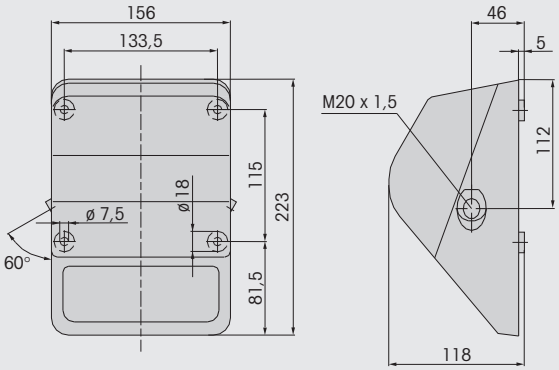
571 Signal Horn



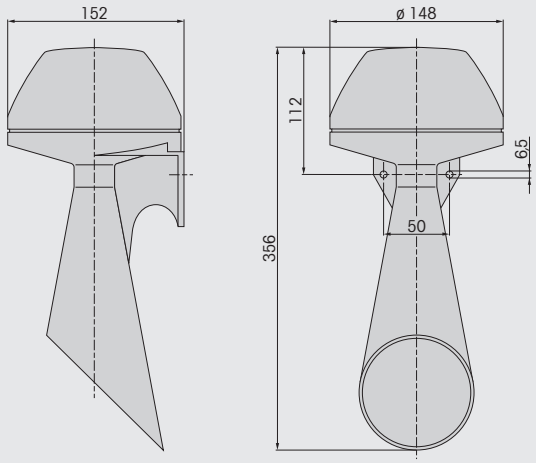
482 Signal Horn



572 Signal Horn



570 Signal Horn

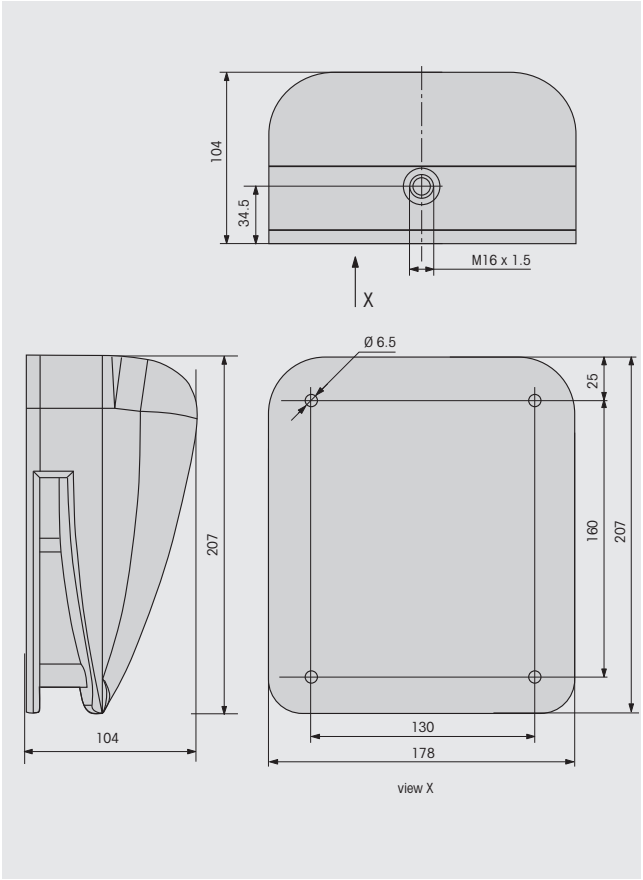


Technical Diagrams

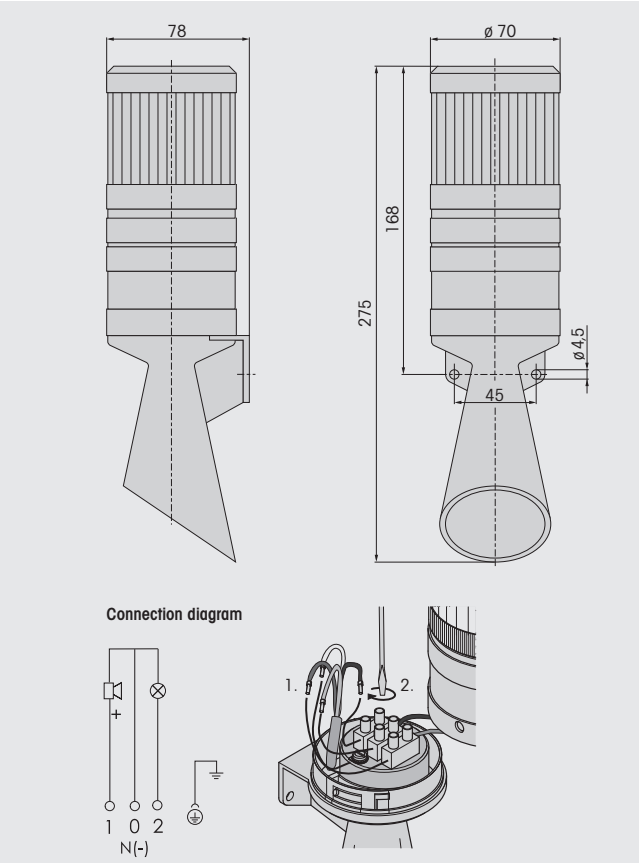
WERMA SIGNALTECHNIK

Technical Diagrams

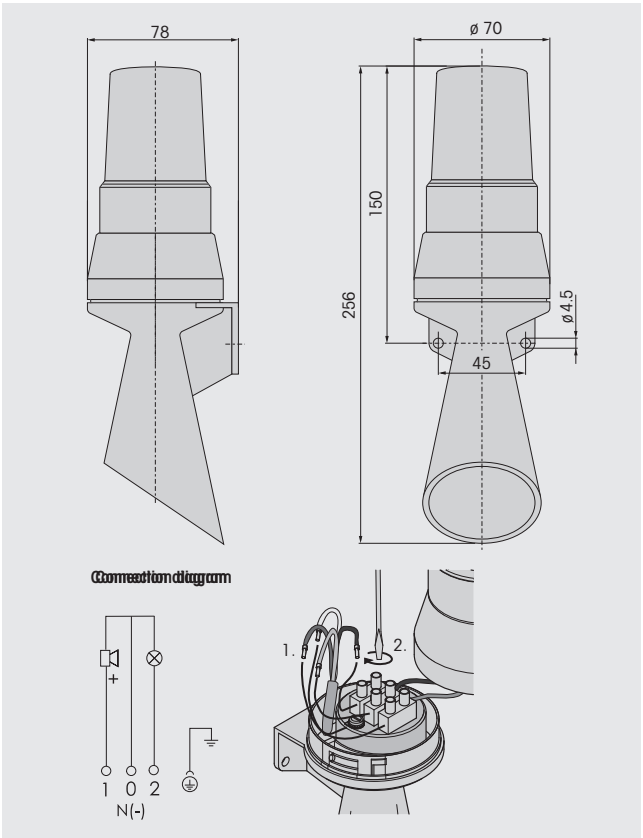
573 Signal Horn



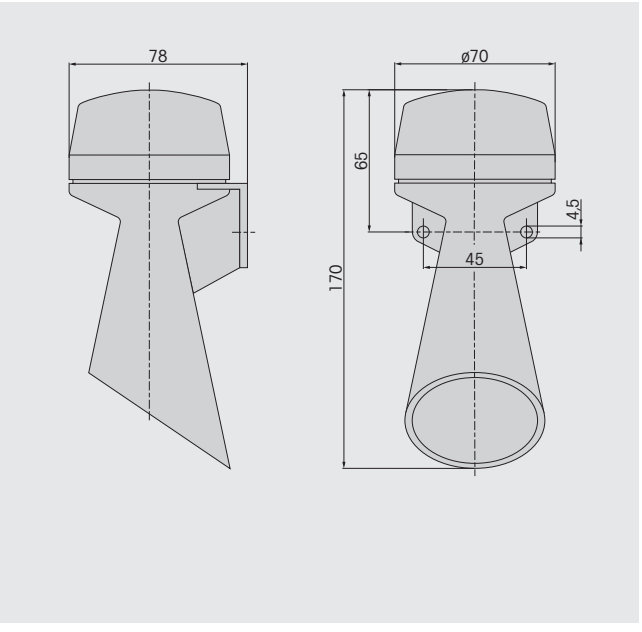
581 Flash/Horn Combination



580 Light/Horn Combination

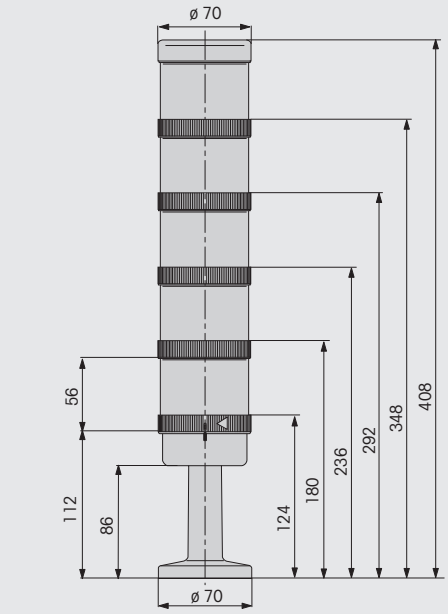


582 Signal Horn

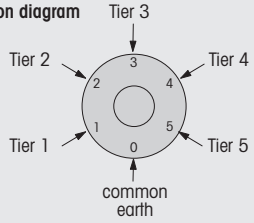


Technical Diagrams

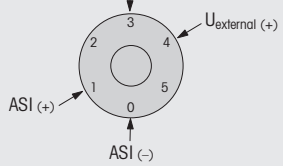
640 **Kombi*SIGN* 71**



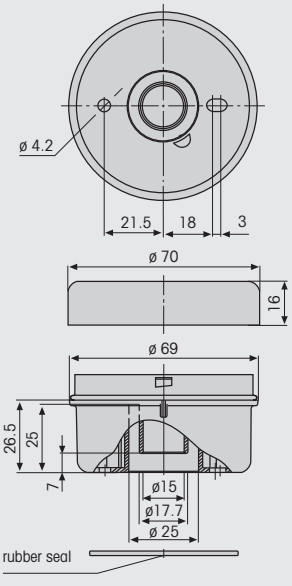
Connection diagram Tier 3



Connection diagram AS Interface element $U_{external}$ (–)

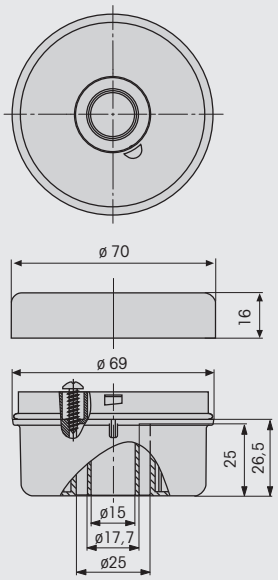


640



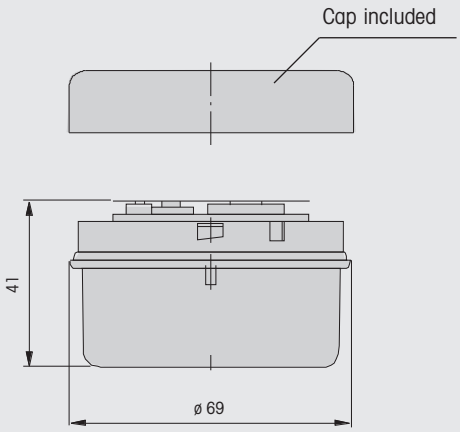
640 8X0 00 Terminal element for base and bracket mounting

640



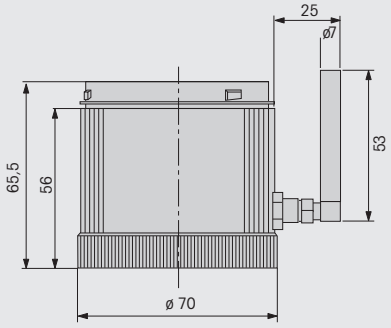
640 8X0 00 Terminal element for tube mounting

640



640 840 00 Terminal element with USB Interface

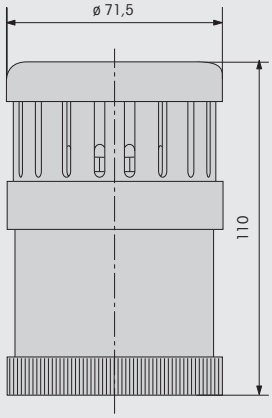
640



646 700 55 GSM Transmitter Element

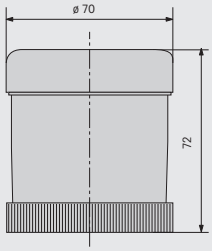
Technical Diagrams

645 **Siren element, self-adjusting**



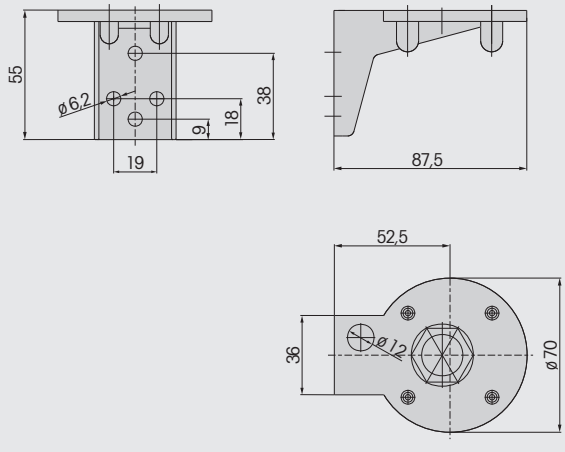
645 810 55 Siren element with self-adjusting sound output

645 **Sirenen-/Buzzer element**



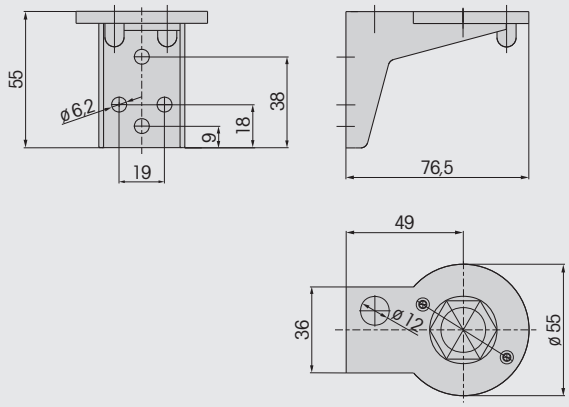
645 8X0 XX Siren element
645 800 XX Buzzer element

