Pfannenberg 60 YEARS

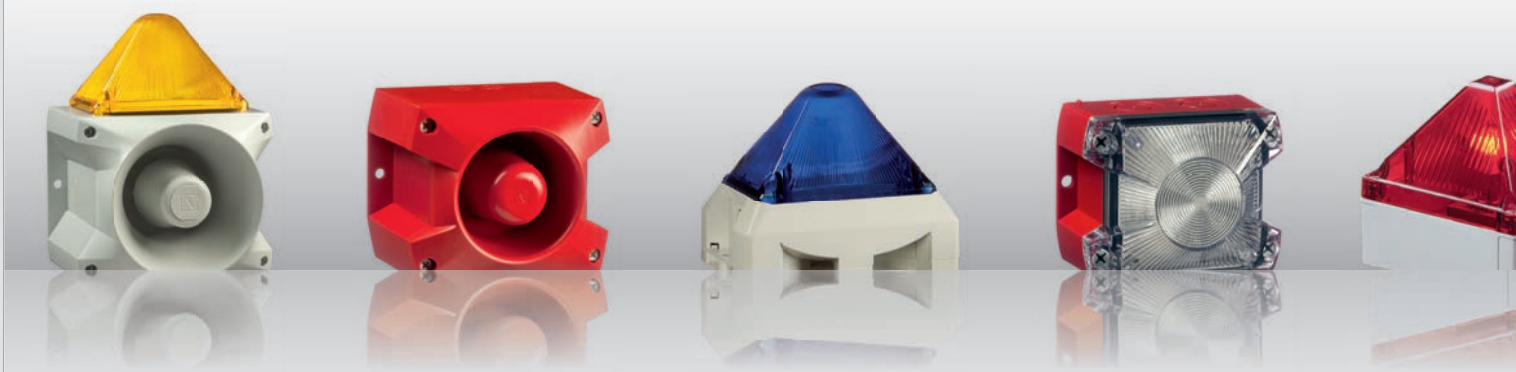
THE COMPLETE SPECTRUM OF SIGNALING TECHNOLOGY

MAIN CATALOGUE | EDITION 14

SHARING COMPETENCE

Pfannenberg
ELECTRO-TECHNOLOGY FOR INDUSTRY


10 YEARS
WARRANTY



SAFETY FOR MAN, MACHINE AND THE ENVIRONMENT

60 YEARS OF PFANNENBERG – YOUR COMPETENT PARTNER FOR VISUAL AND AUDIBLE INDICATION, WARNING AND ALARM SIGNALS

We have continually been extending our portfolio by adding new product innovations since the first flashing lights were invented about 50 years ago. Hardly any other company worldwide can supply from one source and advise so comprehensively in this area as Pfannenberg.

Customer service and “service friendliness” are top priority for us: That’s why, with immediate effect, we provide a 10 year warranty on sounders and flashing sounders from the PATROL, PYRA, DS and Quadro series. And by introducing the “Easy Replacement Process”, we have made it possible for our customers to exchange defective devices even more easily and quickly.

Communication with our partners and customers is important to us. We are only able to tailor our products and services to your fit your needs and provide solutions from one source by communicating with our customers. The Pfannenberg Sizing Software (PSS) which was developed by Pfannenberg helps you to choose the correct signaling solution. The software also contains modules for the calculation of thermal management solutions; you can find a small selection in this catalogue.

With our new series of flashing lights, PYRA M, Pfannenberg is responding to the increased demand for more process reliability in the field of mechanical engineering and construction. The pyramid-shaped flashing light, which is also available as a combination device with an integrated sounder, guarantees the largest possible signaling range thanks to efficient Xenon technology. Certified according to EN 54-23, the new EU standard in the fire alarm sector, the flashing lights are consistent with the Pfannenberg company motto: “Safety for man, machine and the environment”.

Best regards

Andreas Pfannenberg
CEO

SHARING COMPETENCE

SIGNALING TECHNOLOGY

Pfannenberg supplies the entire range of signaling technology from one source, regardless for which application and area of use you want to implement the device. Furthermore, we offer appropriate solutions that are customized to the relevant requirements of the various areas of signaling technology:

- Indication
- Warning
- Alarm

E. g. operation display of a machine informs the operator by means of a signaling device. These types of devices inform personnel who are nearby. These devices are not used for the indication of dangerous situations.

The signaling can, e.g. contain the following information:
- status of a machine, process, test procedure
- lack of ingoing material / material supply is in danger
- quality defect, good / defective information
- process has ended, standby position
- notification and display of errors
- display of room occupancy

E. g. as a start-up signal for a machine.
These types of devices warn about situations that could occur.

The warning can, e.g. be executed for the following events:
- caution: Critical status, proceed with caution
- ready for handling
- attention is necessary
- dangerous situations can occur when no measures are in place
- corrective action is necessary within a suitable amount of time
- warning of economic and health damages
- process is outside the normal operating limit but within an acceptable error limit
- a status change is being executed

Reaction of the user: Monitor and / or take corrective action

E. g. the evacuation alarm in case of a fire. Devices of this nature generate an alarm for emergency situations and have the highest priority.

The alarm can, e.g. be executed for the following events:
- a dangerous situation has already occurred
- danger of life and limb
- acute health risk
- risk for the environment
- abnormal process status
- exceeds maximum tolerance limits

Reaction of the user: Immediate reaction is necessary

5 GOOD REASONS TO CHOOSE PFANNENBERG

ABSOLUTE SAFETY

The Pfannenberg Group's signaling technology is innovative, modern and durable. It offers absolutely secure alarm ability.

ALL-ROUND CARE

Pfannenberg has organised sales in 42 countries on all 5 continents, thus ensuring optimal support. Whether it's about on-site service, comprehensive application advice or the creation of individual solutions, Pfannenberg offers its customers top support around the clock and around the world in the respective national language.

INDIVIDUAL ADVICE

The Pfannenberg Group offers its customers the necessary competence for individual solutions in the most diverse branches of industry (examples):

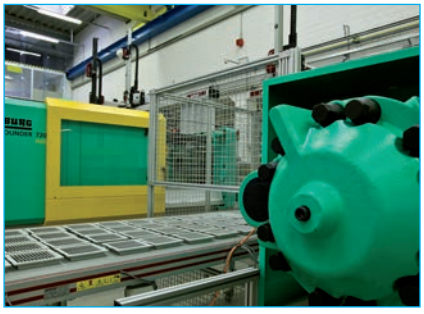
- Machine safety – Function-monitored flashing lights
- Renewable energies – Voice alarms in bio-gas combined heating and power plants
- Building equipment – Obstruction lights
- Fire prevention – Acoustic alarms in gas-fired power stations
- Art illumination – Illumination of the Eiffel Tower with 20,000 flashing lights

SOFTWARE

The Pfannenberg Sizing Software (PSS) helps you plan tailor made signaling technology solutions (dimensioning and select the correct signaling devices like flashing lights, sounders and signal towers).
You can download the software free of charge on www.pfannenberg.com or order it on CD.

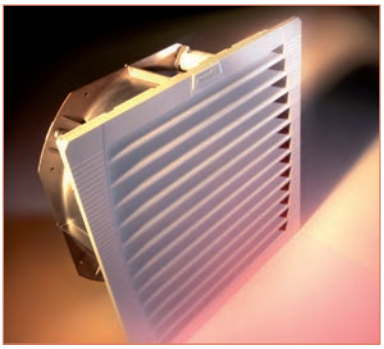
PRODUCTION AROUND THE WORLD

The Pfannenberg Group is constantly optimising its production in order to directly serve customers all over the world on a local basis and to establish a strong network. Pfannenberg links its production in Germany, Italy, USA and China optimally to plastics processing, state-of-the-art sheet metal working and VdS-approved manufacturing.
Our own environmental simulation laboratory enables the manufacturing of 'tested' products for the most extreme application conditions, naturally also with VdS and UL approval.



Plastic injection moulding plant, Pfannenberg, Hamburg

TABLE OF CONTENTS



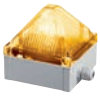
NEW

ALL VISUAL SIGNALING DEVICES AT A GLANCE

	Type	Maximum covering distance as per EN 54-23 in metres (m) [1]					Flash energy	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	10	25	50				GL MED	GOST	UL	EN 54-23 VdS	RS	
	FLASHING LIGHTS														
	**PMF 2030**						30 joules	IP 55	direct mounting 185 x Ø 177 bracket mounting 170.5 x Ø 130		●				46
	PMF 2020						7 joules			●	●			●	48
	PMF 2015						7 joules				●				
	**ABL / ABS**						15 joules	IP 54	without bracket 242 x Ø 80	●	●			●	50
	**P 400 STR**						15 joules	IP 65	220 x Ø 140		●				52
	**Quadro F12**						13 joules	IP 66 IP 67 IK 08	130 x 130 x 130		●				54
	Quadro S						13 joules				●				
NEW 	**PY X-M-10**						10 joules	IP 66 IK 08	124 x 166 x 114	○ [2] ○ [2]	○	○	○ ○		56
NEW 	**PY X-M-05**						5 joules	IP 66 IK 08	124 x 166 x 114	○ [2] ○ [2]	○	○	○ ○		58
	**WBL / WBS**						5 joules	IP 54	200 x Ø 54	●	●			●	60
	WBL-PX						5 joules	IP 54	200 x Ø 54						
	**WBLR**						5 joules	IP 65	144 x 120 x 85	●	●			●	62
	WBSR									●	●		●	●	
	**P 300 STR**						5 joules	IP 65	150 x Ø 100		●				64

[1] with a clear lens

● available
○ in preparation
[2] option

	Type	Maximum covering distance as per EN 54-23 in metres (m) [1]					Flash energy / light intensity	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	10	25	50				GL MED	GOST	UL	EN 54-23 VdS	RS	
FLASHING LIGHTS															
	**PY X-S-05**						5 joules	IP 66 IK 08	85 x 109.5 x 80.6	● [2] ● [2]	●	●	● ●		66
	**DWBL / DWBS**						2.5 joules	IP 54	200 x Ø 54	●	●			●	68
LED LIGHTS															
	**PMF-LED Flex**						30 cd	IP 55	direct mounting 185 x Ø 177 bracket mounting 170.5 x Ø 130		●				70
	**P 400 LDA**						30 cd	IP 65	220 x Ø 140		●				72
	**P 300 LDA**						20 cd	IP 65	150 x Ø 100		●				72
	**Quadro-LED-HI**						70 cd	IP 66 IP 67 IK 08	130 x 130 x 130						74
	**Quadro-LED Flex**						9 cd	IP 66 IP 67 IK 08	130 x 130 x 130		●				76
	**PD 2100-LED**						5 cd	IP 55	128 x 166.2 x 111.2		●				78
	**P 200 LDA**						5 cd	IP 65	80 x Ø 60		●				80
	**P 100 LDA**						5 cd	IP 65	65.5 x Ø 60		●				80

[1] with a clear lens

● available
○ in preparation
[2] option

ALL VISUAL SIGNALING DEVICES AT A GLANCE

	Type	Maximum covering distance as per EN 54-23 in metres (m) [1]					Light intensity / light power	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	10	25	50				GL MED	GOST	UL	EN 54-23 VdS	RS	
	LED LIGHTS														
	**Quadro-LED-TL**						80 cd	IP 66 IK 08	130 x 130 x 396						82
	**P 450 TLA**						60 cd	IP 65	177 x Ø 140		●				84
	**P 350 TLA**						45 cd	IP 65	140 x Ø 100		●				
	**P 22 D**						–	IP 65	52 x Ø 29		●				86
	**P 22 DFS**						–	IP 65	52 x Ø 29		●				
	CONTINUOUS LIGHTS														
	**PD 2100**						15 W	IP 55	128 x 166.2 x 111.2		●				88
	**P 450 TSB**						25 W	IP 65	177 x Ø 140		●				90
	P 450 TDB						2 x 15 W				●				
	**P 350 TSB**						15 W	IP 65	140 x Ø 100		●				
	ROTATING MIRROR LIGHTS														
	**P 400 RTH**						35 / 40 W	IP 65	220 x Ø 140		●				92
	**P 300 RTH**						20 / 25 W	IP 65	150 x Ø 100		●				

[1] with a clear lens

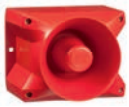
● available
○ in preparation

	Type	Maximum covering distance as per EN 54-23 in metres (m) [1]					Flash energy / light intensity	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	10	25	50				GL MED	GOST	UL	EN 54-23 VdS	RS	
	FUNCTION-MONITORED LIGHTS														
	**Quadro S-M-Flex**						13 joules	IP 66 IP 67 IK 08	130 x 130 x 130		●				94
	**WBL-M / WBS-M**						5 joules	IP 54	242 x Ø 80	●	●			●	96
	**PMF 2015-M**						7 joules	IP 55	direct mounting 185 x Ø 177 bracket mounting 170.5 x Ø 130		●				98
	**PD 2100-M-AS-i (LED)**						5 cd	IP 55	128 x 166.2 x 111.2		●				100
	PD 2100-LED-M						5 cd	IP 55			●				
	SAFETY-RELATED LIGHTS														
	**Quadro F12-SIL**						10 joules	IP 66 IP 67 IK 08	130 x 130 x 130		●				102
	**PMF 2015-SIL**						10 joules	IP 55	direct mounting 185 x Ø 177 bracket mounting 170.5 x Ø 130		●				104
	OBSTRUCTION LIGHTS														
	**POL 10-M**						32 cd	IP 68	240 x Ø 114						106
	POL 10-M-R						10 cd								
	POL 10-M-RA						10 cd								
	POL 32-M						10 cd								
	ART ILLUMINATION														
	**Quadro R**						10 joules	IP 66 IP 67 IK 08	130 x 130 x 130		●				230
	Quadro R-ST						10 joules				●				
	Quadro A-DMX						10 joules				●				232

[1] with a clear lens

● available
○ in preparation

ALL AUDIBLE SIGNALING DEVICES AT A GLANCE

	Type	Maximum covering distance for a 65 dB ambient noise level in in metres (m) [1]					Sound pressure level	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		10	100	250	500	1500				GL MED	GOST	UL	EN 54-3 VdS	RS	
	SOUNDERS														
	**DS 5**						105 dB (A)	IP 66 IP 67	133.5 x 133.5 x 143	●	●	●	●	●	120
	DS 10						110 dB (A)			●			●		
	**DS 5-DN**						105 dB (A)	IP 66 IP 67	133.5 x 133.5 x 143						122
	**PA 1**						100 dB (A)	IP 66 IK 08	86 x 109.5 x 80.6	● [2]	●	●	●	●	124
	**PA 5**						105 dB (A)	IP 66 IK 08	135 x 163.4 x 132	● [2]	●	●	●	●	
	**PA 10**						110 dB (A)	IP 66 IK 08	170 x 214 x 156	● [2]	●	●	●	●	126
	**PA 20**						120 dB (A)	IP 66 IK 08	170 x 214 x 181	● [2]	●	●	●	●	
	**PA 130**						130 dB (A)	IP 54	285 x 490 x 595		●				130
	SAFETY-RELATED SOUNDERS														
	**DS 5-SIL**						105 dB (A)	IP 66 IP 67	133.5 x 133.5 x 143		●			○	132
	DS 10-SIL						110 dB (A)				●			○	
	ELECTRONIC BUZZERS														
	**P 22 DBZ**						80 dB (A) @ 10 cm	IP 40	Ø 29 x 62						134
	P 28 DMC948						91 dB (A)	IP 65	Ø 35.8 x 38.2						
	**P 28 DMC201**						91 dB (A)								
	P 28 DMC948						91 dB (A)								
	P 28 DMC201						91 dB (A)								

[1] The specification for the alarm signal reception range assumes an existing ambient noise level of 65 dB (A). In accordance with applicable regulations, the calculated alarm range for the sound level 65 dB (A) was given + 10 dB (A) = 75 dB (A).

● available
○ in preparation
[2] option

Note:
Using sounders with a sound pressure level of ≥ 120 dB (A) can lead to hearing damage. People must not be permitted to stay in the near vicinity of the sounder. All specified sound pressure levels are based on a measurement distance of 1 m, provided that nothing different is specified.

ALL VISUAL-AUDIBLE SIGNALING DEVICES AT A GLANCE

	Type	Maximum covering distance for a 65 dB ambient noise level in in metres (m) [1]					Sound pressure level (tone) / Light power	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	25	75	150				GL MED	GOST	UL	EN 54-3 EN 54-23	VdS	
	P 22 DBF						80 dB (A) @ 10 cm	IP 40	Ø 29 x 52						141
	SON 4						100 dB (A) 0.25 J	IP 56	86 x 86 x AC: 120 DC: 102		●		●	●	142
	SON 4L						100 dB (A)				●		●	●	
	PY X-MA-05						100 dB (A) 5 J	IP 66 IK 08	134.2 x 166 x 114			○			144
	PY X-MA-10						100 dB (A) 10 J					○			
	DSF 5						105 dB (A) 13 J	IP 66 IP 67	263.5 x 133.5 x 143		●				146
	DSF 10						110 dB (A) 13 J				●				
	PA X 1-05						100 dB (A) 5 J	IP 66 IK 08	172.4 x 109.5 x 80.6	● [2]	●	●	●	●	148
										● [2]			●		
	PA X 5-05						105 dB (A) 5 J	IP 66 IK 08	215 x 163.4 x 132	● [2]	●	●	○	○	
										○			○		
	PA X 5-10						105 dB (A) 10 J			● [2]	●	●	○	○	
										○			○		
	PA X 10-10						110 dB (A) 10 J	IP 66 IK 08	270 x 214 x 156	● [2]	●	●	○	○	150
										○			○		
	PA X 10-15						110 dB (A) 15 J			● [2]	●	●	○	○	
										○			○		
	PA X 20-10						120 dB (A) 10 J	IP 66 IK 08	270 x 214 x 181	● [2]	●	●	○	○	
										○			○		
	PA X 20-15						120 dB (A) 15 J			● [2]	●	●	○	○	
										○			○		

NEW

[1] The specification for the alarm signal reception range assumes an existing ambient noise level of 65 dB (A). In accordance with applicable regulations, the calculated alarm range for the sound level 65 dB (A) was given + 10 dB (A) = 75 dB (A).

● available
○ in preparation
[2] option

Note:
Using sounders with a sound pressure level of ≥ 120 dB (A) can lead to hearing damage. People must not be permitted to stay in the near vicinity of the sounder. All specified sound pressure levels are based on a measurement distance of 1 m, provided that nothing different is specified.

ALL SIGNAL TOWERS AT A GLANCE

	Type	Mounting variations	Operation modes	Light intensity / Sound pressure level	Protection system	Approvals / Standards				Page
						GL	GOST	UL	EN 54-3 / VdS	
	SIGNAL TOWERS Ø 54 MM									
	**BR 50**	stand mounting tube mounting direct mounting	continuous light	7 W	IP 54 (IP 65) [2]		○	●		158
			blinking light	1.5 Hz						
			flashing light	0.6 J / 1 J						
			sounder	85 dB (A)						
	SIGNAL TOWERS Ø 35 MM									
	**BR 35**	stand mounting plinth mounting tube mounting panel mounting	continuous light	AC: 3 W DC: 4 W	IP 54		○	●		165
			sounder	75 dB (A)						

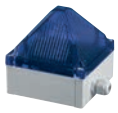
● available
○ in preparation
[2] option

www.pss-pfannenberg.com

Use our PSS Software Tool for easy configuration of the signal tower according to your individual requirements

Further information can be found on the Internet:
www.pfannenberg.com · **www.pfannenberg-spareparts.com**
Keep up to date. Subscribe to our newsletter now:
newsletter.pfannenberg.com

ALL EX SIGNALING DEVICES AT A GLANCE

	Type	Suitable for use in zones						Maximum covering distance as per EN 54-23 in metres (m) [1]					Light intensity/ Sound pressure level	Protection system	Approvals / Standards					Page
		0	1	2	20	21	22	5	25	50	100	125			GL	GOST	UL	EN 54-3 VdS	IEC	
	VISUAL SIGNALING DEVICES																			
	**Quadro F12-3G/3D**			●			●						7.5 J	IP 66 IK 08		●				180
	Quadro-LED Flex-3G/3D			●			●						9 cd	IP 66 IK 08		●				182
	**BR 50-LED 3G/3D**			●			●							IP 65		●				184
	**CWB-ATEX**		●	●		●	●						5 J	IP 66	●	●				186
	**BExBG 15**		●	●		●	●						15 J	IP 66 IP 67		●				188
	BExBG 10		●	●		●	●						10 J			●				
	BExBG 05		●	●		●	●						5 J			●				
	BExBG L1		●	●		●	●						9 cd			●				190
	**IS-mB1**	●	●	●									6 cd	IP 65		●				192
	AUDIBLE SIGNALING DEVICES SOUNDERS																			
	**DS 10 3G/3D**			●			●						110 dB (A)	IP 66 IP 67	●	●		●		194
	DS 5 3G/3D			●			●						105 dB (A)		●	●		●		
	**BExS 120 d/e**		●	●									117 dB (A)	IP 66 IP 67		●		●[2]	●[2]	196
	BExDS 120 d/e		●	●		●	●											●[2]		
	BExS 110 d/e		●	●									110 dB (A)			●		●[2]	●[2]	198
	BExDS 110 d/e		●	●		●	●											●[2]		
	**IS-A105N**	●	●	●									105 dB (A)	IP 66		●				200
	**IS-mA1**	●	●	●									100 dB (A)	IP 65		●				202

● available
○ in preparation

[2] only d version

	Type	Suitable for use in zones						Maximum covering distance for a 65 dB ambient noise level in metres (m) [1]					Sound pressure level / Light intensity	Protection system	Approvals / Standards					Page
		0	1	2	20	21	22	5	25	50	100	125			GL	GOST	UL	EN 54-3 VdS	IEC	
	AUDIBLE SIGNALING DEVICES LOUDSPEAKERS																			
	**BExL 25 d/e**		●	●									117 dB (A)	IP 66 IP 67		●				204
	BExL 15 d/e		●	●									113 dB (A)			●				
	COMBINED VISUAL-AUDIBLE SIGNALING DEVICES																			
	**BExCS 110-05D**		●	●									110 dB (A) 5 J	IP 67		●				206
	BExDCS 110-05D		●	●		●	●									●				
	BExCL 15-05D		●	●									113 dB (A) 5 J			●				208
	**IS-mC1**	●	●	●									100 dB (A) / 6 cd	IP 65		●				210
	ACCESSORIES																			
	**Zener barriers**																			212

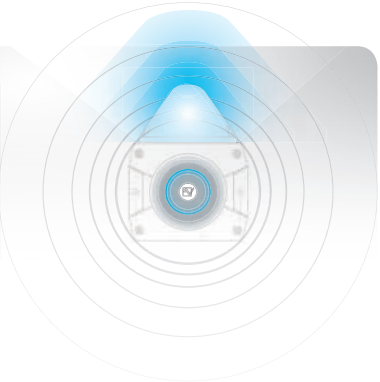
[1] The specification for the alarm signal reception range assumes an existing ambient noise level of 65 dB (A). In accordance with applicable regulations, the calculated alarm range for the sound level 65 dB (A) was given + 10 dB (A) = 75 dB (A).

● available
○ in preparation

Note:
Using sounders with a sound pressure level of ≥ 120 dB (A) can lead to hearing damage. People must not be permitted to stay in the near vicinity of the sounder. All specified sound pressure levels are based on a measurement distance of 1 m, provided that nothing different is specified.

Further information can be found on the Internet:
www.pfannenberg.com · www.pfannenberg-spareparts.com
Keep up to date. Subscribe to our newsletter now:
newsletter.pfannenberg.com

AN EXTENDED WARRANTY FOR SIGNALING DEVICES WORLDWIDE



Over 50 years ago Pfannenberg invented the first industrial flashing light. Today Pfannenberg is still your single source supplier for signaling technology regardless of the application.

THE FOLLOWING SIGNALING TECHNOLOGY PRODUCT SERIES ARE NOW BACKED BY A 10 YEAR WARRANTY.

Flashing Sounders and Sounders

PATROL series

Flashing Lights

PYRA series

High Intensity Flashing & LED Lights

Quadro series

Die-cast Aluminium Sounders

DS series

reddot design award winner 2013

EN 54-3

EN 54-23

VdS

UL C US LISTED

SIL PL

PSS
PFANNENBERG SIZING SOFTWARE

THE SOFTWARE

The Pfannenberg Sizing Software is the free and easy tool we developed to help you determine your cooling requirements. You can easily get a recommendation for the correct device components needed in your project.

SIGNALING PROJECTS

PSS helps you choose the best sounder or visual signaling devices according to your project specifications.
Just define the kind of device you need (visual, audible or combined) and some technical data, the PSS tool will do the rest.

THERMAL MANAGEMENT PROJECTS

You just need to fill in the technical data available for your project (panel dimensions, temperature, heat dissipation, etc) and the software will propose you the best cooling solution such as cooling units, heat exchangers, filterfans or chillers.

Visit our website and try it now!

Download it

Online version

Free app for tablet

Order a cd version

THE NEW PRODUCT STANDARD EN 54-23

EN 54-23 CERTIFIED FLASHING LIGHTS FROM PFANNENBERG

In most European countries EN 54-23 will take effect in 2013 for visual signaling devices. Because of that all visual signaling devices will lose their certifications and may no longer be used for new installations. In particular, all visual signaling devices which have not conformed to EN 54-23 by 1. March 2013 lose VdS approval.

Pfannenberg is the first manufacturer to offer beacons that are certified according to both the new standard and VdS: The flashing light PY X-S-05 and the combined visual-audible device PA X 1-05 are available in the standardized lens colors red and clear. He mounting position of the flashing light is freely selectable. This allows a flexible installation and reduces significantly the number of required signaling devices.

YOUR BENEFITS BY USING FLASHING LIGHTS CERTIFIED WITH EN 54-23:

- Planning dependability in project management
- Guaranteed compliant fire alarm systems
- Minimisation of liability risk
- For system integrators and manufacturer of fire alarm systems: Security regarding system requirements and compatibility
- For building operators: Possible reduction in insurance premium

THE REQUIREMENTS OF EN 54-23 IN PRACTICE

Illumination intensity

An illumination intensity of min. 0.4 lux (lm/m²) is required over the entire coverage volume, i.e. the space in which the alarm signal is to be effective (e.g. production facilities).

Light color

The visual signaling device must emit white or red flashing light.

Flash rate

The flash rate must be between 0.5 Hz and 2 Hz.

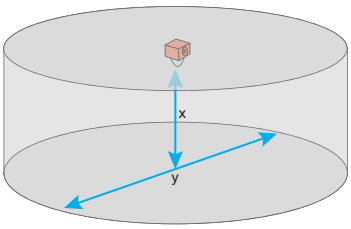
Coverage volume

Visual alarm devices must meet the requirements for the coveragevolume in at least one of the following three categories: ceiling mounted signaling device C; wall mounted signaling device W; or O for signaling devices for which the mounting position is freely selectable.

In order to achieve this, the light intensity of the signaling device must be significantly higher than those used in the past. This also entails an increased power consumption.

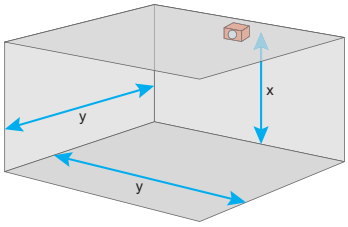
MOUNTING CATEGORIES

Ceiling mounted



Devices from category C are described with the specification C-x-y. “x” stands for the measured maximum installation height in meters (m) at which the signaling device may be placed. Whereas “y” specifies the diameter of the cylindrical coverage volume. Besides the specification of the cylindrical signaling space the devices are only classified for heights up to 3 to 6 or up to 9 m.
Example: C-3-7.5. stands for a ceiling mounted signaling device with a cylindrical coverage volume of 7.5 m diameter and a maximum mounting height of 3 m.

Wall mounted



Category W devices are described with W-x-y. “x” stands for the maximum height of the signaling device on the wall specified in meters (m) with a minimum installation height of 2.4 m. “y” describes the square base area of the cuboid coverage volume.
Example: W-2,4-8 stands for a wall mounted signaling device with a cuboid coverage volume of 2.4 m x 8 m x 8 m, if mounted at a height of 2.4.

Open mounting position

For category O devices the shape of the coverage volume and the mounting position of the signaling device is open. This means there are no restrictions on the formation of the coverage volume. From the user’s perspective this is the most flexible and economical solution, because there is no need to differentiate between ceiling and wall installation (minimisation of inventory) and the greatest possible coverage volume of the signaling device is achieved.

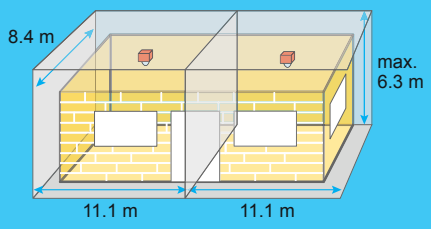
Pfannenberg provides only EN 54-23 flashing lights that are certified for category O.

CALCULATION

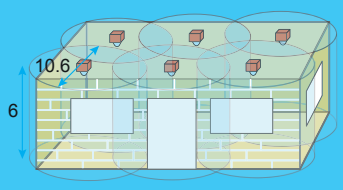
As an example, a room of 20 m length, 8 m width and 3 m height is to be signalled. Planning with the following three devices is compared:

- The Pfannenberg PYRA flashing light (category O) with the following coverage volume 11.1 m x 8.4 m x 6.3 m
- The same device, however if it were only approved for ceiling-mounting, (see advantages of cat. O), coverage volume C-6-10.6.
- A comparable device of category C-3-7.5.

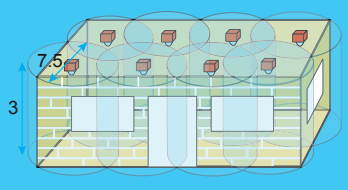
On account of the specified coverage volumes, the following quantities for visual signaling devices arise:



PYRA
(Cat. O) 11.1 x 8.4 m



PYRA
(Cat. C) C-6-10.6



VADs for ceiling mounted position
(Cat. C) C-3-7.5

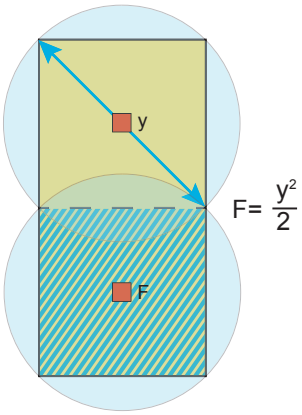
CONCLUSION AND RECOMMENDATION

Category O devices are the most flexible solution

The signaling device can be optionally mounted on the ceiling, wall or another position, whereas category C and W devices are only allowed to be mounted according to their classification.

Category O devices are the most economical solution

- Only one signaling device is required for all mounting positions.
  This avoids having to keep double stock.
- No restriction with the mounting height - devices with the identifier C-3-y are not approved for ceiling heights of 3.2 m for example and a device of category C-6-y has to be taken, which would be far too oversized for this application.
- The shape of a cylinder is generally not compatible with the shape of rooms.
  The actual coverage volume of the device is firstly reduced to a cylinder shape.
  In order to then be in a position to use the shape of the cylinder and to make planning possible, it is necessary to further reduce the coverage volume to the largest possible quadratic area. This automatically requires the use of a larger number of signaling devices in order to ensure alarming of the room.
- The shape requirement with quadratic base area for category W devices means that the actual coverage volume that the device could cover is reduces in certain places. As a result of the artificially reduced coverage volume, an increased number of devices is necessary.
- Category O devices are subject to no restrictions, so the formation of the largest possible coverage volume in the form of a freely selectable cuboid is possible.



THE CONSEQUENCES FROM PLANNING TO PUTTING INTO OPERATION

…for planners and specifiers

- modification of the contractual basis
- modification of the tendering text / items
- consideration in all current and future projects
- information for the ordering customer
- testing and acceptance of the visual signaling device

…for fire detection technology experts

- define the basis for testing/demand for certificates
- testing the function of the visual signaling device and matching with data sheet

…for system integrators

- creation of a system approval according to EN 54-13
- implementation of EN 54-23 approved visual signaling devices in the system

…for installors and specialist companies

- consideration in all current and future projects,
  inform on erroneous items in the tender, possibly revision
- information for the ordering customer
- modification of the offers

…for building operators

- review of the contractual documents
- information to the planning company

PROTECTION SYSTEM

IP PROTECTION SYSTEM

The protection system for devices in accordance with DIN EN 60529 (DIN VDE 0470 IEC 60529) indicates suitability for various environmental conditions.

1st digit	Protection against foreign particles	2nd digit	Protection against water
0	no protection	0	no protection
1	large foreign matter (Ø from 50 mm)	1	vertically dripping water
2	medium-sized foreign matter (Ø from 12.5 mm, length up to 80 mm)	2	water dripping at an angle (up to 15°)
3	small foreign matter (Ø from 2.5 mm)	3	falling spray water up to 60° from the vertical
4	foreign matter in the form of grains (Ø from 1 mm)	4	spray water from all sides
5	dust deposits in non-damaging quantities	4k	spray water from all sides under increased pressure; applies only to road vehicles
6	no entry of dust	5	Water stream (jets) from any angle
		6	strong water stream (jets) (flooding)
		6k	strong water stream (jets) under increased pressure (flooding); applies only to road vehicles
		7	temporary immersion
		8	permanent immersion
		9k	high pressure water/steam cleaning; applies only to road vehicles

COMPARISON OF NEMA AND IEC PROTECTION SYSTEMS – CLASSIFICATION

The ‘National Electrical Manufacturers Association’ (NEMA) sets standards and norms in the USA.

NEMA protection system	Protection	IEC protection system
1	falling dirt	IP 10
2	dripping water and falling dirt	IP 11
3	wind-blown dust, rain and hail; no damage due to external ice formation	IP 54
3 R	rain and hail; no damage due to external ice formation	IP 14
3 S	wind-blown dust, rain and hail; also usable in the case of external ice formation	IP 54
4	wind-blown dust, rain, spray water and water streams; no damage due to external ice formation	IP 56
4 X	wind-blown dust, rain, spray water and water streams; no damage due to external ice formation, rotection against corrosion	
5	dust, falling dirt, dripping non-corrosive fluids	IP 52
6	water streams, temporary immersion; no damage due to external ice formation	IP 67
6 P	water streams, longer periods of immersion	IP 67
12 and 12 K	swirling dust, falling dirt, dripping non-corrosive fluids	IP 52
13	dust, spray water, oil, non-corrosive fluids	IP 54

Please note: IP and NEMA codes are not directly, but rather only approximately, comparable

SIL/PL-COMPLIANT SIGNALING TECHNOLOGY

With the new Machinery Directive, which will apply Europe-wide from 2010 onwards, there will be a change in the requirements for machine safety. More than ever before, certification and market opportunities depend on safety-related products. The new SIL/PL-conform alarm devices from Pfannenberg give machine and plant manufacturers more planning safety; the acceptance process is simplified and accelerated.

The goal of the new standards is risk minimization in the operation of machines to avoid harm to persons. Naturally, the availability of the machine and plant is also increased as a result, which on the other hand has a positive effect on the TCO-evaluation, with immediate effect, probability considerations will henceforth also play a role in the determination of component safety. **SIL** (Safety Integrity Level) and **PL** (Performance Level) have become central terms in the categorisation of risks and safety.

In many cases, purely constructional measures on the machines don‘t go far enough to minimize risk.

In order to keep the existing residual risk of a machine or a plant low, reliable alarms are required, which draw attention to hazards through visual or acoustic warning signals.

For example, as a start-up warning or in muting operation, while protective functions have been disabled. Alerting of personnel in case of gas or chemical leaks requires 100% operational reliability of the signaling devices.

SAFETY INSTRUMENTED SYSTEM SIS (SAFETY LOOP)

Sensor	Logic	Actor
		
Detecting	**Evaluating**	**Alerting**

CAUSES OF WORK ACCIDENTS AT MACHINES

The statistics on the cause of work accidents show a clear picture: Human error is responsible for half of all accidents. These have to be reduced further by means of secure alarm raising.

- Human behavior
- Organisational reasons
- Technical reasons
- Workplace
- Psychological causes

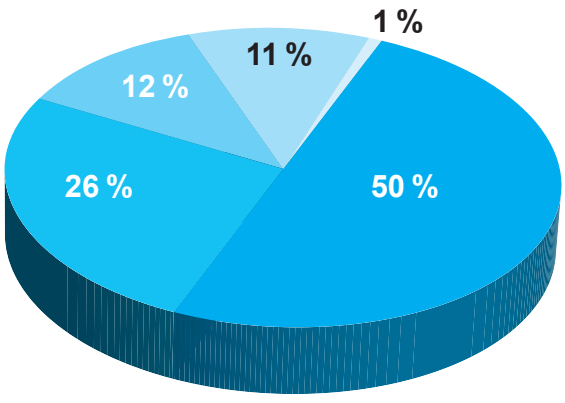


Diagram from safety-network.de

Further information can be found in the download area under „Academy“ at www.pfannenberg.com!

