SIGNALING TECHNOLOGY

MAIN CATALOGUE EDITION 20

THE COMPLETE SPECTRUM OF SIGNALING TECHNOLOGY.

Visual Signaling Devices | Obstruction Lights
Audible Signaling Devices
Combined Visual-Audible Signaling Devices
Signal Towers | Ex Signaling Devices
Art Illumination

SHARING COMPETENCE

Pfannenberg
ELECTRO-TECHNOLOGY FOR INDUSTRY

We help improve safety.

Pfannenberg's 3D-Coverage: a holistic approach for safety assurance.

Our mission is to help provide protection for humans, machines, and the environment. For many years we have developed technically superior signaling devices and now we have created an approach for system designers to follow to ensure that safety goals are met with correctly sized devices at the project development stage.

This Pfannenberg innovation is “3D-Coverage”. This approach looks at the space or area needing to be covered, the standards or codes that must be met, and the detailed performance characteristics of visual and audible signaling devices needed to ensure the safety of personnel within the space. With this, Pfannenberg is the first company to offer a reliable statement about product performance.

Customers and system specifiers will greatly benefit from Pfannenberg’s 3D-Coverage, which creates transparency for signaling product performance and results in more efficient solutions. Now, with both technically advanced products and an all-inclusive approach for establishing performance criteria, planners can easily compare signaling devices to ensure truly capable performance.

In this, the 20th edition of Pfannenberg’s signaling solutions catalogue, an updated look and feel has been developed to assist with product selection as well as highlighting the many industries in which our extensive experience has been utilised. In addition, with the provided product specific webcodes, more detailed information is just a click away.

With worldwide reach, Pfannenberg is well positioned to offer consultation, rapid product delivery, and after sale services to ensure the success of your next safety requirement.

Last, but not least, contact us to find out how much we can do for you. From ordinary to complex, our extensive legacy of successful signaling deployments has given us the experience to address your every need. Please get in touch.

In keeping with our motto "Sharing Competence", our expert staff is at your service to help you find the best possible solutions for your requirements – now and in the future.

What can we do for you?

Andreas Pfannenberg, CEO

Pfannenberg's specialties extend beyond the product in order to deliver the highest performance.

The breadth of available services is the result of many years of experience. Whatever the requirement, we'll help specify the optimum solution for the circumstance with cost-efficient, high quality equipment and advice.

PRODUCTS

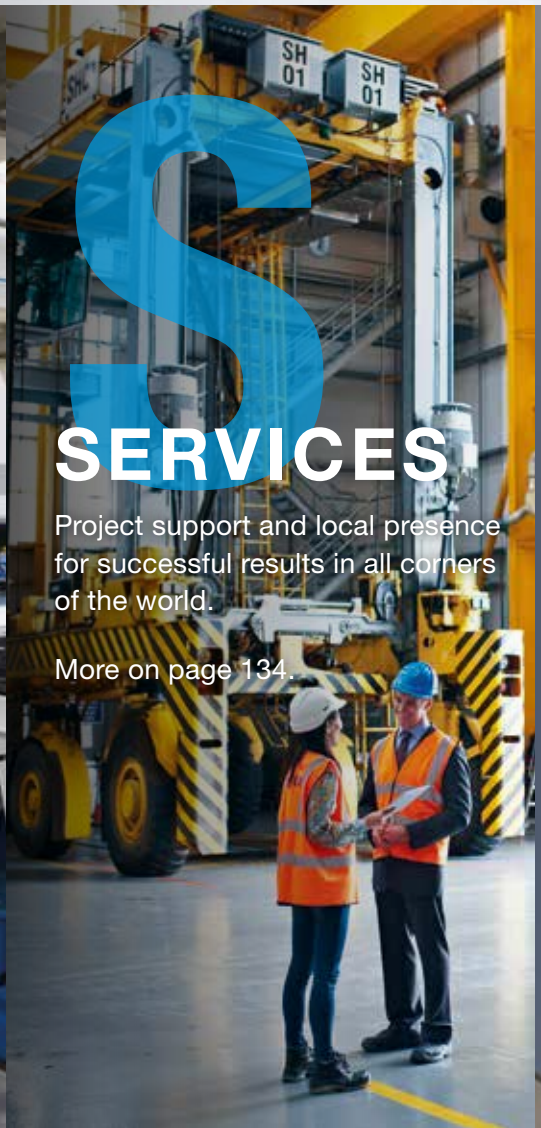
Practical devices for alarm, warning, and indication.

More on page 20.

SOLUTIONS

Requirements-based solutions to ensure protection and safety.

More on page 118.



SERVICES

Project support and local presence for successful results in all corners of the world.

More on page 134.

INDUSTRIES

With experience in many areas we are qualified to address unique situations.

More on page 140.

Pfannenberg 3D COVERAGE

A visual representation of device performance in any space.

A holistic approach to alarm notification planning. Pfannenberg presents 3D-Coverage, a method for determining the actual effective coverage area for audible and visual signaling devices. Now planners can gain confidence in knowing whether signals can be perceived in relation to different environmental conditions and requirements.

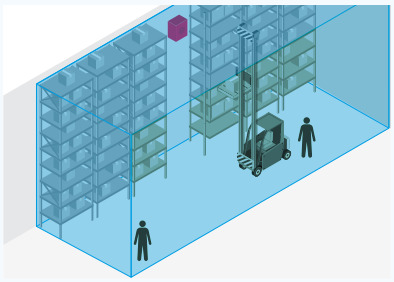
For alarm system planners, specifying engineers, system integrators, and safety managers.

Gain confidence in system design and goals.
Naïve assumptions regarding the performance of signaling devices often lead to under-sizing, which may result in a project being rejected. Expensive upgrades and retrofits may then be required to remedy the situation. 3D-Coverage gives planners the confidence needed upfront for proper sizing with respect to environmental conditions and code requirements. The result is a system that will perform to expectations and be approved.

For all types of alarms in any application.
Regardless of whether the signal is intended for a fire alarm, machinery safety, gas leak alarm, or general workplace safety, 3D-Coverage supports designing the optimal alarm solution. When coverage area and ambient conditions are taken into account, the safety of people and machines is assured.

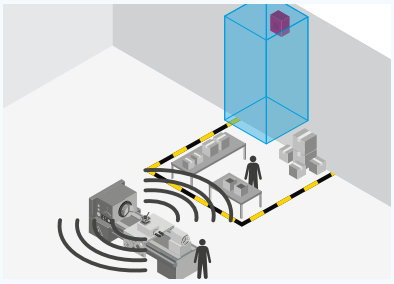
"There are many certified signaling devices to choose from. 3D-Coverage shows me at a glance how well they perform."

Consulting/Specifying Engineer
Job: fire alarm systems in industrial factories, storage facilities, and logistics terminals



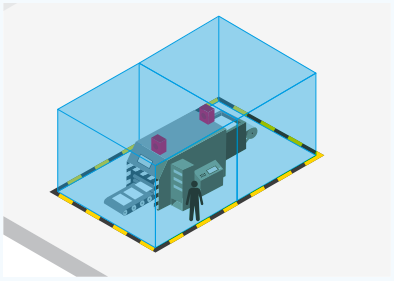
"3D-Coverage clearly shows whether my colleagues at the workbenches are really safe."

Safety Manager
Job: gas detection alarm systems and workplace safety



"3D-Coverage facilitates compliance with machine safety requirements at specific levels of ambient noise."

Operations Manager
Job: machine and tool safety in factories



What is specified on paper is not an indication of performance in a defined space.

The effective coverage parameter.
When designing reliable signaling solutions, one needs to be certain about the area that is to be effectively covered by the signal. 3D-Coverage provides the necessary dimensions to accomplish this since traditional information that is provided on a technical data sheet is insufficient.

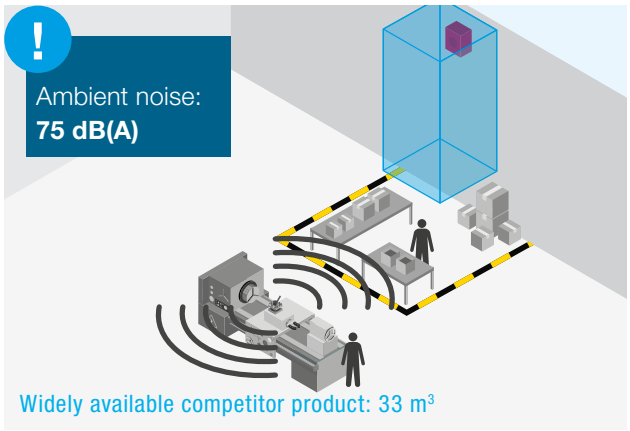
3D-Coverage for audible signaling devices.
In order to determine the actual effective coverage area for an audible signaling appliance, ambient noise and the desired alarm level offset must be considered when sizing the device. Performance by dimension is the only way to be certain that the desired alarm criteria is met by the device.

3D-COVERAGE PERFORMANCE COMPARISON

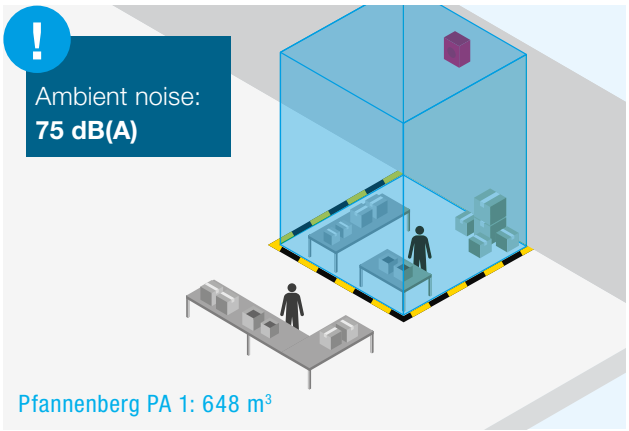
Taking two sounders, for example, each with 100 dB(A) specified nominal output with a requirement to meet 10 db(A) offset over the ambient sound level in accordance with DIN VDE 0833. Alarm tone evaluated is the DIN emergency signal (DIN 33403-3).

PERFORMANCE CLASS	AMBIENT NOISE	OFFSET	REQUIRED SOUND LEVEL	A	B	C	Pfannenberg 3D COVERAGE
Widely available competitor product **100 dB(A)**	70 dB(A)	10 dB(A)	80 dB(A)	6.7 m	5.4 m	5.4 m	195 m^3
	75 dB(A)	10 dB(A)	85 dB(A)	3.7 m	3.0 m	3.0 m*	33 m^3
	80 dB(A)	10 dB(A)	90 dB(A)	2.1 m	1.7 m	1.7 m*	6 m^3
Pfannenberg PA 1 **100 dB(A)**	70 dB(A)	10 dB(A)	80 dB(A)	16 m	14 m	16 m	3,584 m^3
	75 dB(A)	10 dB(A)	85 dB(A)	9 m	8 m	9 m	648 m^3
	80 dB(A)	10 dB(A)	90 dB(A)	5 m	4.5 m	5 m	113 m^3

*NB: Lower than the minimum installation height!



Widely available competitor product: 33 m^3



Pfannenberg PA 1: 648 m^3

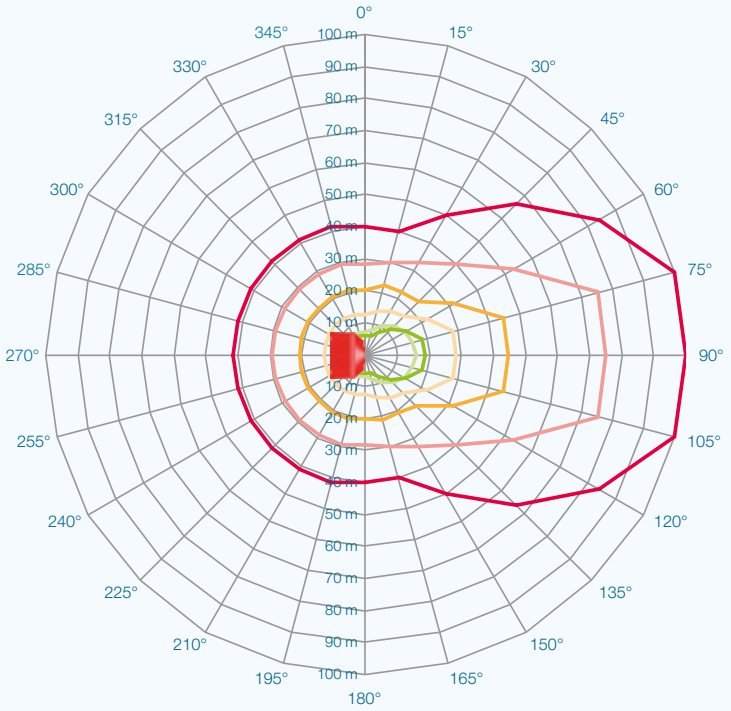
very simplified form

Result:

Despite an identical specified nominal performance of 100 dB(A), there are significant differences in the coverage volume (A x B x C). With ambient noise at 75 dB(A), the Pfannenberg PA 1 sounder achieves a value more than 19 times greater than that of the inferior device.

Balanced range of sounders for spaces of all sizes.

Larger coverage volume from superior technology



Typical coverage volume of Pfannenberg sounders to achieve a required sound level of 80 dB(A), (ambient noise 70 dB(A) plus 10 dB(A) offset).

Audible transmission of a sounder.

Sounder performance is a function of the acoustic driver, the electronics behind it, and the mechanical design of the horn. Not all sounders are created equal. When mapping the sound propagation over a wide dispersion, it becomes clear that some devices are better than others. While it may be evident that the highest output is at a 90° angle in the front of the device, for purposes of effective coverage, it is just as important to consider how sound is transmitted outwards to the sides, top, and bottom. Pfannenberg has optimised all aspects of sounder technology to create the largest coverage area.

Sound generating technology.

Piezoelectric oscillators are used for generating sound in many audible notification appliances since they are inexpensive and have low power consumption. Although these attributes may be appealing, the actual loudness of these devices is much lower than electro-dynamically produced sound, which is the technology used in Pfannenberg sounders. This greater sound generating capacity leads to a larger effective coverage area thereby producing a more effective alarm signal and resulting in fewer devices being needed. Although on paper the piezoelectric device may seem to be a good option, the actual performance to power ratio is noticeably inferior.

True performance revealed.

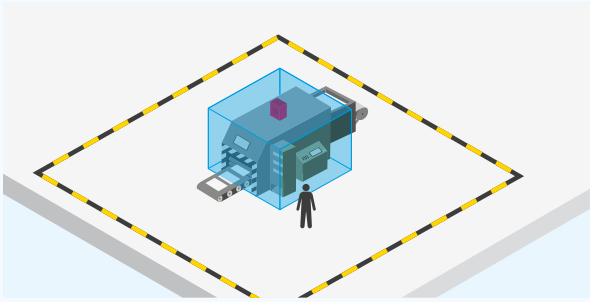
Applications for visual signaling.
Whether signaling for alarm, warning, or indication, the technology used to generate light, the radiation characteristics of lenses and optics, and lens colour are all important characteristics to consider when designing a system to achieve an effective, perceivable signal.

3D-Coverage for visual signaling devices.
The required coverage volume of visual signaling devices varies by local code and application. With 3D-Coverage, it becomes easier to determine effective coverage when overall performance is evaluated with respect to the requirements.

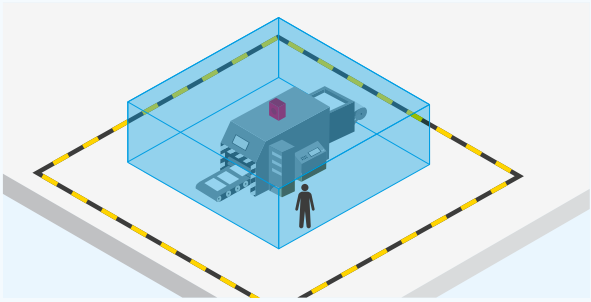
3D-COVERAGE PERFORMANCE COMPARISON

Two flashing lights (red cover versus clear) in alarm and indication applications.

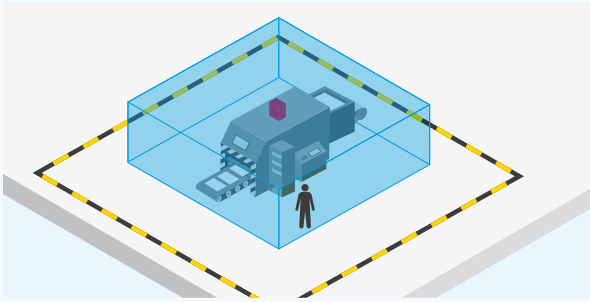
			ALARM		INDICATE	
FLASHING LIGHT	INTENSITY	LENS COLOUR	AREA A x B x C	Pfannenberg 3D COVERAGE	AREA A x B x C	Pfannenberg 3D COVERAGE
PYRA M-10	39 cd	red	11.2 x 7 x 14 m	1,098 m³	50.4 x 31.5 x 63 m	100,019 m³
PYRA M-10	118 cd	clear	18 x 10 x 22.5 m	4,050 m³	81 x 45 x 101 m	368,145 m³



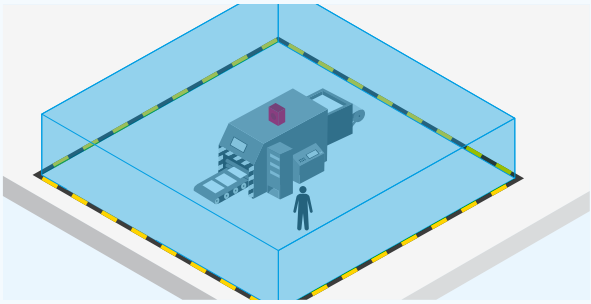
PYRA M red Alarm 1,098 m³



PYRA M red Indicate 100,019 m³



PYRA M clear Alarm 4,050 m³



PYRA M clear Indicate 368,145 m³

very simplified form

Result:

The nominal light intensity of 39 cd and 118 cd result in significant differences in the size of the coverage volume. With a “clear” lens the signal is perceived much more readily. The Xenon technology of Pfannenberg’s flashing lights delivers considerably better performance and efficiency than LED technology.

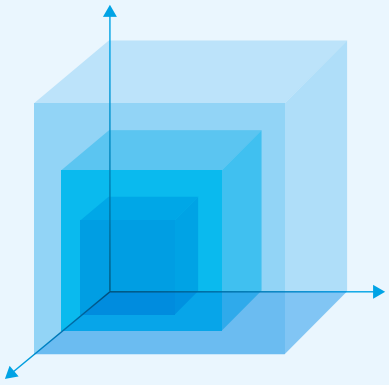
Designing with 3D-Coverage avoids incorrect system sizing.

Guidelines are implemented more efficiently.
Directives such as EN 54-23 require that the ambient conditions within the space in which a signal is to be perceived are taken into account. They specify the output level of signaling devices but do not account for their technical performance surrounding signal transmission – leading to a risk of incorrect sizing. Planning with the aid of 3D-Coverage eliminates this risk. It provides a precise indication of the number of signaling devices required and allows the system to be specified in an efficient, cost-effective manner.

More reliable than marketing data.
Performance data supplied on technical data sheets often results in naïve assumptions about the actual performance of a product. When combined with inadequate consideration of factors such as the ambient noise levels, the danger of insufficient signaling perception is increased. 3D-Coverage takes these factors into account and ensures that audible and visual signals can be heard and seen.

Device performance within a defined space is immediately apparent.

3D-Coverage performance data, A x B x C



PA X 20-15

AUDIBLE

80 dB(A)	98 x 86 x 86 m
85 dB(A)	55 x 48 x 48 m
90 dB(A)	31 x 27 x 27 m

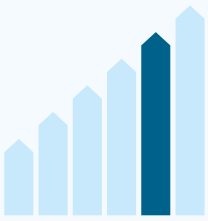
PA X 20-15

VISUAL

Indicate	126 x 99 x 68 m
Warn	56 x 44 x 30 m
Alarm	28 x 22 x 15 m

Coverage area for DIN tone with required sound levels of 80, 85 and 90 dB(A) and clear lens on strobe light in accordance with EN 54-23 requirements for “Indicate”, “Warn” and “Alarm”.

Performance classification



The diagram shows the 3D-Coverage performance classification of a Pfannenberg signaling device in comparison to other Pfannenberg signaling devices.

3D-Coverage in the catalogue.
The following pages contain the guaranteed coverage volume of each signaling device under different environmental situations. For the audible signaling devices, the performance in a given space assumes the use of the DIN tone at a required sound level of 80, 85 and 90 dB(A). For the visual signaling devices, the performance is given for indicate, warn and alarm (EN 54-23) applications. An additional classification symbol allows an at-a-glance comparison with the performance of other Pfannenberg signaling devices.

PSS – the perfect planning aid.
For planning with individual values, Pfannenberg Sizing Software (PSS) is a user-friendly online tool which provides an instant, informed recommendation for the optimum signaling devices and their positioning. It enables you to avoid expensive over-specification and risky under-specification at the planning stage or when reviewing the configuration. PSS is available online and to download at www.pfannenberg.com/pss.

Understanding visual coverage – the effective coverage area for each device varies with requirements for alarm, warning, or indication.

Whether Xenon or LED technology, the purpose of the signal is the important consideration.
For each signaling device, the largest effective coverage area is achieved for “indication” requirements, whereas the smallest is achieved for requirements intended to “alarm” people, since the signal should also be perceived indirectly, i.e. without a direct view of the light. The following examples highlight various applications for “alarm”, “warning”, and “indication”.:

INDICATE

Indication requirements are used to inform machinery operators of certain functioning conditions, or nearby personnel of the status of a situation which is generally low priority. The illumination requirement is typically limited to a localised area.

- status of a machine, process, or test procedure.
- lack of raw material / material supply is nearing depletion.
- quality defect, pass/fail information.
- process has ended, standby position.
- notification and display of errors.
- display of room occupancy.

WARN

Warning requirements are used to alert personnel of nearby danger or inform that a process or condition is in need of attention. These are medium priority situations.:

- moving vehicle or machine – get out of the way.
- dangerous situation – proceed with caution, safe-guards have been removed.
- status is critical, ready for handling – action required.
- attention is necessary.
- process out of tolerance – corrective action needed.
- health hazard – stay clear.
- caution – a status change is being executed.

ALARM

Alarm requirements are used when abrupt evacuation is needed or for emergency situations which require immediate action. These situations demand the highest priority for abrupt action.

- evacuate immediately – fire or gas leak detected.
- acute health risk – toxic substances identified.
- process is abnormal or out of control – immediate action needed.
- maximum tolerance exceeded – immediate attention required.

Ambient noise level for certain areas.

CATEGORY	GROUP	AREA	SOUND PRESSURE LEVEL dB(A)	
Distribution	Logistics	High rise rack with forklifts	60	
Distribution	Logistics	Loading and unloading, handling	65	
Industry	Automotive	Presses	90–110	ⓘ
Industry	Automotive	Automation area	80	
Industry	Automotive	Storage	70	
Industry	Steel	Production	85–110	ⓘ
Industry	Steel	Storage	73	
Industry	Steel	Logistics	75	
Industry	Logistics	High rise rack with forklifts	70	
Industry	Logistics	Refrigerated warehouse	70	
Industry	Logistics	Loading and unloading, handling	75	
Industry	Textile	Production, looms	85	
Industry	Textile	Production, others	78	
Industry	Chemical	Process technology	78	
Industry	Chemical	Loading outdoor	80	
Industry	Wood	Storage	73	
Industry	Wood	Assembling	80	
Industry	Wood	Packaging, commissioning	80	
Industry	Wood	Shipping, dispatch	75	
Industry	Plastics	Loading	75	
Industry	Plastics	Production	85–88	
Industry	Animal feed	Production	70–75	
Industry	Animal feed	Filling, bottling	70	
Industry	Manufacturing	Production	65–75	
Industry	Manufacturing	Loading	70	
Public	Train station	Rail tracks	85	
Public	Train station	Passenger traffic, entrance	70	
Public	Airport	Waiting rooms	65–70	
Public	Airport	Aircraft handling	80–90	ⓘ
Public	School	Classroom	65	
Public	School	Assembly hall	75–80	
Public	University	Assembly hall	70–80	
Public	University	Lecture hall small	65	
Public	University	Lecture hall big	70	
Public	University	Library	60	
Public	Office	Single office room	55	
Public	Office	Open-plan office	65–70	
Public	Office	Call centre	75–80	
Public	Office	Administration building	60	
Public	School	Sports centre	75–80	
Public	Shopping mall	Passage	70–78	
Public	Hotel	Room	55	
Public	Hotel	Corridor	60	
Public	Hotel	Reception	65	

ⓘ >90 dB – additional visual alarm needed

Explanation of approvals.

Please note the following information regarding product certifications and approvals: Most standard Pfannenberg products are already certified through various approval authorities. Additional certifications are available upon request to conform with local requirements. Please be certain to confirm which certifications are normally included and whether these are adequate to satisfy your specific needs. Whenever additional certifications may be required, please contact us for additional information.

The following summarises the various certifications and approval authorities that Pfannenberg has worked with. This review is offered to assist with determining which certifications may be suitable for your local requirements. Please feel free to contact us for additional information to ensure that any products purchased will conform with specified requirements.

Underwriters Laboratories (UL) offers independent testing to ensure product safety. There are generally two levels of certification available depending on whether a product is intended to be used as a standalone device (listed) or a component (recognised).

UL recognised component

UL listed product

The most important markets/countries for the use of the UL logos are the United States and Canada. Approvals for the United States are marked with 'US' at the bottom right of the logo. Approvals for Canada with a 'c' at the bottom left. If there is no country code, then it has approval for the US market. The UL approval is not a mandatory approval for the North American market, but it can make it easier to import there. In addition, the approval generally has a high degree of acceptance among customers.

The EAC logo stands for EurAsian Conformity. It is comparable to the European CE mark and attests to a product's safety. The EAC mark is the approval for the Eurasian economic community and is valid for Russia, Belarus, and Kazakhstan. There is no specific identification of the country by a code. The mark is issued by the respective manufacturer on their own authority, but always with the involvement of an official certification body. The EAC is the successor of the GOST approval.

The CE classification documents the compliance with the European regulations relevant for the product. It is not a test mark, but an administrative one. The CE marking was created mainly to guarantee safe products for consumers within the European Union. CE marking is often referred to as a "passport" for sale to the EU market. CE marking confirms complete compliance with the "basic (safety) requirements" which are specifically determined in EU directives.

The Verband der Sachversicherer (VdS) [= Association of Material Insurers] tests and certifies components for facilities dealing with damage prevention. The VdS guidelines contain requirements for components used for fire alarm and security systems.

Germanischer Lloyd sets standards in technology, quality and safety for shipping and industry. Germanischer Lloyd is additionally a leading certifying body in the fields of wind power, environmental protection, the oil and gas industry and building technology.

The ‘Physikalish-Technische Bundesanstalt’ (PTB) [= Federal Physical/Technical Institute] is a material testing and calibrating body. It is subdivided into several laboratories and, among other things, tests and approves technical equipment for potentially explosive areas. The existing CENELEC standards form the basis. The PTB is the authorised EU testing body for the Federal Republic of Germany.

The ‘Bundesamt für Wehrtechnik und Beschaffung’ (BWB) [= Federal Office of Military Equipment and Procurement] administers and catalogues the technical equipment of the armed forces. Affiliated to it are technical defence authorities and arsenals, which conduct product testing in accordance with VG standards. These materials are listed in the SAK catalogue.

The AS-i (Actuator Sensor Interface) is an inexpensive, fast bus system for the transmission of data and energy that reduces cabling and saves on I/O cards and terminal strips. AS-Interface products conform to the EN 50295 and IEC 62026-2 specifications.

The Bundesamt für Verkehr (Federal Ministry of Transport) governs public transportation in Switzerland. It covers transport by rail and cable car, freight trains, buses and ships.

The ‘International Civil Aviation Organization’ sets standards for technology, quality and safety in international air traffic. The ‚Allgemeine Verwaltungsvorschrift zur Kennzeichnung von Luftfahrthindernissen‘ (AVV) [= General Administrative Rules for the Identification of Aviation Obstacles] sets the standards for technology, quality and safety in air traffic in Germany.

MarED is the co-ordination group for the Notified Bodies assigned by the Member States to carry out the conformity assessment procedures referred to in the Marine Equipment Directive (COUNCIL DIRECTIVE 96/98/EC of 20 December 1996 on Marine Equipment).

Products marked with the Ex test symbol and test number are approved for use in potentially explosive areas.

The certification department CNBOP-PIB conducts voluntary product certifications within the scope of fire protection for the European and local Polish market.

Explanation of Icons.

Technology features

IP 54 up to IP 68
protection systems

+50 °C / –20 °C up to +70 °C / –50 °C
operating temperatures

IK08
impact-proof housing

10 Years
10 years warranty

Sync
synchronous operation

inrush current limitation

external tone selection

acoustic penetration

light sensor

brightness adjustable

volume control

redundant

LED
light source LED

X
light source Xenon flash tube

SIL / PL
SIL/PL version

EX
Ex protected signaling device

M
monitored signaling device

colour code clear

Approvals / Standards

VdS
Verband der Sachversicherer (Association of Material Insurers)

AVV
Allgemeine Verwaltungsvorschrift zur Kennzeichnung von Luftfahrthindernissen (General Administrative Rules for the Identification of Aviation Obstacles)

ICAO
International Civil Aviation Organization

UL
Underwriters Laboratories

EN 54-23
European Standard visual alarms

EN 54-3
European Standard acoustic alarms

Pfannenberg PYRA M and ABL flashing lights, DS sounder for gate security and fire alert

New: Quick reference web lookup.

Find additional information quickly for products of interest by entering the appropriate webcode into the search window at www.pfannenberg.com.

You can find the webcodes after each product data table or the accompanying information texts such as application examples, usage-advantages for the user and technical designs. Use our new service in order to get more detailed information about the products and other topics described here in the catalogue quickly and easily.

How to use:

1. Write down the “#” plus the short 4-digit number combination.
2. On the internet, visit pfannenberg.com.
3. Type in the “#” followed by the 4-digit code in the search window on the top right and click “enter”.

Here you will find additional information relative to the performance and use of Pfannenberg products, including

- Technical data.
- Catalogue sheets.
- CAD data.
- 3D models
- Operating instructions.
- Certifications and approvals.
- BIM project data.

Keep up to date with Pfannenberg by registering to receive our free email newsletter. This service provides information on new products and applications for signaling devices as well as enclosure thermal management solutions and chillers.

- Use webcode #2959 for newsletter registration.

Pfannenberg BR 50 signal tower
for machinery safety

PRODUCTS P

SPECIFIC APPLICATIONS

GENERAL APPLICATIONS

VISUAL SIGNALING DEVICES

AUDIBLE SIGNALING DEVICES

COMBINED VISUAL-AUDIBLE SIGNALING DEVICES

SIGNAL TOWERS

SOLUTIONS S

SERVICES S

INDUSTRIES I

Protecting man, machine and the environment.

PRODUCTS

Safety and efficiency – these are the areas for which Pfannenberg signaling devices offer ideal solutions. With innovative designs, robust construction, and a legacy of fulfilling demanding requirements, Pfannenberg has the experience and know-how to help with your next industrial signaling application.

Industry-leading 10-year warranty.

When uncertainty surrounding safety and efficiency is unacceptable. Pfannenberg quality is unwavering. With over 50 years of experience in developing visual and audible signaling solutions, we are so confident in our designs that we stand behind them for a long time. Enjoy the confidence and benefit of a 10 year warranty on our most popular standard items. Should anything go wrong, we will make it right – and with locations worldwide, there is a local point of contact to help.

	TYPE	COVERING DISTANCE	PERFORMANCE	HOUSING MATERIAL	PROTECTION SYSTEM	RATED VOLTAGE	PAGE
	**PA 1 | PA 5**	18–32 m	100–105 dB (A)	PC / ABS blend	IP 66 IK08	230 V AC 10–57 V DC	70
	**PA 10 | PA 20**	56–178 m	110–120 dB (A)			95–265 V AC 10–60 V DC	70
	**PA X 1-05** **PA X 5-05**	18–32 m	100–105 dB (A) 5 J			230 V AC 24 V DC	84
	**PA X 10-10** **PA X 20-15**	56–178 m	110–120 dB (A) 10–15 J			230 V AC 24 V DC	84
	**DS 5 | DS 10** **DS 5-SIL | DS 10-SIL** **DS 5 3G/3D | DS 10 3G/3D**	32–56 m	105–110 dB (A)	die-cast aluminium	IP 66 IP 67 IK08	230 V AC 24 V DC	68
	**DSF 5 | DSF 10**	32–56 m	105–110 dB (A) 13 J	PC / die-cast aluminium	IP 66 IP 67 IK08	24 V DC	82
	**Quadro F12** **Quadro F12-SIL** **Quadro S-M-Flex** **Quadro-LED-HI** **Quadro-LED Flex-3G/3D**	5–19 m	10–13 J 9–140 cd	polycarbonate	IP 66 IP 67 IK08	230 V AC, 24 V DC 24 V DC 230 V AC 24 V DC 24 V AC/DC	40
	**PY X-S-05**	11 m	5 J | 44 cd	PC / ABS blend	IP 66 IK08	230 V AC 24 V DC	46
	**PY X-M-05** **PY X-M-10**	11–17 m	5–10 J 44–118 cd	PC / ABS	IP 66 IK08	230 V AC, 24 V AC/DC 230 V AC, 24 V DC	44
	**PY X-MA-05** **PY X-MA-10**	11–17 m	100 dB (A) 5–10 J	PC / ABS	IP 66 IK08	230 V AC 24 V AC/DC	80

Fire alarm notification appliances in conformance with EN 54-3 and EN 54-23.

Audible and visual alarms from Pfannenberg. EN 54-3 defines the requirements, tests and performance features of audible signaling devices which are intended for use as notification appliances in fire alarm systems throughout the European Union.

Since 1 January 2014, fire alarm systems must also have visual notification appliances which comply with the requirements set forth by EN 54-23. Pfannenberg is the first manufacturer to offer VdS certified flashing lights which meet these requirements.

EN 54-23	**PY X-S-05** **24 V I 48 V DC** **with/without SSM*** ⁄ I ●	  5 Joule flashing lights	page 46
	PY X-M-05 I PY X-M-10 **24 V DC** **SSM*** ⁄ I ●	  5/10 Joule flashing lights	page 44
EN 54-23 EN 54-3	**PA X 1-05** **24 V I 48 V DC** **with/without SSM*** ⁄ I ●	  5 Joule / 100 dB(A) flashing sounders	page 84
EN 54-3	**DS 5 I DS 10** **12 V I 24 V DC** **115 V I 230 V AC**	 105/110 dB(A) sounders	page 68
	PA 1 I PA 5 **24–48 V DC**	  100 dB(A) sounder 105 dB(A) sounder	page 70
	PA 10 I PA 20 **24–48 V DC** **115–230 V AC**	  110 dB(A) sounder 120 dB(A) sounder	page 70

* SSM = Soft Start Module; reduced inrush current

Created for extreme conditions:

TYPE	VIBRATION AND SHOCK-RESISTANT	HIGHER RESISTANCE TO IMPACT	IP SYSTEM ≥66	IMPERVIOUS TO SEAWATER	UV-STABLE	T_A > 40 °C	T_A < 25 °C
PMF 2020	+	–	○	○	○	+	+
ABL GL	+	○	○	+	+	+	+
WBL GL	+	○	○	+	+	+	+
PYRA®	○	+	+	○	○	+	+
PYRA® GL	+	+	+	+	○	+	+
QUADRO	+	+	+	+	+	+	+
PA X	○	+	+	○	○	+	+
PA X GL I MED	+	+	+	+	○	+	+
PATROL	○	+	+	○	○	+	+
PATROL GL I MED	+	+	+	+	○	+	+
DS	○	+	+	+	+	+	+
DS GL	+	+	+	+	+	+	+

\+ recommended
– not recommended
○ applicable

MED-certified signaling devices.