640 Accessories

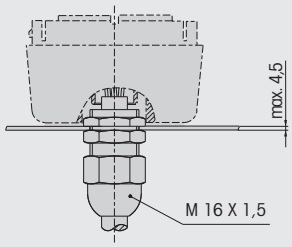


960 000 01 Bracket

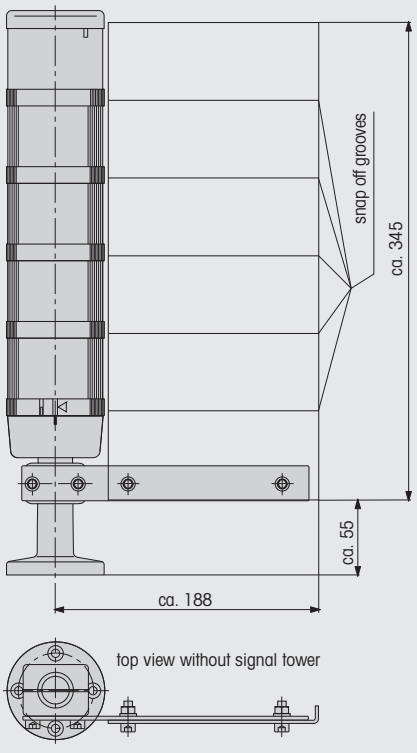
640 Accessories



960 000 02 Bracket



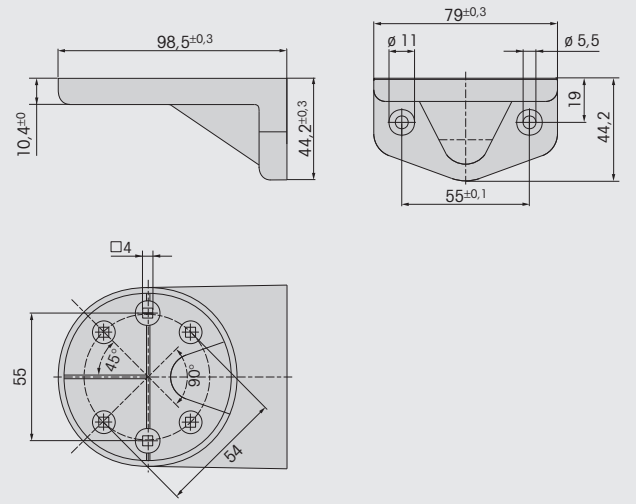
960 000 04 PG screw for base mounting



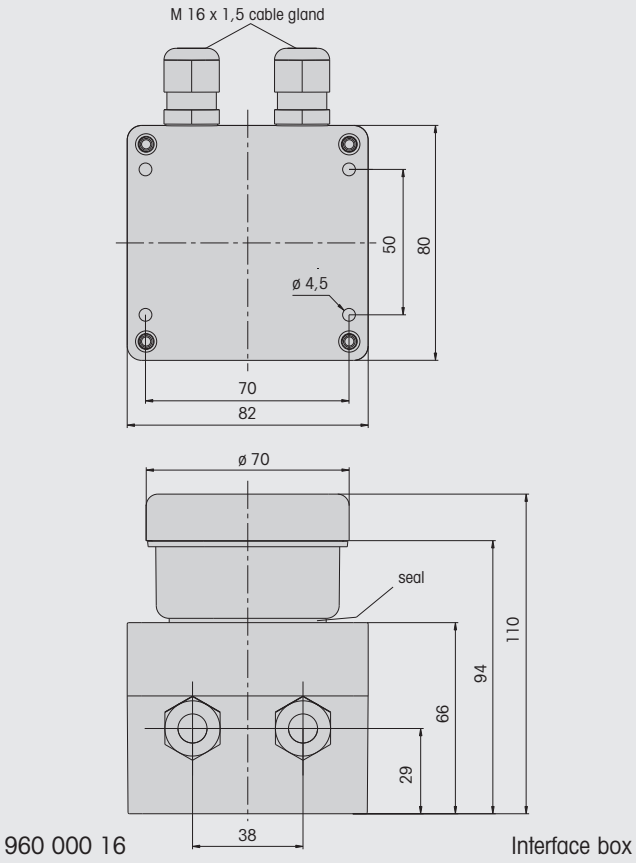
960 000 05 Indication board

Technical Diagrams

640 Accessories

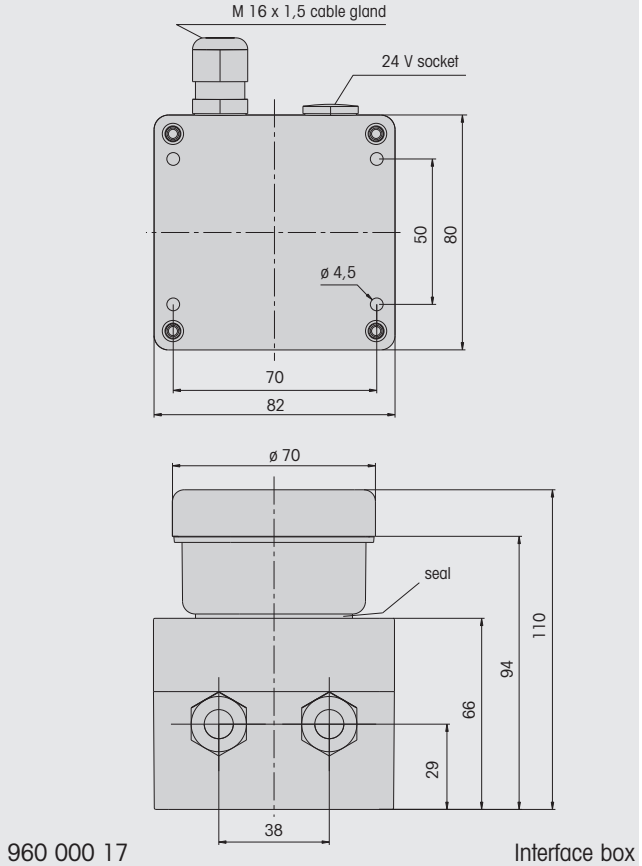


960 000 14 Bracket

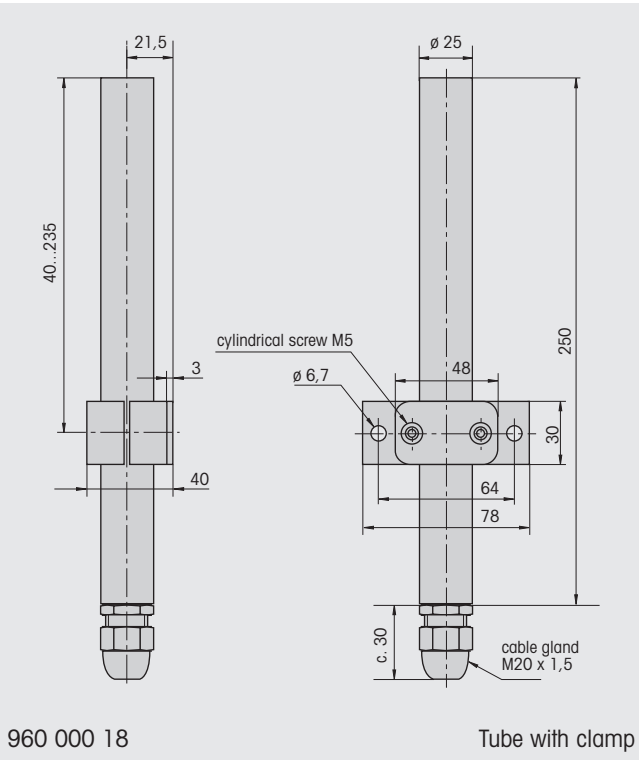


960 000 16 Interface box

640 Accessories



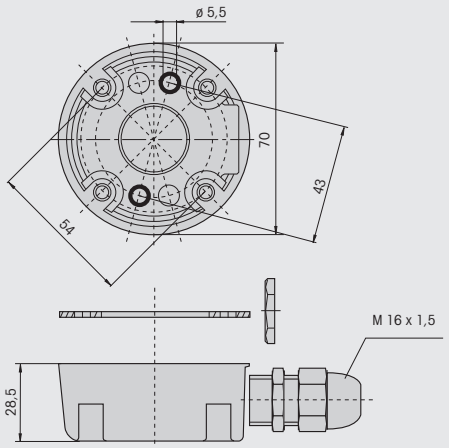
960 000 17 Interface box



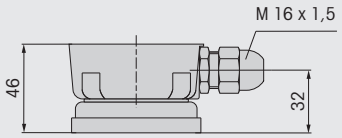
960 000 18 Tube with clamp

Technical Diagrams

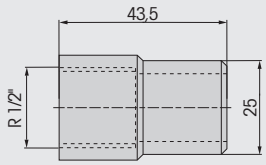
640 Accessories



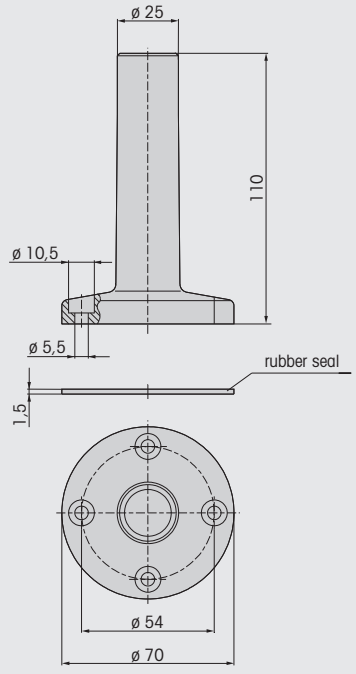
975 840 01 Adapter box



975 840 04 Adapter box with magnetic base

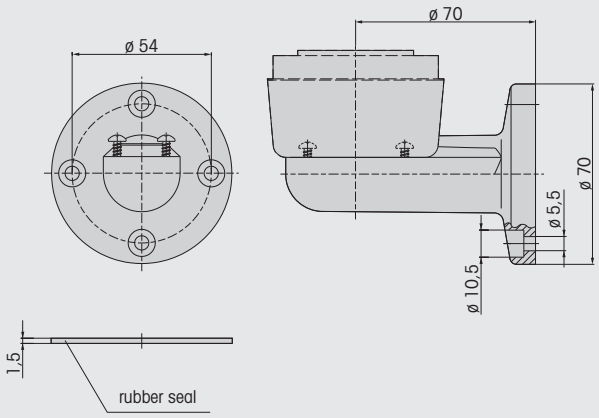


975 840 02 Adapter

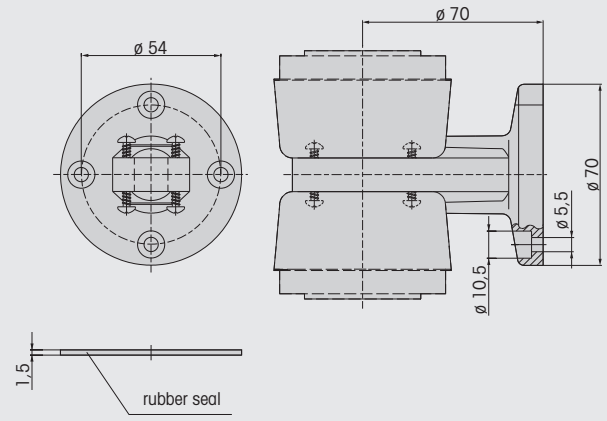


975 840 10 Base with tube

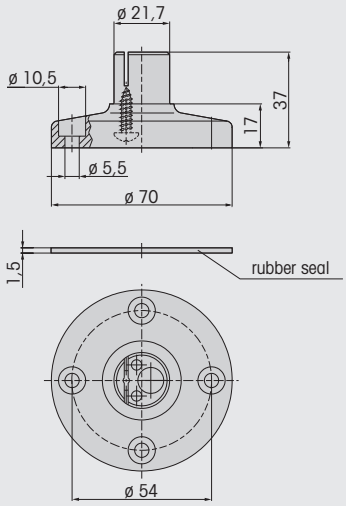
640 Accessories



975 840 85 Bracket



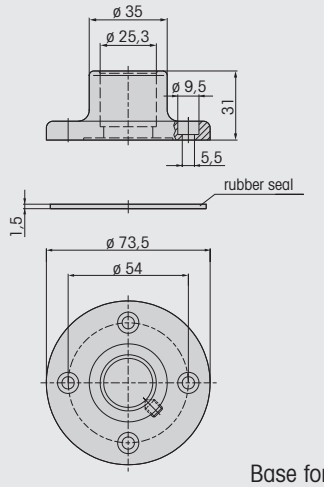
975 840 86 2-sided bracket



975 840 90 Base for tube, plastic

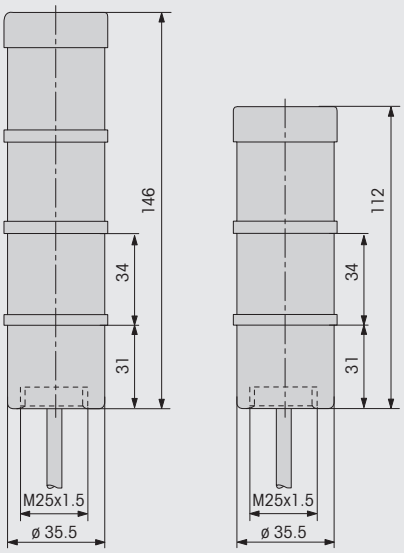
Technical Diagrams

640 Accessories

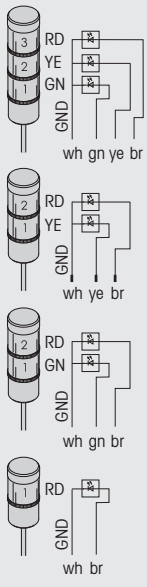


975 840 91 Base for tube, metal

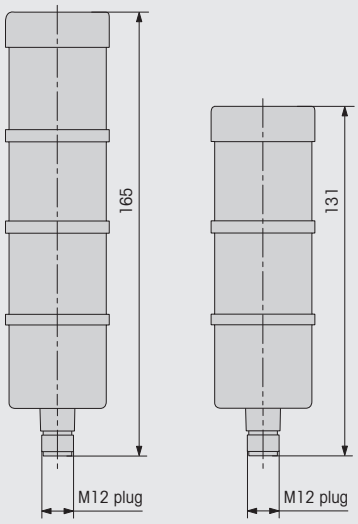
693



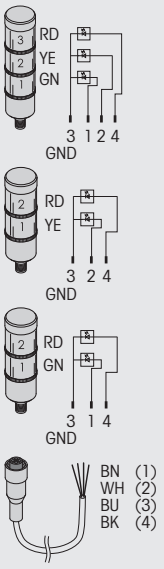
Connection diagrams



Kompakt 36



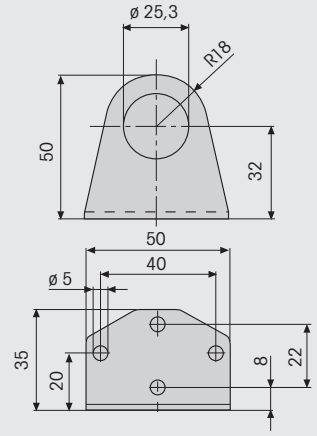
Connection diagrams



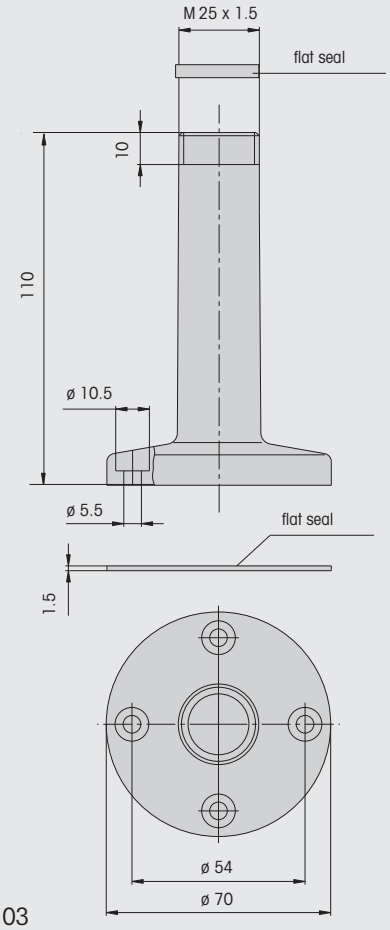
WERMA SIGNALTECHNIK

Technical Diagrams

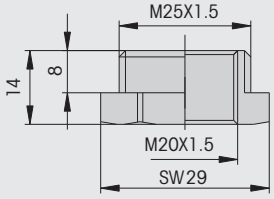
693 Accessories



960 693 01 Bracket

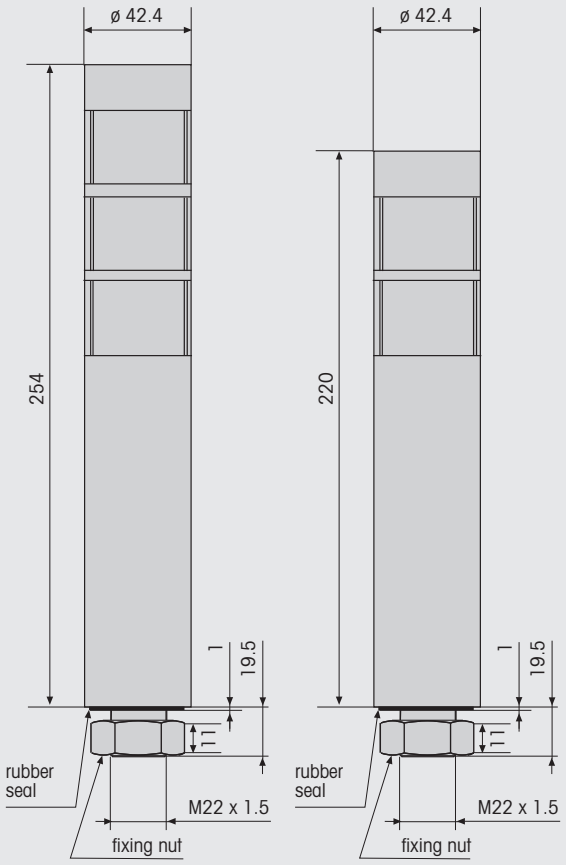


960 693 03 Base with tube

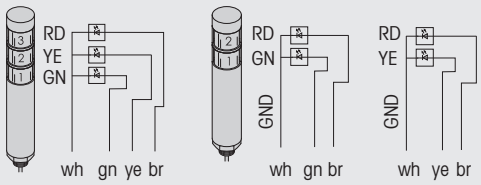


960 693 04 Adapter

694 de*SIGN* 42

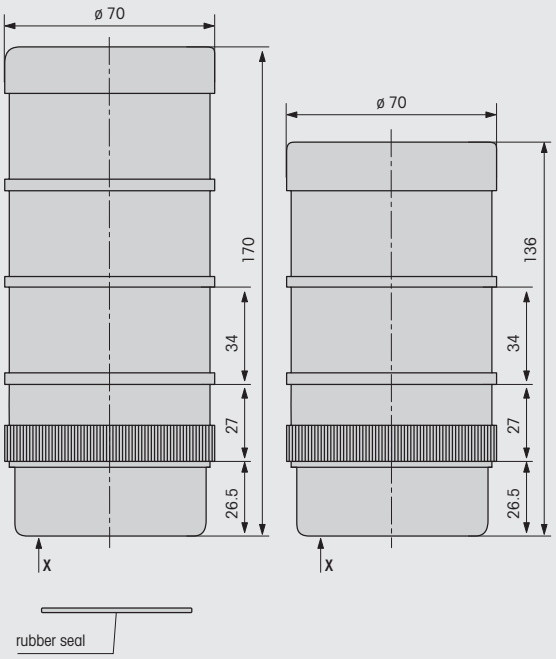


Connection diagrams

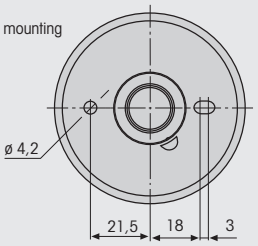


Technical Diagrams

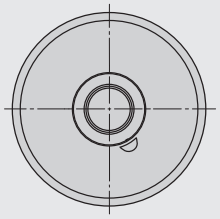
697 Kompakt 71



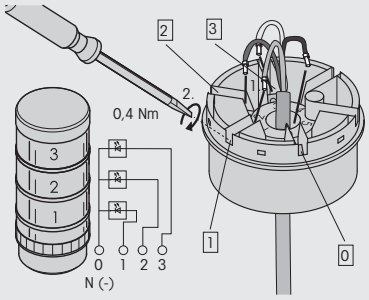
View X
surface-/bracket mounting



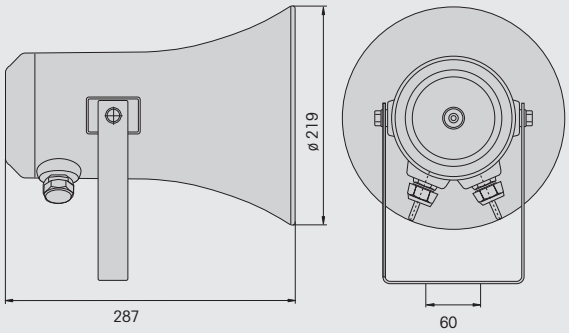
View X
tube mounting



Connection diagram

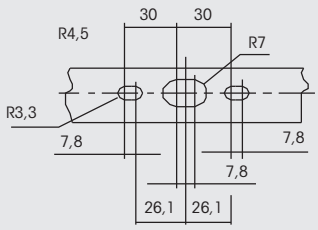


710 Ex Loudspeaker

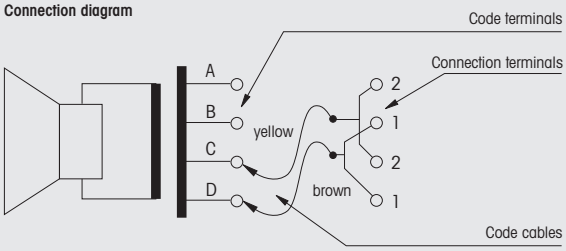


View Z

View Z



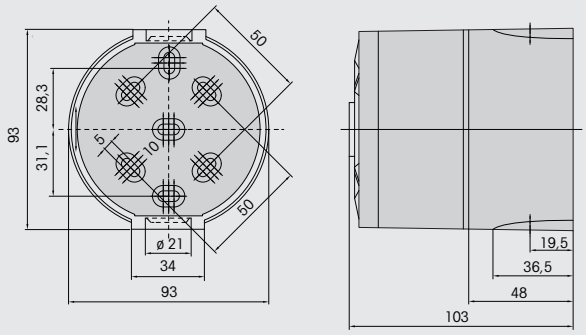
Connection diagram



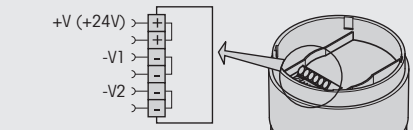
Code wire		Power
brown	yellow	(Watts)
D	**C**	**25,0** (As-delivered cond.)
C	**B**	**12,5**
B	**A**	**8,0**
D	**B**	**4,0**
C	**A**	**2,0**
D	**A**	**1,0**