THE NEW MACHINERY DIRECTIVE 2006/42/EC

The transition period for the new Machinery Directive 2006/42/EC ends on 1 January 2010. It has already been signed on 17 May 2006 and published on 9 June 2006 in the official gazette of the European Union (Abl. L 157).

Two new safety standards are coming into effect with the Machinery Directive. Firstly, DIN EN ISO 13849-1, which replaces the standard DIN EN 954-1 of the old Machinery Directive 98/37/EG. The other is DIN EN 62061.

The goal of these new safety standards is risk minimization in the operation of machines. Therefore, the requirements with regard to certification of products for manufacturers of plants and machines were made more stringent. Now, probability considerations are also taken as inputs in determining the safety of components.

Planning security and market opportunities of manufacturers of machines and plants are thus supported by a safety-related visual and acoustic alarm system from Pfannenberg.

SIL/PL GRADATION

Allocation of the level after a risk analysis. What is calculated here is the probability of failure of the system.

Average probability of a dangerous failure per hour.

PFH_D	Performance Level DIN EN ISO 13849-1	Safety Integrity Level DIN EN 62061
10^{-4}	PL a	---
10^{-5}	PL b	SIL 1
$3 \cdot 10^{-5}$	PL c	
10^{-6}	PL d	SIL 2
10^{-7}	PL e	SIL 3
10^{-8}	---	SIL 4
10^{-9}		

SAFETY FROM THE BEGINNING: SIL/PL-CONFORM SIGNALING BY PFANNENBERG

As with all chains, the safety chain is only as strong as its weakest link!

This integral view of safety functions is the foundation of the respective norms from process and systems engineering, as well as mechanical engineering. Visual and audible warning devices are, as the definition clearly states, devices, which warn people about acute dangers. Therefore, these need to be implemented into safety chains of many applications. This is the link of the change that reaches people!

The integration of visual and audible warning devices in the safety chain is required by norm in many applications. For example, machines that are hard to view as a whole must be equipped with start-up alarms according to SIL 1 and respectively, PLc. Machines are defined as hard to view when they have a length of 7 m or more.

Further applications for SIL-capable signaling devices are, amongst others
- muting indication (i.e. during safety function bypassed by the safety-related controller)
- excess rotation speed warning
- machine stop delay warning

Applications in process and plant safety (Control Technology/PCS), e.g. in case of
- leaks / gas warning
- high-pressure / overfilling

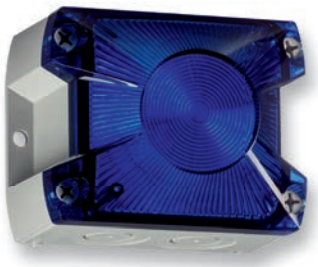
Functional safety in process automation normally based on the statutory order of hazardous incidents. The statutory order refers to the design of safety-relevant devices in EN 61508 and EN 61511 respectively. They define the safety steps which describe the measures to control risks of equipment.

Among others, the VDMA (German Association of Machinery Manufacturers) and the ZVEI (German Electrical and Electronics Industry Association) inform intensively about the implementation of safety standards.

SIL compliant signaling devices by Pfannenberg can be found on pages 102, 104 and 132.

VISUAL SIGNALING DEVICES BY PFANNENBERG

Our comprehensive range includes:
- xenon flashing lights
- halogen blinking and continuous lights
- continuous lights with filament lamps
- LED multifunction lights
- rotating mirror lights
- panel mount blinking and continuous indicators
- combination lights
- traffic light lights
- signal towers
- visual signaling devices for the Ex area
- SIL conform visual signaling devices
- obstacle lights



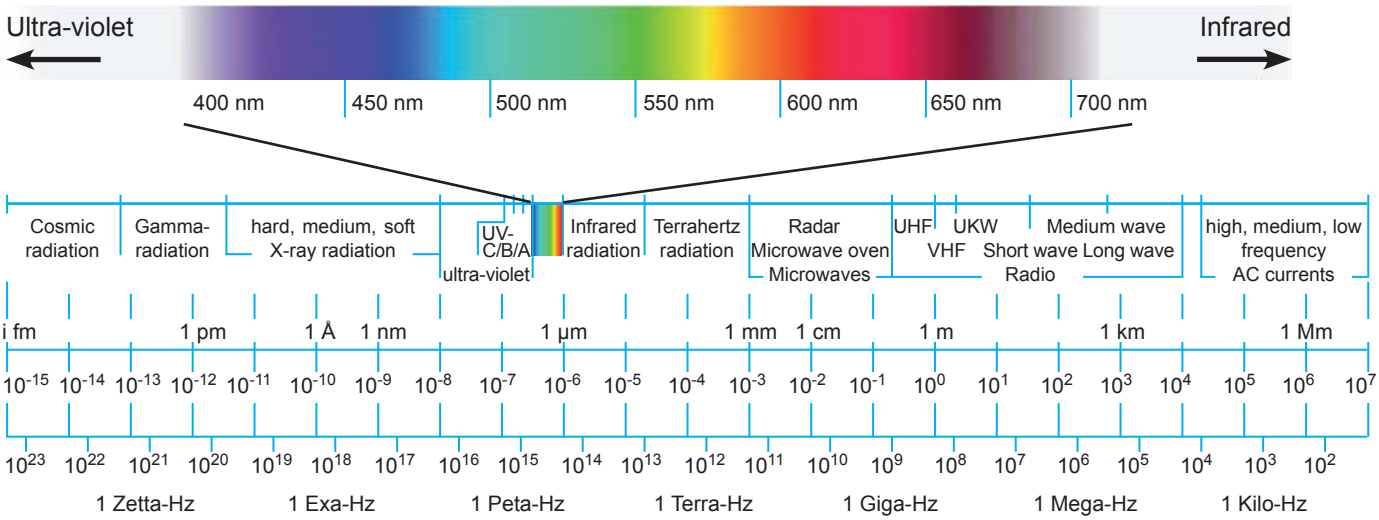
A large proportion of our signaling devices are provided with the following features, which make their use in special applications possible, such as in safety-relevant applications:
- synchronisation of several lights
- redundant structure
- integrated function monitoring
- limitation of initial current

BASIC PRINCIPLES OF OPTICS

Light moves as electromagnetic wave, which are distinguished from one another by their wavelength. The wavelengths of that part of the electromagnetic spectrum, which are visible to the human eye lie between 380 nm and 780 nm and are called the visible spectrum.

The visible spectrum itself is in turn made up of different electromagnetic waves that generate the perception of different colours in our eyes. The limits of the visible spectrum are represented by infrared and ultra-violet light.

The spectrum visible to the human eye (light)



TYPES OF LIGHT GENERATION

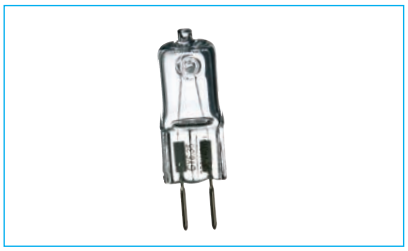
There are several ways of generating light in signaling technology.

Filament lamp

In the filament lamp, an electric conductor (filament) is heated up by an electric current to the point where it glows and is perceived as a source of light. In order to protect the tungsten filament against the oxygen in the air and to prolong its service life, it is shielded by a vacuum in a glass bulb. The power of a filament lamp is expressed in Watts and is calculated as follows:

Power (P) = Voltage (U) • Current (I)

Although this type of light generation is still being used, it is being displaced more and more in the market due to its very limited service life and poor light production.

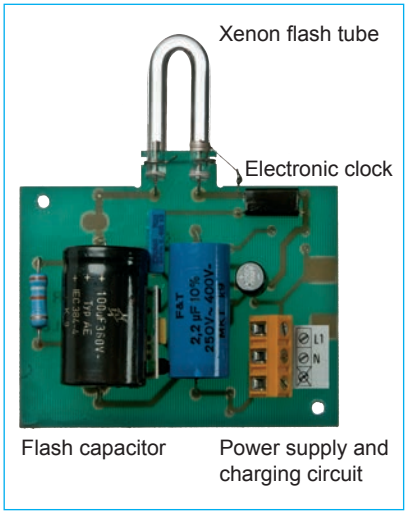


Halogen lamp

The glass bulb of a halogen lamp is filled with halogen bromine, which virtually doubles the service life of this lamp compared to the ‚normal' filament lamp, as well as increases the light production and allows the bulb to be operated at higher temperatures. The light output of a halogen lamp remains virtually constant throughout its service life.

LED Lamp

A light-emitting diode is an electronic semiconductor. If current flows through the diode in the conducting direction, it emits light. The light energy is released in the form of photons. Light diodes are not temperature radiators. They are insensitive to impacts and vibration and consume little current. The service life of an LED is described as the time period over which the light yield decreases to half of its initial value and is usually more than 50,000 hours. Since LEDs are available in all normal colours, the use of colour filters is not necessary. LED lamps are available in exchangeable versions with a fitting or as permanently installed LED arrays.



Gas discharge lamps

The energy stored in the capacitor discharges in the gas-filled glass tube and forms a light arc. Xenon gas is predominantly used in signal technology. The flash energy per individual flash is calculated according to the following equation:

$$E = 1/2 \cdot C \cdot U^2$$

E = Flash energy (Joules)
C = Capacity of flash capacitor (Farads)
U = Charging voltage (Volts)

The electrode material is subjected to a very large load during the discharge. Although very hard metals such as tungsten are used for the electrode, a certain amount of the metal is removed depending on the load and is deposited as a dark film on the inside of the flash tube. The advantage of this technology is the high signaling effect due to the concentrated light pulse.

XENON TECHNOLOGY VERSUS LED TECHNOLOGY

Currently, the LED technology is the buzz in the area of generating light. In signaling technology, LED is being used increasingly. Thereby, LED is connected with positive characteristics such as energy efficiency, life span and insensitivity to mechanical influences, which cancel out the negative side, the price.

Visual signaling technology must cover various application in three areas:

ALARM	WARNING	INDICATION

in which there are different requirements, e.g. special visual appearance, for the products.

While the positive characteristics of LED technology come to use almost to 100% in the area of “Informing”, in the areas “Warning” and “Alarm”, the advantages of the LED technology are scarcely considered. When taking the area “Alarm” into consideration, the perceptibility is in the foreground in order to convey the signal and therewith, the urgency of the alarm to the observer. Here, devices based on Xenon technology exhibit distinct advantages, e.g. the differential luminance, which can be ascribed to the formation of the light impulse.

A Xenon flashing light creates a very short (approx. 250 ms), yet very intense impulse with a peak value of well over 100 000 cd, which cannot be produced by means of LED technology. Typical curve progressions are depicted in figures 1 and 2. It is clearly visible that the light intensity of the LEDs only has a flat progression, in contrast to the Xenon flash tubes. Both lights have almost the same effective luminous intensity.

When comparing the bottom line of the expense of energy for both technologies, the LED is also, in this aspect, not advantageous. The effective power consumption of a Xenon flashing light is lower when compared to a LED flashing light that has almost the same effective luminous intensity as the Xenon light. Furthermore, LED lights with the same effective luminous intensity as compared to Xenon lights are significantly more expensive. I.e. not only are the operating costs, but also the acquisition costs in favor of the Xenon technology.

Luminous intensity / course of time of a Xenon flashing light

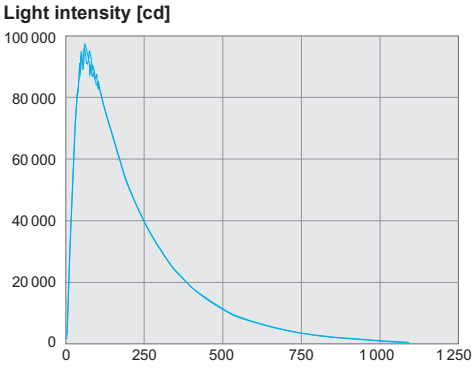


Figure 1

Luminous intensity / course of time of a LED flashing light

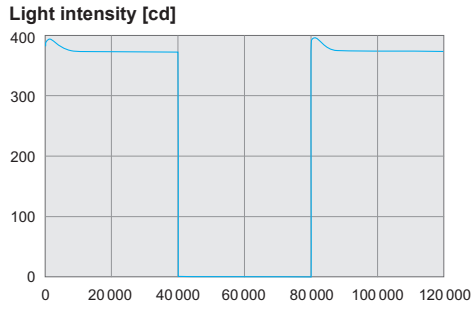


Figure 2

Another advantage of Xenon lights are the emission characteristics. Whilst in LED technology, these only produce an approximate omni-directional characteristic through the arrangement of the LEDs in the casing, the Xenon technology has a radiating point of light that provides for this from the get go. The emission characteristics are identical in all directions and thus, no „optical gaps“ are created in all directions of light.

The duty cycle is a positive LED characteristic that offers an advantage over Xenon technology. Yet when you take into consideration that special alarm devices are only needed and activated in dangerous situations, the life span of the lights is not crucial criteria. Pfannenberg Xenon flashing lights have a life span of a minimum 8 million flashes; this is adequate to warn of dangerous situations, in most cases, for a period of at least 20 years. All Xenon flashing light tubes are secured by means of an additional steel rod in Pfannenberg products so that the mechanical influences (shock/vibration) are reduced to a minimum.

In applications where the signaling devices are not just used frequently but also function as a permanent beacon, the advantage of LED-based devices is obvious: The duty cycle and low power consumption cannot be surpassed.

THE MOST IMPORTANT LIGHT VARIABLES IN SIGNALING TECHNOLOGY ARE:

- light intensity
- luminous flux
- illumination intensity

Light intensity is measured in Candela [cd].
The light intensity is the radiation power of a light source per dihedral angle, weighted with the spectral sensitivity of the eye. The directional dependence of the luminous flux is represented. This is particularly important in signal technology, since it is not about illuminating a room, but rather about the directed transmission of light to the observer.

light intensity [cd] = luminous flux [lm] / dihedral angle [sr]

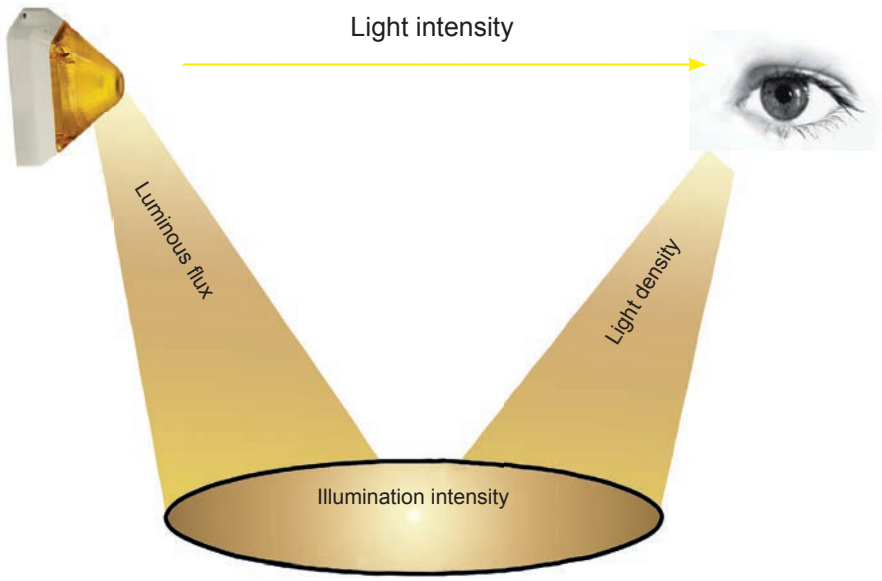
For example, the light intensity of a household candle is around 1 cd.

Luminous flux Φ is expressed in Lumen [lm].
The luminous flux is a measure of the entire visible radiation that is radiated in all directions from a source of light and, as opposed to light intensity, is not directionally dependent.

Illumination intensity is expressed in Lux [lx].
The illumination intensity describes the amount of the luminous flux that strikes a given area. It is the quotient of luminous flux and area.

illumination intensity [lx] = luminous flux [lm] / area A (m^2)

The illumination intensity is inversely proportional to the square of the distance. A doubling of the distance therefore results in the illumination intensity being reduced to one quarter.



TYPES OF BEACON

Visual signaling takes place by means of colour, light intensity and lighting duration. Four types of beacons with different signaling effects are essentially offered in signal technology;

Continuous lights – lowest signaling effect

The light intensity of the continuous light changes with the power of the lamp and the use of different colours and types of lenses. This type of beacon is normally used to display a status and serves to a lesser extent as a means of an alarm.

Blinking lights – increased signaling effect

The observer's attention is increased by means of switching the lamp on and off with a blinking frequency of normally 1 to 2 Hz. This type of beacon is used, for example, as a warning signal.

Rotating mirror lights – high signaling effect

A rotating light cone is generated by means of diverting the light using the internal rotating mirror. Higher attention is gained at faster rotary speeds. Smooth lenses are used for these beacons in order to exploit the light effect to its fullest and to avoid scattering effects. As opposed to flashing beacons, the dazzling effect is reduced with rotating mirror beacons.

Flashing lights – highest signaling effect

The charged capacitor discharges its energy into the gas-filled glass tube and forms a light arc. This very short and very intensive light effect generates the highest signal attention. Among other things, this type of beacon is used as a top priority alarm.

MEANING OF THE COLOURS IN VISUAL SIGNALING

The signal colours red, amber, yellow, green, blue and clear are mainly used in signal technology.
Different lamp colours convey different messages to the observer in accordance with EN 60078, EN 981 and DIN VDE 0199.

Colour	Process status (as per IEC 73)	Process data (as per IEC 73)	Meaning / message category	Purpose	User reaction (as per DIN VDE 0199)	Example application
red	emergency	limit value exceeded	• danger • abnormal status • act immediately • urgent rescue or protection measure	• emergency • alarm • stop • prohibited • failure	immediate reaction	• stop sign • prohibiting sign • emergency stop devices
yellow / amber	abnormal	warning limit reached	• caution • be prepared • act if necessary	• attention required • change of status • intervention	monitor and/or intervene	indication of dangers, such as: fire, explosion, radiation, chemical influences, obstructions etc.
green	normal	within normal range	• everything ok • normal status • safe • no danger • danger is pastr • first aid	• return to normal process • continue	no action required	• identification of escape routes and emergency exits • first aid and rescue stations
blue	specified meaning	specified meaning	• display of necessity for specified action • command sign • notice • machine-specific	• action • protection • extraordinary attention • safety-relevant regulation or precaution with priority	specified action	• obligation to wear personal protective equipment • location of a telephone • etc.
white / clear	neutral		not assigned any particular meaning			
other	neutral					

LIGHT PERMEABILITY OF COLOURED LENSES

Depending on the respective light source and the various lens colours, the following percentage of light typically penetrates through:

Colour	Filament lamp	Halogen lamp	Xenon lamp
clear	100%	100%	100%
yellow	95%	94%	93%
amber	70%	70%	70%
red	17%	27%	23%
green	12%	15 %	25%
blue	15%	20%	24%

This reduction in the light intensity must be taken into consideration when selecting the right signaling device!

Due to the narrow spectrum of LED light sources, only a small reduction in the light is to be expected if the colour of the lens corresponds to the colour of the LED.

PLANNING VISUAL SIGNALING

EN 54-23 for Europe and NFPA 72 for the USA offer a tangible basis for the design of visual signaling:

The table below is based on the following calculation equation and can also be used for other room sizes or distances:

$$d = \sqrt{I_{Eff} / E}$$

d is the distance between the observer and the alarm device in metres [m]
I_{eff} is the effective light intensity in Candela [cd]
E is the illumination intensity in Lux [lx]

The illumination intensity E must not fall below 0.4 lx at any place within the defined signal reception area.

Examples of the signaling devices to be used, depending on the room size

maximum room size (m x m)	minimum light intensity (effective intensity [cd])		
	1 light/room	2 lights/room	3 lights/room (synchronised)
6 x 6	15	not permitted	not permitted
12 x 12	60	30	15
18 x 18	135	95	30
24 x 24	240	135	60

Due to the complexity when considering visual signaling, we recommend checking the efficiency of the alarm on-site by using a representative group of people. In doing so, a ‘worst case’ scenario must always be performed based on the environmental conditions.

PERCEPTION OF THE BRIGHTNESS OF LIGHT FOR WARNINGS AND ALARMS

A few tips to assist you in selecting the right visual signaling devices:
Doubling the distance reduces the light power by 75% to 1/4 of its strength. If the distance is quadrupled, the light power is reduced to 1/16.
Visual alarms are ideal when there is a direct (unobstructed) line of sight between the beacon and the observer.
Reflected light can be perceived inadequately.

In an alarm area (dangerous condition, immediate action), the beacon will also be perceived without direct visual contact provided that **the light intensity of the alarm device is 10 times brighter than the ambient light.**
In a warning area (critical condition, intervene), the signal will be perceived adequately via direct visual contact or reflection provided that **the light intensity of the warning device is 5 times brighter than the ambient light.**

OPTICAL AND ELECTRONIC MONITORING

Monitoring of visual alarm devices plays a very important role, especially in the case of safety-relevant applications. Monitoring is offered in two different technical versions.

One method is to monitor the correct function of a flashing light by opto-electronic means. The light flash from the flashing light is fed via an optical fibre to a phototransistor, which converts the optical impulse to an electrical impulse. The optical fibre is located in the housing of the flashing light and directed downwards, which excludes false triggering due to the effect of daylight. Additionally, any flashing light with a 1 Hz flash rate can be retrofitted with an external flash monitor. The downstream circuitry evaluates the pulse and its regular repetition.

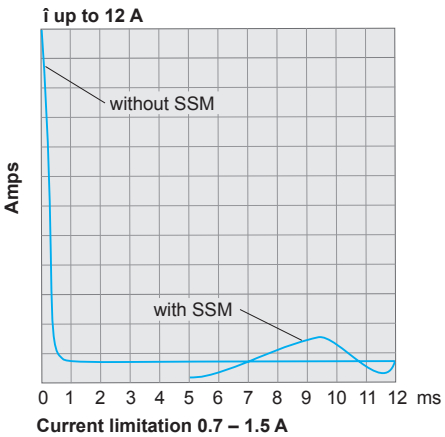
As soon as the operating voltage is applied, the evaluation relay closes the error contact. If the operating voltage fails, the relay opens immediately. This method of operation represents the fail-safe normally-closed circuit function and guarantees an alarm even if the operating voltage fails. On the other hand, the error message contact serves the continuative alarming, e.g. in an error message line, or the direct blocking of further machine processes. It is possible to relay the error alarm as a normally-closed function. The second method of electronic monitoring is to integrate a flash monitor in the processor of the flashing beacon. In this case the regular charging and discharging of the flashing beacon capacitor is monitored. If one status is not present, an error message is relayed via a floating, normally-closed contact.

INRUSH CURRENT LIMITATION

Visual alarm devices can draw a greatly increased initial current for a very short period of time. This is due to the circuit-related input capacity. This can lead an overload of the relay contacts at the moment when power is turned on and to the premature triggering of overcurrent circuit breakers.

For special requirements, Pfannenberg can supply you with visual alarm devices that are factory fitted with an initial current limiter. Pfannenberg also offers external current limiting modules, so-called soft-start modules (SSM), for retrofitting or supplementing visual signaling devices.

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



Current limitation 0.7 – 1.5 A

AUDIBLE SIGNALING DEVICES BY PFANNENBERG

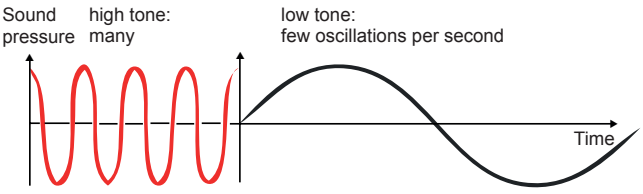
Our comprehensive range includes:
- electronic multi-tone sounders
- electronic multi-tone sirens and horns
- programmable voice sounders
  (also in synchronised versions)
- combined signaling devices
- buzzers and panel mounted buzzers
- audible signaling devices for the Ex area
- SIL conform audible signaling devices

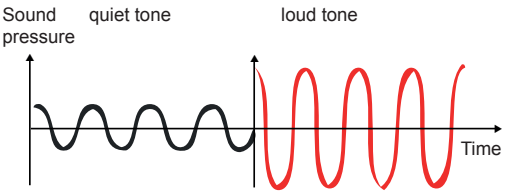
BASIC PRINCIPLES OF ACOUSTICS

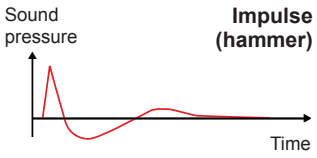
A source of sound causes the air to oscillate, resulting in alternating compression and relaxation of the air. This pressure wave propagates itself in the form of a wave and causes the eardrum to oscillate, triggering the process of hearing.
The sound pressure of oscillation is measured in microbars (µbar). The number of oscillations per second is called the frequency. Its unit of measurement is Hertz (Hz).

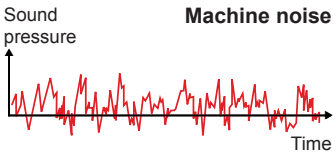
DIFFERENT TYPES OF SOUND

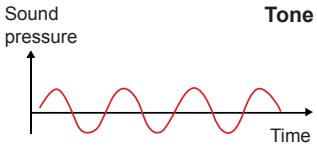
- a harmonic oscillation produces a tone
- a sound represents a mixture of tones
- noise is the name given to a mixture of numerous tones,
  rapidly changing frequencies and rapidly changing sound volumes
- a bang is produced by a sudden beginning of a mechanical oscillation of very short duration and great loudness

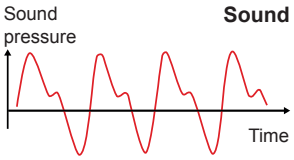












Properties of sound waves:
- the number of vibrations per unit of time = frequency
- range of the oscillation = amplitude

FREQUENCY RANGE AND SOUND PRESSURE LEVEL

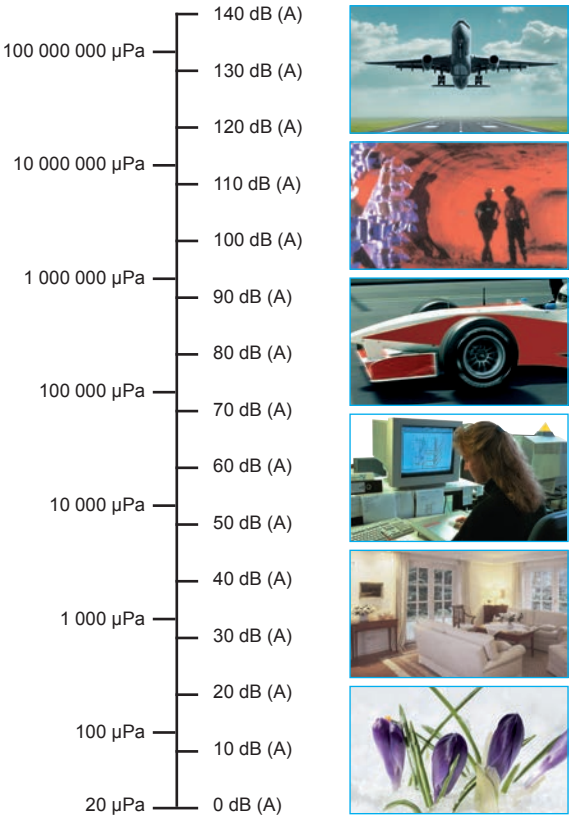
The range of human hearing is from 20 to 20,000 Hz. Deeper sounds (infrasound) and higher sounds (ultrasound) cannot be heard. The human ear is most sensitive to sound between 500 Hz and 3 kHz. With regard to volume, a sound pressure of 2/10,000 = 0.0002 µbar is just barely audible.

This limit value is called 'hearing threshold pressure'. A sound pressure of 200 µbar and above causes pain. This is known as the pain threshold.

In order to make the hearing range more manageable in terms of numbers, the ratio of the actual measured sound pressure to the hearing threshold pressure is converted to a logarithm. This logarithmic relationship is known as the sound pressure level and is expressed in decibels (dB).

The equation is:

$$Lp = 20 \times \log \frac{\text{measured sound pressure in µbar}}{\text{hearing threshold pressure in µbar}} \text{ dB}$$



BASIC PRINCIPLES OF ACOUSTIC AUDIBILITY

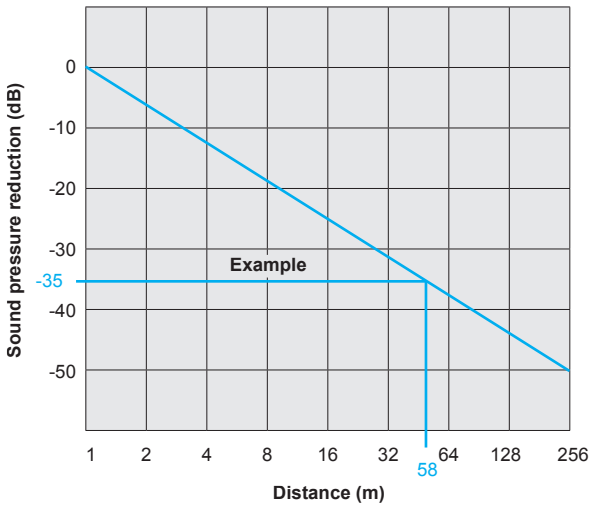
The loudness of a sounder is expressed in dB (A) and measured at a distance of 1 metre (USA 10 feet). The smallest increase in the sound level that the human ear can detect is 3 dB. An increase of 6 dB is equivalent to a doubling of the sound pressure. An increase of around 10 dB is perceived as being twice as loud.

Lower frequencies (at the same sound level) are perceived to be quieter. This is all the more pronounced at lower sound levels.

Alarm signals can be better heard when the difference between the frequency of the ambient noise and that of the sounder is greater. Interfering factors are, for example, damping, fog, obstructions, wind speed and direction, rain and air humidity.

A doubling of the distance to the source of the sound is equivalent to a reduction in the sound level of around 6 dB, e.g. there is a sound pressure level reduction of 35 dB at a distance of 58 m.

Reduction in the sound pressure level in relation to the distance between the sounder and the listener's ear



A large number of audio samples of different tones are available at **www.pfannenberg.com/support**.

TYPES OF SOUND GENERATION

Sound capsule – electromagnetic sound generation

In the sound capsule, anchors connected to the membrane are pre-magnetised by a permanent magnet. When a voltage is applied, the membrane is stimulated to oscillate, generating sound waves that are perceived as an audible tone. Despite its relatively simple and compact structure, the sound capsule has a relatively high efficiency level. For that reason this technology is often used in appliances with small dimensions.

Loudspeaker – electro-dynamic sound generation

The electro-dynamic loudspeaker consists of a membrane connected to a central oscillating coil. This coil is located within the magnetic field of a permanent magnet. If the voltage of the signal to be transmitted is applied to this coil, an alternating electromagnetic field is generated that causes the membrane to move and, hence, to generate sound pressure. Various membranes (smaller or larger, softer or harder) and different coils and permanent magnets are used, depending on the frequency range. Electrodynamic loudspeakers are ideally suited for generating high sound pressure.

Horn loudspeaker – electro-dynamic sound generation

The membrane in a horn loudspeaker acts on a very small space – the pressure chamber. The velocity of the air particles is increased in this pressure chamber due to its small cross-sectional size. This principle increases efficiency considerably in comparison to other designs. Due to the high sound pressure, which can be attained and the high frequency range that can be transmitted, horn loudspeakers are ideal for the transmission of sound in large areas. Horn loudspeakers are usually insensitive to weather and are very robust.

Piezo-electric effect

At the heart of a piezo loudspeaker is a crystal. When a voltage is applied to this crystal, it deforms as a result and is thus set in motion. Piezo loudspeakers essentially transmit only higher frequency ranges and are not suitable for penetrating through obstructions such as walls. The advantage of these systems lies in their high impedance and, therefore, low power consumption.

PLANNING AUDIBLE SIGNALING

In order to determine the acoustic alarm, it is important to know the 'starting value' (existing ambient noise level) and the 'target value' to be calculated.
According to the EN ISO 7731 standard (replacement for EN 457), a sounder should have a minimum sound level of 65 dB (A).

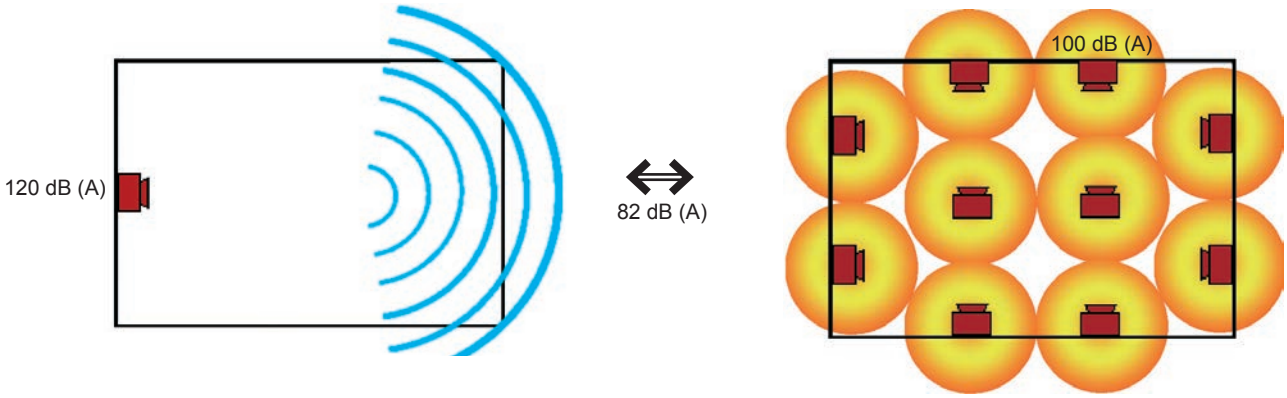
Standard	Minimum difference to the ambient noise level	Application
EN ISO 7731	at least 15 dB (A)	Public areas and workplaces
DIN VDE 0833 EN 60849	at least 10 dB (A)	Fire alarm (in fire alarm systems) Evacuation signal (in alarm systems)

From a required sound level of 110 dB (A) upwards, it is recommended to use visual signaling devices in addition to acoustic alarms.

Example calculation

There are various possibilities of achieving 82 dB (A) for an area of 50 x 30 m:

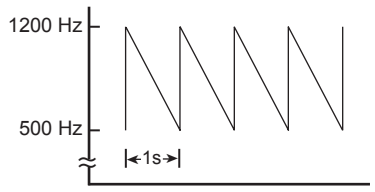
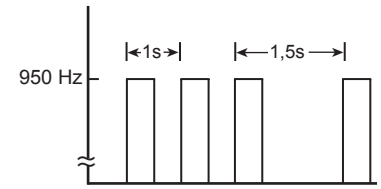
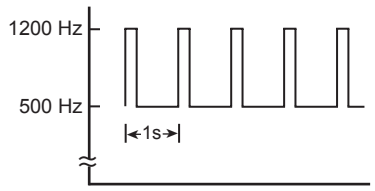
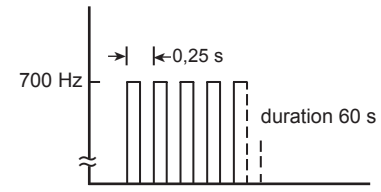
1 x 120 dB (A) or 10 x 100 dB (A) sounders are required.
Sound transmission area of a 100 dB (A) sounder in order to achieve 82 dB (A) = 200 m^2
Sound transmission area of a 120 dB (A) sounder in order to achieve 82 dB (A) = 20,000 m^2



The type of signaling (number of sounders) used is essentially determined by the geometric properties of the room, the shape of any obstructions and the maximum permissible sound pressure level of the sounder. When using a sounder with, for example, 120 dB (A), it must be ensured that people cannot be in the near vicinity of the sounder. If this is not possible, a divided installation should to be chosen.

THE MEANING OF DIFFERENT TONES

Pfannenberg sounders can generate up to 80 different tones. All tones can selected individually and must be adapted to suit the respective environmental conditions. Therefore, some of the pre-installed tones have a pre-defined meaning.