The European Marine Equipment Directive (MED) mandates the use of MED-certified signaling devices in fire alarm systems on board of ships. This applies to all EU-flagged ships and ships intended to fly the flag of an EU country.

Shipping companies, service providers and suppliers of fire alarm systems rely on our MED-certified products. They enable standard-compliant and reliable fire alarm signaling on all ships, from the bridge through the gangways and cabins to the machine rooms and holds.

The specific suitability of our signaling devices for use under the demanding conditions of the maritime sector is additionally confirmed by DNV-GL approval.

All signaling devices shown here are MED and DNV-GL certified.

Contact us directly at
marine-signals@pfannenberg.com.

For detailed information on MED certification and our products, visit
www.pfannenberg.com/med.

MED-certified audible signaling devices

(see page 70)

PA 1
- Up to 105 dB(A)
- IP 66
- 230 V AC, 12–48 V DC

PA 5
- Up to 108 dB(A)
- IP 66
- 230 V AC, 12–48 V DC

PA 10
- Up to 116 dB(A)
- IP 66
- 110–240 V AC, 12–48 V DC

PA 20
- Up to 124 dB(A)
- IP 66
- 110–240 V AC, 12–48 V DC

MED-certified visual and audible signaling devices

(see page 84)

PA X 1-05
- Up to 105 dB(A)
- 5 Joules
- IP 66
- 230 V AC, 24 V | 48 V DC

PA X 5-05 / 5-10
- Up to 108 dB(A)
- 5 Joules / 10 Joules
- IP 66
- 230 V AC, 24 V | 48 V DC

PA X 10-10 / 10-15
- Up to 116 dB(A)
- 10 Joules / 15 Joules
- IP 66
- 115 V | 230 V AC, 24 V | 48 V DC

PA X 20-10 / 20-15
- Up to 124 dB(A)
- 10 Joules / 15 Joules
- IP 66
- 115 V | 230 V AC, 24 V | 48 V DC

Functional safety signaling devices – additional monitoring circuity for fault detection.

For risk mitigation surrounding hazardous machinery and processes in accordance with machinery safety directives 2006/42/EG, EN ISO 13849-1, DIN EN 62061 (PL); and plant safety directives Seveso III, IEC 610308, and IEC 61511 (SIL).

Pfannenberg's safety related signaling devices are intended for use in Safety Instrumented Systems (SIS) which have a Safety Integrity Level (SIL) up to **SIL 2 / PLd**. These devices are equipped with integrated self-monitoring functions, which automatically satisfy the requirement for regular inspection of warning devices.

Since signaling equipment performs a safety protection function on machines and systems, the consequences of an error in the signaling devices represents a potential risk that must be taken into consideration.

	TYPE	3D-COVERAGE LEVEL	LIGHT INTENSITY	SOUND PRESSURE LEVEL	PROTECTION SYSTEM	RATED VOLTAGE	PAGE
	Quadro F12-SIL		10 J 118 cd		IP 66 IP 67 IK08	24 V DC	40
	PMF 2015-SIL		10 J 200 cd		IP 55	230 V AC 24 V DC	34
	DS 5-SIL			105 dB (A)	IP 66 IP 67	230 V AC 24 V DC	68
	DS 10-SIL			110 dB (A)			

More information in the Solutions chapter on page 118.

Function monitored xenon flashing lights and LED continuous lights.

These devices are equipped with integrated self-monitoring functions to satisfy the requirements of EN 60825-1, DIN 54113-2, EN 50129, EN 12352:2000 and others.

Should the signaling device ever fail, a relay contact is activated for remotely recognising the fault. This feature is particularly useful around life threatening equipment such as laser cutters, x-ray scanners, radioactive processes, and railway crossings.

TYPE	3D-COVERAGE LEVEL	LIGHT SOURCE	OPERATING MODE	PROTECTION SYSTEM	RATED VOLTAGE	PAGE
Quadro S-M-Flex		xenon flash tube	flashing light adjustable 13 J I 140 cd	IP 66 IP 67 IK08	230 V AC	40
PMF 2015-M		xenon flash tube	double flash 1 Hz 7 J I 200 cd	IP 55	24 V DC	34
WBL-M		xenon flash tube	flashing light 1 Hz 5 J I 44 cd	IP 54	230 V AC	38
PD 2100-M-AS-i		LED	continuous light 5 cd	IP 55	28 V	52

AS-i-Bus signaling devices.

LED signal light and 50 mm indicating stacklights with integrated AS-i slave. AS-Interface is a networking alternative to the individual wiring of field devices. It can be used as a partner network for higher level fieldbus networks such as Profibus, DeviceNet, Interbus and Industrial Ethernet, for whom it offers a low-cost remote I/O solution. It is used in automation applications, including: conveyor control, packaging machines, process control valves, bottling plants, food production lines, electrical distribution systems, airport baggage carousels, and elevators.
Pfannenberg is a full member of the international AS-i union, and thereby qualified to develop and manufacture AS-i certified components.

TYPE	OPERATING MODE	PERFORMANCE		PAGE
PD 2100-M-AS-i	LED continuous light	function monitored and AS-i power supplied with integrated AS-i slave module		52
BR 50-AS-i	LED module I sounder module I continuous light module I blinking light module	up to 4 stages modular 50 mm stacklight, with integrated AS-i slave module and power supply via AS-i wire	up to 4 stages and 32 slaves	94
BR 50-AS-i-AB			up to 3 stages and 64 slaves	

Ex protected signaling devices.

The visual and audible signaling devices in the Ex series from Pfannenberg are of a particularly robust construction and are impervious to environmental impact and to chemicals.
They are licensed for use in atmospheres containing flammable gases or flammable dusts which means they can be used in zones 0, 1, and 2 as well as in zones 20, 21 and 22. Pfannenberg offers suitable and cost-effective visual or audible alerting solutions for any likelihood or frequency of occurrence of explosive atmospheres.

	TYPE	CATEGORY (AREA OF USE)	PERFORMANCE	PAGE
	BExBG 05 BExBG 15	2G (Zone 1, 2) 2D (Zone 21, 22)	5 Joules 15 Joules	56
	CWB-ATEX	2G (Zone 1, 2) 2D (Zone 21, 22)	5 Joules	58
	Quadro-LED Flex-3G/3D	3G (Zone 2) 3D (Zone 22)	9 cd	42
	IS-mB1	1G (Zone 0, 1, 2)	6 cd	60
	IS-A105N	1G (Zone 0, 1, 2)	105 dB (A)	74
	IS-mA1	1G (Zone 0, 1, 2)	100 dB (A)	60
	DS 5 3G/3D DS 10 3G/3D	3G (Zone 2) 3D (Zone 22)	105 dB (A) 110 dB (A)	68
	BExS 110 BExS 120	2G (Zone 1, 2)	110 dB (A) 117 dB (A)	76
	BExDS 110 BExDS 120	2G (Zone 1, 2) 2D (Zone 21, 22)	110 dB (A) 117 dB (A)	76
	BExCS 110-05D	2G (Zone 1, 2)	5 Joules 110 dB (A)	90
	IS-mC1	1G (Zone 0, 1, 2)	6 cd 100 dB (A)	60
	BR 50-LED 3G/3D	3G (Zone 2) 3D (Zone 22)		104
	Zener barriers Z 728 Z 928 Z 786			63

Safety for man, machine and the environment.

If it's about safety, Pfannenberg is always the right choice, because the Pfannenberg brand stands for "protecting man, machine and the environment".
Global references speak a clear language. Ex-protected signaling devices by Pfannenberg are subjected to the toughest demands every day and are in use wherever explosive atmospheres can be formed, e. g. in oil and gas drilling in the North Sea – by Shell DEA, Exxon Mobil ... – or in refineries and chemical plants – at BASF, Bayer, Degussa …

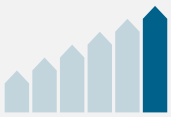
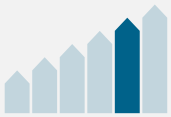
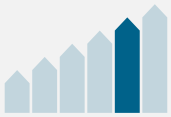
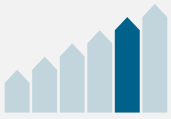
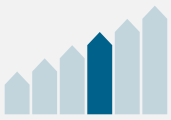
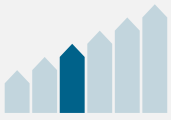
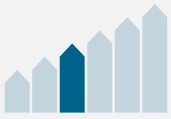
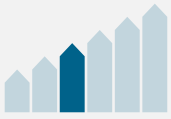
Regardless of whether it's about corrosion, vibration, shock or alternating climates, you are always on the safe side with Ex alarm products by Pfannenberg!

Gas detection with visual and acoustic alarms:
sounder DS 10 ATEX and flashing light CWB-ATEX.

Acoustic alarm in a gas-fired power station:
sounder BExS 120 ATEX.

Visual signaling notification appliances.

Visual signaling devices at a glance

	TYPE	3D-COVERAGE LEVEL [1]	LIGHT INTENSITY	PROTECTION SYSTEM	DIMENSIONS (H x W x D) mm	APPROVALS/STANDARDS					PAGE
						GL	EAC	UL	EN 54-23	VdS	
	FLASHING LIGHTS										
	PMF 2030		30 J	IP 55	bracket mounting 170.5 x Ø 130 direct mounting 185 x Ø 177		●				34
	PMF 2015		7 J				●				
	ABL / ABS		15 J	IP 54	without bracket 242 x Ø 80	● [2]	●				38
	Quadro F12		13 J	IP 66 IP 67 IK08	130 x 130 x 130		●				40
	PY X-M-10		10 J	IP 66 IK08	124 x 166 x 114		●	●	●	●	44
	PY X-M-05		5 J	IP 66 IK08	124 x 166 x 114		●	●	●	●	
	WBL / WBS		5 J	IP 54	200 x Ø 54	●	●				38
	PY X-S-05		5 J	IP 66 IK08	85 x 109.5 x 80.6	● [2]	●	●			46
	TRAFFIC LIGHTS										
	Quadro-LED-TL		80 cd	IP 66 IK08	130 x 130 x 396		●				48
	P 450 TLA		60 cd	IP 65	177 x Ø 140		●				48

[1] with a clear lens

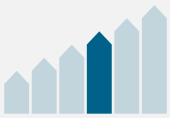
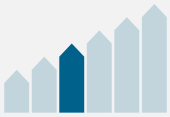
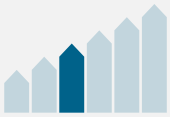
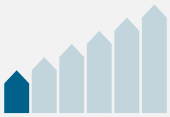
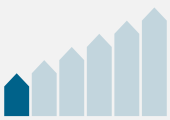
● available ○ pending [2] option

Visual signaling devices at a glance

	TYPE	3D-COVERAGE LEVEL [1]	LIGHT INTENSITY	PROTECTION SYSTEM	DIMENSIONS (H X W x D) mm	APPROVALS/STANDARDS					PAGE
						GL	EAC	UL	EN 54-23	VdS	
	LED LIGHTS										
	Quadro-LED-HI		75 cd	IP 66 IP 67 IK08	130 x 130 x 130		●				42
	PMF-LED Flex		27 cd	IP 66 IK08	130 x 130 x 396		●				50
	PD 2100-LED		5 cd	IP 55	128 x 166.2 x 111.2		●				52
	FUNCTION-MONITORED LIGHTS										
	PMF 2015-M		7 J	IP 55	bracket mounting 170.5 x Ø 130 direct mounting 185 x Ø 177		●				34
	Quadro S-M-Flex		13 J	IP 66 IP 67 IK08	130 x 130 x 130		●				40
	WBL-M		5 J	IP 64	242 x Ø 80	● [2]	●				38
	PD 2100-M-AS-i		5 cd	IP 55	128 x 166.2 x 111.2		●				52
	SAFETY-RELATED LIGHTS										
	PMF 2015-SIL		10 J	IP 55	bracket mounting 170.5 x Ø 130 direct mounting 185 x Ø 177		●				34
	Quadro F12-SIL		10 J	IP 66 IP 67 IK08	130 x 130 x 130		●				40

[1] with a clear lens

● available ○ pending [2] option

	TYPE	3D-COVERAGE LEVEL [1]	LIGHT INTENSITY	PROTECTION SYSTEM	DIMENSIONS (H X W x D) mm	APPROVALS/STANDARDS					PAGE
						GL	EAC	UL	EN 54-23	VdS	
	OBSTRUCTION LIGHTS										
	POL 32-M		32 cd	IP 68	240 x Ø 114		●				54
	POL 10-M-RA		18 cd				●				
	EX-ATEX FLASHING LIGHTS										
	BExBG 15		15 J	IP 66 IP 67	239.5 x 165 x 165		●				56
	BExBG 05		5 J	IP 66 IP 67	239.5 x 165 x 165		●				
	CWB-ATEX		5 J	IP 66	260 x Ø 70	●	●				58
	EX-ATEX LED LIGHTS										
	Quadro-LED Flex-3G/3D		9 cd	IP 66 IK08	130 x 130 x 130		●				42
	IS-mB1		5 cd	IP 65	85 x Ø 88.7		●				60

[1] with a clear lens

● available ○ pending [2] option

PMF
Flashing Lights

SIL / PL

X
xenon

M
monitored

Powerful 360° omnidirectional signalling
for large distances (indoor and outdoor).

Robust, solid-state design
Xenon flash tubes are secured by a mechanical clamp and unlike rotating lights with motorised elements there is no risk of failure due to moving parts.

Up to 30 Joule flash energy
High energy impulse creates an intense light flash for effective signal coverage in large areas.

Highly effective light beam
Fresnel lens optics provide a brilliant horizontal light stream for long distance signal transmission.

Exceptional performance
withstands extreme temperatures and is safeguarded against potential voltage fluctuations.

Very good perceptibility
over great distances; low power consumption.

Versatile mounting
choose direct mount for flat surface installation or bracket mount for attaching to walls or pipes.

Several versions to serve specific needs

PMF 2015	PMF 2030	PMF 2015-SIL	PMF 2015-M bracket mounting
High visibility, low power flashing light.	Extreme high visibility, low power flashing light.	High visibility, low power flashing light, conforming to **SIL 2 / PLd** safety integrity level. Includes self-monitoring function.	High visibility, low power flashing light with self-monitoring function. Additional contact closure included to alert operators of potential failure in the ability to generate a flashing light output. The light carries type approval from the Swiss Ministry of Transport. An independent technical safety report within the definitions of EN 50129 exists.

FLASHING LIGHTS

IP 55
protection system

+55 °C
–40 °C
operating temperature

PRODUCT		PMF 2015		PMF 2030	
		direct mounting	bracket mounting	direct mounting	bracket mounting
ARTICLE NO.	230 V	21007104000	21007104010	21010104000	21010104010
ARTICLE NO.	24 V	21007804000	21007804010		
ARTICLE NO.	230 V	21007105000	21007105010	21010105000	21010105010
ARTICLE NO.	24 V	21007805000	21007805010		
DATA					
Light source		xenon flash tube: quad, double flash		xenon flash tube	
Operating range		195–253 V	18–30 V	195–253 V	
		AC 50 I 60 Hz	DC	AC 50 I 60 Hz	
Nominal current consumption				450 mA @ 230 V	
	2 flashes	0.08 A	0.65 A		
Flash energy and flash rate		7 J @ 1 Hz = 60 flashes/min		max. 30 J @ 1 Hz = 60 flashes/min switchable to 20 J	
Light intensity (DIN 5037) [1]		250 cd		1,500 cd	
Max. viewing distance		366 m		898 m	
Operating temperature		–40 … +55 °C			
Protection system according to EN 60529		IP 55 (vertical mounting)			
Service life of light source		light emission still 70 % after 8,000,000 flashes			
Material	lens	polycarbonate (PC), fresnel characteristic			
	housing	acrylonitrile butadiene styrene (ABS)	polycarbonate (PC)	acrylonitrile butadiene styrene (ABS)	polycarbonate (PC)
Dimensions (X x Y + Y2)		177 x 185 + 0 mm	130 x 170.5 + 90 mm	177 x 185 + 0 mm	130 x 170.5 + 90 mm

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

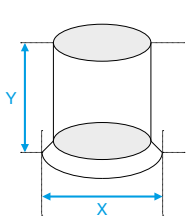
[1] with a clear lens

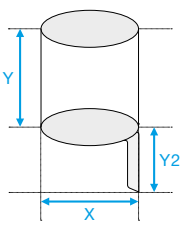
EAC

Webcode
#3113

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com





FLASHING LIGHTS

IP 55
protection system

+55 °C
–30 °C
operating temperature

PRODUCT		PMF 2015-SIL		PMF 2015-M
		direct mounting	bracket mounting	bracket mounting
ARTICLE NO.	230 V	21007104601	21007104611	
ARTICLE NO.	24 V	21007804601	21007804611	21007804012
ARTICLE NO.	230 V	21007105601	21007105611	
ARTICLE NO.	24 V	21007805601	21007805611	21007805012
DATA				
Light source		xenon flash tube		xenon flash tube: double flash
Operating range		195–253 V	18–30 V	
		AC 50 I 60 Hz	DC	
Nominal current consumption	flashing light	250 mA	700 mA	0.65 A
	diagnostic channel	0.08 A	0.65 A	
	monitoring unit			0.05 A
Alarm contact	version	positively driven contact (1x NC, 1x NO)		
	max. switching power	1,500 VA AC		
Flash energy and flash rate		10 J @ 1 Hz = 60 flashes/min		7 J @ 1 Hz = 60 flashes/min
Light intensity (DIN 5037) [1]		225 cd		250 cd
Max. viewing distance		348 m		366 m
Operating temperature		–30 … +55 °C		
Protection system according to EN 60529		IP 55 (vertical mounting)		
Service life of light source		light emission still 70 % after 8,000,000 flashes		
Material	lens	polycarbonate (PC), fresnel characteristic		
	housing	acrylonitrile butadiene styrene (ABS)	polycarbonate (PC)	polycarbonate (PC)
Dimensions (X x Y + Y2)		177 x 185 + 0 mm	130 x 170.5 + 90 mm	130 x 170.5 + 90 mm

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

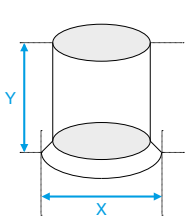
[1] with a clear lens

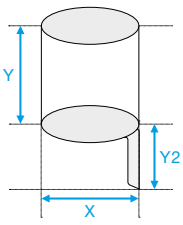
EAC

Webcode
#3114

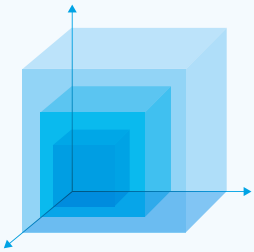
Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com





3D-Coverage performance data, A x B x C



PMF 2015

Indicate	54 x 171.9 x 171.9 m
Warn	24 x 76.4 x 76.4 m
Alarm	12 x 38.2 x 38.2 m

PMF 2015-SIL

Indicate	52.2 x 173.7 x 173.7 m
Warn	23.2 x 77.2 x 77.2 m
Alarm	11.6 x 38.6 x 38.6 m

PMF 2015-M

Indicate	54 x 171.9 x 171.9 m
Warn	24 x 76.4 x 76.4 m
Alarm	12 x 38.2 x 38.2 m

PMF 2030

Indicate	144 x 450 x 450 m
Warn	64 x 200 x 200 m
Alarm	32 x 100 x 100 m

Coverage area according to the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

Models with alternative features available upon request

PMF	PMF 2020	PMF-LED Flex
Alternate operating voltages, such as 115 V AC. Choice of lens colours: clear | amber | red | green | blue.	Shock and vibration tolerant designs with GL approval. Also suitable for cranes and floor conveyor applications.	The brightest LED technology with multi-function capability. Externally controllable operation with continuous, blinking, flashing and rotating beacon modes. No moving parts for utmost reliability. See page 50.

WBL/WBS | ABL/ABS
Flashing Lights

X xenon

M monitored

Powerful
Extremely bright and highly visible flashing strobe light for signaling in large manufacturing areas and warehouses as well as outdoor spaces.

Robust and reliable
With corrosion resistant anodised aluminum housing and mounting bracket, as well as a high strength polycarbonate lens, the signal light is ideal for tough industrial requirements.

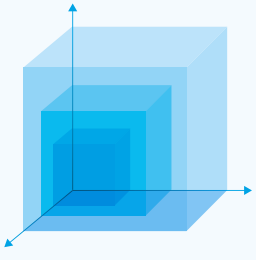
Flash tube
Xenon strobe generates highly visible light without sensitive filaments. A steel fixing clamp provides additional resistance to shock and vibration.

IP 54 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust.

GL
Germanischer Lloyd approved versions available for maritime applications and areas prone to high shock and vibration conditions.

Integrated fault-monitoring
Optional version WBL-M with integrated fault-monitoring relay for enhanced human safety applications such as with x-ray and laser equipment.

3D-Coverage performance data, A x B x C



WBL/WBS		ABL/ABS	
Indicate	63 x 62.1 x 62.1 m	Indicate	127.8 x 160.2 x 160.2 m
Warn	28 x 27.6 x 27.6 m	Warn	56.8 x 71.2 x 71.2 m
Alarm	14 x 13.8 x 13.8 m	Alarm	28.4 x 35.6 x 35.6 m

Coverage area according to the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

FLASHING LIGHTS

IP 54
protection system

+55 °C
–40 °C
WBL/WBS | ABL/ABS

+55 °C
–20 °C
WBL-M


WBL/WBS


WBL-M
ABL/ABS

PRODUCT	WBL	WBS	WBL-M	ABL	ABS
ARTICLE NO.	21003103000	21003803000	21003103156	21001103000	21001803000
ARTICLE NO.	21003104000	21003804000	on request	21001104000	21001804000
ARTICLE NO.	21003105000	21003805000	21003105156	21001105000	21001805000
DATA					
Light source	xenon flash tube				
Operating range	185–255 V AC 50 | 60 Hz	18–35 V DC	185–242 V AC 50 | 60 Hz	185–255 V AC 50 | 60 Hz	18–30 V DC
Nominal current consumption	0.07 A	0.25 A	0.07 A	0.18 A	0.7 A
Max. switching voltage			250 V AC		
Flash energy and flash rate	5 J @ 1 Hz = 60 flashes/min			15 J @ 1 Hz = 60 flashes/min	
Light intensity (DIN 5037) [1]	61 cd			226 cd	
Max. viewing distance	181 m			348 m	
Operating temperature	–40 … +55 °C		–20 … +55 °C	–40 … +55 °C	
Protection system according to EN 60529	IP 54				
Service life of light source	light emission still 70 % after 8,000,000 flashes				
Material – lens	polycarbonate (PC)				
Material – housing	aluminium (Al Mg Si 1), anodised				
Material – base	polycarbonate (PC) with fibre glass				
Dimensions (X x Y)	54 x 200 mm		80 x 242 mm	80 x 242 mm	

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

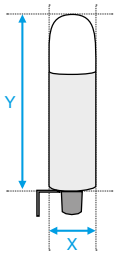
Models with alternative features available upon request

ABL/ABS | WBL/WBS in 115 V AC and other operating voltages like 127 | 110 | 48 | 42 | 24 V AC or 110 | 60 | 48 | 36 | 12 V DC.	Choice of lens colours: clear | white | yellow | amber | red | green | blue.	WBL-M with 42 V AC supply.	WBS-M with 12 | 24 | 48 V DC supply.	WBL-PX – WBL with inrush current limitation below 6 A for only 110 µS.	DWBL/DWBS – 2.5 Joule, 54 mm diameter aluminium enclosure.	Versions with 30 | 45 | 90 | 120 flashes per minute.

Webcode
#3115

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Quadro
Flashing Lights

SIL / PL

X — xenon

M — monitored

Positive enclosure sealing
Leak path risk is eliminated since the lens fastening screws are located outside the sealing gasket area.

IP 66/67 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Impact resistant housing and lens
Achieves IK08 impact rating to endure harsh environments.

Inrush current regulator
Provides electrical protection for control devices such as switching components and relays.

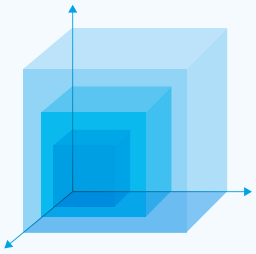
Flexible wiring schemes
Multiple cable and conduit entries provide ease of installation in any orientation.

–40 °C to +55 °C temperature range
Suitable for use in thermal conditions encountered in factories and all corners of the worlds.

High quality, long life components
Provides the utmost in reliability and longevity.

Redundant electrical contacts
Provides ease of wiring and daisy-chain connection for multi-unit installations.

3D-Coverage performance data, A x B x C



Quadro F12 | Quadro S-M-Flex

Indicate	113.9 x 77.9 x 124.7 m
Warn	50.6 x 34.6 x 55.4 m
Alarm	25.3 x 17.3 x 27.7 m

Quadro F12-SIL

Indicate	106.2 x 80.6 x 106.7 m
Warn	47.2 x 35.8 x 47.4 m
Alarm	23.6 x 17.9 x 23.7 m

Coverage area according to the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

Several versions to serve specific needs

Quadro F12	Quadro F12-SIL	Quadro S-M-Flex
Standard version with solid-state xenon flash tube.	SIL version suitable for use in safety integrated systems to SIL 2 / PLd. Function monitored with fault relay contact and solid-state xenon flash tube.	Function monitored with fault relay contact and solid-state xenon flash tube. Multi-unit flash synchronisation for daisy-chained installations. On-board, adjustable flash frequency and light output intensity.

Models with alternative features available upon request

Quadro	Quadro S	Quadro R	Quadro DMX	Quadro F12 3G/3D
In 115 V AC and other operating voltages, other colours like blue, green, white, clear.	Multi-unit flash synchronisation for daisy-chained installations and solid-state xenon flash tube.	Solid-state xenon flash tube with integrated random flash function for “sparkling effect”. Used for spectacle illumination applications (as featured on the Eiffel Tower).	Solid-state xenon flash tube with integrated DMX control for generating illumination arrangements and light shows.	Solid-state xenon flash tube for hazardous area use. Certified for Ex zones 2 and 22.

FLASHING LIGHTS

IP 66
protection systems

IP 67

IK08
impact-proof housing

+55 °C
–40 °C
Quadro F12

Sync
Quadro F12
Quadro S-M-Flex

I
lim
t
Quadro F12
Quadro S-M-Flex

10 Years
warranty

PRODUCT		Quadro F12		Quadro F12-SIL	Quadro S-M-Flex
ARTICLE NO.		on request	on request	on request	21041101179
ARTICLE NO.		21041103000	21041803000	21041803601	on request
ARTICLE NO.		21041104000	21041804000	21041804601	21042104179
ARTICLE NO.		21041105000	21041805000	21041805601	21042105179
DATA					
Light source		xenon flash tube			
Operating range		195–253 V	18–30 V		195–253 V
		AC 50 I 60 Hz	DC		AC 50 I 60 Hz
Current consumption	flashing light	250 mA @ 230 V	700 mA@ 24 V		250 mA @ 1 Hz / 13 J / 230 V
	diagnostic channel			65 mA	
Initial current limited to		<7 A / 150 µs	<5 A / 2 ms		
Alarm contact	version			positively driven contact (1x NC, 1x NO)	
Alarm output					230 V / 80 mA
Flash energy and flash rate		13 J @ 1 Hz = 60 flashes/min		10 J @ 1 Hz = 60 flashes/min	max. 13 J flash rate adjustable
Light intensity (DIN 5037) [1]		260 cd		225 cd	260 cd
Max. viewing distance		374 m		348 m	374 m
Operating temperature		–40 … +55 °C		–30 … +55 °C	–25 … +55 °C
Protection system according to EN 60529		IP 66 I IP 67, mounting arbitrary			
Impact resistance as per EN 50102		IK08			
Service life of light source		light emission still 70 % after 12,000,000 flashes		light emission still 70 % after 8,000,000 flashes	light emission still 70 % after 12,000,000 flashes
Material	lens	polycarbonate (PC)			
	housing	polycarbonate (PC)			
Dimensions (X x Y x Z)		130 x 130 x 130 mm			

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

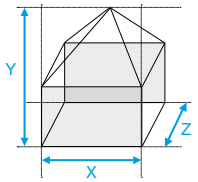
[1] with a clear lens

EAC

Webcode
#3116

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Quadro
LED Lights

LED EX

Advanced LED technology
User-adjustable brightness up to 75 cd (LED-Hi) and selection of several signaling modes:
- continuous light.
- blinking light.
- flashing light.

–40 °C to +55 °C temperature range
Suitable for use in thermal conditions encountered in factories and all corners of the worlds.

IP 66/67 and IK08 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Inrush current regulator
Provides electrical protection for control devices such as switching components and relays.

Shape-moulded gasket
Stays in-place and cannot get lost.

Hazardous area approved (LED Flex-3G/3D)
Certified for use in Ex zone 2 (per EN 60079-10) and zone 22 (per EN 61241-10).

Positive enclosure sealing
Leak path risk is eliminated since the lens fastening screws are located outside the sealing gasket area.

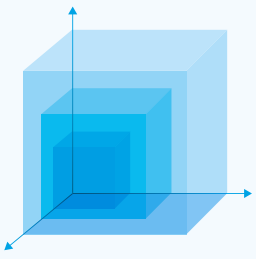
Wide range power supplies
11–60 V DC and
90–253 V AC and DC!).

Flexible wiring schemes
Multiple cable and conduit entries provide ease of installation in any orientation.

External selectable operating mode (LED-HI DC)
Adapt continuous, blinking, and flashing modes to signalling requirements.

Redundant electrical contacts
Provides ease of wiring and daisy-chain connection for multi-unit installations.

3D-Coverage performance data, A x B x C



Quadro-LED-HI

Indicate	47.7 x 35.6 x 46.8 m
Warn	21.2 x 15.8 x 20.8 m
Alarm	10.6 x 7.9 x 10.4 m

Quadro-LED Flex-3G/3D

Indicate	25.2 x 9.5 x 38.7 m
Warn	11.2 x 4.2 x 17.2 m
Alarm	5.6 x 2.1 x 8.6 m

Coverage area according to the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

Several versions to serve specific needs

Quadro-LED-HI	Quadro-LED Flex-3G/3D
Standard version with advanced, high-output, solid state LEDs, long service life, shock and vibration tolerant.	Certified for Ex zone 2/22 hazardous area use. Adjustable operating modes of continuous, blinking, flashing, and rotating (LED rotating sequence with no moving parts).

Further models upon request

Quadro-LED Flex-3G/3D
In 115 V / 230 V AC.

LED LIGHTS

IP 66

IP 67
Quadro-LED-HI

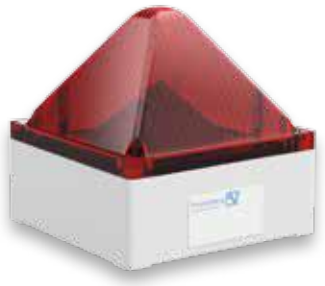
IK08
impact-proof housing

+55 °C
–40 °C
Quadro-LED-HI

+55 °C
–20 °C
Quadro-LED Flex-3G/3D

brightness adjustable
(Quadro-LED-HI)

10 Years
warranty



PRODUCT		Quadro-LED-HI		Quadro-LED Flex-3G/3D
ARTICLE NO.		21108643000	21108633000	21104633009
ARTICLE NO.		21108644000	21108634000	21104634009
ARTICLE NO.		21108645000	21108635000	21104635009
DATA				
Light source		LED		
Operating range		90–253 V	11–60 V	15–40 V AC 10–60 V DC
		AC/DC	DC	AC/DC
Current consumption (@ 1 Hz flash)		45 mA @ 230 V AC	165 mA @ 24 V DC	75 mA @ 24 V DC
Operating mode		operating mode internally and externally (DC) selectable		
Light intensity (DIN 5037) [1]		75 cd (reducible)		9 cd
Max. viewing distance		201 m		70 m
Operating temperature		–40 … +55 °C		–20 … +55 °C
Protection system according to EN 60529		IP 66 I IP 67		IP 66
Impact resistance as per EN 50102		IK08		
Service life of light source		>50,000 hrs		>50,000 hrs
Material	lens	polycarbonate (PC)		
	housing	polycarbonate (PC)		
Dimensions (X x Y x Z)		130 x 130 x 130 mm		

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

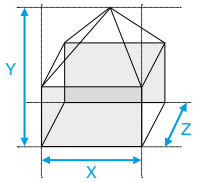
PRODUCT	Quadro-LED Flex-3G/3D
Explosion protection	II3G Ex nR II T5 X –20 °C ≤ Ta ≤ +55 °C II3G Ex nR II T6 X –20 °C ≤ Ta ≤ +50 °C II3D IP66 T 85°C X –20 °C ≤ Ta ≤ +55 °C
Category (area of use)	3G (Zone 2), 3D (Zone 22)
Special conditions	X: according to the requirements of prDIN EN 60 079-0, DIN EN 61241-0 (2007) and DIN EN 61241-1 (2005), the equipment is suitable for applications with a low degree of mechanical danger. It must therefore be ensured that the light is mounted with sufficient protection against impacts. A protective cage is not mandatory.

EAC

Webcode
#3111

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



PYRA X-M
Flashing Lights

Powerful
Extremely bright and highly visible flashing strobe light for signaling in large manufacturing areas and warehouses as well as outdoor spaces.

Intelligent installation
Electrical wiring is conducted in the base box to avoid clumsy 3-hand assembly. Wires are safely routed where the potential for pinching and errors are eliminated.

Flash tube
Xenon strobe generates highly visible light without sensitive filaments. A steel fixing clamp provides additional resistance to shock and vibration.

Circuit loading stability
24 V AC/DC versions incorporate constant current regulators for stable and efficient system operation.

Shape-moulded gasket
Stays in-place and cannot get lost.

Inrush current regulator
Provides electrical protection for control devices such as switching components and relays (option).

EN 54-23 certified (SSM version)
Satisfies EU requirements for fire alarm safety.

Plug and socket connections
Upper and lower parts combine positively to simplify installation. When separated, electrical hazards are eliminated for handling.

Impact resistant housing and lens
Achieves IK08 impact rating to endure harsh environments.

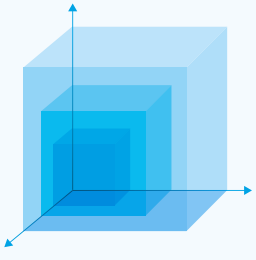
IP 66 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Captive fasteners
Installation and assembly is simplified and screws cannot get lost.