Technical Diagrams

714 Ex Multi-Tone Sounder

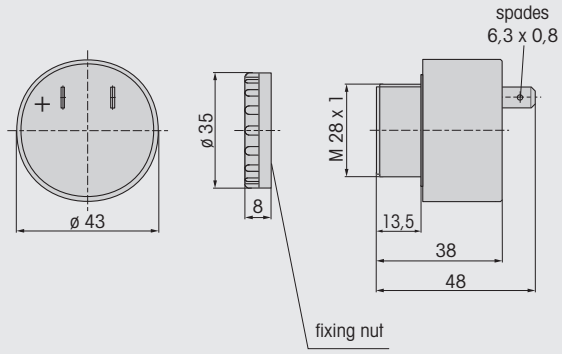


Connection diagram

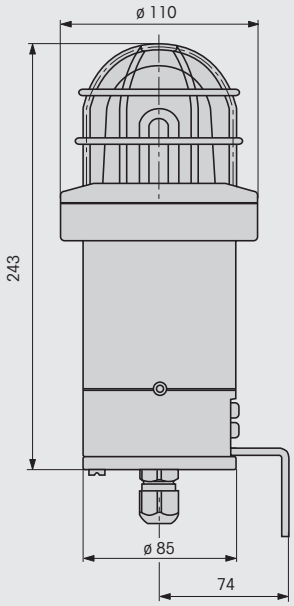


	Tone
-V1	A
-V2	B

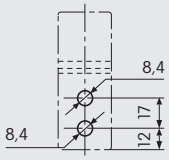
718 Ex Electronic Installation Buzzer



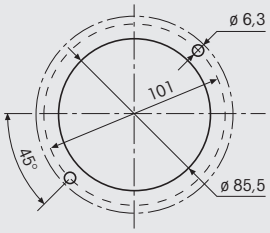
720 Ex Flash Beacon



drilling sketch bracket mounting

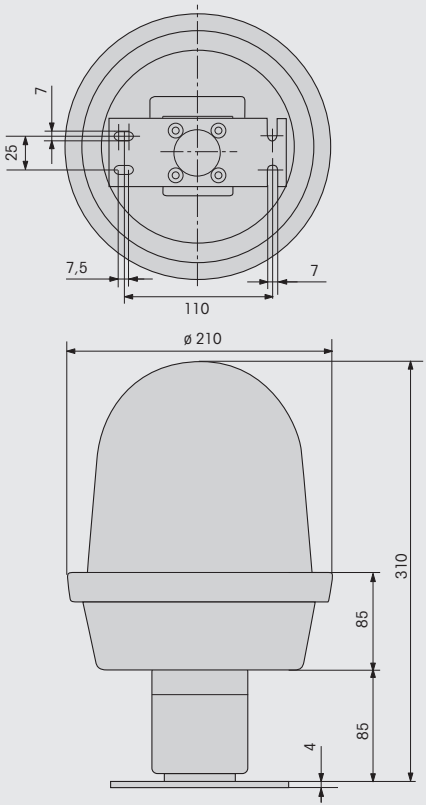


drilling sketch installation mounting

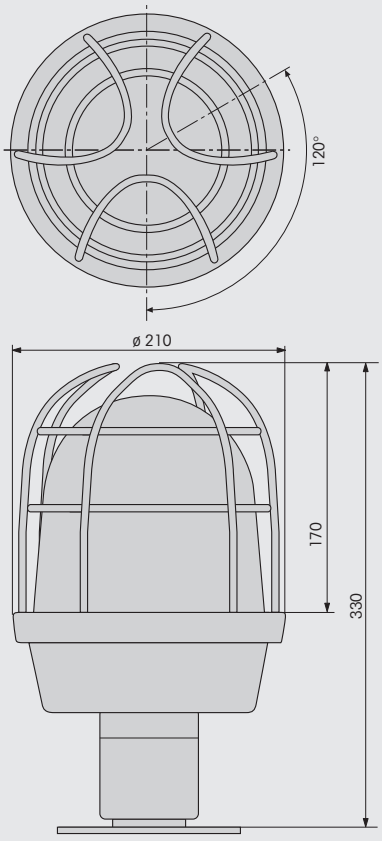


Technical Diagrams

738 Ex Double Flash Beacon

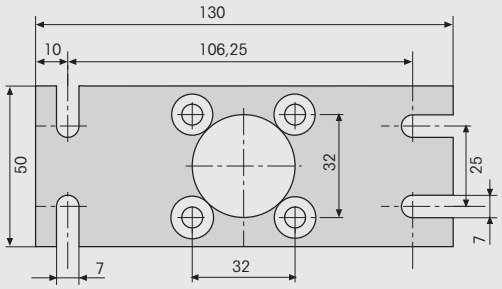


738 Accessories

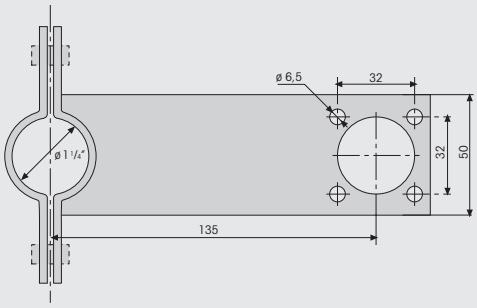


975 783 01 Wire guard

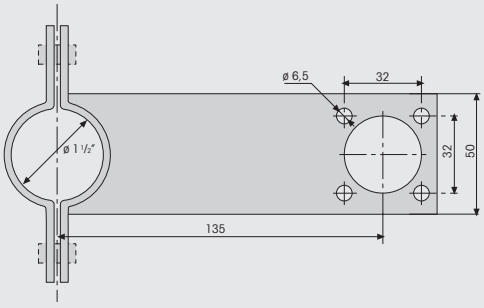
738 Accessories



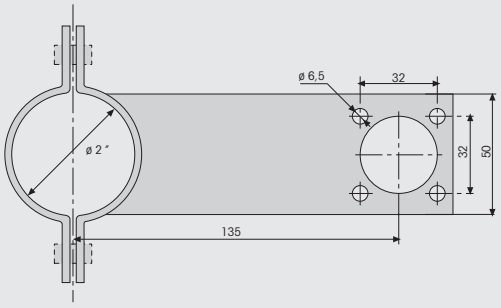
975 783 02 Mounting plate



975 783 03 Clamp for tube mounting 1¼″



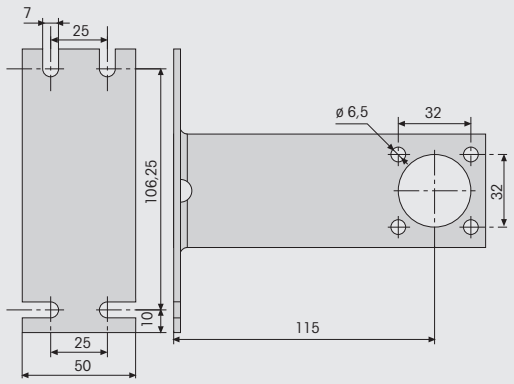
975 783 04 Clamp for tube mounting 1½″



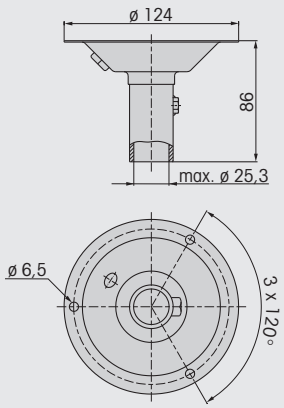
975 783 05 Clamp for tube mounting 2″

Technical Diagrams

738 Accessories

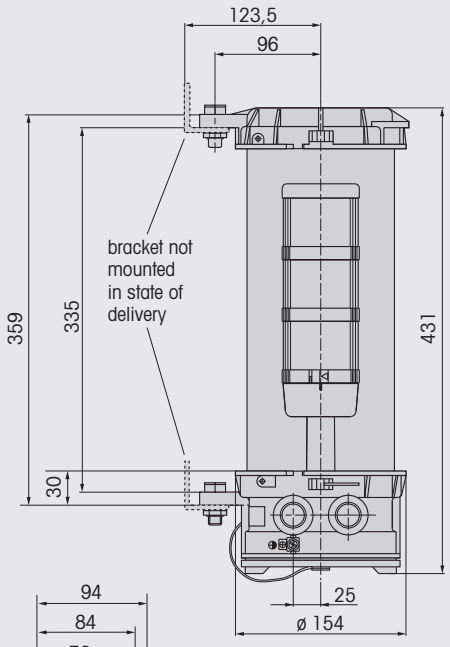


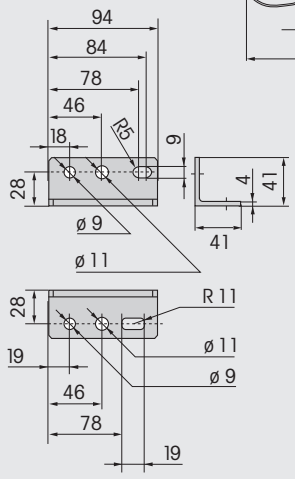
975 783 06 Bracket

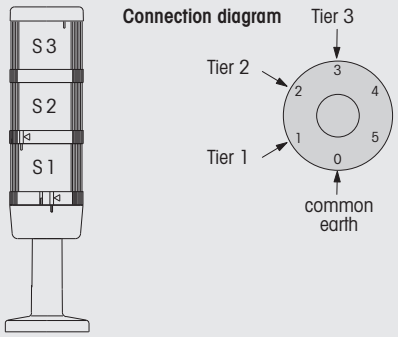


975 883 02 Flange for tube mounting

740 Ex Signal Tower

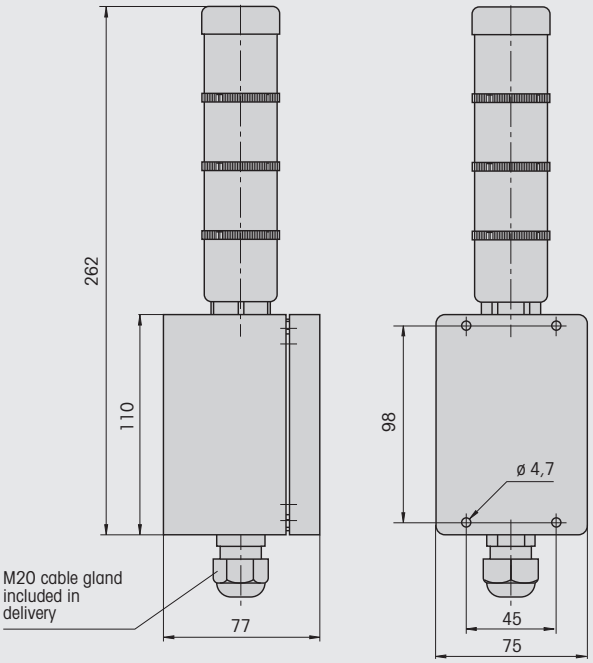


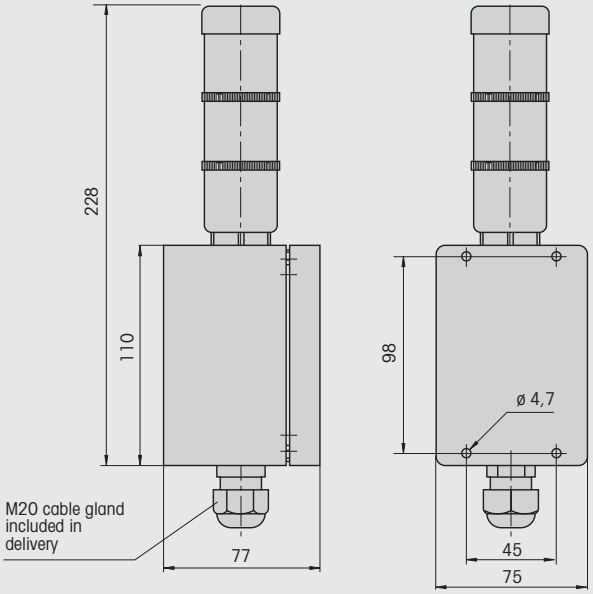




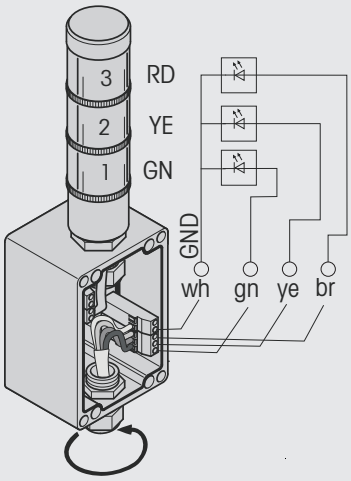
Technical Diagrams

741 **Ex LED Signal Tower**

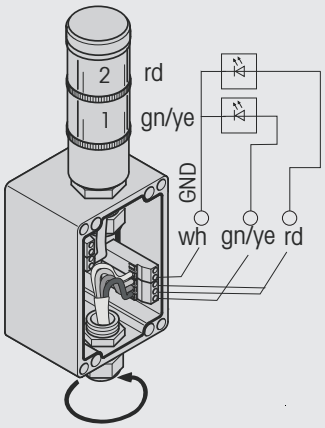




Connection diagram

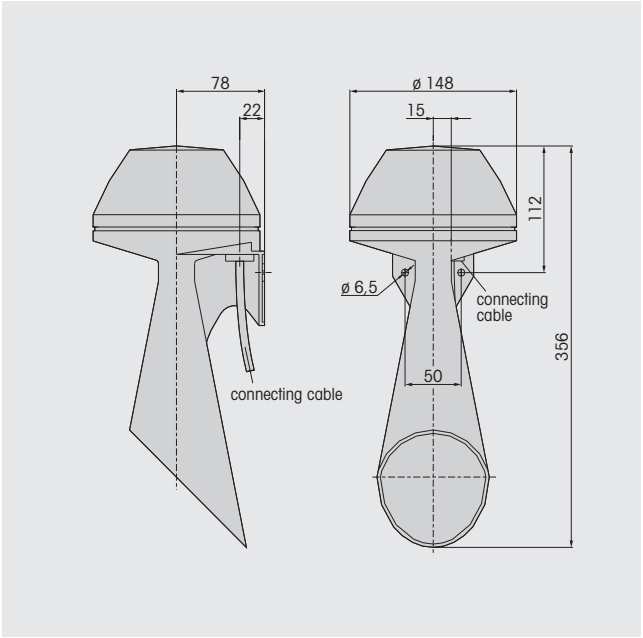


Connection diagram

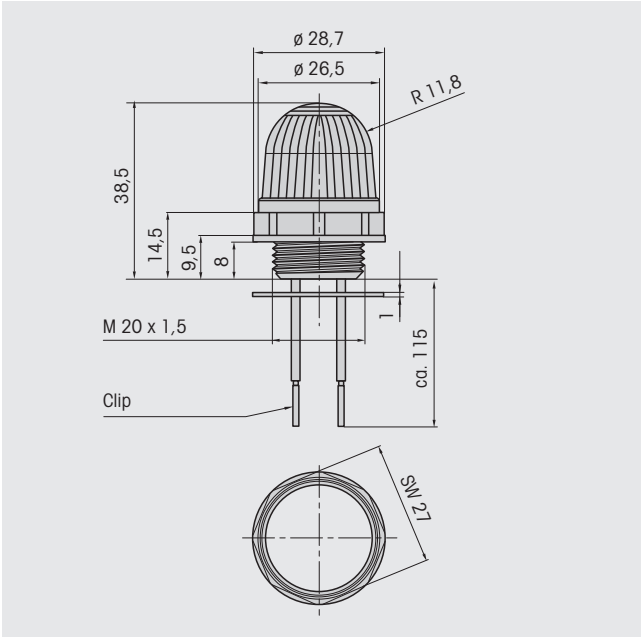


Technical Diagrams

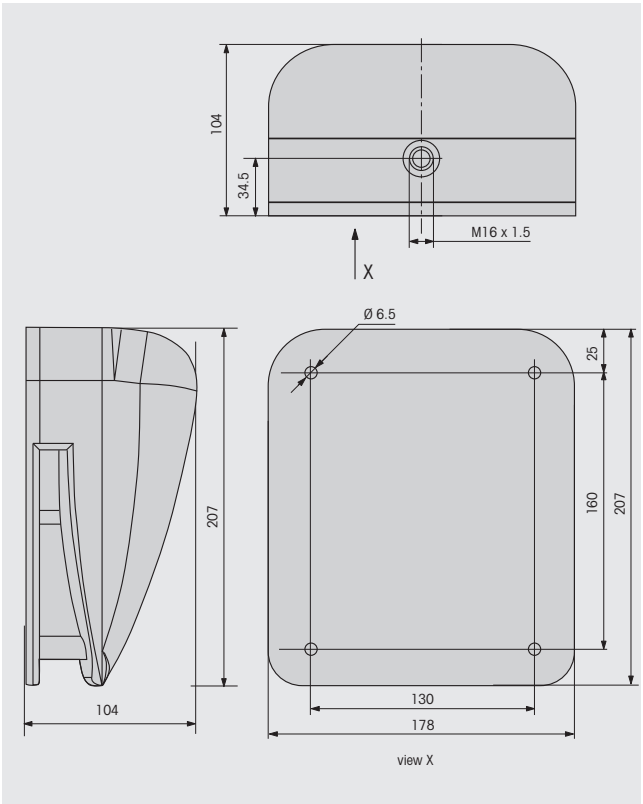
750 Ex Signal Horn



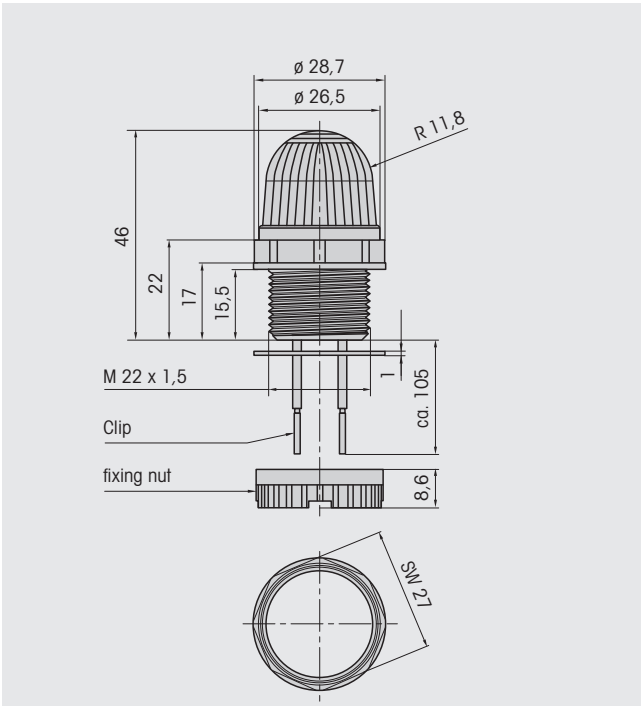
770 Ex Installation LED Beacon



761 Ex Signal Horn

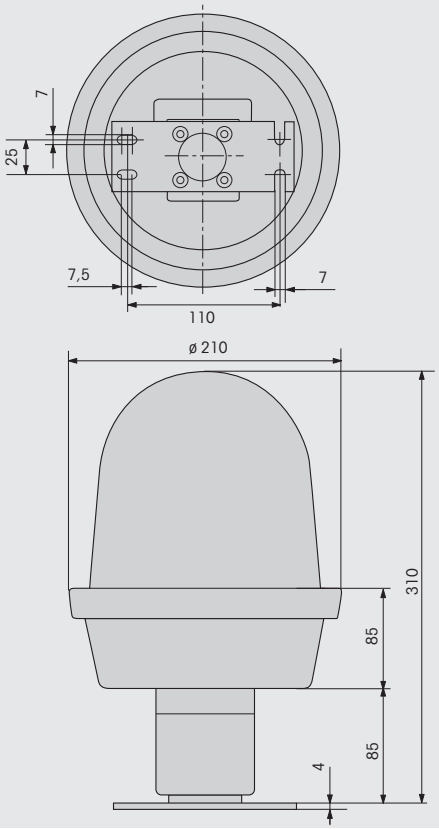


771 Ex Installation LED Beacon

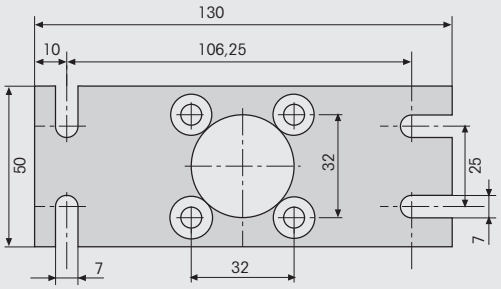


Technical Diagrams

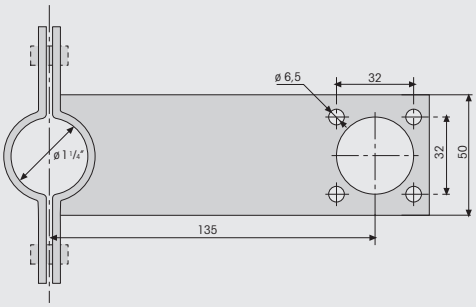
783/784 Ex Rotating Mirror-/Ex Rotating Signal Beacon



783/784 Accessories

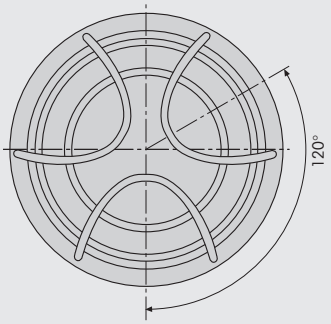


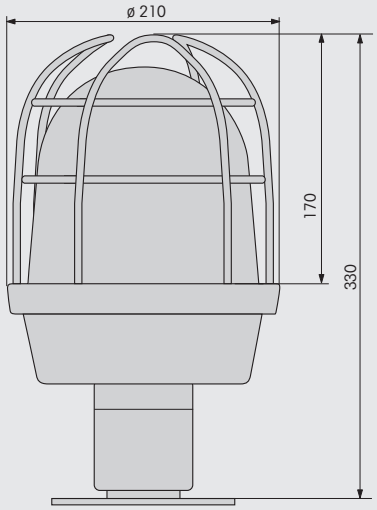
975 783 02 Mounting plate



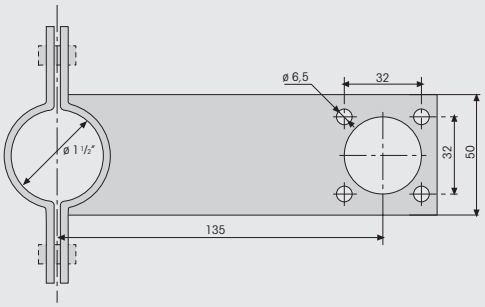
975 783 03 Clamp for tube mounting 1¼″

783/784 Accessories

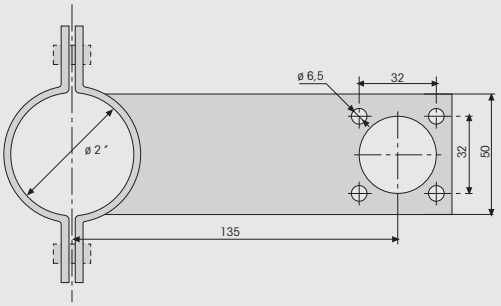




975 783 01 Wire guard



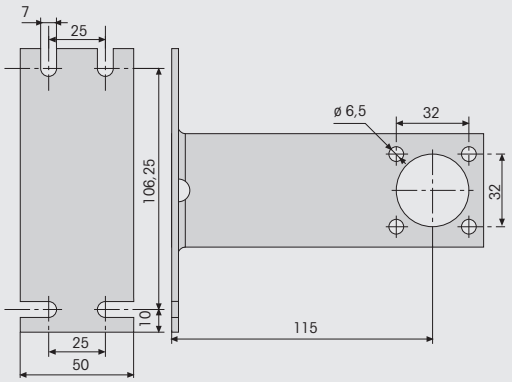
975 783 04 Clamp for tube mounting 1½″



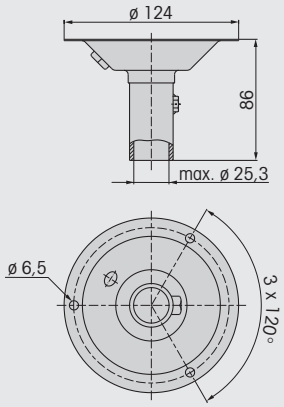
975 783 05 Clamp for tube mounting 2″

Technical Diagrams

783/784 Accessories

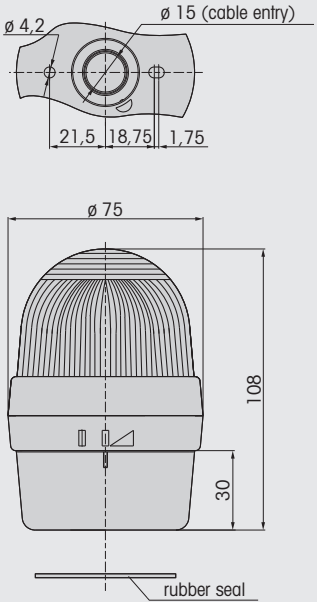


975 783 06 Bracket

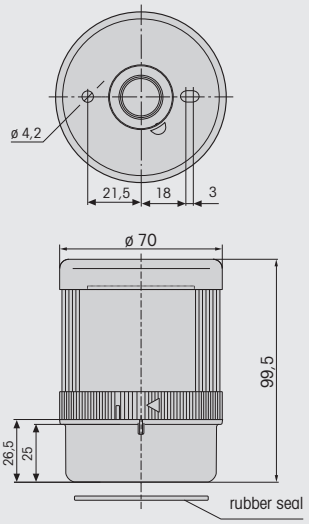


975 883 02 Flange for tube mounting

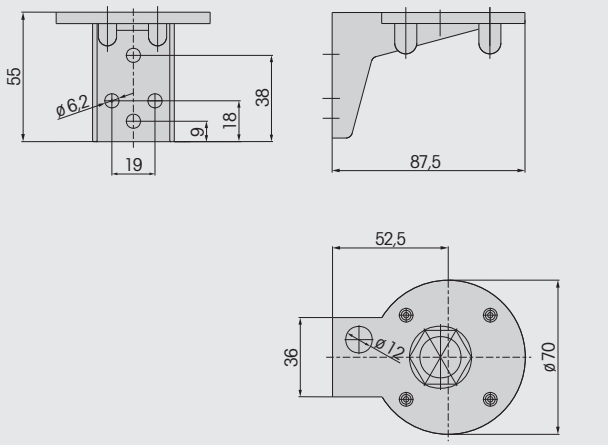
805/806/807 Permanent/LED/Flashing Beacon



806 Monitorable LED Signal Beacon



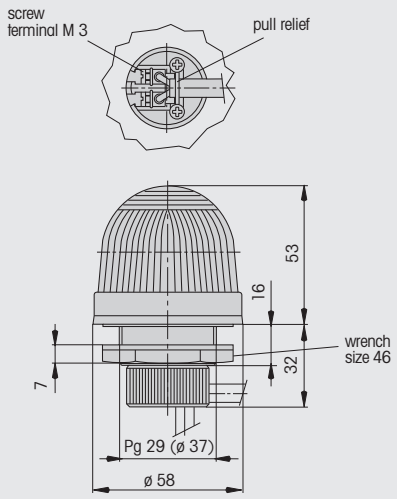
806 Accessories



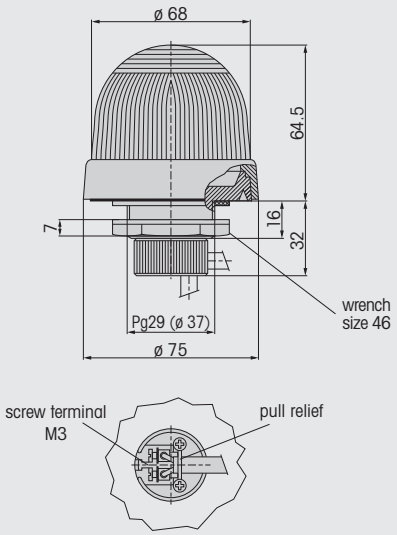
960 000 01 Bracket

Technical Diagrams

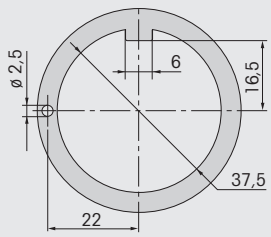
800/801/802 Permanent/LED/Flashing Beacon



815/816/817 Permanent/LED/Flashing Beacon

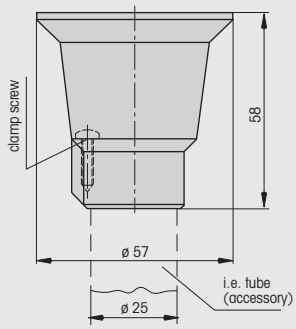


800 - 802 / 815 - 817 Accessories

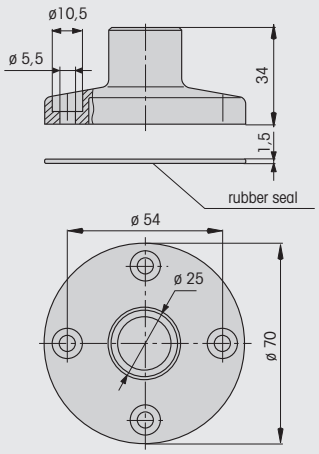


975 815 22 Anti-twist device

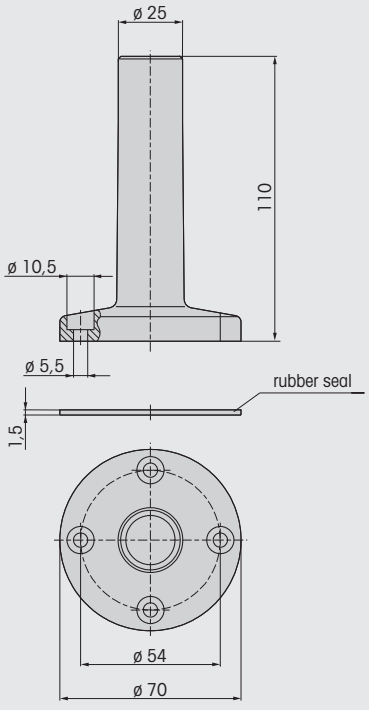
800 - 802 / 815 - 817 Accessories



975 812 01 Tube adapter



975 812 02 Base for surface mounting

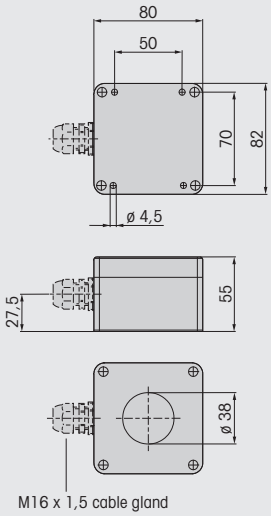


975 840 10 Base with tube

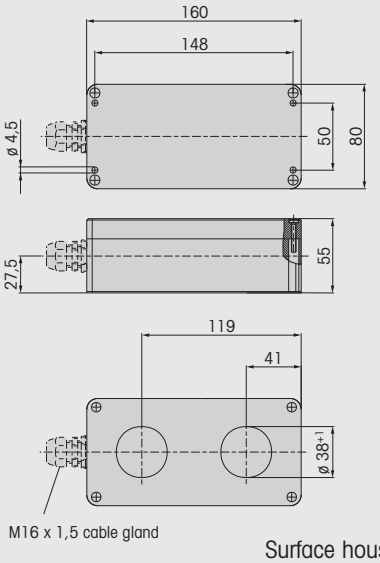
WERMA SIGNALTECHNIK

Technical Diagrams

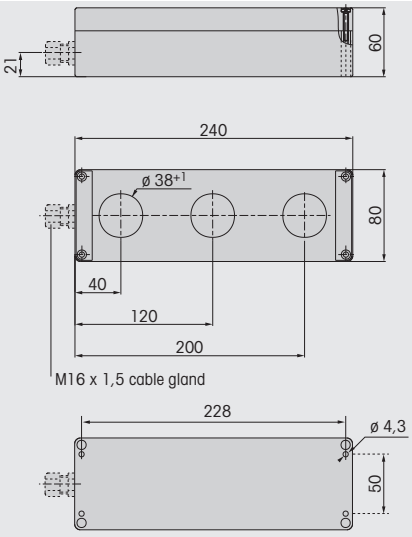
800 - 802 / 815 - 817 Accessories



975 815 03 Surface housing single

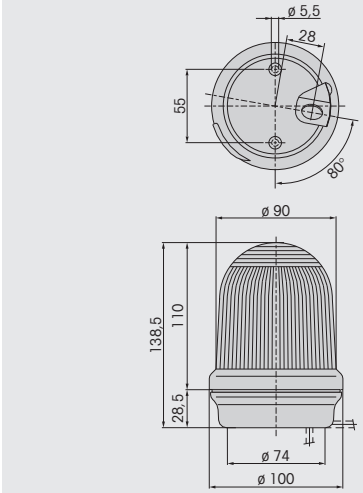


975 815 07 Surface housing double

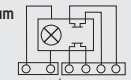


975 815 08 Surface housing triple

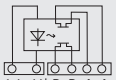
826/827/828/829 Permanent/Blinking/Flashing/LED Beacon