Standard		
DIN 33404	Acoustic alarm signal for workplaces in cases of fire, gas, explosion or radiation danger	
ISO 8201	Emergency evacuation signal	
NFS 32-001	Fire alarm in France	
SS 031711	Emergency signal in Sweden	

A large number of audio samples of different tones are available at **www.pfannenberg.com/support**.

MONITORING: STANDBY CURRENT

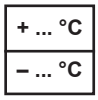
There are two ways of monitoring the standby current electronically using a terminal resistor in order to monitor acoustic signaling devices:

- measurement of the current below the lower nominal voltage limit of the device, or
- measurement of the standby current by reversing the supply voltage poles

INRUSH CURRENT LIMITATION

Acoustic alarm devices can draw a strongly increased initial current for a very short period of time. This is caused by the circuit-related input capacity. For special requirements, acoustic alarm devices are available with an initial current limiter.

PICTOGRAMS

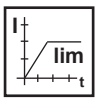


Operating temperature range.
Highest and lowest temperature values ensured by the technical data.

Protection system specification according to DIN EN 60529. General information on the protection of electrical equipment against contact, foreign particles and water. Devices with IP 54 can be used outdoors.

Impact-proof housing.
Protection system specification according to DIN EN 50102.

Activation input with
opto-coupler 24 V DC / 2 mA.



Equipment with inrush
current limitation.

Optional flash rate
(standard: 60 flashes/min.).

Protective cage made of rustproof metal.
Active protection against contact and sabotage, plus operation under ‘tough‘ conditions.

External flash monitoring for visual alarms. The flash is detected and monitored via a fibre-optic cable. In the case of a malfunction, an alarm is given in the form of a ’normally closed function’ (floating contact).

Volume control.
For the optimal adaptation of the signal to the surroundings and the avoidance of startled reactions.

Optional brightness,
e.g. 3 Joules.

External tone selection.
For controlling various types of tones in a device.

Reception range of the signaling device, within which the signal is adequately perceived.

Synchronous operation of several signaling devices. Light pulses or tones are rendered in absolute synchronisation.

Noise level reduction by means of external switch.

Light sensor.
Automatic adjustment to the ambient light.

Acoustic penetration.
Excellent acoustic penetration of acoustic obstacles such as walls and doors.

The European standard for the approval of acoustic alarms in fire protection facilities.

The European standard for the approval of visual alarms in fire protection facilities.

APPROVALS AND TEST SYMBOLS

Germanischer Lloyd

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.

VdS-Zulassung
VdS Schadenverhütung GmbH

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 protection against fire and burglary.

UL
Underwriters Laboratories

The Underwriters Laboratories test and register products in accordance with the requirements of the North American market. The approvals are valid for the USA and Canada.

GOST

GOST certification applies to products tested in accordance with the requirements and standards of the Russian Federation. The GOST standards cover over 20 industries.

Products marked with the Ex test symbol and test number are approved for use in potentially explosive areas (further details from page 182 onward).

Russian Maritime Register of Shipping (RS)

The Russian Maritime Register of Shipping sets the standards for technology, quality and safety for shipping and industry in the Russian Federation. It additionally functions as a certifying body, for example in the fields of defence, the oil and gas industry and building technology.

Schweizerische Eidgenossenschaft

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.

PTB

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.

Bundesamt für Wehrtechnik und Beschaffung

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, in which type testing is carried out 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.

ICAO

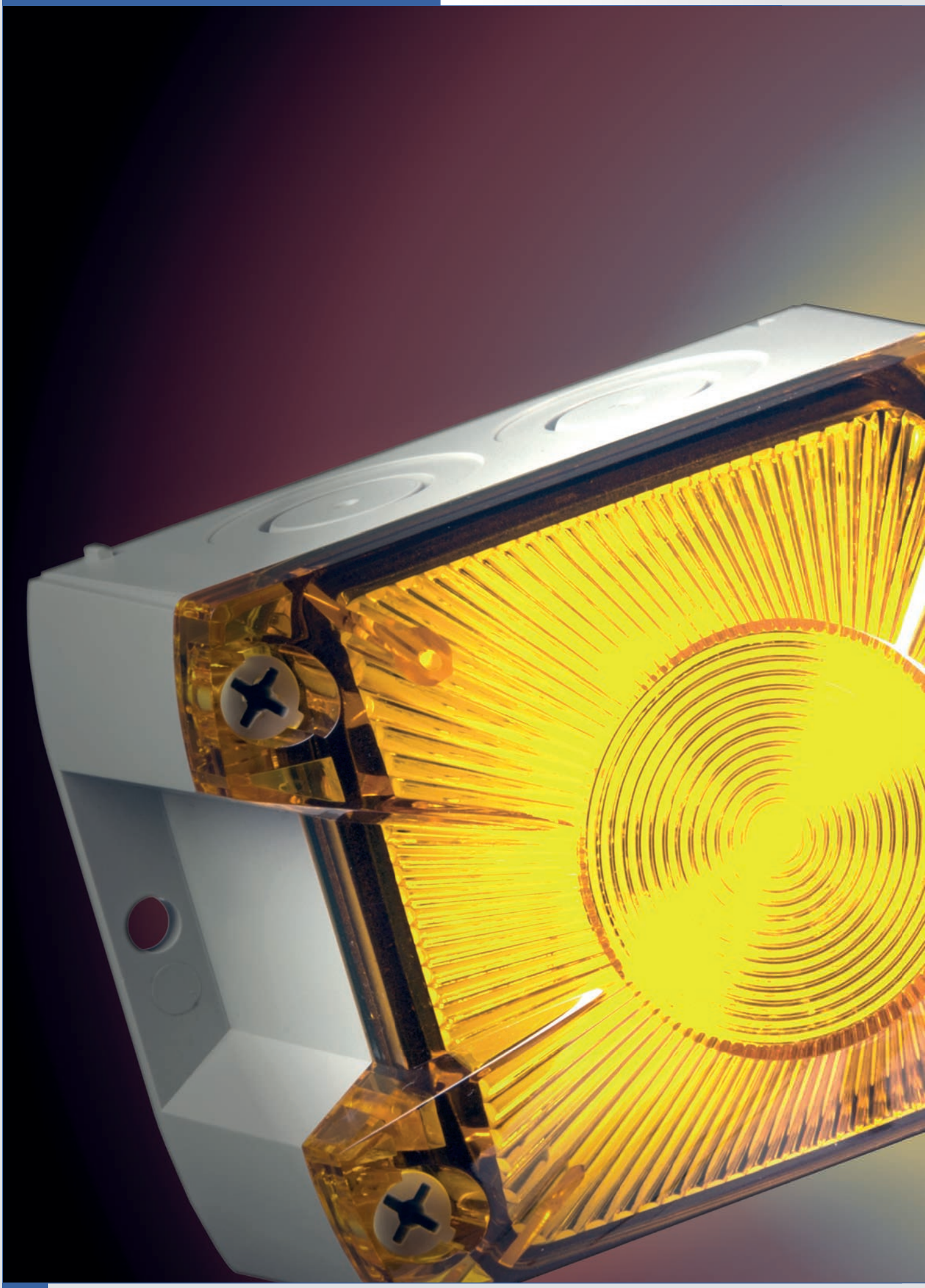
The ‘International Civil Aviation Organization’ sets standards for technology, quality and safety in international air traffic. The ‚Allgemeine Verwaltungsvorschrift zur Kennzeichnung von Luftfahrthindernissen‘ (AVV) [= General Administrative Rules for the Identification of Aviation Obstacles] sets the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

MED

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).

Centrum Naukowo Badawcze Ochrony Przeciwpozarowej

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



A FLASH SAYS MORE THAN A THOUSAND WORDS!

VISUAL SIGNALING DEVICES ENSURE SAFETY AT FIRST SIGHT

Regardless of whether you use flashing lights or continuous lights – Pfannenberg's visual signaling devices are ‚eye-catchers' that can save lives in every respect. They ensure any process status can be displayed in a timely manner. Thanks to their unmistakable demand for action, they offer the best prerequisites for running trouble-free production processes.

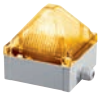
Benefit from top quality standards and a unique complete range.

ALL VISUAL SIGNALING DEVICES AT A GLANCE

	Type	Maximum covering distance as per EN 54-23 in metres (m) [1]					Flash energy	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2,5	5	10	25	50				GL MED	GOST	UL	EN 54-23 VdS	RS	
	FLASHING LIGHTS														
	**PMF 2030**						30 joules	IP 55	direct mounting 185 x Ø 177 bracket mounting 170.5 x Ø 130		●				46
	PMF 2020						7 joules			●	●			●	48
	PMF 2015						7 joules				●				
	**ABL / ABS**						15 joules	IP 54	without bracket 242 x Ø 80	●	●			●	50
	**P 400 STR**						15 joules	IP 65	220 x Ø 140		●				52
	**Quadro F12**						13 joules	IP 66 IP 67 IK 08	130 x 130 x 130		●				54
	Quadro S						13 joules				●				
NEW 	**PY X-M-10**						10 joules	IP 66 IK 08	124 x 166 x 114	○ [2]	○	○	○		56
										○ [2]			○		
NEW 	**PY X-M-05**						5 joules	IP 66 IK 08	124 x 166 x 114	○ [2]	○	○	○		58
										○ [2]			○		
	**WBL / WBS**						5 joules	IP 54	200 x Ø 54	●	●			●	60
	WBL-PX						5 joules	IP 54	200 x Ø 54						
	**WBLR**						5 joules	IP 65	144 x 120 x 85	●	●			●	62
	WBSR									●	●		●	●	
	**P 300 STR**						5 joules	IP 65	150 x Ø 100		●				64

[1] with a clear lens

● available
○ in preparation
[2] option

	Type	Maximum covering distance as per EN 54-23 in metres (m) [1]					Flash energy / light intensity	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	10	25	50				GL MED	GOST	UL	EN 54-23 VdS	RS	
	FLASHING LIGHTS														
	**PY X-S-05**						5 joules	IP 66 IK 08	85 x 109.5 x 80.6	● [2] ● [2]	●	●	● ●		66
	**DWBL / DWBS**						2.5 joules	IP 54	200 x Ø 54	●	●			●	68
	LED LIGHTS														
	**PMF-LED Flex**						30 cd	IP 55	direct mounting 185 x Ø 177 bracket mounting 170.5 x Ø 130		●				70
	**P 400 LDA**						30 cd	IP 65	220 x Ø 140		●				72
	**P 300 LDA**						20 cd	IP 65	150 x Ø 100		●				72
	**Quadro-LED-HI**						70 cd	IP 66 IP 67 IK 08	130 x 130 x 130						74
	**Quadro-LED Flex**						9 cd	IP 66 IP 67 IK 08	130 x 130 x 130		●				76
	**PD 2100-LED**						5 cd	IP 55	128 x 166.2 x 111.2		●				78
	**P 200 LDA**						5 cd	IP 65	80 x Ø 60		●				80
	**P 100 LDA**						5 cd	IP 65	65.5 x Ø 60		●				80

[1] with a clear lens

● available
○ in preparation
[2] option

ALL VISUAL SIGNALING DEVICES AT A GLANCE

	Type	Maximum covering distance as per EN 54-23 in metres (m) [1]					Light intensity / light power	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	10	25	50				GL MED	GOST	UL	EN 54-23 VdS	RS	
	LED LIGHTS														
	**Quadro-LED-TL**						80 cd	IP 66 IK 08	130 x 130 x 396						82
	**P 450 TLA**						60 cd	IP 65	177 x Ø 140		●				84
	**P 350 TLA**						45 cd	IP 65	140 x Ø 100		●				
	**P 22 D**						–	IP 65	52 x Ø 29		●				86
	**P 22 DFS**						–	IP 65	52 x Ø 29		●				
	CONTINUOUS LIGHTS														
	**PD 2100**						15 W	IP 55	128 x 166.2 x 111.2		●				88
	**P 450 TSB**						25 W	IP 65	177 x Ø 140		●				90
	P 450 TDB						2 x 15 W				●				
	**P 350 TSB**						15 W	IP 65	140 x Ø 100		●				
	ROTATING MIRROR LIGHTS														
	**P 400 RTH**						35 / 40 W	IP 65	220 x Ø 140		●				92
	**P 300 RTH**						20 / 25 W	IP 65	150 x Ø 100		●				

[1] with a clear lens

● available
○ in preparation

	Type	Maximum covering distance as per EN 54-23 in metres (m) [1]					Flash energy / light intensity	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	10	25	50				GL MED	GOST	UL	EN 54-23 VdS	RS	
	FUNCTION-MONITORED LIGHTS														
	**Quadro S-M-Flex**						13 joules	IP 66 IP 67 IK 08	130 x 130 x 130		●				94
	**WBL-M / WBS-M**						5 joules	IP 54	242 x Ø 80	●	●			●	96
	**PMF 2015-M**						7 joules	IP 55	direct mounting 185 x Ø 177 bracket mounting 170.5 x Ø 130		●				98
	**PD 2100-M-AS-i (LED)**						5 cd	IP 55	128 x 166.2 x 111.2		●				100
	PD 2100-LED-M						5 cd	IP 55			●				
	SAFETY-RELATED LIGHTS														
	**Quadro F12-SIL**						10 joules	IP 66 IP 67 IK 08	130 x 130 x 130		●				102
	**PMF 2015-SIL**						10 joules	IP 55	direct mounting 185 x Ø 177 bracket mounting 170.5 x Ø 130		●				104
	OBSTRUCTION LIGHTS														
	**POL 10-M**						32 cd	IP 68	240 x Ø 114						106
	POL 10-M-R						10 cd								
	POL 10-M-RA						10 cd								
	POL 32-M						10 cd								

[1] with a clear lens

● available
○ in preparation

Further information can be found on the Internet:
www.pfannenberg.com · www.pfannenberg-spareparts.com
Keep up to date. Subscribe to our newsletter now:
newsletter.pfannenberg.com

ALL-ROUND FLASHING LIGHT 30 J
PMF 2030

Secure 360° alarm for large distances (indoors or outdoors)

- extremely reliable and durable due to the use of state-of-the-art electronic components – no replacement of mechanical or electrical wearing parts necessary
- reliable performance even under the toughest working and production conditions, e.g. possible voltage fluctuations, high ambient temperatures up to + 55 °C, high relative humidity up to 90%
- mounting-friendly; large variety of mounting methods
- bracket-mounting using solid stainless steel bracket or direct mounting with enclosed flat seal
- maximum flash energy 30 joules
- good light bundling is achieved in the horizontal plane thanks to the lens in the form of a fresnel lens and the special xenon flash tube
- very good perceptibility over great distances; low power consumption

r = 61 m
Covering distance as per EN 54

IP 55
Protection system

+ 55 °C
- 40 °C
Operating temperature

Electrical data		PMF 2030			
Rated voltage		230 V AC			
Rated frequency		50 / 60 Hz			
Operating range		195 – 253 V			
Nominal current consumption	@ 30 J	1 Hz: 450 mA	0.75 Hz: 380 mA	0.5 Hz: 310 mA	0.1 Hz: 150 mA
	@ 20 J	1 Hz: 400 mA	0.75 Hz: 340 mA	0.5 Hz: 290 mA	0.1 Hz: 140 mA

Mechanical data		PMF 2030
Light source		xenon flash tube
Flash rate		1 Hz = 60 flashes/min., see flash frequency table
Flash energy		max. 30 J, switchable to 20 J
Light intensity (DIN 5037) [1]		1,500 cd
Lens colours		clear, amber, red, green, blue
Lens type		lens with fresnel characteristic
Beam angle	vertical	approx. 16°
	horizontal	360°
Operating temperature		- 40 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 55 (vertical mounting)
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	bracket mounting: polycarbonate (PC) / direct mounting: acrylonitrile butadiene styrene (ABS)
Cable entry	bracket mounting	M20 x 1.5
Connecting terminal		single wire 0.5 – 2.5 mm², fine wire 0.5 – 1.5 mm², with cable end sleeves DIN 46228/1
Weight	bracket mounting	1.25 kg
	direct mounting	0.75 kg

[1] with a clear lens

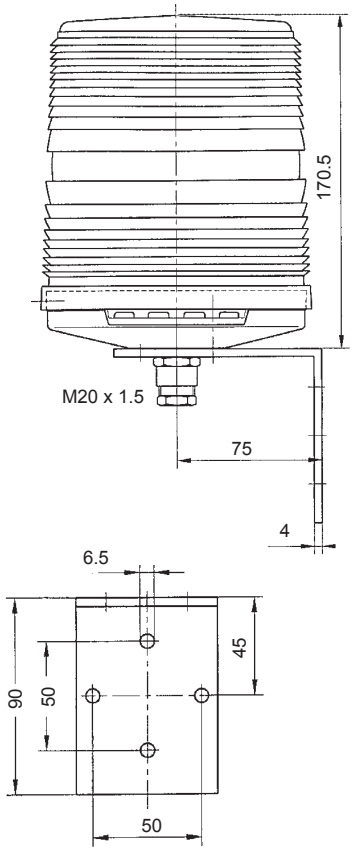
Flash frequencies

S1				Flash energy	Flash rate
1	2	3	4		
OFF	OFF	OFF	OFF	30 J	1 Hz
ON	OFF	OFF	OFF		0.75 Hz
OFF	ON	OFF	OFF		0.5 Hz
ON	ON	OFF	OFF		0.1 Hz

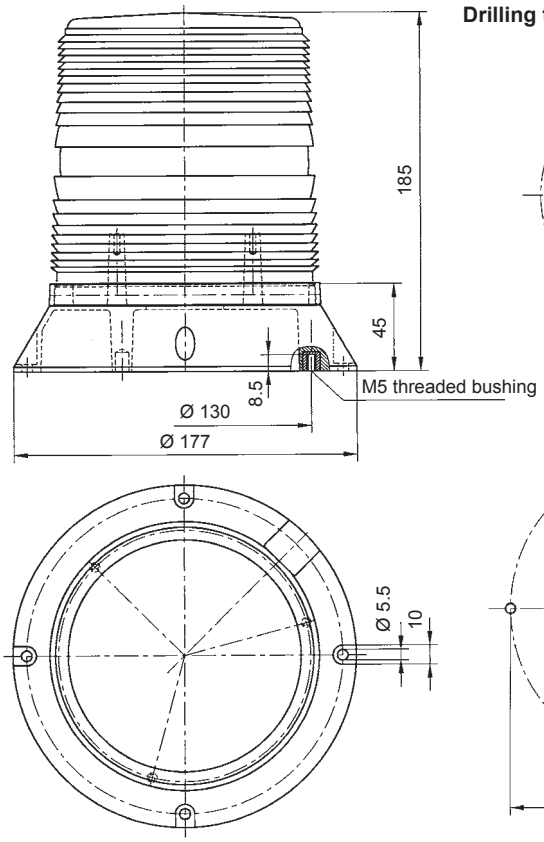
S1				Flash energy	Flash rate
1	2	3	4		
OFF	OFF	ON	OFF	20 J	1 Hz
ON	OFF	ON	OFF		0.75 Hz
OFF	ON	ON	OFF		0.5 Hz
ON	ON	ON	OFF		0.1 Hz

Dimensions

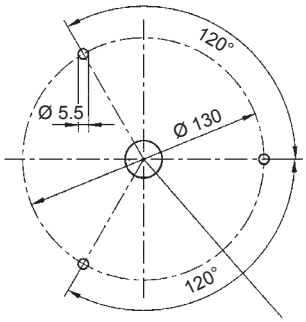
Bracket mounting



Direct mounting

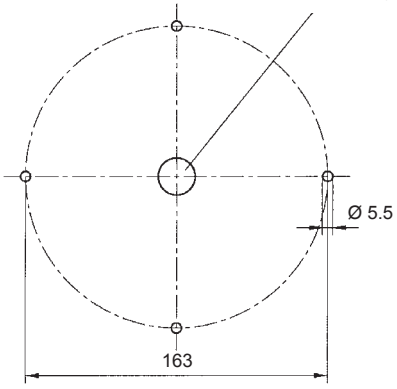


Drilling template 1 (for M5 threaded bushing)



Drilling template 2

diameter variable depending on cable entry



Two different drilling templates are available for fixing the light (direct mounting). M5 x 8 threaded bushes are set into the base of the light for fixing according to drilling template 1. Drilling template 2 allows the light to be fixed using 4 through bolts or similar from above.

Ordering details

Article numbers		PMF 2030 direct mounting	PMF 2030 bracket mounting
Lens colour	**Rated voltage**	230 V AC	230 V AC
amber		210 10 10 4 000	210 10 10 4 010
red		210 10 10 5 000	210 10 10 5 010

Article numbers for other colours and voltages on request

Options / Accessories

GOST

See page 108 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **“Machine safety - visual alarm signals“.**
Requirements contained in the DIN EN 981 standard: **“Machine safety - system of acoustic and visual alarm and information signals“,** can be fulfilled.

The colours ‘red’ for the emergency signal and ‘yellow’ for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
“Coding of display devices and control elements using colours and supplementary means“.

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

ALL-ROUND FLASHING LIGHTS 14 J
PMF 2020 / PMF 2015

Extremely bright due to 14 joules total flash energy of the impulse group and light bundling with fesnel lens, low power consumption (energy-saving)

- choice of three different flash combinations with fast flash rate (PMF 2015: two flash combinations)
- extremely reliable and durable due to the use of state-of-the-art electronic components – no replacement of mechanical or electrical wearing parts necessary
- large variety of mounting methods – direct or using a bracket
- exchangeable due to broadly used drilling template
- extremely reliable and durable: fit it and forget it!
- especially suitable for cranes and floor conveyors
- highest mechanical stability, shock tested as per DIN EN 60069-2-29 (PMF 2020, GL approval is standard)
- flash tube additionally secured by a steel clamp

Covering distance as per EN 54

Protection system

Operating temperature

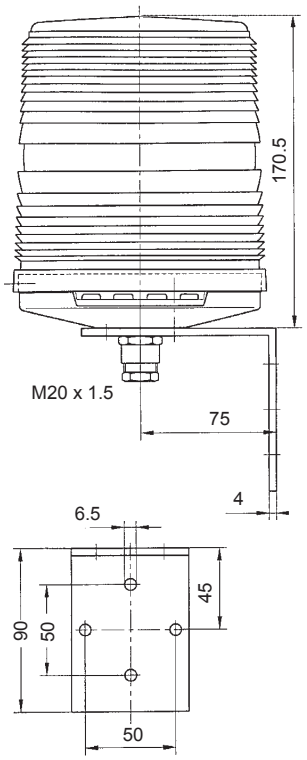
Electrical data		PMF 2020				PMF 2015			
Rated voltage		230 V AC	110 V AC	24 V DC	12 V DC	230 V AC	110 V AC	24 V DC	12 V DC
Rated frequency		50 / 60 Hz	50 / 60 Hz			50 / 60 Hz	50 / 60 Hz		
Operating range		195 – 253 V	90 – 135 V	18 – 30 V	11 – 15 V	195 – 253 V	90 – 135 V	18 – 30 V	11 – 15 V
Nominal current consumption	4 flashes	0.08 A	0.14 A	0.75 A	1.1 A	0.07 A	0.14 A	0.6 A	1.1 A
	2 flashes	0.09 A	0.15 A	0.8 A	1.15 A	0.08 A	0.16 A	0.65 A	1.2 A
	single flash	0.14 A	0.23 A	1 A	1.35 A				

Mechanical data		PMF 2020	PMF 2015
Operating mode		quad, double, single flash	quad, double flash
Flash energy of the main flash		7 J (12 V: 5 J)	7 J
Light intensity (DIN 5037) [1]		200 cd	
Lens colours		clear, amber, red, green, blue	
Lens type		lens with fresnel characteristic	
Beam angle	vertical	approx. 16 °	
	horizontal	360 °	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 55 (vertical mounting)	
Duty cycle		100%	
Service life of the flash tube		light emission still 70% after 8,000,000 flashes	
Material	lens	polycarbonate (PC)	
	housing	bracket mounting: polycarbonate (PC) / direct mounting: acrylonitrile butadiene styrene (ABS)	
Cable entry	bracket mounting	M20 x 1.5	M20 x 1.5 for cables 6.5 - 13.5 mm
Connecting terminal		single wire 0.5 – 2.5 mm², fine wire 0.5 – 1.5 mm², with cable end sleeves DIN 46228/1	
Weight	bracket mounting	AC: 1.1 kg / DC: 1.2 kg	
	direct mounting	AC: 0.6 kg / DC: 0.7 kg	

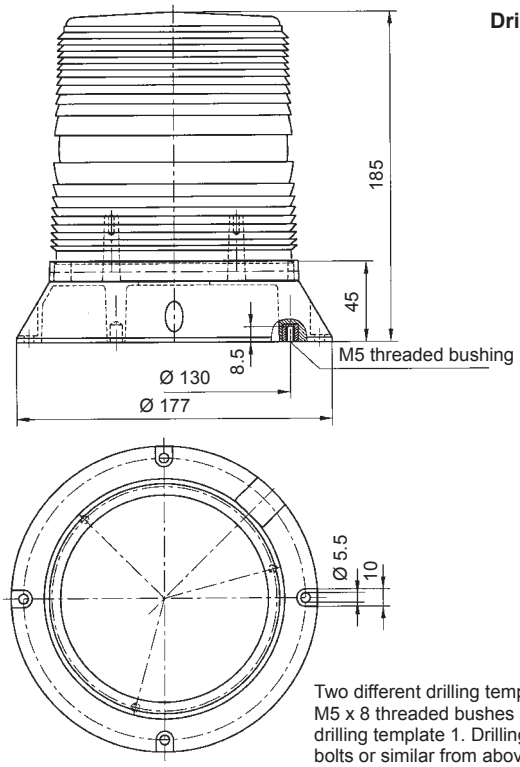
[1] with a clear lens

Dimensions

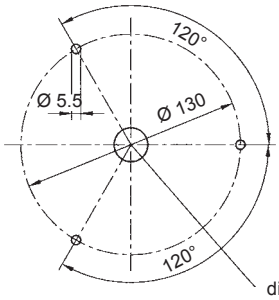
Bracket mounting



Direct mounting

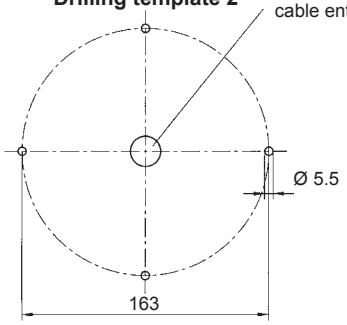


Drilling template 1 (for M5 threaded bushing)



diameter variable depending on cable entry

Drilling template 2

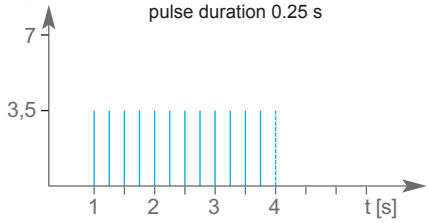


Two different drilling templates are available for fixing the light (direct mounting). M5 x 8 threaded bushes are set into the base of the light for fixing according to drilling template 1. Drilling template 2 allows the light to be fixed using 4 through bolts or similar from above.

Flash rate

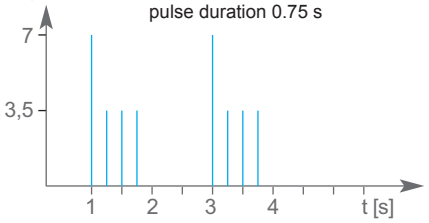
PMF 2020

Energy single flash [J]
single flash
240 flashes/min.
pulse duration 0.25 s

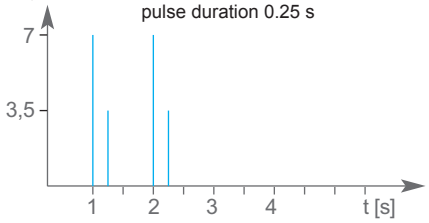


PMF 2020 / PMF 2015

Energy single flash [J]
4 flashes
120 flashes/min.
pulse duration 0.75 s



Energy single flash [J]
2 flashes
120 flashes/min.
pulse duration 0.25 s



Ordering details

Article numbers		PMF 2020 direct mounting GL		PMF 2020 bracket mounting GL		PMF 2015 direct mounting		PMF 2015 bracket mounting	
Lens colour	**Rated voltage**	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC
amber		21009104001	21009804001	21009104011	21009804011	21007104000	21007804000	21007104010	21007804010
red		21009105001	21009805001	21009105011	21009805011	21007105000	21007805000	21007105010	21007805010

Article numbers for other colours and voltages on request

Options / Accessories

GL GOST

See page 108 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.
The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

FLASHING ALARM LIGHTS 15 J
ABL/ABS

The powerful flashing light in a metal housing

- designed for alarm functions outdoors and in large halls and plants
- also available with GL approval
- housing and fixing bracket made of sturdy anodised aluminium
- aggressive environmental conditions or driving rain cannot damage the light
- impact-proof lens
- ideally suited for tough industrial environments
- flash tube additionally secured by a steel clamp

Covering distance as per EN 54

Protection system

Operating temperature

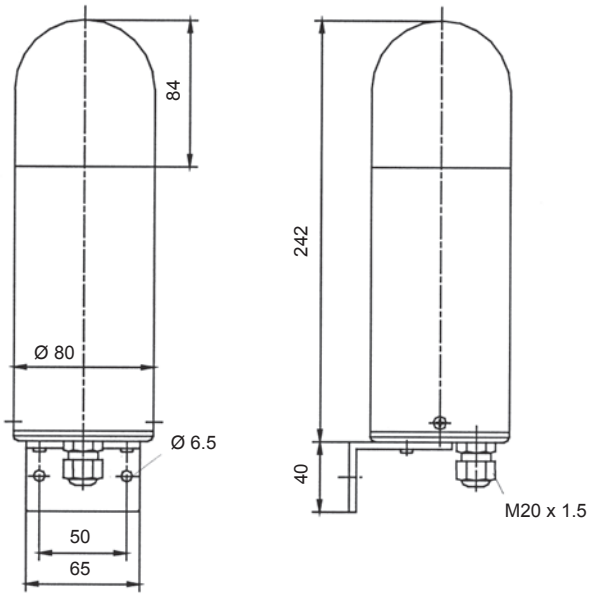
Electrical data AC	ABL					
Rated voltage	230 V AC	127 V AC	110 V AC	48 V AC	42 V AC	24 V AC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Operating range	185 – 255 V	108 – 140 V	95 – 127 V	40 – 54 V	35 – 50 V	20 – 30 V
Nominal current consumption	0.18 A	0.25 A	0.33 A	0.69 A	0.78 A	1.29 A

Electrical data DC	ABS				
Rated voltage	60 V DC	48 V DC	36 V DC	24 V DC	12 V DC
Operating range	50 – 72 V	40 – 60 V	29 – 43 V	18 – 30 V	10 – 15 V
Nominal current consumption	0.26 A	0.35 A	0.55 A	0.7 A	1.5 A

Mechanical data		ABL	ABS
Flash rate		1 Hz = 60 flashes/min.	
Flash energy		15 J	
Light intensity (DIN 5037) [1]		214 cd	
Lens colours		clear, white, yellow, amber, red, green, blue	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 54 (vertical mounting)	
Duty cycle		100%	
Service life of the flash tube		light emission still 70% after 8,000,000 flashes	
Material	lens	polycarbonate (PC)	
	housing	aluminium (Al Mg Si 1), yellow anodised	
	base	polycarbonate (PC) with fibre glass	
Cable entry		M20 x 1.5	
Connecting terminal		single wire 0.5 – 2.5 mm², fine wire 0.5 – 1.5 mm², with cable end sleeves DIN 46228/1	
Weight	AC	650 g	
	DC		800 g

[1] with a clear lens

Dimensions



Ordering details

Article numbers		ABL		ABS
Lens colour	Rated voltage	230 V AC	110 V AC	24 V DC
yellow		210 01 10 3 000	210 01 16 3 000	210 01 80 3 000
amber		210 01 10 4 000	210 01 16 4 000	210 01 80 4 000
red		210 01 10 5 000	210 01 16 5 000	210 01 80 5 000

Article numbers for other colours and voltages on request

Options / Accessories

GL GOST 30 45

Article number:
287 10 50 0 042

See pages 108/109 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

SPECTRA FLASHING LIGHT 15 J
P 400 STR (Ø 140 MM)

Powerful flashing alarm light for universal use

- large variety of mounting methods due to modular design principle:
  – surface-mounted devices for mounting directly or on a wall bracket or a tubular stand
  – also for exposed installation locations through combination of wall bracket and tubular stand
  – cable entry at the side (2 x) or through the base of the housing
- durable, sturdy and functionally reliable due to the use of high-quality plastic
- optimum illumination due to prismatic coloured lens
- electronic components mechanically protected for highest mounting security
- attracts maximum attention due to adjustable flash rates
- synchronous flash sequence operation of several lights

Covering distance as per EN 54

Protection system

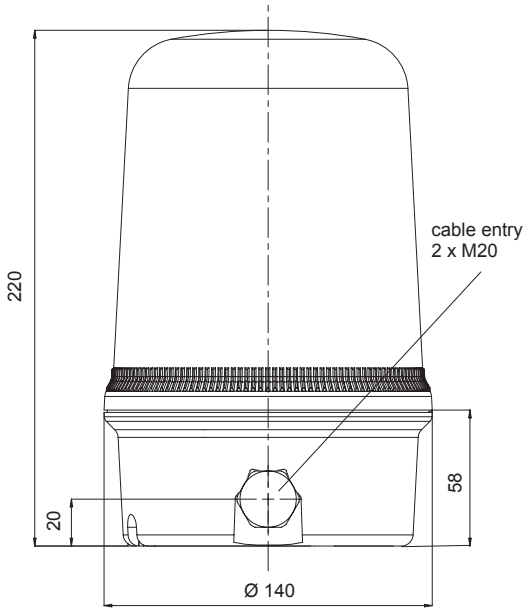
Operating temperature

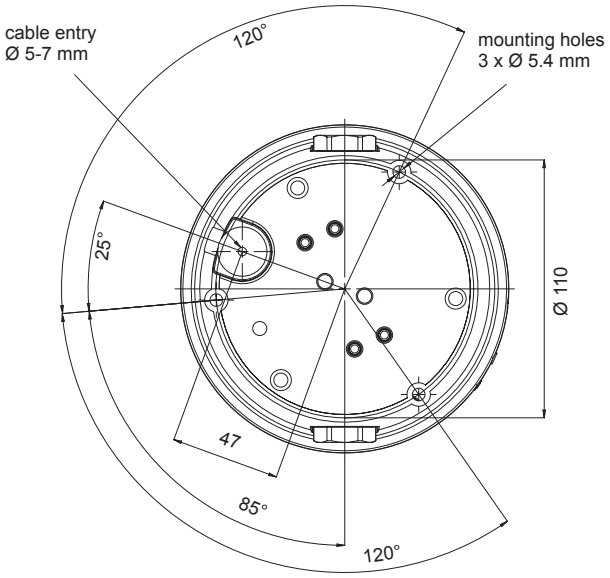
Electrical data	P 400 STR		
Rated voltage	230 V AC	115 V AC	24 V AC/DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz / DC
Operating range	207 – 253 V	100 – 130 V	20 – 28 V
Nominal current consumption	225 mA	400 mA	870 mA

Mechanical data		P 400 STR
Light source		xenon flash tube
Flash rate	230 V / 115 V	1 Hz
	24 V	1 Hz / 1.5 Hz / double flash
Flash energy		15 J @ 1 Hz
Light intensity (DIN 5037) [1]		165 cd
Lens colours		clear, yellow, amber, red, green, blue
Lens type		prismatic
Operating temperature		- 25 °C ... + 50 °C
Relative humidity		90% @ + 20 °C
Protection system according to EN 60529		IP 65
Service life of the flash tube		light emission still 70% after 5,000,000 flashes
Material		polycarbonate (PC)
Design		bayonet with anti-tamper locking screw
Mounting		surface mounting (wall bracket and tubular stand available as accessories)
Cable entry		1 x 5-7 mm push through grommet (bottom side); 2 x M20 cable entries sideways
Connecting terminal		screw terminal 1.5 mm²
Weight	AC	632 g
	DC	696 g

[1] with a clear lens

Dimensions





Ordering details

Article numbers		P 400 STR		
Lens colour	**Rated voltage**	230 V AC	115 V AC	24 V AC/DC
yellow		213 44 10 3 000	213 44 15 3 000	213 44 40 3 000
amber		213 44 10 4 000	213 44 15 4 000	213 44 40 4 000
red		213 44 10 5 000	213 44 15 5 000	213 44 40 5 000

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Wall bracket
Article number:
213 94 00 0 000

Tubular stand 145 mm
Article number:
213 95 00 0 000

Wall holder
only in combination with tubular stand
Article number:
282 50 20 0 000

See pages 110/111 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

FLASHING LIGHTS 13 J
Quadro F12 / Quadro S

Quadro F12

- industrial successor to the legendary Eiffel Tower light
- design adapted to suit industrial requirements; mounted via concealed interior holes or external lugs; fast, flexible and secure
- outstanding mechanical strength with IP 66, IP 67 and IK 08;
- whether in the open air, in a hailstorm or when high pressure cleaning systems are used, the Quadro stays sealed and signals reliably

Quadro S

- automatic synchronised flashing light
- a maximum of 10 flashing lights can be operated parallel and synchronously an unlimited time period; i.e. the flashes of all lights are generated simultaneously

Covering distance as per EN 54

Protection system

Protection system

Impact-proof housing

Operating temperature

Warranty

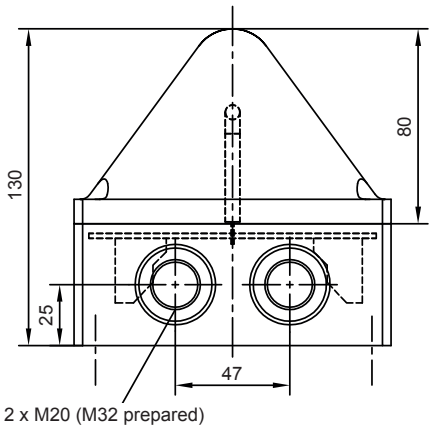
Electrical data	Quadro F12			Quadro S
Rated voltage	230 V AC	115 V AC	24 V DC	230 V AC
Rated frequency	50 / 60 Hz	50 / 60 Hz		50 / 60 Hz
Operating range	195 – 253 V	95 – 127 V	18 – 30 V	195 – 253 V
Nominal current consumption	250 mA	340 mA	700 mA	250 mA
Initial current limited to	< 7 A / 150 µs	< 7 A / 150 µs	< 5 A / 2 ms	< 1 A / 50 ms

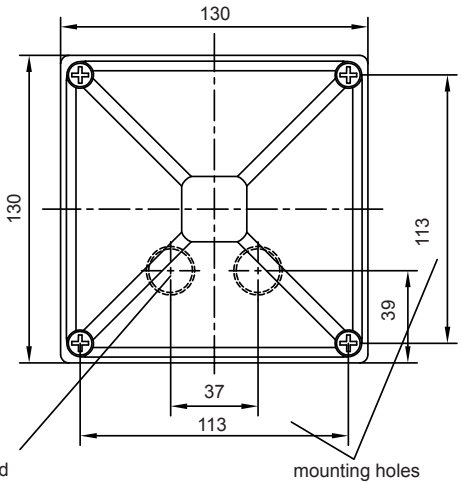
Mechanical data		Quadro F12	Quadro S
Flash rate		1 Hz = 60 flashes/min.	
Flash energy		13 J	
Light intensity (DIN 5037) [1]		140 cd	
Lens colours		clear, white, yellow, amber, red, green, blue	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		100%	
Protection system according to EN 60529		IP 66, IP 67, mounting arbitrary	
Impact resistance as per EN 50102		IK 08	
Protection class		II	
Duty cycle		100%	
Service life of the flash tube		light emission still 70% after 12,000,000 flashes	
Material	lens	polycarbonate (PC)	
	housing	polycarbonate (PC), RAL 7035	
Cable entry		2 x M20 bottom side / 2 x M20/M32 sideways	2 x M20 sideways
Connecting terminal		cage clamp terminal 0.08 - 2.5 mm²	
Mounting	external lugs	113 x 153 mm – M5 or 127.1 x 127.1 mm – M5	
	internal holes	113 x 113 mm	
Weight		600 g	

[1] with a clear lens

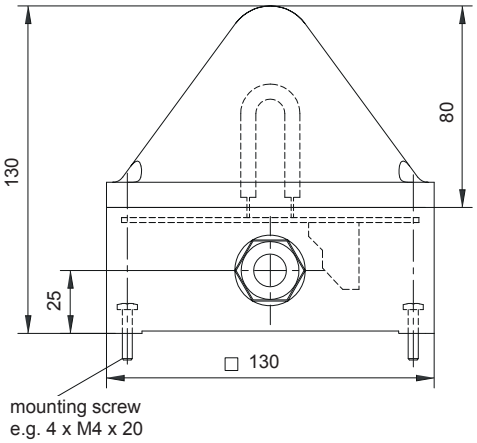
Dimensions

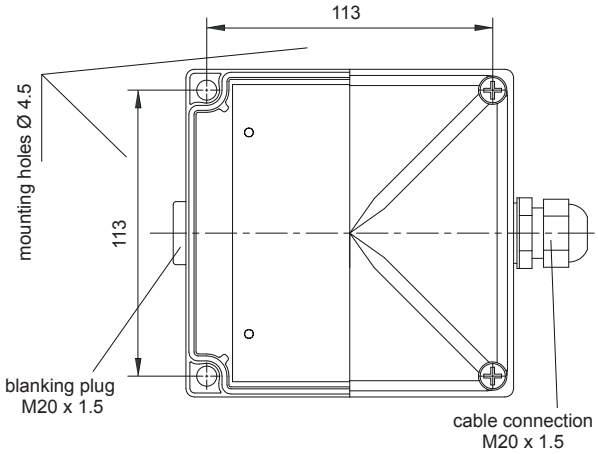
Quadro F12





Quadro S





Additional mounting possible via external lugs (included).