Flexible mounting options
Integrated hole template adapts to many common electrical workboxes worldwide. Installs upright on enclosures, downward from ceiling, or vertically on walls.

Further significant advantages
can be seen on a video on our website, please type the webcode #3553 into the search field.

3D-Coverage performance data, A x B x C



PY X-M-05 | PY X-M-05-SSM

Indicate	56.7 x 28.8 x 61.2 m
Warn	25.2 x 12.8 x 27.2 m
Alarm	12.6 x 6.4 x 13.6 m

PY X-M-10 | PY X-M-10-SSM

Indicate	81 x 45 x 101.7 m
Warn	36 x 20 x 45.2 m
Alarm	18 x 10 x 22.6 m

Coverage area according to the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

FLASHING LIGHTS

IP 66 — protection system

IK08 — impact-proof housing

+55 °C / –40 °C — operating temperature

EN 54-23 — SSM version

VdS — SSM version

10 Years — warranty

	EN 54-23					EN 54-23
PRODUCT	**PY X-M-05**		**PY X-M-05-SSM**	**PY X-M-10**		**PY X-M-10-SSM**
ARTICLE NO. ● ⊘	21550101000	21550811000	21550801005	21551101000	21551811000	21551801005
ARTICLE NO. ● ●	21550103000	21550813000	–	21551103000	21551813000	–
ARTICLE NO. ● ●	21550104000	21550814000	–	21551104000	21551814000	–
ARTICLE NO. ● ●	21550105000	21550815000	21550805005	21551105000	21551815000	21551805005
ARTICLE NO. ● ⊘	21550101055	21550811055	on request	21551101055	21551811055	on request
ARTICLE NO. ● ●	21550103055	21550813055	–	21551103055	21551813055	–
ARTICLE NO. ● ●	21550104055	21550814055	–	21551104055	21551814055	–
ARTICLE NO. ● ●	21550105055	21550815055	on request	21551105055	21551815055	on request
DATA						
Light source	xenon flash tube					
Operating range	187–255 V	AC: 18–30 V DC: 10–57 V	18–30 V	187–255 V	10–57 V	18–30 V
	AC 50 I 60 Hz	AC 50 I 60 Hz / DC	DC	AC 50 I 60 Hz	DC	DC
Nominal current consumption	60 mA @ 230 V	AC: 600 mA DC: 280 mA @ 24 V		150 mA @ 230 V	540 mA @ 24 V	
Flash energy and flash rate	5 J @ 1 Hz = 60 flashes/min			10 J @ 1 Hz = 60 flashes/min		
Light intensity (DIN 5037) [1]	56 cd			149 cd		
Max. viewing distance	173 m			283 m		
Operating temperature	–40 … +55 °C					
Protection system according to EN 60529	IP 66					
Impact resistance as per EN 50102	IK08					
Service life of light source	light emission still 70 % after 8,000,000 flashes					
Material lens	⊘ ○ ● ● ● ● ● polycarbonate (PC)					
Material housing	PC/ABS, RAL 3000 ● I PC/ABS, RAL 7035 ●					
Dimensions (X x Y x Z)	166 x 124 x 114 mm					

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

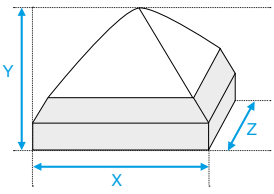
Models with alternative features available upon request

115 V AC.	Choice of lens colours: clear I white I yellow I amber I red I green I blue.	White enclosure.

Webcode
#3117

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



PYRA X-S
Flashing Lights

Captive fasteners
Installation and assembly is simplified and screws cannot get lost.

Plug and socket connections
Upper and lower parts combine positively to simplify installation. When separated, electrical hazards are eliminated for handling.

EN 54-23 certified,
and therefor applicable for fire alert.

Shape-moulded gasket
Stays in-place and cannot get lost.

Flexible mounting options
Integrated hole template adapts to many common electrical workboxes worldwide. Installs upright on enclosures, downward from ceiling, or vertically on walls.

Intelligent installation
Electrical wiring is conducted in the base box to avoid clumsy 3-hand assembly. Wires are safely routed where the potential for pinching and errors are eliminated.

IP 66 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

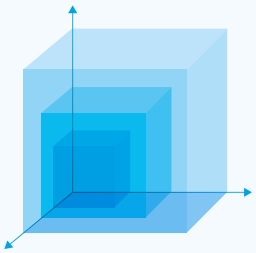
Impact resistant housing and lens
Achieves IK08 impact rating to endure harsh environments.

High quality components
Longevity is assured with 70 % light emission even after 8 million flashes.

–40 °C to +55 °C temperature range
Suitable for use in thermal conditions encountered in factories and all corners of the worlds.

Further significant advantages
can be seen on a video on our website, please type the webcode #3553 into the search field.

3D-Coverage performance data, A x B x C



PY X-S-05

Indicate	45.9 x 39.2 x 50.9 m
Warn	20.4 x 17.4 x 22.6 m
Alarm	10.2 x 8.7 x 11.3 m

Coverage area according to the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

FLASHING LIGHTS

IP 66
protection system

IK08
impact-proof housing

+55 °C
–40 °C
operating temperature

EN 54-23
24 V DC
48 V DC

VdS
24 V DC
48 V DC

10 Years
warranty

PRODUCT		PY X-S-05			
ARTICLE NO.		21510101000	21510801000	21510101055	21510801055
ARTICLE NO.		21510103000	21510803000	21510103055	21510803055
ARTICLE NO.		21510104000	21510804000	21510104055	21510804055
ARTICLE NO.		21510105000	21510805000	21510105055	21510805055
DATA					
Light source		xenon flash tube			
Operating range		187–255 V AC 50 I 60 Hz	18–30 V DC	187–255 V AC 50 I 60 Hz	18–30 V DC
Nominal current consumption		55 mA @ 230 V	300 mA @ 24 V	55 mA @ 230 V	300 mA @ 24 V
Flash energy and flash rate		5 J @ 1 Hz = 60 flashes/min			
Light intensity (DIN 5037) [1]		50 cd			
Max. viewing distance		164 m			
Operating temperature		–40 … +55 °C			
Protection system according to EN 60529		IP 66			
Impact resistance as per EN 50102		IK08			
Service life of light source		light emission still 70 % after 8,000,000 flashes			
Material	lens	polycarbonate (PC)			
	housing	polycarbonate (PC), RAL 3000		polycarbonate (PC), RAL 7035	
Dimensions (X x Y x Z)		109.5 x 85.8 x 80.6 mm			

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

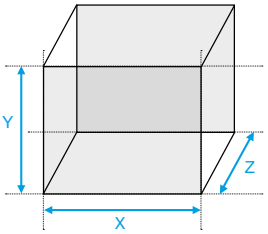
Models with alternative features available upon request

115 V AC I 24 V AC I 48 V DC I 12 V DC.	Choice of lens colours: clear I white I yellow I amber I red I green I blue.	White enclosure.	GL.	CNBOP.	Soft Start Module.

Webcode
#3118

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Traffic Lights

LED

Quadro LED-TL

Very bright LED
Face-on LEDs provide far-reaching signals for traffic control and machinery feedback applications.

IP 66 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Impact resistant housing and lens
Achieves IK08 impact rating to endure harsh environments

Mounting
Mounted using external lugs or internal holes that do not impair the IP protection; mounting can be performed in any direction.

Optional dimmer:
Light sensor provides automatic attenuation of light intensity for glare avoidance during night time operation.

Field of application examples
Traffic routing in non-public areas, conveyer and storage systems, crane safety, container handling systems.

Spectra P 450 TLA

Robust construction
LED technology provides high tolerance to shock and vibration. High quality plastic housing offers corrosion resistance.

Highly visible
Clear prismatic lenses and coloured LEDs offer a high degree of signal perception even in daylight and bright surroundings.

Glare protection
Visor shields against sunlight interference.

Optional mounting bracket
Creates multi-unit signal light array and provides alignment adjustability.

TRAFFIC LIGHTS

IP 66
Quadro LED-TL

IP 65
P 450 TLA

IK08
Quadro LED-TL

+55 °C
–30 °C
Quadro LED-TL

+50 °C
–25 °C
P 450 TLA

PRODUCT		Quadro LED-TL		P 450 TLA	
ARTICLE NO. ● ● ●		21106640008	21106630008	–	–
ARTICLE NO. ●				21355645000	21355635000
ARTICLE NO. ●				21355646000	21355636000
DATA					
Light source		high output LED array			
Operating range		85–265 V AC 50 I 60 Hz	10–30 V DC	90–253 V AC 50 I 60 Hz	10–30 V DC
Nominal current consumption		3x 100 mA I 3x 65 mA	3x 290 mA	15–40 mA	175 mA
Light intensity (DIN 5037)		>75 cd		60 cd	
Max. viewing distance		207 m		180 m	
Operating temperature		–30 … +55 °C		–25 … +50 °C	
Protection system according to EN 60529		IP 66		IP 65	
Impact resistance as per EN 50102		IK08			
Service life of light source		>50,000 hrs			
Material	lens	● ● ● polycarbonate (PC), UV resistant		polycarbonate (PC), UL 94 V0 f1	
	housing	polycarbonate (PC), UV resistant		polycarbonate (PC), UL 94 V0 f1	
Dimensions (X x Y x Z)		396 x 130 x 130 mm		140 x 177 x 140 mm	

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC

Light sensor optional
(Quadro LED-TL)

Wall brackets optional
(P 450 TLA)
See page 62

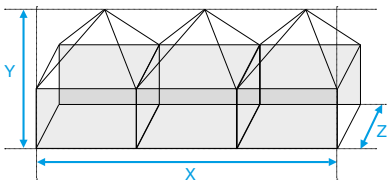
Models with alternative features available upon request

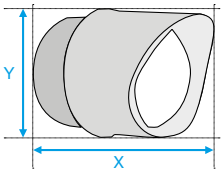
Quadro LED-TL available as single-element light fixtures in green, amber, or red which may be combined to create multi stage traffic signals or operator feedback lighting.	P 450 TLA available as single-element light fixtures in green, amber, or red which may be combined to create multi stage traffic signals or operator feedback lighting.

Webcode
#3119

Comprehensive technical documentation such as
- **operating instruction, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com





PMF
Multi-Function Light

LED

LED technology – multi-function capability
Durable, low power, high output LEDs with an array of signal action.

Rotating mirror effect
LED's illuminated in a circular chase offer a durable, no-moving-parts alternative to legacy rotating mirror lights.

Maintenance-free
Service life exceeds 50,000 hrs.

Externally controllable operating modes
4 different alarms from the same unit:
- continuous light
- blinking light
- flashing light
- rotating beacon effect

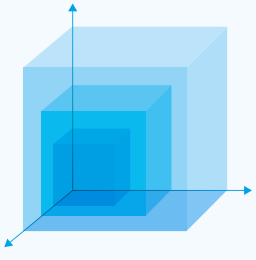
Flexible operating voltages
AC and DC powered versions.

Soft Start Module
Limits inrush current for 24 V AC/DC versions and permits direct control by PLC transistor outputs, eliminating the need for interposing relays.

Low power consumption
Energy efficient, solid-state design is also shock and vibration tolerant.

Highly effective light beam
Fresnel lens optics provide a brilliant horizontal light stream for long distance signal transmission.

3D-Coverage performance data, A x B x C



PMF-LED Flex

Indicate	11.3 x 62.6 x 62.6 m
Warn	5 x 27.8 x 27.8 m
Alarm	2.5 x 13.9 x 13.9 m

Coverage area according to the applications „Indicate", „Warn" and „Alarm" (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

LED LIGHTS

IP 55
protection system

+55 °C
–30 °C
operating temperature

inrush current limitation

PRODUCT		PMF-LED Flex			
		direct mounting		bracket mounting	
ARTICLE NO.		21151644006		21151644007	
ARTICLE NO.		21151645006		21151645007	
DATA					
Light source		8 x 2 LEDs (3 chip version)			
Operating range		95–253 V		100–350 V	
		AC 50 I 60 Hz		DC	
Nominal current consumption	continuous light	60 mA @ 230 V		35 mA @ 220 V	
Operating mode		continuous light	blinking light	flashing light	rotating all-round light
Flash rate of the main flash			1.5 Hz	1 Hz	2.5 Hz
Light intensity (DIN 5037) [1]		27 cd			
Max. viewing distance		120 m			
Beam angle	vertical	approx. 16 °			
Operating temperature		–30 … +55 °C			
Protection system according to EN 60529		IP 55 (vertical mounting)			
Service life of light source		>50,000 hrs			
Material	lens	polycarbonate (PC), fresnel characteristic			
	housing	acrylonitrile butadiene styrene (ABS)		polycarbonate (PC)	
Dimensions (X x Y + Y2)		Ø 177 x 185 + 0 mm		Ø 130 x 170.5 + 90 mm	

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

EAC

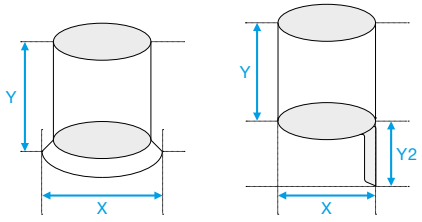
Models with alternative features available upon request

24 V AC/DC.	Choice of lens colours: clear I amber I red I green I blue.

Webcode
#3120

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Continuous Lights

LED

Machinery status light
The complementary pyramid design provides modern aesthetics for the OEM machine builder.

Rugged LED technology
Shock and vibration tolerant, long service life, reliable operation, zero maintenance, and low power consumption.

Opaque illumination effect
The coloured lens offers an attractive signal glow and eliminates LED light “hot spots”.

For safety-relevant applications,
such as x-ray and laser equipment and any other machine.

AS-i-Bus
Supplying of the light directly by bus system. Control and function monitoring directly via AS interface (PD 2100-M-AS-i).

Models with alternative features available upon request

Choice of lens colours: clear | white | yellow | amber | red | green | blue.

LED CONTINUOUS LIGHTS

IP 55
protection system

+45 °C
–25 °C
operating temperature

PRODUCT		PD 2100-LED		PD 2100-M-AS-i
ARTICLE NO. ●				21120502004
ARTICLE NO. ●		21120615000	21120605000	21120505004
DATA				
Light source		LED		
Operating range		207–253 V	AC: 18–27 V DC: 19–30 V	26.5–32.6 V
Nominal current consumption		12 mA @ 230 V	AC: 115 mA @ 24 V DC: 65 mA @ 24 V	approx. 250 mA
Alarm output				via AS-i Bus
Light intensity (DIN 5037) [1]		5 cd		
Max. viewing distance		52 m		
Operating temperature		–25 … +45 °C		
Protection system according to EN 60529		IP 55 (if mounted vertically/horizontally)		
Service life of light source		>50,000 hrs		
Material	lens	○ ○ ● ● ● ● ● polycarbonate (PC)		
	housing	acrylonitrile butadiene styrene (ABS)		
Type of connection				M12 plug connector, 4-pole
	Pin 1			AS-i +
	Pin 2			NC
	Pin 3			AS-i –
	Pin 4			NC
Addressing socket				DC jack, Ø 1.3 mm, AS-i + I AS-i –
AS-i specification				AS-i 2.1, A/B capable EN 50295
Dimensions (X x Y x Z)		166.2 x 111.2 x 128 mm		

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

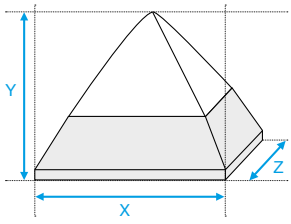
[1] with a clear lens

EAC

Webcode
#3121

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



POL
Obstacle Lights

LED obstacle lights
AVV approved, compliant to ICAO, Annex 14, Volume 1, Chapter 6.

Omnidirectional LED array
Light radiation of 360° offers superb marking of aviation obstructions for night time and twilight safety.

Optional redundancy for added safety:
Incorporates dual LEDs and circuitry to eliminate the need for backup or redundant fixtures.

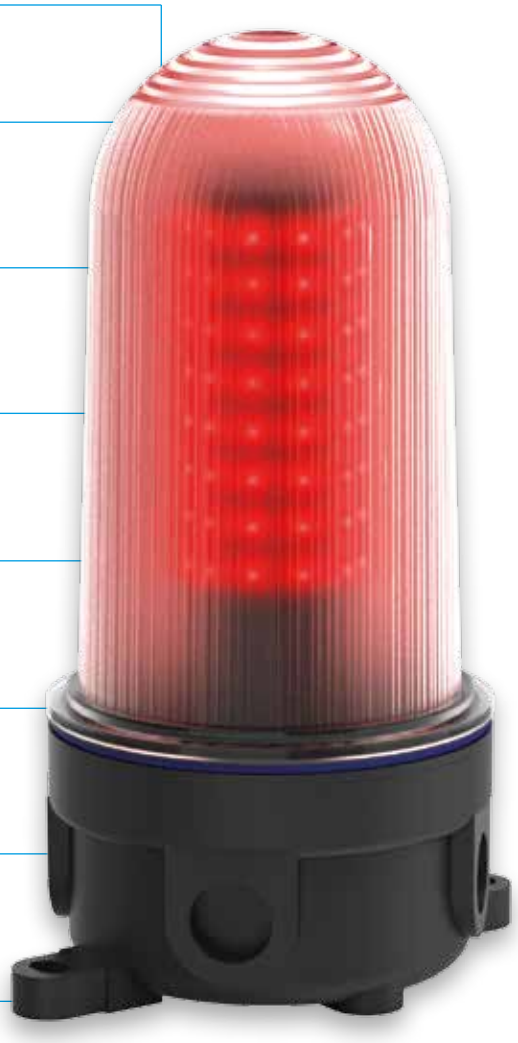
Automatic switching over
to standby light in case of error or by means of external control system.

Self-monitoring
Integrated functional fault monitoring with dry contact relay permits automatic switchover to backup lighting.

Maintenance free
Shock and vibration tolerant LEDs provide a service life in excess of 50,000 hrs.

Breathable membrane
Integrated within the cable gland to prevent condensation.

Optional plug contact
For simplified installation.



Several versions to serve specific needs

POL 10-M-RA	POL 32-M
10 cd intensity, integrated fault monitoring, redundant LED array, automatic switchover.	32 cd intensity, integrated fault monitoring.
Low intensity ICAO type A, AVV.	Low intensity ICAO type B.

OBSTACLE LIGHTS

AVV
POL 10

ICAO

IP 68
protection system

+55 °C
–40 °C
operating temperature

redundant

PRODUCT		POL 10-M-RA		POL 32-M	
ARTICLE NO.		21105641010	21105631010	21105681005	21105671005
DATA					
Light source		LED array (red)			
Operating range		85–265 V AC 50 I 60 Hz	9.6–28.8 V DC	85–265 V AC 50 I 60 Hz	9.6–28.8 V DC
Current consumption, determined arithmetically		60 mA @ 115 V 40 mA @ 230 V	600 mA @ 12 V 350 mA @ 24 V	96 mA @ 115 V 45 mA @ 230 V	800 mA @ 12 V 430 mA @ 24 V
Version		monitored, redundant		monitored	
Light intensity (DIN 5037)		18 cd		32 cd	
Light colour		aviation red			
Beam angle	vertical	approx. ±35°			
	horizontal	360°			
Operating temperature		–40 … +55 °C			
Protection system according to EN 60529		IP 68			
Service life of light source		>50,000 hrs			
Material	lens	polycarbonate (PC)			
	base	polybutylene terephthalate (PBT)			
Dimensions (X x Y)		118 x 240 mm			

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC

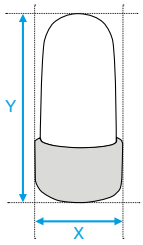
Models with alternative features available upon request

All POL versions in 48 V DC.	POL 10-M: 10 cd, monitored.	POL 10-M-R: 10 cd intensity, integrated fault monitoring, redundant LED array, relay contact for external switchover.

Webcode
#3123

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Ex-ATEX Flashing Lights

EX

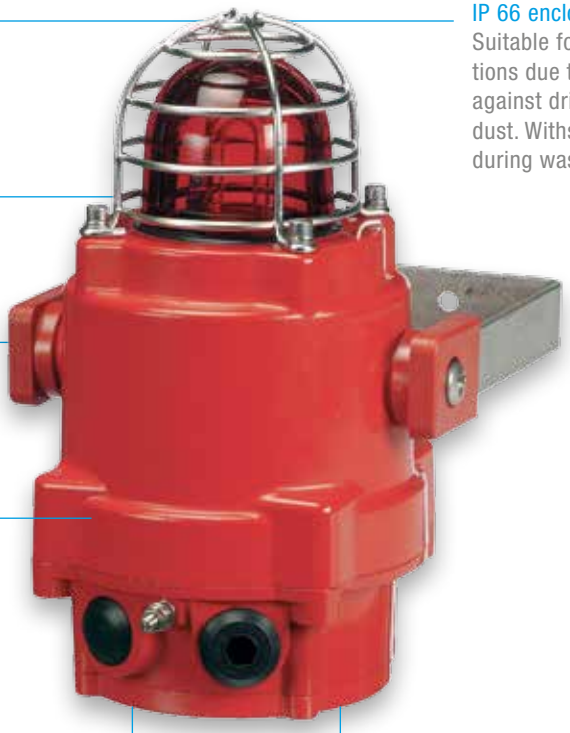
Powerful visual safety for hazardous areas
Up to 15 Joule flashing light energy to alert personnel of danger in both combustible gas and dust environments.

ATEX certified for Zones 1, 2, 21, 22
Satisfies requirements for device category 2D and 2G.

Choice of housing protection scheme
Category “d” flame proof enclosure or category “e” enhanced safety for ease of safe electrical connection.

Robust construction
Durable, cast-aluminium housing and stainless steel protection cage endures saltwater and other corrosives for demanding marine and industrial environments.

Wide range
of operating temperatures from –50 °C to +70 °C.



IP 66 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Convenient mounting
Stainless steel bracket permits ease of installation for any orientation.

Models with alternative features available upon request

BExBG05 in 115 V AC, 12 V DC, 48 V DC, BExBG15 in 48 V DC.	Choice of lens colours: clear	yellow	amber	red	green	blue.	Less expensive versions with higher IP rating but without “e” enhanced safety electrical connection.

EX-ATEX FLASHING LIGHTS

IP 66
protection system

+70 °C
–50 °C
operating temperature

PRODUCT		BExBG15-E		BExBG05-E	
ARTICLE NO.		31110103000	31110803000	31130103000	31130803000
ARTICLE NO.		31110104000	31110804000	31130104000	31130804000
ARTICLE NO.		31110105000	31110805000	31130105000	31130805000
DATA					
Operating range		230 V ±10 %	24 V ±25 %	230 V ±10 %	24 V ±25 %
		AC 50 I 60 Hz	DC	AC 50 I 60 Hz	DC
Current consumption		170 mA @ 230 V AC	860 mA @ 24 V DC	55 mA @ 230 V AC	300 mA @ 24 V DC
Type of protection		Ex de IP 66			
Explosion protection		II 2G Ex de IIC T4 or T5 II 2D Ex tD A21 IP66 T125		II 2G Ex de IIC T4, T5 or T6 II 2D Ex tD A21 IP66 T115	
Category (area of use)		2G (Zone 1, 2) 2D (Zone 21, 22)			
Certificate of conformity		KEMA 01 ATEX 2030			
Flash energy and flash rate		15 J @ 1 Hz = 60 flashes/min		5 J @ 1 Hz = 60 flashes/min	
Light intensity (DIN 5037) [1]		226 cd		55 cd	
Max. viewing distance		348 m		172 m	
Temperature class T		T4 / T125°C @ Ta –50 °C ... +70 °C T110°C @ Ta –50 °C ... +55 °C T5 / T85°C @ Ta –50 °C ... +40 °C		T4 / T115°C @ Ta –50 °C ... +70 °C T5 / T100°C @ Ta –50 °C ... +55 °C T6 / T85°C @ Ta –50 °C ... +40 °C	
Protection system according to EN 60529		IP 66			
Service life of light source		light emission still 70 % after 8,000,000 flashes			
Material	lens	glass			
	housing	die-cast aluminium, resistant to salt water, marine grade LM6			
Dimensions (X x Y)		Ø 165 x 239.5 mm			

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

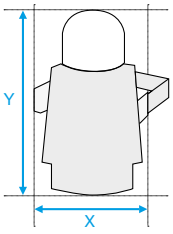
[1] with a clear lens

EAC

Webcode
#3124

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Ex-ATEX
Flashing Lights

EX

Visual safety for hazardous areas
Up to 5 Joule flashing light energy to alert personnel of danger in both combustible gas and dust environments.

ATEX certified for Zones 1, 2, 21, 22
Satisfies requirements for device category 2G/3G and 2D/3D.

Choice of housing protection scheme
Category “d” flame proof enclosure or category “e” enhanced safety for ease of safe electrical connection.

Optional
available with different mounting accessories; for pipe clamp, mounting bracket and mounting plate. Stainless steel protective cage available.

Robust and reliable
With corrosion resistant anodised aluminium housing and mounting bracket, as well as a high strength polycarbonate lens, the signal light is ideal for tough industrial requirements.

Flash tube
Xenon strobe generates highly visible light without sensitive filaments. A steel fixing clamp provides additional resistance to shock and vibration.

IP 66 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

GL
Germanischer Lloyd approved versions available for maritime applications and areas prone to high shock and vibration conditions.

Models with alternative features available upon request

CWB-ATEX in 110–127 V AC and 60–80 V DC.	Choice of lens colours: clear	yellow	amber	red	green	blue.

EX-ATEX FLASHING LIGHT

IP 66
protection system

+50 °C
–40 °C
operating temperature

PRODUCT		CWB-ATEX		
ARTICLE NO.		31006103000	31006903000	
ARTICLE NO.		31006104000	31006904000	
ARTICLE NO.		31006105000	31006905000	
DATA				
Operating range		230 V ±10 %	24–42 V ±10 %	12–48 V ±10 %
		AC 50 I 60 Hz	AC 50 I 60 Hz	DC
Current consumption		0.08 A @ 230 V AC	0.5–0.3 A	0.5–0.3 A
Type of protection		“d” flame proof enclosure for light housing “e” enhanced safety for terminal box		
Explosion protection		II 2G Ex d e IIC T6 Gb II 2G Ex d e IIC T5 Gb II 2D Ex tb IIIC T85°C Db IP66 (T6) II 2D Ex tb IIIC T100°C Db IP66 (T5)		
Category (area of use)		2G (Zone 1, 2) 2D (Zone 21, 22)		
Certificate of conformity		LCIE 02 ATEX 6113		
Flash energy and flash rate		5 J @ 1 Hz		
Light intensity (DIN 5037) [1]		55 cd		
Max. viewing distance		172 m		
Temperature class	T6	T_{amb}: –40 °C ... +40 °C		
	T5	T_{amb}: –40 °C ... +50 °C		
Protection system according to EN 60529		IP 66		
Service life of light source		light emission still 70 % after 8,000,000 flashes		
Material	lens	polycarbonate (PC)		
	housing	aluminium alloy		
Dimensions (X x Y x Z)		91 x 260 x 82 mm		

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

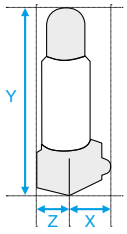
Protective cage optional
See page 63

Mounting bracket optional
See page 63

Webcode
#3125

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Ex-ATEX
Alarm Devices IS-Mini

EX

Intrinsically safe signalling
Choose from audible, visual, or combined audible-visual alarms for hazardous areas.

Zones 0, 1 and 2
Certified for use in Ex zones 0, 1 and 2 when used with a certified zener barrier or galvanic isolator.

Effective alarming
Choice of 100 dB(A) sounder, blinking LED array, or both.

Compact design
Permits versatile installation in practically any space.

Audible notification
Choice of 49 unique alarm tones with three stages of tone control for distinctive signalling of specific events. Audible signals are synchronised across multiple units connected in series. Volume control adjusts output level to fit the signalling space required.

Low power consumption
Ideal for use as a notification appliance in fire alarm systems.

Signal control
Sounder and blinking light can be independently controlled.

Visual notification
Choice of yellow/amber, red, green or blue LEDs with selectable blinking frequency of 1 or 2 Hz.

Wide range
of operating temperatures from –40 °C to +60 °C.

Zener barriers
To achieve intrinsically safe operation, units must be connected with a zener barrier or galvanic isolator. See accessory pages for available models.

Models with alternative features available upon request

IS-mB1 with other lens colours like amber I green I blue.	IS-mC1 with other lens colours like amber I green I blue.

EX-ATEX ALARM DEVICES

IP 67
protection system

+60 °C
–40 °C
operating temperature


IS-mA1


IS-mB1


IS-mC1

PRODUCT		IS-mA1	IS-mB1	IS-mC1
ARTICLE NO.		32034800000		
ARTICLE NO.			31008804000	32035804000
ARTICLE NO.			31008805000	32035805000
DATA				
Operating mode		sounder	blinking light	blinking sounder
Operating range		16–28 V DC	16–28 V DC	16–28 V DC
Current consumption		25 mA @ 24 V DC	25 mA @ 24 V DC	48 mA@ 24 V DC
		typical for connection to 24 V DC via 28 V / 300 Ω zener barrier		
Type of protection		"ia" inherently safe		
Explosion protection		II 1G EEx ia IIC T4	II 1G EEx ia IIC T4	II 1G Ex ia IIC T4
Category (area of use)		1G (Zone 0, 1, 2)		
Certificate of conformity		SIRA 05 ATEX2084 X		
Temperature class T		T4 @ Ta –40 °C ... +60 °C		
Sound pressure level		100 dB(A)		100 dB(A)
Sound level reduction		–20 dB		–20 dB
Alarm tones		49		49
Light source			LED	
Blinking rate			can be set to 2 Hz or 1 Hz	
Max. viewing distance			52 m	
Protection system according to EN 60529		IP 65		
Service life of light source		light emission still 70 % after 8,000,000 flashes		
Material	housing	acrylonitrile butadiene styrene (ABS), self-extinguishing UL94V0 & 5VA		
	lens		polycarbonate (PC)	
Dimensions (X x Y x Z)		88.7 x 99 x 95 mm	88.7 x 85 x 95 mm	88.7 x 116 x 95 mm

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

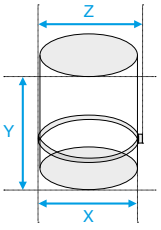
Power must be connected via a zener barrier (max. 28 V DC, 93 mA DC, 0.66 W) or a galvanic isolator, specified by the system certificate (see page 63).

EAC

Webcode
#3126

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Accessories

PROTECTIVE CAGES

For safeguarding the lenses of signal lights against impact from foreign objects. Particularly useful for use on lights installed onto vehicles and fork lifts.

Detailed technical information:

SUITABLE FOR ...	PD	WBL I WBS	ABL I ABS I WBL-M I WBS-M
ARTICLE NO.	287105000040	28710500041	28710500042
DATA			
Material	steel, powder-coated		
Colour	white, similar to RAL 9016		

ACCESSORIES PYRA® FLASHING LIGHTS

Detailed technical information:

		PY X-S	PY X-M
Enclosure fitting	Used for combining multiple PY X-S series lights together or installing one light to an electrical enclosure.	28300000003	–
Surface gasket	For use when surface mounting to an electrical enclosure to maintain the IP rating of the enclosure.	28300000004	28111500000
Tamper-proof sealing (pack of 4)	Inserts into the head of the plastic 3/8-turn fasteners of PYRA® series units to disable access to internal components.	28300000002	
Panel mount installation kit PYRA®	Permits flush mounting of PYRA® lights to enclosure panels through a rectangular cutout. Includes mating electrical connector and mounting hardware.	28300000010	

ACCESSORIES TRAFFIC LIGHTS

Detailed technical information:

		QUADRO LED-TL	P 450 TLA
Enclosure fitting	For connection (daisy-chaining) of several traffic lights Quadro LED-TL.	28112000003	–
P 400 RAB001 Wall bracket	Wall mount bracket for SPECTRA lights.	–	21394000000
P 450 TMB-2 Wall bracket set for combinations of 2 or 3 lights	Metal wall mount bracket for SPECTRA traffic lights and combinations.	–	21397000000
P 450 TMB-1 Wall bracket for single mounting		–	21399000000

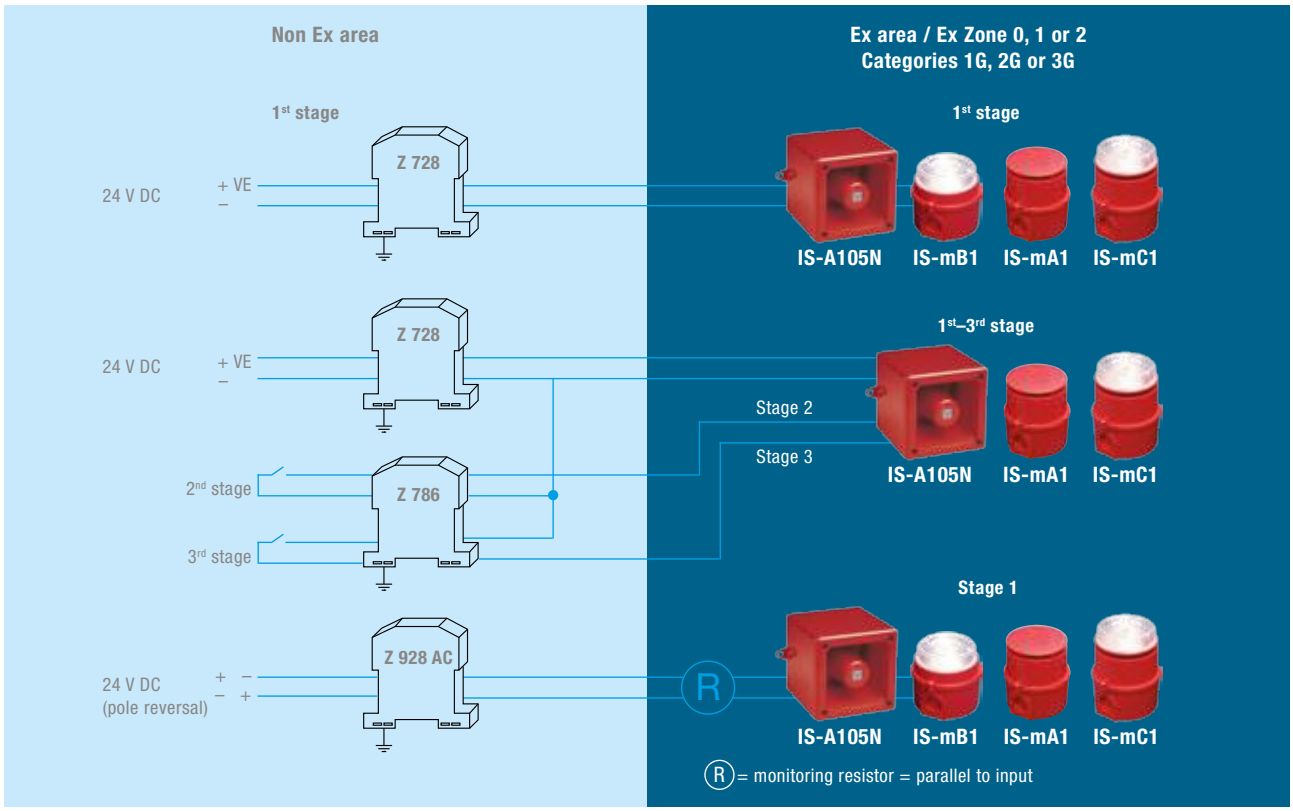
ZENER BARRIERS

PRODUCT	Z 728	Z 928	Z 786
ARTICLE NO.	38109800000	38109300000	38109800001
DATA			
Design	terminal housing made of makrolon, flammability class UL 94 V-0		
Dimensions (H x W x D)	110 x 12.5 x 115 mm		
Mounting	snap fitting to 35 mm DIN rail conforming to DIN EN 50022		
Connection	self-opening apparatus terminals; max. wire cross-section 2 x 2.5 mm²		
Ambient temperature	–20 °C … +60 °C		

Detailed technical information:

Webcode
#3552

Combination possibilities: Zener barrier, IS-A105N sounder and IS-Mini series alarm.