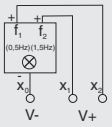
Connection diagram
828 X10 55



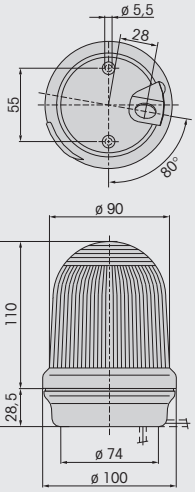
Connection diagram
829 X70 55



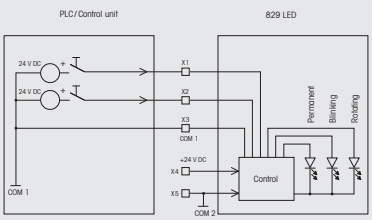
Connection diagram
828 X20 55



829 LED Permanent/Blinking/Rotating Beacon with external triggering

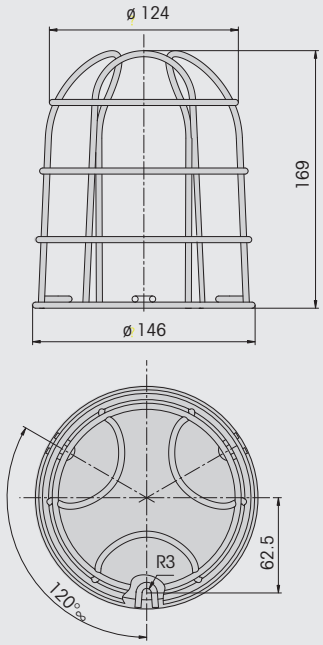


Connection diagram

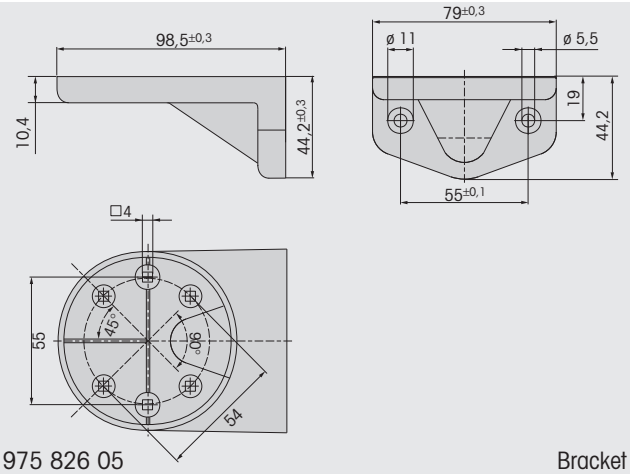


Technical Diagrams

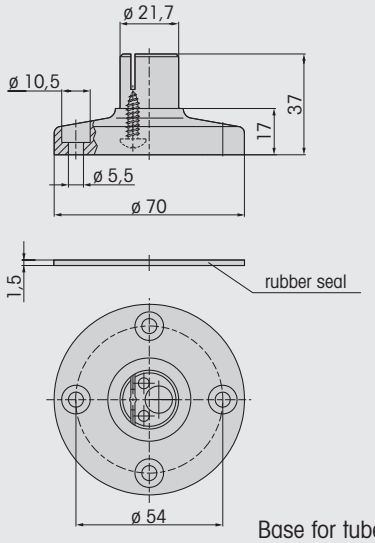
826/827/828/829 Accessories



975 826 03 Wire guard

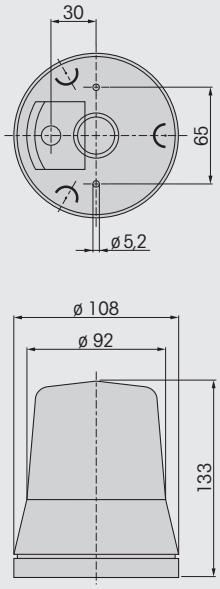


975 826 05 Bracket

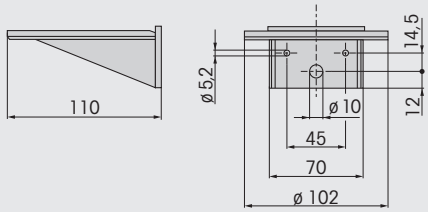


975 840 90 Base for tube, plastic

830 Flashing Beacon

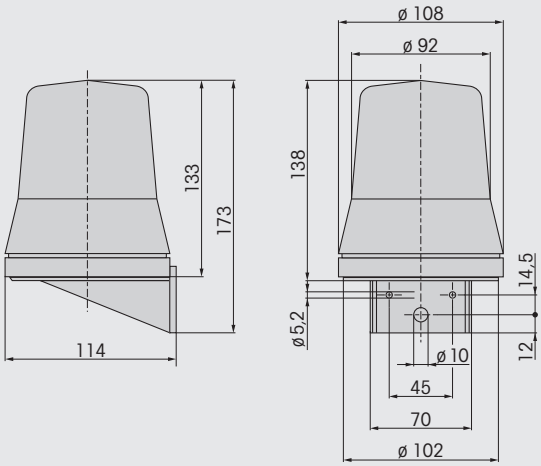


830 Accessories



975 835 01 Bracket

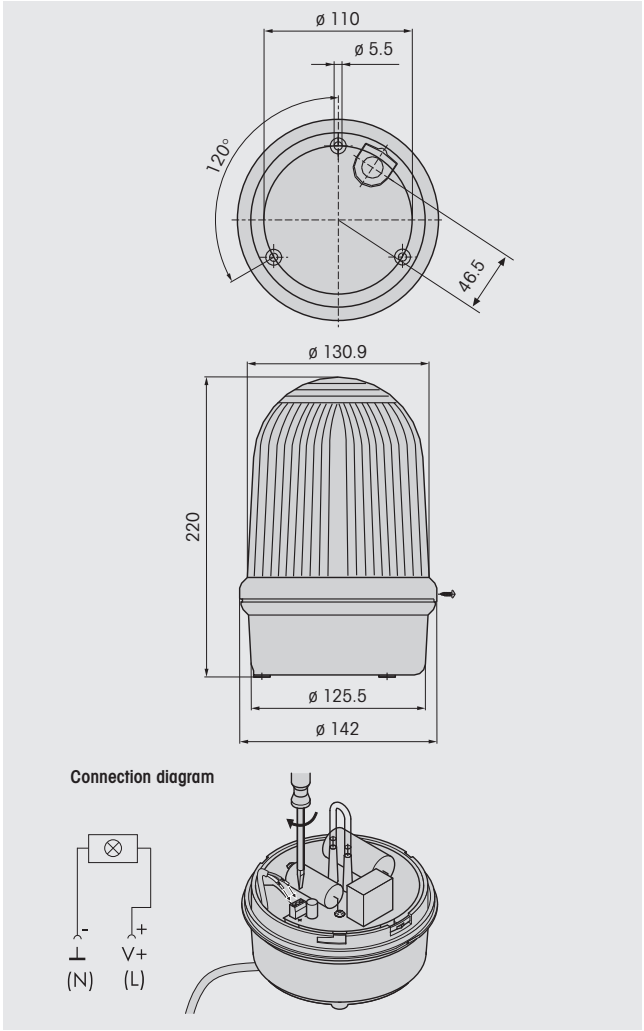
835 Flashing Beacon



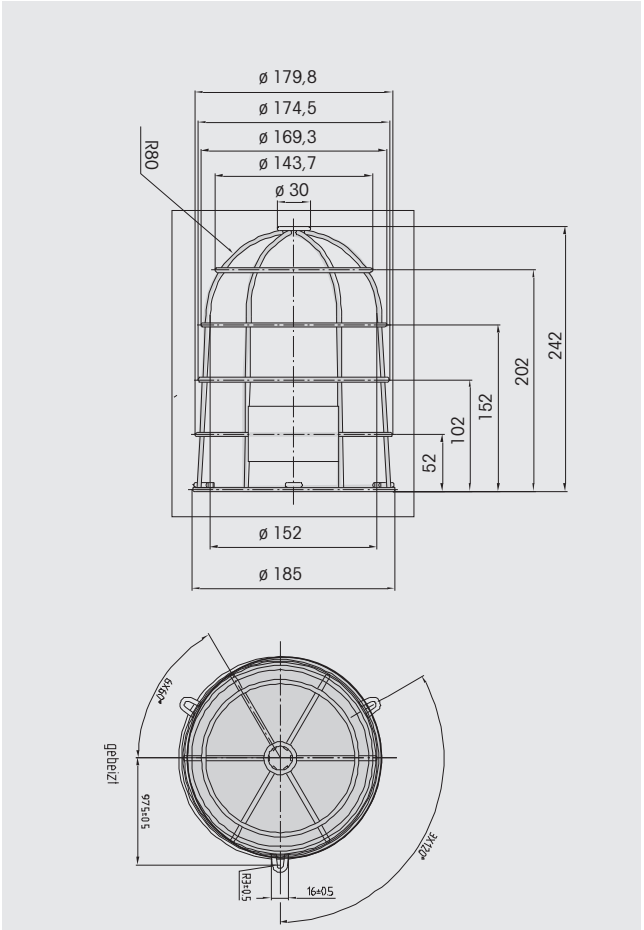
WERMA SIGNALTECHNIK

Technical Diagrams

838 Double Flash Beacon

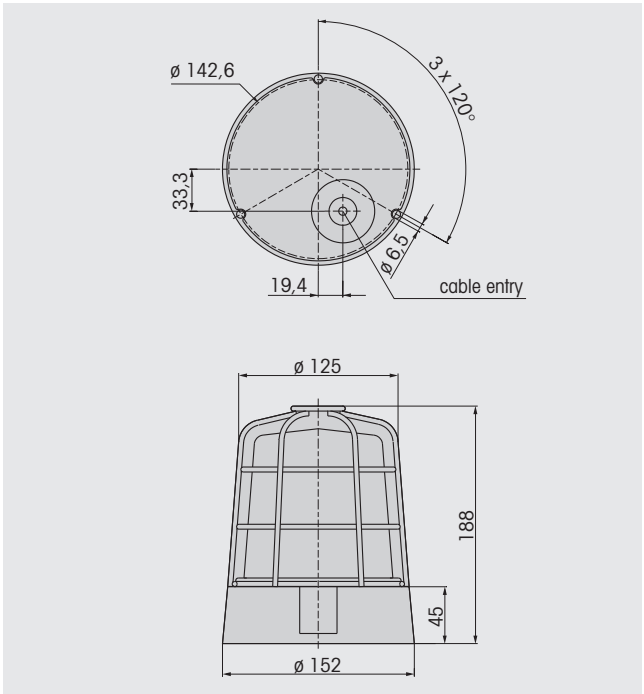


838/884 Accessories



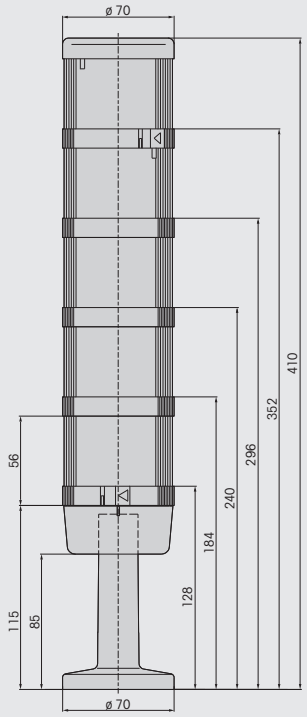
975 883 08 Wire guard

839 Double Flash Beacon

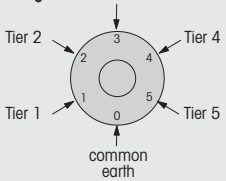


Technical Diagrams

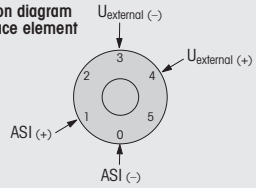
840 **Kombi*SIGN* 70**



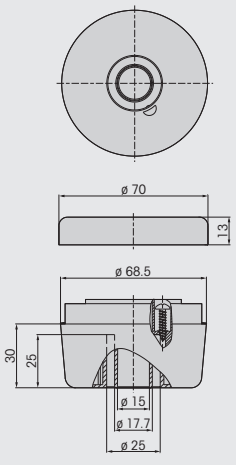
Connection diagram Tier 3



Connection diagram AS Interface element $U_{external}$ (–)

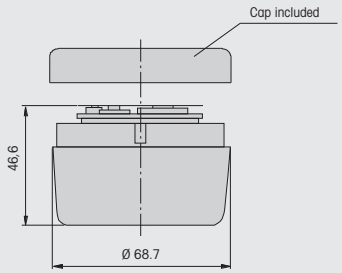


840



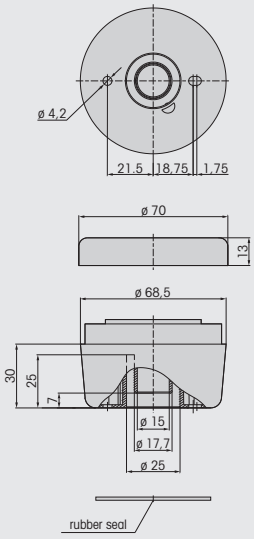
840 X80 00 Terminal element for tube mounting

840



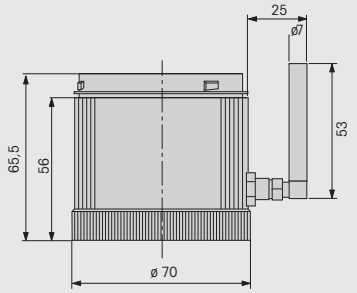
840 580 00 Terminal element with USB Interface

840



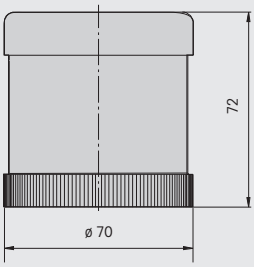
840 085 00 Terminal element for base/bracket mounting