Ordering details

Article numbers		Quadro F12			Quadro S
Lens colour	**Rated voltage**	230 V AC	115 V AC	24 V DC	230 V AC
clear		210 41 10 1 000	210 41 16 1 000	210 41 80 1 000	210 42 10 1 000
yellow		210 41 10 3 000	210 41 16 3 000	210 41 80 3 000	210 42 10 3 000
amber		210 41 10 4 000	210 41 16 4 000	210 41 80 4 000	210 42 10 4 000
red		210 41 10 5 000	210 41 16 5 000	210 41 80 5 000	210 42 10 5 000

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **“Machine safety - visual alarm signals“.**
Requirements contained in the DIN EN 981 standard: **“Machine safety - system of acoustic and visual alarm and information signals“,** can be fulfilled.

The colours ‘red’ for the emergency signal and ‘yellow’ for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
“Coding of display devices and control elements using colours and supplementary means“.

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

PYRA FLASHING LIGHT 10 J
PY X-M-10

- safe – an incorrect installation is virtually impossible
- easy – significantly shorter assembly and installation times
- economical – largest possible signaling range due to effective XENON technology
- installation options with external lugs or internal holes
- choice of four different flash rates via DIP switch
- suitable for panel mounting
- electronic constant current regulation at 24 V DC devices to avoid load fluctuations
- integrated inrush current limitation and undervoltage detection (option)
- providing full synchronization on multi-flashing light systems

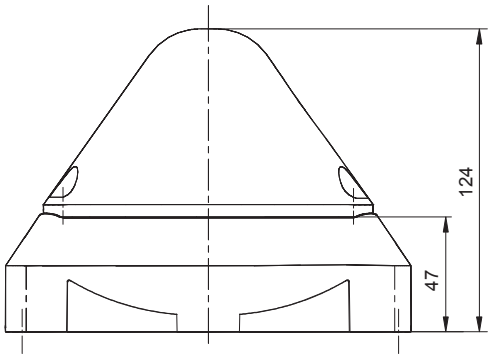
r = 17 m	IP 66	IK 08	+ 55 °C / - 40 °C	EN 54-23	VdS	UL	Sync	10 Years
Covering distance as per EN 54	Protection system	Impact-proof housing	Operating temperature	pending	pending	pending		Warranty

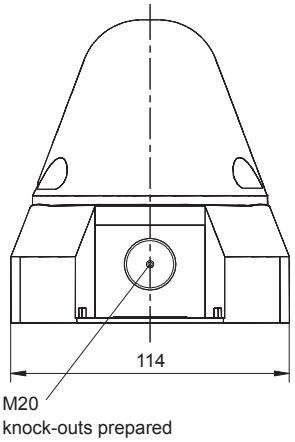
Electrical data	PY X-M-10		
Rated voltage	230 V AC	115 V AC	24 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	
Operating range	187 – 255 V	90 – 135 V	10 – 60 V
Nominal current consumption @ 1 Hz	150 mA	240 mA	540 mA @ 24 V

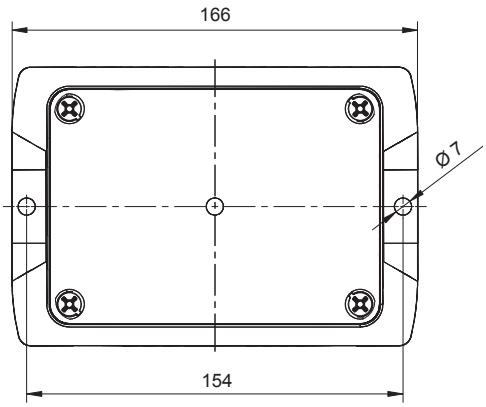
Mechanical data		PY X-M-10
Flash rate		0.1 / 0.5 / 0.75 / 1 Hz (DIP switch)
Flash energy		10 J
Light intensity (DIN 5037) [1]		118 cd
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 40 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		max. 90%
Protection system according to EN 60529		IP 66
Protection class		II
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	PC / ABS
Housing colours		RAL 3000 (flame red) / RAL 7035 (light grey) / RAL 9003 (signal white)
Cable entry		2 x M20 on side, 2 x M20 on bottom
Integrated seal with cable entry		6 – 13 mm
Connecting terminal		2.5 mm² fine wire, AWG 16
Weight		440 g

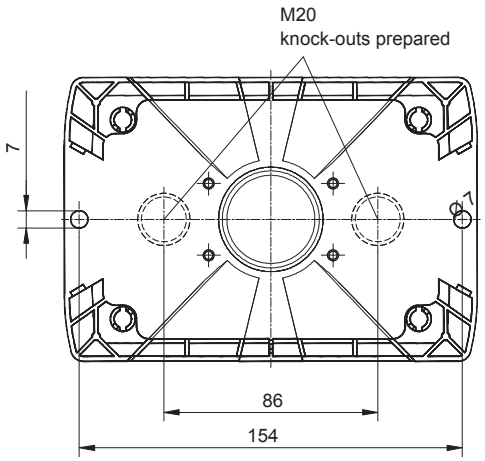
[1] with a clear lens

Dimensions









Ordering details

Article numbers		PY X-M-10 – housing red		
Lens colour	Rated voltage	230 V AC	115 V AC	24 V DC
clear		215 51 10 1 000	215 51 15 1 000	215 51 81 1 000 [1]
yellow		215 51 10 3 000	215 51 15 3 000	215 51 81 3 000
red		215 51 10 5 000	215 51 15 5 000	215 51 81 5 000 [1]
Article numbers		**PY X-M-10 – housing grey**		
Lens colour	Rated voltage	230 V AC	115 V AC	24 V DC
clear		215 51 10 1 055	215 51 15 1 055	215 51 81 1 055 [1]
yellow		215 51 10 3 055	215 51 15 3 055	215 51 81 3 055
red		215 51 10 5 055	215 51 15 5 055	215 51 81 5 055 [1]

Article numbers for other colours and voltages on request

[1] **version with EN 54-23 approval**

Options / Accessories

Surface gasket | **Tamper-proof sealing** | **Panel mounting kit** | I lim t

See page 109 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

PYRA FLASHING LIGHT 5 J
PY X-M-05

- safe – an incorrect installation is virtually impossible
- easy – significantly shorter assembly and installation times
- economical – largest possible signaling range due to effective XENON technology
- installation options with external lugs or internal holes
- choice of four different flash rates via DIP switch
- suitable for panel mounting
- electronic constant current regulation at 24 V AC/DC devices to avoid load fluctuations
- integrated inrush current limitation and undervoltage detection (option)
- providing full synchronization on multi-flashing light systems

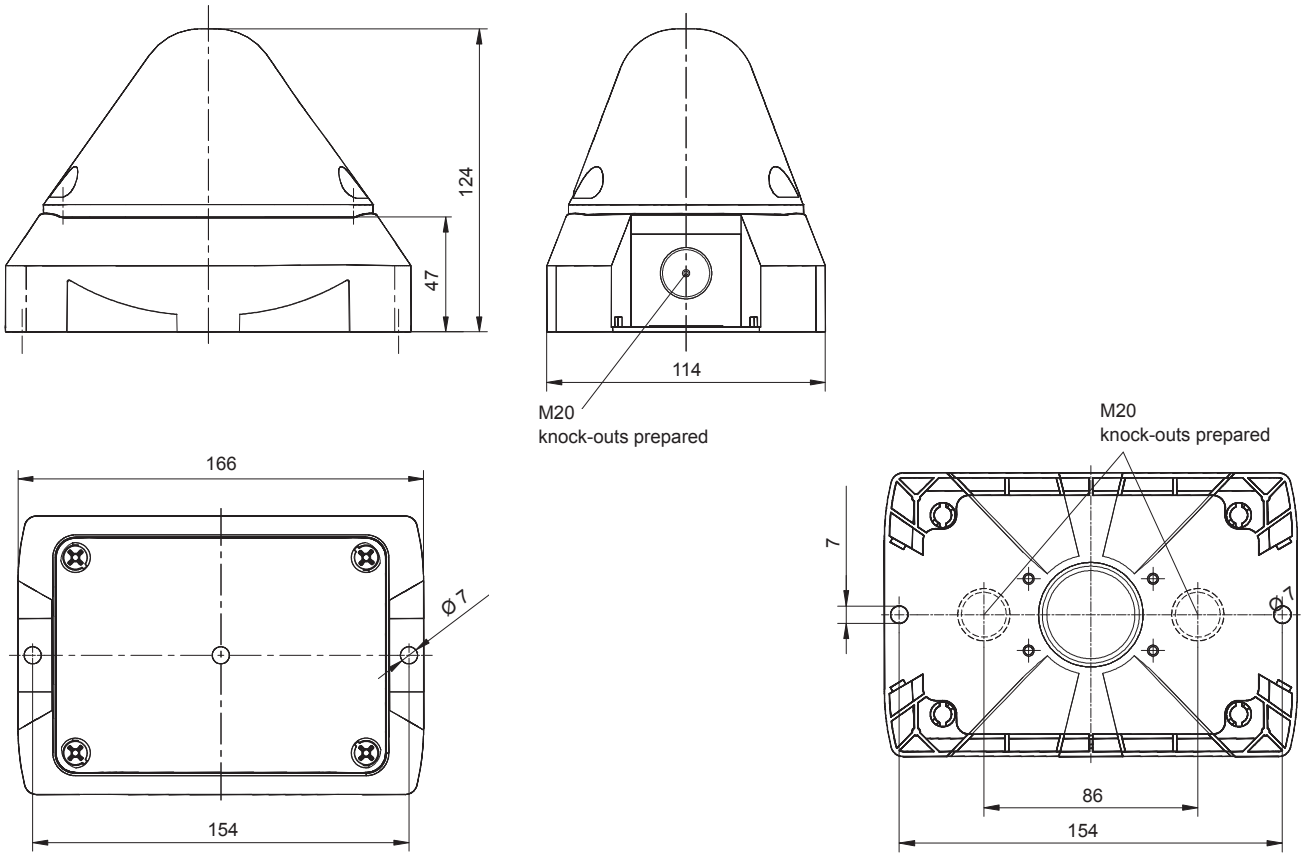
r = 11 m	IP 66	IK 08	+ 55 °C / - 40 °C	EN 54-23	VdS	UL	Sync	10 Years
Covering distance as per EN 54	Protection system	Impact-proof housing	Operating temperature	pending	pending	pending		Warranty

Electrical data	PY X-M-05		
Rated voltage	230 V AC	115 V AC	24 V AC/DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz / DC
Operating range	187 – 255 V	90 – 135 V	AC: 18 – 30 V DC: 10 – 60 V
Nominal current consumption @ 1 Hz	60 mA	110 mA	AC: 600 mA DC: 280 mA @ 24 V

Mechanical data		PY X-M-05
Flash rate		0.1 / 0.5 / 0.75 / 1 Hz (DIP switch)
Flash energy		5 J
Light intensity (DIN 5037) [1]		44 cd
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 40 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		max. 90%
Protection system according to EN 60529		IP 66
Protection class		II
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	PC / ABS
Housing colours		RAL 3000 (flame red) / RAL 7035 (light grey) / RAL 9003 (signal white)
Cable entry		2 x M20 on side, 2 x M20 on bottom
Integrated seal with cable entry		6 – 13 mm
Connecting terminal		2.5 mm² fine wire, AWG 16
Weight	AC	400 g
	AC/DC	420 g

[1] with a clear lens

Dimensions



Ordering details

Article numbers		PY X-M-05 – housing red		
Lens colour	Rated voltage	230 V AC	115 V AC	24 V AC/DC
clear		215 50 10 1 000	215 50 15 1 000	215 50 81 1 000 [1]
yellow		215 50 10 3 000	215 50 15 3 000	215 50 81 3 000
red		215 50 10 5 000	215 50 15 5 000	215 50 81 5 000 [1]
Article numbers		**PY X-M-05 – housing grey**		
Lens colour	Rated voltage	230 V AC	115 V AC	24 V AC/DC
clear		215 50 10 1 055	215 50 15 1 055	215 50 81 1 055 [1]
yellow		215 50 10 3 055	215 50 15 3 055	215 50 81 3 055
red		215 50 10 5 055	215 50 15 5 055	215 50 81 5 055 [1]

Article numbers for other colours and voltages on request

[1] **version with EN 54-23 approval**

Options / Accessories

Surface gasket | **Tamper-proof sealing** | **Panel mounting kit** | I lim t

See page 109 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

FLASHING WARNING LIGHTS 5 J
WBL/WBS / WBL-PX

The classics of flashing lights
- sturdy metal housing
- universally usable
- also available with GL approval
- housing and fixing bracket made of sturdy anodised aluminium
- aggressive environmental conditions or driving rain cannot damage the light
- impact-proof lens
- ideally suited for tough industrial environments
- flash tube additionally secured by a steel clamp

Covering distance as per EN 54

Protection system

Operating temperature

WBL-PX

Electrical data AC	WBL				
Rated voltage	230 V AC	110 V AC	48 V AC	42 V AC	24 V AC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Operating range	185 – 255 V	90 – 135 V	40 – 54 V	35 – 50 V	20 – 30 V
Nominal current consumption	0.07 A	0.1 A	0.47 A	0.5 A	0.77 A

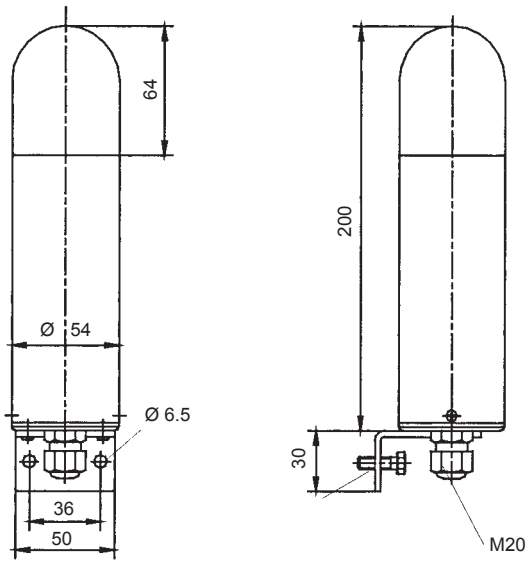
Electrical data DC	WBS					
Rated voltage	110 V DC	80 V DC	60 V DC	48 V DC	24 V DC	12 V DC
Operating range	88 – 132 V	64 – 96 V	50 – 72 V	40 – 60 V	18 – 35 V	10 – 15 V
Nominal current consumption	0.09 A	0.11 A	0.13 A	0.18 A	0.25 A	0.6 A

Electrical data	WBL-PX
Rated voltage	230 V AC
Rated frequency	50 / 60 Hz
Operating range	185 – 255 V
Nominal current consumption	0.055 A
Initial current limited to	≤ 6 A / 110 µs

Mechanical data		WBL	WBS	WBL-PX
Flash rate		1 Hz = 60 flashes/min.		
Flash energy		5 J		
Light intensity (DIN 5037) [1]		44 cd		
Lens colours		clear, white, yellow, amber, red, green, blue		
Operating temperature		- 40 °C ... + 55 °C		
Storage temperature		- 40 °C ... + 70 °C		
Relative humidity		90%		
Protection system according to EN 60529		IP 54 (vertical mounting)		
Duty cycle		100%		
Service life of the flash tube		light emission still 70% after 8,000,000 flashes		
Material	lens	polycarbonate (PC)		
	housing	aluminium (Al Mg Si 1), yellow anodised		
	base	polycarbonate (PC) with fibre glass		
Cable entry		M20 x 1.5		
Connecting terminal		single wire 0.5 – 2.5 mm², fine wire 0.5 – 1.5 mm², with cable end sleeves DIN 46228/1		
Weight	AC	260 g		260 g
	DC		300 g	

[1] with a clear lens

Dimensions



Ordering details

Article numbers		WBL		WBS	
Lens colour	Rated voltage	230 V AC	110 V AC	60 V DC	24 V DC
yellow		210 03 10 3 000	210 03 16 3 000	210 03 65 3 000	210 03 80 3 000
amber		210 03 10 4 000	210 03 16 4 000	210 03 65 4 000	210 03 80 4 000
red		210 03 10 5 000	210 03 16 5 000	210 03 65 5 000	210 03 80 5 000

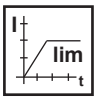
Article numbers		WBL-PX
Lens colour	Rated voltage	230 V AC
yellow		210 03 10 3 175

Article numbers for other colours and voltages on request

Options / Accessories

GL

GOST



Article number:
287 10 50 0 041

See pages 108/109 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

FLASHING WARNING LIGHTS 5 J WBLR/WBSR

Visual alarm in compact plastic housing

- especially suitable for outdoor applications due to high protection system
- mounting via concealed interior holes
- safe mounting without breaching IP protection
- flash tube additionally secured by a steel clamp

r = 11 m
Covering distance as per EN 54

IP 65
Protection system

+ 55 °C
- 40 °C
Operating temperature

VdS
24 V DC, 48 V DC

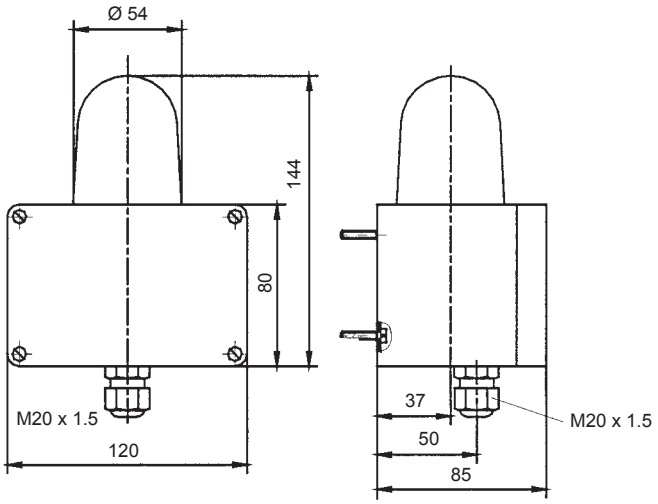
Electrical data AC	WBLR				
Rated voltage	230 V AC	110 V AC	48 V AC	42 V AC	24 V AC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Operating range	185 – 255 V	90 – 135 V	40 – 54 V	35 – 50 V	20 – 30 V
Nominal current consumption	0.07 A	0.1 A	0.47 A	0.5 A	0.77 A

Electrical data DC	WBSR					
Rated voltage	110 V DC	80 V DC	60 V DC	48 V DC	24 V DC	12 V DC
Operating range	88 – 132 V	64 – 96 V	50 – 72 V	40 – 60 V	18 – 35 V	10 – 15 V
Nominal current consumption	0.09 A	0.11 A	0.13 A	0.18 A	0.25 A	0.6 A

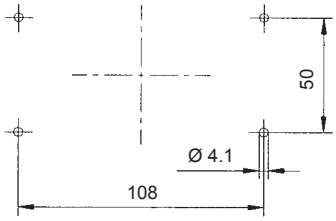
Mechanical data		WBLR	WBSR
Flash rate		1 Hz = 60 flashes/min.	
Flash energy		5 J	
Light intensity (DIN 5037) [1]		44 cd	
Lens colours		clear, white, yellow, amber, red, green, blue	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 65	
Duty cycle		100%	
Service life of the flash tube		light emission still 70% after 8,000,000 flashes	
Material	lens	polycarbonate (PC)	
	housing	ABS, light grey, similar to RAL 7035	
Cable entry		M20 x 1.5	
Connecting terminal		single wire 0.5 – 2.5 mm², fine wire 0.5 – 1.5 mm², with cable end sleeves DIN 46228/1	
Weight	AC	290 g	
	DC	300 g	

[1] with a clear lens

Dimensions



Mounting holes



Ordering details

Article numbers		WBLR		WBSR
Lens colour	**Rated voltage**	230 V AC	110 V AC	24 V DC
yellow		210 04 10 3 000	210 04 16 3 000	210 04 80 3 000
amber		210 04 10 4 000	210 04 16 4 000	210 04 80 4 000
red		210 04 10 5 000	210 04 16 5 000	210 04 80 5 000

Article numbers for other colours and voltages on request

Options / Accessories

GL

GOST

Article number:
287 10 50 0 043

See pages 108/109 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

SPECTRA FLASHING LIGHT 5 J
P 300 STR (Ø 100 MM)

Flashing warning light for universal use

- large variety of mounting methods due to modular design principle:
  – surface-mounted devices for mounting directly or on a wall bracket or a tubular stand
  – also for exposed installation locations through combination of wall bracket and tubular stand
  – cable entry at the side or through the base of the housing
- durable, sturdy and functionally reliable due to the use of high-quality plastic
- optimum illumination due to prismatic coloured lens
- electronic components mechanically protected for highest mounting security
- synchronous flash sequence operation of several lights

Covering distance as per EN 54

Protection system

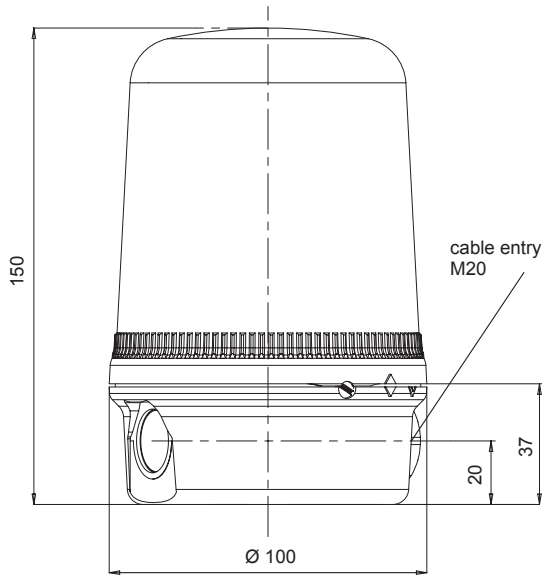
Operating temperature

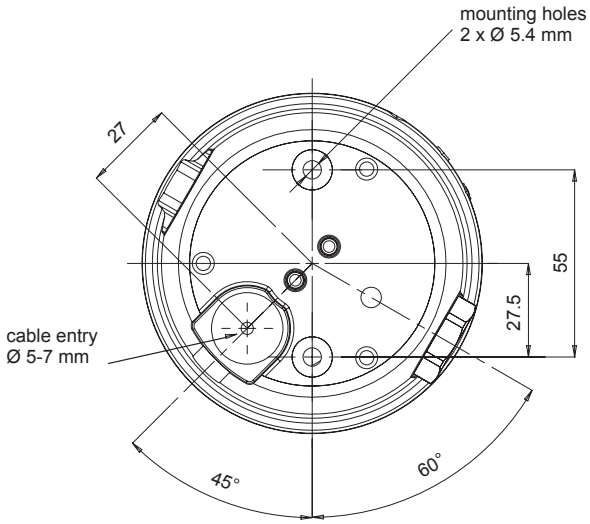
Electrical data	P 300 STR		
Rated voltage	230 V AC	115 V AC	24 V AC/DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	20 – 28 V
Operating range	207 – 253 V	100 – 130 V	250 mA / 300 mA
Nominal current consumption	35 mA	70 mA	

Mechanical data		P 300 STR
Light source		xenon flash tube
Flash rate	230 V / 115 V	1 Hz
	24 V	1 Hz / 1.5 Hz / double flash
Flash energy		5 J @ 1 Hz
Light intensity (DIN 5037) [1]		40 cd
Lens colours		clear, yellow, amber, red, green, blue
Lens type		prismatic
Operating temperature		- 25 °C ... + 50 °C
Relative humidity		90% @ + 20 °C
Protection system according to EN 60529		IP 65
Service life of the flash tube		light emission still 70% after 5,000,000 flashes
Material		polycarbonate (PC), UL 94 VO f1
Design		bayonet with anti-tamper locking screw
Mounting		surface mounting (wall bracket and tubular stand available as accessories)
Cable entry		1 x 5-7 mm push through grommet (bottom side); 1 x M20 cable entry sideways
Connecting terminal		screw terminal 1.5 mm²
Weight	AC	300 g
	DC	325 g

[1] with a clear lens

Dimensions





Ordering details

Article numbers		P 300 STR		
Lens colour	**Rated voltage**	230 V AC	115 V AC	24 V AC/DC
yellow		213 34 10 3 000	213 34 15 3 000	213 34 40 3 000
amber		213 34 10 4 000	213 34 15 4 000	213 34 40 4 000
red		213 34 10 5 000	213 34 15 5 000	213 34 40 5 000

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Wall bracket
Article number:
213 92 00 0 000

Tubular stand 140 mm
Article number:
213 93 00 0 000

Wall holder only in combination with tubular stand
Article number:
282 50 20 0 000

See pages 110/111 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

PYRA COMPACT FLASHING LIGHT 5 J
PY X-S-05

The compact flashing light is not only adaptable to many applications, but it is also impressive due to its safe and simple mounting

- installation options with external lugs or internal holes
- simple electrical connection on the bottom of the casing
- impact-proof lens
- suitable for panel mounting
- housing colours: red, grey or white
- optional with Soft-Start-Module for reduction of starting current
- modular design: housing can be easily stacked side-by side

EN 54-23-relevant data you can find on pages 20-22, or just call us!

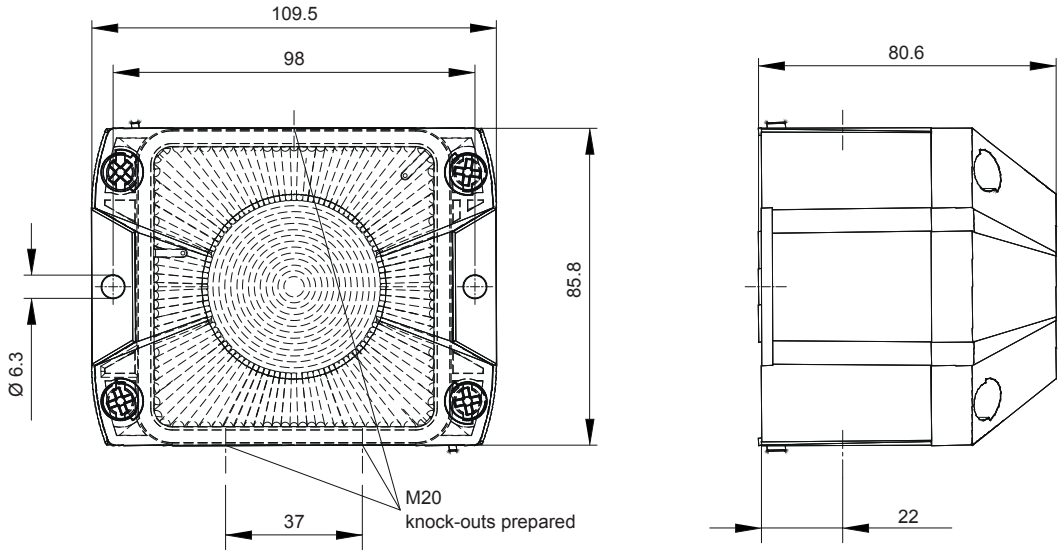
r = 11 m	IP 66	IK 08	+ 55 °C / - 40 °C	EN 54-23	VdS	UL	10 Years
Covering distance as per EN 54	Protection system	Impact-proof housing	Operating temperature	24 V DC, 48 V DC	24 V DC, 48 V DC		Warranty

Electrical data	PY X-S-05					
Rated voltage	230 V AC	115 V AC	24 V AC	48 V DC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range	187 – 255 V	90 – 135 V	18 – 30 V	40 – 60 V	18 – 30 V	12 – 15 V
Nominal current consumption	55 mA	100 mA	800 mA	170 mA	300 mA	600 mA

Mechanical data		PY X-S-05
Flash rate		1 Hz = 60 flashes/min.
Flash energy		5 J
Light intensity (DIN 5037) [1]		44 cd (max. 55 cd)
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 40 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		max. 90%
Protection system according to EN 60529		IP 66
Protection class		II
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	PC / ABS blend
Colour	housing	similar to RAL 3000 (flame red) / RAL 7035 (light grey) / RAL 9003 (signal white)
Cable entry		3 x M20 knock-outs on side, 1 knock-out on back
Integrated seal with cable entry		6 – 13 mm (feed-through grommet)
Connecting terminal		2.5 mm² fine wire with cable end sleeve, AWG 16
Weight	AC	165 g
	DC	200 g

[1] with a clear lens

Dimensions



Ordering details

Article numbers		PY X-S-05 – housing red		
Lens colour	Rated voltage	230 V AC	115 V AC	24 V DC
clear				215 10 80 1 000 [1]
yellow		215 10 10 3 000	215 10 15 3 000	215 10 80 3 000
amber		215 10 10 4 000	215 10 15 4 000	215 10 80 4 000
red		215 10 10 5 000	215 10 15 5 000	215 10 80 5 000 [1]
Article numbers		**PY X-S-05 – housing grey**		
Lens colour	Rated voltage	230 V AC	115 V AC	24 V DC
clear			215 10 15 1 055	215 10 80 1 055 [1]
yellow		215 10 10 3 055	215 10 15 3 055	215 10 80 3 055
amber		215 10 10 4 055	215 10 15 4 055	215 10 80 4 055
red		215 10 10 5 055	215 10 15 5 055	215 10 80 5 055 [1]

Article numbers for other colours and voltages on request

[1] **version with EN 54-23 approval**

Options / Accessories

GL

MED

CNBOP

Enclo-sure fitting

Surface gasket

Tamper-proof sealing

Panel mount-ing kit

SSM
(only for 24 V DC)

See pages 109/112 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

FLASHING WARNING LIGHTS 2.5 J DWBL/DWBS

Flashing light for direct installation at the workstation

- no dazzle – but secure alarm function
- also available with GL approval
- housing and fixing bracket made of sturdy anodised aluminium
- impact-proof lens
- flash tube additionally secured by a steel clamp

Covering distance as per EN 54

Protection system

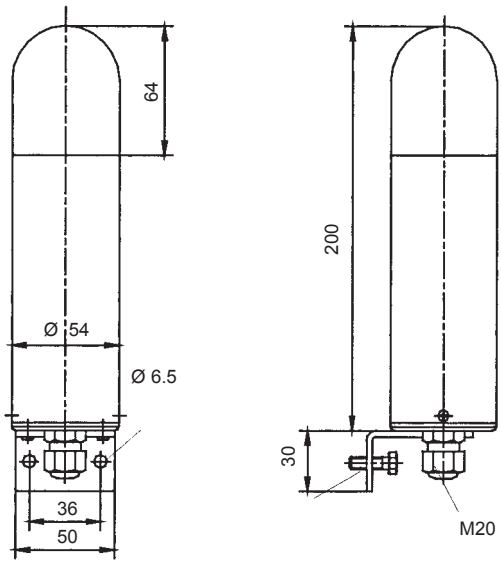
Operating temperature

Electrical data AC	DWBL				
Rated voltage	230 V AC	110 V AC	48 V AC	42 V AC	24 V AC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Operating range	185 – 255 V	90 – 135 V	40 – 54 V	35 – 50 V	20 – 30 V
Nominal current consumption	0.04 A	0.05 A	0.26 A	0.29 A	0.5 A
Electrical data DC	**DWBS**				
Rated voltage	12 V DC	24 V DC	48 V DC	60 V DC	80 V DC
Operating range	10 – 15 V	18 – 30 V	40 – 60 V	50 – 72 V	64 – 96 V
Nominal current consumption	0.27 A	0.15 A	0.1 A	0.07 A	0.067 A