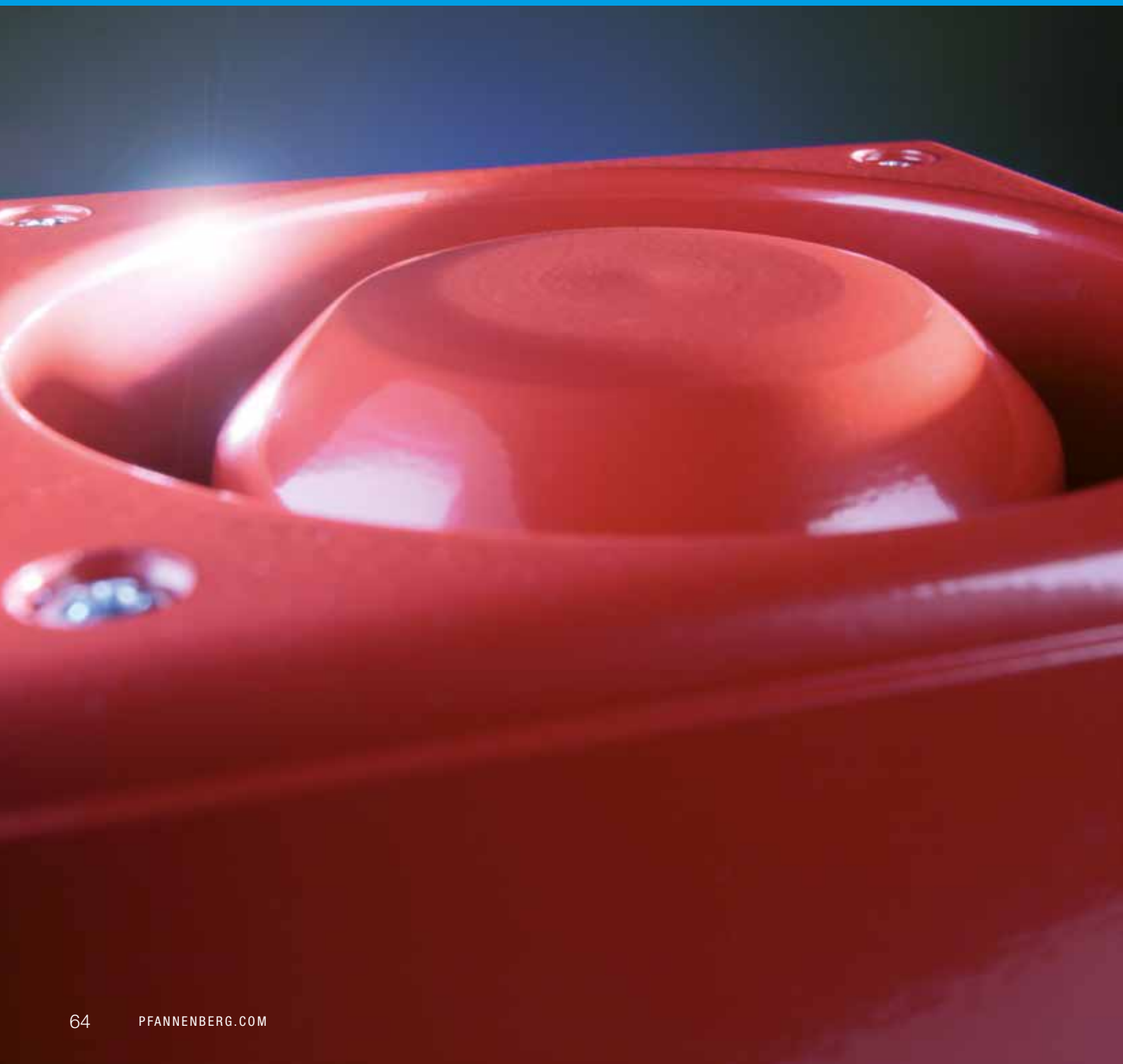
ACCESSORIES CWB-ATEX

PRODUCT		ARTICLE NO.
Mounting bracket	stainless steel	38108100100
Standard bracket set	stainless steel	38108100150
Mounting plate	stainless steel	38108100000
Pipe clamps	R1 1/4" stainless steel	38108101000
	R1 1/2" stainless steel	38108101200
	R2" stainless steel	38108102000
Protective cage	stainless steel	38108100200

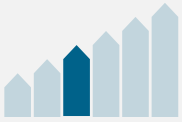
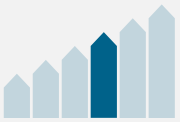
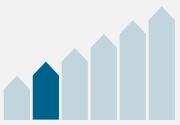
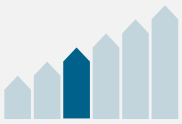
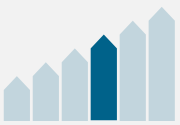
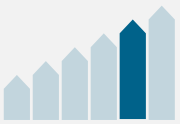
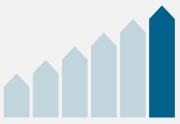
Detailed technical information:

Webcode
#3557

Audible signaling notification appliances.



Audible signaling devices at a glance

	TYPE	3D-COVERAGE LEVEL [1]	SOUND PRESSURE LEVEL	PROTECTION SYSTEM	DIMENSIONS (H x W x D) mm	APPROVALS/STANDARDS						PAGE
						GL	MED	EAC	UL	EN 54-3	VdS	
	SOUNDERS											
	**DS 5**		105 dB(A)	IP 66 IP 67	133.5 x 133.5 x 143	● [2]		●	● [2]	●	●	68
	**DS 10**		110 dB(A)	IP 66 IP 67	133.5 x 133.5 x 143	● [2]		●	● [2]	●	●	
	**PA 1**		100 dB(A)	IP 66 IK08	86 x 109.5 x 80.6	● [2]	● [2]	●	●	●	●	70
	**PA 5**		105 dB(A)	IP 66 IK08	135 x 163.4 x 132	● [2]	● [2]	●	●	●	●	
	**PA 10**		110 dB(A)	IP 66 IK08	170 x 214 x 156	● [2]	● [2]	●	●	●	●	
	**PA 20**		120 dB(A)	IP 66 IK08	170 x 214 x 181	● [2]	● [2]	●	●	●	●	
	**PA 130**		130 dB(A)	IP 54	285 x 490 x 595			●				72

● available
○ pending
[2] option

Sound pressure levels approaching 120 dB(A) and higher can lead to hearing damage. Caution must be exercised to ensure that personnel are not within the vicinity of such elevated sound pressure levels. High output sounders are intended for use in outdoor applications or in large manufacturing spaces where hearing protection may be in use.

Unless specified otherwise, sound pressure level is measured at a 1 m distance.

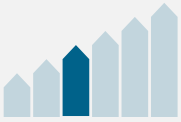
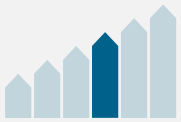
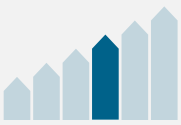
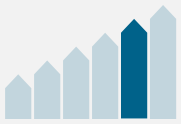
Audible signaling devices at a glance

	TYPE	3D-COVERAGE LEVEL [1]	SOUND PRESSURE LEVEL	PROTECTION SYSTEM	DIMENSIONS (H x W x D) mm	APPROVALS/STANDARDS						PAGE
						GL	MED	EAC	UL	EN 54-3	VdS	
	SAFETY-RELATED SOUNDERS											
	DS 5-SIL		105 dB(A)	IP 66 IP 67	133.5 x 133.5 x 143			●				68
	DS 10-SIL		110 dB(A)	IP 66 IP 67	133.5 x 133.5 x 143			●				
	ELECTRONIC BUZZERS											
	P 22 DBZ		80 dB(A) @ 10 cm	IP 40	Ø 29 x 62			●				73
	P 28 DMC301		91 dB(A)	IP 65	Ø 35.8 x 38.2			●				
	P 28 DMB530		91 dB(A)	IP 65	Ø 35.8 x 38.2			●				
	EX-ATEX SOUNDERS											
	IS-mA1		100 dB(A)	IP 65	Ø 88.7 x 99			●				60
	IS-A105N		105 dB(A)	IP 66	130 x 130 x 132			●				74

● available
○ pending
[2] option

Sound pressure levels approaching 120 dB(A) and higher can lead to hearing damage. Caution must be exercised to ensure that personnel are not within the vicinity of such elevated sound pressure levels. High output sounders are intended for use in outdoor applications or in large manufacturing spaces where hearing protection may be in use.

Unless specified otherwise, sound pressure level is measured at a 1 m distance.

	TYPE	3D-COVERAGE LEVEL [1]	SOUND PRESSURE LEVEL	PROTECTION SYSTEM	DIMENSIONS (H x W x D) mm	APPROVALS/STANDARDS						PAGE
						GL	MED	EAC	UL	EN 54-3	VdS	
	EX-ATEX SOUNDERS											
	DS 5 3G/3D		105 dB(A)	IP 66 IP 67	133.5 x 133.5 x 143	● [2]		●		●	●	68
	DS 10 3G/3D		110 dB(A)	IP 66 IP 67	133.5 x 133.5 x 143	● [2]		●		●	●	
	BExS 110E		110 dB(A)	IP 66	Ø 181 x 275			●				76
	BExDS 120E		117 dB(A)	IP 66	Ø 220 x 326			●				

● available
○ pending
[2] option

Sound pressure levels approaching 120 dB(A) and higher can lead to hearing damage. Caution must be exercised to ensure that personnel are not within the vicinity of such elevated sound pressure levels. High output sounders are intended for use in outdoor applications or in large manufacturing spaces where hearing protection may be in use.

Unless specified otherwise, sound pressure level is measured at a 1 m distance.

DS
Sounders

EX

SIL / PL

Die-cast aluminium housing
Resistant to UV light, seawater, and many chemicals. Sturdy construction resists vandalism to ensure a high degree of functional safety.

Selectable audible notification
Choice of 32 unique alarm tones with three stages of tone control for distinctive signalling of specific events.

Choice of output levels
Versions for 105 dB(A) and 110 dB(A) sound pressure levels to suit a variety of signal coverage needs.

Strong, metal mounting lugs
Ensures a safe and secure installation onto many types of surfaces.

SIL conforming versions
Versions for Safety Instrumented Systems up to SIL 2 / PLd. Integrated self-monitoring function satisfies the requirement for routine system checks and eliminates the need for redundant devices.

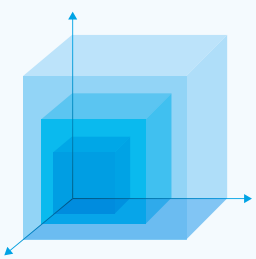
Electromagnetic sound capsule technology
Acoustic signal includes a share of low frequency side bands for excellent sound penetration of walls and doors for highly effective alarming.

ATEX certified for Zones 2 and 22 (option)
Optional versions satisfy requirements for device category 3G and 3D in hazardous areas.

IP 66/67 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Stainless steel cable gland
Included to ensure a high degree of electrical connection integrity.

3D-Coverage performance data, A x B x C



DS 5
DS 5-SIL
DS 5 3G/3D ATEX

80 dB(A)	23.1 x 27.5 x 23.1 m
85 dB(A)	13 x 15.5 x 13 m
90 dB(A)	7.3 x 8.8 x 7.3 m

DS 10
DS 10-SIL
DS 10 3G/3D ATEX

80 dB(A)	33.4 x 43.7 x 33.4 m
85 dB(A)	18.8 x 24.5 x 18.8 m
90 dB(A)	10.6 x 13.8 x 10.6 m

Coverage area with DIN tone and required sound levels of 80, 85 and 90 dB(A). To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

SOUNDERS

IP 66
IP 67
protection system

+55 °C
–40 °C
DS 5 | DS 10

+55 °C
–25 °C
DS 5-SIL | DS 10-SIL
DS 5 | DS 10
3G/3D ATEX

acoustic penetration

EN 54-3
DS 5 | DS 10
DS 5 | DS 10
3G/3D ATEX

VdS G28609
DS 5 | DS 10
DS 5 | DS 10
3G/3D ATEX

10 Years
warranty

PRODUCT		DS 5		DS 10	
ARTICLE NO.	STANDARD	23106100000	23106800000	23111100000	23111800000
ARTICLE NO.	SIL	23106100601	23106800601	23111100601	23111800601
ARTICLE NO.	3G/3D ATEX	23106100007	23106800007	23111100007	23111800007
DATA					
Operating range		195–253 V SIL: 95–253 V	19–29 V	195–253 V SIL: 95–253 V	19–29 V
		AC 50 | 60 Hz	DC	AC 50 | 60 Hz	DC
Nominal current consumption	sounder	0.06 A @ 230 V	0.28 A	0.06 A @ 230 V	0.42 A
	SIL: diagnostic channel	30 mA	20 mA	30 mA	20 mA

	DS 5 | DS 10	DS 5-SIL | DS 10-SIL	DS 5 3G/3D | DS 10 3G/3D
Sound pressure level	105 dB(A) | 110 dB(A)		105 dB(A) | 110 dB(A)
Sound level reduction	DS 5: –20 dB via potentiometer (optional)		
Alarm tones	32 / 4 tones are externally selectable, tone table on page 108		
Operating temperature	–40 … +55 °C	–25 … +55 °C	–25 … +55 °C
Protection system according to EN 60529	IP 66 | IP 67		
Explosion protection			II 3G Ex nA II T4 II 3D Ex tD A22 IP 67 T135°C
Category (area of use)			3G (Zone 2), 3D (Zone 22)
Material	die-cast aluminium GD-Al Si12 Cu		
Surface coating	epoxy resin paint		
Cable bushing	2x M20 (1x chrome-plated brass cable fitting, 1x chrome-plated brass blanking plug)		
Dimensions (X x Y x Z)	133.5 x 133.5 x 143 mm		

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

c UL us LISTED
DS 5 | DS 10

EAC
GL 30457-83-HH
DS 5 | DS 10
DS 5 | DS 10 3G/3D

DS 5-SIL | DS 10-SIL

DS 5

External tone selection control

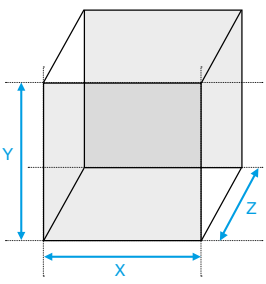
Models with alternative features available upon request

DS 5 and DS 10 in 115 V AC.

Webcode
#3127

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



PA
Sounders

Captive fastener
Installation and assembly is simplified and screws cannot get lost.

Shape-moulded gasket
Stays in-place and cannot get lost.

Plug and socket connections
Upper and lower parts combine positively to simplify installation. When separated, electrical hazards are eliminated for handling.

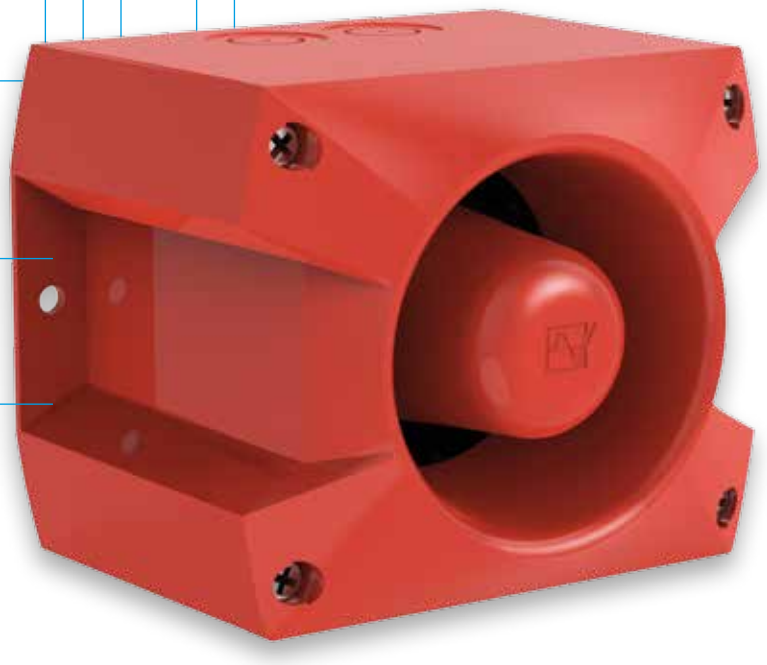
Selectable audible notification
Choice of 80 unique alarm tones with four stages of tone control for distinctive signalling of specific events.

Impact resistant housing
Achieves IK08 impact rating to endure harsh environments.

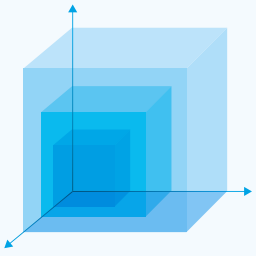
IP 66 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Electromagnetic sound capsule technology
Acoustic signal includes a share of low frequency side bands for excellent sound penetration of walls and doors for highly effective alarming.

Intelligent installation
Electrical wiring is conducted in the base box to avoid clumsy 3-hand assembly. Wires are safely routed where the potential for pinching and errors are eliminated.



3D-Coverage performance data, A x B x C



Coverage area with DIN tone and required sound levels of 80, 85 and 90 dB(A). To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

PA 1

80 dB(A)	16 x 13.8 x 16 m
85 dB(A)	9 x 7.8 x 9 m
90 dB(A)	5.1 x 4.4 x 5.1 m

PA 5

80 dB(A)	14.1 x 18.1 x 14.1 m
85 dB(A)	7.9 x 10.2 x 7.9 m
90 dB(A)	4.4 x 5.7 x 4.4 m

PA 10

80 dB(A)	52.8 x 73.3 x 52.8 m
85 dB(A)	29.7 x 41.2 x 29.7 m
90 dB(A)	16.7 x 23.2 x 16.7 m

PA 20

80 dB(A)	85.6 x 97.7 x 85.6 m
85 dB(A)	48.1 x 55 x 48.1 m
90 dB(A)	27.1 x 30.9 x 27.1 m

SOUNDERS

IP 66 — protection system
IK08 — impact-proof housing
+55 °C / –40 °C — operating temperature
acoustic penetration
external tone selection

EN 54-3 — 24–48 V DC
VdS — 24–48 V DC
UL
10 Years — warranty


PA 1


PA 10


PA 5


PA 20

PRODUCT	PA 1		PA 5	
ARTICLE NO. ●	23310100000	23310630000	23350100000	23350630000
ARTICLE NO. ●	23310100055	23310630055	23350100055	23350630055
DATA				
Operating range	195–253 V AC 50 I 60 Hz	10–57 V DC	195–253 V AC 50 I 60 Hz	10–57 V DC
Nominal current consumption	9–15 mA @ 230 V	6–80 mA	9–15 mA @ 230 V	6–80 mA

PRODUCT	PA 10		PA 20	
ARTICLE NO. ●	23360640000	23360630000	23370640000	23370630000
ARTICLE NO. ●	23360640055	23360630055	23370640055	23370630055
DATA				
Operating range	95–265 V AC 50 I 60 Hz	10–60 V DC	95–265 V AC 50 I 60 Hz	10–60 V DC
Nominal current consumption	20–115 mA @ 230 V	60–485 mA	75–330 mA @ 230 V	120–880 mA

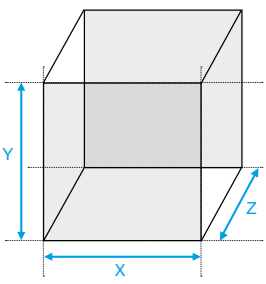
	PA 1	PA 5	PA 10	PA 20
Sound pressure level	100 dB(A)	105 dB(A)	110 dB(A)	120 dB(A)
Sound level reduction	max. –12 dB via potentiometer		max. –12 dB via potentiometer	
Alarm tones	80 / 4 tones are externally selectable, tone table on page 106			
Operating temperature	–40 … +55 °C			
Protection system according to EN 60529	IP 66			
Material	PC / ABS blend similar to RAL 3000 ● I RAL 7035 ● I RAL 9003 ○			
Dimensions (X x Y x Z)	109.5 x 86 x 80.6 mm	163.4 x 135 x 132 mm	214 x 170 x 156 mm	214 x 170 x 181 mm

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC — Option — Option — I t lim t — Enclosure fitting — Surface gasket — Tamper-proof sealing — Panel mounting kit

Models with alternative features available upon request

PA 1 and PA 5 in 115 V AC.



Webcode #3128

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com

SOUNDERS

IP 54
protection system

+50 °C
–20 °C
operating temperature

external tone selection

130 dB(A) sounder
Provides wide area notification in open spaces or in very loud ambient conditions. Suitable for use in civil defence warning systems.

Selectable audible notification
Choice of 80 unique alarm tones with nine stages of tone control for distinctive signalling of specific events.

Integrated self-monitoring,
Versatile self-test functions including fault detection relay and switchable 4.7 kΩ terminal resistor for cable integrity monitoring.

IP 54 enclosure rating
Suitable for use in all weather conditions due to the provided protection against water and dust.

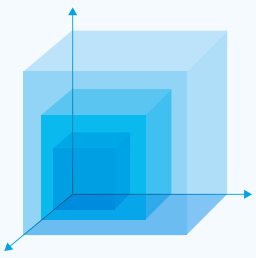
Sound pressure levels approaching 120 dB(A) and higher can lead to hearing damage. Caution must be exercised to ensure that personnel are not within the vicinity of such elevated sound pressure levels. High output sounders are intended for use in outdoor applications or in large manufacturing spaces where hearing protection may be in use. Unless specified otherwise, sound pressure level is measured at a 1 m distance.

PRODUCT		PA 130	
ARTICLE NO.		23026100000	23026910000
DATA			
Rated voltage		230 V	20–60 V
		AC 50 I 60 Hz	DC
Operating range		–25 % / +15 %	20–60 V
Nominal current consumption		1 A	4 A
Sound pressure level		130 dB(A)	
Alarm tones		80, incl. DIN tone	
Remote controlled tones		9 tones, externally controllable	
Operating temperature		–20 … +50 °C	
Protection system according to EN 60529		IP 54	
Material	housing – horn	MOPLEN plastic	
	housing – circuitry	aluminium, painted	
Dimensions (X x Y x Z)		490 x 285 x 595 mm	

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC

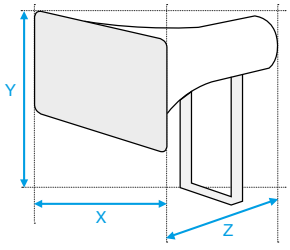
3D-Coverage performance data, A x B x C



PA 130

80 db(A)	213.6 x 286.9 x 213.6 m
85 db(A)	120.1 x 161.3 x 120.1 m
90 db(A)	67.6 x 90.7 x 67.6 m

Coverage area with DIN tone and required sound levels of 80, 85 and 90 dB(A). To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.



Webcode
#3129

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com

PANEL MOUNT BUZZERS

IP 40 P 22

IP 65 P 28

+50 °C / –25 °C P 22

+65 °C / –25 °C P 28

Piezo buzzer with screw terminal connections
High output device for local machinery status alerts

22 mm or 28 mm standard mounting
Diameter matches many common components. Ease of installation into control panel systems.

Variety of signal types
Continuous and pulsating tone.

IP 65 device and mount
With appropriate gasket. Wash-down capable.

Volume adjuster
Also available with easily adjustable volume control.

PRODUCT		P 22 DBZ		P 28 DMC301	P 28 DMB530
ARTICLE NO.		23270100000	23270800000	23260110000	23265800000
DATA					
Rated voltage		230 V	24 V AC/DC	230 V	30 V
		AC 50 I 60 Hz	AC/DC	AC 50 I 60 Hz	DC
Operating range				130–230 V	5–30 V
Nominal current consumption		15–30 mA		20 mA @ 130 V 40 mA @ 220 V	2 mA @ 5 V 20 mA @ 30 V
Tone frequency		2400 Hz		2900 Hz	2900 Hz
Operating mode		pulsating tone (1 Hz)		continuous tone	continuous tone / pulsating tone (1 Hz)
Sound pressure level		80 dB(A) @ 10 cm		91 dB(A) @ 230 V	91 dB(A) @ 30 V
Sound level reduction				–20 dB	
Operating temperature		–25 … +50 °C		–25 … +65 °C	
Protection system according to EN 60529		IP 40		IP 65	
Material	housing	polycarbonate (PC)		plastic NORYL® N-190, UL 49-V0	
Mounting		panel mounting Ø 22.5 mm max. 7 mm thickness		panel mounting Ø 28.6 mm max. 6.3 mm thickness	
Dimensions (X x Y)		Ø 29 x 62 mm		Ø 35.8 x 38.2 mm	

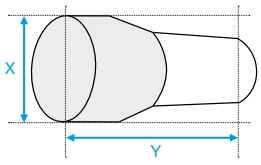
For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC

Webcode
#3130

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



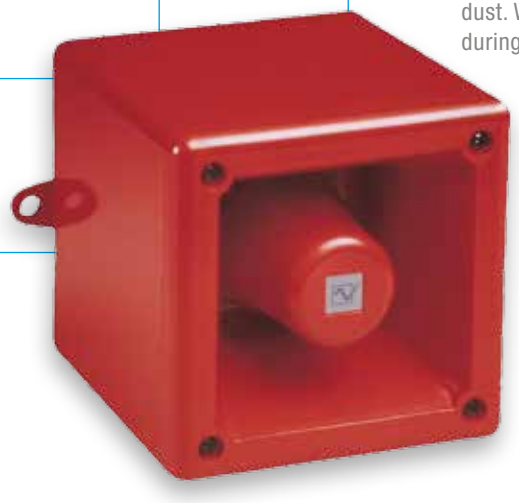
Ex-ATEX Sounders

EX

Intrinsically safe audible signalling
105 dB(A) sounder for hazardous areas, with volume control and selectable tone stages.

Zones 0, 1 and 2
Certified for use in Ex zones 0, 1 and 2 when used with a certified zener barrier or galvanic isolator.

Audible notification
Choice of 49 unique alarm tones with three stages of tone control for distinctive signalling of specific events. Audible signals are synchronised across multiple units connected in series. Volume control adjusts output level to fit the signalling space required.



IP 66 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

EX-ATEX SOUNDERS

IP 66
protection system

+60 °C
–40 °C
operating temperature

PRODUCT	IS-A105N
ARTICLE NO.	32033800000
DATA	
Operating range	10–28 V DC
Current consumption	25 mA @ 24 V DC (typical for connection to 24 V DC via 28 V / 300 Ω zener barrier)
Type of protection	"ia" inherently safe
Explosion protection	II 1G Ex ia IIC T4 –40 °C ... +60 °C Ta
Category (area of use)	1G (Zone 0) 2G (Zone 1) 3G (Zone 2)
Certificate of conformity	SIRA 04 ATEX 2301 X
Sound pressure level	up to 105 dB(A) ±3 dB(A)
Sound level reduction	up to 15 dB(A) via an internal potentiometer
Alarm tones	49, can be set via DIP switch / 2 tones are externally selectable
Protection system according to EN 60529	IP 66
Material	acrylonitrile butadiene styrene (ABS), self-extinguishing, similar UL 94 V0
Dimensions (X x Y x Z)	130 x 130 x 132 mm

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

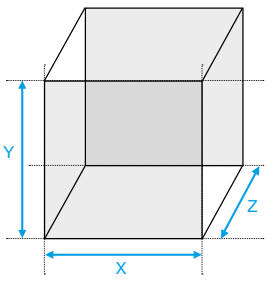
Power must be connected via a zener barrier (max. 28 V DC, 93 mA DC, 0.66 W) or a galvanic isolator, specified by the system certificate (see page 63).

EAC

Webcode
#3132

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Ex-ATEX Sounders

EX

Powerful electronic sounders
Certified for hazardous area use. When human safety matters most. Robust metal housing and flame retardant ABS projection horn for wide area notification.

ATEX certified for Zones 1 and 2
Satisfies requirements for device category 2G and 3G in hazardous areas with additional versions for Zones 21 and 22 (device categories 2D and 3D).

Choice of output level and tone
Versions for 110 and 120 dB(A) output levels, each with 32 selectable tones and 3 stages of alarm to signal multiple unique circumstances or events with one device.

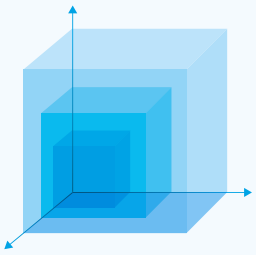
IP 66/67 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Robust construction
Durable, cast-aluminium housing and stainless steel protection cage endures saltwater and other corrosives for demanding marine and industrial environments.

Wide range
of operating temperatures from –50 °C to +70 °C.

Convenient mounting
Stainless steel bracket permits ease of installation for any orientation.

3D-Coverage performance data, A x B x C



	BExS 110 | BExDS 110	BExS 120 | BExDS 120
80 db(A)	27.4 x 23.2 x 27.4 m	74.3 x 89.7 x 74.3 m
85 db(A)	15.4 x 13 x 15.4 m	41.8 x 50.5 x 41.8 m
90 db(A)	8.7 x 7.3 x 8.7 m	23.5 x 28.4 x 23.5 m

Coverage area with DIN tone and required sound levels of 80, 85 and 90 dB(A). To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

Models with alternative features available upon request

BExS and BExDS in 115 V AC and 12 V, 48 V DC.

EX-ATEX SOUNDERS

IP 66
IP 67
protection system

+70 °C
–50 °C
operating temperature

EN 54-3
Exd
24 V DC

VdS G209081
Exd
24 V DC

PRODUCT		BExS 110D	BExS 110E	BExDS 110D	BExDS 110E
ARTICLE NO.	230 V AC	32080100000	32082100000	32075100000	32085100000
ARTICLE NO.	24 V DC	32080800000	32082800000	on request	on request
PRODUCT		**BExS 120D**	**BExS 120E**	**BExDS 120D**	**BExDS 120E**
ARTICLE NO.	230 V AC	32076100000	32078100000	32089100000	32081100000
ARTICLE NO.	24 V DC	32076800000	32078800000	on request	on request

DATA

		BExS 110 | BExDS 110		BExS 120 | BExDS 120	
Operating range		230 V ±10 %	24 V ±25 %	230 V ±10 %	24 V ±25 %
		AC 50 | 60 Hz	DC	AC 50 | 60 Hz	DC
Current consumption		56 mA @ 230 V AC	250 mA @ 24 V DC	90 mA @ 230 V AC	800 mA @ 24 V DC
		BExS 110	**BExDS 110**	**BExS 120**	**BExDS 120**
Sound pressure level		110 dB(A) ±3 dB(A)		117 dB(A) ±3 dB(A)	
Sound level reduction		–9 dB			
Alarm tones		32, tone table on page 109			
Material	housing	die-cast aluminium LM6			
	horn	ABS, self-extinguishing, similar UL 94 VO & 5VA FR ABS, Ex II 2D anti-static ABS			
Dimensions (X x Y)		Ø 181 x 275 mm		Ø 220 x 326 mm	
		BExS 110	**BExS 120**	**BExDS 110**	**BExDS 120**
Protection system		“d” = IP 67 or “e” = IP 66			
Explosion protection		II 2G Ex d IIC T4 II 2G Ex de IIC T4 II 2G Ex d IIB T4 II 2G Ex de IIB T4		II 2G/D Ex d IIC T4 100°C II 2G/D Ex de IIC T4 100°C II 2G/D Ex d IIB T4 115°C II 2G/D Ex de IIB T4 115°C	
Category (area of use)		2G (Zone 1) 3G (Zone 2)		2G (Zone 1) / 2D (Zone 21) 3G (Zone 2) / 3D (Zone 22)	
Certificate of conformity		KEMA 99 ATEX 7906		KEMA 99 ATEX 6312	
Temperature class T		IIC: T4 @ –50 °C ... +55 °C Ta IIB: T4 @ –50 °C ... +70 °C Ta		T4 @ –50 °C ... +55 °C Ta	

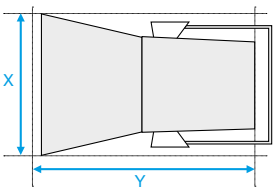
For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC

Webcode
#3131

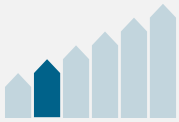
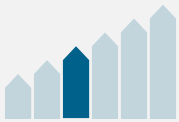
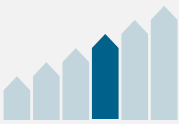
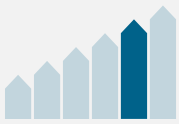
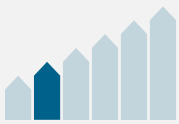
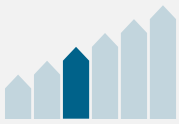
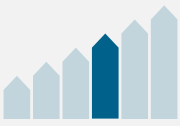
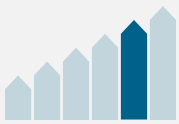
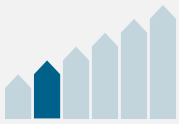
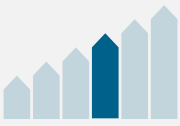
Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



Signals for both sight and sound improve notification effectiveness.

Combined visual-audible signaling devices at a glance

	TYPE	3D-COVERAGE LEVEL	SOUND PRESSURE LEVEL | LIGHT POWER	PROTECTION SYSTEM	DIMENSIONS (H x W x D) mm	APPROVALS/STANDARDS							PAGE
						GL	MED	EAC	UL	EN 54-3	EN 54-23	VdS	
	PY X-MA-05		100 dB(A) 5 J	IP 66 IK08	134.2 x 166 x 114			●	●				80
	PY X-MA-10		100 dB(A) 10 J	IP 66 IK08	134.2 x 166 x 114			●	●				
	DSF 5		105 dB(A) 13 J	IP 66 IP 67 IK08	263.5 x 133.5 x 143			●					82
	DSF 10		110 dB(A) 13 J	IP 66 IP 67 IK08	263.5 x 133.5 x 143			●					
	PA X 1-05		100 dB(A) 5 J	IP 66 IK08	172.4 x 109.5 x 80.6	●[2]	●[2]	●	●	●	●	●	84
	PA X 5-05		105 dB(A) 5 J	IP 66 IK08	215 x 163.4 x 132	●[2]	●[2]	●	●				
	PA X 10-10		110 dB(A) 10 J	IP 66 IK08	270 x 214 x 156	●[2]	●[2]	●	●				84
	PA X 20-15		120 dB(A) 15 J	IP 66 IK08	270 x 214 x 181	●[2]	●[2]	●	●				
	IS-mC1		100 dB(A) 5 cd	IP 65	116 x Ø 88.7			●					60
	BExCS 110-05D		110 dB(A) 5 J	IP 67	Ø 181 x 368			●					90

● available
○ pending
[2] option

Sound pressure levels approaching 120 dB(A) and higher can lead to hearing damage. Caution must be exercised to ensure that personnel are not within the vicinity of such elevated sound pressure levels. High output sounders are intended for use in outdoor applications or in large manufacturing spaces where hearing protection may be in use.