840



840 700 55 GSM Transmitter Element

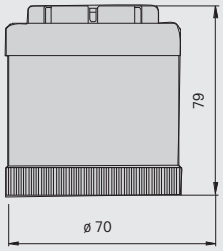
844 **Buzzer-/Siren element**



844 118 XX Buzzer element
844 126 XX Siren element

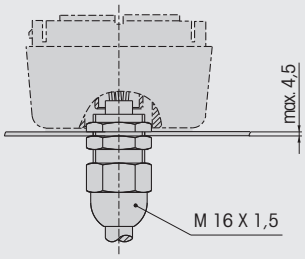
Technical Diagrams

844 Siren element

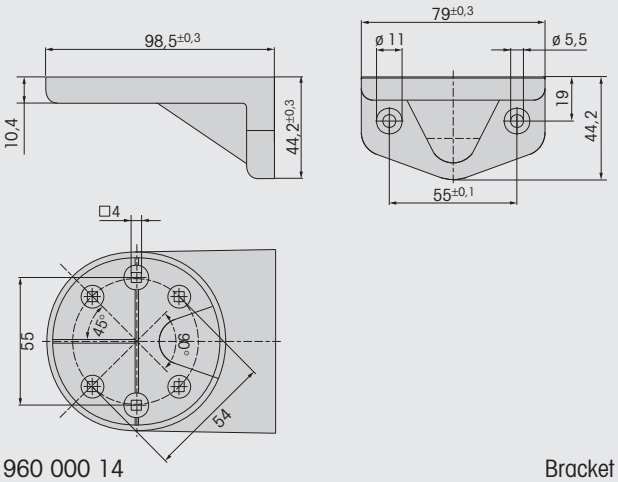


844 123 55 Siren element

840 Accessories

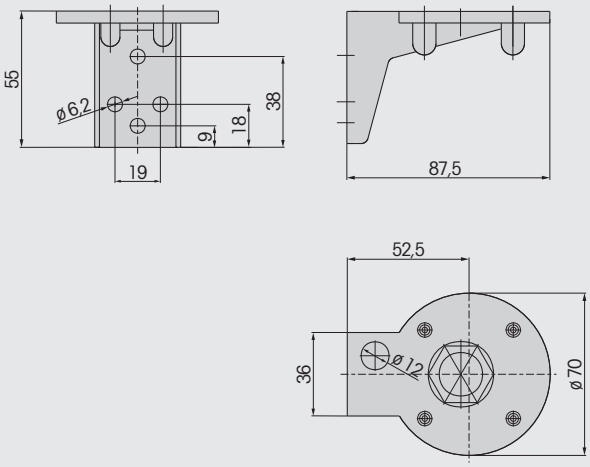


960 000 04 PG screw for base mounting

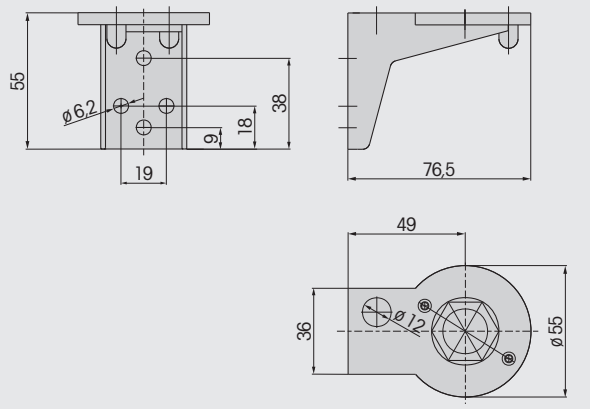


960 000 14 Bracket

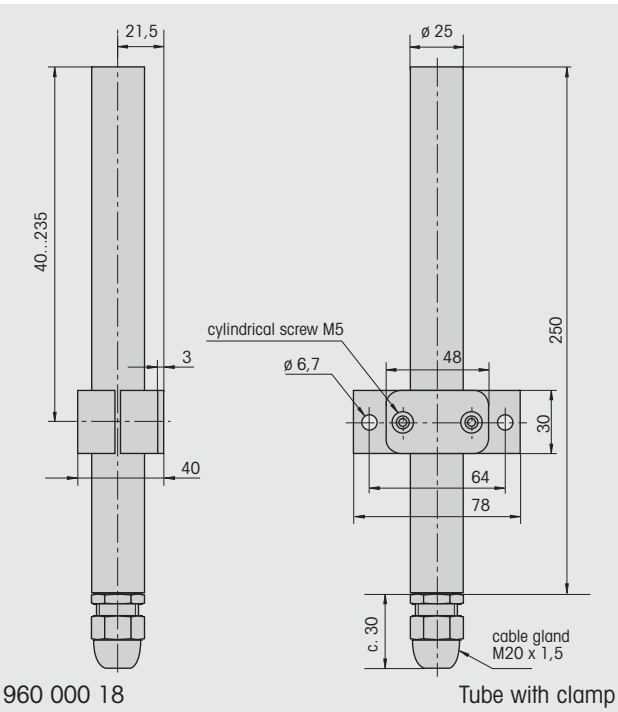
840 Accessories



960 000 01 Bracket



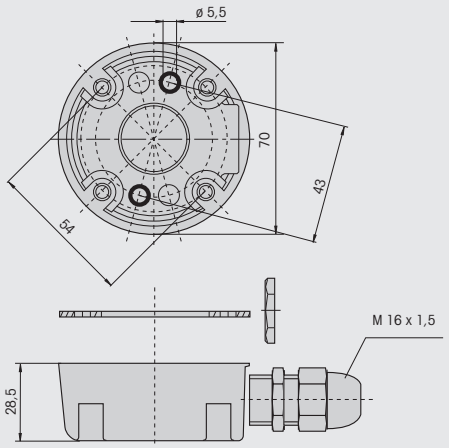
960 000 02 Bracket



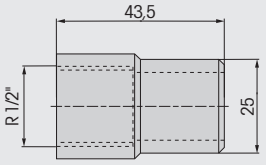
960 000 18 Tube with clamp

Technical Diagrams

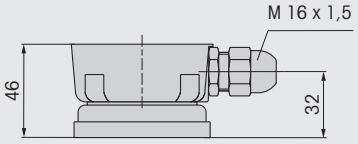
840 Accessories



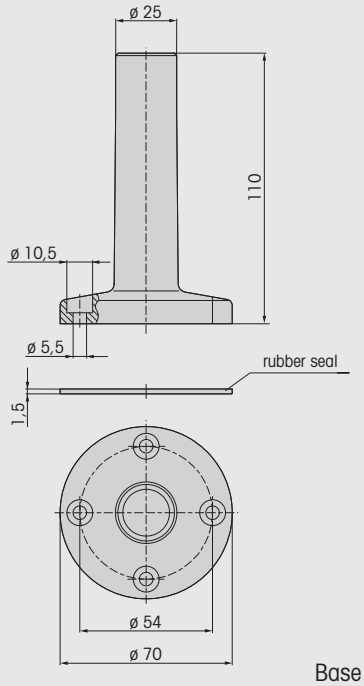
975 840 01 Adapter box



975 840 02 Adapter

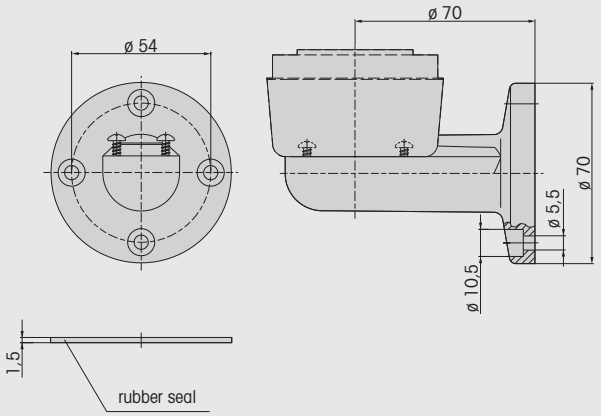


975 840 04 Contact box with magnetic base

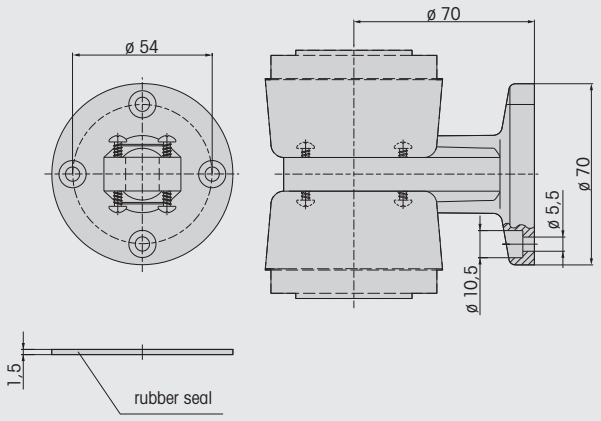


975 840 10 Base with tube

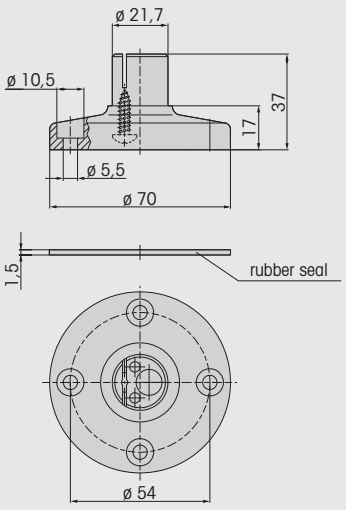
840 Accessories



975 840 85 Bracket



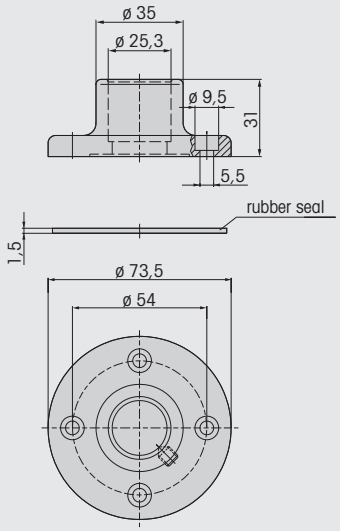
975 840 86 2-sided bracket



975 840 90 Base for tube, plastic

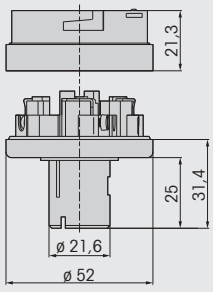
Technical Diagrams

840 Accessories

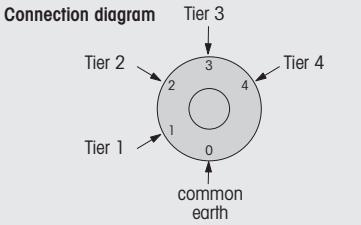


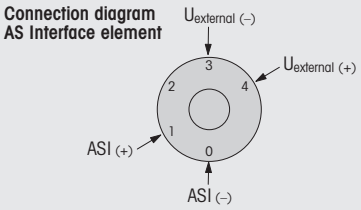
975 840 91 — Base for tube, metal

845 Accessories

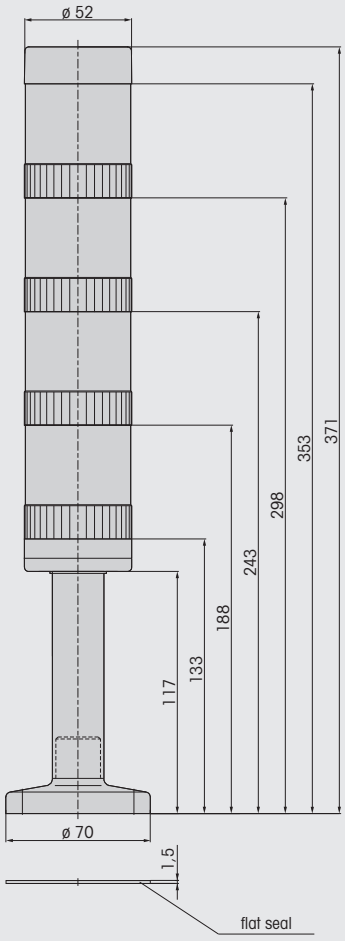


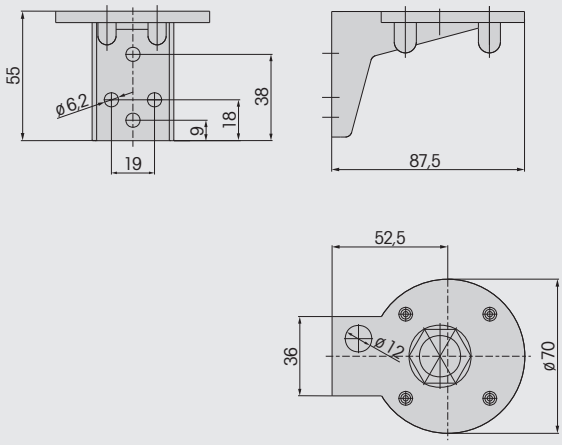
845 000 00 — Terminal element





845 Kombi*SIGN* 50

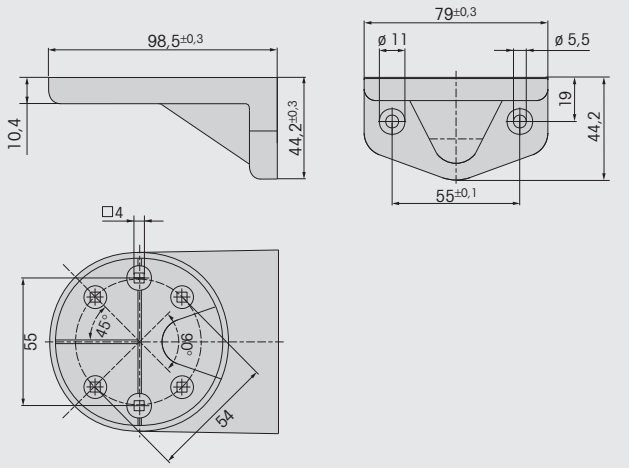




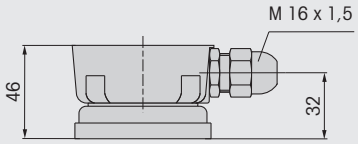
960 000 01 — Bracket

Technical Diagrams

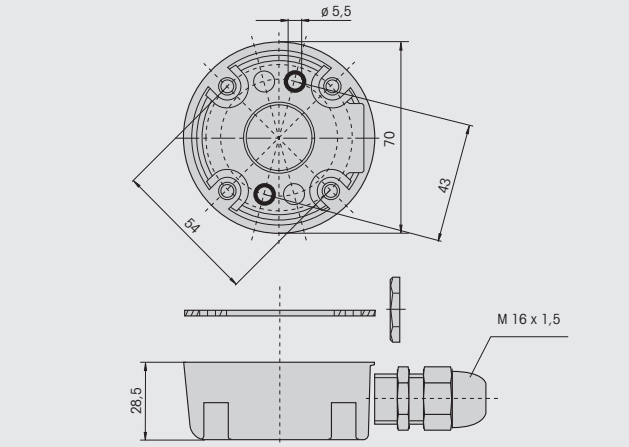
845 Accessories



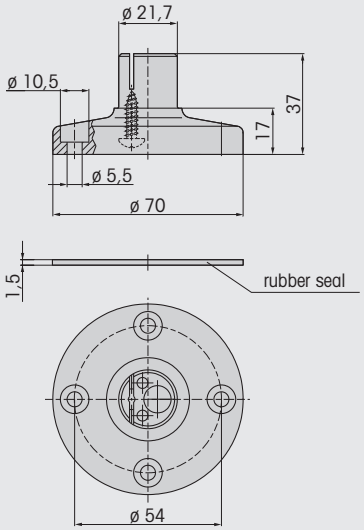
960 000 14 Bracket



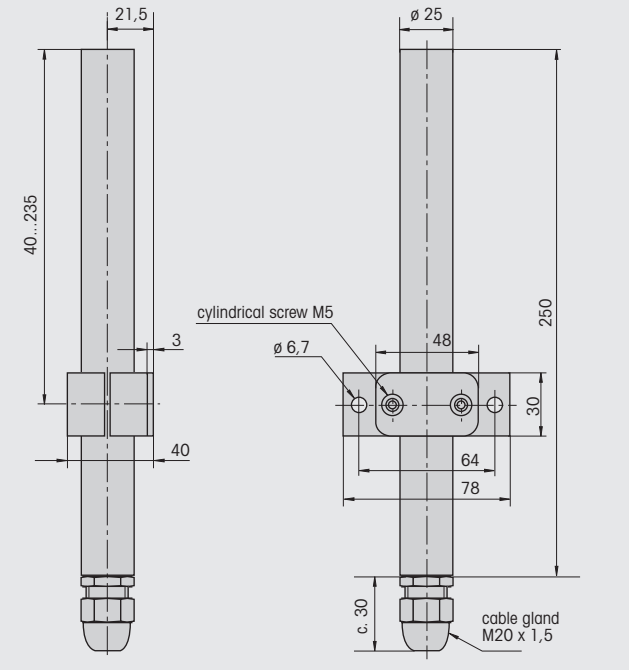
975 840 04 Contact box with magnetic base



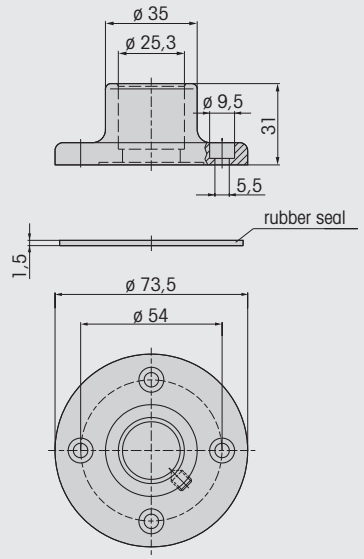
975 840 01 Adapter box



975 840 90 Base for tube, plastic



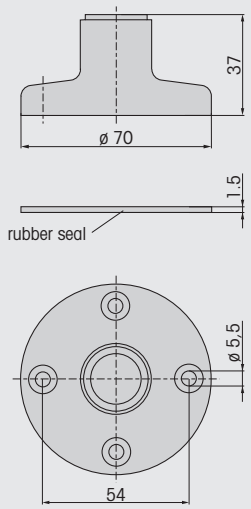
960 000 18 Tube with clamp



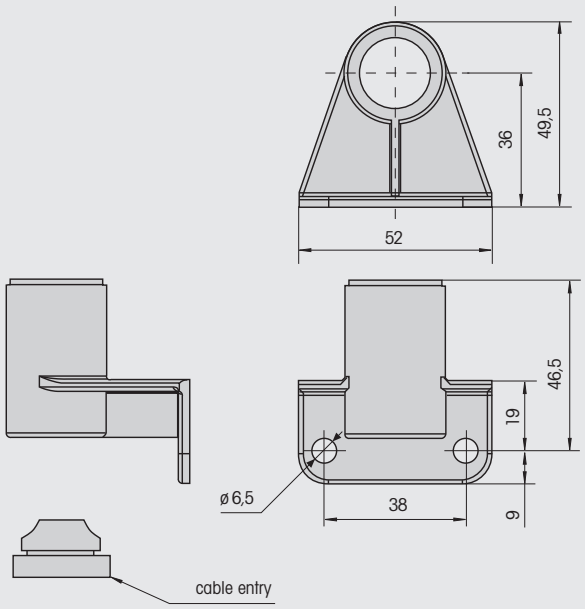
975 840 91 Base for tube, metal

Technical Diagrams

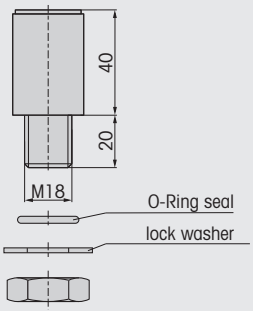
845 Accessories



975 845 01 — Base for surface mounting

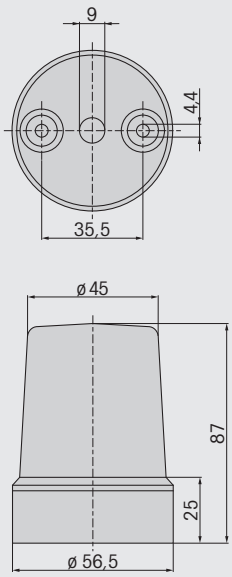


975 845 02 — Bracket



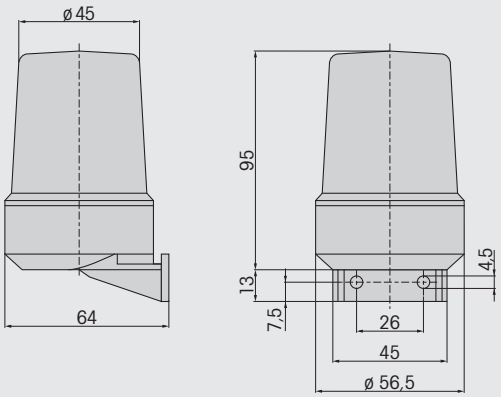
975 845 03 — Adapter for single hole mounting

850 Permanent Beacon



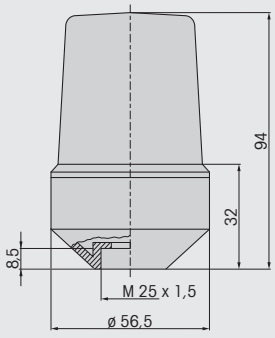
Base mounting

851 Permanent Beacon



Bracket mounting

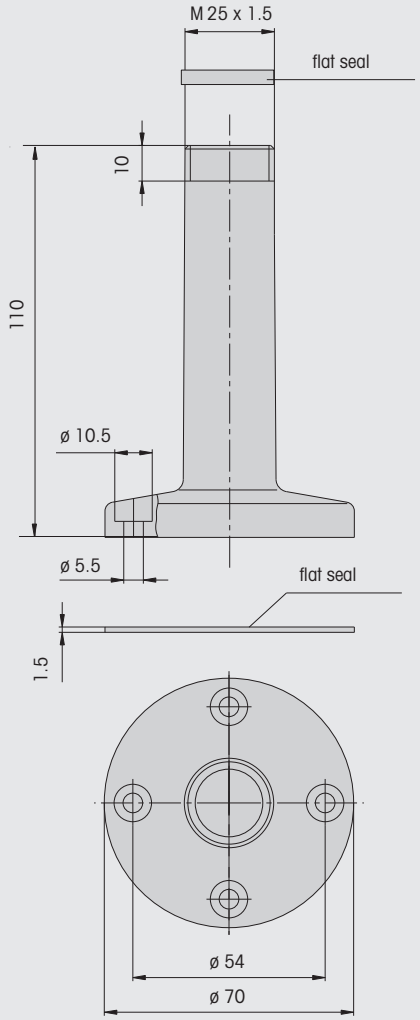
852 Permanent Beacon



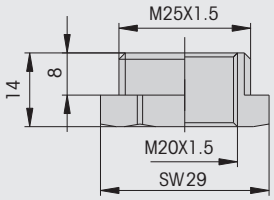
Tube mounting

Technical Diagrams

850 Accessories

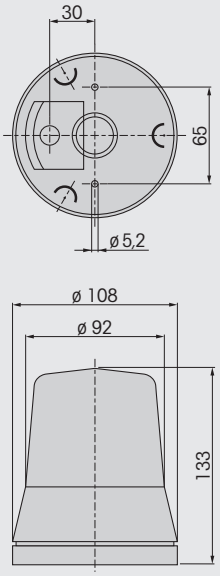


960 693 03 Base with tube

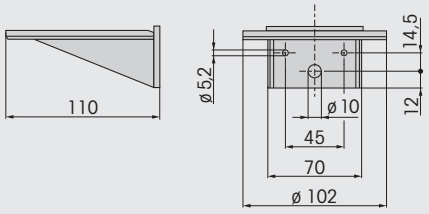


960 693 04 Adapter

870 Permanent Beacon

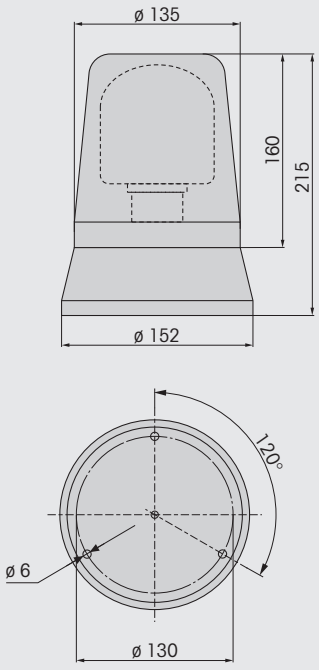


870 Accessories



975 835 01 Bracket

880 Rotating Mirror Beacon



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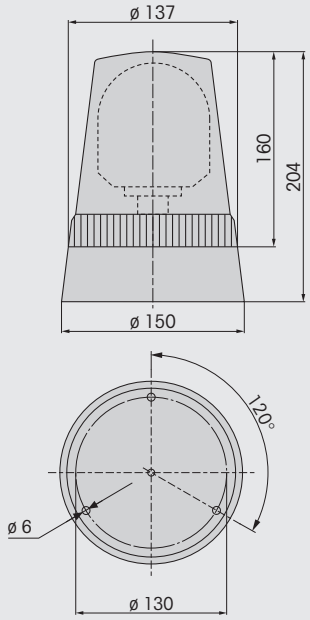
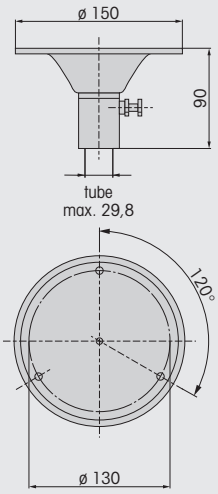
Technical Diagrams

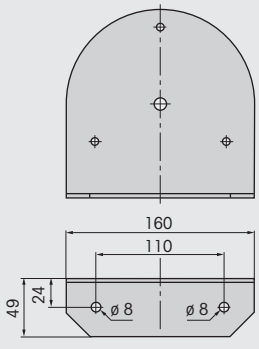
881 Rotating Mirror Beacon



880/881 Accessories

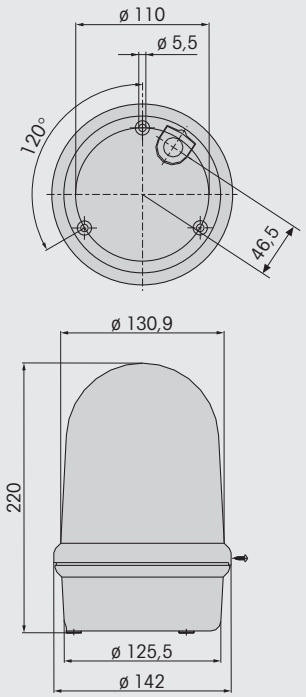


880 000 00 Flange for tube mounting

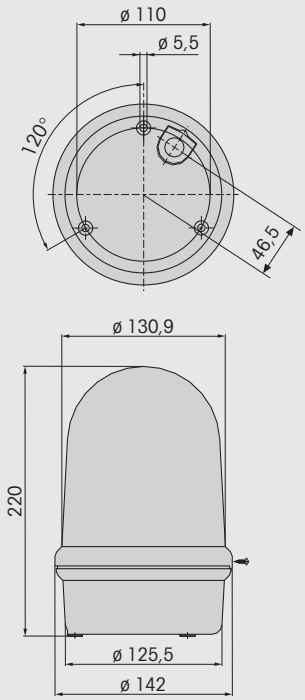


975 881 01 Bracket

883 Rotating Mirror Beacon

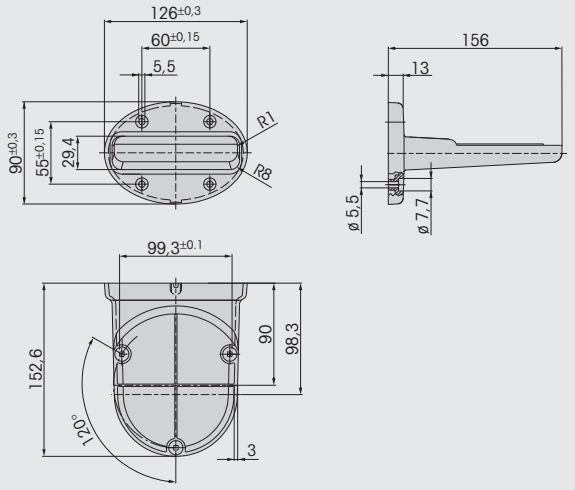


884 Revolving Signal Beacon

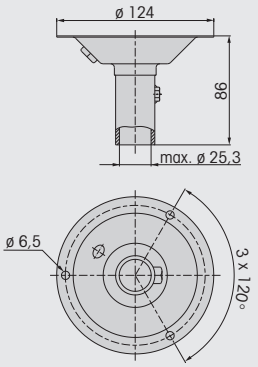


Technical Diagrams

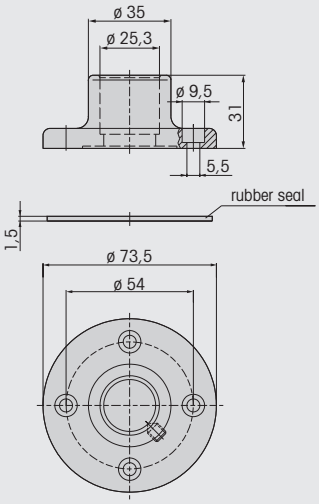
883/884 Accessories



975 883 06 Bracket

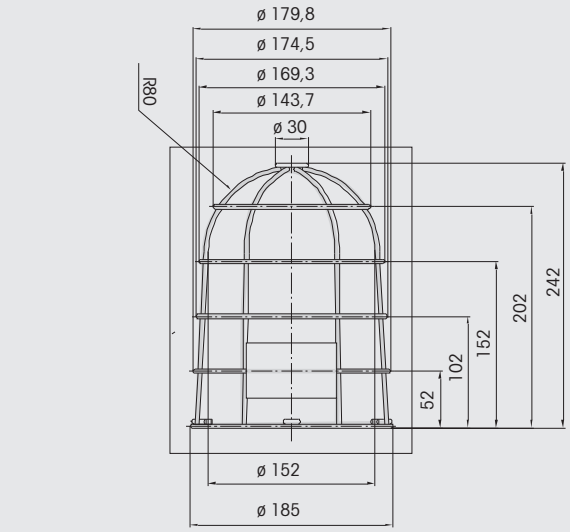


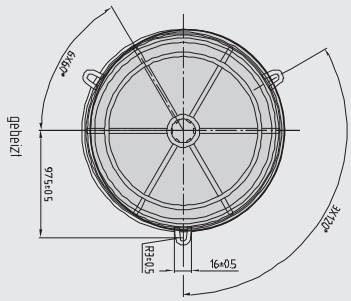
975 883 02 Flange for tube mounting



975 840 91 Base for tube, metal

838/884 Accessories

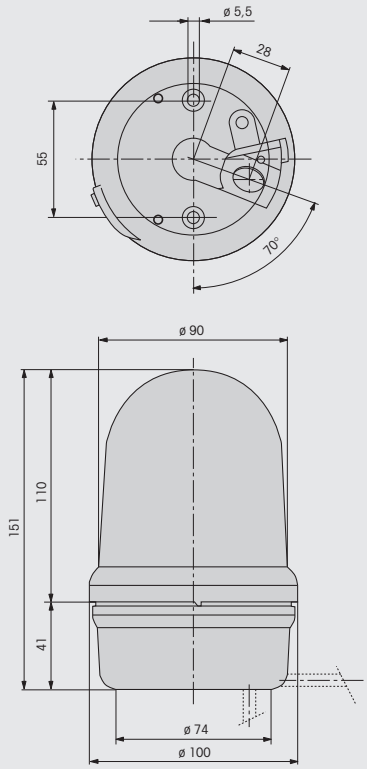




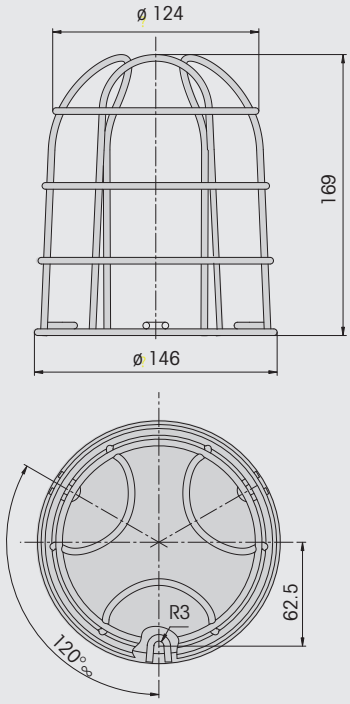
975 883 08 Wire guard

Technical Diagrams

885 Rotating Mirror Beacon

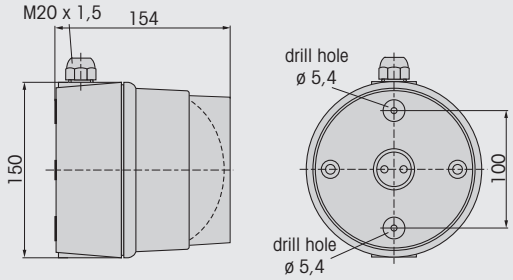


885 Accessories

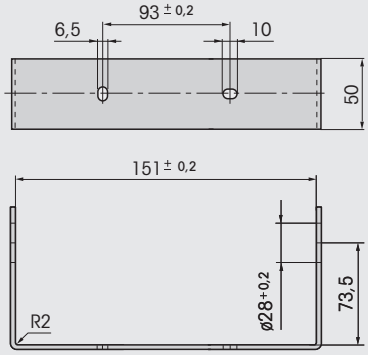


975 826 09 Wire guard

890 LED Beacon/LED Traffic Light



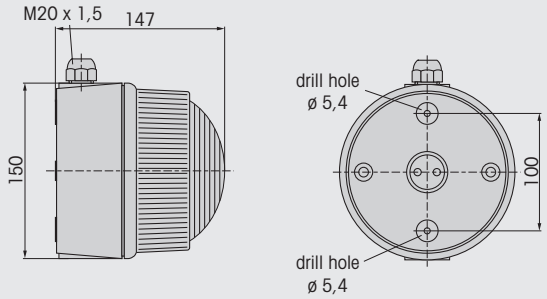
890 Accessories



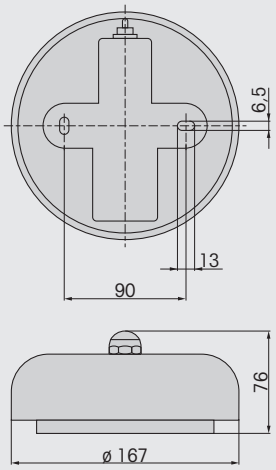
975 890 19
975 890 21
975 890 22 Fixing bow