Mechanical data		DWBL	DWBS
Flash rate		1 Hz = 60 flashes/min.	
Flash energy		2.5 J	
Light intensity (DIN 5037) [1]		8 cd	
Lens colours		clear, white, yellow, amber, red, green, blue	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 54 (vertical mounting)	
Duty cycle		100%	
Service life of the flash tube		light emission still 70% after 8,000,000 flashes	
Material	lens	polycarbonate (PC)	
	housing	aluminium (Al Mg Si 1), yellow anodised	
	base	polycarbonate (PC) with fibre glass	
Cable entry		M20 x 1.5	
Connecting terminal		single wire 0.5 – 2.5 mm², fine wire 0.5 – 1.5 mm², with cable end sleeves DIN 46228/1	
Weight	AC	270 g	
	DC		300 g

[1] with a clear lens

Dimensions



Ordering details

Article numbers		DWBL		DWBS
Lens colour	Rated voltage	230 V AC	110 V AC	24 V DC
yellow		210 05 10 3 000	210 05 16 3 000	210 05 80 3 000
amber		210 05 10 4 000	210 05 16 4 000	210 05 80 4 000
red		210 05 10 5 000	210 05 16 5 000	210 05 80 5 000

Article numbers for other colours and voltages on request

Options / Accessories

GL

GOST

30

90

120

Article number:
287 10 50 0 041

See pages 108/109 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

LED MULTI-FUNCTION LIGHT
PMF-LED Flex

Multi-function light with the brightest LED technology
- rotating mirror effect, extremely low power consumption
- highly insensitive to vibration
- maintenance-free service life exceeding 50,000 hrs
- externally selectable operating mode, one device for 4 different alarms:
  – continuous light
  – blinking light
  – flashing light
  – rotating beacon effect without susceptible mechanics
- inexpensive and flexible; wide range power supplies as standard
- 24 V AC/DC devices as standard with soft-start module
- can be operated directly via 24 V transistor PLC output, no additional relay control necessary
- long-life replacement for conventional rotating mirror lights

Covering distance as per EN 54

Protection system

Operating temperature

Electrical data	PMF-LED Flex			
Rated voltage	115 V AC	230 V AC	230 V DC	24 V AC/DC
Operating range	95 – 253 V AC		100 – 350 V DC	10 – 60 V DC / 15 – 40 V AC
Current consumption in continuous light mode	90 mA	60 mA	55 mA	DC: 250 mA

Mechanical data		PMF-LED Flex			
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 source		8 x 2 LEDs (3 chip version)			
Light intensity (DIN 5037) [1]		30 cd			
Lens colours		amber, red, green, blue			
Lens type		lens with fresnel characteristic			
Beam angle	vertical	approx. 16°			
	horizontal	360°			
Operating temperature		- 30 °C ... + 55 °C			
Storage temperature		- 40 °C ... + 70 °C			
Relative humidity		90%			
Protection system according to EN 60529		IP 55 (vertical mounting)			
Duty cycle		100%			
Service life of light source		> 50,000 hrs			
Material	lens	polycarbonate (PC)			
	housing	bracket mounting: polycarbonate (PC) / direct mounting: acrylonitrile butadiene styrene (ABS)			
Cable entry	bracket mounting	M20 x 1.5			
Connecting terminal		cage clamp terminal 0.08 - 2.5 mm²			
Weight		direct mounting: 620 g / bracket mounting: 900 g			

[1] with a clear lens

Operating modes

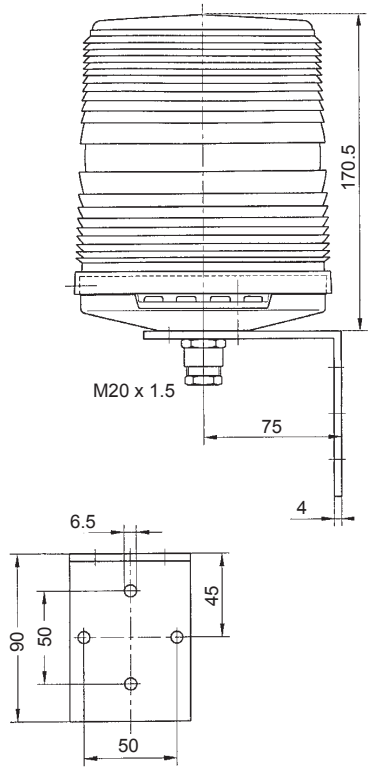
S1			Selection via internal DIP switch	
1	2	3		
OFF	OFF	OFF	OFF	
OFF	OFF	ON	all-round light	2.5 Hz
OFF	ON	OFF	continuous light	
OFF	ON	ON	blinking light	1.5 Hz
ON	OFF	OFF	flashing light	1 Hz
ON	OFF	ON	all-round light	2.5 Hz
ON	ON	OFF	continuous light	
ON	ON	ON	blinking light	1.5 Hz

S1 - 1	X1 - 1	2	3	4	Selection via external control	
(S1-2 = OFF, S1-3 = OFF)						
OFF	-/N	+/L			OFF (standby)	
OFF	-/N	+/L		+/L	all-round light	2.5 Hz
OFF	-/N	+/L	+/L		continuous light	
OFF	-/N	+/L	+/L	+/L	blinking light	1.5 Hz
ON	-/N	+/L			flashing light	1 Hz
ON	-/N	+/L		+/L	all-round light	2.5 Hz
ON	-/N	+/L	+/L		continuous light	
ON	-/N	+/L	+/L	+/L	blinking light	1.5 Hz

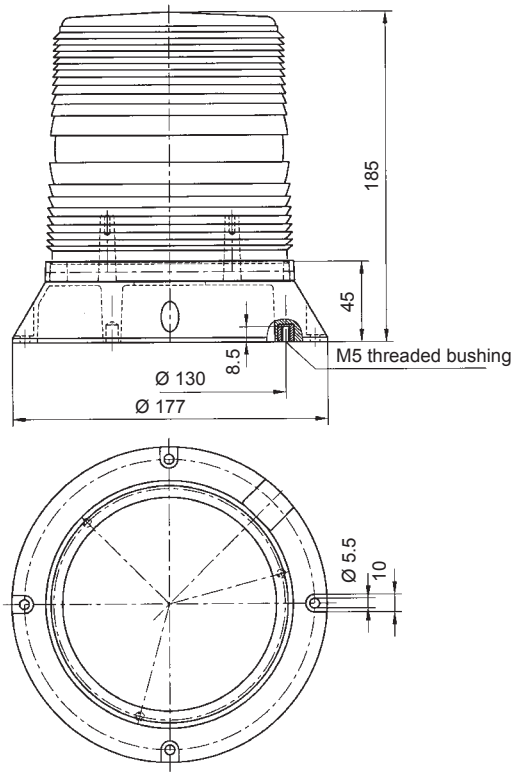
S1 - 1	X1 - 1	2	3	4	Selection via BAV option (24 V AC/DC only)	
(S1-2 = OFF, S1-3 = OFF)						
OFF	-/N			+/L	all-round light	2.5 Hz
OFF	-/N		+/L		continuous light	
OFF	-/N		+/L	+/L	blinking light	1.5 Hz
ON	-/N	+/L			flashing light	1 Hz
ON	-/N			+/L	all-round light	2.5 Hz
ON	-/N		+/L		continuous light	
ON	-/N		+/L	+/L	blinking light	1.5 Hz

Dimensions

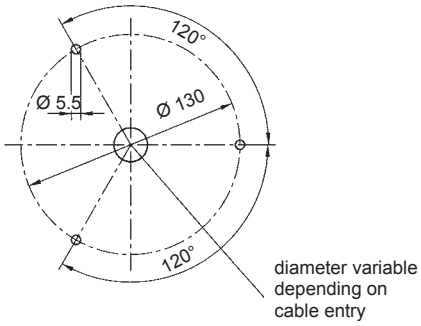
Bracket mounting



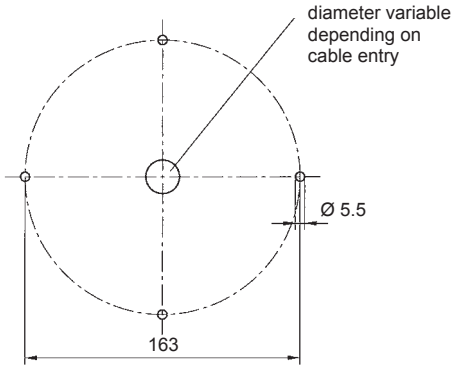
Direct mounting



Drilling template 1 for M5 threaded bushing



Drilling template 2



Ordering details

Article numbers		PMF-LED Flex direct mounting		PMF-LED Flex bracket mounting	
Lens colour	**Rated voltage**	230 V	24 V AC/DC	230 V	24 V AC/DC
amber		211 51 64 4 006	211 51 63 4 006	211 51 64 4 007	211 51 63 4 007
red		211 51 64 5 006	211 51 63 5 006	211 51 64 5 007	211 51 63 5 007

Article numbers for other colours on request

Conformity to standards

The visual characteristics of LED lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

SPECTRA LED MULTI-FUNCTION LIGHTS
P 400 LDA (Ø 140 MM) / P 300 LDA (Ø 100 MM)

P 400 LDA

Covering distance as per EN 54

P 300 LDA

Covering distance as per EN 54

Protection system

Operating temperature

LED multi-function lights for extreme requirements

- energy-saving and durable thanks to the use of maintenance-free LED technology
- as standard with on-site selectable signaling mode (9 different modes)
- externally switchable signaling mode (for DC versions only)
- large variety of mounting methods due to modular design principle:
  – surface-mounted devices for mounting directly or on a wall bracket or a tubular stand
  – also for exposed installation locations through combination of wall bracket and tubular stand
  – cable entry at the side or through the base of the housing
- durable, sturdy and functionally reliable due to the use of high-quality plastic
- optimum illumination due to prismatic coloured lens

Electrical data	P 400 LDA			P 300 LDA	
Rated voltage	115 V AC	230 V AC	12 / 24 V DC	115 / 230 V AC	12 / 24 V DC
Operating range	100 – 130 V	207 – 253 V	10 – 50 V	90 – 253 V	10 – 50 V
Nominal current consumption	140 mA	70 mA	400 mA @ 24 V DC	90 mA @ 115 V AC 50 mA @ 230 V AC	130 mA @ 24 V DC

Mechanical data		P 400 LDA	P 300 LDA
Operating mode		LED multi-function light with 9 internally selectable operating modes	
Light source		high output LED array	
Light intensity (DIN 5037) [1]		30 cd	20 cd
Lens colours		yellow, amber, red, green, blue	
Lens type		prismatic	
Operating temperature		- 25 °C ... + 50 °C	
Relative humidity		90% @ + 20 °C	
Protection system according to EN 60529		IP 65	
Service life of light source		> 50,000 hrs	
Material		polycarbonate (PC), UL 94 VO f1	
Design		bayonet with anti-tamper locking screw	
Mounting		surface mounting (wall bracket and tubular stand available as accessories)	
Cable entry		1 x 5-7 mm push through grommet (bottom side); 2 x M20 cable entries sideways	
Connecting terminal		screw terminal 1.5 mm²	
Weight	AC	595 g	285 g
	DC	845 g	285 g

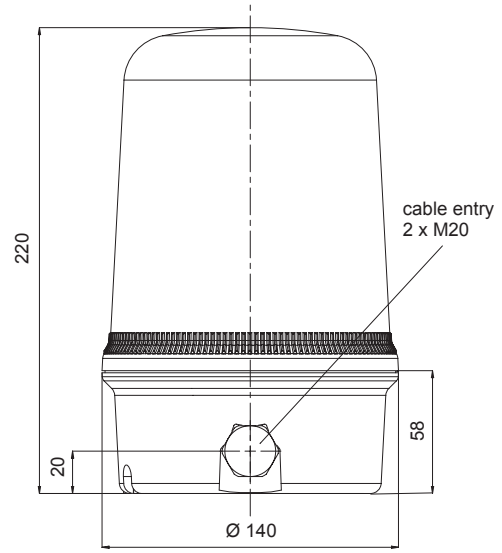
[1] with a clear lens

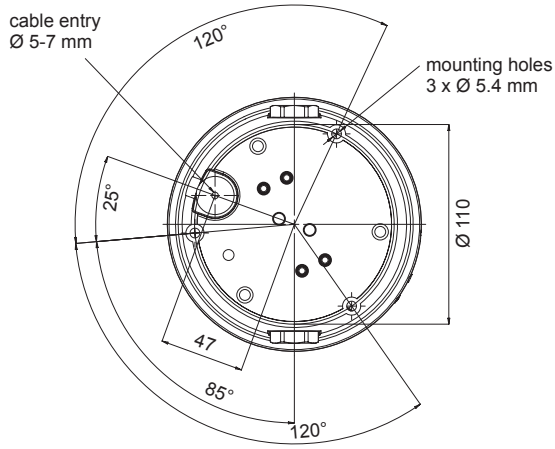
Operating modes Stage 1: internally selectable, stages 2 & 3 externally controllable (DC lights only)

	P 400 LDA			P 300 LDA	
Mode	**Stage 1**	**Stage 2 (only DC)**	**Stage 3 (only DC)**	**Stage 1**	**Stage 2 (only DC)**
1	all LEDs on	alternating flash 2 Hz	double flash 2 Hz	all LEDs on	alternating flash 2 Hz
2	rotation: slow “on”	alternating flash 2 Hz	all LEDs on	rotation: slow “on”	alternating flash 2 Hz
3	single flash 2 Hz	rotation: fast “off”	all LEDs on	single flash 2 Hz	rotation: fast “off”
4	rotation: fast “on”	single flash 2 Hz	all LEDs on	rotation: fast “on”	single flash 2 Hz
5	rotation: slow “off”	double flash 1 Hz	all LEDs on	rotation: slow “off”	double flash 1 Hz
6	double flash 1 Hz	rotation: fast “off”	all LEDs on	double flash 1 Hz	rotation: fast “off”
7	rotation: fast “off”	double flash 2 Hz	all LEDs on	rotation: fast “off”	double flash 2 Hz
8	double flash 2 Hz	alternating flash 2 Hz	double flash 2 Hz	alternating flash 2 Hz	all LEDs on
9	alternating flash 2 Hz	rotation: fast “off”	alternating flash 2 Hz	rotation: fast “off”	all LEDs on

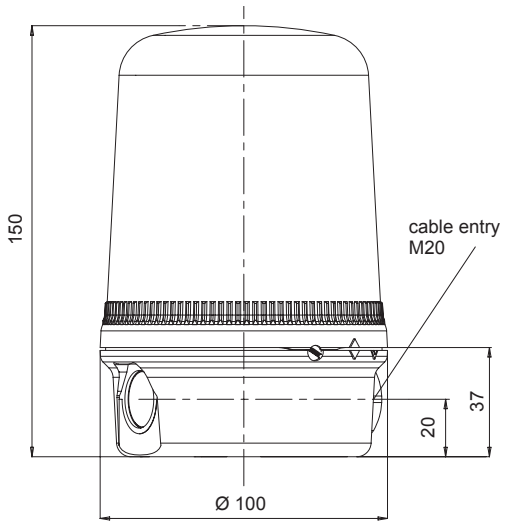
Dimensions

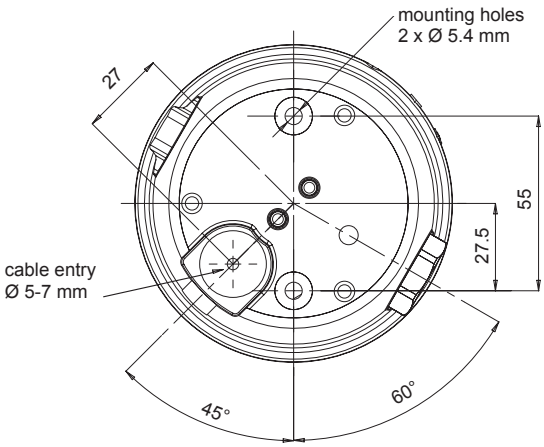
P 400 LDA





P 300 LDA





Ordering details

Article numbers		P 400 LDA			P 300 LDA	
Lens colour	**Rated voltage**	230 V AC	115 V AC	12 / 24 V DC	115 / 230 V AC	12 / 24 V DC
yellow		213 48 10 3 000	213 48 15 3 000	213 48 90 3 000	213 38 17 3 000	213 38 90 3 000
amber		213 48 10 4 000	213 48 15 4 000	213 48 90 4 000	213 38 17 4 000	213 38 90 4 000
red		213 48 10 5 000	213 48 15 5 000	213 48 90 5 000	213 38 17 5 000	213 38 90 5 000

Article numbers for other colours on request

Options / Accessories

GOST

Wall bracket for P 400
Article number:
213 94 00 0 000

Wall bracket for P 300
Article number:
213 92 00 0 000

Tubular stand 145 mm for P 400
Article number:
213 95 00 0 000

Tubular stand 140 mm for P 300
Article number:
213 93 00 0 000

Wall holder only in combination with tubular stand
Article number:
282 50 20 0 000

See pages 110/111 for further information

Conformity to standards

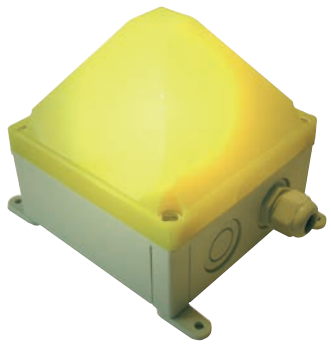
The visual characteristics of LED lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

LED MULTI-FUNCTION LIGHT
Quadro-LED-HI



Designed for tough requirements under industrial conditions

- innovative LED-Leuchte mit großer Signalwirkung
- suitable for indoor and outdoor use
- extremely insensitive to shock and vibration
- 3 selectable operating modes as standard:
  – continuous light
  – blinking light
  – flashing light
- 24 V AC/DC devices as standard with soft-start module
- double-pole terminal
- inexpensive and flexible; wide range power supplies as standard

r = 16 m	IP 66	IP 67	IK 08	+ 55 °C / - 30 °C	10 Years
Covering distance as per EN 54	Protection system	Protection system	Impact-proof housing	Operating temperature	Warranty

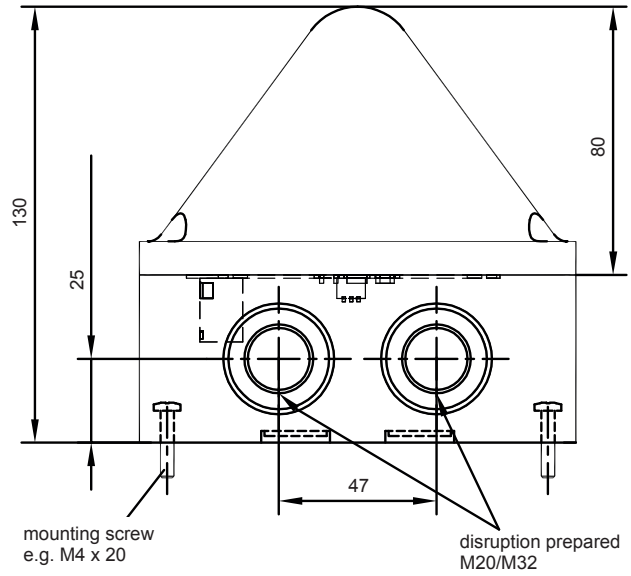
Electrical data		Quadro-LED-HI	
Rated voltage		115 / 230 V AC	24 V DC
Rated frequency		50 / 60 Hz	60 Hz
Operating range	AC	95 – 253 V	–
	DC	–	11 – 60 V
Current consumption in continuous light mode		100 mA	180 mA @ 24 V DC

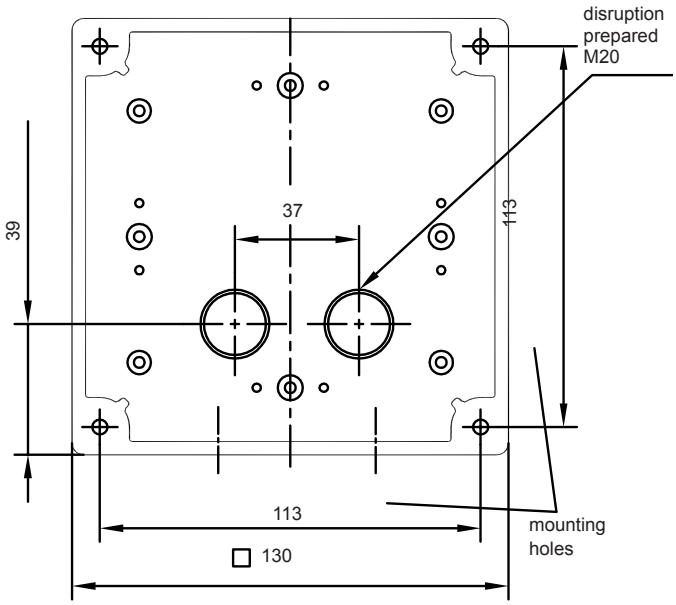
Q2/2015

Mechanical data		Quadro-LED-HI		
Operating mode (internally and externally selectable)		continuous light	blinking light	flashing light
Light alternation frequency			1 Hz / 2 Hz	0.1 Hz / 0.5 Hz / 0.75 Hz / 1 Hz / 2 Hz
Light source		4 high output LED		
Light intensity (DIN 5037) [1]		70 cd (reducible)		
Lens colours		clear, white, yellow, amber, red, green, blue		
Operating temperature		- 30 °C ... + 55 °C		
Storage temperature		- 40 °C ... + 70 °C		
Relative humidity		100%		
Protection system according to EN 60529		IP 66, IP 67, mounting arbitrary		
Impact resistance as per EN 50102		IK 08		
Protection class		II		
Service life of light source		≥ 50,000 hrs		
Material	lens	polycarbonate (PC)		
	housing	polycarbonate (PC), grey RAL 7035		
Cable entry		2 x M20/M32 sideways, 2 x M20 bottom side		
Connecting terminal		spring-type terminal 0.08 – 2.5 mm² (2 per Pol)		
Weight		500 g		

[1] with a clear lens

Dimensions





Additional mounting possible via external lugs (included).

Operating modes

S1			Quadro-LED-HI	
1	2	3		
OFF	OFF	OFF	continuous light	
ON	OFF	OFF	flashing light	1 Hz
OFF	ON	OFF	flashing light	2 Hz
ON	ON	OFF	flashing light	0.75 Hz
OFF	OFF	ON	flashing light	0.5 Hz
ON	OFF	ON	flashing light	0.1Hz
OFF	ON	ON	blinking light	1 Hz
ON	ON	ON	blinking light	2 Hz

Ordering details

Article numbers		Quadro-LED-HI	
Lens colour	**Rated voltage**	230 V AC	24 V DC
yellow		on request	on request
amber		on request	on request
red		on request	on request

Article numbers for other colours on request

Conformity to standards

The visual characteristics of LED lights conform to the European standard DIN EN 842: **“Machine safety - visual alarm signals“.**
Requirements contained in the DIN EN 981 standard: **“Machine safety - system of acoustic and visual alarm and information signals“,** can be fulfilled.

The colours ‘red’ for the emergency signal and ‘yellow’ for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
“Coding of display devices and control elements using colours and supplementary means“.

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

LED MULTI-FUNCTION LIGHT
Quadro-LED Flex

- designed for tough requirements under industrial conditions
- suitable for indoor and outdoor use
- extremely insensitive to shock and vibration
- internally and externally selectable operating mode as standard - one device for 4 different alarms:
  – continuous light
  – blinking light
  – flashing light
  – rotating light (non-wearing)
- 24 V AC/DC devices as standard with soft-start module
- can be operated directly via 24 V transistor PLC output, no additional relay control necessary
- inexpensive and flexible; wide range power supplies as standard

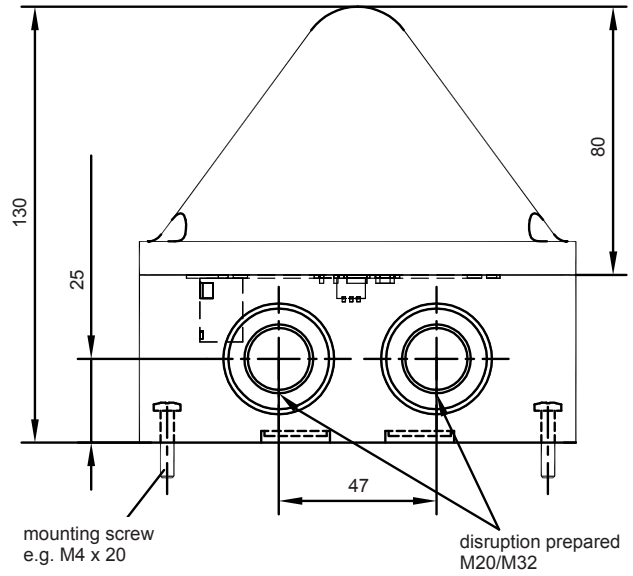
r = 5 m	IP 66	IP 67	IK 08	+ 55 °C / - 30 °C	10 Years
Covering distance as per EN 54	Protection system	Protection system	Impact-proof housing	Operating temperature	Warranty

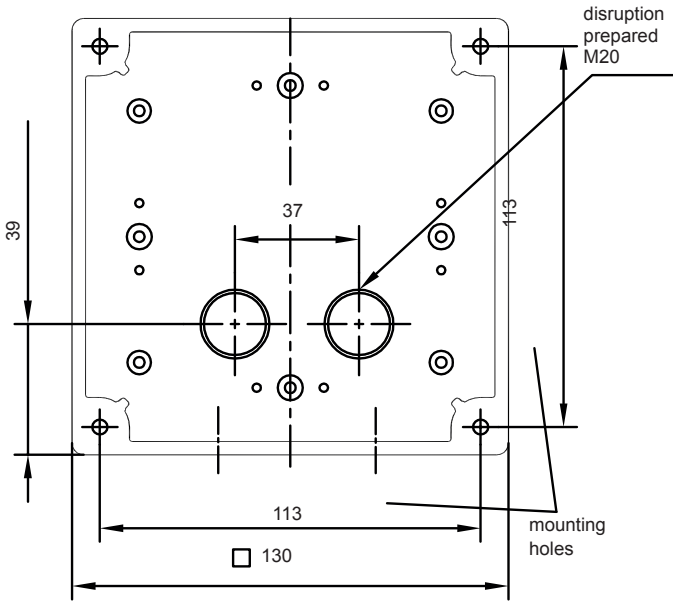
Electrical data		Quadro-LED Flex		
Rated voltage		115 / 230 V AC/DC		24 V AC/DC
Rated frequency		50 / 60 Hz / DC		50 / 60 Hz / DC
Operating range	AC	95 V – 253 V		15 V – 40 V
	DC	100 V – 350 V		10 V – 60 V
Current consumption in continuous light mode	AC	115 V: < 90 mA	230 V: 60 mA	24 V: 420 mA
	DC	120 V: < 55 mA	220 V: 35 mA	24 V: 250 mA

Mechanical data		Quadro-LED Flex			
Operating mode (internally and externally selectable)		continuous light	blinking light	flashing light	rotating all-round light
Light alternation frequency			1.5 Hz	1 Hz	2.5 Hz
Light source		LED; 8 x 2 LEDs (3 chip version)			
Light intensity (DIN 5037) [1]		9 cd			
Lens colours		clear, white, yellow, amber, red, green, blue			
Operating temperature		- 30 °C ... + 55 °C			
Storage temperature		- 40 °C ... + 70 °C			
Relative humidity		100%			
Protection system according to EN 60529		IP 66, IP 67, mounting arbitrary			
Impact resistance as per EN 50102		IK 08			
Protection class		II			
Service life of light source		≥ 50,000 hrs			
Material	lens	polycarbonate (PC)			
	housing	polycarbonate (PC), grey RAL 7035			
Cable entry		2 x M20/M32 sideways, 2 x M20 bottom side			
Connecting terminal		spring-type terminal 0.08 – 2.5 mm²			
Weight		500 g			

[1] with a clear lens

Dimensions





Additional mounting possible via external lugs (included).

Operating modes

S1			Selection via internal DIP switch	
1	2	3		
OFF	OFF	OFF	OFF	
OFF	OFF	ON	all-round light	2.5 Hz
OFF	ON	OFF	continuous light	
OFF	ON	ON	blinking light	1.5 Hz
ON	OFF	OFF	flashing light	1 Hz
ON	OFF	ON	all-round light	2.5 Hz
ON	ON	OFF	continuous light	
ON	ON	ON	blinking light	1.5 Hz

S1 -	X1 -				Selection via external control	
1	1	2	3	4		
(S1-2 = OFF, S1-3 = OFF)						
OFF	-/N	+/L			OFF (standby)	
OFF	-/N	+/L		+/L	all-round light	2.5 Hz
OFF	-/N	+/L	+/L		continuous light	
OFF	-/N	+/L	+/L	+/L	blinking light	1.5 Hz
ON	-/N	+/L			flashing light	1 Hz
ON	-/N	+/L		+/L	all-round light	2.5 Hz
ON	-/N	+/L	+/L		continuous light	
ON	-/N	+/L	+/L	+/L	blinking light	1.5 Hz

S1 -	X1 -				Selection via BAV option (24 V AC/DC only)	
1	1	2	3	4		
(S1-2 = OFF, S1-3 = OFF)						
OFF	-/N			+/L	all-round light	2.5 Hz
OFF	-/N		+/L		continuous light	
OFF	-/N		+/L	+/L	blinking light	1.5 Hz
ON	-/N	+/L			flashing light	1 Hz
ON	-/N			+/L	all-round light	2.5 Hz
ON	-/N		+/L		continuous light	
ON	-/N		+/L	+/L	blinking light	1.5 Hz

Ordering details

Article numbers		Quadro-LED Flex	
Lens colour	Rated voltage	230 V AC/DC	24 V AC/DC
yellow		211 04 64 3 000	211 04 63 3 000
amber		211 04 64 4 000	211 04 63 4 000
red		211 04 64 5 000	211 04 63 5 000

Article numbers for other colours on request

Options / Accessories

GOST

Conformity to standards

The visual characteristics of LED lights conform to the European standard DIN EN 842: **“Machine safety - visual alarm signals“.**
Requirements contained in the DIN EN 981 standard: **“Machine safety - system of acoustic and visual alarm and information signals“,** can be fulfilled.

The colours ‘red’ for the emergency signal and ‘yellow’ for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
“Coding of display devices and control elements using colours and supplementary means“.

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

LED CONTINUOUS LIGHT
PD 2100-LED

Machine lights in an elegant pyramid design, equipped with LED light source for extremely long service life (> 50,000 hrs)

- vibration/shock-resistant
- low power consumption
- minimised maintenance costs
- non-compromising safety
- outstanding illumination of the coloured lens due to scattering lens

Covering distance as per EN 54

Protection system

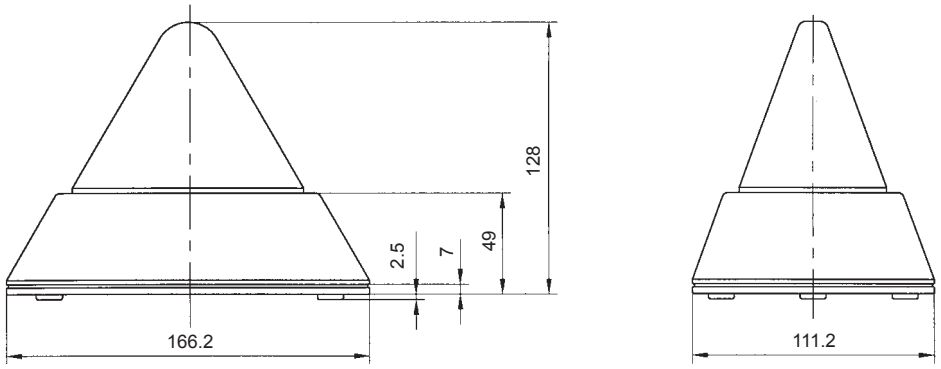
Operating temperature

Electrical data	PD 2100-LED		
Rated voltage	230 V AC	115 V AC	24 V AC/DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz / DC
Operating range	± 10%	± 10%	AC: 18 – 27 V DC: 19 – 30 V
Nominal current consumption	12 mA	24 mA	AC: 115 mA DC: 65 mA

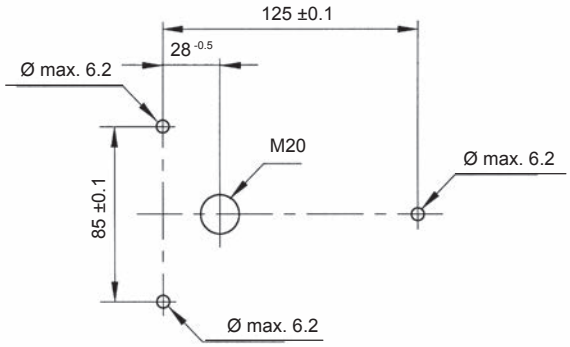
Mechanical data		PD 2100-LED
Light source		LED
Light intensity (DIN 5037) [1]		5 cd
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 25 °C ... + 55 °C
Storage temperature		- 40 °C ... + 80 °C
Relative humidity		90%
Protection system according to EN 60529		IP 55 (if mounted vertically/horizontally)
Protection class		II
Duty cycle		100%
Service life of light source		> 50,000 hrs
Material	lens	polycarbonate (PC)
	housing	ABS, light grey similar to RAL 7035
	baseplate	ABS, light grey similar to RAL 7035
Cable entry		M20 x 1.5, either at the side or underneath
Connecting terminal		fine wire 0.14 – 2.5 mm²
Weight	AC	380 g
	AC/DC	270 g

[1] with a clear lens

Dimensions



Mounting holes



Ordering details

Article numbers		PD 2100-LED	
Lens colour	Rated voltage	230 V AC	24 V AC/DC
clear		211 20 61 1 000	211 20 60 1 000
yellow		211 20 61 3 000	211 20 60 3 000
amber		211 20 61 4 000	211 20 60 4 000
red		211 20 61 5 000	211 20 60 5 000
green		211 20 61 6 000	211 20 60 6 000
blue		211 20 61 7 000	211 20 60 7 000

Options / Accessories

GOST

Article number:
287 10 50 0 040

See page 109 for further information

Conformity to standards

The visual characteristics of LED lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

SPECTRA COMPACT LED CONTINUOUS LIGHTS P 200 LDA / P 100 LDA (Ø 60 MM)

Compact LED light series, also for installation where space is limited

- energy-saving and durable thanks to the use of maintenance-free LED technology
- large variety of mounting methods due to modular design principle:
  – panel-mounted devices with convenient plug contact (P 100)
  – surface-mounted devices for mounting directly or on a wall bracket or a tubular stand (P 200)
- durable, sturdy and functionally reliable due to the use of high-quality plastic
- optimum illumination due to prismatic coloured lens
- also for exposed installation locations by combining wall bracket and tubular stand
- high IP protection in any installation position

Covering distance as per EN 54

Protection system

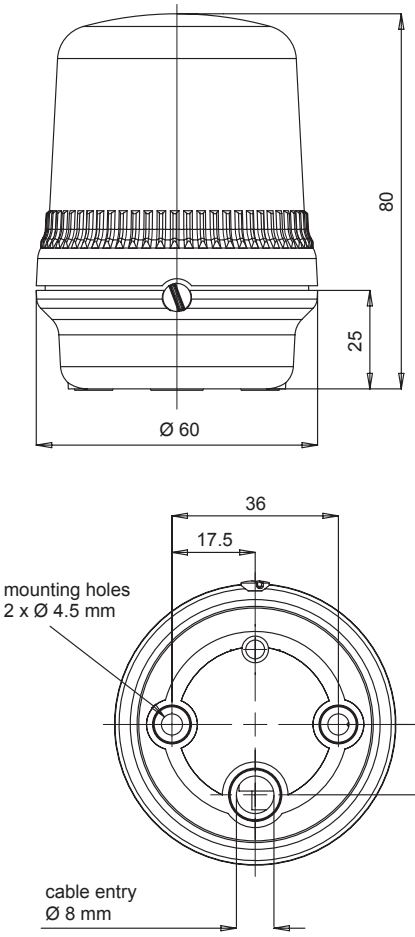
Operating temperature

Electrical data	P 200 LDA		P 100 LDA	
Rated voltage	115 / 230 V AC	12 / 24 V DC	115 / 230 V AC	12 / 24 V DC
Rated frequency	50 / 60 Hz		50 / 60 Hz	
Operating range	90 – 253 V	10 – 30 V	90 – 253 V	10 – 30 V
Nominal current consumption	32 mA	80 mA	12 mA	80 mA