Unless specified otherwise, sound pressure level is measured at a 1 m distance.

PYRA X-MA
Flashing Light Sounders

Powerful flashing light with sounder
Choice of 5 or 10 Joule flash energy with a 100 dB(A) sounder in an attractive design.

Flexible mounting options
Integrated hole template adapts to many common electrical workboxes worldwide. Installs upright on enclosures, downward from ceiling, or vertically on walls.

Intelligent installation
Electrical wiring is conducted in the base box to avoid clumsy 3-hand assembly. Wires are safely routed where the potential for pinching and errors are eliminated.

Selectable output signals
On-board selection of 4 different light flash rates and 8 different acoustic alarm tones (tone table on page 108).

Captive fasteners
Installation and assembly is simplified and screws cannot get lost.

Independent signalling
Visual and acoustic signal outputs can be controlled separately.

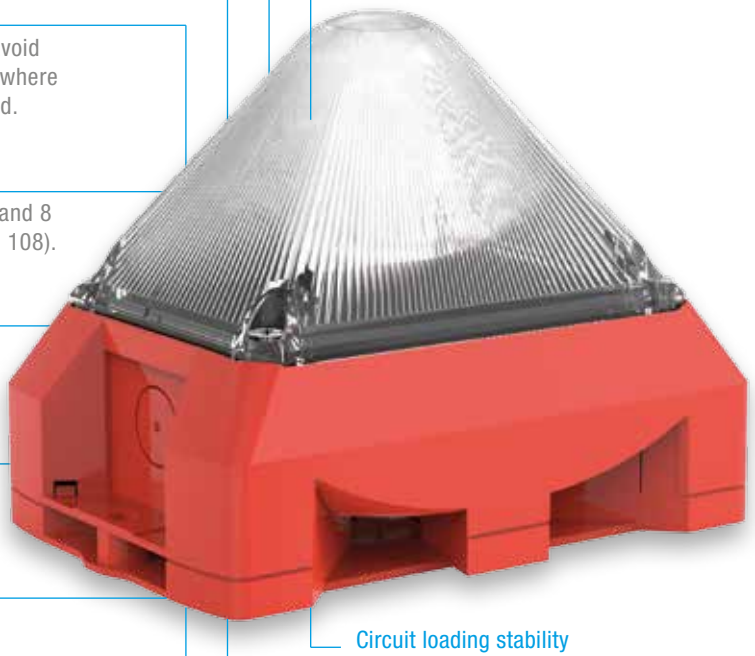
EN 54-23 certified
Satisfies EU requirements for fire alarm safety.

Shape-moulded gasket
Stays in-place and cannot get lost.

Inrush current regulator
Provides electrical protection for control devices such as switching components and relays.

IP 66 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

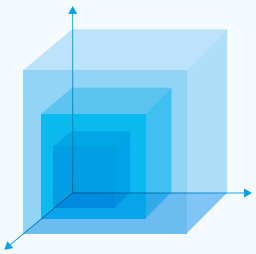
Impact resistant housing and lens
Achieves IK08 impact rating to endure harsh environments.



Circuit loading stability
24 V AC/DC versions incorporate constant current regulators for stable and efficient system operation.

Further significant advantages
can be seen on a video on our website, please type the webcode #3553 into the search field.

3D-Coverage performance data, A x B x C



		PY X-MA-05	PY X-MA-10
AUDIBLE	80 db(A)	8.7 x 4.8 x 8.7 m	8.7 x 4.8 x 8.7 m
	85 db(A)	4.9 x 2.7 x 4.9 m	4.9 x 2.7 x 4.9 m
	90 db(A)	2.8 x 1.5 x 2.8 m	2.8 x 1.5 x 2.8 m
VISUAL	Indicate	56.7 x 28.8 x 61.2 m	81 x 45 x 101.7 m
	Warn	25.2 x 12.8 x 27.2 m	36 x 20 x 45.2 m
	Alarm	12.6 x 6.4 x 13.6 m	18 x 10 x 22.6 m

Coverage area with DIN tone and required sound levels of 80, 85 and 90 dB(A) and also to be used for the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

FLASHING LIGHT SOUNDERS

IP 66 — protection system

IK08 — impact-proof housing

+55 °C / –40 °C — operating temperature

EN 54-23 — 24 V DC, 48 V DC

VdS — 24 V DC, 48 V DC

UL

10 Years — warranty

PRODUCT		PY X-MA-05		PY X-MA-10	
ARTICLE NO.	🔴 🟡	21554103000	21554813000	21555103000	21555813000
ARTICLE NO.	🔴 🟠	21554104000	21554814000	21555104000	21555814000
ARTICLE NO.	🔴 🔴	21554105000	21554815000	21555105000	21555815000
ARTICLE NO.	⚪ 🟡	21554103055	21554813055	21555103055	21555813055
ARTICLE NO.	⚪ 🟠	21554104055	21554814055	21555104055	21555814055
ARTICLE NO.	⚪ 🔴	21554105055	21554815055	21555105055	21555815055
DATA					
Operating range		187–255 V	AC: 18–30 V DC: 10–57 V	187–255 V	10–57 V
		AC 50 I 60 Hz	AC 50 I 60 Hz / DC	AC 50 I 60 Hz	DC
Nominal current consumption		70–75 mA	AC: 310 mA DC: 280 mA @ 24 V	160–165 mA	540 mA @ 24 V
Sound pressure level		100 dB(A)			
Sound level reduction		max. –20 dB via potentiometer			
Flash energy and flash rate		5 J @ 0.1 I 0.5 I 0.75 I 1 Hz			
Light intensity (DIN 5037) [1]		56 cd		149 cd	
Max. viewing distance		173 m		283 m	
Operating temperature		–40 … +55 °C			
Protection system according to EN 60529		IP 66			
Impact resistance as per EN 50102		IK08			
Service life of light source		light emission still 70 % after 8,000,000 flashes			
Material	lens	⚪ 🟡 🟠 🔴 🟢 🔵 polycarbonate (PC)			
	housing	PC/ABS, RAL 3000 🔴 I PC/ABS, RAL 7035 ⚪			
Dimensions (X x Y x Z)		166 x 134.2 x 114 mm			

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

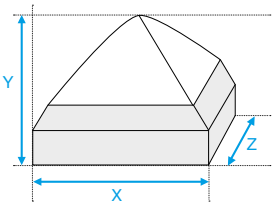
Models with alternative features available upon request

115 V AC.	Choice of lens colours: clear I white I yellow I amber I red I green I blue.	White enclosure.	Soft Start Module.

Webcode #3133

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com



DSF
Flashing Sounders

Powerful flashing light with sounder
Choice of 105 or 110 dB(A) sounder with 13 Joule flashing strobe light.

32 tone selection
A vast selection of unique tones, many in conformance with international requirements. Three stages of tone control for distinctive signalling of specific events.

Electromagnetic sound capsule technology
Acoustic signal includes a share of low frequency side bands for excellent sound penetration of walls and doors for highly effective alarming.

Strong, metal mounting lugs
Ensures a safe and secure installation onto many types of surfaces.

Stainless steel cable gland
Included to ensure a high degree of electrical connection integrity.

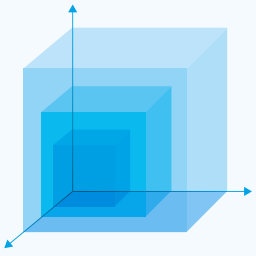
IP 66/67 enclosure rating
Suitable for use in all weather conditions due to the provided protection against driving rain, snow, ice, and dust. Withstands hose-directed spray during wash-down requirements.

Impact resistant housing and lens
Achieves IK08 impact rating to endure harsh environments.

Integrated function monitoring (optional)
Optional version with integrated fault-monitoring relay for enhanced human safety applications such as with gas leak evacuation alarms.

High quality, long life components
Provides the utmost in reliability and longevity.

3D-Coverage performance data, A x B x C



		DSF 5	DSF 10
AUDIBLE	80 db(A)	23.1 x 27.5 x 23.1 m	33.4 x 43.7 x 33.4 m
AUDIBLE	85 db(A)	13 x 15.5 x 13 m	18.8 x 24.5 x 18.8 m
AUDIBLE	90 db(A)	7.3 x 8.8 x 7.3 m	10.6 x 13.8 x 10.6 m
VISUAL	Indicate	60 x 45 x 11 m	60 x 45 x 11 m
VISUAL	Warn	40 x 25 x 9 m	40 x 25 x 9 m
VISUAL	Alarm	15 x 10 x 7 m	15 x 10 x 7 m

Coverage area with DIN tone and required sound levels of 80, 85 and 90 dB(A) and also to be used for the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

FLASHING SOUNDERS

IP 66
IP 67
protection system

IK08
impact-proof housing

+55 °C
–40 °C
operating temperature

acoustic penetration

10 Years
warranty

PRODUCT		DSF 5		DSF 10	
ARTICLE NO.		23107105000	23107805000	23112105000	23112805000
DATA					
Operating range		195–253 V AC 50 I 60 Hz	19–29 V DC	195–253 V AC 50 I 60 Hz	19–29 V DC
Nominal current consumption		0,19 A	0,98 A	0,76 A	1,12 A
Sound pressure level		105 dB(A)		110 dB(A)	
Alarm tones		32 / 4 tones are externally selectable, tone table on page 108			
Flash energy and flash rate		13 J @ 1 Hz = 60 flashes/min			
Light intensity (DIN 5037) [1]		260 cd			
Max. viewing distance		374 m			
Operating temperature		–40 … +55 °C			
Protection system according to EN 60529		IP 66 I IP 67			
Impact resistance as per EN 50102		IK08			
Material	lens	polycarbonate (PC)			
	housing	die-cast aluminium GD-Al Si12 Cu			
Surface coating		epoxy resin paint			
Cable bushing		2 x M20 x 1.5			
Dimensions (X x Y x Z)		133.5 x 263.5 x 143 mm			

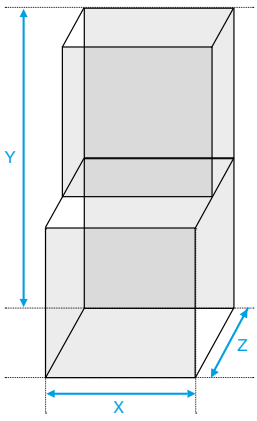
For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

External tone selection control

Models with alternative features available upon request

115 V AC.	Choice of lens colours: clear I yellow I amber I red I green I blue.



Webcode
#3134

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com

PA X
Flashing Sounders

Captive fasteners
Installation and assembly is simplified and screws cannot get lost.

Shape-moulded gasket
Stays in-place and cannot get lost.

Flash tube
Xenon strobe generates highly visible light without sensitive filaments and is inherently resistant to shock and vibration.

Selectable audible notification
Choice of 80 unique alarm tones with four stages of tone control for distinctive signalling of specific events.

Plug and socket connections
Upper and lower sections combine positively to simplify installation. When separated, electrical hazards are eliminated for handling.

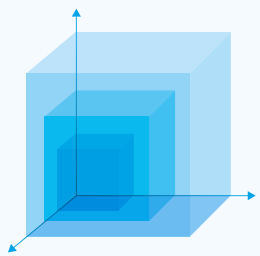
PA X 1-05

PA X 5-05

PA X 10-10

PA X 20-15

3D-Coverage performance data, A x B x C



Coverage area with DIN tone and required sound levels of 80, 85 and 90 dB(A) and also to be used for the applications „Indicate“, „Warn“ and „Alarm“ (EN 54-23) with clear lens. To determine the exact signaling area for your needs, please use the online available Pfannenberg Sizing Software PSS.

PA X 1-05

AUDIBLE	80 dB(A)	16 x 13.8 x 16 m
	85 dB(A)	9 x 7.8 x 9 m
	90 dB(A)	5.1 x 4.4 x 5.1 m
VISUAL	Indicate	18.5 x 31.5 x 49.5 m
	Warn	8.2 x 14 x 22 m
	Alarm	4.1 x 7 x 11 m

Electromagnetic sound capsule technology
Acoustic signal includes a share of low frequency side bands for excellent sound penetration of walls and doors for highly effective alarming.

Intelligent installation
Electrical wiring is conducted in the base box to avoid clumsy 3-hand assembly. Wires are safely routed where the potential for pinching and errors are eliminated.

High quality components
Longevity is assured with 70 % light emission even after 8 million flashes.

Flexible mounting options
Integrated hole template adapts to many common electrical workboxes worldwide. Installs upright on enclosures, downward from ceiling, or vertically on walls.

Further significant advantages
can be seen on a video on our website, please type the webcode #3553 into the search field.

		PA X 5-05	PA X 10-10	PA X 20-15
AUDIBLE	80 dB(A)	14.1 x 18.1 x 14.1 m	52.8 x 73.3 x 52.8 m	85.6 x 97.7 x 85.6 m
AUDIBLE	85 dB(A)	7.9 x 10.2 x 7.9 m	29.7 x 41.2 x 29.7 m	48.1 x 55 x 48.1 m
AUDIBLE	90 dB(A)	4.4 x 5.7 x 4.4 m	16.7 x 23.2 x 16.7 m	27.1 x 30.9 x 27.1 m
VISUAL	Indicate	44.1 x 37.4 x 67.5 m	68 x 61.7 x 119.7 m	84.6 x 74.7 x 144.5 m
VISUAL	Warn	19.6 x 16.6 x 30 m	30.2 x 27.4 x 53.2 m	37.6 x 33.2 x 64.2 m
VISUAL	Alarm	9.8 x 8.3 x 15 m	15.1 x 13.7 x 26.6 m	18.8 x 16.6 x 32.1 m

FLASHING SOUNDERS

IP 66 — protection system

IK08 — impact-proof housing

+55 °C / –40 °C — operating temperature

acoustic penetration

external tone selection

EN 54-3 — PA X 1-05 24 V DC

EN 54-23 — PA X 1-05 24 V DC

VdS — PA X 1-05 24 V DC

UL

10 Years — warranty

PA X 1-05

PA X 5-05

PRODUCT	PA X 1-05 – housing red		PA X 1-05 – housing grey	
ARTICLE NO. ●	23311103000	23311803000	23311103055	23311803055
ARTICLE NO. ●	23311104000	23311804000	23311104055	23311804055
ARTICLE NO. ●	23311105000	23311805000	23311105055	23311805055
DATA				
Operating range	187–255 V	18–30 V	187–255 V	18–30 V
Rated frequency	AC 50 I 60 Hz	DC	AC 50 I 60 Hz	DC
Nominal current consumption	65–70 mA @ 230 V	315–365 mA @ 24 V	65–70 mA @ 230 V	315–365 mA @ 24 V

PRODUCT	PA X 5-05 – housing red		PA X 5-05 – housing grey	
ARTICLE NO. ●	23351103000	23351803000	23351103055	23351803055
ARTICLE NO. ●	23351104000	23351804000	23351104055	23351804055
ARTICLE NO. ●	23351105000	23351805000	23351105055	23351805055
DATA				
Operating range	187–255 V	18–30 V	187–255 V	18–30 V
Rated frequency	AC 50 I 60 Hz	DC	AC 50 I 60 Hz	DC
Nominal current consumption	65–70 mA @ 230 V	315–365 mA @ 24 V	65–70 mA @ 230 V	315–365 mA @ 24 V

		PA X 1-05	PA X 5-05
Sound pressure level		100 dB(A)	105 dB(A)
Sound level reduction		max. –12 dB via potentiometer	
Alarm tones		80 / 4 tones are externally selectable, tone table on page 106	
Flash energy and flash rate		5 J @ 1 Hz = 60 flashes/min	
Light intensity (DIN 5037) [1]		44 cd	47 cd
Max. viewing distance		164 m	173 m
Operating temperature		–40 … +55 °C	
Protection system according to EN 60529		IP 66	
Impact resistance as per EN 50102		IK08	
Material	lens	⁄ ○ ● ● ● ● polycarbonate (PC)	
	housing	polycarbonate (PC), RAL 3000 ● I polycarbonate (PC), RAL 7035 ●	
Dimensions (X x Y x Z)		109.5 x 172.4 x 80.6 mm	163.4 x 215 x 132 mm

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC

Option

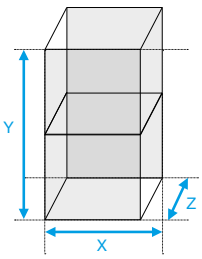
PA X 1-05

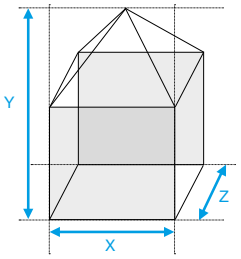
SSM, 24 V DC

Surface gasket

Tamper-proof sealing

[1] with a clear lens





Webcode #3558

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com

FLASHING SOUNDERS

IP 66 — protection system
IK08 — impact-proof housing
+55 °C / –40 °C — operating temperature
acoustic penetration
external tone selection
UL
10 Years — warranty


PA X 10-10


PA X 20-15

PRODUCT	PA X 10-10 – housing red		PA X 10-10 – housing grey	
ARTICLE NO.	23361103000	23361803000	23361103055	23361803055
ARTICLE NO.	23361104000	23361804000	23361104055	23361804055
ARTICLE NO.	23361105000	23361805000	23361105055	23361805055
DATA				
Operating range	187–255 V	18–30 V	187–255 V	18–30 V
Rated frequency	AC 50 I 60 Hz	DC	AC 50 I 60 Hz	DC
Nominal current consumption	160–215 mA @ 230 V	665–935 mA @ 24 V	160–215 mA @ 230 V	665–935 mA @ 24 V

PRODUCT	PA X 20-15 – housing red		PA X 20-15 – housing grey	
ARTICLE NO.	23372103000	23372803000	23372103055	23372803055
ARTICLE NO.	23372104000	23372804000	23372104055	23372804055
ARTICLE NO.	23372105000	23372805000	23372105055	23372805055
DATA				
Operating range	187–255 V	18–30 V	187–255 V	18–30 V
Rated frequency	AC 50 I 60 Hz	DC	AC 50 I 60 Hz	DC
Nominal current consumption	165–385 mA @ 230 V	945–1540 mA @ 24 V	165–385 mA @ 230 V	945–1540 mA @ 24 V

	PA X 10-10	PA X 20-15
Sound pressure level	110 dB(A)	115 dB(A)
Sound level reduction	max. –12 dB via potentiometer	
Alarm tones	80 / 4 tones are externally selectable, tone table on page 106	
Flash energy and flash rate	10 J @ 1 Hz = 60 flashes/min	15 J @ 1 Hz = 60 flashes/min
Light intensity (DIN 5037) [1]	129 cd	190 cd
Max. viewing distance	283 m	377 m
Operating temperature	–40 … +55 °C	
Protection system according to EN 60529	IP 66	
Impact resistance as per EN 50102	IK08	
Material – lens	polycarbonate (PC)	
Material – housing	polycarbonate (PC), RAL 3000 I polycarbonate (PC), RAL 7035	
Dimensions (X x Y x Z)	214 x 270 x 156 mm	214 x 270 x 181 mm

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

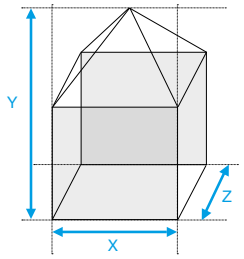
Option

SSM, 24 V DC

Surface gasket

Tamper-proof sealing

[1] with a clear lens



Webcode
#3135

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
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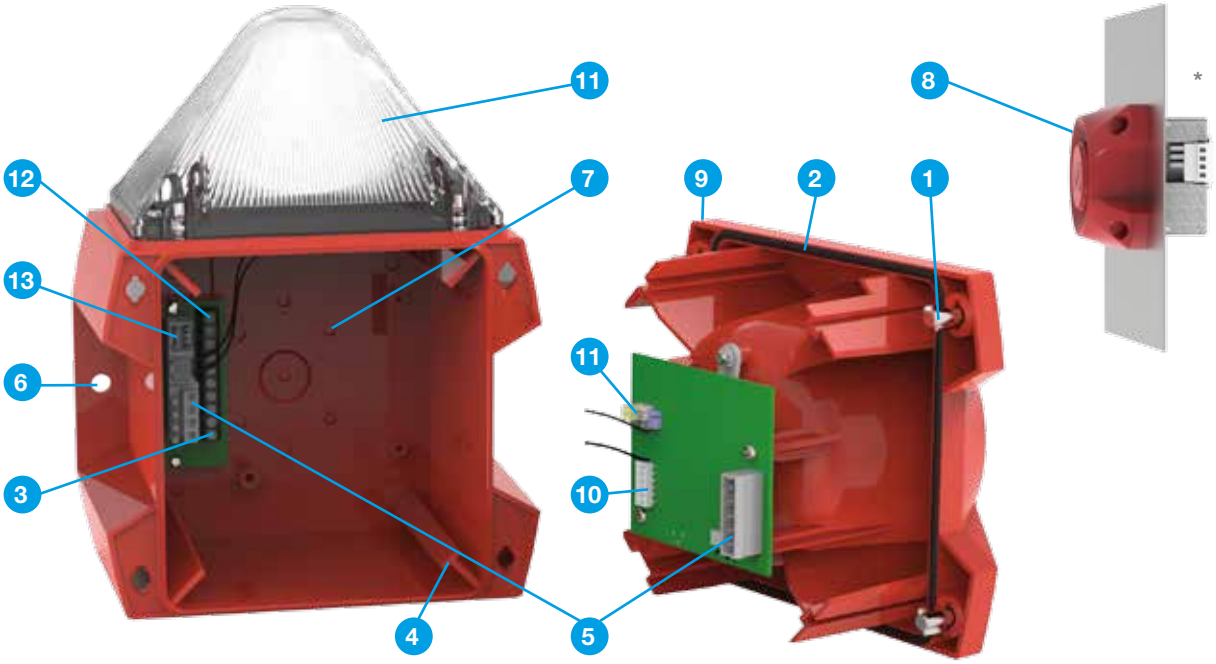
PATROL & PYRA® advantages.



* Installation kit necessary.

Unique enclosure fasteners.
- 3/8-turn fasteners 1 permit quick and easy assembly.
- Fasteners are captivated so they cannot be dropped or lost.
- Optional tamper-proof fastener plugs protect the unit from unauthorised alteration.
- Fastener appearance reveals whether “closed” (x) or “open” (+).

Enclosure sealing integrity.
- Gasket 2 is permanently adhered to the enclosure cover so the gasket will never get dropped or lost.
- Enclosure fasteners 1 are outside of the sealing area to ensure that the IP rating is not compromised by fastener holes.

Error-free electrical connections.
- Screw terminal strip 3 is located in the base-box portion of the enclosure allowing for easy, one person installation – a clumsy, third hand is not needed.
- Acoustic driver electrically connects to the base-box through an integrated mechanical keyway 4 and multi-pin electrical connector 5 to ensure a proper assembly every time.
- No loose wires are present between the base-box and acoustic driver which could be pinched upon final assembly.
- A redundant set of electrical screw terminal connections 3 supports daisy-chaining of multiple devices.
- Knockouts are provided on multiple sides to support a variety of wiring and interconnection scenarios.

Numerous mounting options.
- Integrated external flange 6 is stronger than mounting lugs.
- An assortment of internal pilot marks 7 offer worldwide compatibility with a variety of standard electrical workboxes.
- Entire device can be wall mounted or panel mounted optional with finger guard 8.
- Acoustic module 9 by itself can be flush mounted to an enclosure panel or door with optional panel mounting kit.

Vast selection of integrated tones.
- Choose from 80 different tones by DIP switch 10 setting.
- Multiple tone stages permit the same device to emit up to four different alarms based on circumstance.
- Internal volume control 11.

Improved acoustic driver.
- Sound capsule technology delivers more low frequency punch than piezoelectric elements for superior sound penetration through walls, doors, and other obstructions.

Extreme environment compatibility.
- NEMA type 4/4X and IP 66 rating survives exposure to dust, liquids, water spray, and corrosives.
- –40 to +55 °C temperature range.
- High strength housing is a blend of ABS and polycarbonate plastic that is flame retardant and UV stabilised.

Integral xenon flashing light.
- Xenon flashing light ⓫ is part of the original design inception, rather than a bolted on afterthought. As such, the light is more visible. Additionally, the light's intensity is properly sized to match the coverage area of the associated sounder. 5, 10, and 15 Joule flash energies are available.

Xenon flashing light connections made from single terminal strip.
- Pre-wired light connections are made at the terminal strip ⓬ that is also the electrical connection point for the sounder. Since all connections are made from one common connection point, installation is quicker and easier.

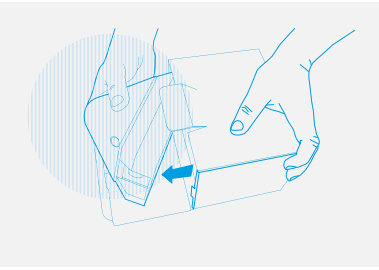
Choice of alarm action – combined or separate.
- The light can either be activated in conjunction with the sounder or separately from it ⓭. Separate operation is often desired to silence the sounder after a certain elapsed time while the light continues to flash.

Life span exceeds 8,000,000 flashes.
- The superior technology behind Pfannenberg's flashing lights permit an unrivalled life span of 8,000,000 flashes while retaining greater than 70 % light emission.

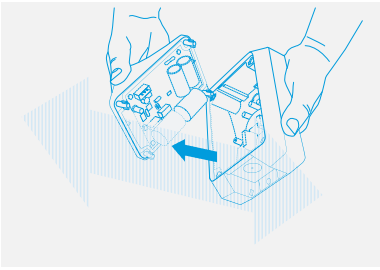
Worldwide certifications for universal acceptance.
- UL, cUL, CE, VdS, GL, EN 54-3.

Mounting system „Plug and Play".

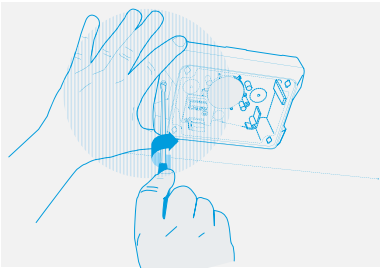
STEP 1 – Remove from package
supplied ready for mounting.



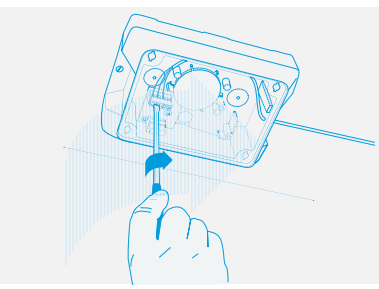
STEP 2 – Separate
the components.



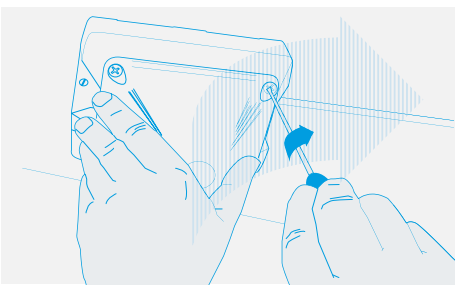
STEP 3 – Mount
the base box.



STEP 4 – Connect
the wiring.



STEP 5 – Secure
the cover to the base box.



Quick, easy, and safe installation.
Saves time and reduces costs. Potential errors are eliminated since an incorrect assembly is not possible.

Ex-ATEX
Flashing Sounders

EX

Visual and audible signalling
Combined flashing strobe light and powerful sounder for enhanced alarming and safety.

ATEX certified for Zones 1 and 2
Satisfies requirements for device category 2G and 3G in hazardous areas with additional versions for Zones 21 and 22 (device categories 2D and 3D).

Independent signaling
Visual and acoustic signal outputs can be controlled separately.

32 tone selection
A vast selection of unique tones, many in conformance with international requirements. Three stages of tone control for distinctive signalling of specific events.

Powerful electronic sounder
110 dB(A) output sound pressure intensity provides alarm coverage for large areas, both indoors and outdoors.

Flashing strobe light
5 Joule flash energy provides visual perception over wide areas. The Xenon flash tube is shock and vibration tolerant while the stainless steel cage protects against impacts from foreign objects.

Synchronised flash
Supports simultaneous or alternating 1 Hz flash for multiple devices connected in series.

Convenient mounting
Stainless steel bracket permits ease of installation for any orientation.

Robust construction
Durable, cast-aluminium housing and stainless steel protection cage endures saltwater and other corrosives for demanding marine and industrial environments.

High IP rating
Aggressive environmental conditions or driving rain cannot damage the device, because of resistant surfaces and high IP rated enclosure.

Models with alternative features available upon request

BExCS in 115 V AC and 12 V, 48 V DC.	Choice of lens colours: clear	yellow	amber	red	green	blue.	BExDCS for dust applications in zone 21 and 22.

EX-ATEX FLASHING SOUNDERS

IP 67
protection system

+70 °C
–50 °C
operating temperature

PRODUCT		BExCS 110-05D	
ARTICLE NO.		32074103000	32074803000
ARTICLE NO.		32074105000	32074805000
DATA SOUNDER			
Operating range		230 V ±10 %	24 V ±25 %
		AC 50 I 60 Hz	DC
Current consumption		56 mA @ 230 V AC	265 mA@ 24 V DC
DATA FLASHING LIGHT			
Operating range		230 V ±10 %	20–30 V
		AC 50 I 60 Hz	DC
Current consumption		55 mA @ 230 V AC	300 mA@ 24 V DC
DATA			
Explosion protection		II 2G Ex d IIB T4 –50 °C ... +70 °C Ta	
Category (area of use)		2G (Zone 1) 3G (Zone 2)	
Certificate of conformity		KEMA 03 ATEX 2545 X	
Sound pressure level		110 dB(A)	
Sound level reduction		–9 dB	
Alarm tones		32, tone table on page 109	
Flash energy and flash rate		5 J @ 1 Hz	
Light intensity (DIN 5037) [1]		55 cd	
Max. viewing distance		172 m	
Protection system according to EN 60529		IP 67	
Service life of light source		light emission still 70 % after 8,000,000 flashes	
Material	lens	glass	
	housing	die-cast aluminium LM6	
	horn	ABS self-extinguishing, similar UL 94 V0 & 5VA FR ABS, Ex II 2D anti-static ABS	
Dimensions (X x Y)		Ø 181 x 368 mm	

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

[1] with a clear lens

EAC

Webcode
#3136

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
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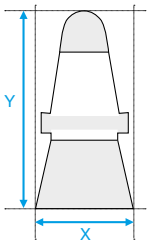


Reliable status indication for industrial processes and machinery functions.

Signal towers at a glance

BR 50
54 mm

BR 35
35 mm

BR 50-LED 3G/3D
54 mm
Zone 2 | 22

Signal Towers
BR 50

Slim yet perceptible design
54 mm diameter complements industrial machinery while offering excellent visibility.

Modular design
Simplifies configuration and assembly of a wide variety of colour and illumination options.

IP 54 / IP 65 enclosure rating
Standard indoor version is easily upgraded for use in outdoor applications and wash-down requirements with optional o-rings.

Simple custom configurations
Up to 5 modules can be stacked with 6 different lens colours. Configuration can be changed to suit new requirements.

Stable structure
Mechanical and electronic components are uncoupled, resulting in a more stable structure that is less sensitive to vibration.

Versatile mounting options
Tubular stand or bracket with various tube lengths, or direct to enclosure.

Self-monitoring module
Integrated functional fault monitoring with redundant LED array and dry contact relay supports automatic switchover to secondary LEDs and remote fault notification.

AS-I BUS module
Simple integration to the AS-i Interface BUS System for up to 4 stages or 62 master/slave connections.

Ex-ATEX version (option)
Suitable for zones 2 and 22. See page 104.

Further models on request

BR 50 in 115 V AC.

Webcode
#3137

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com

SIGNAL TOWERS

IP 54
protection system

UL

+55 °C
–25 °C
operating temperature

PRODUCT		BR 50 (standard modules)					
DATA							
Modules		continuous light		blinking light 1.5 Hz		flashing light	sounder
Segment stages (total)		max. 5 (order and colour can be selected individually)					
Light source [1]		bulb BA15d	LED	bulb BA15d	LED		
Rated power	per stage	7 W	depending on voltage	7 W	depending on voltage	15–40 mA	175 mA
	per stage if 5 stages	5 W		5 W			
Flash energy	230 V AC					0.6 J	
	24 V AC/DC					24 V: 1 J	
Sound pressure level							85 dB (A)
Alarm tones							7 (tone table page 109)
Nominal current consumption	230 V AC	35 mA	15 mA	35 mA	–	10.5 mA	15 mA
	operating range	–15 % ... +10 %				–10 % ... +15 %	–15 % ... +10 %
	24 V DC	300 mA	30 mA	250 mA	30 mA	AC/DC: 100 mA	12 mA
	operating range	–15 % ... +20 %		10–30 V		AC: 10–27 V DC: 10–35 V	–15 % ... +20 %
Operating temperature	bulb	–25 °C ... +50 °C					–10 °C ... +45 °C
	LED	–30 °C ... + 60 °C					
Protection system according to EN 60529		IP 54					IP 43
Service life of light source		approx. 1,500 hrs	approx. 50,000 hrs	approx. 1,500 hrs	approx. 50,000 hrs	light emission still 70 % after 8,000,000 flashes	
Material	lens	polycarbonate (PC), UV resistant					
	base	acrylonitrile butadiene styrene (ABS)					

PRODUCT	BR 50 (special modules)		
DATA			
Modules	monitored continuous light	BR 50 AS-i Bus slave	
		AS-i	AS-i-AB
Module types	2 x 8 LED, monitored continuous light	LED, sounder, continuous light, blinking light	
Segment stages (total)	max. 3	max. 4	max. 3
AS-i profile		S-8.F.E	S-8.A.E
AS-i specification		AS-i 3.0 / EN 50295	
Max. slave/master		31	62
Alarm output	max. 230 V / 80 mA, R_{ONmax} = 35 Ω (closed at error-free operation)		
Rated power	24 V DC		
Nominal current consumption	approx. 35 mA	<0.25 A	
Operating range	–15 % ... +20 %	26.5–31.6 V	
Service life of light source	50,000 hrs @ 24 °C, 40 % R.H.		

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC

Configuration alternatives

STAGE 5

Sounder module

STAGE 4

Flashing light module

STAGE 3

Continuous light module with LED

STAGE 2

Blinking light module

Monitored module

STAGE 1

Continuous light module

AS-i-module

MOUNTING VARIANTS

Modular design permits quick and easy configuration and assembly.