Technical Diagrams

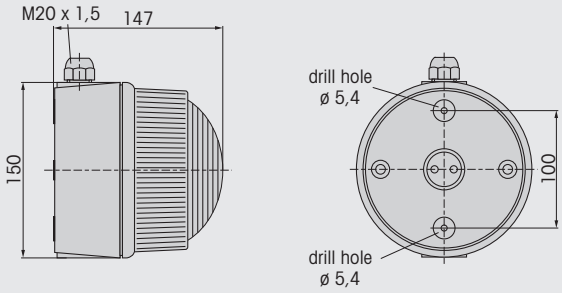
895 **Permanent Beacon**



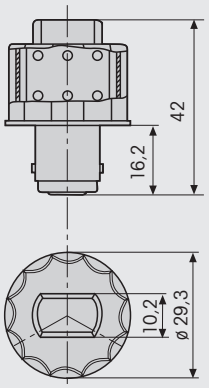
914 **Alarm Bell**



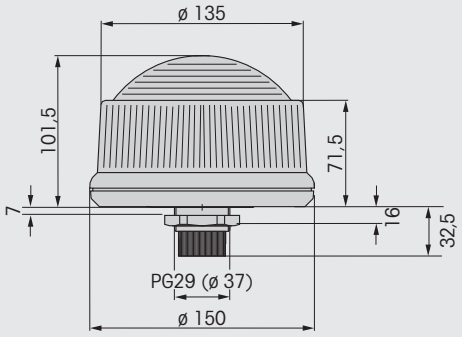
897 **Flashing Beacon**



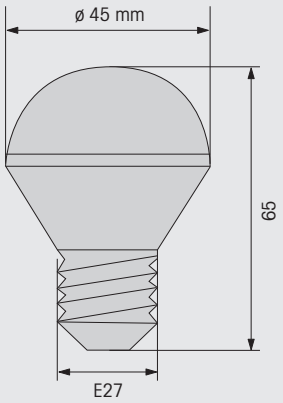
956 **LED Bulb**



898 **Installation Signal Beacon**

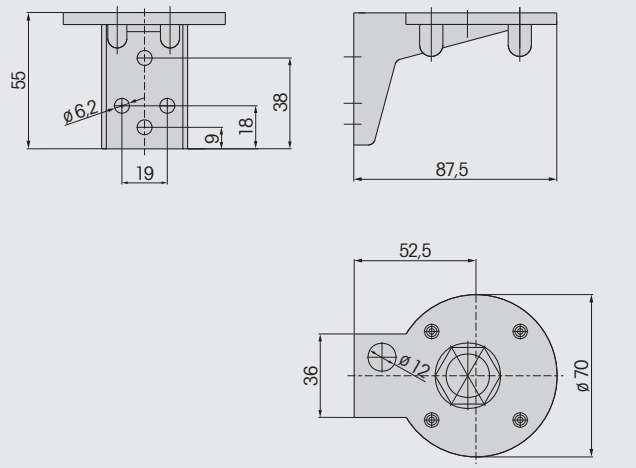


956 **LED Bulb E27**

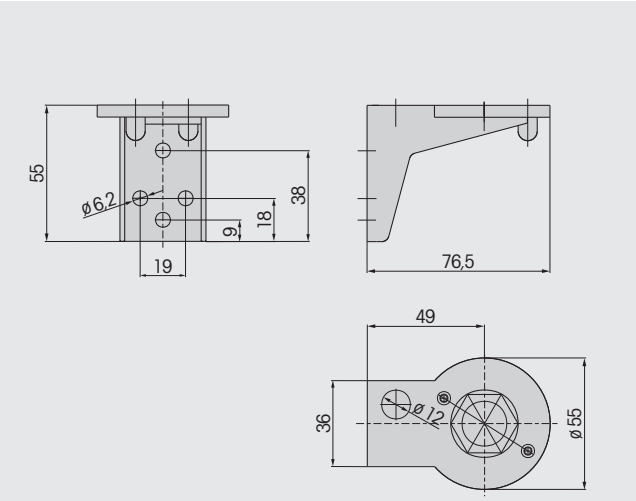


Technical Diagrams

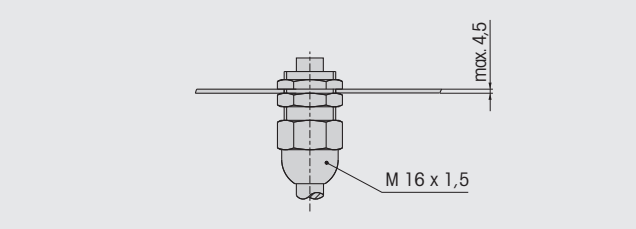
960 000 01 **Bracket**



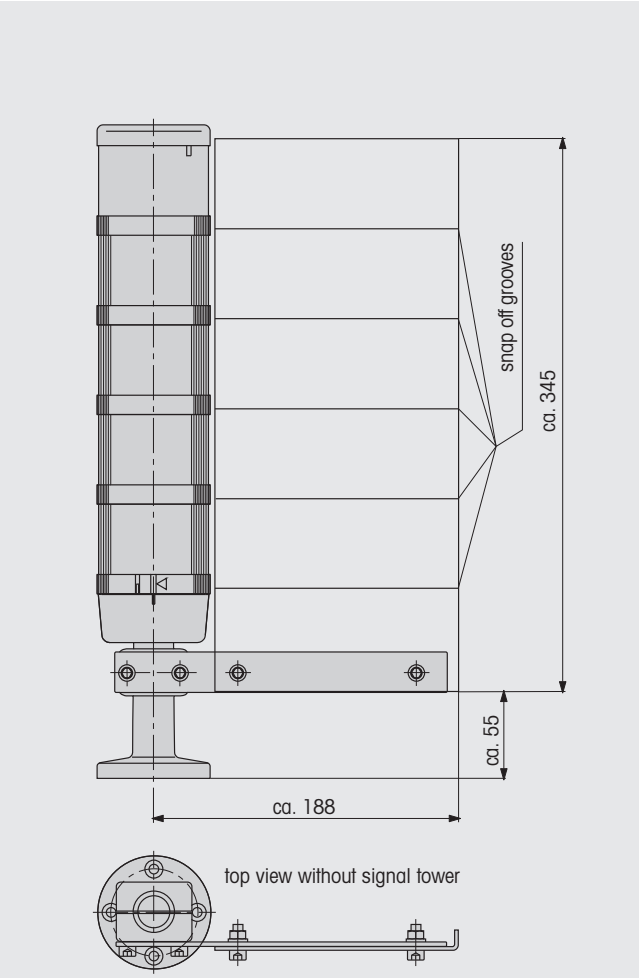
960 000 02 **Bracket**



960 000 04 **Cable gland**

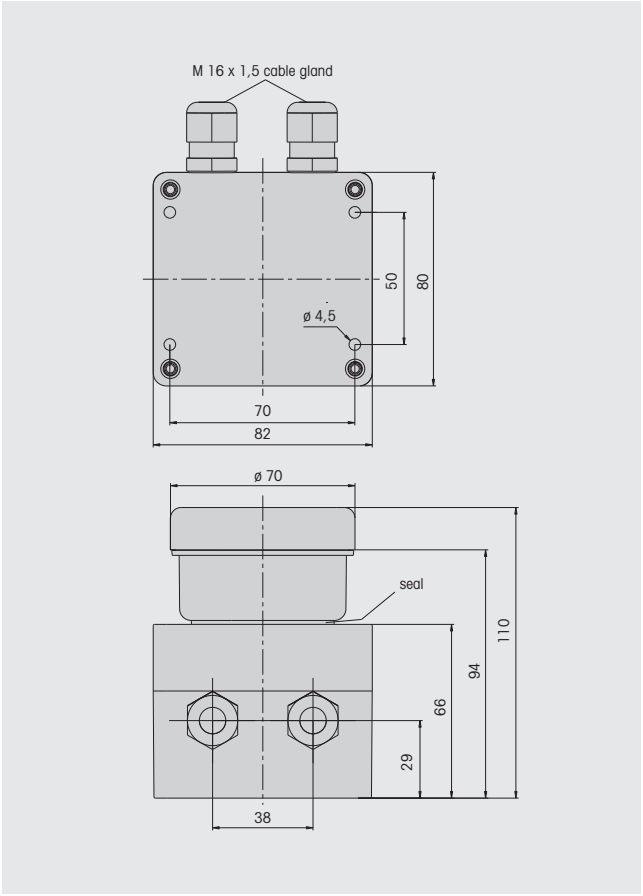


960 000 05 **Indication Board**

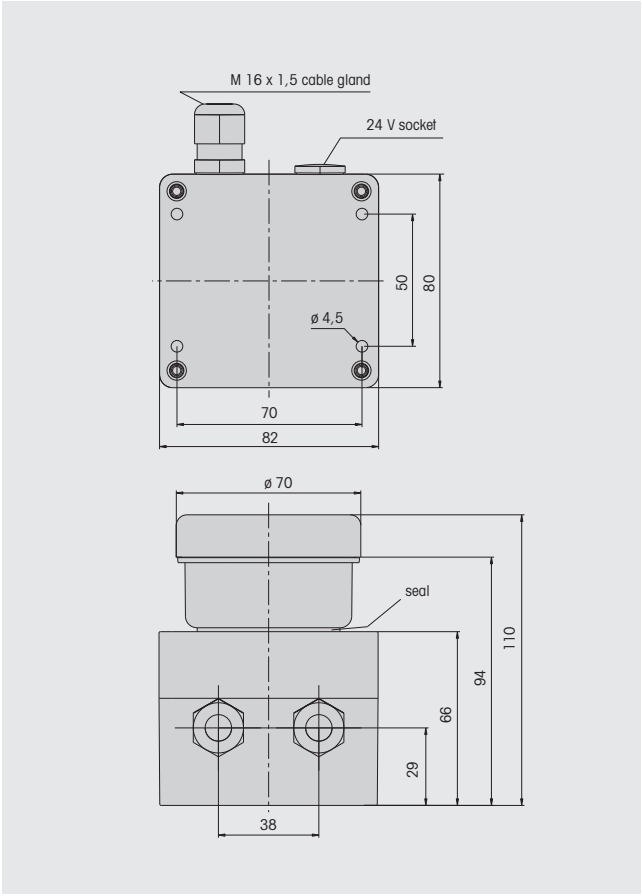


Technical Diagrams

960 000 16 **Interface Box**

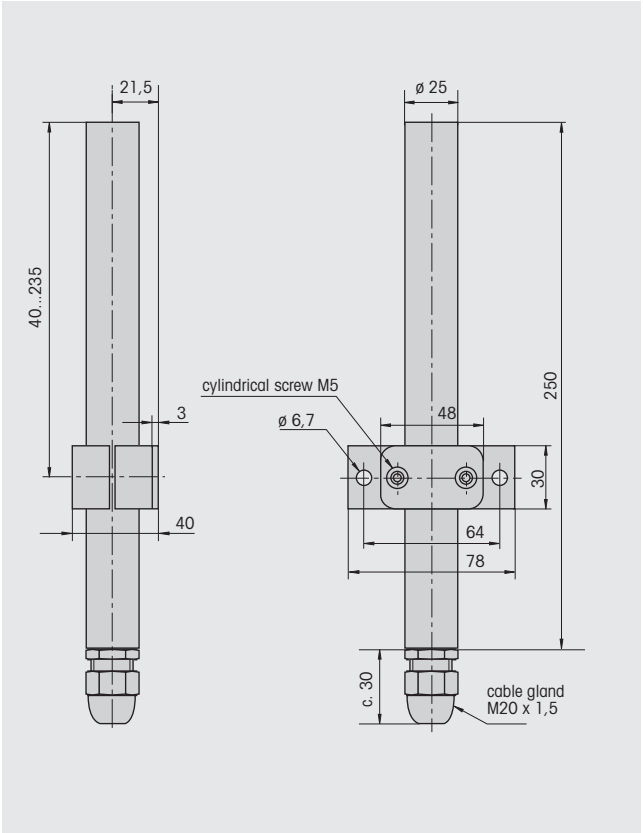


960 000 17 **Interface Box**

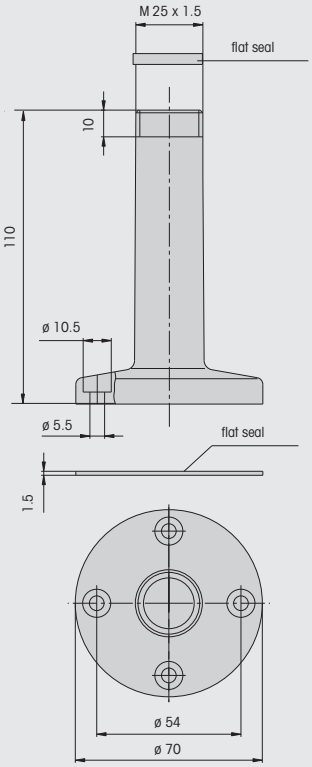


Technical Diagrams Accessories

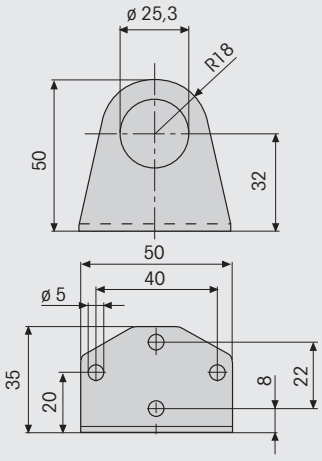
960 000 18 — **Tube with clamp**



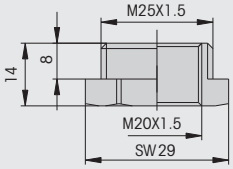
960 693 03 — **Base with tube**



960 693 01 — **Bracket**



960 693 04 — **Adapter**



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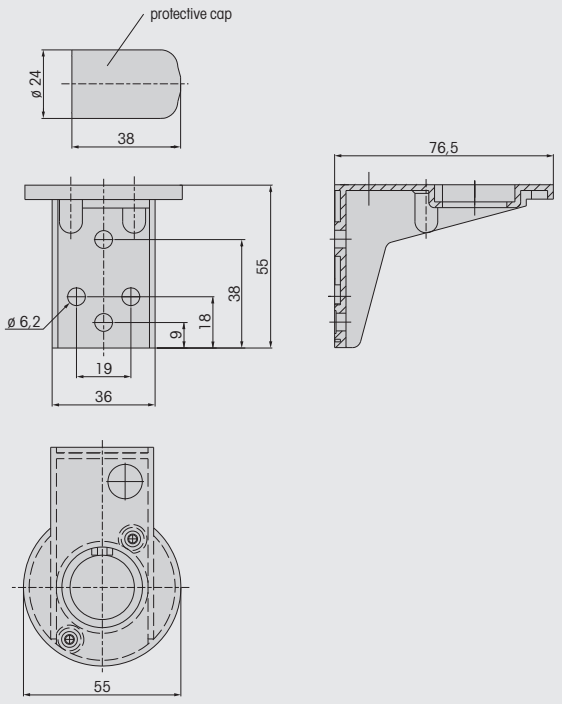
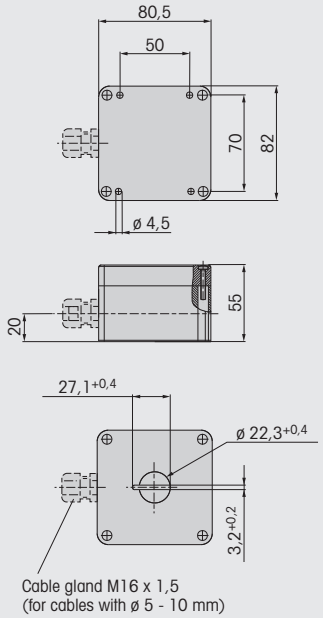
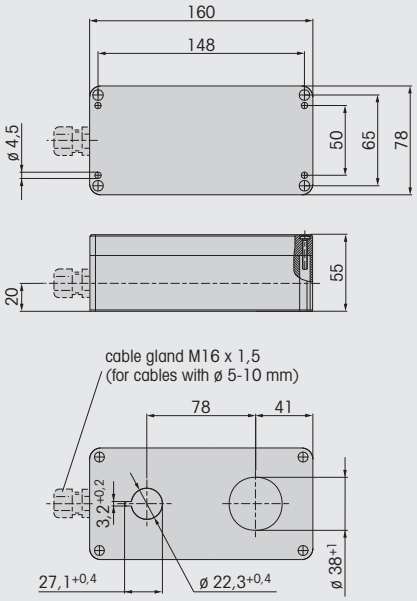
975 109 01 Bracket



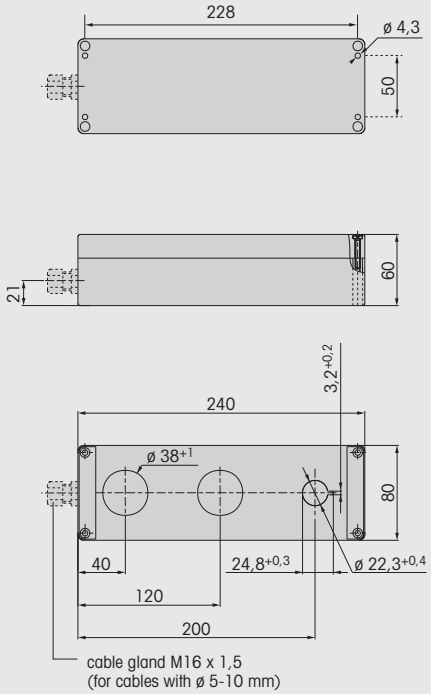
975 109 02 Surface housing single



975 109 03 Surface housing double



975 109 04 Surface housing triple



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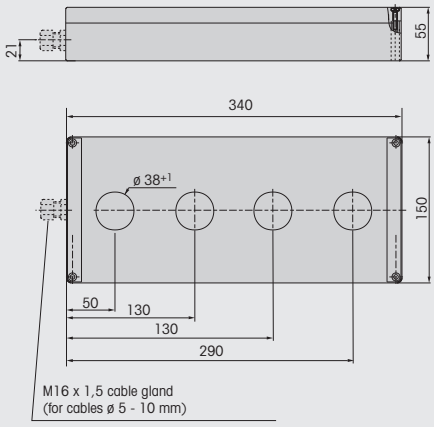
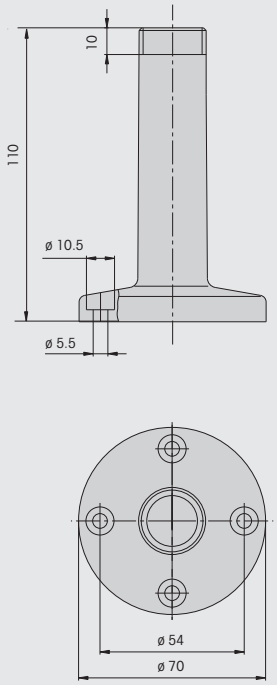
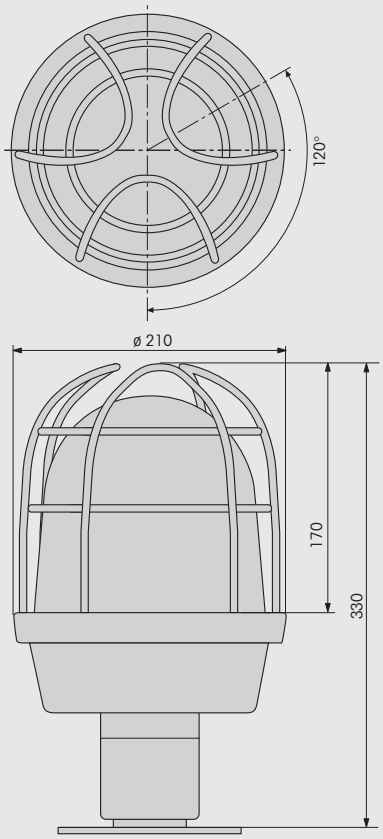
975 109 05 Surface housing quadruple



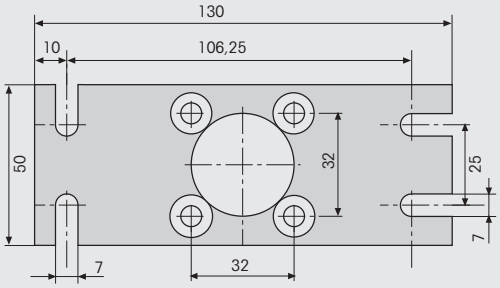
975 209 01 Base with tube



975 783 01 Wire guard



975 783 01 Mounting plate



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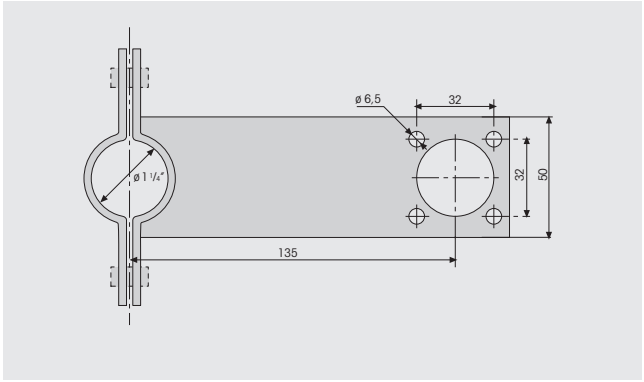
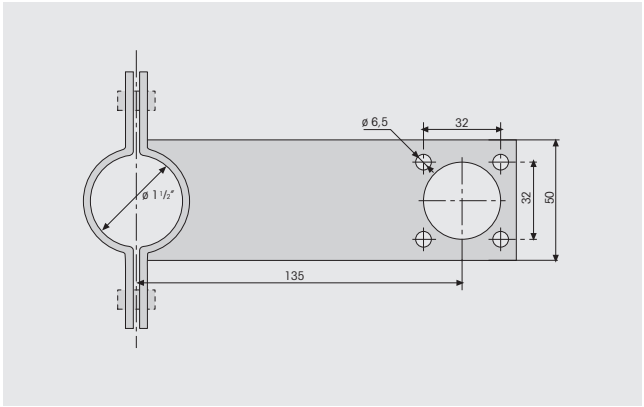
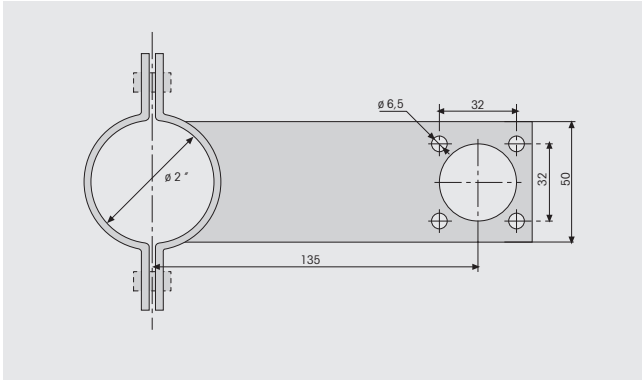
975 783 03 Clamp for tube mounting 1¼"



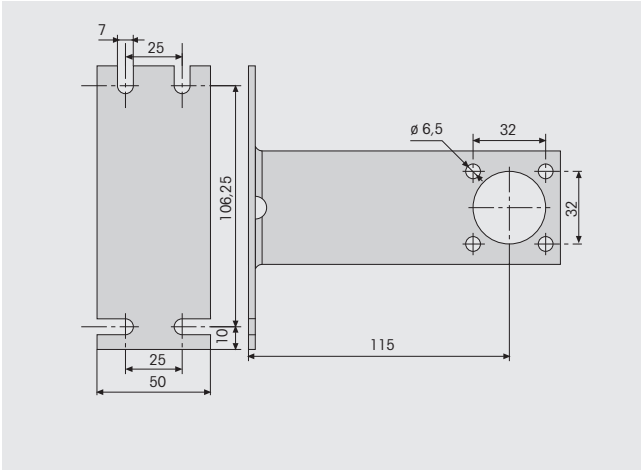
975 783 04 Clamp for tube mounting 1½"



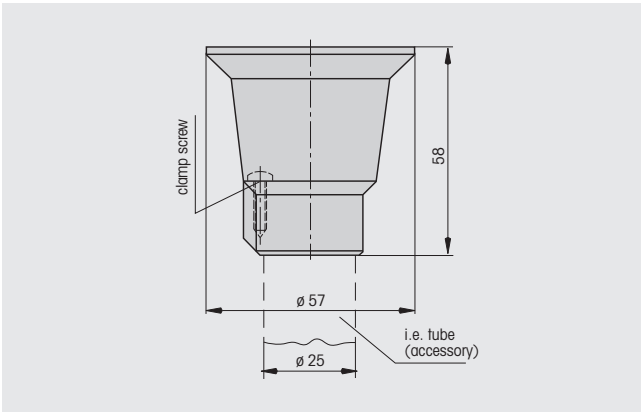
975 783 05 Clamp for tube mounting 2"



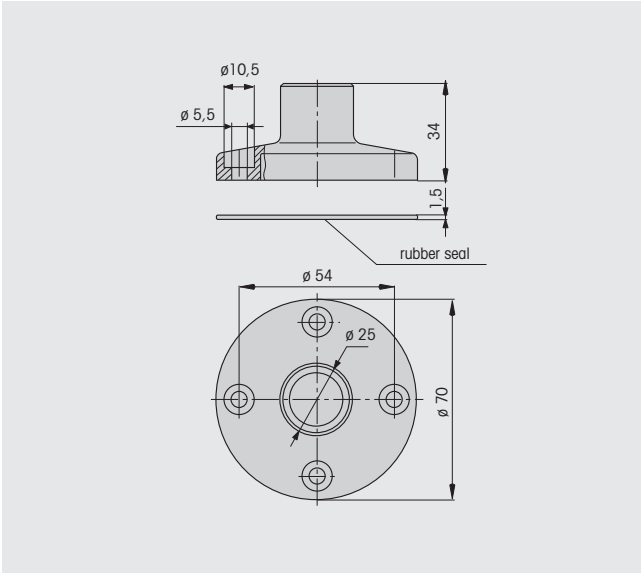
975 783 06 Bracket



975 812 01 Tube adapter



975 812 02 Base for surface mounting



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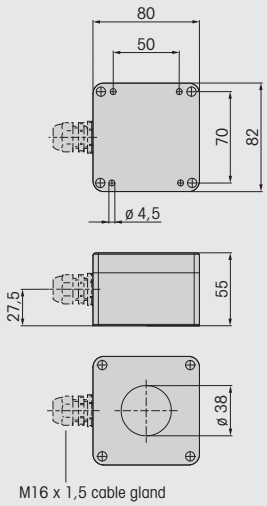
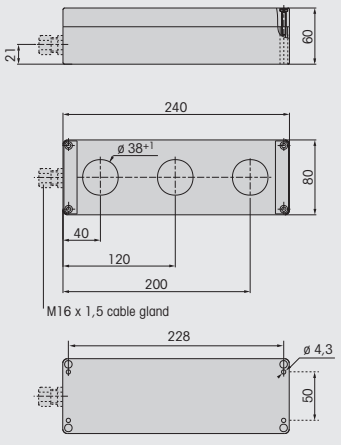
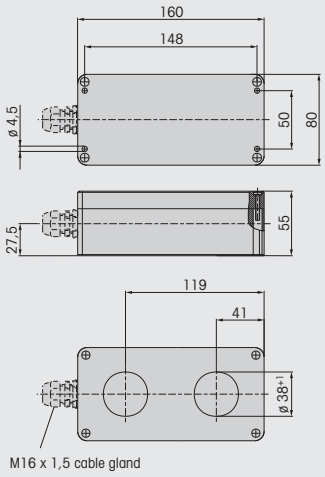
975 815 03 Surface housing single