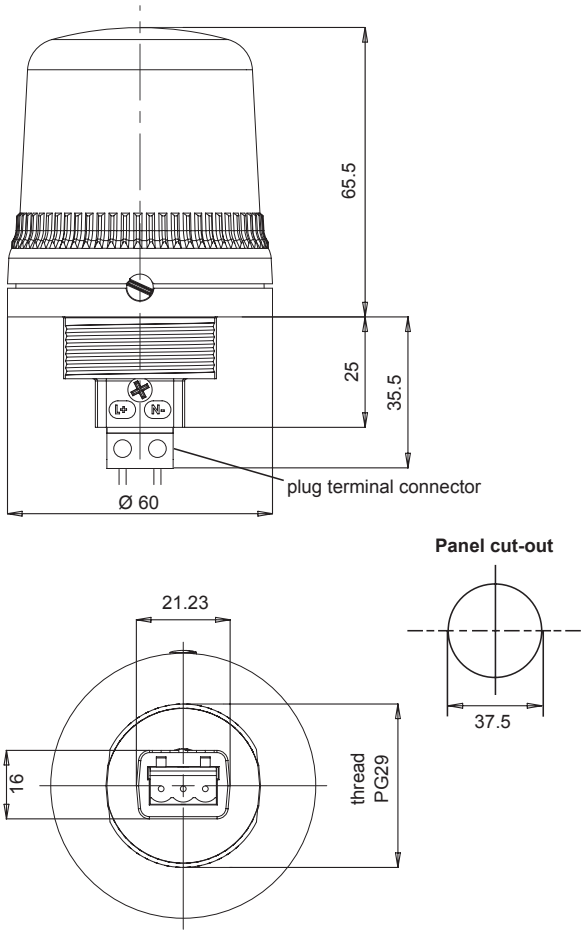
Mechanical data	P 200 LDA	P 100 LDA
Operating mode	LED continuous light	
Light source	9 high output LEDs	
Lens colours	yellow, amber, red, green, blue	
Lens type	prismatic	
Operating temperature	- 25 °C ... + 50 °C	
Relative humidity	90% @ + 20 °C	
Protection system according to EN 60529	IP 65	
Service life of light source	> 50,000 hrs	
Material	polycarbonate (PC), UL 94 VO f1	
Design	bayonet with anti-tamper locking screw	
Mounting	surface mounting (wall bracket and tubular stand available as accessories)	panel-mounting: Ø 37.5 mm (PG29)
Connecting terminal	screw terminal 1.5 mm²	screw terminal 1.5 mm² pluggable
Weight	78 g	93 g

Dimensions

P 200 LDA



P 100 LDA



Ordering details

Article numbers		P 200 LDA		P 100 LDA	
Lens colour	**Rated voltage**	115 / 230 V AC	12 / 24 V DC	115 / 230 V AC	12 / 24 V DC
yellow		213 28 64 3 000	213 28 63 3 000	213 18 64 3 000	213 18 63 3 000
amber		213 28 64 4 000	213 28 63 4 000	213 18 64 4 000	213 18 63 4 000
red		213 28 64 5 000	213 28 63 5 000	213 18 64 5 000	213 18 63 5 000

Article numbers for other colours on request

Options / Accessories

GOST

Wall bracket only for P 200 LDA
Article number:
213 90 00 0 000

Tubular stand 137 mm only for P 200 LDA
Article number:
213 91 00 0 000

Wall holder only in combination with tubular stand
Article number:
282 50 20 0 000

See pages 110/111 for further information

Conformity to standards

The visual characteristics of LED lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

TRAFFIC LIGHT
Quadro LED-TL

Bright LED signal lights for traffic light applications, e.g. for
- traffic routing in non-public areas
- conveyer and storage systems
- crane safety (see also ‘Regulations and standards for crane applications’, page 81)
- container handling systems

- extraordinary housing protection (IP 66, IK 08 and UV-protected PC housing) and innovative LED technology provide for very bright signals, long service lives and reliable operation
- mounted using external lugs or internal holes that do not impair the IP protection; mounting can be performed in any direction
- preassembled as traffic light and ready to connect
- also available as non-preassembled version
- optionally with integrated light sensor for optimal adaptation to the ambient light (glare avoidance)

Protection system

Impact-proof housing

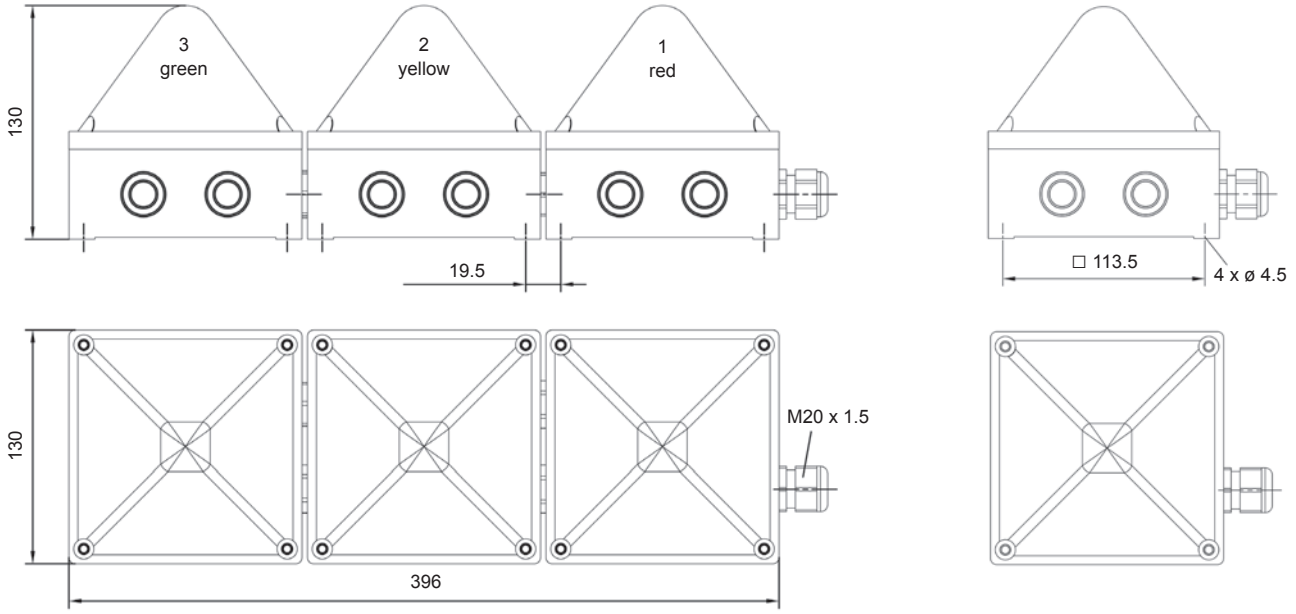
Operating temperature


Light sensor (optional)

Electrical data	Quadro LED-TL	
Rated voltage	115 / 230 V AC	24 V DC
Rated frequency	50 / 60 Hz	
Operating range	85 – 265 V	10 – 30 V
Max. current consumption	60 mA / 30 mA	1.06 A

Mechanical data		Quadro LED-TL
Operating mode		LED continuous light
Light source		high output LED array
Light intensity (DIN 5037)		> 80 cd
Lens colours		red / yellow / green
Operating temperature		- 30 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		95%
Protection system according to EN 60529		IP 66; IK 08 (EN 50102), mounting arbitrary
Duty cycle		100%
Service life of light source		> 50,000 hrs
Material	lens	polycarbonate (PC), UV-resistant
	housing	polycarbonate (PC), UV-resistant, RAL 7035
Cable entry		M20/M32 sideways, other imprints prepared
Connecting terminal		cage clamp terminal 0.08 – 2.5 mm² (in the red light)
Mounting		external lugs or internal holes
Weight		1.32 kg

Dimensions



Regulations and standards for crane applications		
DIN-EN 13000:2004-09 Cranes – truck-mounted cranes	Visual warning to the driver (EN 842) in the case of	- approaching the load capacity (at 90 - 98.5% of the permissible load capacity) - triggering of the overload safety system - overriding of the overload safety system
DIN-EN 14439:2006 Safety – rotating tower cranes	Visual warning by the crane driver (EN 457) to persons in the vicinity in the case of	- remote control – green, continuous light - anti-collision – white, blinking light - rotating (in some cases when required by local authorities) – green, blinking light
	Visual warning to the driver (EN 842) in the case of	- approaching the load capacity (at 90 - 95% of the permissible load capacity) – yellow, continuous light - wind warning and alarm – yellow, blinking light and red, blinking light

Ordering details

Article numbers		Quadro LED-TL		Quadro LED-TLi (with light sensor)	
Lens colour	**Rated voltage**	115/230 V AC	24 V DC	115/230 V AC	24 V DC
red / yellow / green		211 06 64 0 008	211 06 63 0 008	211 07 64 0 008	211 07 63 0 008
yellow		211 06 64 3 000	211 06 63 3 000	211 07 64 3 000	211 07 63 3 000
red		211 06 64 5 000	211 06 63 5 000	211 07 64 5 000	211 07 63 5 000
green		211 06 64 6 000	211 06 63 6 000	211 07 64 6 000	211 07 63 6 000

Article numbers for other combinations on request

Options / Accessories

Enclo-sure fitting

Article number:
281 12 00 0 003

Conformity to standards

The visual characteristics of LED lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

SPECTRA TRAFFIC LIGHTS
P 450 TLA (Ø 140 MM) / P 350 TLA (Ø 100 MM)

Signal lights for traffic light applications
- simple to combine for horizontal or vertical configuration
- convenient electrical connection of combined traffic lights
- safe and maintenance-free even under the influence of extreme vibration thanks to LED technology
- clear signalling even in extremely bright surroundings thanks to the use of clear lenses
- stable fixing bracket for flexible alignment and mounting (optional)
- durable, sturdy and functionally reliable due to the use of high-quality plastic
- high signaling effect due to prismatic coloured lens
- glare protection adjustable to suit local conditions
- high IP protection in any installation position
- connecting piece for traffic light combinations included

P 450 TLA

Covering distance as per EN 54

P 350 TLA

Covering distance as per EN 54

Protection system

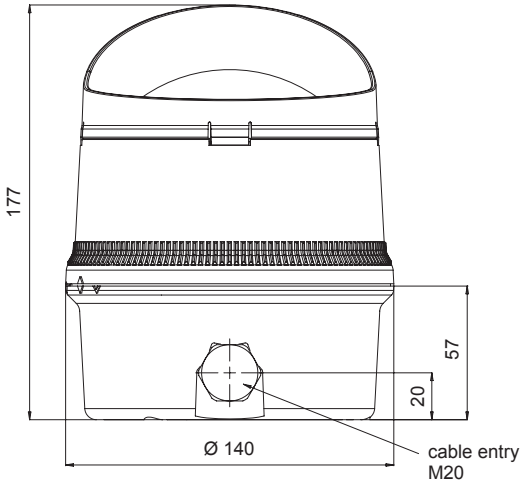
Operating temperature

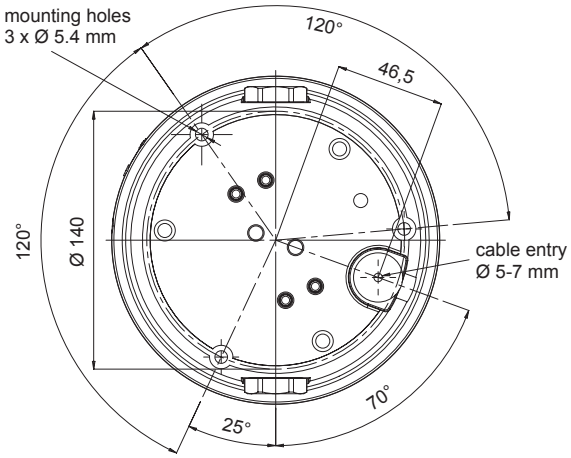
Electrical data	P 450 TLA		P 350 TLA	
Rated voltage	115 / 230 V AC	12 / 24 V DC	115 / 230 V AC	12 / 24 V DC
Operating range	90 – 253 V	10 – 30 V	90 – 253 V	10 – 30 V
Nominal current consumption	15 – 40 mA	175 mA	10 – 40 mA	140 mA

Mechanical data	P 450 TLA	P 350 TLA
Operating mode	LED continuous light	LED continuous light
Light source	high output LED array	
Light intensity (DIN 5037)	60 cd	45 cd
Lens colour	clear	
Operating temperature	- 25 °C ... + 50 °C	
Relative humidity	90% @ + 20 °C	
Protection system according to EN 60529	IP 65	
Duty cycle	100%	
Service life of light source	> 50,000 hrs	
Material	polycarbonate (PC), UL 94 VO f1	
Design	bayonet with anti-tamper locking screw	
Mounting	surface mounting (wall bracket available as accessories)	
Connecting terminal	screw terminal 2 x 1.5 mm^2	screw terminal 2 x 1.5 mm^2
Cable entry	1 x 5-7 mm push through grommet (bottom side); 2 x M20 cable entries sideways (incl. connecting piece)	1 x 5-7 mm push through grommet; 2 x M20 cable entries (incl. connecting piece)
Weight	410 g	230 g

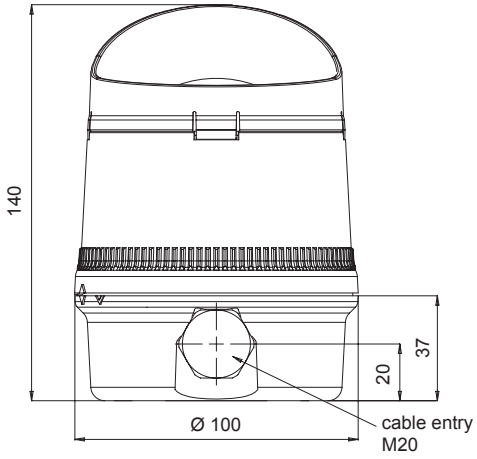
Dimensions

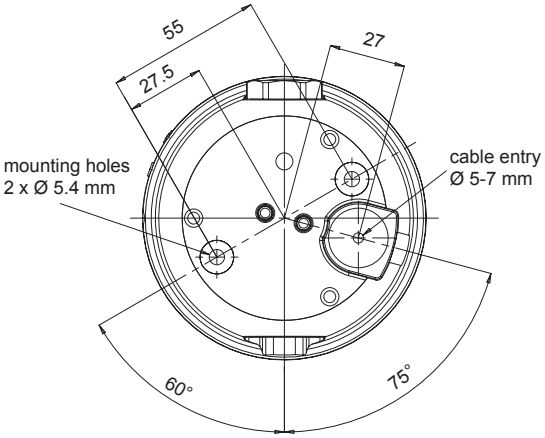
P 450 TLA





P 350 TLA





Ordering details

Article numbers		P 450 TLA		P 350 TLA	
Lens colour	**Rated voltage**	115 / 230 V AC	12 / 24 V DC	115 / 230 V AC	12 / 24 V DC
amber		213 55 64 4 000	213 55 63 4 000	213 52 64 4 000	213 52 63 4 000
red		213 55 64 5 000	213 55 63 5 000	213 52 64 5 000	213 52 63 5 000
green		213 55 64 6 000	213 55 63 6 000	213 52 64 6 000	213 52 63 6 000

Options / Accessories

GOST

Wall bracket for single mounting P 450
Article number:
213 99 00 0 000

Wall bracket for single mounting P 350
Article number:
213 98 00 0 000

Wall bracket-set for combinations of 2 or 3 P 450
Article number:
213 97 00 0 000

Wall bracket-set for combinations of 2 or 3 P 350
Article number:
213 96 00 0 000

See page 111 for further information

CONTINUOUS LED PANEL MOUNT INDICATOR P 22 D
BLINKING LED PANEL MOUNT INDICATOR P 22 DFS

Indicator lamps for 22.5 mm mounting hole

- guaranteed high protection class (IP 65) to the housing
- superior shape, hence high signaling effect on all sides
- optimum illumination through the use of multi-chip LED array
- easy to mount labels holders available as accessories
- simple electrical connection by means of screw terminal

IP 65
Protection system

+ 50 °C
- 25 °C
Operating temperature

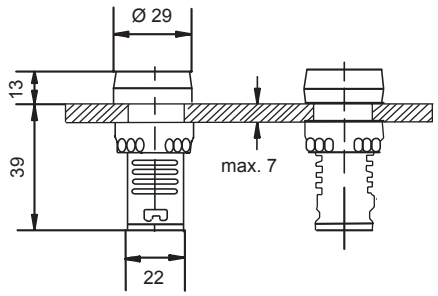
Electrical data	P 22 D red / amber				
Rated voltage	230 V AC	115 V AC	48 V AC/DC	24 V AC/DC	12 V AC/DC
Nominal current consumption	25 mA	25 mA	20 mA	80 mA	80 mA
Electrical data	**P 22 D white / green / blue**				
Rated voltage	230 V AC	115 V AC	48 V AC/DC	24 V AC/DC	12 V AC/DC
Nominal current consumption	25 mA	25 mA	20 mA	20 mA	20 mA
Electrical data	**P 22 DFS**				
Rated voltage	230 V AC	115 V AC	48 V AC/DC	24 V AC/DC	
Nominal current consumption	15 – 30 mA				

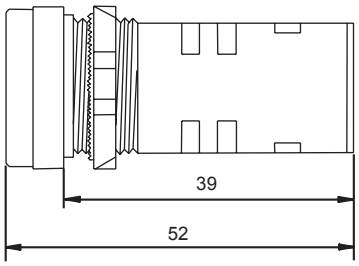
Mechanical data	P 22 D	P 22 DFS
Operating mode	continuous light	1 Hz blinking light
Light source	LED array	
Lens colours	white, amber, red, green, blue	red
Operating temperature	- 25 °C ... + 50 °C	
Storage temperature	90% @ + 20 °C	
Protection system according to EN 60529	IP 65 (to housing)	
Service life of light source	> 50,000 hrs	
Mounting	panel-mounting: Ø 22.5 mm	
Connecting terminal	screw terminal 1.5 mm²	
Weight	90 g	

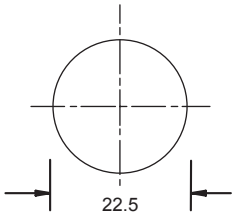
Dimensions

Panel cut-out

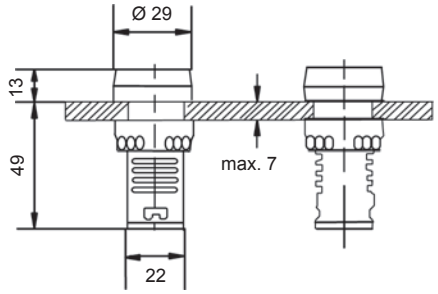
P 22 D

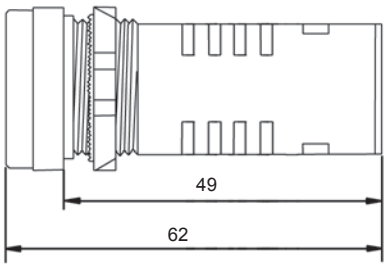


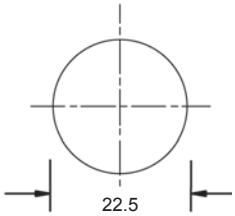




P 22 DFS







Ordering details

Article numbers		P 22 D				
Lens colour	Rated voltage	230 V AC	115 V AC	48 V AC/DC	24 V AC/DC	12 V AC/DC
white		232 73 10 2 000	232 73 15 2 000	232 73 70 2 000	232 73 80 2 000	232 73 85 2 000
amber		232 73 10 4 000	232 73 15 4 000	232 73 70 4 000	232 73 80 4 000	232 73 85 4 000
red		232 73 10 5 000	232 73 15 5 000	232 73 70 5 000	232 73 80 5 000	232 73 85 5 000
green		232 73 10 6 000	232 73 15 6 000	232 73 70 6 000	232 73 80 6 000	232 73 85 6 000
blue		232 73 10 7 000	232 73 15 7 000	232 73 70 7 000	232 73 80 7 000	232 73 85 7 000

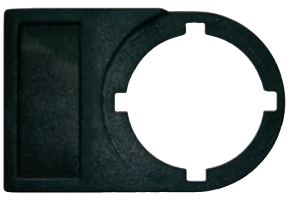
Article numbers		P 22 DFS			
Lens colour	Rated voltage	230 V AC	115 V AC	48 V AC/DC	24 V AC/DC
red		232 71 10 5 000	232 71 15 5 000	232 71 70 5 000	232 71 80 5 000

Options / Accessories

GOST

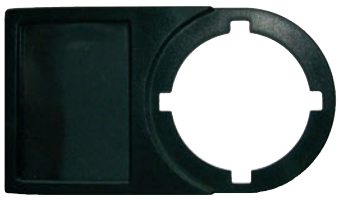
Label holder **25 x 10 mm**

Article number:
232 92 00 0 000



Label holder **25 x 18 mm**

Article number:
232 91 00 0 000



CONTINUOUS LIGHT
PD 2100

Status lights for universal use

- machine light in an elegant pyramid design

Covering distance as per EN 54

Protection system

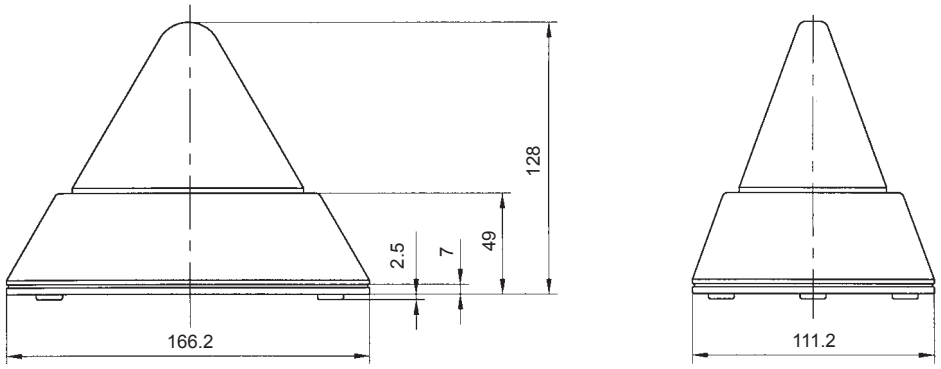
Operating temperature

Electrical data	PD 2100
Rated voltage	max. 250 V
Power consumption	max. 15 W *

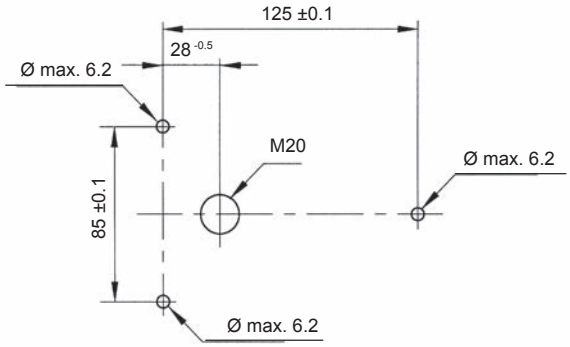
* light source not included

Mechanical data		PD 2100
Operating mode		continuous light
Light source		BA15d, E14
Light power		max. 15 W
Lens colours		clear, yellow, amber, red, green, blue
Operating temperature		- 40 °C ... + 32 °C
Storage temperature		- 40 °C ... + 80 °C
Relative humidity		90%
Protection system according to EN 60529		IP 55 (if mounted vertically/horizontally)
Duty cycle		100%
Material	lens	polycarbonate (PC)
	housing	ABS, light grey similar to RAL 7035, (optionally graphite grey RAL 7024)
Cable entry		M20 x 1.5 either at the side or underneath
Weight		250 g

Dimensions



Mounting holes



Ordering details

Article numbers		PD 2100	
Lens colour	Socket	BA15d	E14
clear		211 20 30 1 000	211 20 10 1 000
yellow		211 20 30 3 000	211 20 10 3 000
amber		211 20 30 4 000	211 20 10 4 000
red		211 20 30 5 000	211 20 10 5 000
green		211 20 30 6 000	211 20 10 6 000
blue		211 20 30 7 000	211 20 10 7 000

* please order light bulb separately

Options / Accessories

GOST

Light source

Article number:
287 10 50 0 042

See pages 109/112 for further information

Conformity to standards

The visual characteristics of continuous lights conform to the European standard DIN EN 842: **“Machine safety - visual alarm signals“.**
Requirements contained in the DIN EN 981 standard: **“Machine safety - system of acoustic and visual alarm and information signals“,** can be fulfilled.

The colours ‘red’ for the emergency signal and ‘yellow’ for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
“Coding of display devices and control elements using colours and supplementary means“.

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

SPECTRA TRAFFIC LIGHTS
P 450 TSB / P 450 TDB (Ø 140 MM) / P 350 TSB (Ø 100 MM)

Signal lights for traffic light applications
- simple to combine for horizontal or vertical configuration
- also for safety-relevant applications through use of two light sources (TDB)
- stable fixing bracket for flexible alignment and mounting (option)
- durable, sturdy and functionally reliable due to the use of high-quality plastic
- high signaling effect due to prismatic coloured lens
- glare protection adjustable to suit local conditions
- high IP protection in any installation position
- connecting piece for traffic light combinations included

P 450 TSB	P 450 TDB	P 350 TSB		
r = 10 m	r = 6 m	r = 6 m	IP 65	+ 50 °C / - 25 °C
Covering distance as per EN 54	Covering distance as per EN 54	Covering distance as per EN 54	Protection system	Operating temperature

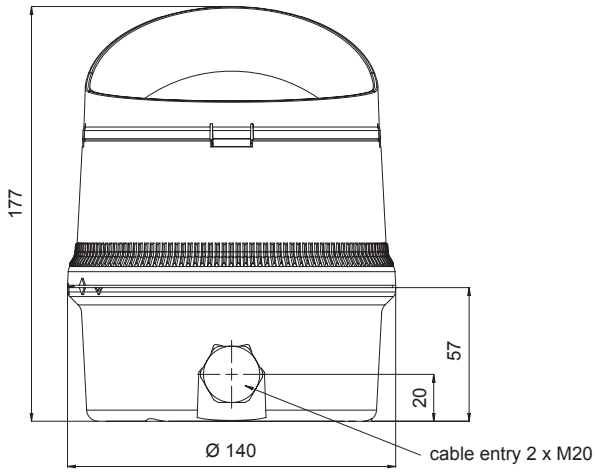
Electrical data	P 450 TSB	P 450 TDB	P 350 TSB
Rated voltage	12 – 250 V *	12 – 250 V *	12 – 250 V *
Power consumption	25 W	2 x 15 W	15 W

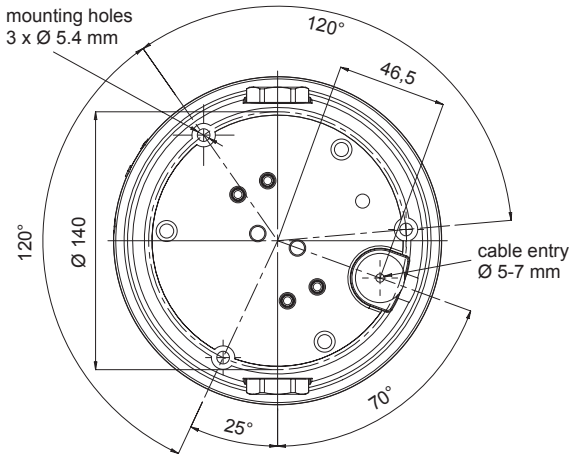
* light source not included

Mechanical data	P 450 TSB	P 450 TDB	P 350 TSB
Operating mode	continuous light	continuous light (redundant)	continuous light
Light source	filament lamp E27	2 x filament lamp E14	filament lamp E14
Lens colours	amber, red, green		
Operating temperature	- 25 °C ... + 50 °C		
Relative humidity	90% @ + 20 °C		
Protection system according to EN 60529	IP 65		
Material	polycarbonate (PC), UL 94 VO f1		
Design	bayonet with anti-tamper locking screw		
Mounting	surface mounting (wall bracket available as accessories)		
Cable entry	1 x 5-7 mm push through grommet; 1 x M20 cable entry (incl. connecting piece)	1 x 5-7 mm push through grommet (bottom side); 2 x M20 cable entries sideways (incl. connecting piece)	1 x 5-7 mm push through grommet; 1 x M20 cable entry (incl. connecting piece)
Connecting terminal	screw terminal 1.5 mm²		
Weight	395 g	380 g	210 g

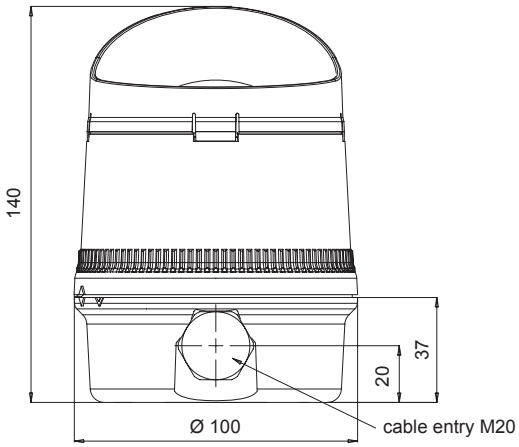
Dimensions

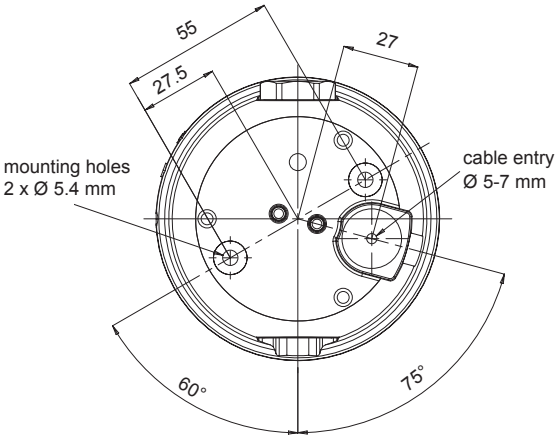
P 450 TSB / P 450 TDB





P 350 TSB





Ordering details

Article numbers		P 450 TSB	P 450 TDB	P 350 TSB
Lens colour	**Rated voltage**	12 – 250 V *	12 – 250 V *	12 – 250 V *
amber		213 54 65 4 000	213 53 62 4 000	213 51 62 4 000
red		213 54 65 5 000	213 53 62 5 000	213 51 62 5 000
green		213 54 65 6 000	213 53 62 6 000	213 51 62 6 000

* please order light bulb separately

Options / Accessories

GOST

Wall bracket for single mounting P 450
Article number: **213 99 00 0 000**

Wall bracket for single mounting P 350
Article number: **213 98 00 0 000**

Wall bracket-set for combinations of 2 or 3 P 450
Article number: **213 97 00 0 000**

Wall bracket-set for combinations of 2 or 3 P 350
Article number: **213 96 00 0 000**

Light source

See pages 111/112 for further information

Conformity to standards

The visual characteristics of continuous lights conform to the European standard DIN EN 842: **“Machine safety - visual alarm signals“.**
Requirements contained in the DIN EN 981 standard: **“Machine safety - system of acoustic and visual alarm and information signals“,** can be fulfilled.
The colours ‘red’ for the emergency signal and ‘yellow’ for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
“Coding of display devices and control elements using colours and supplementary means“.

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

SPECTRA ROTATING MIRROR LIGHTS
P 400 RTH (Ø 140 MM) / P 300 RTH (Ø 100 MM)

Sturdy rotating mirror lights, also for installation where space is limited

- very high signaling effect due to the use of halogen lamps
- large variety of mounting methods due to modular design principle:
  – surface-mounted devices for mounting directly or on a wall bracket or a tubular stand
  – also for exposed installation locations through combination of wall bracket and tubular stand
  – cable entry at the side or through the base of the housing
- durable, sturdy and functionally reliable due to the use of high-quality plastic

P 400 RTH P 300 RTH

Covering distance as per EN 54

Protection system

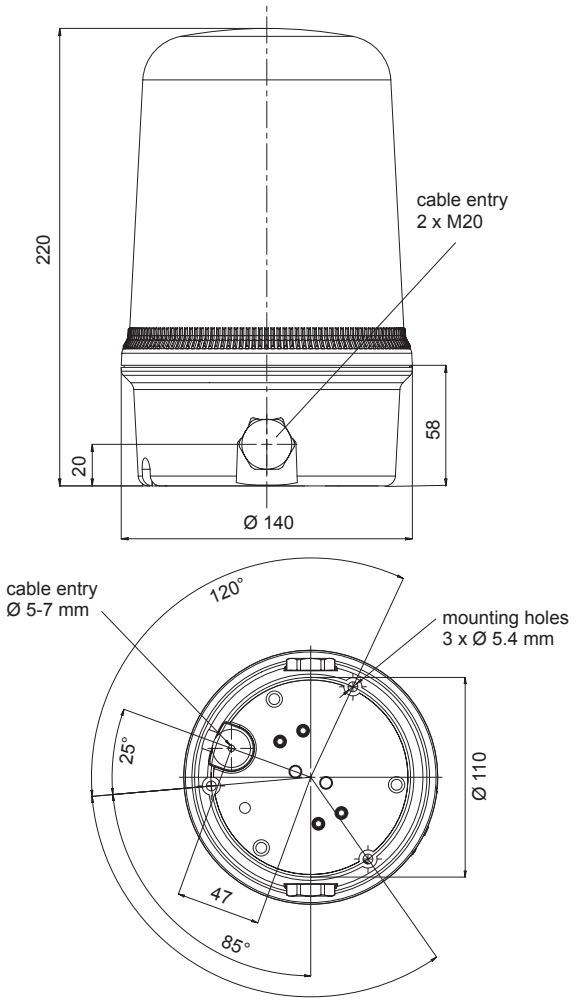
Operating temperature

Electrical data	P 400 RTH				P 300 RTH			
Rated voltage	230 V AC	115 V AC	24 V DC	12 V DC	230 V AC	115 V AC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz			50 / 60 Hz	50 / 60 Hz		
Nominal current consumption	186 mA	338 mA	1.54 A	3 A	117 mA	216 mA	0.91 A	1.72 A
Capacity of light source	40 W	40 W	35 W	35 W	25 W	25 W	20 W	20 W

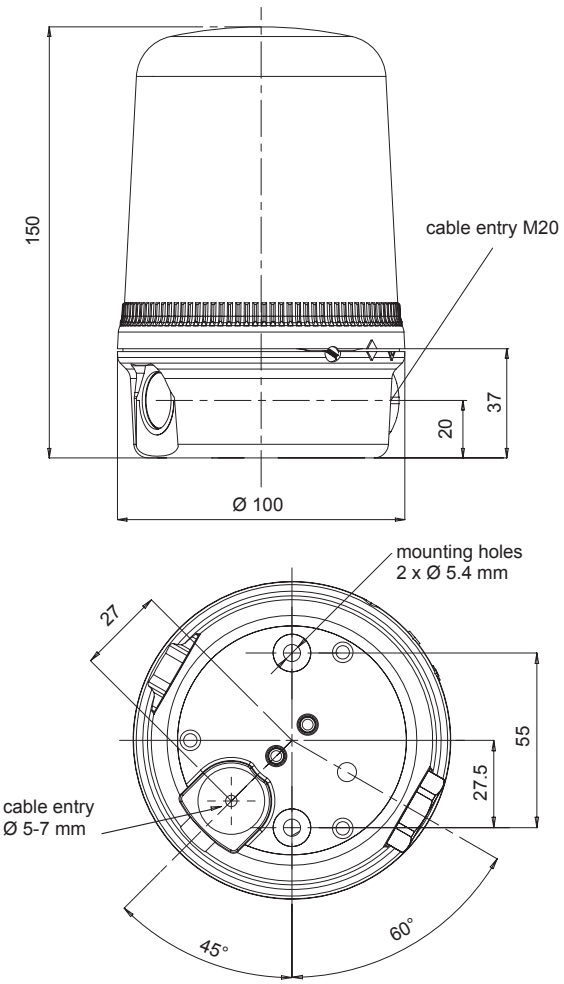
Mechanical data	P 400 RTH	P 300 RTH
Operating mode	halogen rotating mirror light	
Light source	halogen lamp G6.35 / GY6.35	
Rotation	approx. 180 rpm	
Lens colours	clear, yellow, amber, red, green, blue	
Lens type	plain, transparent	
Operating temperature	- 25 °C ... + 50 °C	
Relative humidity	90% @ + 20 °C	
Protection system according to EN 60529	IP 65	
Duty cycle	100%	
Lebensdauer	> 5,000 hrs	
Material	polycarbonate (PC), UL 94 VO f1	
Design	bayonet with anti-tamper locking screw	
Mounting	surface mounting (wall bracket and tubular stand available as accessories)	
Installation position	arbitrary	
Connecting terminal	screw terminal 1.5 mm²	
Cable entry	1 x 5-7 mm push through grommet (bottom side); 1 x M20 cable entry sideways	
Weight	578 g	370 g

Dimensions

P 400 RTH



P 300 RTH



Ordering details

Article numbers		P 400 RTH				P 300 RTH			
Lens colour	**Rated voltage**	230 V AC	115 V AC	24 V DC	12 V DC	230 V AC	115 V AC	24 V DC	12 V DC
yellow		21347103000	21347153000	21347803000	21347853000	21337103000	21337153000	21337803000	21337853000
amber		21347104000	21347154000	21347804000	21347854000	21337104000	21337154000	21337804000	21337854000
red		21347105000	21347155000	21347805000	21347855000	21337105000	21337155000	21337805000	21337855000

Article numbers for other colours on request

Options / Accessories

GOST

Wall bracket for P 400
Article number:
213 94 00 0 000

Wall bracket for P 300
Article number:
213 92 00 0 000

Tubular stand 145 mm for P 400
Article number:
213 95 00 0 000

Tubular stand 140 mm for P 300
Article number:
213 93 00 0 000

Wall holder only in combination with tubular stand
Article number:
282 50 20 0 000

See pages 110/111 for further information

Conformity to standards

The visual characteristics of rotating mirror lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

FLASHING LIGHT 13 J
Quadro S-M-Flex

Proven tunnel safety light; conforms to the guideline of the Swiss Federal Highways Authority: 'Signaling systems of safety devices in tunnels'

- synchronised flashing of up to 10 beacons in series with no additional controller
- initial current limited to below 1 A
- integrated function monitoring with fault message contact
- variable brightness and flash frequency settings on-site on the device
- use of double-pole terminal for the simple connection of parallel operated lights

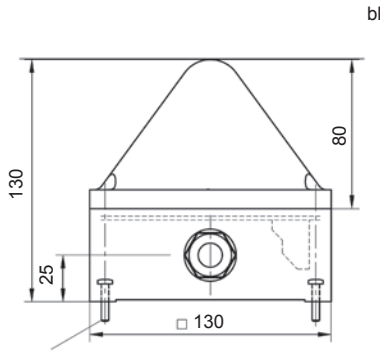
r = 19 m	IP 66	IP 67	IK 08	I lim t	Sync	+ 55 °C / - 25 °C	10 Years
Covering distance as per EN 54	Protection system	Protection system	Impact-proof housing	Inrush current limited to < 1A		Operating temperature	Warranty

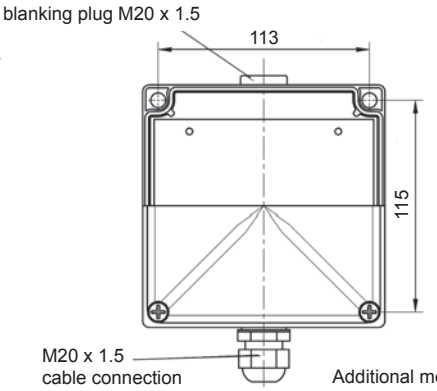
Electrical data	Quadro S-M-Flex	
Rated voltage	230 V AC	115 V AC
Rated frequency	50 / 60 Hz	50 / 60 Hz
Operating range	195 – 253 V	95 – 127 V
Nominal current consumption	250 mA (1 Hz / 13 J)	350 mA (1 Hz / 13 J)
Initial current limited to	< 1 A / 10 ms	
Alarm output	230 V / 80 mA	

Mechanical data		Quadro S-M-Flex
Flash rate		adjustable (1 Hz = 60 flashes/min. factory setting)
Flash energy		max. 13 J
Light intensity (DIN 5037) [1]		140 cd
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 25 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		100%
Protection system according to EN 60529		IP 66, IP 67; mounting arbitrary
Impact resistance as per EN 50102		IK 08
Protection class		II
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 12,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	polycarbonate (PC), RAL 7035
Connecting terminal		cage clamp terminal 0.08 - 2.5 mm²
Cable entry (prepared)		2 x M20 x 1.5 sideways
Mounting	external lugs	113 x 153 mm – M5 or 127.1 x 127.1 mm – M5
	internal holes	113 x 113 mm
Weight		600 g

[1] with a clear lens

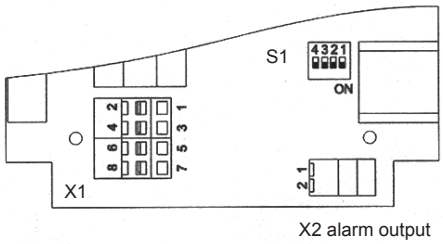
Dimensions

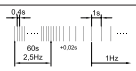
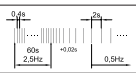
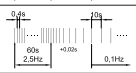
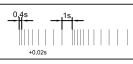




Additional mounting possible via external lugs (included).