ARTICLE NO.			BR 50 MODULES	
VERSION			230 V AC	24 V DC
Base and end module		BR50-BC	28250010000	
Continuous light module		BR50-CL-CL	28250040010	
		BR50-CL-YE	28250040030	
		BR50-CL-AM	28250040040	
		BR50-CL-RE	28250040050	
		BR50-CL-GR	28250040060	
		BR50-CL-BL	28250040070	
Blinking light module		BR50-BL-CL	28250051010	28250058010
		BR50-BL-YE	28250051030	28250058030
		BR50-BL-AM	28250051040	28250058040
		BR50-BL-RE	28250051050	28250058050
		BR50-BL-GR	28250051060	28250058060
		BR50-BL-BL	28250051070	28250058070
Flashing light module		BR50-FL-CL	28250071010	28250078010
		BR50-FL-YE	28250071030	28250078030
		BR50-FL-AM	28250071040	28250078040
		BR50-FL-RE	28250071050	28250078050
		BR50-FL-GR	28250071060	28250078060
		BR50-FL-BL	28250071070	28250078070
LED module, monitored (top module)		BR50-LED-M-YE	–	28250068030
		BR50-LED-M-RE	–	28250068050
LED module, monitored (bottom module)		BR50-LED-M-YE	–	28250368030
		BR50-LED-M-RE	–	28250368050
Sounder module		BR50-SM	28250081000	28250088000
AS-i module		BR50-AS-i	28250148300	
AS-i-AB module		BR50-AS-i-AB	28250178300	
Mounting stand (stainless steel) with plinth	100 mm	BR50-S100	28250150010	
	250 mm	BR50-S250	28250150020	
	400 mm	BR50-S400	28250150040	
Tube with thread and bracket (stainless steel), excl. seal and cable	100 mm	BR50-T100	28250160010	
	250 mm	BR50-T250	28250160020	
	400 mm	BR50-T400	28250160040	
Wall bracket for mounting stand		BR50-W	28250200000	
Mounting kit		BR50-BG	28250210000	
Module gasket IP 65		BR50-MG	28250220000	
Tube gasket IP 65		BR50-TG	28250230000	
Lamp remover		BR50-LS	28250250000	

Filament bulbs or LED lamps for continuous and blinking modules must be ordered separately.

Base and end module | Light module clear | Light module yellow | Light module amber | Light module red | Light module green | Light module blue | AS-i module | Sounder module

Ordering example

SIGNAL TOWER 5-stage, IP 65		ARTICLE NO.	
	Version	230 V AC	24 V DC
 Sounder module	**BR50-SM**	28250081000	28250088000
	+		
 Flashing light module	**BR50-MG** + **BR50-FL**	28250220000	
		28250071050	28250078050
	+		
 Continuous light module with bulb or LED	**BR50-MG** + **BR50-CL** + **bulb** or **LED BA15d**	28250220000	
		28250040060	
		28213000004	28213000000
		28213000018	28213000011
	+		
 Blinking light module with bulb or LED	**BR50-MG** + **BR50-BL** + **bulb** or **LED BA15d**	28250220000	
		28250051030	28250058030
		28213000004	28213000000
		28213000030	28213000007
	+		
 Continuous light module with bulb or LED	**BR50-MG** + **BR50-CL** + **bulb** or **LED BA15d** + **BR50-MG** + **BR50-BC**	28250220000	
		28250040010	
		28213000004	28213000000
		28213000014	28213000006
		28250220000	
		28250010000	
	+		
 Mounting stand (100 mm) and seal	**BR50-TG**	28250230000	
	BR50-S100	28250150010	

Accessories for BR 50

MULTI-LED BA15D AND FILAMENT LAMPS

LED lamps – the long-lasting alternative to filament bulbs.
- durable, shock and vibration tolerant with service life exceeding 50,000 hrs.
- low power consumption (e.g. 30 mA at 24 V).
- “plus” versions for extra brightness include additional surface mount LEDs on board.

VERSION		ARTICLE NO. 230 V AC [1]	ARTICLE NO. 24 V AC/DC
LED standard plus		28213000013	
LED standard		28213000014	28213000006
LED standard plus			28213000007
LED standard		28213000015	
LED standard plus			28213000009
LED standard		28213000016	
LED standard plus		28213000017	
LED standard		28213000018	28213000011
LED standard plus		28213000019	
LED standard		28213000020	28213000012
Filament lamp	BR50-L 7 W	28213000004	28213000000
Filament lamp	BR50-L 5 W	28213000005	28213000001

[1] not for blinking light module BR 50-BL, article numbers upon request.

LAMP REMOVER

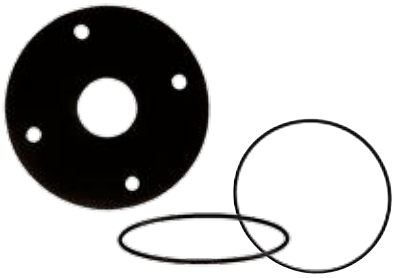
Lamp tool for simple bulb installation or removal.

		ARTICLE NO.
Lamp remover	BR50-LS	28250250000

GASKETS

Module o-rings and mounting gaskets to achieve IP 65 ingress protection for outdoor and wash-down applications.

		ARTICLE NO.
Direct mounting set	BR50-BG	28250210000
Module gasket IP 65 (1 x per light module plus 1 x base module)	BR50-MG	28250220000
Tube gasket IP 65 (for tubular stand or tube mounting only)	BR50-TG	28250230000



WALL BRACKET WITH HOOD

Accommodates wall mounting of the BR 50 on a tubular stand.

		ARTICLE NO.
Wall bracket	BR50-W	28250200000

Signal Towers
BR 35

Compact machinery status indicator
35 mm diameter complements industrial machinery while offering excellent visibility.

Modular design
Simplifies configuration and assembly of a wide variety of lens colour options.

Prismatic lenses
Provide dispersion of light for high visibility from all sides. High impact resistant polycarbonate material.

Satisfies many requirements
Provides machinery and process status indication for production lines, laboratories, medical equipment, and conveyor systems.

Patented design
no. 9706583.8, utility patent no. 29716867.3.

Choice of lamp type
Supports filament bulbs or LED lamps.

www.pss-pfannenberg.com

Pfannenberg's PSS software tool provides easy signal tower configuration to suit individual requirements.

SIGNAL TOWERS

IP 54
protection system

+55 °C
–35 °C
LED

+45 °C
–35 °C
filament lamp

PRODUCT		BR 35	
DATA			
Rated voltage		230 V AC 50 I 60 Hz	24 V DC
Operating range		–15 % ... +10 %	–15 % ... +20 %
Capacity of light source		3 W	4 W
Light source	AC	BA9s, 3 W (previously installed)	
	DC	BA9s, max. 4 W (previously installed)	
Number of modules		max. 4	
Operating temperature	LED	–35 °C ... +55 °C	
	filament lamp	–35 °C ... +45 °C	
Protection system according to EN 60529		IP 54	
Service life of light source		approx. 1,000 hrs	
Material	lens	polycarbonate (PC)	
	housing	acrylonitrile butadiene styrene (ABS)	
	tube	stainless steel	
Type of connection		cable length 0.5 m tube mounting; 0.65 m panel mounting	
Mounting methods		mounting stand, plinth mounting, tube mounting, panel mounting (see drawings on page 103)	
For additional models, options and voltages visit www.pfannenberg.com or contact us directly.			

Further models on request

BR 35 in 12 V DC and 115 V AC.

Webcode
#3138

Comprehensive technical documentation such as
- **operating instructions, technical data, approvals**
- **support for planning, 3D models, CAD data**

can be retrieved by entering this webcode in the search window on www.pfannenberg.com

BR 35 MOUNTING STAND		ARTICLE NO.	
Version		230 V AC	24 V DC
1-stage	BR 35-1-S	22080101000	22080801000
2-stage	BR 35-2-S	22080102000	22080802000
3-stage	BR 35-3-S	22080103000	22080803000
4-stage	BR 35-4-S	22080104000	22080804000
3-stage with fixed colour order: top: ●, middle: ●, bottom: ●		22080100000	22080800000

BR 35 PLINTH MOUNTING		ARTICLE NO.	
Version		230 V AC	24 V DC
1-stage	BR 35-1-P	22081101000	22081801000
2-stage	BR 35-2-P	22081102000	22081802000
3-stage	BR 35-3-P	22081103000	22081803000
4-stage	BR 35-4-P	22081104000	22081804000

BR 35 TUBE MOUNTING		ARTICLE NO.	
Version		230 V AC	24 V DC
1-stage	BR 35-1-T	22082101000	22082801000
2-stage	BR 35-2-T	22082102000	22082802000
3-stage	BR 35-3-T	22082103000	22082803000
4-stage	BR 35-4-T	22082104000	22082804000

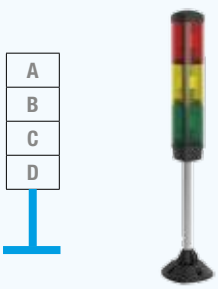
BR 35 PANEL MOUNTING		ARTICLE NO.	
Version		230 V AC	24 V DC
1-stage	BR 35-1-PM	22083101000	22083801000
2-stage	BR 35-2-PM	22083102000	22083802000
3-stage	BR 35-3-PM	22083103000	22083803000
4-stage	BR 35-4-PM	22083104000	22083804000

Article numbers for other voltages on request.

OPTIONS	ACCESSORIES		ARTICLE NO.
Product			
Plastic mounting bracket for stand- or plinth mounting		BR35-W	28235200020
Metal mounting bracket for tube mounting		BR35-A	28235200010
Assembly kit for sounder module			28235808000

Ordering examples

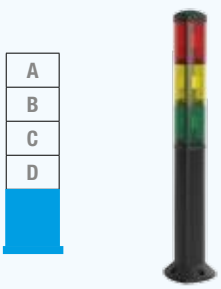
Mounting stand



3-stage BR 35
mounting stand
24 V DC, colour order:
A = ●
B = ●
C = ●

Article no.:
22080803000

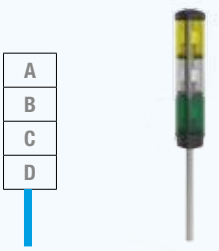
Plinth mounting



3-stage BR 35
plinth mounting
230 V AC, colour order:
A = ●
B = ●
C = ●

Article no.:
22081103000

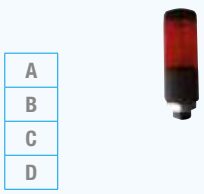
Tube mounting



3-stage BR 35
tube mounting
24 V DC, colour order:
A = ●
B = ●
C = ●

Article no.:
22082803000

Panel mounting

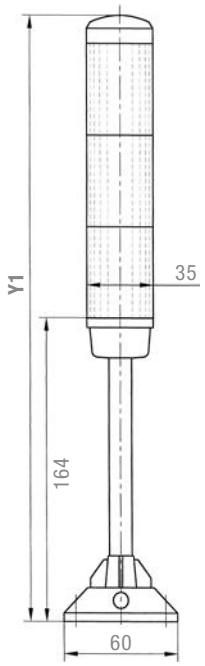


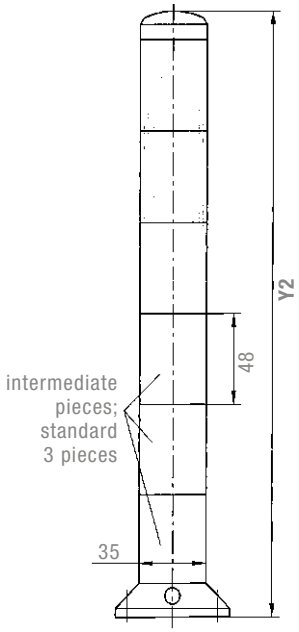
1-stage BR 35
panel mounting
230 V AC, colour order:
A = ●

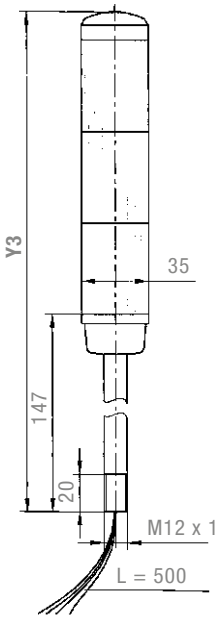
Article no.:
22083101000

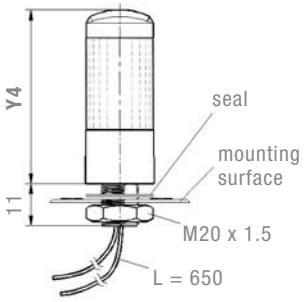
Please indicate color sequence (A/B/C/D) in your order as depicted above.

MOUNTING STAND	PLINTH MOUNTING	TUBE MOUNTING	PANEL MOUNTING









	Y1	Y2	Y3	Y4
1-stage	228	228	210	91
2-stage	276	276	258	142
3-stage	324	324	306	190
4-stage	372	372	354	238
5-stage	420	420	402	286

Accessories for BR 35

LIGHT SOURCE

Filament lamps and LEDs for signal towers from the BR 35 series.

			ARTICLE NO.
LED		24 V AC/DC	28613000000
LED		24 V AC/DC	28613000001
LED		24 V AC/DC	28613000002
LED		24 V AC/DC	28613000003
LED		24 V AC/DC	28613000004
Filament lamp	pack of 5	230 V AC 3 W	28813000000
Filament lamp	pack of 5	115 V AC 3 W	28813000001
Filament lamp	pack of 5	24 V DC 4 W	28813000002
Filament lamp	pack of 5	12 V DC 4 W	28813000003

MOUNTING BRACKET

Bracket for mounting the BR 35.

		ARTICLE NO.
Metal bracket for tube mounting	BR 35-A	28235200010
Plastic bracket for mounting on tubular stand or plinth	BR 35-W	28235200020

Ex-ATEX Signal Towers

EX

ATEX certified for Zones 2 and 22
Satisfies requirements for device category 3G and 3D in hazardous areas.

Low power, high output LEDs
Reliable operation with service life exceeding 50,000 hrs.

Prismatic lenses
Provide dispersion of light for high visibility from all sides. High impact resistant polycarbonate material.

Applications
For hazardous areas where there is a risk of explosion due to the presence of combustible gas or dust.

Further models on request

BR 50 3G/3D in 230 V AC, other colours like clear, amber and other colour combinations.

EX-ATEX SIGNAL TOWERS

IP 65
protection system

+50 °C
–20 °C
operating temperature

PRODUCT		BR 50-LED 3G/3D			
ARTICLE NO.		22093401000	22093401106	22093402300	22093403000
DATA					
Version		1-stage	1-stage	2-stage	3-stage
Colour order		●	●	● ●	● ● ●
Operating range		18–28 V			
		AC 50 I 60 Hz I DC			
Current consumption	AC	60 mA @ 24 V	60 mA @ 24 V	90 mA @ 24 V	130 mA @ 24 V
	DC	50 mA @ 24 V	50 mA @ 24 V	80 mA @ 24 V	120 mA @ 24 V
Explosion protection		II 3G Ex nA II T5 X –20 °C ≤ Ta ≤ +50 °C II 3D tDA22 IP 65 T85°C X –20 °C ≤ Ta ≤ +50 °C			
Category (area of use)		3G (Zone 2) 3D (Zone 22)			
Temperature class T		T5			
Special conditions		X: according to the requirements of prDIN EN 60 079-0, DIN EN 61241-0 (2007) and DIN EN 61241-1 (2005), the equipment is suitable for applications with a low degree of mechanical danger. It must therefore be ensured that the light is mounted with sufficient protection against impacts. A protective cage is not mandatory.			
Operating mode		continuous light			
Light source		LED			
Operating temperature		–20 °C … +50 °C			
Protection system according to EN 60529		IP 65			
Service life of light source		>50,000 hrs			
Material	lens	⊘ ● ● ● ● ● polycarbonate (PC)			
	housing	acrylonitrile butadiene styrene (ABS)			
	connector housing	polycarbonate (PC)			
Dimensions (X x Y1 x Y2 x Z)		82 x 80 x 109 x 85 mm		82 x 80 x 172 x 85 mm	82 x 80 x 235 x 85 mm

For additional models, options and voltages visit www.pfannenberg.com or contact us directly.

EAC

Webcode
#3139

Comprehensive technical documentation such as
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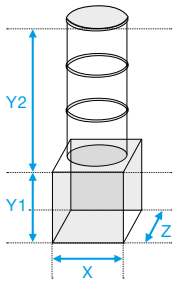
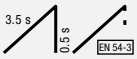
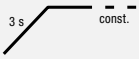
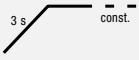
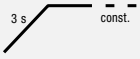
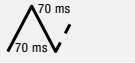
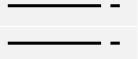
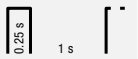
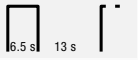
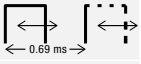
- **support for planning, 3D models, CAD data**

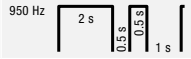
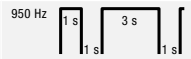
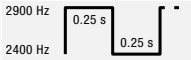
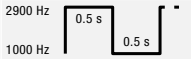
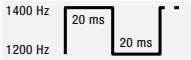
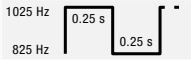
can be retrieved by entering this webcode in the search window on www.pfannenberg.com

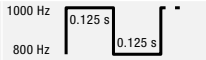
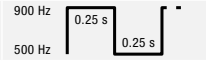
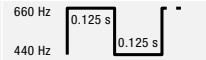
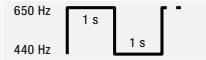


Tone table **PA 1 | PA 5 | PA 10 | PA 20**

NO.	DESCRIPTION	
1	no tone	
2	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	
9	Slow whoop, fire alarm, UK BS5839-1	
11	Interrupted tone (fast)	
13	Interrupted tone	
15	Slow whoop, evacuation alarm Netherlands NEN 2575	
16	Slow whoop, Australian evacuation alarm AS2220	
18	Slow whoop, NFPA	
22	Pulsating tone, Australien alert AS1670, ISO8201	
23	Siren	
24	Siren	
25	Siren	
26	Siren, industrial alarm Germany	
27	Sweeping	
29	Sweeping (fast)	
30	Sweeping	
31	Sweeping, France NFC48-265	
33	Sweeping (medium), UK BS5839-1	
34	Sweeping (fast)	
35	Sweeping (fast), UK BS5839-1	
36	Sweeping	
43	Sweeping	
44	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm	
45	Sweeping	
46	Sweeping, general alarm Finland	
52	Continuous tone	
53	Continuous tone	
54	Continuous tone, Finland (all-clear signal)	
55	Continuous tone, PFEER gasalarm	
56	Continuous tone	

NO.	DESCRIPTION	
57	Continuous tone, UK BS5839-1	
59	Continuous tone	
60	Continuous tone	
61	Continuous tone	
63	Continuous tone	
65	Continuous tone, Sweden SS031711 (all-clear signal)	
66	Continuous tone	
67	Continuous tone, Germany KTA3901 (all-clear signal)	
68	Continuous tone	
69	Continuous tone	
71	Continuous tone	
77	Interrupted tone	
82	Interrupted tone, PFEER (general alarm), UK BS5839-1 (back-up alarm)	
83	Interrupted tone, PFEER (general alarm)	
88	Interrupted tone	
90	Interrupted tone	
91	Interrupted tone	
92	Interrupted tone	
93	Interrupted tone (fast), horn	
97	Interrupted tone	
98	Interrupted tone, Sweden SS031711 (emergency signal)	
100	Interrupted tone, industrial alarm Germany	
101	Interrupted tone, Sweden SS031711 (important message (pre-mess))	
102	Interrupted tone, Sweden SS031711 (local warning)	
103	Interrupted tone, Sweden SS031711 (air raid warning)	
104	Interrupted tone, Sweden SS031711 (emergency signal)	
107	Interrupted tone, Germany KTA3901 (evacuation alarm)	
109	Interrupted tone, Australia AS2220, AS1610, AS1670	
110	Interrupted tone, (fast variable), bell	
111	Interrupted tone, ISO8201 (emergency evacuation signal), USA (evacuation alarm)	
112	Interrupted tone, ISO8201 (emergency evacuation signal)	
113	Interrupted tone, ISO8201 (emergency evacuation signal), sweeping	

NO.	DESCRIPTION	
115	Interrupted tone, IMO (telephone call)	
116	Interrupted tone, IMO (leave ship)	
117	Interrupted tone, IMO SOLAS III/50 + SOLAS III/6.4 (general alarm)	
122	Alternating tone	
123	Alternating tone	
124	Alternating tone, Singapore	
125	Alternating tone	
128	Alternating tone	
130	Alternating tone, UK BS5839-1 (fire alarm)	

NO.	DESCRIPTION	
131	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	
135	Alternating tone, UK BS5839-1 (fire alarm, increased urgency – railway crossing)	
142	Alternating tone	
143	Alternating tone, industrial alarm Germany	
144	Alternating tone	
146	Alternating tone, France NFS 32-001 (fire alarm)	
147	Alternating tone, Sweden SS031711	
148	Alternating tone, Sweden SS031711	
152	Alternating tone (two tone chime)	

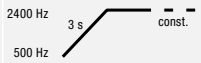
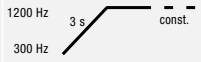
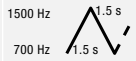
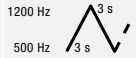
Control of the tones **PA 1 I PA 5 I PA 10 I PA 20**

DIP-SWITCH (SETTING OF BASIC TONE)							EXTERNAL TONE SELECTION		
							C1	C2	C1+C2
1	2	3	4	5	6	BASIC TONE	TONE NO.		
						1	2	88	57
ON						2 *	128	112	57
	ON					2	26	100	93
ON	ON					2	61	131	112
		ON				9	57	11	82
ON		ON				15	131	52	112
	ON	ON				16	109	52	56
ON	ON	ON				18	111	57	68
			ON			22	16	109	68
ON			ON			23	131	52	112
	ON		ON			24	131	52	131
ON	ON		ON			25	131	52	92
		ON	ON			26	2	100	93
ON		ON	ON			27	123	52	92
	ON	ON				29	35	52	61
ON	ON	ON				30	27	52	77
				ON		31	131	52	57
ON				ON		33	30	52	35
	ON			ON		34	35	52	93
ON	ON			ON		35	27	52	110
		ON		ON		36	146	67	57
ON		ON		ON		43	131	52	91
	ON	ON		ON		45	2	57	93
ON	ON	ON		ON		52	15	65	82
			ON	ON		54	46	54	131
ON			ON	ON		55	131	52	128
	ON		ON	ON		56	82	35	33
ON	ON		ON	ON		59	143	59	101
			ON	ON		60	131	52	125
ON		ON	ON	ON		65	131	52	93
	ON	ON	ON	ON		66	110	52	107
ON	ON	ON	ON	ON		69	131	52	110

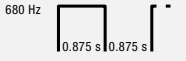
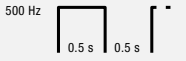
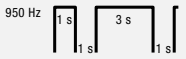
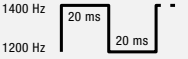
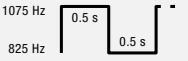
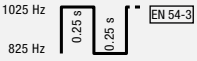
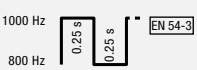
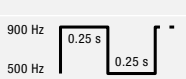
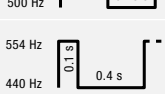
DIP-SWITCH (SETTING OF BASIC TONE)							EXTERNAL TONE SELECTION		
							C1	C2	C1+C2
1	2	3	4	5	6	BASIC TONE	TONE NO.		
					ON	71	131	52	93
ON					ON	77	61	52	122
	ON				ON	82	131	52	83
ON	ON				ON	83	56	2	82
		ON			ON	88	2	57	128
ON		ON			ON	90	131	52	125
	ON	ON			ON	91	30	52	110
ON	ON	ON			ON	92	33	52	57
			ON		ON	93	2	128	57
ON			ON		ON	97	2	63	93
	ON		ON		ON	100	131	52	125
ON	ON		ON		ON	101	98	102	65
		ON	ON		ON	103	131	65	147
ON		ON	ON		ON	104	103	65	101
	ON	ON	ON		ON	109	16	52	22
ON	ON	ON	ON		ON	110	131	61	91
				ON	ON	112	2	57	128
ON				ON	ON	113	52	123	104
	ON			ON	ON	115	117	116	44
ON	ON			ON	ON	116	117	93	125
		ON		ON	ON	117	93	116	125
ON		ON		ON	ON	123	27	52	77
	ON	ON		ON	ON	124	53	83	2
ON	ON	ON		ON	ON	130	2	107	67
			ON	ON	ON	131	2	112	57
ON			ON	ON	ON	135	16	56	109
	ON		ON	ON	ON	142	2	54	88
ON	ON		ON	ON	ON	143	59	93	33
		ON	ON	ON	ON	144	110	61	2
ON		ON	ON	ON	ON	146	31	67	57
	ON	ON	ON	ON	ON	148	131	52	92
ON	ON	ON	ON	ON	ON	152	110	61	13

* factory setting

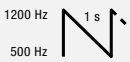
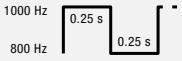
Tone table **DS 5 I DS 10 I DSF 5 I DSF 10**

NO.	DESCRIPTION – BASIC TONE (PRESET: TONE 2)		STAGE 2	3	4
0	no tone		2	88	57
2 [1]	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP		128	112	57
15	Slow whoop, evacuation alarm Netherlands NEN 2575		131	54	112
23	Siren		24	60	112
24	Siren		55	23	131
26	Pulsating tone, industrial alarm Germany		2	100	93
31	Sweeping, France NFC48-265		128	54	57
32	selection of available tone combinations in stages 2, 3 and 4				
36	Sweeping		146	67	57
45	Sweeping		2	57	93
54	Continuous tone, Finland (all-clear signal)		2	57	67
55	Continuous tone, PFEER gasalarm		2	88	128
57	Continuous tone, UK BS5839-1		2	128	88
60	Continuous tone		24	93	125
63	Continuous tone		2	97	93
67	Continuous tone, Germany KTA3901 (all-clear signal)		24	93	125
88	Interrupted tone		2	57	128

[1] factory setting

NO.	DESCRIPTION – BASIC TONE (PRESET: TONE 2)		STAGE 2	3	4
90	Interrupted tone		2	127	108
92	Interrupted tone		131	146	57
93	Interrupted tone (fast), horn		2	128	57
97	Interrupted tone		2	63	93
98	Interrupted tone, Sweden SS031711 (emergency signal)		112	128	57
100	Interrupted tone, industrial alarm Germany		2	57	125
108	Interrupted tone		2	127	60
112	Interrupted tone, ISO8201 (emergency evacuation signal)		2	57	128
116	Interrupted tone, IMO (leave ship)		117	93	125
117	Interrupted tone, IMO SOLAS III/50 + SOLAS III/6.4 (general alarm)		93	116	125
125	Alternating tone		57	93	24
127	Alternating tone		2	90	60
128	Alternating tone		2	112	57
131	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)		24	55	23
142	Alternating tone		2	54	88
146	Alternating tone, France NFS 32-001 (fire alarm)		128	67	57

Tone table **PY X-MA-05 I PY X-MA-10**

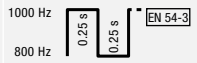
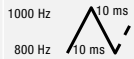
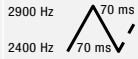
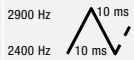
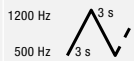
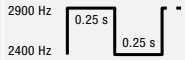
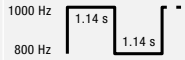
NO.	DESCRIPTION	
2	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	
9	Slow whoop, fire alarm, UK BS5839-1	
131	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	

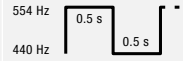
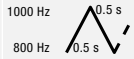
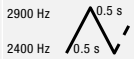
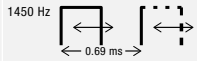
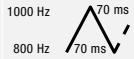
[1] factory setting

NO.	DESCRIPTION	
160	Continuous tone (horn)	
161	Continuous tone	
162 [1]	Interrupted tone	
163	Interrupted tone	
164	Slow whoop	

Tone table

BEXS 110 I BEXDS 110 I BEXS 120 I BEXDS 120 I BEXCS 110-05D

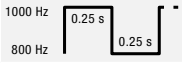
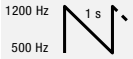
NO.	DESCRIPTION – BASIC TONE		STAGE 2	STAGE 3
1	Continuous tone		31	11
2 [1]	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)		17	5
3	Slow whoop		2	5
4	Sweeping (fast)		6	5
5	Continuous tone		3	27
6	Sweeping		7	5
7	Sweeping (fast)		10	5
8	Sweeping		2	5
9	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP		15	2
10	Alternating tone		7	5
11	Interrupted tone		31	1
12	Alternating tone		4	5
13	Interrupted tone		15	5
14	Interrupted tone		4	5
15	Continuous tone		2	5
16	Interrupted tone		18	5
17	Alternating tone, France NFS 32-001 (fire alarm)		2	27

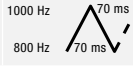
NO.	DESCRIPTION – BASIC TONE		STAGE 2	STAGE 3
18	Interrupted tone, Sweden SS031711 (air raid warning)		2	5
19	Sweeping, France NFC48-265		2	5
20	Continuous tone, Sweden SS031711 (all-clear signal)		2	5
21	Alternating tone, Sweden SS031711		2	5
22	Interrupted tone		2	5
23	Interrupted tone		6	5
24	Sweeping (medium), UK BS5839-1		29	5
25	Sweeping		29	5
26	Interrupted tone, (fast variable), bell		2	1
27	Continuous tone		26	5
28	Continuous tone		2	5
29	Sweeping (fast), UK BS5839-1		7	5
30	Interrupted tone, Australia AS2220, AS1610, AS1670		32	5
31	Sawtooth, DIN tone 33404-3 Germany (emergency signal)		11	1
32	Slow whoop, Australian evacuation alarm AS2220		26	1

[1] factory setting

The sounder can be set externally to the respective tones of stage 2 & 3. Tone 2 is preset.

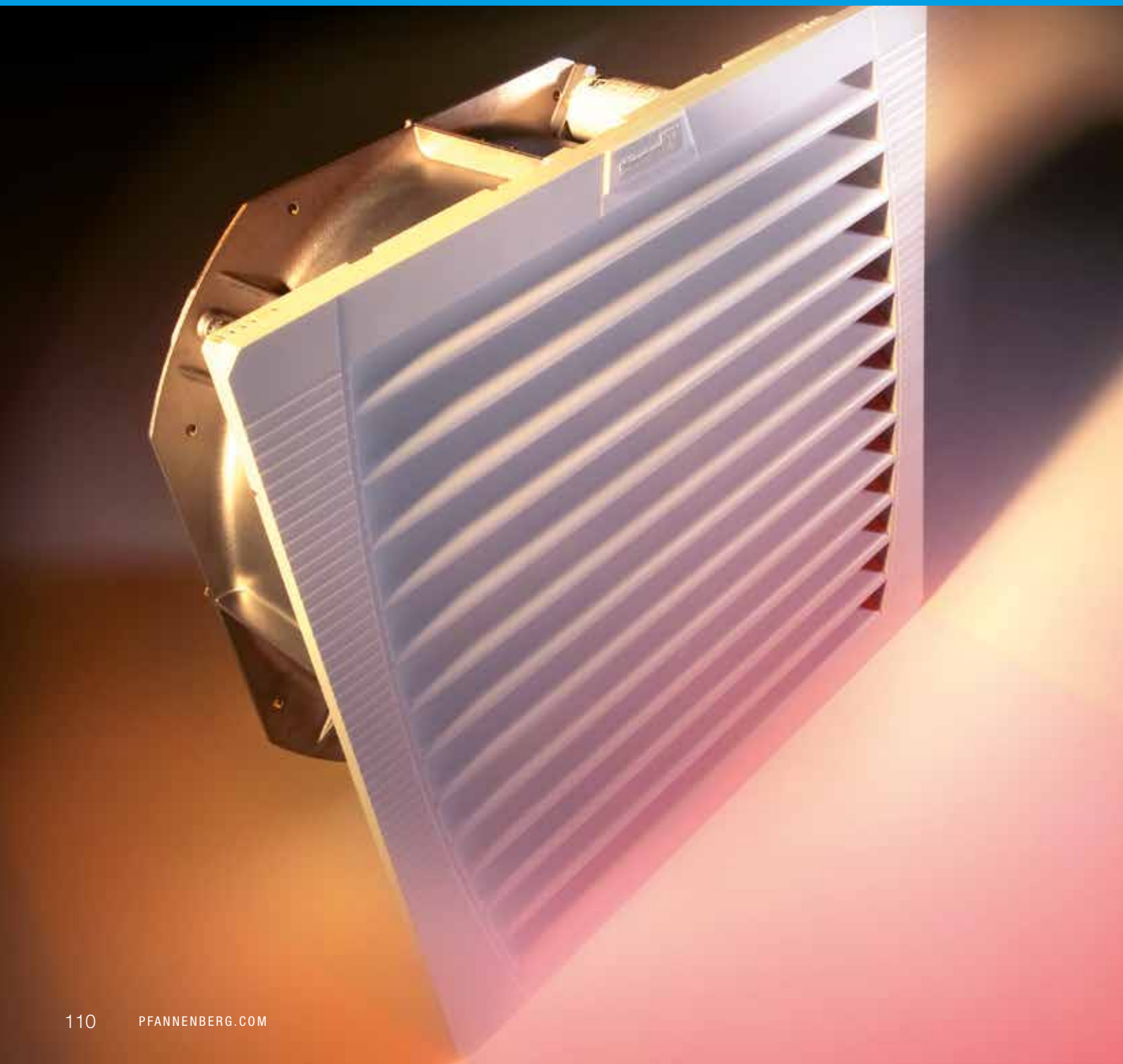
Tone table BR 50-SM

NO.	DESCRIPTION	
1	Alternating tone	
2	Slow whoop	
3	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	
4	Alternating tone, France NFS 32-001 (fire alarm)	

NO.	DESCRIPTION	
5 [1]	Continuous tone	
6	Simulated bell	
7	Sweeping	

[1] factory setting

Efficient cooling and heating.



Cooling units, filterfans, heat exchangers, heaters, thermostats, hygrostats and chillers.

Pfannenberg also offers, in addition to the area of signaling technology, a very comprehensive product portfolio for the thermal management of electrical enclosures and process cooling. Pfannenberg is one of the few manufacturers worldwide which offers complete competence developed in-house – from filterfans, cooling units and chillers to heaters and thermostats. You can also profit here from comprehensive know-how and several years' application experience in various industrial areas.

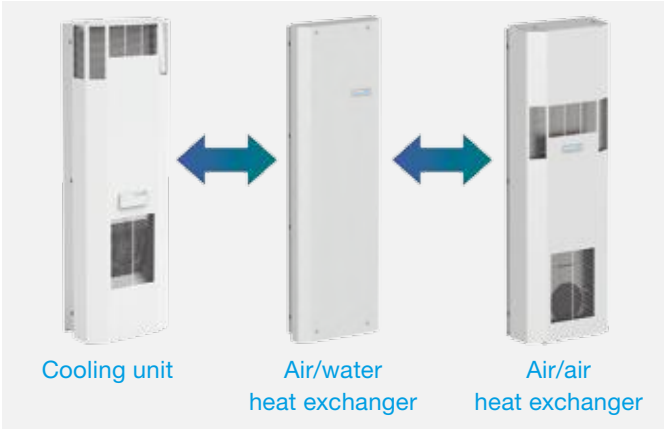
You can find the entire portfolio of Pfannenberg thermal management and process cooling of electrical enclosures and chillers on www.pfannenberg.com.
Or just order your complimentary copy of the whole catalogue **"Thermal Management – thermal management for electrical enclosures and process cooling"** on +49 40 73412 156.