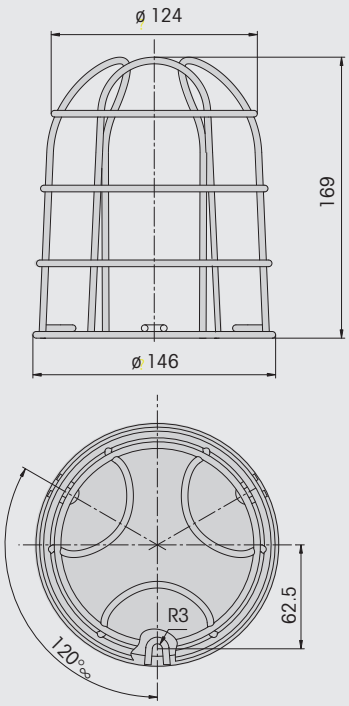
975 815 08 Surface housing triple



975 815 07 Surface housing double



975 826 03 Wire guard



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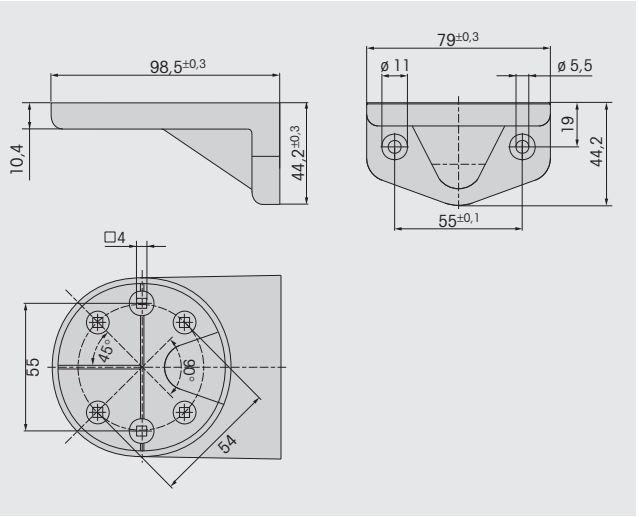
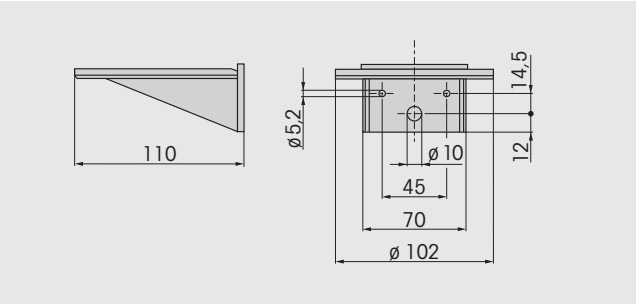
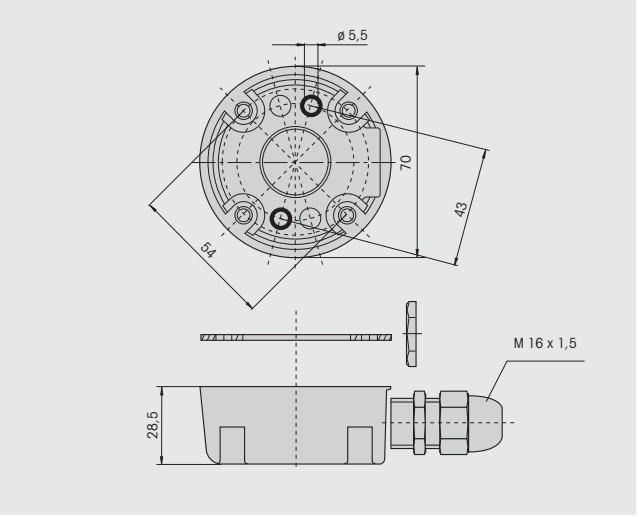
975 826 05 — **Bracket**



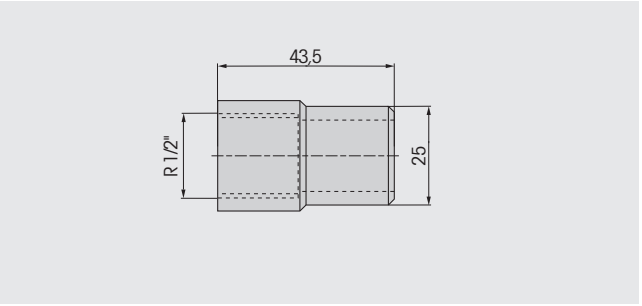
975 835 01 — **Bracket**



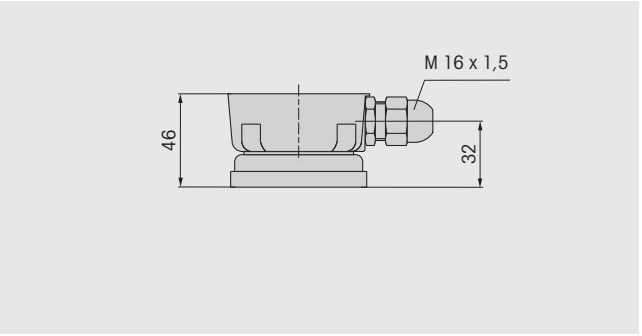
975 840 01 — **Adapter box**



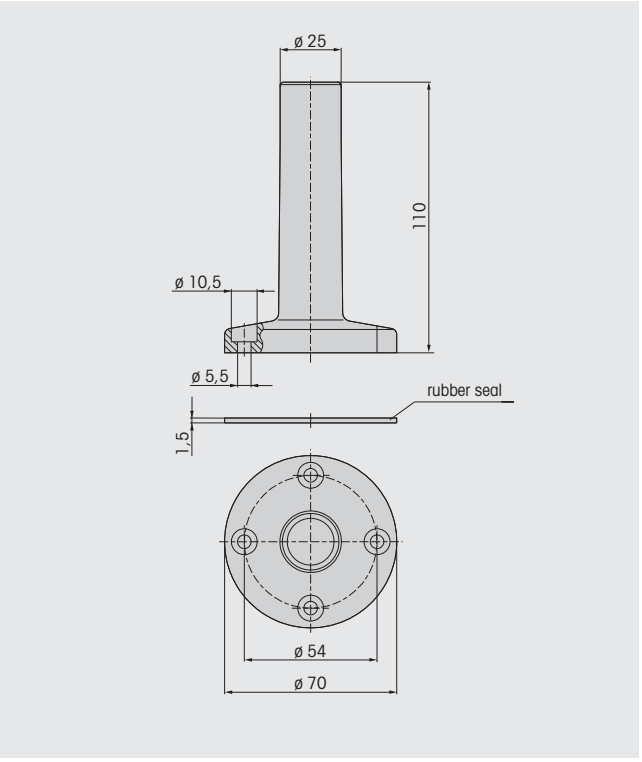
975 840 02 — **Adapter**



975 840 04 — **Contact box with magnetic base**



975 840 10 — **Base with tube**



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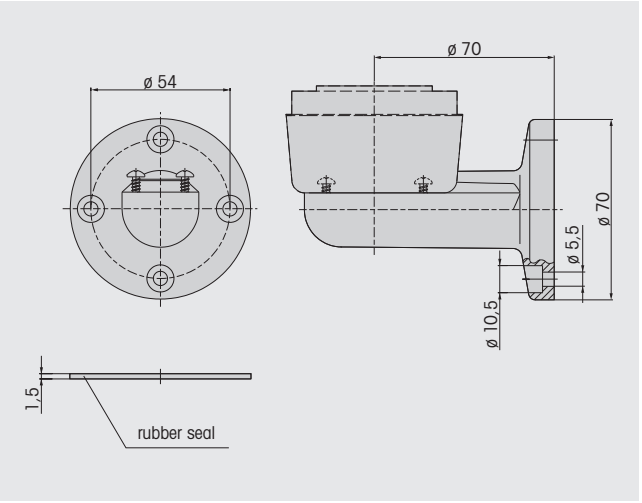
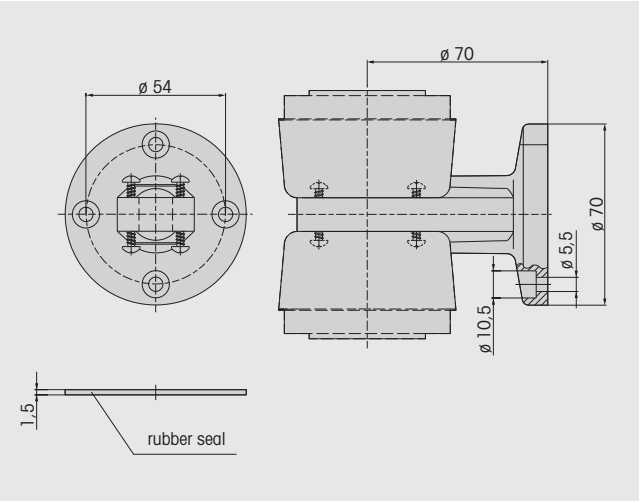
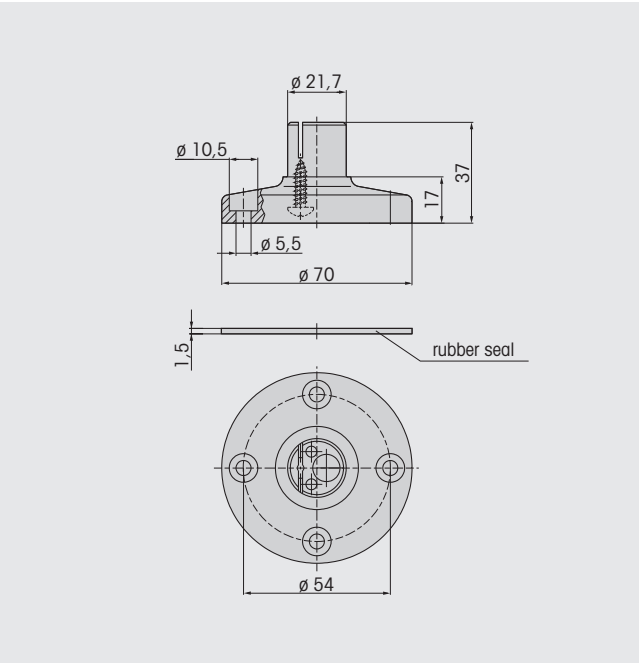
975 840 85 — **Bracket**



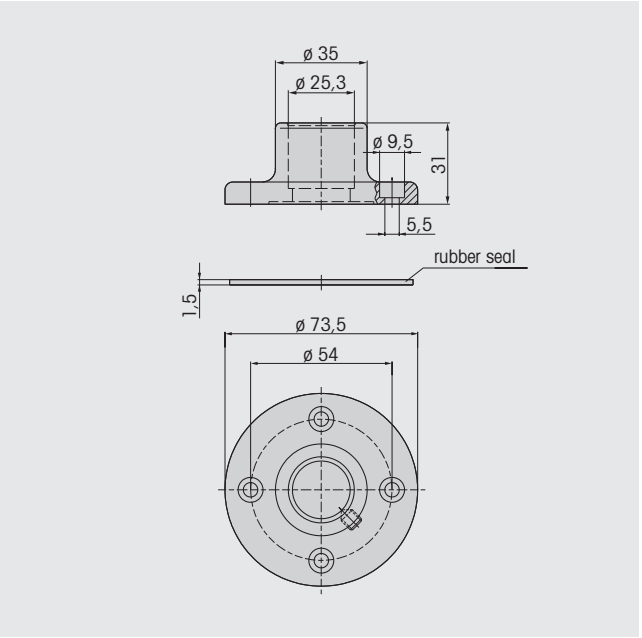
975 840 86 — **2-sided bracket**



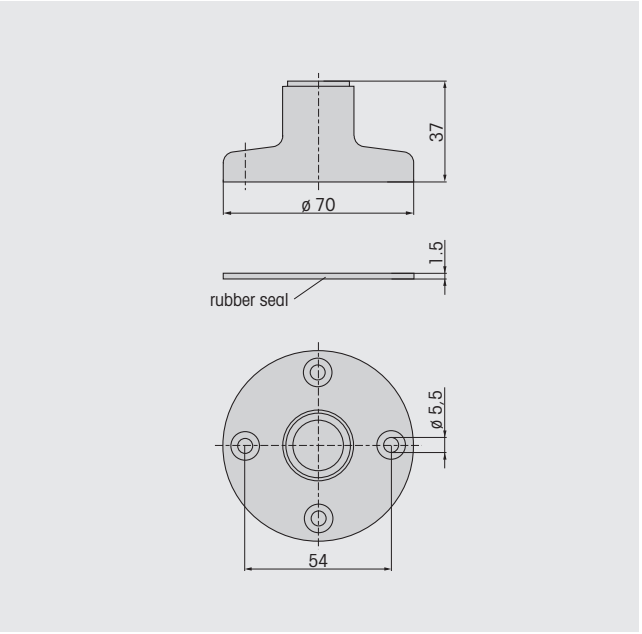
975 840 90 — **Base for tube, plastic**



975 840 91 — **Base for tube, metal**

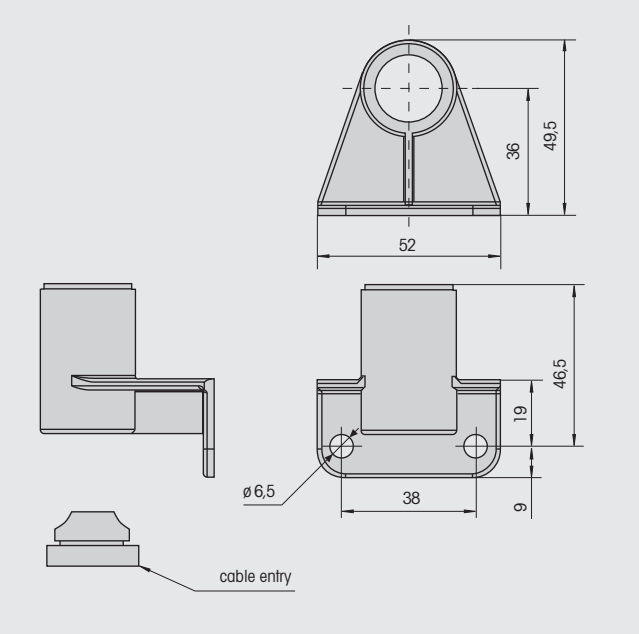


975 845 01 — **Base for surface mounting**

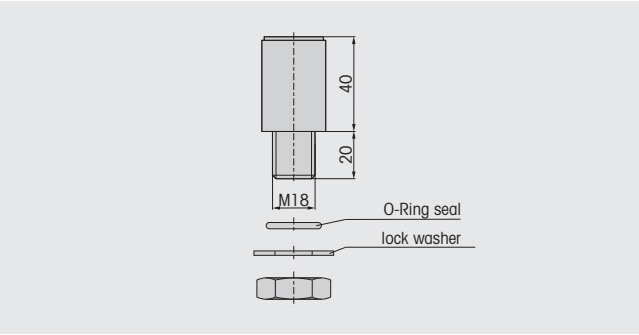


Technical Diagrams Accessories

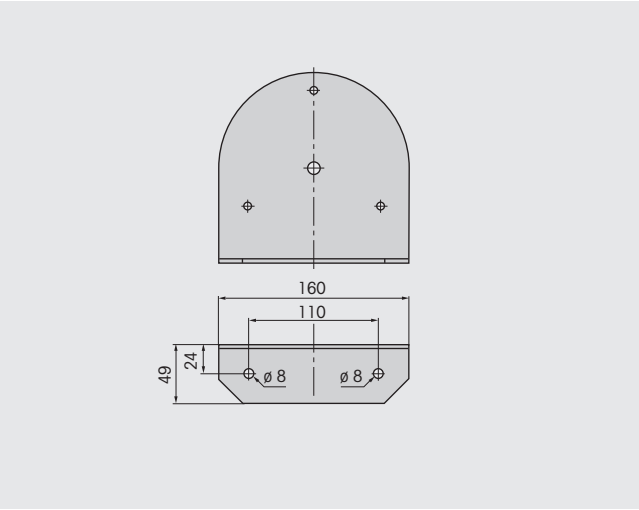
975 845 02 **Bracket**



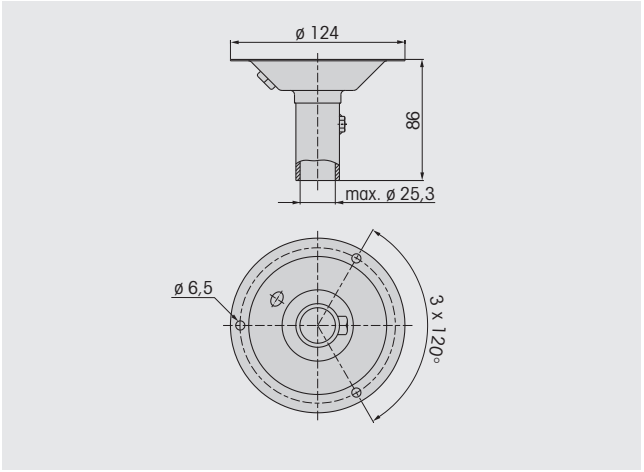
975 845 03 **Adapter for single hole mounting**



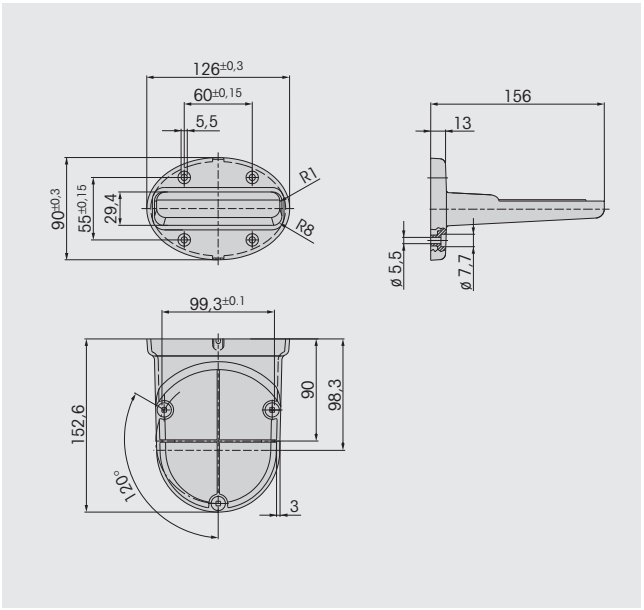
975 881 01 **Bracket**



975 883 02 **Flange for tube mounting**



975 883 06 **Bracket**



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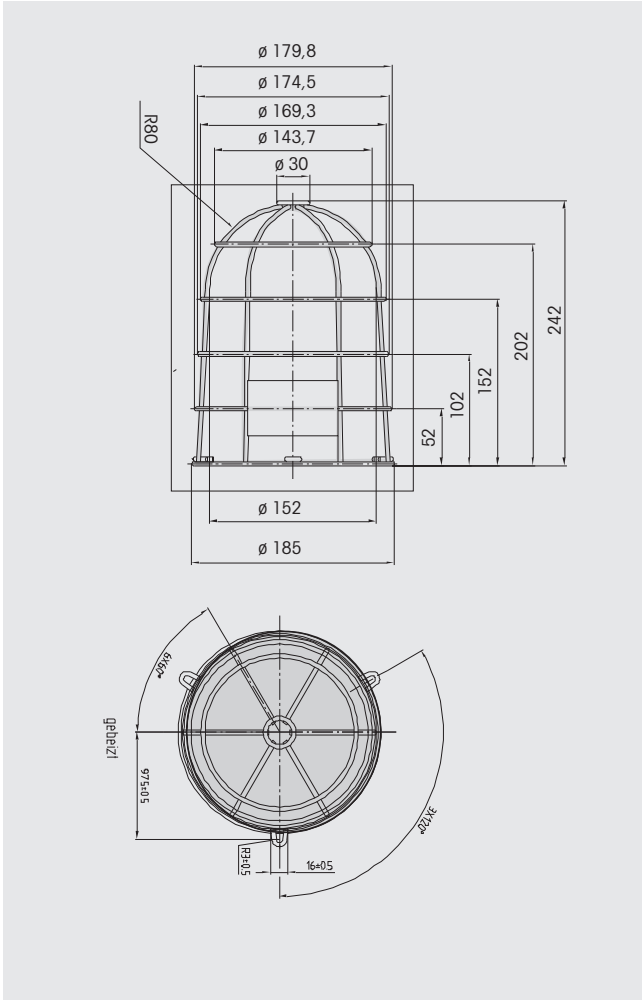
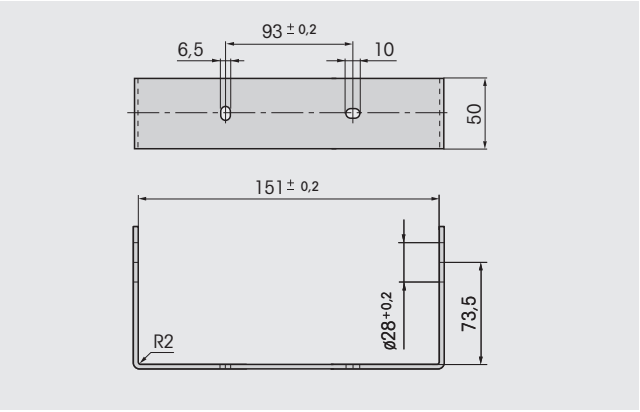
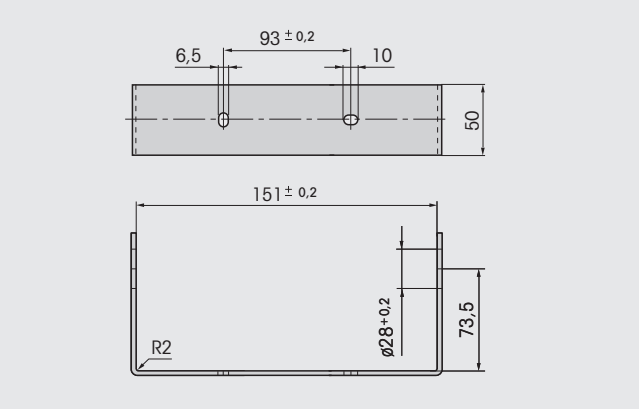
Technical Diagrams Accessories

975 883 08 **Wire guard**



975 890 19
975 890 21
975 890 22 **Fixing bow**





General Information

Overview

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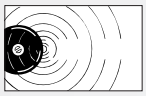
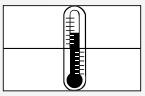
Key to Pictograms

Protection rating according to EN 60 529: Explanation page 257



Volume in decibels (dB (A)) measured at 1 m distance

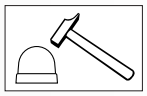
Net weight excluding packaging, in grams, ie. kgs



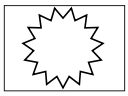
Working temperature in °C, highest and lowest rating

Special version for drive and triggering by PLC

Flash energy in watt seconds (Joules)



Impact resistance in Joules



Light intensity in candela. Explanation page 256

Product descriptions

The product descriptions found in the price list and on all documents is with immediate effect made up of the following information:

Product type:
Electronic Buzzer
LED Permanent Beacon
etc.

Fixing:
BM = Base mounting
BWM = Base/Bracket mounting
EM = Installation mounting
RM = Tube mounting
WM = Bracket mounting

Tone type:
32 tones
4 tones
etc.

alternating
cont./pulse
continuous
pulse

Voltage:
12 V
24 V
115 V
230 V
etc.

Voltage type:
AC
DC
UC

Colour:
BK = black
BU = blue
CL = clear
GN = green
GY = grey
RD = red
YE = yellow

Examples:
Electr. Buzzer_EM_Continuous tone_115 V UC
LED Permanent Beacon_EM_24 V DC_RD

General notes on catalogue descriptions

Sound levels and frequencies

The specified sound levels are based on tests carried out in our factory. These levels are typical for the specific products and inevitably subject to variation. Mounting position and/or type can alter specifications.