Fault message contact



DIP switch setting				Setting	
4	3	2	1	Frequency (Hz)	Flash energy (J)
				1	13
			ON	1.33	13
		ON		0.5	13
		ON	ON	0.1	13
	ON			1	7.5
	ON		ON	2	7.5
	ON	ON		0.5	7.5
	ON	ON	ON	0.1	7.5
ON				1.5	11
ON			ON	1.75	10
ON		ON		2.5	7.5
ON		ON	ON		7.5
ON	ON				7.5
ON	ON		ON		7.5
ON	ON	ON		 repeating	7.5
ON	ON	ON	ON	only one flash	13
without synchronisation				0.66	7.5

Ordering details

Article numbers		Quadro S-M-Flex
Lens colour	Rated voltage	230 V AC
clear		210 42 10 1 179
yellow		210 42 10 3 179
amber		210 42 10 4 179
red		210 42 10 5 179

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.
The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

FLASHING WARNING LIGHTS 5 J
WBL-M / WBS-M

Flashing light with integrated flash monitoring and fault message contact

- for systems with safety-relevant applications, such as X-ray and laser equipment
- housing and fixing bracket made of sturdy anodised aluminium
- also available with GL approval
- ideally suited for tough industrial environments
- flash tube secured by additional steel clamp
- impact-proof lens

Covering distance as per EN 54

Protection system

Operating temperature

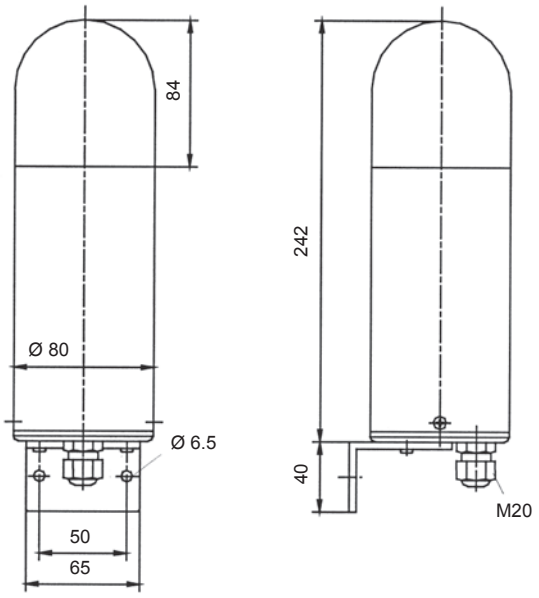
Electrical data	WBL-M		WBS-M		
Rated voltage	230 V AC	42 V AC	48 V DC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz			
Operating range	185 – 242 V	37 – 47 V	40 – 57 V	18 – 35 V	10 – 15 V
Nominal current consumption	0.07 A	0.5 A	0.18 W	0.25 A	0.6 A

Switching capacity of the faiure indication	
Switching voltage	max. 250 V AC
Switching current	max. 3 A

Mechanical data		WBL-M / WBS-M
Flash rate		1 Hz = 60 flashes/min.
Flash energy		5 J
Light intensity (DIN 5037) [1]		44 cd
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 20 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 54 (vertical mounting)
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	aluminium (Al Mg Si 1), yellow anodised
	base	polycarbonate (PC) with fibre glass
Cable entry		M20 x 1.5
Connecting terminal		single wire 0.5 – 2.5 mm², fine wire 0.5 – 1.5 mm², with cable end sleeves DIN 46228/1
Weight		700 g

[1] with a clear lens

Dimensions



Ordering details

Article numbers		WBL-M		WBS-M
Lens colour	Rated voltage	230 V AC	115 V AC	24 V DC
yellow		210 03 10 3 156	210 03 16 3 156	210 03 80 3 156
amber		210 03 10 4 156	210 03 16 4 156	210 03 80 4 156
red		210 03 10 5 156	210 03 16 5 156	210 03 80 5 156

Article numbers for other colours and voltages on request

Options / Accessories

GL

GOST

Article number:
287 10 50 0 042

See page 109 for further information

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

ALL-ROUND FLASHING LIGHT
PMF 2015-M

Extremely bright due to 14 joules total flash energy of the impulse group and light bundling with fesnel lens, low power consumption (energy-saving)

- the function of the flashing light is monitored internally via an optical sensor and evaluation circuitry
- both sub-systems (flashing light and monitoring unit) have separate operating voltage connections
- the light is extremely failure-tolerant and carries type approval from the Swiss Ministry of Transport
- independent technical safety report within the definitions of EN 50129 exists

Covering distance as per EN 54

Protection system

Operating temperature

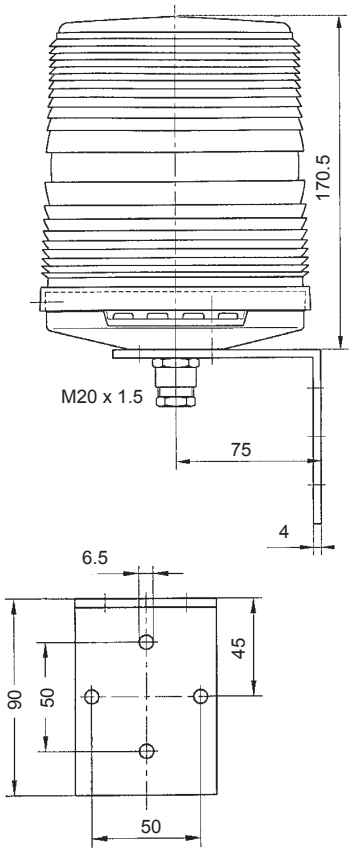
Electrical data		PMF 2015-M
Rated voltage		24 V DC
Operating range		18 – 30 V
Current consumption	flashing light	0.65 A
	monitoring unit	0.05 A
Alarm contact	contact version	positively driven contact (1 x NC, 1 x NO)
	switching current	max. 6 A
	switching voltage	max. 250 V AC
	max. switching power (AC)	1,500 VA
	recommended minimum load	> 50 mW

Mechanical data		PMF 2015-M
Operating mode		double flash
Light source		xenon flash tube
Flash rate of the main flash		1 Hz = 60 flashes/min.
Flash energy of the main flash		7 J
Light intensity (DIN 5037) [1]		200 cd
Lens colours		clear, amber, red, green, blue
Lens type		lens with fresnel characteristic
Beam angle	vertical	approx. 16°
	horizontal	360°
Operating temperature		- 30 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 55 (vertical mounting)
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	bracket mounting: polycarbonate (PC) / direct mounting: acrylonitrile butadiene styrene (ABS)
Cable entry	bracket mounting	M20 x 1.5 for cables 6.5 – 13.5 mm
Connecting terminal		0.08 – 2.5 mm²

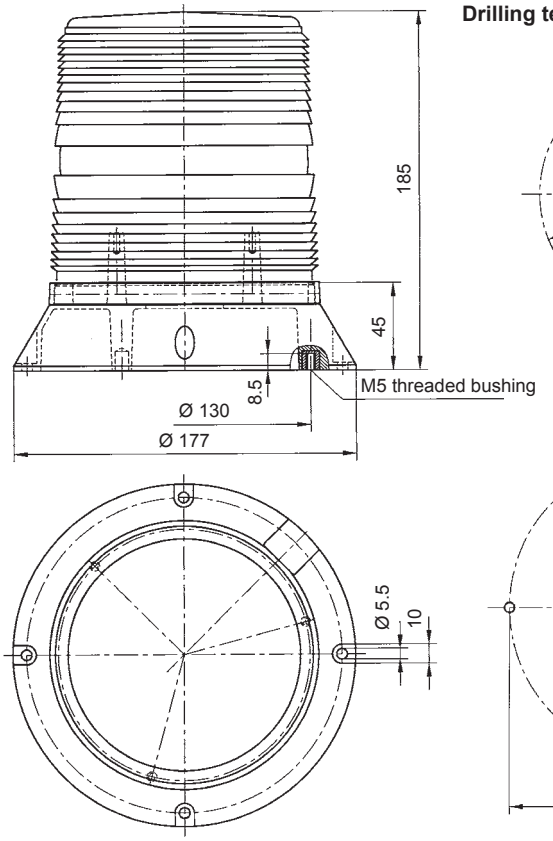
[1] with a clear lens

Dimensions

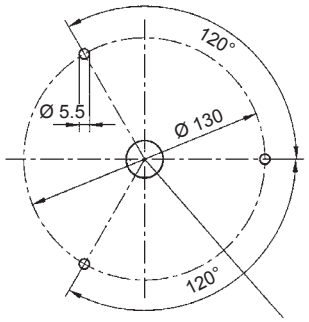
Bracket mounting



Direct mounting

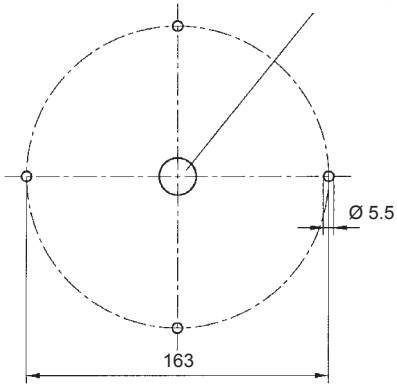


Drilling template 1 (for M5 threaded bushing)



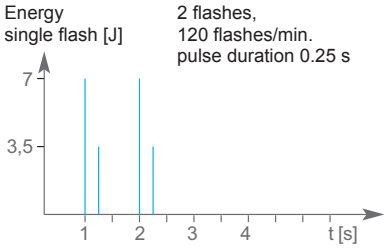
Drilling template 2

diameter variable depending on cable entry



Two different drilling templates are available for fixing the light (direct mounting). M5 x 8 threaded bushes are set into the base of the light for fixing according to drilling template 1. Drilling template 2 allows the light to be fixed using 4 through bolts or similar from above.

Flash rate



Ordering details

Article numbers		PMF 2015-M bracket mounting
Lens colour	**Rated voltage**	24 V DC
amber		210 07 80 4 012
red		210 07 80 5 012

Article numbers for other colours on request

Options / Accessories

GOST

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.
The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV
EN 50129:2003	Railway applications – telecommunication technology, signalling technology and data processing systems – safety-relevant electronic systems for signal technology
EN 12352:2000	Traffic routing systems, warning and safety lights class: L1 C red F3 O3 M0 T1 S3

LED CONTINUOUS LIGHTS
PD 2100-M-AS-i / PD 2100-LED-M

Machine lights in an elegant pyramid design, equipped with LED light source for extremely long service life (> 50 000 hrs)

- vibration/shock-resistant
- low power consumption
- minimised maintenance costs
- non-compromising safety
- outstanding illumination of the coloured lens due to scattering lens
- integrated function monitoring with potential-free fault contact
- for safety-relevant applications, such as X-ray and laser equipment

Additional for AS-i-Bus light:

- supplying of the light directly by bus system
- control and function monitoring directly via AS interface

		M-AS-i	LED-M
r = 4 m	IP 55	+ 45 °C / - 25 °C	+ 55 °C / - 25 °C
Covering distance as per EN 54	Protection system	Operating temperature	Operating temperature

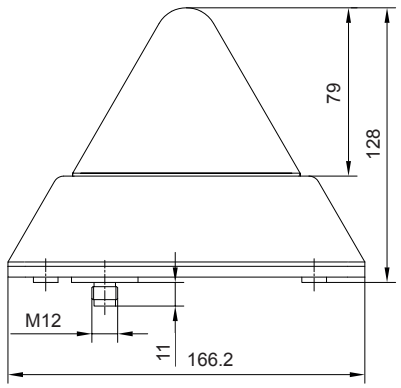
Electrical data	PD 2100-M-AS-i	PD 2100-LED-M	
Rated voltage	28 V	230 V AC	24 V DC
Nominal current consumption	approx. 250 mA	12 mA	65 mA
Rated frequency		50 / 60 Hz	
Operating range	26.5 – 32.6 V	± 10%	21 – 29 V
Alarm output	via AS-i Bus	230 V / 80 mA (MOS relay, $R_{ON\ max.}$ = 35 Ω) (NC)	

Mechanical data		PD 2100-M-AS-i	PD 2100-LED-M
Operating mode		continuous light	
Light source		LED	
Light intensity (DIN 5037) [1]		5 cd	
Lens colours		clear, white, yellow, amber, red, green, blue	
Operating temperature		- 25 °C ... + 45 °C	- 25 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 55 (if mounted vertically/horizontally)	
Protection class			II
Duty cycle		100%	
Service life of light source		> 50,000 hrs	
Material	lens	polycarbonate (PC)	
	housing	ABS, light grey similar to RAL 7035	
	baseplate	ABS, light grey similar to RAL 7035	
Cable entry			M20 x 1.5, either at the side or underneath
Connecting terminal			fine wire 0.14 – 2.5 mm²
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 +, AS-i –	
AS-i spezification		AS-i 2.1, A/B capable EN 50295	
Weight		300 g	AC: 380 g / DC: 270 g

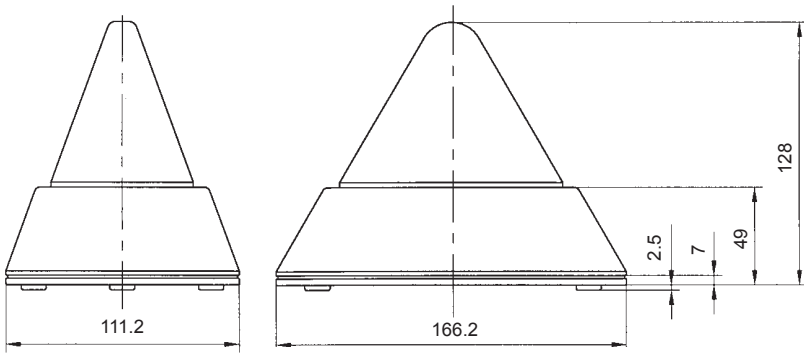
[1] with a clear lens

Dimensions

PD 2100-M-AS-i

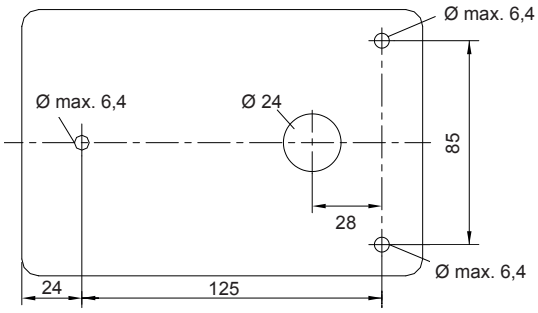


PD 2100-LED-M

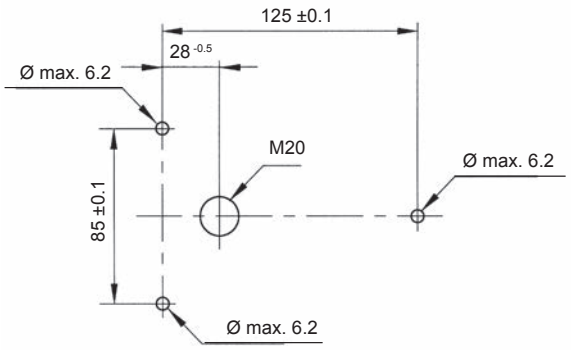


Mounting holes

PD 2100-M-AS-i



PD 2100-LED-M



Ordering details

Article numbers		PD 2100-M-AS-i	PD 2100-LED-M
Lens colour	**Rated voltage**	26.5 V – 32.6 V	24 V DC
white		211 20 50 2 004	
yellow			211 20 60 3 005
red		211 20 50 5 004	211 20 60 5 005

Article numbers for other colours on request

Options / Accessories

GOST

Article number:
287 10 50 0 040

See page 109 for further information

Conformity to standards

The visual characteristics of continuous lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.

The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

References to visual alarm devices can be found in the following standards:

EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837
DIN EN 54	Fire alarm systems
DIN 54113-2	Radiation protection regulations for the technical operation of X-ray equipment up to 500 kV

FLASHING LIGHT 10 J
Quadro F12-SIL

Integrated safety in sturdy Quadro-Design

- to signal dangerous situations in safety-relevant application such as process and plant safety, e.g.
  - leaks / gas warning
  - high-pressure / overfilling

  and machine safety, e.g. as
  - start-up warning
  - muting indication
  - machine stop delay warning
- by means of integrated self-monitoring of the devices the normative required, regular inspection of warning devices is ensured
- the warning devices can be implemented in Safety Instrumented Systems (SIS) up to **SIL 2/PLd**

We would be more than happy to provide all safety-technical key data.

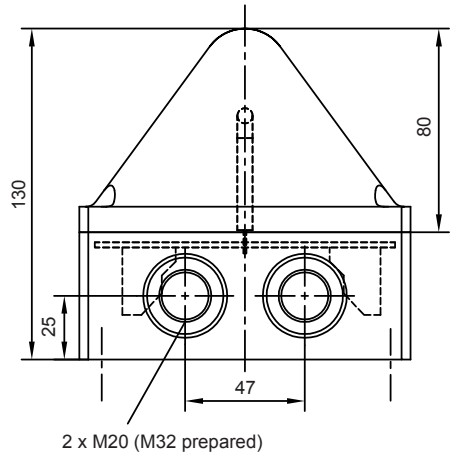
r = 17 m	IP 66	IP 67	IK 08	+ 55 °C / - 30 °C	10 Years
Covering distance as per EN 54	Protection system	Protection system	Impact-proof housing	Operating temperature	Warranty

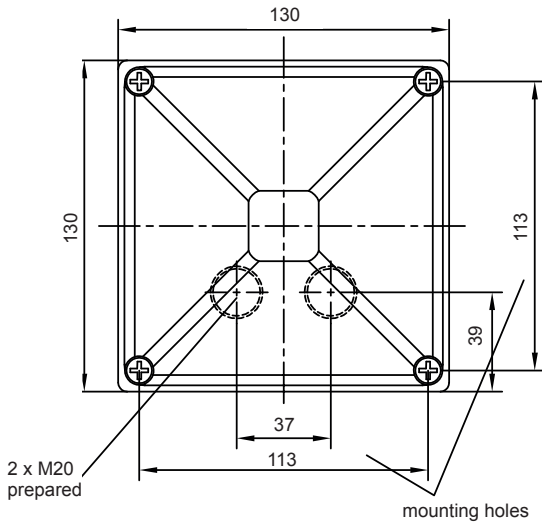
Electrical data		Quadro F12-SIL		
Rated voltage		230 V AC	115 V AC	24 V DC
Rated frequency		50 / 60 Hz	50 / 60 Hz	
Operating range		195 – 253 V	95 – 127 V	18 – 30 V
Nominal current consumption	flashing light	250 mA	350 mA	700 mA
	diagnostics channel	100 mA	100 mA	65 mA
Alarm contact	contact version	positively driven contact (1 x NC, 1 x NO)		
	switching current	max. 6 A		
	switching voltage	max. 250 V AC		
	max. switching power (AC)	1,500 VA		
	recommended minimum load	> 50 mW		

Mechanical data		Quadro F12-SIL
Flash rate		1 Hz = 60 flashes/min.
Flash energy		10 J
Light intensity (DIN 5037) [1]		118 cd
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 30 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		100%
Protection system according to EN 60529		IP 66, IP 67, mounting arbitrary
Impact resistance as per EN 50102		IK 08
Protection class		II
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	polycarbonate (PC), RAL 7035
Cable entry		2 x M20 bottom side / 2 x M20/M32 sideways
Connecting terminal		cage clamp terminal 0.08 - 2.5 mm²
Mounting	external lugs	113 x 153 mm – M5 or 127.1 x 127.1 mm – M5
	internal holes	113 x 113 mm
Weight		600 g

[1] with a clear lens

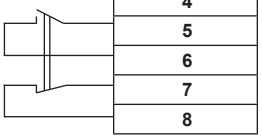
Dimensions





Additional mounting possible via external lugs (included).

Connection diagram



1	L/+	Operating voltage flashing light
2	N/-	Operating voltage flashing light
3	L/+	Operating voltage monitoring channel
4	N/-	Operating voltage monitoring channel
5	Alarm relay NO	(mechanical safety relay,
6	Alarm relay NO	positively driven contacts,
7	Alarm relay NC	voltage rating 250V/6A
8	Alarm relay NC	minimum contact load 10mA/5V)

Ordering details

Article numbers		Quadro F12-SIL	
Lens colour	**Rated voltage**	230 V AC	24 V DC
yellow		210 41 10 3 601	210 41 80 3 601
amber		210 41 10 4 601	210 41 80 4 601
red		210 41 10 5 601	210 41 80 5 601

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.
The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 01990:
"Coding of display devices and control elements using colours and supplementary means".

The visual alarms fulfill the requirements to the functional safety according to:
EN 61508 Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 61511 Functional safety - Safety instrumented systems for the process industry sector

The devices can be used in safety related control systems in accordance with the following standards:
EN ISO 13849-1 Safety of machinery - Safety related parts of control systems – part 1
EN 62061 Safety of machinery - Functional safety of electrical/electronic/programmable electronic safety-related systems

ALL-ROUND FLASHING LIGHT 10 J
PMF 2015-SIL

Extremely bright flashing light by light bundling with fesnel lens, low power consumption

- to signal dangerous situations in safety-relevant application such as process and plant safety, e.g.
  - leaks / gas warning
  - high-pressure / overfilling

  and machine safety, e.g. as
  - start-up warning
  - muting indication
  - machine stop delay warning
- by means of integrated self-monitoring of the devices the normative required, regular inspection of warning devices is ensured
- the warning devices can be implemented in Safety Instrumented Systems (SIS) up to **SIL 2/PLd**

We would be more than happy to provide all safety-technical key data.

r = 22 m
Covering distance as per EN 54

IP 55
Protection system

+ 55 °C
- 30 °C
Operating temperature

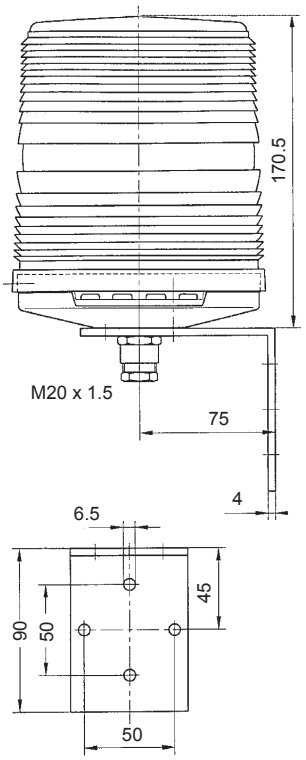
Electrical data		PMF 2015-SIL	
Rated voltage		230 V AC	24 V DC
Rated frequency		50 / 60 Hz	
Operating range		195 – 253 V	18 – 30 V
Nominal current consumption	flashing light	250 mA	700 mA
	diagnostics channel	100 mA	65 mA
Alarm contact	contact version	positively driven contact (1 x NC, 1 x NO)	
	switching current	max. 6 A	
	switching voltage	max. 250 V AC	
	max. switching power (AC)	1,500 VA	
	recommended minimum load	> 50 mW	

Mechanical data		PMF 2015-SIL
Flash rate of the main flash		1 Hz = 60 flashes/min.
Flash energy of the main flash		10 J
Light intensity (DIN 5037) [1]		200 cd
Lens colours		clear, amber, red, green, blue
Lens type		lens with fresnel characteristic
Beam angle	vertical	approx. 16 °
	horizontal	360 °
Operating temperature		- 30 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 55 (vertical mounting)
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	bracket mounting: polycarbonate (PC) / direct mounting: acrylonitrile butadiene styrene (ABS)
Cable entry	bracket mounting	M20 x 1.5 for cables 6.5 - 13,5 mm
Connecting terminal		single wire 0.5 – 2.5 mm^2, fine wire 0.5 – 1.5 mm^2, with cable end sleeves DIN 46228/1
Weight	bracket mounting	AC: 1.1 kg / DC: 1.2 kg
	direct mounting	AC: 0.6 kg / DC: 0.7 kg

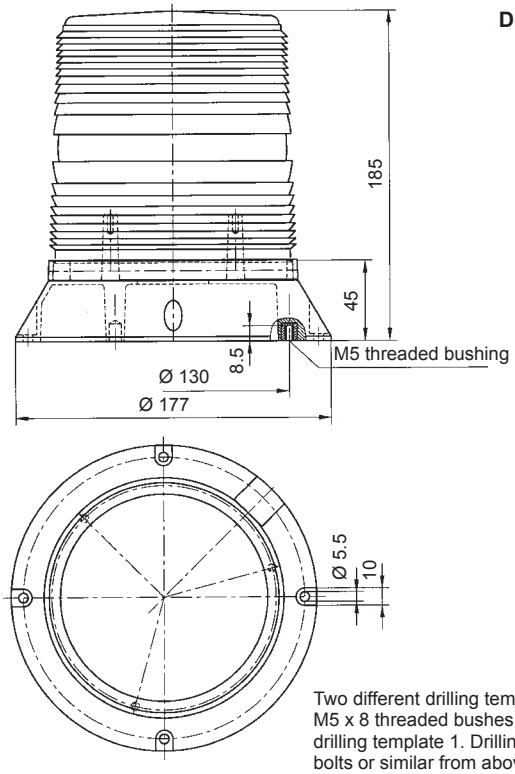
[1] with a clear lens

Dimensions

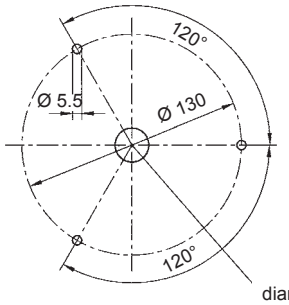
Bracket mounting



Direct mounting

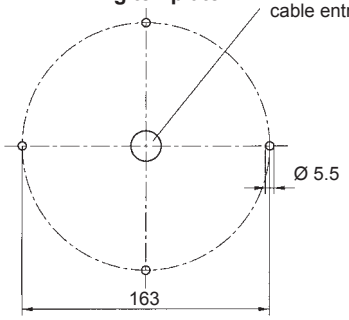


Drilling template 1 (for M5 threaded bushing)



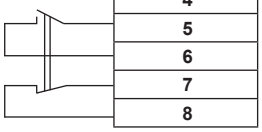
Drilling template 2

diameter variable depending on cable entry



Two different drilling templates are available for fixing the light (direct mounting). M5 x 8 threaded bushes are set into the base of the light for fixing according to drilling template 1. Drilling template 2 allows the light to be fixed using 4 through bolts or similar from above.

Connection diagram



1	L/+ Operating voltage flashing light
2	N/- Operating voltage flashing light
3	L/+ Operating voltage monitoring channel
4	N/- Operating voltage monitoring channel
5	Alarm relay NO (mechanical safety relay,
6	Alarm relay NO positively driven contacts,
7	Alarm relay NC voltage rating 250V/6A
8	Alarm relay NC minimum contact load 10mA/5V)

Ordering details

Article numbers		PMF 2015-SIL direct mounting		PMF 2015-SIL bracket mounting	
Lens colour	**Rated voltage**	230 V AC	24 V DC	230 V AC	24 V DC
amber		210 07 10 4 601	210 07 80 4 601	210 07 10 4 611	210 07 80 4 611
red		210 07 10 5 601	210 07 80 5 601	210 07 10 5 611	210 07 80 5 611

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Conformity to standards

The visual characteristics of flashing lights conform to the European standard DIN EN 842: **"Machine safety - visual alarm signals".**
Requirements contained in the DIN EN 981 standard: **"Machine safety - system of acoustic and visual alarm and information signals",** can be fulfilled.
The colours 'red' for the emergency signal and 'yellow' for the warning signal conform to the requirements of IEC 73 / DIN EN 60073 / VDE 0199:
"Coding of display devices and control elements using colours and supplementary means".

The visual alarms fulfill the requirements to the functional safety according to:
EN 61508 Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 61511 Functional safety - Safety instrumented systems for the process industry sector

The devices can be used in safety related control systems in accordance with the following standards:
EN ISO 13849-1 Safety of machinery - Safety related parts of control systems – part 1
EN 62061 Safety of machinery - Functional safety of electrical/electronic/programmable electronic safety-related systems

LED OBSTACLE LIGHTS
POL 10, POL 32

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

- omnidirectional light with a radiation angle of 360° for operation at night and at twilight (night identification of aviation obstacles)
- 2 in 1: optional completely redundant construction of LED, electronics and power supply in one housing. A 2nd light is therefore not necessary.
- automatic switching over to standby light in case of error or by means of external control system
- integrated function monitoring with potential-free fault contact
- extremely long service life of over 50,000 hrs., hence maintenance-free
- optionally equipped with mounting-friendly plug contact

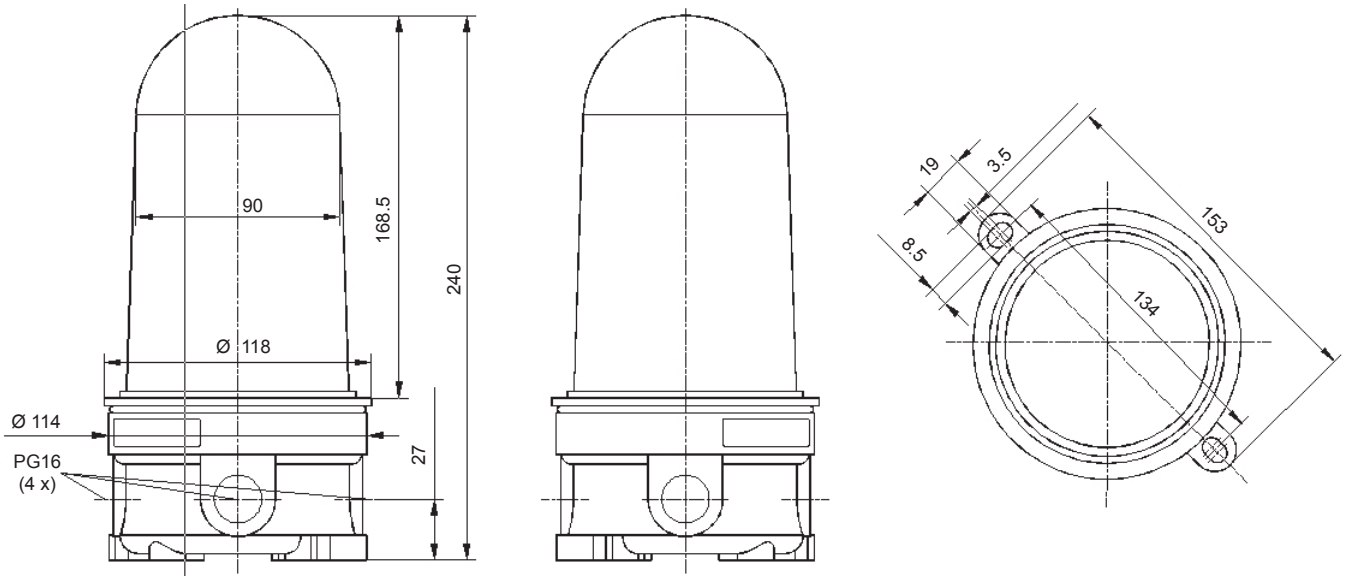
POL 10

AVV	ICAO	IP 68	+ 55 °C - 40 °C
Approval	Approval	Proctection system	Operating temperature

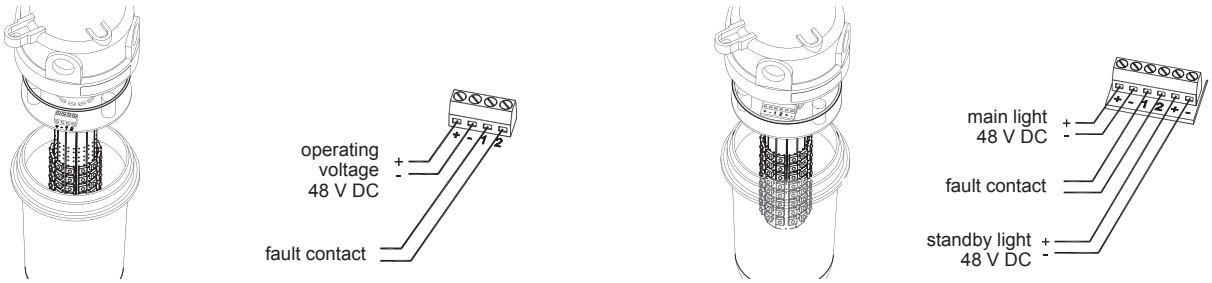
Electrical data		POL 32			POL 10		
Rated voltage		115 / 230 V AC	48 V DC	12 / 24 V DC	115 / 230 V AC	48 V DC	12 / 24 V DC
Rated frequency		50 / 60 Hz			50 / 60 Hz		
Operating range		85 – 265 V	40 – 57 V	9.6 – 28.8 V	85 – 265 V	40 – 57 V	9.6 – 28.8 V
Current consumption, determined arithmetically	115 V	96 mA			60 mA		
	230 V	45 mA			40 mA		
	48 V		270 mA			180 mA	
	24 V			430 mA			350 mA
	12 V			800 mA			600 mA
Fault contact	NC	max. 230 V, 80 mA					

Mechanical data		POL 32-M	POL 10-M	POL 10-M-R	POL 10-M-RA
Operating mode		continuous light			
Light source		LED array (red)		2 x LED array	
Version	monitored (standard)	●	●	●	●
	redundant			●	●
Activation of standby light in case of error by means of				external switching	automatic switching
Light intensity (DIN 5037)		> 32 cd	> 10 cd		
Lens colour		clear			
Light colour		aviation red			
Beam angle	vertical	approx. ± 35°			
	horizontal	360°			
Operating temperature		- 40 °C ... + 55 °C			
Storage temperature		- 40 °C ... + 70 °C			
Relative humidity		100%			
Protection system according to EN 60529		IP 68			
Duty cycle		100%			
Service life of light source		> 50,000 hrs			
Material	lens	polycarbonate (PC)			
	base	polybutylene terephthalate (PBT)			
Mounting		direct mounting			
Connecting terminals		0.5 - 1.5 mm² fine wire - H05(07)V-K, 0.5 - 2.5 mm² single wire - H05(07)V-U			
Weight		approx. 750 g			
Approvals		ICAO	ICAO / AVV	ICAO / AVV	ICAO / AVV

Dimensions



POL 32-M	POL 10



Ordering details

Article numbers	POL 32-M	POL 10-M	POL 10-M-R	POL 10-M-RA
Rated voltage				
115 / 230 V AC	211 05 68 1 005	211 05 64 1 005	211 05 64 1 011	211 05 64 1 010
48 V DC	211 05 66 1 005	211 05 65 1 005	211 05 65 1 011	211 05 65 1 010
12 / 24 V DC	211 05 67 1 005	211 05 63 1 005	211 05 63 1 011	211 05 63 1 010

Options / Accessories

Plug connec-tor

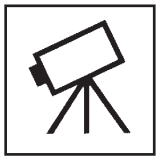
Power Supply

See page 111 for further information

Conformity to standards

The lights complies with the requirements of ICAO, Annex 14, Volume 1, Chapter 6.
The lights are approved in Germany in accordance with the General Administrative Rules for the Identification of Aircraft Obstructions (AVV).