The following chapter shows you a selection of Pfannenberg's thermal management portfolio – cut-out compatible, energy efficient and service-friendly.

Protecting man, machine and the environment.

Cut-out compatibility.

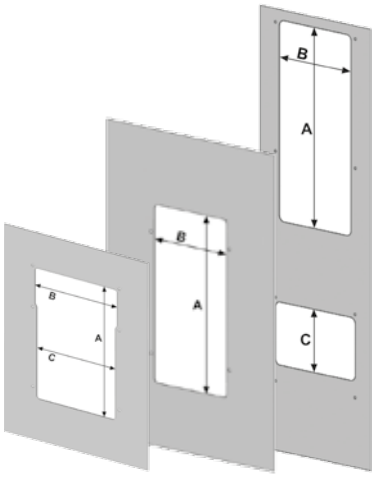
Components in the enclosure are often updated and the requirements to thermal management change. An air/air heat exchanger which was previously the optimal solution is not suitable any more. The exchange with an active **ECOOL** cooling unit or an air/water heat exchanger can be carried out easily and without problems, because the units have the same cut-out dimensions. Thus, the process stability is also ensured after extensive modifications.

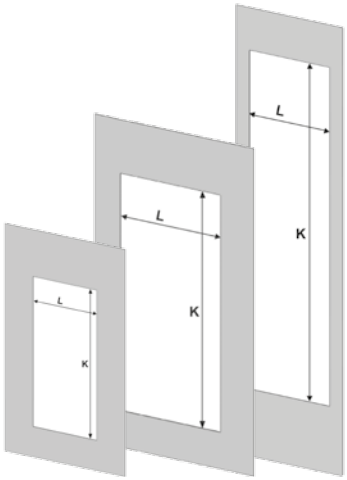


CUT-OUT	COOLING UNIT	AIR/WATER HEAT EXCHANGER	AIR/AIR HEAT EXCHANGER
Size 1	DTx 9041	PWx 6105 PWx 6052	PAx 6043
Size 2	DTx 6301C DTx 6201C	PWx 6302C PWx 6152	PAx 6133 PAx 6103 PAx 6073
Size 3	DTx 6801 DTx 6501 DTx 6401 DTx 6301 DTx 6201	PWx 6502 PWx 6302	PAx 6203 PAx 6173

CUT-OUT OUTER MOUNTING	SIZE 1	SIZE 2	SIZE 3
A	472 mm	662 mm	700 mm
B	285 mm	320 mm	315 mm
C	272 mm	–	220 mm

CUT-OUT RECESSED MOUNTING	SIZE 1	SIZE 2	SIZE 3
K	577 mm	900 mm	1510 mm
L	350 mm	380 mm	450 mm





The advantages at a glance.

- Flexible adjustment to cooling requirements according to ambient conditions.
- Possibility of late decision for the thermal management concept.
- Reduced construction efforts – only 3 cut-out sizes.
- Reduced number of cabinet variations.
- Interchangeable thermal management concepts without mechanical reworking.

Cooling units.

TYPE	COOLING CAPACITY*	RATED VOLTAGE	CUT-OUT DIMENSION (H x W)
... for partially recessed mounting in the door or side			
€COOL DTI 6801	4,000 W	400 V 3~	1510 x 450 mm
€COOL DTI 6501	2,500 W	400 V 3~	
€COOL DTI 6401	2,000 W	230 V ı 400 V 3~	
€COOL DTI 6301	1,500 W	115 V ı 230 V ı 400 V 2~	
€COOL DTI 6201	1,000 W	115 V ı 230 V ı 400 V 2~	
€COOL DTI 6301C	1,500 W	115 V ı 230 V ı 400 V 2~	962 x 410 mm
€COOL DTI 6201C	1,000 W	115 V ı 230 V ı 400 V 2~	
DTI 9041	870 W	115 V ı 230 V ı 400 V 2~	577 x 350 mm
DTI 9031	510 W	115 V ı 230 V ı 400 V 2~	495 x 265 mm
DTI 9021	320 W	115 V ı 230 V	289 x 304 mm
DTFI 9021	320 W	115 V ı 230 V ı 400 V 2~	291 x 291 mm

... for outer mounting on the door or side			
€COOL DTS 6801	4,000 W	400 V 3~	700 x 315 ı 220 x 315 mm
€COOL DTS 6501	2,500 W	400 V 3~	
€COOL DTS 6401	2,000 W	230 V ı 400 V 3~	
€COOL DTS 6301	1,500 W	115 V ı 230 V ı 400 V 2~	
€COOL DTS 6201	1,000 W	115 V ı 230 V ı 400 V 2~	
€COOL DTS 6301C	1,500 W	115 V ı 230 V ı 400 V 2~	968 x 410 mm
€COOL DTS 6201C	1,000 W	115 V ı 230 V ı 400 V 2~	
DTS 9041	870 W	115 V ı 230 V ı 400 V 2~	472 x 285/272 mm
DTS 9031	510 W	115 V ı 230 V ı 400 V 2~	422 x 215 mm
DTS 9011H	300 W	230 V	300 x 495 x 140 mm

TYPE	COOLING CAPACITY*	RATED VOLTAGE	CUT-OUT DIMENSION (D x W)
... for top mounting			
€COOL DTT 6801	4,000 W	400 V 3~	392 x 692 mm
€COOL DTT 6601	3,000 W	400 V 3~	
€COOL DTT 6401	2,000 W	115 V ı 230 V ı 400 V 2~	390 x 490 mm
€COOL DTT 6301	1,500 W	115 V ı 230 V ı 400 V 2~	
€COOL DTT 6201	1,000 W	115 V ı 230 V ı 400 V 2~	260 x 475 mm
€COOL DTT 6101	500 W	115 V ı 230 V	

* (A35/A35) in accordance with EN 14511: at +35 °C ambient temperature and +35 °C temperature inside enclosure.

Air/water heat exchangers.

TYPE	COOLING CAPACITY	RATED VOLTAGE	CUT-OUT DIMENSION (H x W)
... for partially recessed mounting in the door or side			
ECOOL PWI 6502	5,000 W	115 V I 230 V I 400 V	1510 x 450 mm
ECOOL PWI 6302	3,000 W	115 V I 230 V I 400 V	
ECOOL PWI 6302C	4,000 W	115 V I 230 V I 400 V	900 x 380 mm
ECOOL PWI 6152	1,500 W	115 V I 230 V I 400 V	
ECOOL PWI 6102	1,000 W	115 V I 230 V	577 x 350 mm
ECOOL PWI 6052	500 W	115 V I 230 V	
... for outer mounting on the door or side			
ECOOL PWS 6502	5,000 W	115 V I 230 V I 400 V	700 x 315 I 220 x 315 mm
ECOOL PWS 6302	3,000 W	115 V I 230 V I 400 V	
ECOOL PWS 6302C	4,000 W	115 V I 230 V I 400 V	662 x 320 mm
ECOOL PWS 6152	1,500 W	115 V I 230 V I 400 V	
ECOOL PWS 6102	1,000 W	115 V I 230 V	472 x 285/272 mm
ECOOL PWS 6052	500 W	115 V I 230 V	

ECOOL PWI 6302

ECOOL PWS 6502

Air/air heat exchangers.

TYPE	SPECIFIC COOLING CAPACITY	RATED VOLTAGE	CUT-OUT DIMENSION (H x W)
... for partially recessed mounting in the door or side			
ECOOL PAI 6203	100 W/K	115 V I 230 V	1510 x 450 mm
ECOOL PAI 6173	85 W/K	115 V I 230 V	
ECOOL PAI 6133	65 W/K	115 V I 230 V	900 x 380 mm
ECOOL PAI 6103	50 W/K	115 V I 230 V	
ECOOL PAI 6073	35 W/K	115 V I 230 V	
ECOOL PAI 6043	20 W/K	115 V I 230 V	577 x 350 mm
... for outer mounting on the door or side			
ECOOL PAS 6203	100 W/K	115 V I 230 V	700 x 315 I 220 x 315 mm
ECOOL PAS 6173	85 W/K	115 V I 230 V	
ECOOL PAS 6133	65 W/K	115 V I 230 V	662 x 320 mm
ECOOL PAS 6103	50 W/K	115 V I 230 V	
ECOOL PAS 6073	35 W/K	115 V I 230 V	
ECOOL PAS 6043	20 W/K	115 V I 230 V	472 x 285/272 mm

ECOOL Air/air heat exchangers

Chillers.

TYPE	COOLING CAPACITY	RATED VOLTAGE	DIMENSIONS (H x W x D)
ECOOL CC Chillers			
CC 6601	6,500 W	400 3~ I 460 3~	984 x 601 x 670 mm
CC 6501	5,000 W	400 3~ I 460 3~	
CC 6401	3,500 W	400 3~ I 460 3~	
CC 6301	2,400 W	115 V I 230 1~	626 x 600 x 480 mm
CC 6201	1,700 W	115 V I 230 1~	
CC 6101	1,100 W	115 V I 230 1~	
EB Chillers			
EB 400 WT	40,000 W	400 3~ I 460 3~	1410 x 1680 x 790 mm
EB 400 OIL	40,000 W	400 3~ I 460 3~	
EB 160 WT	16,000 W	400 3~ I 460 3~	1400 x 855 x 800 mm
EB 190 OIL	19,000 W	400 3~ I 460 3~	1410 x 1230 x 790 mm
EB 80 WT	8,000 W	400 3~ I 460 3~	1225 x 600 x 760 mm
EB 60 OIL	6,000 W	400 3~ I 460 3~	955 x 600 x 555 mm

ECOOL CC 6101

EB 80 WT

Filterfans 4.0.

TYPE	AIRFLOW RATE [1] IP 54 / IP 55	RATED VOLTAGE	CUT-OUT DIMENSION (H x W) [2]
ECOOL PF Filterfans *			
PF 11.000	19 / - m^3/h	115 V I 230 V AC 12 V I 24 V I 48 V DC	92 x 92 mm
PF 22.000	50 / 56 m^3/h		125 x 125 mm
PF 32.000	98 / 100 m^3/h		177 x 177 mm
PF 42.500	125 / 145 m^3/h		223 x 223 mm
PF 43.000	223 / 233 m^3/h		
PF 65.000	480 / 505 m^3/h	115 V I 230 V AC	291 x 291 mm
PF 66.000	640 / 770 m^3/h	400/460 V 3 ~ 115 V I 230 V AC	
PF 67.000	867 / 925 m^3/h		
ECOOL PFA Exhaust filters *			
PFA 10.000			92 x 92 mm
PFA 20.000			125 x 125 mm
PFA 30.000			177 x 177 mm
PFA 40.000			223 x 223 mm
PFA 60.000			291 x 291 mm

* EMC versions also available

ECOOL Filterfans 4.0

ECOOL PTF Filterfans for top mounting			
PTF 60.500	500 / 350 m^3/h	115 V I 230 V AC	291 x 291 mm
PTF 60.700	700 / 550 m^3/h		
PTF 61.000	1,000 / 750 m^3/h		
ECOOL PTFA Exhaust filters for top mounting			
PTFA 60.000			291 x 291 mm

[1] free-blowing [2] for material thicknesses up to 2 mm

ECOOL Filterfan 4.0 for top mounting

Heaters.

TYPE	HEATING PERFORMANCE	RATED VOLTAGE	DIMENSIONS (H x W x D)
FLH Radiant heaters			
FLH 010	10 W	110–250 V AC	100 x 70 x 50 mm
FLH 015	15 W	110–250 V AC	
FLH 030	30 W	110–250 V AC	
FLH 045	45 W	110–250 V AC	
FLH 060	60 W	110–250 V AC	175 x 70 x 50 mm
FLH 075	75 W	110–250 V AC	
FLH 100	100 W	110–250 V AC	
FLH 150	150 W	110–250 V AC	250 x 70 x 50 mm
FLH Fan Heaters			
FLH 250	250 W	115 V | 230 V AC	186.5 x 85 x 104 mm
FLH 400	400 W	115 V | 230 V AC	226.5 x 85 x 104 mm
FLH-T Fan heaters with integrated thermostat			
FLH-T 250	250 W	115 V | 230 V AC	100 x 150 x 164 mm
FLH-T 400	400 W	115 V | 230 V AC	
FLH-T 600	600 W	115 V | 230 V AC	
FLH-T 800	800 W	115 V | 230 V AC	
FLH-T 1000	1,000 W	115 V | 230 V AC	
PFH Compact fan heaters			
PFH 200	200 W	115 V | 230 V AC	142 x 88 x 126 mm
PFH 300	300 W	115 V | 230 V AC	
PFH 400	400 W	115 V | 230 V AC	
PFH 500	500 W	115 V | 230 V AC	
PFH 650	650 W	115 V | 230 V AC	
PFH 800	800 W	115 V | 230 V AC	
PFH 1000	1,000 W	115 V | 230 V AC	
PFH 1200	1,200 W	115 V | 230 V AC	
PFH-T Compact fan heaters with integrated thermostat			
PFH-T 200	200 W	115 V | 230 V AC	142 x 88 x 139 mm
PFH-T 300	300 W	115 V | 230 V AC	
PFH-T 400	400 W	115 V | 230 V AC	
PFH-T 500	500 W	115 V | 230 V AC	
PFH-T 650	650 W	115 V | 230 V AC	
PFH-T 800	800 W	115 V | 230 V AC	
PFH-T 1000	1,000 W	115 V | 230 V AC	
PFH-T 1200	1,200 W	115 V | 230 V AC	

FLH 010 – FLH 045

FLH 060 – FLH 100

FLH 250

FLH-T

PFH

PFH-T

Thermostats and hygrostats.

TYPE	OPERATING TEMPERATURE RANGE	TYPE OF CONTACT	SWITCHING POINT TOLERANCE	DIMENSIONS (H x W x D)
FLZ Thermostats				
FLZ 510	–40 … +80 °C	changeover	±3 K	59.5 x 37 x 47.5 mm
FLZ 520		N.C.	±4 K	72 x 40 x 36 mm
FLZ 530		N.O.	±4 K	
FLZ 541	–40 … +80 °C	N.C. ı N.O.	±4 K	80.5 x 59 x 38 mm
FLZ 542		N.C. ı N.C.	±4 K	
FLZ 543		N.O. ı N.O.	±4 K	
FLZ Hygrostats				
FLZ 600	0 … +60 °C	changeover	approx. 5 %	60 x 37 x 55 mm
FLZ 610	–20 … +60 °C	changeover/relay	approx. 2 K ±1 K approx. 4 % R.H. ±1 %	80.5 x 59 x 38 mm

FLZ 510

FLZ 541

FLZ 610

Enclosure lighting systems.

TYPE	LIGHT INTENSITY	RATED VOLTAGE	TYPE OF CONNECTION	DIMENSIONS (L x H x D)
Standard Lamp Systems – LED				
PLS 008 Mini LED	324 Lm	230 V AC	mains cable (1.8 m) with plug included	300 x 28 x 24 mm
PLS 013 Mini LED	612 Lm	230 V AC		530 x 28 x 24 mm

SOLUTIONS

Pfannenberg's approach to safe, efficient, and cost-effective signaling solutions is the Pfannenberg Advantage™. This four-tiered approach includes plant assessment, solution development, ROI analysis, and fulfillment. Examples on the following pages highlight several applications to give insight as to how this approach helps lead our clients to successful, economical solutions.

Guaranteed performance.

Pfannenberg 3D COVERAGE

Guaranteed performance assures system approval and prevents dangerous under-sizing and expensive over-sizing of the system.

Pfannenberg signalling devices are certified and approved as fire alarm notification appliances in compliance with European EN 54-3 and EN 54-23 requirements. For each device, Pfannenberg provides the dimensions for an acceptable output signal range that is needed to accurately plan visual and audible fire alarm systems. The dimensions for height, width, and depth are used with the Pfannenberg 3D-Coverage approach to ensure adequate performance with respect to the requirements set forth in the fire alarm system codes and standards.

This approach serves to eliminate two potential risks – system under-sizing and system over-sizing. Under-sized systems pose a safety risk since the output signal range is inadequate to meet code requirements. In addition, under-sized systems can be denied approval by the authority having jurisdiction (AHJ). Over-sized systems may include more devices than are needed, resulting in in a system that costs more than necessary and is at risk of being rejected by the purchaser.

1. Through understanding the actual signalling range, it becomes possible to determine the **number of devices** needed for a defined room or area.
2. The signalling range also defines the effective coverage area, permitting **determination of the maximum distance between devices**.
3. Additionally, it is possible to **determine the optimum device** type and the appropriate performance class.

Pfannenberg Sizing Software (PSS) is available to assist with the 3D-Coverage approach. Available online, this utility helps system planners and specifiers accurately size fire alarm systems based on the true capability of the notification appliances with respect to the conditions within the environment in which they are to be used.

Understanding true effective coverage, as provided by the 3D-Coverage approach, leads to accurate alarm system sizing and confidence in final system approval by the AHJ – as well as assured safety to personnel. Since product marketing data is typically insufficient, this is only possible when actual performance capability is considered. Pfannenberg helps make this happen.

Flashing light
PY X-S-05
See page 46

Sounder
PA 1
See page 70

Cost effectiveness.

Planning and designing visual and audible notification appliances for fire alarm systems requires professional awareness and specific knowledge of the structures and ambient conditions present within buildings and manufacturing plants. Consideration of this information is essential for ensuring correct system sizing and a cost-effective solution.

a) Audible notification appliances must be loud enough to be capable of delivering an alarm signal which effectively covers the entire intended space. However, they also may not be too loud, i.e. they should not cause any shock reactions when in operation.
b) Visual notification appliances must be able to be seen but not be annoying or contribute to physiological dysfunctions.

In order to configure the ideal system for the given ambient conditions and required coverage area, it is necessary to select devices with optimal performance.

1. Pfannenberg's EN 54-23 approved flashing lights provide a significantly larger coverage area than LED notification appliances. Although LED light may have a smaller current draw, the overall power required per square meter of effective coverage area is lower for the flashing lights.
2. Pfannenberg's EN 54-3 approved sounders utilise electromagnetic sound capsule technology to deliver a superior notification signal over a wider coverage area. This creates a more effective and safer system when compared to those with devices using piezo crystal oscillators.
3. With smart designs, higher performance, and efficient operation, Pfannenberg's visual and audible notification appliances contribute to a cost-effective system. With fewer devices needed, wiring and connection costs are reduced while their quick and easy assembly helps save time during installation.
4. With the free Pfannenberg Sizing Software (PSS), planners, engineers, system integrators and construction companies can plan their fire alarm project easily, comprehensibly, and in compliance with codes & standards.
5. Additional support from Pfannenberg is available. From help with determining the number of units to suit a particular room size, to effective coverage area calculations for specific devices, and even on site ambient noise measurements, our worldwide team is in place to provide assistance to planners, system integrators, contractors, and building owners.

Flashing light
PY X-M-10
See page 44

Sounder
DS 10
See page 68

Comprehensive information can be found in our brochure: 'A perfect fire alarm system needs perfect planning'.

The PSS is online, as app and download available at: **www.pfannenberg.com/pss.**

Functional safety
IEC 61508 | IEC 61511 (SIL) – plant safety.

On June 1, 2015, the European Directive, Seveso III, became law. In Germany, this was implemented with the Amendment to the Hazardous Incident Ordinance (12 BImSchV). With this, official government inspections and monitoring are required.

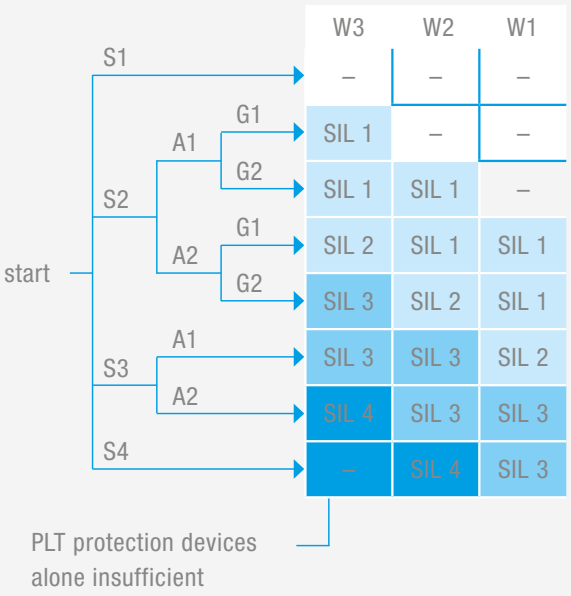
Basic requirements include obligations and precautions to prevent hazardous incidents and their possible consequences. This includes outfitting the operating area with sufficient alarm, warning, and safety equipment. Pfannenberg has supported such requirements for many years with SIL/PL compliant signalling devices for harsh industrial environments. By including the key safety data and operational features, the sounders and flashing lights can easily be integrated in the safety concept of machines and Industrial facilities.

- Signalling devices perform a safety protection function on machines and systems. The consequences of a potential fault in these devices present a potential risk if not detected.
- A hazard graph is an important reference for the classification of the machine, process system, or industrial facility as it clearly illustrates the complex preliminary work needed in order to plan and implement relevant safety related projects.

PMF-SIL
can be implemented up to PLd / SIL 2
See page 34

Quadro-SIL
can be implemented up to PLd / SIL 2
See page 40

Hazard graph according to IEC 61508.



S = Extent of damage
S1 minor injury of a person
S2 serious, irreversible injury of one or more people or death of one person
S3 death of several people
S4 disastrous effects with several dead

A = Likelihood of people being in the area
A1 rarely to slightly more often
A2 frequently to continuously

G = Danger prevention
G1 possible under certain conditions
G2 barely possible

W = Likelihood of occurrence
W1 very small
W2 small
W3 relatively high

Comprehensive information such as
- **flyer, SIL/PL info sheet, poster**
- **publications, applications**

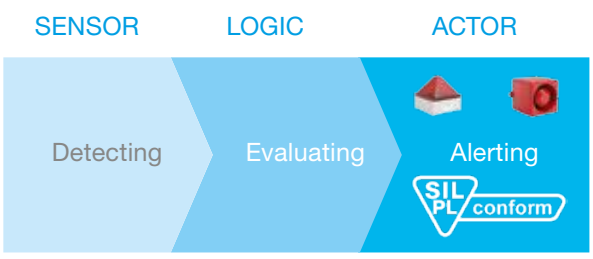
can be retrieved by entering this webcode in the search window on www.pfannenberg.com

Functional safety
EN ISO 13849-1 (PL) – machine safety.

Enacted on January 1, 2010 the machinery directive 2006/42/EG brought forth two machinery safety standards: DIN EN ISO 13849-1 (which replaces Norm DIN EN 954-1 of the old machinery directive 98/37/EG), and DIN EN 62061. This information was published in June 2006 in the Official Journal of the European Union (OJ L 157).

The objective of these safety norms is to minimize risks associated with the operation of machines. The results are stricter requirements imposed upon machinery manufacturers and industrial facility developers for the certification of products. Cause and event probability considerations were also included in the safety regulation of components. To keep the operational system's risk stack minimised, alarm devices which have a high functional safety are required. The use of combine visual and audible signalling devices was also widely recommended.

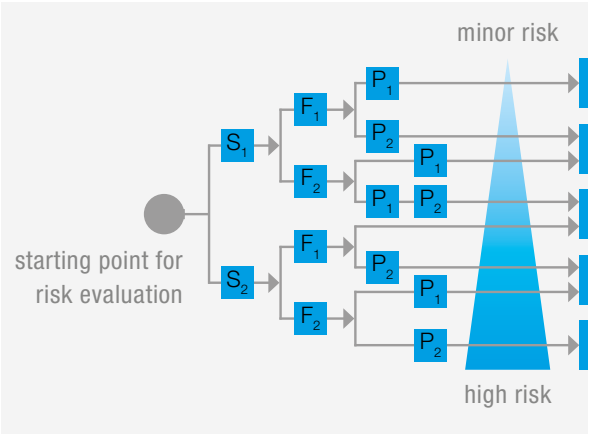
Safety Instrumented System SIS (Safety Loop).



DS 5-SIL
can be implemented up to PLd / SIL 2
See page 68

DS 10-SIL
can be implemented up to PLd / SIL 2
See page 68

Risk assessment.



Software assistant SISTEMA.

Control safety of machines – easily calculated.

The manufacturer-independent calculation tool SISTEMA, from the Institut für Arbeitsschutz (IFA) (German Occupational Health and Safety Department) helps users evaluate safety-related control systems according to EN ISO 13849-1 and simplifies risk analysis. The Windows tool builds the structure of the safety-related control components and calculates the reliability values at various detailed levels including the achieved Performance Level (PL).

Webcode
#3551

Robust signaling devices to withstand the rigours of tough use.

Shock and vibration-resistant: GL certified signaling devices.

Conditions including rough mechanical environments like shock, vibration, and impact will require robust signaling devices that can endure the punishment. Mining conveyors, stamping machines, punch presses, gantry cranes, railway transportation, and wind turbines represent some of these areas. Pfannenberg offers ruggedly constructed audible and visual alarm and notification equipment that can handle the world's toughest situations.

GL certified versions of our signaling devices incorporate additional protection to endure shock and vibration. This same certification includes shipboard marine use. Pfannenberg products are proudly found in maritime applications worldwide.

Impact resistance – designed in: signaling devices with impact rating IK08.

High strength plastics; saltwater grade cast aluminium; agency certifications; IK08 impact rating – these are the attributes familiar to Pfannenberg and required for devices to withstand the rigours of many industrial situations as well as harsh natural outdoor environments and events. Whether banged around on conveyors and cranes, smashed against by the seven seas, or pummeled by hail and ice, reliable signaling from Pfannenberg stands the test.

The goal of Pfannenberg has always been to endure. Investment in engineering, testing, materials, and certifications are the tools that help us achieve. With IK08, high levels of mechanical stress are endured, even without protective metal cages, because when safety matters, signaling must operate.

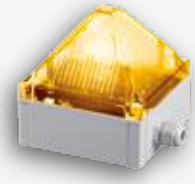
GL

PA X GL
See page 84

PYRA® GL
See page 46

IK08

PATROL
See page 70



Quadro
See page 40

Dust, water, aggressive vapours? Signaling devices that endure!

Dust-proof and waterproof: signaling devices with IP 66 protection system (and above).

Signalling devices must function under very difficult environmental conditions. For example, in the construction and timber industries, in the manufacture of glass, plastic and pharmaceuticals, and in many areas of the food industry. Wherever raw materials are broken up and a process creates dust, vapour, or steam; or in work and production areas which are regularly cleaned with water, signaling devices must be protected from the ingress of foreign material.

Signaling devices with IP 66 protection system (and above) fulfil the most demanding requirements in these application areas. They are totally impervious to dust and also resist flooding and powerful jets of water. Their functionality in demanding indoor applications and in tough outdoor environments is outstanding.

Seawater resilient and corrosion resistant signalling devices for near and offshore applications.

Applications on board ships, in harbours or in near-shore wind farms place particular demands on materials of construction and require quality workmanship.

High-quality plastics and high IP protection ratings provide electronic components with optimum protection from aggressive, salty air and from contact with water. Versions with aluminium housing are reliably protected from corrosion by a seawater-resistant alloy with a low copper content.

Pfannenberg has a proud tradition of safety on the high seas protecting people, machines, and the environment. Even the world's largest cruise ship – The Harmony of the Seas, features Pfannenberg signaling devices.

IP 66

DS
See page 68

PYRA®
See page 46

WBL GL
See page 38

PATROL MED
See page 70

Impervious to UV light, heat, and cold.

UV-stable devices for long-term use outdoors.
Whether installed outdoors on buildings, at sewage treatment facilities, within fuel depots, or on waterways, signaling devices that are outdoors are exposed to the damaging effects of the sun. UV light affects the durability of plastics and paint. Brittleness and cracking are the result. Pfannenberg prevents such damage through UV stabilisers which are added to the paint and injection moulded plastics used on our signaling devices.

Additional devices available with cast aluminium construction also offer robust solutions to outdoor situations as well as providing outstanding protection from impact.

Survive the temperature extremes anywhere in the world and inside demanding factories.
Pfannenberg's signaling devices are designed for use in temperatures ranging from –40 °C to +55 °C, whether fluctuating or constant, at one extreme or the other.

Applications in steel or glass production, desert and tropical conditions, ski resorts, arctic climates, and cold storage facilities are dependably fulfilled by Pfannenberg signaling devices.

UV resistant

ABL GL
See page 38

DS GL
See page 68

extreme T conditions

PATROL GL
See page 70

PMF 2030
See page 34

Explosion safety.

As a European manufacture of signaling devices, Pfannenberg follows the International Electrical Code (IEC) for qualifying and identifying equipment that is suitable for use in potentially explosive environments. This follows and is in accordance with ATEX directives 94/9/EU and 1999/92/EU.

Potentially explosive areas are those in which there is a risk of explosion due to the presence of combustible materials. The Ex-zones identify areas according to the probability of the occurrence of an explosive atmosphere. The determination of the zones is the responsibility of the operator, however, final approval for use of any equipment may lie with a local AHJ.

Care must be exercised when selecting equipment that is appropriate for use in potentially hazardous combustible areas.

Items to consider include:

1. The device functionality.
2. The suitability for use in the expected operating and ambient conditions.
3. The requirements regarding explosion protection.

Zone 0/20
An explosive atmosphere exists frequently or constantly.

Zone 1/21
An explosive atmosphere occurs occasionally.

Zone 2/22
An explosive atmosphere occurs only rarely and only for a short time.

Ex Flashing light
Quadro-LED Flex-3G/3D
Zone 2/22

See page 42

Ex Sounder
DS 10 ATEX
Zone 2/22

See page 68

Ex Sounder
BExS 120 ATEX
Zone 1/21

See page 76

Ex Flashing light
CWB ATEX
Zone 1/21

See page 58

Switching contacts have a tough job: surviving capacitive inrush loads.

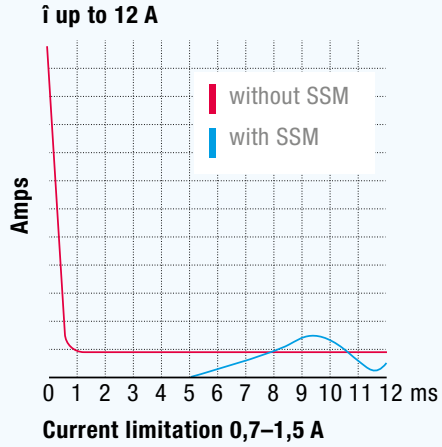
Regardless of technology utilised, optical and acoustic signaling devices can generate a very high inrush current due to their often capacitive switching behavior. Devices with just a few watts of output can produce inrush current pulses in the micro-second range which, due to their capacitive characteristics, can climb to more than 100 times the rated current capacity of a switching contact.

The challenge: protect relays and fuses from being overloaded.

Capacitive current peaks can cause overloads and potential damage to relay contacts at the switch-on moment. Additionally, premature triggering of electronic overcurrent protection circuits can occur.

The Pfannenberg solution: integrated inrush current limitation plus soft start module.

For such fault-prone systems, Pfannenberg offers optical and acoustic signalling devices with integrated inrush current limitation. In addition many units can be equipped with soft-start modules (SSM) (exclusively for 24 V DC devices).



Example of the current curve with and without a soft start module

Device protection and line fault monitoring.

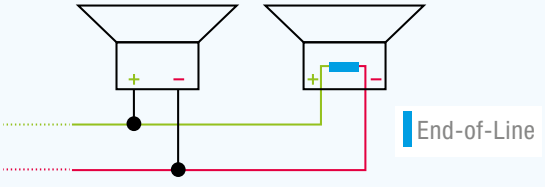
Soft start modules (SSM) offer multiple benefits, including:

- Current draw limitation – protection for switching circuits at the control device.
- Reverse polarity protection – unit is unharmed and inactive if improper wiring is conducted or reverse polarity power is intentionally supplied.
- Under-voltage shutoff – circuitry prohibits the device from turning on at a supply voltage level that is below a predetermined value.

Device, cable, and wiring integrity monitoring with end-of-line resistor.

It is often advantageous to check cable continuity and provide an alert should a fault be detected. This is particularly beneficial in multi-unit installations that are installed in a daisy-chained manner across a parallel wiring circuit. With the benefit of the SSM features, line monitoring can be accomplished in two different manners when an “end of line resistor” is installed at the system’s terminating device:

- by applying a reverse polarity voltage into the system.
- by applying a normal polarity voltage into the system which is below the under-voltage limit of the devices wired to it.



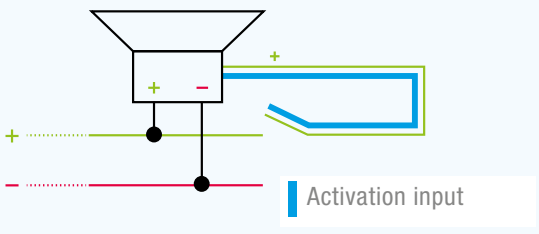
For either technique the resulting quiescent current flowing through the resistor can be monitored and measured. If the current is missing or out of tolerance, a fault is detected.

These methods, which are very often used in fire alarm systems, permit power circuit functionality to be verified in a very simple manner. However, this test does not examine the actual operability of the signal devices themselves. In order to achieve fault monitoring and detection of the functionality of the signalling devices themselves, units with built-in function monitoring must be used and additional wiring leads must be connected to interrogate the state of their fault relay circuit.

Advantages of transistor controlled operation (PLC).

Most signaling devices are typically activated by switching on the supply voltage, which can lead to high levels of inrush current. Another technique for eliminating the potential damaging effects this may have on the control electronics is to configure a system that is constantly powered with the signaling devices remaining inactive until required.

This is accomplished by using signaling devices that are capable of being activated via an additional control input. This control input is typically activated by a low current, transistorized output circuit, which is common among PLCs.



Additional advantages of PLC controlled operation:

High current loads, due to simultaneous activation of several signalling devices, can be avoided. In addition, operation for multiple signalling devices can be synchronised and signal mode controlled via the control input.

Synchronisation.

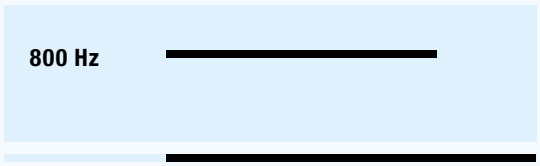
Since the control signal reaches all devices simultaneously, their activation also occurs concurrently. This provides synchronous output signals for all connected devices. This technique can also be repeated after an allotted time interval in order to counteract signal drift.

Signal mode control.

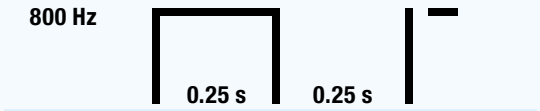
System planners and operators can benefit from using signalling devices that provide multiple modes of operation. For audible devices this can be a choice different output tones. For visual devices this can be a choice of different flash frequencies. Some signalling devices offer the ability to have their operating modes remotely controlled with the transistorised output of the PLC.