The rated frequencies of buzzers are also dependent on the tolerances of the individual components and can vary up to 500 Hz from the quoted rating. No frequency rating can be stated for horns as the spectrum is so wide that any stated rating cannot be accurate. The fundamental frequency for AC devices is 100 Hz, for DC devices c. 200 - 500 Hz. This means that they emit a deeper tone than piezo devices which have values typically between 2000 and 3000 Hz.

Current consumption

The current consumption levels quoted are standard values. The ratings are based on the virtual value for AC, i.e. the average value for DC.

The measured value is normally calculated over a period of 10 seconds. The highest current consumption rating can be considerably higher than the calculated rating.

The starting current of a product can be above the rated current by ten fold.

Assured values

The technical specifications of our products have been rigorously and thoroughly tested. A quality guarantee according to § 463 BGB is however only applicable where expressly stated.
WERMA is only liable for damage arising from the failure of guaranteed properties when the guarantee was expressly intended to protect the customer from this damage.

Measurements, weights, ratings and illustrations are subject to technical amendment.

Marks of conformity and protection types

All WERMA products bearing the CE mark conform to current EC regulations and are tested for adherence to EMV codes.

Products with this mark have been tested and registered by UL for the North-American market. This confirmation is also valid for Canada. Their production is checked by UL.

VDE mark for devices used as a technical working element as defined by the Device Safety Law (GSG), for medical products as defined by the Medical Products Law (MPG), for installation material and components.
The VDE mark verifies conformity with the VDE regulations or the European/internationally harmonised norms and confirms compliance with the protection requirements of the relevant guidelines. The VDE mark stands for the safety of the product with regard to electrical, mechanical, thermal, toxic, radiological and other dangers.

REG.-Nr. XXXX

VDE register number (VDE cerificate with production monitoring).
We use this mark on two conditions: Compliance with relevant paragraphs of VDE norms, if a fully relevant VDE norm for the product does not exist or if the product, e.g. assembly, requires special conditions for its use in devices. For cables and wires the VDE register number or relevant mark is used if no special conditions exist for these products but they could be tested by refering to existing norms. Special versions for example fall into this category as well as all versions with non-normed cables and wires.

Devices bearing this mark and number are authorized for use in hazardous areas. Ex-devices guarantee a high level of resistance to extreme conditions.

This mark confirms that the product is suited to the intended application and conforms to the relevant standards and guidelines. In addition, the technical specifications provided by the manufacturer are certified by the TÜV.

The VdS guidelines contain the standards which signal devices must fulfil in order to be built into intruder and fire alarm systems.

e11

This approval symbol documents that the product fulfills the minimum technical requirements for use on vehicles.

Key to optical and audible signals

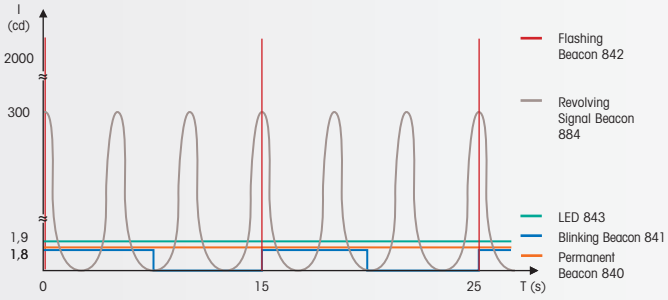
optical signals	
colour	**meaning**
red 	extreme danger / hazardous conditions
yellow 	beware / dangerous conditions imminent
green 	normal conditions
blue 	conditions requiring defined action
white/ clear 	no particular meaning

audible signals	
signal tone	**meaning**
MULTI-TONE: scale in differing frequencies (various high / low frequencies) with regular, cyclical intervals	extreme danger / immediate action
TWO-TONE: scale in differing frequencies (one high, one low frequency) with regular, cyclical intervals	extreme danger / immediate action
ALTERNATING TONE: continuous tone with graduated decrease and increase of sound frequencies	danger / immediate action
PULSE TONE: regular intervals between on and off cycle	danger / immediate reaction
CONTINUOUS TONE: continuous tone in specific frequency	safety

Light intensity of optical signal devices

Light intensity of LED

Details pertaining to beacons with LED are based on a standing of December 2000. Component-related improvements are continually developing; please enquire as to the current light intensity should the need arise.



Light intensity of beacons with bulbs

Light intensity pertains to the bulbs used by WERMA; the use of other bulbs may lead to discrepancies.

Specifications made on product pages

The light intensity of optical signal devices is given in the form of a pictogram. Specifications are based generally on signal beacons with 24 V DC with a clear dome.

Exceptions to the operating voltage are rotating mirror beacons 880, 881, 883 and rotating signal beacon 884. These are quoted in the most common version with 230 V AC.

Testing is carried out with the beacons in the most frequent working position and therefore in the observer's field of vision.

	Voltage	Dome colour	Light intensity in candela
Permanent light	24 V DC	clear	max. value
Flashing light	24 V DC	clear	Blondel-Rey*
LED permanent light	24 V DC	clear	max. value
Rotating mirror beacon	230 V AC	clear	Blondel-Rey*
Revolving beacon 884	230 V AC	clear	Blondel-Rey*

*The Blondel-Rey value defines the physiological perception of brightness.

Protection ratings

Protection ratings for signal devices: Protection ratings for housings DIN EN 60529 (DIN VDE 0470 IEC 60529).

First digit:
degree of protection against contact with dangerous parts and the intrusion of foreign particles.

IP 0X no protection

IP 1X protection against contact with the back of the hand.

IP 2X protection against finger contact with live or moving parts in the appliance. The test finger with ø 12 mm and 80 mm length must not come into contact with dangerous parts. A ball of 12.5 mm diameter should not be able to fully penetrate the housing.

IP 3X test bar ø 2.5 mm may not penetrate the housing.

IP 4X a wire with ø 1 mm may not penetrate the housing.

IP 5X complete protection against dust cannot be guaranteed, but dust is not able to accumulate in such a way as to impair the operation of the device.

IP 6X total protection against dust (no penetration).

Second digit:
degree of protection against water.

IP X0 no protection.

IP X1 protection against vertically falling water drops.

IP X2 protection against water drops so long as the device is tilted to an angle of 15°.

IP X3 protection against water spraying at any angle up to 60° to the vertical.

IP X4 protection against water spraying at any angle.

IP X5 protection against jets of water directed from any angle at the appliance.

IP X6 protection against heavy seas. A strong jet of water may not harm the appliance.

IP X7 protection against occasional immersion.

IP X8 protection against permanent immersion.

Comparison between NEMA and IEC protection ratings – classification

NEMA Protection Type Number	IEC Protection Classification Designation	NEMA Protection Type Number	IEC Protection Classification Designation
1	IP 10	4 and 4 X	IP 56
2	IP 11	5	IP 52
3	IP 54	6 and 6 P	IP 67
3 R	IP 14	12 and 12 K	IP 52
3 S	IP 54	13	IP 54

Cannot be used to convert IEC Classification Designations to NEMA Type Numbers.
Note: This comparison is based on tests specified in IEC Publication 60529.

AS-Interface

AS-Interface, the Actuator Sensor Interface and its distinctive 'yellow cable' is one of the most innovative networking solutions in modern automation technology.

Concieved in 1990 as a cost-efficient, feature-rich alternative to conventional hard-wiring, AS-Interface has now been proven in hundreds of thousands of products and applications spanning the entire automation spectrum.

AS-Interface offers many of the benefits of more powerful and expensive fieldbuses, but at much lower cost and at much simpler application. The complete network is controlled automatically by a 'master' which polls the network sending and receiving data from each connected device in turn. It automatically senses and registers any connected devices, thus neither configuration nor application-specific software for the master is necessary.

Unique technology

Due to the cable structure, AS-Interface offers a unique mounting technology. Without any cutting or removal of insulation, sharp pins penetrate the cable insulation making the electrical contact as the connection elements are closed. This technology ensures protection up to IP 65.

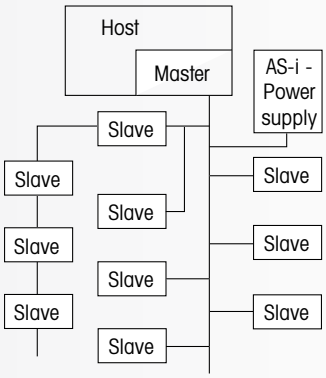
Cost savings

In general, applications from as few as ten sensors and actuators to very large systems can benefit, especially when the whole life cost advantages are taken into account. Distributing the input and output functionality is one starting point for cost savings, enabling point to point wiring systems to be reduced to a single cable, eliminating or reducing cable trees, service cabinets and multiple connectors. The special AS-Interface connection technology replaces work-intensive wiring. The tree structure permits better optimised system design and improved layouts, bringing easier installation and maintenance. Network configuration is eliminated.

WERMA Signaltechnik GmbH & Co. KG has been a member of the AS – Interface® Association since 1996.

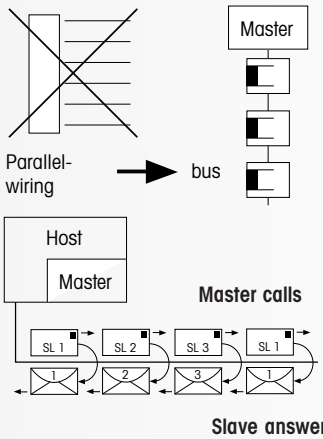
WERMA's product range encompasses products with AS-Interface® for Kombi*SIGN* 50, 70 and 71 as well as customised developments. The entire BUS electronic system is integrated in the element placed at the base of the signal tower. 3 signal tower elements in conjunction with up to 62 addresses or 4 signal tower elements in conjunction with up to 31 addresses can be assembled on top of the AS-Interface element (see pages 47 + 57). Modern LED technology in light elements makes it possible to obtain both energy and data directly out from the yellow dual wire cable.
The Kombi*SIGN* AS-Interface® elements offer the customer beneficial features such as an addressing socket and a status LED. In addition the voltage supply for the element is switchable between an internal bus supply or an additional external supply.

System Survey



- Single master-slave principle
- Up to 62 slaves with one master
- Per slave up to 4 digital inputs + 4 digital outputs
- Max. 248 digital inputs and outputs
- Additional 4 parameter bits/salve
- Also possible: analogue I/O
- Electronic slave addressing
- Free structure of the network

How AS-Interface® works



- AS-Interface® – a bus system, which subsitutes parallel wired installation from pic to sensors and actuators
- Data and energy on the same cable
- 1 Master and max. 62 slaves
- Total cycle time < 10 ms – with max. number of 32 slaves
- Master-slave principle: The master calls and the called slave answers immediately

Cable power

The yellow cable can carry up to 8 A, which means that no additional wiring is required in typical installation. Several hundred mA may be drawn by a single slave device on the network. Where higher power is needed, or for emergency stop situations, a black secondary DC or AC power cable offers complementary advantages. If round cable is preferred, a wide variety of screw and push-fit termination modules permits that too, with no performance compromise.

www.werma.com – The Signal Device Site on the Internet

Just a few clicks from your goal – WERMA's new Internet presence

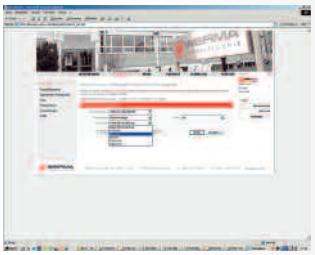
In April of this year the completely redesigned WERMA homepage was placed online. You can now find a range of tools under www.werma.com, considerably improving the product search and providing significant additional benefits for our customers. Anyone can now locate the desired information and products, quickly and effectively – or simply piece together their own individually tailored solutions.

Pay us a virtual visit and check out the new site!

Uniform design – strong presence!

With a quicker load time and a bright, attractive appearance, the new website provides the customer with an immediate overview of the most important topics directly on the start page.

With the **„Click&Find"** search, the customer selects the **product characteristics** (e.g. type of audible signal) from the „Drop-down" menu and is immediately directed to the required signal device.



Signal tower configurator – with a few clicks to your individual product

Individual customer requirements are of vital importance to WERMA Signaltechnik: with the help of interactive pictures and questions the new "configurator" enables the customer to quickly and easily assemble a signal tower according to his wishes.

Quick and user friendly product search

Our product search system is now even simpler, especially tailored to the individual needs of our customers: using three different search functions everyone can now find the product they are looking for.

For those who are still not sure which product they require, the **product categories** can be employed for navigation purposes. The narrower the selected category, the closer the product match to the customer requirements.

For those who already know precisely which product they require, the desired **order number** can simply be entered into the search field at the top right hand corner.

Extensive download area

The download area provides an extensive range of information for our customers. Technical drawings, instruction leaflets, technical data sheets and product photos can be printed out at any time.

Sales Network – Germany

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06 / 07 39 98 / 99	Ingenieurbüro Automatisierungstechnik Dr.-Ing. Klaus Zimmermann Hauptstr. 15 06493 Neudorf Tel. (03 94 84) 63 64 Fax (03 94 84) 63 19 E-mail: ib-zimmermann@gmx.de
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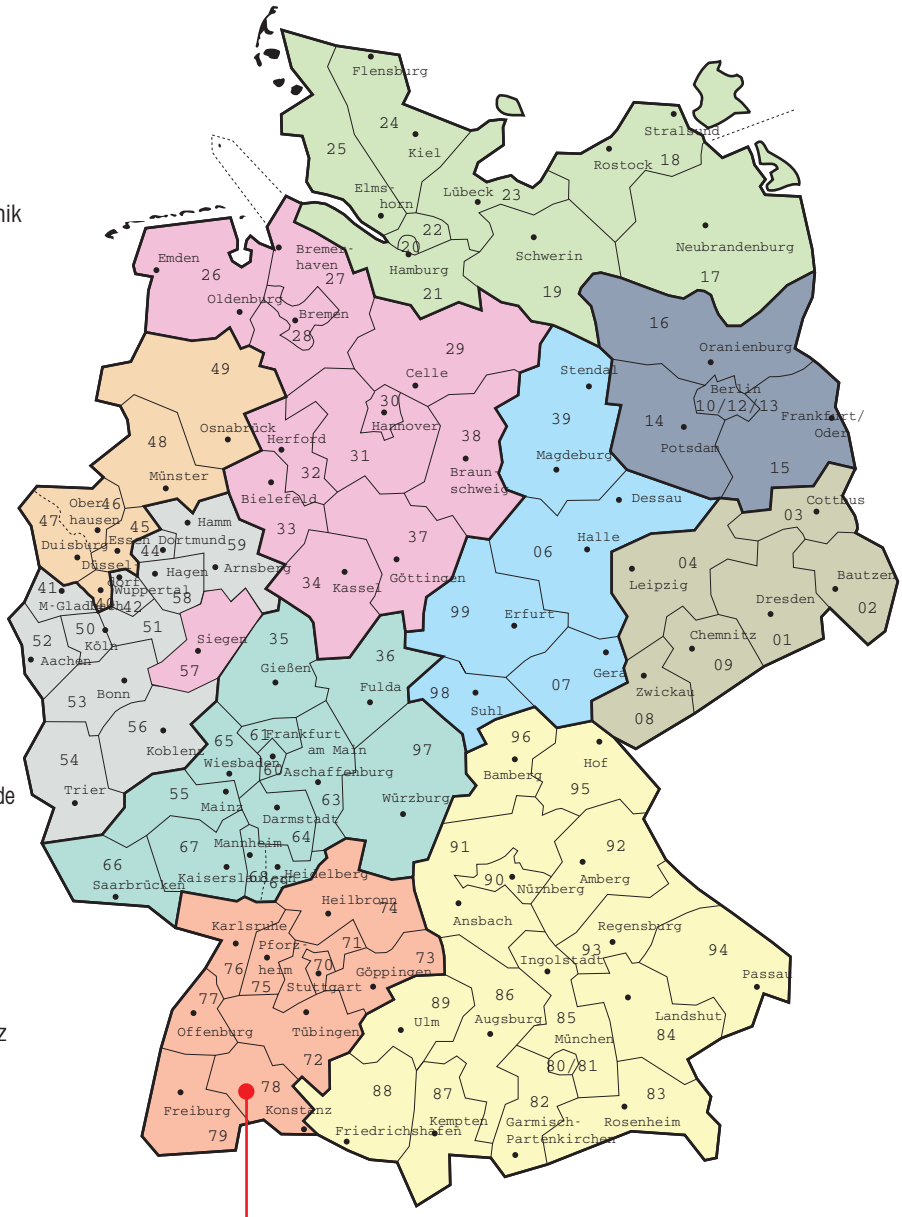

70 - 79	**Location:** WERMA Signaltechnik GmbH + Co. KG Dürbheimer Str. 15 78604 Rietheim-Weilheim Tel. (0 74 24) 95 57-0 Fax (0 74 24) 95 57-44 E-mail: info@werma.com Internet: www.werma.com

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Terms and Conditions for Delivery and Payment

All supplies and services from our Rietheim, Germany plant are subject to the "General Conditions of Supply for Products and Services of the Electronic Industry" (ZVEI). Any divergent conditions are set in italics.

The foremost articles are listed hereto:

1. General conditions

The scope of the supplies or services (hereinafter called "Supplies") are defined by the written declarations of both parties to the contract. General terms and conditions of the Purchaser apply only where expressly accepted in writing by the Supplier or service provider (hereinafter called "Supplier").

Partial Supplies are permissible where they can be reasonably expected of the Purchaser.

2. Prices and terms of payment

Our prices are net prices, without V.A.T. or packaging charges and are valid from factory premises.

The minimum order sum for inland deliveries is 30.- EUR, for overseas deliveries 130.- EUR. A surcharge of 6.- EUR will be imposed for inland orders of less than the above sum and 13.- EUR for overseas orders of less than the above sum.

All payments are to be effected at the latest within 30 days of the date of invoice unless otherwise stated. WERMA grants 2% discount for payments effected within 14 days from the date of invoice.

Initial deliveries are on the basis of payment in advance or payment on delivery.

3. Retention of title

The items of Supplies (Secured Goods) remain property of the Supplier until each and every claim against the Purchaser to which the Supplier is entitled under this business relationship has been duly satisfied. If the value of all security rights of the Supplier exceeds the value of all secured claims by more than 20%, the Supplier will release a corresponding part of the security rights at the Purchaser's request.

In cases of breaches of liabilities on the part of the Purchaser, in particular a default in payment, the Supplier is entitled to termination and to take back the goods. *The taking back or assertion of the retention of title does not require termination by the Supplier. No termination of contract shall arise in these circumstances or on a seizure of the goods by the Supplier, unless the Supplier should have expressly declared this.*

WERMA's proprietary right expires only upon full payment.

4. Time for delivery and delay

Observance of the *stipulated* time for delivery is conditional upon the timely receipt of all documents, necessary permits and releases, especially of plans to be provided by the Purchaser, as well as fulfilment of the agreed terms of payment and other obligations by the Purchaser.

If non-observance of the time for delivery is due to force majeure such as mobilization, war, riot or similar events, e.g. strike or lockout, such time shall be extended accordingly.

5. Transfer of risk

Even where "carriage paid" delivery has been agreed, the risk passes to the Purchaser as follows:

If the supply does not include assembly or erection, when goods have been delivered to or picked up by carrier. At the Purchaser's request and expense, supplies can be insured by the Supplier against the ordinary risks of transport.

6. Taking delivery

The purchaser may not refuse acceptance of deliveries on account of minor defects.

Goods may only be returned using the standard postal service and upon agreement with WERMA. A surcharge of 20% of the product value is payable for the return of standard goods, that is at least 30.- EUR to cover the cost of unpacking, checking and re-packing in the interests of the next purchaser. Damaged goods and special articles (i.e. all articles which are not listed with order number in the currently valid catalogue) may not be returned.

7. Warranty

The Supplier shall be liable for material defects as follows:

All those parts or services which display a material defect within the limitation period (regardless of the period of operation) shall at the discretion of the Supplier be improved subsequently without payment, re-delivered or re-rendered, provided that the cause of this was already present at the time of passing of risk.

Claims for material defect shall be barred after 24 months. This shall not apply in as far as statute prescribes longer periods by virtue of sections 438 (1) (2) (builings and building materials), 479 (1) (claim under a right of recourse) and 634a (1) (2) (building defects) BGB.

The Purchaser shall notify the Supplier in writing of material defects without delay.

Payments by the Purchaser may be withheld on notification of defect to such an extent as bears a reasonable relationship to the material defects arising. The Purchaser may only withhold payments if notification of a defect is given, for which there is unquestionable justification. The Supplier may require the Purchaser to reimburse the expenses arising from cases where the notification of defect is unjustifiable.

The Supplier shall initially always be allowed the oppotunity of subsequent performance within a reasonable period of time. The Purchaser may rescind the contract or reduce the payment regardless of any claims for damages in pursuance of section 9 hereto, if the subsequent performance shall fail to be effective.

Claims based on a defect shall not arise merely for a slight discrepancy from the agreed characteristic, for merely slight impairment

to usefulness, for natural wear of loss which arises following the passing of risk as a consequence of improper or negligent treatment, excessive use, unsuitable operating materials, defective building work, unsuitable building ground or which arise by reason of particular external influences which are not anticipated by the contract, as well as for defects in software which are not reproducable. No claims based on a defect shall similarly arise for the consequences resulting from improper modifications made or improper repair work carried out by the Purchaser or third party.

Claims by the Purchaser for expenses necessitated for the purposes of subsequent performance, in particular costs of carriage, transport, work and materials are excluded to such an extent as the expenses increase because the subject matter of the delivery has been subsequently conveyed to a location other than the place of business of the Purchaser, unless the conveyance corresponds with its use according to contract.

Legal claims by the Purchaser against the Supplier under a right of recourse shall only arise inasmuch as the Purchaser has not entered into any agreements with its custoner over and above the statutory claims arising for defects. The preceding paragraph shall further apply correspondingly to the extent of the claims under a right of recourse of the Purchaser against the Supplier.

Furthermore, section 9 hereto (further liability) shall apply to claims for damages. More far-reaching or further claims by the Purchaser agains the Supplier and those acting on its behalf on account of a defect other than those regulated in this section are excluded.

8. Impossibility of performance, revision of contract

The Purchaser may demand damages to such extent as the delivery is impossible unless the Supplier is not responsible for the impossibility. The claim for damages of the Purchaser shall however be limited to 10 % of the value of that part of the delivery which can not be taken into useful operation by reason of the impossibility. This limitation shall not apply in so far as liability is imposed by law in cases of wilfulness, gross negligence or on account of death, physical injury or impairment to health. An alteration in the onus to proof to the detriment of the Purchaser is not connected herewith. The right of the Purchaser to rescind the contract shall remain unaffected.

Where unforeseeable events as described in Art. 4 paragraph 2 substantially change the economic importance or the contents of the supplies or considerably affect the Supplier's business, the contract will be adapted accordingly with due regard to the principle of good faith. Where this is not economically reasonable, the Supplier has the right to terminate the contract. If the Supplier wants to make use of this right of termination, he has to notify the Purchaser in writing immediately after becoming aware of the significance of the event. This applies even where at first an extension of the delivery time had been agreed with the Purchaser.

9. Further liability

Claims by the Purchaser for compensation and reimbursement of expenses (hereinafter called "further liability") on whatever legal basis, in particular on account of breach of duties arising out of the contractual obligation and from tortious acts, are excluded.

This shall not apply where liability is imposed by law, for example, pursuant to the law of product liability, in cases of wilfulness, gross negligence, on account of death, physical injury or impairment to health, or on account of breach of material contractual obligations. The further liability for breach of material contractual obligations shall however be limited to forseeable damage typical for a contract, unless wilfulness or gross negligence is present or liability exists on account of death, physical injury or impairment to health. An alteration in the onus of proof to the detriment of the Purchaser is not connected with the said provisions.

10. Competent Court

Sole competent court for any dispute arising directly or indirectly from the above contract is D-78532 Tuttlingen.

All contractual business is regulated by German law, not regarding the United Nations Agreement concerning international sales (CISG).

11. Validity of the contract

Even in case of legal invalidity of individual items, the remaining parts of the contract remain binding save where adherence to the contract would mean an undue hardship on one of the parties.

12. Alterations

WERMA reserves the right to alter its products to the end of technical improvement.

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