Output signal clocking.

For acoustic signalling devices, the operator can also use the control signal to configure a customized tone output time signature. For example, a device with a continuous frequency output tone can be modulated to produce custom acoustic output sequences (see examples on the previous page).



Setting: continuous tone 800 Hz



modulated at 2 Hz

modulated with arbitrary signal

Adjustable operating modes for flashing and LED lights.

The ability to select a variety of operating modes for visual notification appliances provides users with the advantage of configuring systems which:

- Offer different signals from one area to the next to avoid confusion.
- Are intelligent by alerting the operator of unique events through differing modes of operation.

While some devices permit selection of the operating mode by on-board switches, others offer external control for remote selection.

Extend service life.

Signal mode selection offers the further advantage of extending the service life of the device by reducing the flash frequency. For example, a device operating at a flashing frequency of 0.5 Hz (30 flashes/minute) instead of 1 Hz (60 flashes/minute), will have nearly double the lifetime.

Adapts to specific situations.

Visual signaling devices with adjustable operating modes provide distinct advantages when it comes to operational efficiency.

For example, modes can be remotely controlled to identify different conditions:

LED lights:

Continuous light: Everything ok
Blinking light: Warning
Flashing light: Immediate action required

Xenon strobes:

0.1 Hz (one every 10 sec): Warning: Danger area
1.0 Hz (one per sec): Evacuation

Operating voltages in support of worldwide requirements.

Fig.: Compact flashing light used for a safety application in a tunnel. The input voltage range of 70–264 V AC and 73–140 V DC supports both line (mains) and backup battery power

Signaling equipment is used worldwide to promote safety and improve efficiency. As a global supplier of signaling devices, Pfannenberg develops products for use in a wide range of applications. To support these installations, the power requirements of the devices must adapt to situations which may not be typical.

A wide variety installations and available power:

Power plant construction: **110 V or 220 V DC**
Railway vehicles: **36 V DC, 74 V DC, 110 V DC**
Industrial facilities: **24 V AC, 42 V AC**
Switching gear: **100 V AC**
Telecommunications: **48 V DC, 60 V DC**
Crane equipment: **48 V AC**
Fork lift trucks: **80 V DC**
Emergency power applications: **AC and DC**

Pfannenberg's products support many common and not so common power supply voltages.

Featured catalogue items support the most typical power supply voltages of **24 V DC, 115 V AC** and **230 V AC**. In addition, many items support operation from less common supply voltages.

Pfannenberg signaling devices are compatible with a wide range of available power.

Alternating current (AC):
12 V / 24 V / 42 V / 48 V / 127 V / 240 V
Direct current (DC):
12 V / 28 V / 48 V / 60 V / 80 V / 110 V / 220 V

Accommodating global requirements with a wide range of powering options.

Many of Pfannenberg's signaling devices are engineered to operate from a single, wide range of power, making them a universal fit for many requirements (e.g. 10–60 V DC or 90–253 V AC/DC). This offers several advantages:

- One device for a wide range of applications.
- Less equipment variance simplifies installation and maintenance.
- Reduces stocking requirements.

Upgrade incandescent bulbs to LEDs without false alarms.

The illumination of aviation obstacles such as buildings, chimneys, power lines, and radio towers require reliable and long-lasting solutions. Pfannenberg offers operators planning to switch from incandescent bulbs to long life LED technology solutions that enable a trouble-free transition (10 cd and 32 cd).

Error-free changeover with reliable current-monitor operation.

When switching from incandescent bulbs to LED obstacle lights, it is important to provide the system's current monitor with correct information to prevent false alarms. To keep costs at a minimum, it is also important that replacements adapt directly to the existing cabling and power supply.

Overcoming false alarms.

When operating LED obstacle lights, current consumption fluctuations can occur due to temperature changes and aging. Current monitors have an especially tough time distinguishing between current fluctuations present in some commercially available LED solutions and actual faults. This can lead to false alarm triggering of a monitoring system.

Obstacle lighting failures must be reported to aviation authorities and be repaired as quickly as possible, since the obstacle is no longer sufficiently marked. A false alarm and unnecessarily reporting a fault can be particularly annoying and expensive.

Pfannenberg's LED systems with no false alarm risk.

The Pfannenberg POL 10 and POL 32 obstacle lights are engineered to permit easy connection to the existing 2-wire power supply **with continuous current-monitor operation**.

In addition, with integrated fault monitoring, they recognise the failure of a critical number of LEDs and reduce the current consumption of the lighting to a minimum. This permits the current monitor to detect a clear fault signal so that corrective measures can be **carried out reliably**.

Pfannenberg also offers redundant-design obstacle lights for replacement in "low intensity Type A" (10 cd) applications. These units offer several advantages:

- long service life
- clear fault detection for the current monitor
- extended reaction time to enable planned repair procedures
- avoids costly emergency reaction

Additional information about Pfannenberg obstacle lighting can be found on page 54.

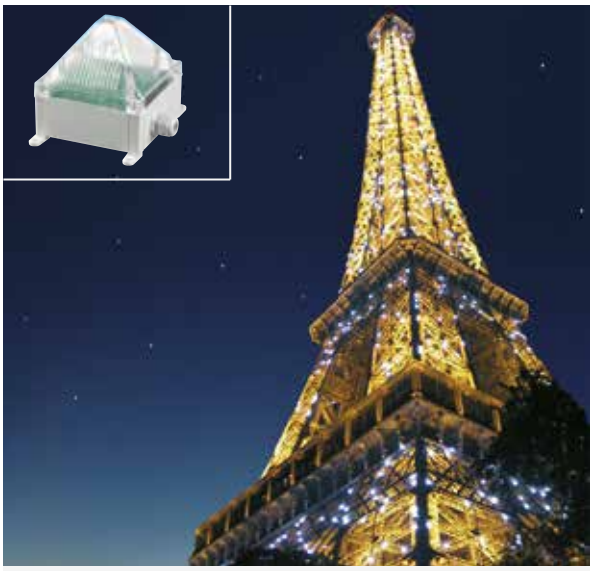
Obstacle light
POL 10, POL 32
See page 54

ART ILLUMINATION.

A completely different side of Pfannenberg: Artistic lighting and spectacle illumination.

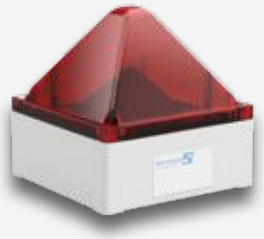
Pfannenberg is proud to have been involved in beautiful adaptations of our durable lighting solutions on some of the world's most renowned landmarks. Presented here are a few examples designed to captivate audiences with flashing light technology by Pfannenberg.

St. Petersburg, Russia
TV Tower and Trinity Bridge
9,500 Pfannenberg flashing lights



Paris, France
Eiffel Tower
20,000 Pfannenberg flashing lights

Le Havre – Honfleur, France
Pont de Normandie
800 Pfannenberg flashing lights



Quadro A-DMX

- Solid-state Xenon flash tube with integrated DMX control for generating illumination arrangements and light shows.
- Multiple units connect in a daisy-chained fashion to a DMX-Bus system.
- Can be directly controlled by the DMX-Master.
- Rugged plug connectors for power supply and DMX-Bus (inlet and outlet).

Contact us for further information and to discuss ideas for your project.
Global Product Management:
+49 40 73412 226

SERVICES

Pfannenberg offers advice and support. Whether you need assistance with planning, a plant survey or audit, alarm system sizing, commissioning, extended warranties, or preventive maintenance, we have you covered with our global network.

A consulting partner for planning.

Pfannenberg offers extensive assistance for the design of signaling systems. Whether for factory efficiency, building or machinery safety, or evacuation due to fire or gas leak, we are available to assist by phone, online, or in person. Have your project done correctly the first time by relying on our many years of configuring safe signaling solutions.

Information that goes beyond the product specifications.

Codes, norms, directives, and guidelines – whatever you call them, they are constantly evolving. Let us help you ensure that whatever system you are planning is compliant and approvable. Among other things, we offer sound level measurements to map the ambient noise in your facility and we can help you decide if a safety related system (SIL/PL) is necessary. We can provide modified or custom products to meet your requirements. Let our consulting services help you achieve whatever it takes to get to the best result.

We are very happy to help! Just email or phone:

service@pfannenberg.com / +49 40 73412 167

Building Information Modeling (BIM).

Building Information Modeling has evolved to be a time-saving tool for system designers and specifiers. Pfannenberg supports this design approach by providing relevant data files which include the coverage area for signaling devices. This information can be used to create a three dimensional virtual building model. Autodesk Revit and other file formats are available. Visit www.pfannenberg.com for these downloads.

Pfannenberg 3D COVERAGE

Download Revit data free at

www.pfannenberg.com

Download tender specifications for bid projects.

Tender specifications and guide specifications are available to help ensure accuracy in system design and assist with procurement and planning. We also support consulting and specifying engineers with their master specifications.

Online download portal

Find tender specifications in a variety of formats at **www.ausschreiben.de/katalog/pfannenberg/export**:

Word

Excel

RTF

PDF

Text

GAEB XML
GAEB 90


DATANORM 5

ÖNORM

Unrivalled 10-year warranty.

We believe crucial products require the best warranty. The safety of many of our products is supported for 10 years, with replacement items readily available and dispatched from our worldwide locations. Have confidence in knowing your system performance will not be compromised.

Visual and audible signaling devices with a 10-year warranty.

All units in the DS, PATROL, PYRA® and Quadro series carry a factory-backed 10-year warranty. Please see page 22 for more details about these products.

Worldwide easy-replacement program.

Should an item fail for any reason, a replacement is available quickly. A simple process ensures your system quickly returns to full capacity:

- **Step 1:** To claim a replacement under guarantee, just contact your nearest Pfannenberg sales organisation (an agent or Pfannenberg branch) with a report of the defect.
- **Step 2:** Pfannenberg or your agent will review the matter over the phone and you will receive without delay a new or reconditioned replacement device and an information package about further procedures which will include your RMA number.
- **Step 3:** Only now do you return the defective device (in the packaging in which the replacement device was delivered) to a Pfannenberg sales organisation for checking.

Additional details and service information are available at

www.pfannenberg.com

PSS – online planning software for sizing and configuring reliable safety systems.

Avoid errors with ineffective coverage range and ensure code acceptance by utilising the free Pfannenberg Sizing Software (PSS). This online utility helps ensure the resulting system is correctly specified to meet signaling requirements and done so in a cost-effective manner. PSS takes the area needed to be effectively covered by the alarm or warning signal into consideration along with code requirements to ensure proper sizing and number of units needed for safe results.

Step 1: Define requirements.
The user-friendly PSS interface allows easy data entry of application requirements such as type of alert, area dimensions, ambient noise levels, signal tone, lens colour, IP protection, and available power supply voltage. The software calculates the best possible solution and presents a report with one or more device recommendations.

Step 2: Select a device recommendation.
From the presented product choices, a selection is made. Additional options such as housing colour and SIL conformity (or other versions) are presented as options. Once the final selection is made, it is stored as a system component. Results of all selected products are later presented on a planning report.

Step 3: Download the planning report.
Details of the system configuration are presented to assist with planning certainty. Additional data such as ceiling or wall mounting location, coverage area dimensions and a 3D-Coverage pictorial present a complete picture of the devices and their coverage.

Signal tower / stacklight configurator.
PSS also contains a module to enable configuration of the modular signal towers within the BR 50 and BR 35 series of devices. The software guides the user through the selection of the various stackable modules, supply voltages, lens colours, LED or filament bulb choices, mounting accessories, and additional O-rings and seals to achieve the optional higher IP ratings. This tool ensures that nothing is overlooked when creating a bill of materials for the components needed to create the desired signal tower.

Access to the latest PSS version.
Find the Pfannenberg Sizing Software online here:
www.pfannenberg.com/pss

Example of the PSS project planning report.

Product selection result.

Pfannenberg 3D COVERAGE

Project

- Title: Fire alerting hall 3
- Create date: 26-Sep-2016
- Amend date: 26-Sep-2016

Processor

- Company: Fire-Engineering SE
- Name: Steve Wright
- Address: Bourbon Road 33
- City: London

Customer

- Company: Superior Production Ltd
- Name:
- Address: Nobel Way 12
- City: Horsens DK

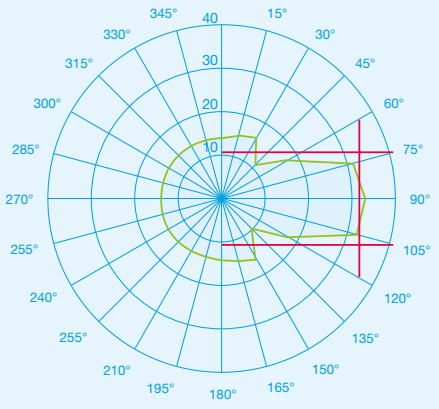
Preselection

Signal types:	Audible signaling devices
Alarm type:	Building/fire alerting
Design type:	Hall (maximum distance of two signaling devices)
Room size:	Length: 210 m Width: 36 m Height: 12 m
Ambient noise sound level:	73 dB(A)
Offset to ambient noise:	10 dB(A)
Selected tone:	Sweden (emergency signal)
Voltage:	24 V DC
Housing colours:	

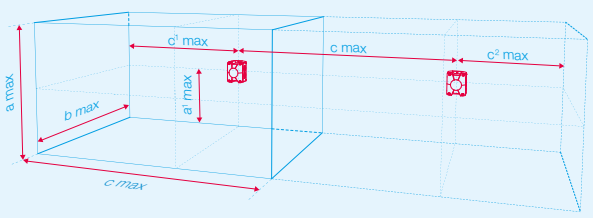
Result

Signaling device with the following data

Product:	PA 10 10–60 V DC
Article number:	23360630000
Rated sound pressure level:	116 dB(A)
Coverage area:	see illustration
Protection system:	IP 54, IP 55, IP 65, IP 66
Housing colours:	flame red RAL 3000



Wall mounting (main radiation into the room)
Number of needed units: 14



a max = 28.2 m
a¹ max = 14.1 m
b max = 31.5 m
c max = 21.1 m
c¹ max = 10.5 m
c² max = 10.5 m

INDUSTRIES

Equipment from Pfannenberg has been used worldwide in a variety of industries, such as infrastructure, material handling & cranes, water treatment, automotive, machinery, and food & beverage. Our extensive experience is available to help with configuring the best solutions for safety and efficiency.

Occupied spaces: global safety, local solutions.

Modern towns and cities with highly-functional leisure and work spaces support the problem-free running of everyday life. The technical solutions within public and commercial buildings must be monitored to keep things running smoothly. Pfannenberg products help ensure that process upsets are quickly addressed and millions of people remain comfortable and safe.

Reliability: in any place at any time.
Pfannenberg products meet the highest standards and are suitable for use in a wide range of requirements. Signaling devices keep people safe by generating alarms in the event of hazards like fire, gas leaks, intruders, accidents, severe weather, and technical defects. Whether in large public areas, confined spaces, in the air, or at sea, safety is assured with products from Pfannenberg.

Keeping machinery and equipment running smoothly.
Public buildings like schools, hospitals, office complexes, or factories all rely on functioning building technology. The functionality of sensitive control electronics found in HVAC and pumping systems, for example, are protected from breakdown with Pfannenberg's innovative thermal management solutions.

Cooling units help keep controllers and variable frequency drives (VFDs) operating at peak efficiency, while heaters and thermostats keep electrical enclosures moisture-free by eliminating potential corrosion-causing condensation. Whether critical for climate control or keeping systems such as moving gates, rolling doors, parking ticket machines, and building access controls from malfunctioning, solutions from Pfannenberg are a smart investment.

Pfannenberg solutions for safety in commercial and public buildings:

- Audible and visual warning systems.
- Fire and gas alarms.
- Obstacle lights on tall structures.
- Thermal management for electronic control systems in electrical enclosures.

Sounder PA 1

Hygrostat FLZ 600

Flashing light PY X-M-05

Radiant heater FLH 045

Airport safety and efficiency.

Air traffic and the number of airline passengers are on the rise as is evident with the increase of mega-hubs in the Middle East and Asia. Wherever automation plays a large role in the efficient handling of flights, passengers, cargo, and luggage, Pfannenberg products keep operations running smoothly and passengers safe. Around the world, planners, engineers, and architects of these complex systems benefit from Pfannenberg's competence in these areas.

All-round flashing light
PMF 2030

Air/water heat exchangers
ECOOL series

Sounder PA 1

Fan Heater PFH 200

Signaling solutions for airport terminals.

Safety to people is everyone's concern and wherever large numbers congregate, it becomes even greater. Safety is achieved in all areas of the airport facility with signaling solutions from Pfannenberg. Visual and audible alarms for:

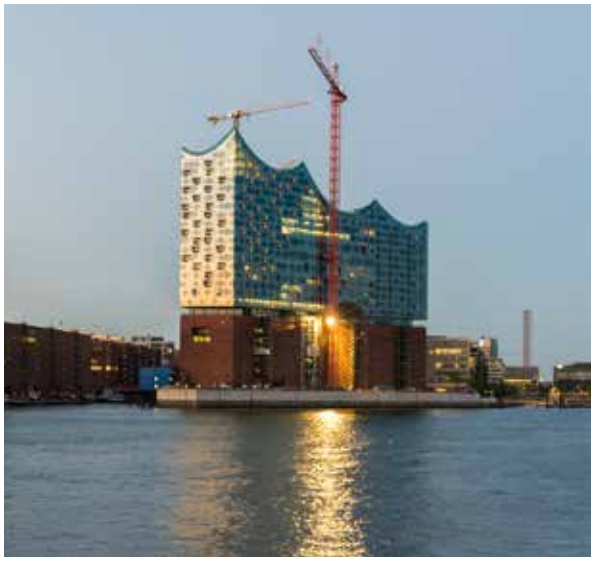
- Baggage carrousel startup alarms
- Fire and gas leak alarms
- Intruder alerts
- Tower and building obstruction warning
- Passenger guidance indication
- Jet bridge movement alarms
- Moving vehicle alarms

Thermal management solutions for airport terminals.

Up-time for machinery and systems is critical to keep the flow of people, baggage, and cargo moving. Pfannenberg's thermal management solutions for enclosed electronics ensures optimal operating conditions and machinery longevity for such systems as:

- Conveyor and escalator controls
- X-ray screening equipment
- Ticket and ATM kiosks
- Control center consoles
- Digital signage

Crane lighting: safe signaling day and night.



Whether on large-scale construction sites or in container terminals: cranes move heavy loads with high precision. To prevent collisions, signal generators are tasked with reliably and unmistakably displaying wind and loads, remote operation as well as movement and overload situations.

The challenge for optical signals: glare hazard at night.

When used on top of as well as on cranes, optical and acoustic signals need to make their way over significant distances. Optical signals present the additional challenge of having to adapt to changing light conditions. Light signals which are clearly visible during bright daytime hours must not blind viewers at night and become a potential hazard.

Pfannenberg has the solution: signal generators which automatically adjust their brightness.

They are resistant to vibrations, dust and water, extremely bright during the day and **glare-free** at night. With its specially developed signal generators, Pfannenberg offers superior solutions for crane manufacturers, e.g. the Quadro LED-TL signal light.

The robust, bright traffic light meets the requirements of DIN-EN 13000:2004-09 for mobile cranes as well as DIN-EN 14439:2007 for tower cranes and can be equipped with a sensor that enables **automatic dimming** of the light intensity during night-time operation. Also perfect for equipping container cranes, which are often used around the clock.

Traffic light Quadro LED-TL, IP 66, IK08, UV protection, light intensity >75 cd, can be equipped with light sensor for optimal adaptation to ambient light.

Safety at port and on the high seas.

Container and cargo ships, tankers, workboats, cruise ships, navy vessels, submarines, and other maritime vessels require keen attention to safety due to the perils of operating on dangerous waterways. Likewise at port facilities when cargo is loaded or unloaded, several risks are concurrently present which can compromise the safety of passengers and dockside personnel. Pfannenberg signaling solutions have contributed worldwide to the safety of maritime operations by protecting man, machine, and the environment.

Safety at the harbour.

Robust Pfannenberg signaling devices provide faithful safety alerts under harsh, outdoor conditions, including:

- Crane operator feedback and bystander warning.
- Reach stacker movement.
- Spreader bar engagement.
- Traffic safety.
- High wind and capacity overload alarm.
- Accidents with hazardous chemicals.

MED certified flashing sounder
PA X 10-10

Safety on board.

Pfannenberg signaling devices with high IP ratings and GL certified maritime approvals provide safety onboard ships and vessels for many requirements, including:

- Engine room fire or combustible gas leak.
- Bilge pump failure.
- General safety alarms.
- Fire alarms in cabin areas.
- Trouble in the cargo hold.

Water and wastewater treatment.

Potable water, storm water, and sewage treatment systems all rely on a variety of control systems and equipment to ensure safe and reliable operation. Additionally, personnel must be kept safe around the hazardous chemicals used in the treatment processes. Pfannenberg offers a number of key items to ensure the reliability of these operations and warn of any hazards that may be encountered.

Longevity for pumping and control systems.

Water treatment works utilise pumping systems for moving the liquid to the appropriate equipment or location. With thermal management systems from Pfannenberg, control equipment and variable frequency drive systems (VFDs) are maintained at optimal operating conditions to ensure that the service life of the equipment is not compromised and the liquid gets to where it needs to be. Additional drive or control systems on conveyors, dewatering presses and centrifuges, and scrubbers are similarly protected.

Safety in the treatment facility.

Pfannenberg's rugged signaling devices are ideal for use in the diverse indoor and outdoor areas of a treatment facility. Evacuation alarms for fires or potential leaks of hazardous chlorine or methane gas can be sized with effective alarm coverage to meet the needs of such plants which may be comprised of a variety of buildings and confined spaces.

Where safety integrity systems are desired, such as with sludge handling areas and digesters, SIL compliant devices and units with hazardous, explosive area certifications are available.

Automotive industry: keeping the entire supply chain productive.

As one of the largest industries, automotive encompasses a vast array of support activities. Raw material preparation, component fabrication such as tires, body metal stampings, and suspension forgings, the assembly process itself with motorised conveyors, automated painting and robotics, and a vast array of control equipment, to name several. With worldwide demand on the rise, the automotive industry supply chain strives to maximise uptime to help keep costs minimised.

Pfannenberg's support for the automotive industry runs deep – for protecting machinery and controls from damaging heat, personnel from motion, fire, and toxic hazards, and helping to keep processes from failing.

Versatile signaling for the plant floor.
Sounders with multiple tones and alarm stages provide feedback to operators about specific issues occurring in their production cell. Such "smart signals" permit quicker attentive reaction for resolving problems.

Extremely bright flashing strobe lights can be perceived from any orientation to enable plant personnel to be immediately alerted of any issues. The bright Xenon visual signal covers very large areas across the plant floor.

For safety in all industrial situations, Pfannenberg offers SIL/PL compliant devices as well as ATEX hazardous area use models.

All-round flashing light
PMF

Sounder
DS

All-round flashing light
- High output Xenon flash (up to 30 Joule).
- Visible in any direction.
- Mechanically stable and rugged – no moving parts.
- Versatile mounting options.

Sounder
- Up to 110 dB(A) output sound pressure level.
- Die-cast aluminium housing.
- Multiple tone capability.
- Sealed construction.

Safe and efficient operation of complex machinery.

Visual and audible signaling devices have many different roles in industrial manufacturing and quality assurance procedures. They indicate a wide range of different statuses and warn, alert and protect humans and machines from danger in SIL, Ex and function-monitored versions, sometimes operating in complex and sophisticated applications.

Metal industry.

The start-up of machines and presses, status displays on lifting and work platforms, malfunctions such as coolant or lubricant failure and the requirement to restock a feeder with parts – our products guarantee that a host of safety and production-relevant statuses throughout the manufacturing environment are signaled reliably. In doing this, they make a major contribution to cutting the number of accidents at work and to reducing line stoppage times.

Timber, paper and printing industry.

Where there is the potential for combustible dusts to ignite, our visual and audible ex signaling devices ensure that production runs safely, even up to the point of evacuation. Where there are greater demands on functional safety, with start-up warnings for example, our loop-enabled SIL devices are used. Our signal towers indicate smooth operation of high-volume printing facilities and sorting machines and in the event of a general fault signal, allow the section affected to be identified quickly.

X-ray and laser applications.

Our lights with function monitoring are used where even the normal operation of machines can present a danger to people. Examples here are X-ray applications in industrial quality assurance and the use of class 3B and class 4 laser systems. The failsafe signaling devices prevent X-ray machines from being switched on again if a safety component is defective and ensure that the laser is switched off.

Signal tower BR 50 LED-M with function-monitored modules

Function-monitored light PD 2100-M-AS-i

Gates and barriers.

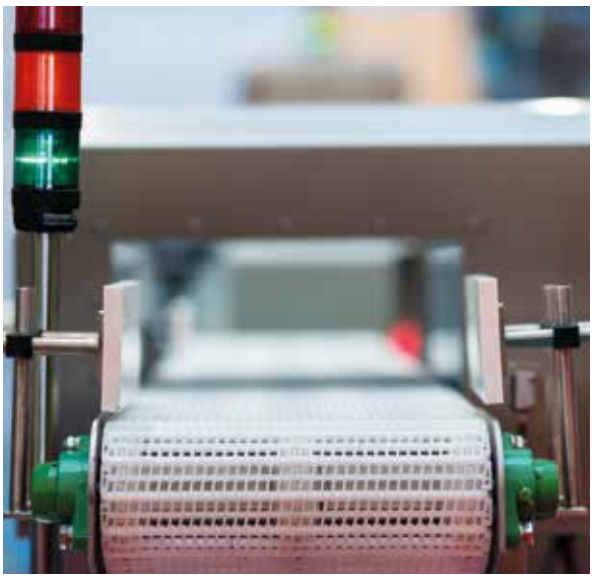
The use of electrical gates and barriers in industrial, commercial and domestic areas can cause accidents for humans and vehicles if they are trapped, crushed or hit by them. In this case lamps are used which reliably indicate closing or opening statuses and warn of malfunctions and hazards.

Flashing light PMF

Traffic light Spectra P 450 TLA

Continuous excellence.

Rapid-cycle sequences are a major feature in the manufacturing and packaging of food and beverage products. Our specific components and solutions for signaling, alerting and thermal management support the production processes with outstanding performance levels.



Modern and innovative signaling technology.

Signaling technology is faced with a variety of different challenges running from the high operating speeds of different systems, various conveyor belts and production steps, to high background noise levels.

Status displays must give a permanent overview of machine and line statuses to optimise response times and minimise expensive downtimes.

Warning lights and alarm devices must signal hazards, risks and technical faults promptly in order to ensure system safety and reduce risks.

Against this background, combinations of audible and visual signaling devices reliably provide warnings and alarms even when loud conveyor belts are running to capacity. For example, our BR 50 signal tower: modular in construction – it signals the particular conditions and hazardous situations using a continuous light, flashing light, blinking light or sound. Via an AS-i module it can also be integrated into AS-i networks.

Reliable cooling performance.

Nearly all products in the food sector are packaged by means of special packaging machines. In the field of primary packaging – ultramodern tubular bag packaging and shrink wrap machines are used, which enable enormous throughput levels.

To achieve maximum availability of the packaging lines, series 9 cooling units are responsible for cooling sophisticated control electronics.

The cooling units are available with a stainless steel hood and are suitable for space-saving partially recessed door, side mounting and the classical door, or side mounted versions. Because of the large distances between the intake and exhaust vents, they incorporate long ducting which ensures a reliable flow of air for the electrical enclosures – which eliminates the formation of hot spots.

Signal tower BR 50

Cooling unit series 9

Ready for any speed.

Labelling machines are used in the food and beverage industry. These apply labels to bottles and cans with great precision and at high speeds.

Maximum performance for high-speed processes.
Labelling machines are generally located in climatically stable environments; electronic components in electrical enclosures are cooled using powerful and energy-efficient 4.0 series **ECOOL** filterfans.

Type BR 50 signal towers ensure reliable signaling of all process states. With a lifetime of over 50,000 hours, they provide a technically and economically optimum solution.

Quality control with no downtime.
Quantities and weights are checked and labels, closures and seals are inspected. These processes happen at high throughput rates, in fractions of seconds.

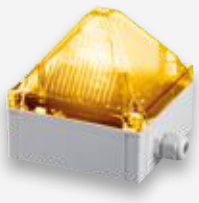
For this, compact cooling units in stainless steel ensure reliable cooling of the sophisticated weight and quality monitoring control units.

To display process states accurately and trigger an alarm if necessary – integrated function-monitored status lights with a high IP protection system and audible alarms are used.

Security right to the end.
In the field of secondary packaging, cartoners and bulk packers are used. Compact series 3 cooling units are responsible for cooling the electrical enclosure electronics.

With IP 56 protection and a corrosion-free stainless steel hood, the maintenance-free units used in packaging processes prove to be significantly resistant to external factors.

Because of the weight and size of the moving parts, signaling devices with a high protection system are required. This is a specification which our Quadro F12 flashing light with IP 56 protection (IK08) fully satisfies.



Flashing light Quadro F12

ECOOL Filterfan 4.0, stainless steel design

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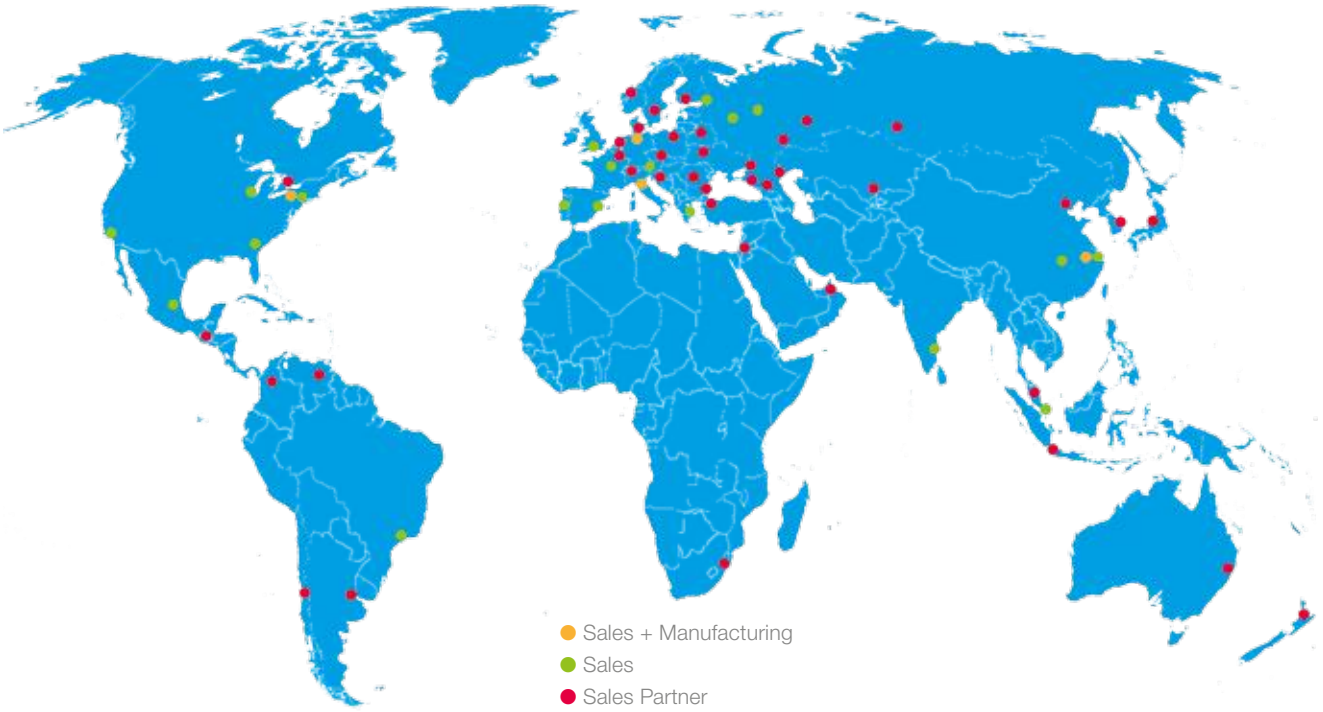
Pfannenberg – worldwide expertise in signaling technology and thermal management.



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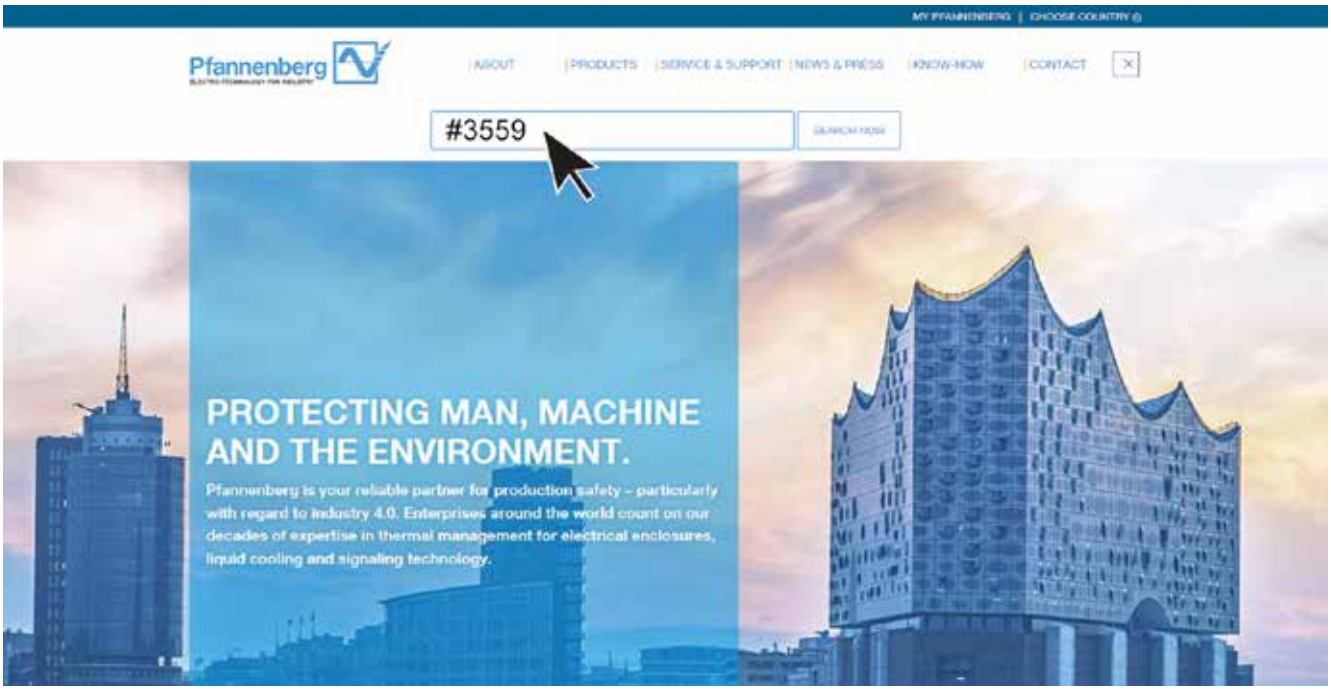

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