ACCESSORIES



EXTERNAL FLASH MONITORING SYSTEM

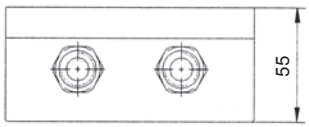
This device monitors the correct functioning of a flashing light by opto-electronic means. The flash from the light is fed via an optical fibre to a phototransistor, which converts the optical impulse to an electrical impulse. The electronic circuit evaluates the pulse and its regular repetition. As soon as the operating voltage is applied, the evaluation relay closes the changeover contact. If the operating voltage fails, the relay opens immediately.

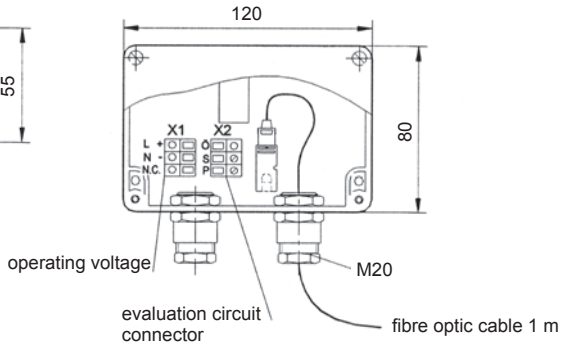
This method of operation represents the fail-safe normally-closed circuit function and guarantees an alarm even if the operating voltage fails. On the other hand, the changeover contact serves to continue an alarm, e.g. in an failure message line, or the direct blocking of further machine processes.

Electrical data	External flash monitoring			
Rated voltage	230 V AC	12 V DC	24 V DC	48 V DC
Rated frequency	50 / 60 Hz			
Operating range	198 – 242 V	11 – 15 V	16 – 34 V	38 – 52 V
Nominal current consumption	0.001 A	0.05 A	0.05 A	0.05 A

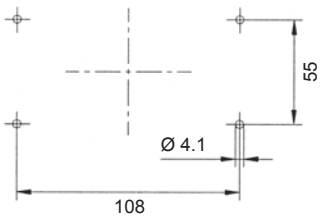
Mechanical data		External flash monitoring
Fibre optic cable		1 m
Duty cycle		100%
Switching capacity of the evaluation circuit		max. 230 V AC: 2 A
Operating temperature		- 20 °C ... + 50 °C
Storage temperature		- 40 °C ... + 50 °C
Relative humidity		90%
Protection system according to EN 60529		IP 55
Material		acrylonitrile butadiene styrene (ABS)
Colour		similar to RAL 7035
Cable entry		2 x M20
Weight	AC	330 g
	DC	230 g

Dimensions





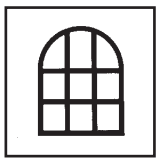
Mounting holes



Ordering details

suitable for ...	Rated voltage	Article number
any flashing light with a 1 Hz flash rate	24 V DC	291 30 80 0 000

Article numbers for other voltages on request



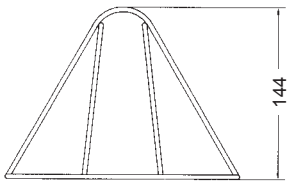
PROTECTIVE CAGES

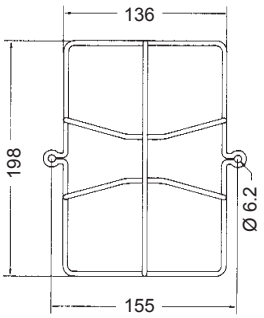
For protection against large mechanical demands. A very useful accessory for visual signaling devices fitted to vehicles, such as fork lift trucks or driverless transport vehicles.

Mechanical data	Protective cages
Material	steel, powder-coated
Colour	white, similar to RAL 9016

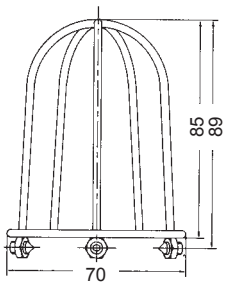
Dimensions

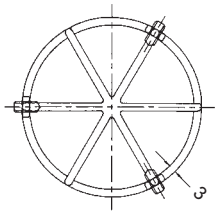
for PD



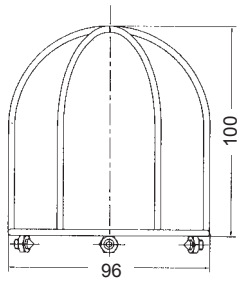


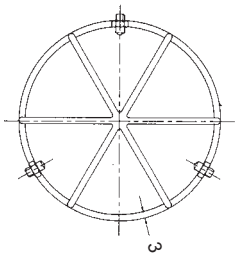
for WBL/WBS, DWBL/DWBS



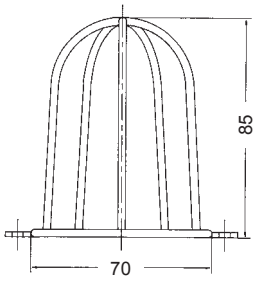


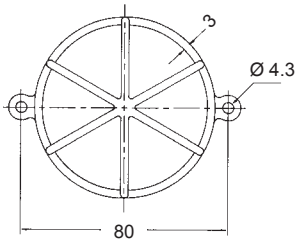
for ABL/ABL, WB-M





for WBLR/WBSR





Ordering details

suitable for ...	Weight	Article number
PD	165 g	287 10 50 0 040
WBL/WBS, DWBL/DWBS	55 g	287 10 50 0 041
ABL/ABS, WBL-M/WBS-M	65 g	287 10 50 0 042
WBLR/WBSR	52 g	287 10 50 0 043

ACCESSORIES PYRA FLASHING LIGHTS

Ordering details

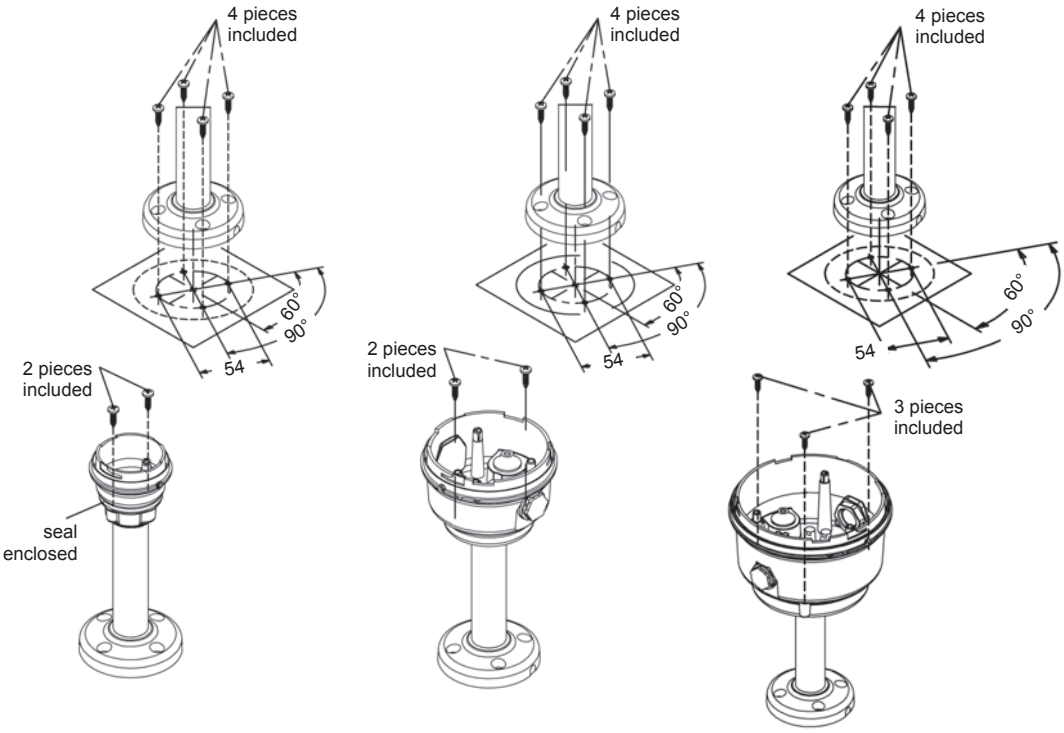
Article numbers		PY X-S	PY X-M
Enclosure fitting	For connection (daisy-chaining) of several flashing lights of the PY X-S series.	283 00 00 0 003	–
Surface gasket	Sealing of the flashing light installation surface when, e.g. cable entry is executed from the back.	283 00 00 0 004	281 11 50 0 000
Tamper-proof sealing (pack of 4)	Anti-tamper sealing for fasteners of the PYRA devices after installation in order to prevent manipulation of the devices.	283 00 00 0 002	
Panel mount installation kit PYRA	The PYRA devices are also suitable for panel mounting. This kit consists of a plug connector for the electrical contact, as well as all installation materials.	283 00 00 0 010	

TUBULAR STAND

Tubular stand for mounting SPECTRA lights.

Dimensions

P 200 TMA001	P 300 TMA001	P 400 TMA001



Ordering details

Article numbers	Height	P 200 TMA001	P 300 TMA001	P 400 TMA001
for P 200 series	**137 mm**	213 91 00 0 000	–	–
for P 300 series	**140 mm**	–	213 93 00 0 000	–
for P 400 series	**145 mm**	–	–	213 95 00 0 000

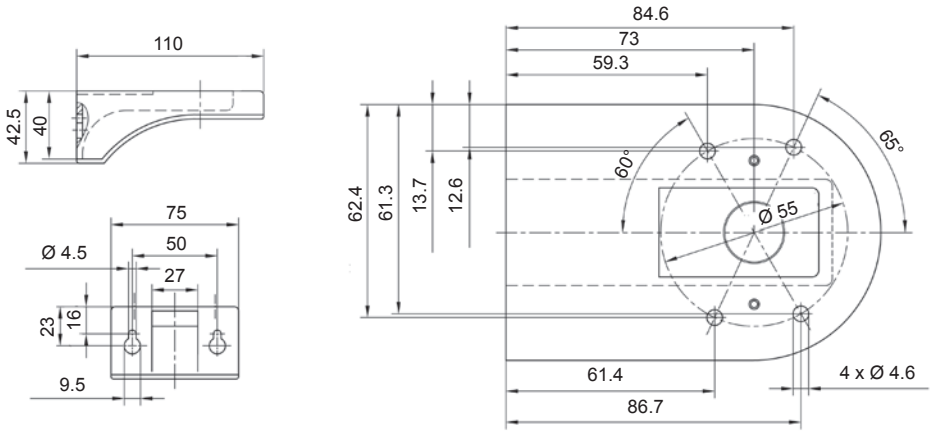
further tubular stand lengths on enquiry

WALL HOLDER WITH HOOD

Wall holder for mounting SPECTRA lights on tubular stands.

Dimensions

BR 50-W



Ordering details

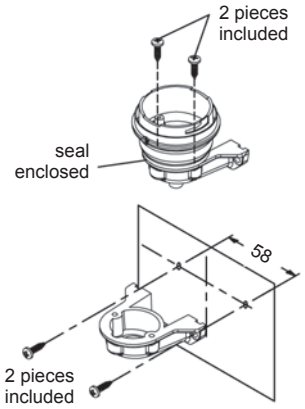
suitable for ...	Article number
mounting the P 200 / P 300 / P 400 series on tubular stands	282 50 20 0 000

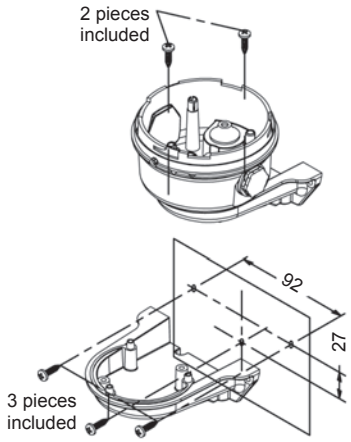
WALL BRACKET

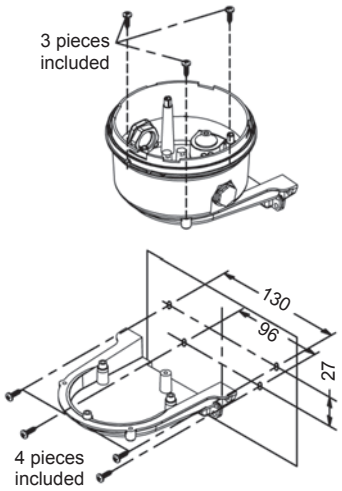
Wall bracket for mounting SPECTRA lights.

Dimensions

P 200 RAB001	P 300 RAB001	P 400 RAB001







Ordering details

Article numbers	P 200 RAB001	P 300 RAB001	P 400 RAB001
for P 200 series	213 90 00 0 000	–	–
for P 300 series	–	213 92 00 0 000	–
for P 400 series	–	–	213 94 00 0 000

WALL BRACKET FOR TRAFFIC LIGHTS

Metal wall bracket for traffic lights and combinations.

Ordering details

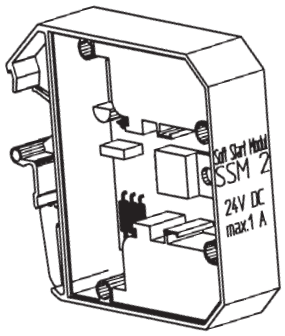
Article numbers	P 350 TMB	P 450 TMB
Wall bracket for single mounting of the P 350	213 98 00 0 000	–
Wall bracket for single mounting of the P 450	–	213 99 00 0 000
Wall bracket set for combinations of 2 or 3 P 350	213 96 00 0 000	–
Wall bracket set for combinations of 2 or 3 P 450	–	213 97 00 0 000

POWER SUPPLY / BATTERY BACKUP

- complete solution for uninterrupted power supply of obstruction lights
- plug&play solutions with integrated connectors available
- several back-up times for all applications and countries
- always integrated in a switch cabinet

Ordering details

Article number	Night-Tower Plug
for POL 10 / POL 32	280 13 00 0 007



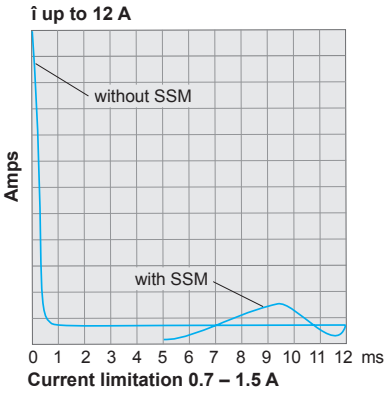
SOFT START MODULE SSM2

The module enables the soft start and limitation of the large initial current peaks of capacitive consumers. This includes all DC devices with a smoothing capacitor on the voltage input, regardless of whether the devices are sounders or flashing lights. The SSM soft start module prevents the overloading of the relay contacts when switching on and the premature triggering of overcurrent circuit breakers (e.g. PLC controller). The module is available as a built-in housing for DIN rail mounting or is already integrated in various devices.

Data	SSM2
Rated voltage	24 V DC
Operating range	18 – 30 V
Nominal current consumption	1 A
Operating temperature	- 40 °C ... + 50 °C
Storage temperature	- 40 °C ... + 70 °C
Relative humidity	90%

Ordering details

suitable for ...	Article number
DC devices	410 00 00 0 500



Current limitation 0.7 – 1.5 A

LIGHT SOURCES

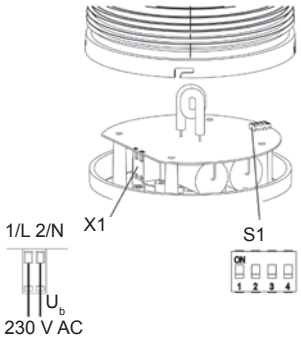
FILAMENT LAMPS

Filament lamps for Pfannenberg lights with socket

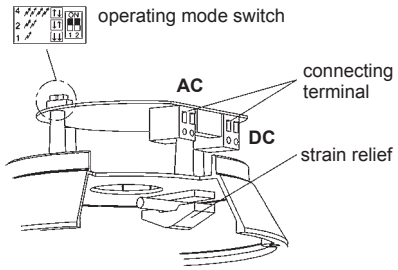
Product	suitable for ...	Rated voltage	Article number
Filament lamp E14 15 W	PD / P 350 TSB / P 450 TDB	24 V	281 13 00 0 000
Filament lamp E14 15 W	PD / P 350 TSB / P 450 TDB	12 V	281 13 00 0 001
Filament lamp E14 15 W	PD / P 350 TSB / P 450 TDB	48 V	281 13 00 0 002
Filament lamp E14 15 W	PD / P 350 TSB / P 450 TDB	110 V	281 13 00 0 003
Filament lamp E14 15 W	PD / P 350 TSB / P 450 TDB	240 V	281 13 00 0 004
Filament lamp E27 25 W	P 450 TSB	24 V	281 13 00 0 019
Filament lamp E27 25 W	P 450 TSB	115 V	281 13 00 0 020
Filament lamp E27 25 W	P 450 TSB	230 V	281 13 00 0 021
Halogen lamp G6.35/GY6.35 20 W	P 300 RTH	12 V	281 13 00 0 027
Halogen lamp G6.35/GY6.35 20 W	P 300 RTH	24 V	281 13 00 0 028
Halogen lamp G6.35/GY6.35 25 W	P 300 RTH	115 V	281 13 00 0 029
Halogen lamp G6.35/GY6.35 25 W	P 300 RTH	230 V	281 13 00 0 030
Halogen lamp G6.35/GY6.35 35 W	P 400 RTH	12 V	281 13 00 0 031
Halogen lamp G6.35/GY6.35 35 W	P 400 RTH	24 V	281 13 00 0 032
Halogen lamp G6.35/GY6.35 40 W	P 400 RTH	115 V	281 13 00 0 033
Halogen lamp G6.35/GY6.35 40 W	P 400 RTH	230 V	281 13 00 0 034

CONNECTION DIAGRAMS

PMF 2030

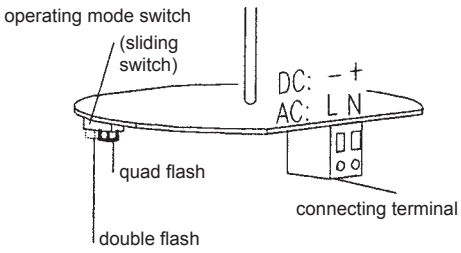


PMF 2020



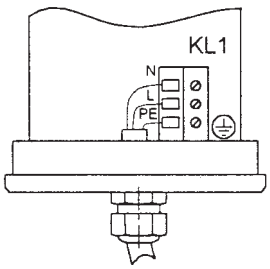
The operating modes quad flash (factory setting), double flash and single flash can be set via the DIP switch, which is accessible from the side.

PMF 2015

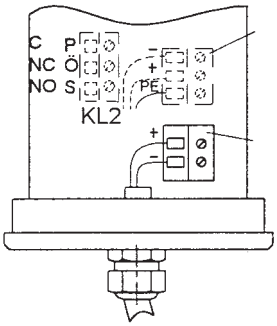


The operating modes quad flash (factory setting) and double flash can be set via the DIP switch, which is accessible from the side.

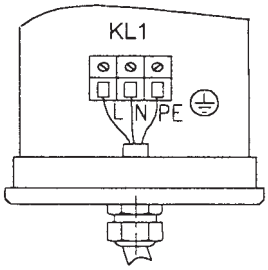
ABL



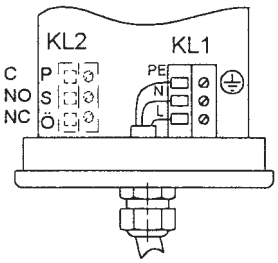
ABS / WBS / DWBS WBS-M



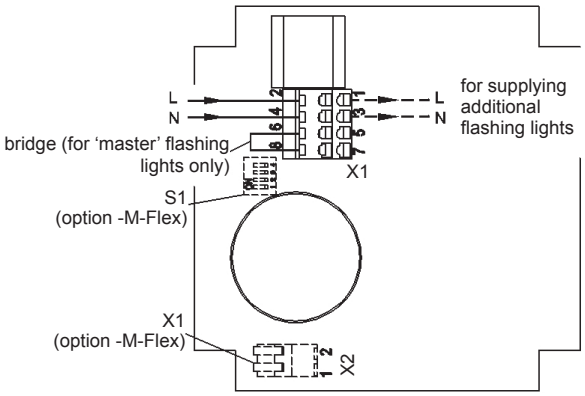
WBL / WBL-PX DWBL

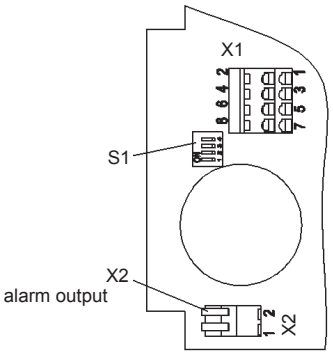


WBL-M 230 V AC

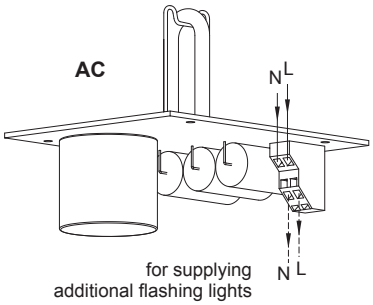


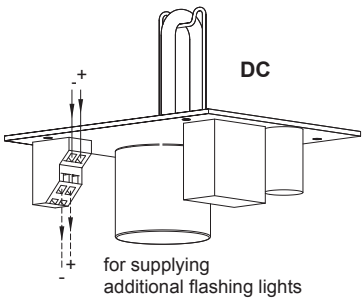
Quadro S / Quadro S-M-Flex



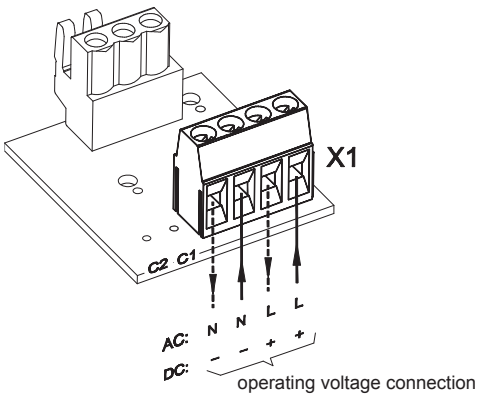


Quadro F12

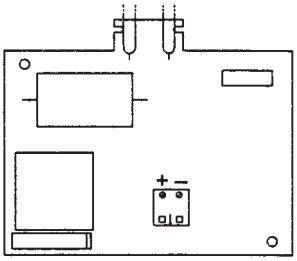




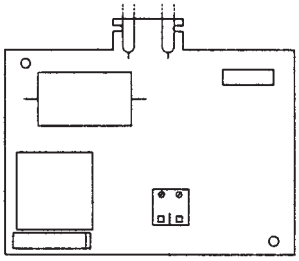
PY X-M-10 / PY X-M-05



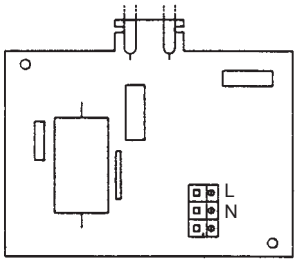
WBSR



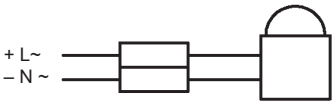
WBLR (< 42 V AC)



WBLR (> 110 V AC)

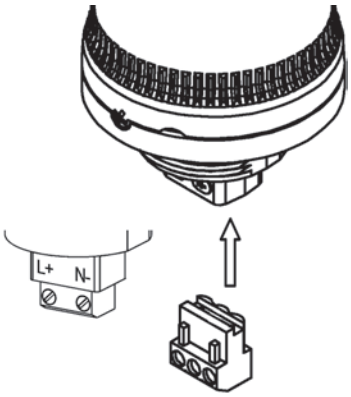


P 300 STR / P 400 STR

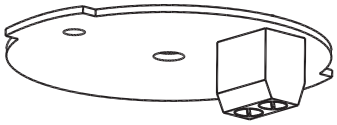


Colour	D/C	A/C
brown	+	L~
blue	–	N ~

P 100 LDA

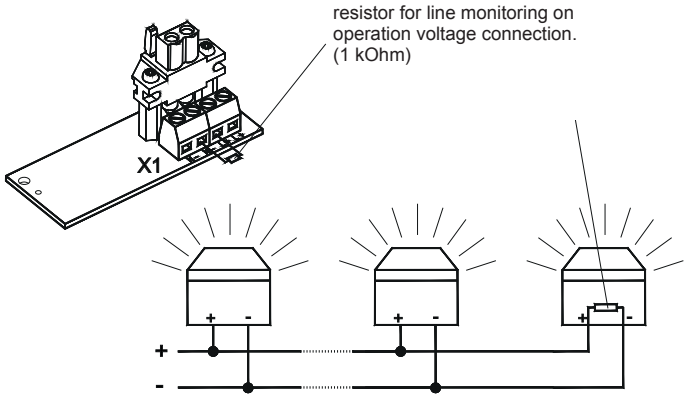


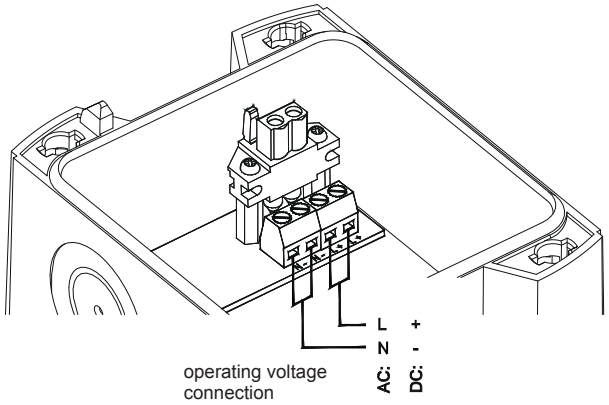
P 200 LDA



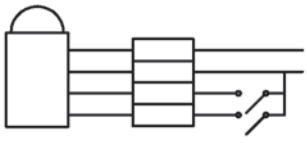
DC	AC
+	L~
-	N~

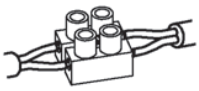
PY X-S-05





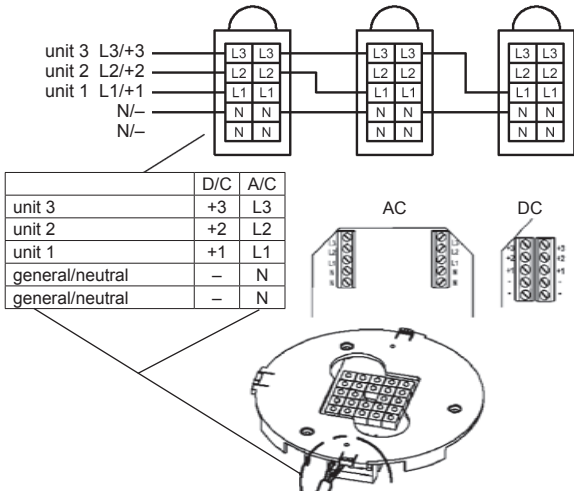
P 400 LDA





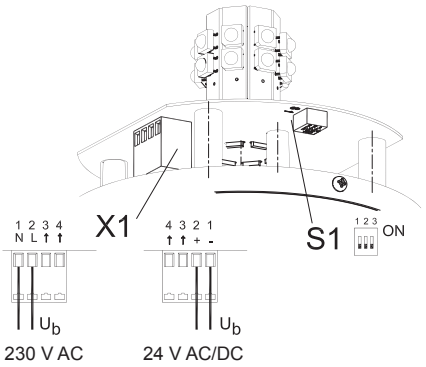
Colour	D/C	A/C
red / brown	+	L~
blue	–	N ~
green stage 2	–	
yellow stage 3	–	

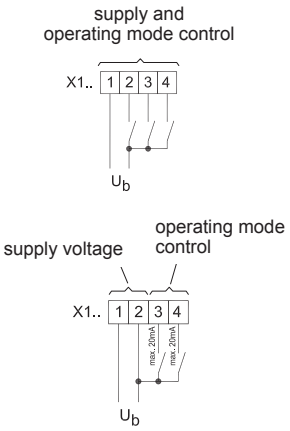
P 450 TLA / P 350 TLA



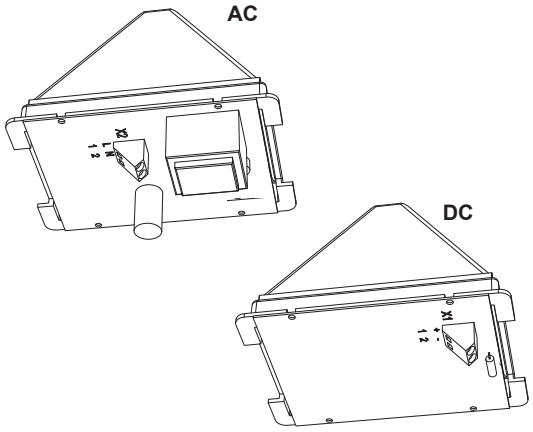
	D/C	A/C
unit 3	+3	L3
unit 2	+2	L2
unit 1	+1	L1
general/neutral	–	N
general/neutral	–	N

PMF-LED Flex

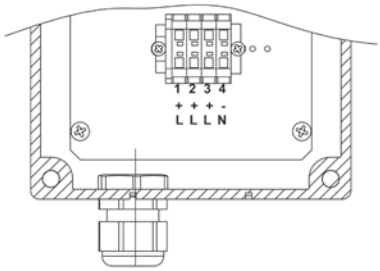


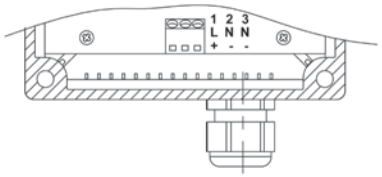


PD 2100-LED

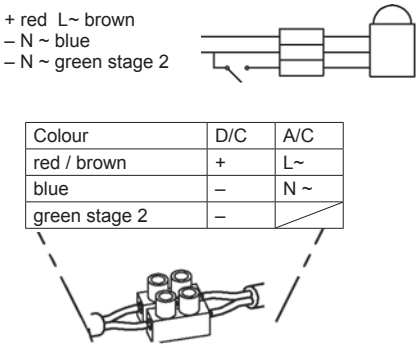


Quadro LED-TL



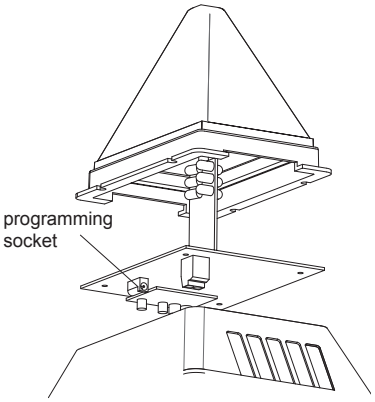


P 300 LDA

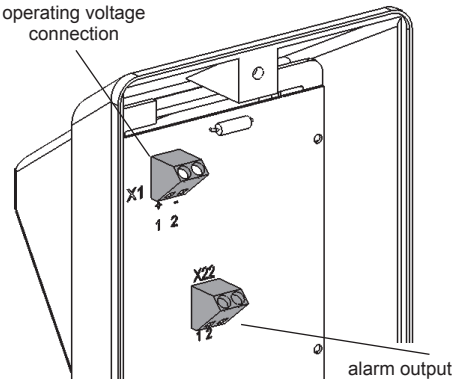


Colour	D/C	A/C
red / brown	+	L~
blue	–	N ~
green stage 2	–	

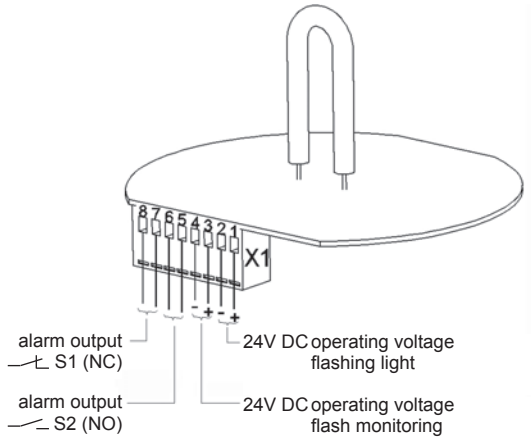
PD 2100-M-AS-i

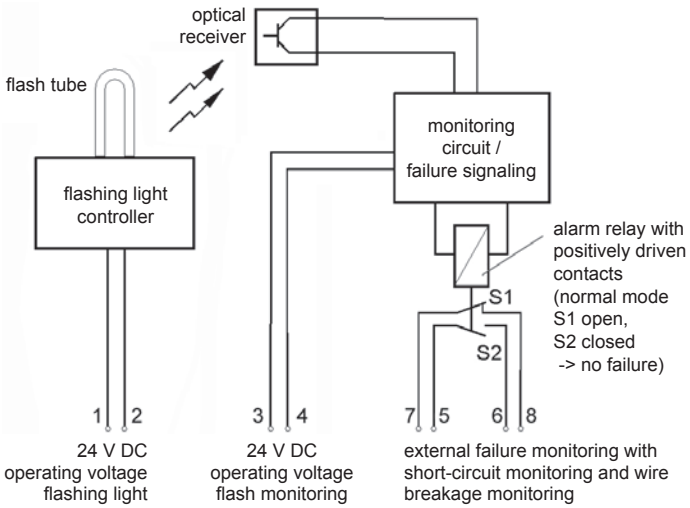


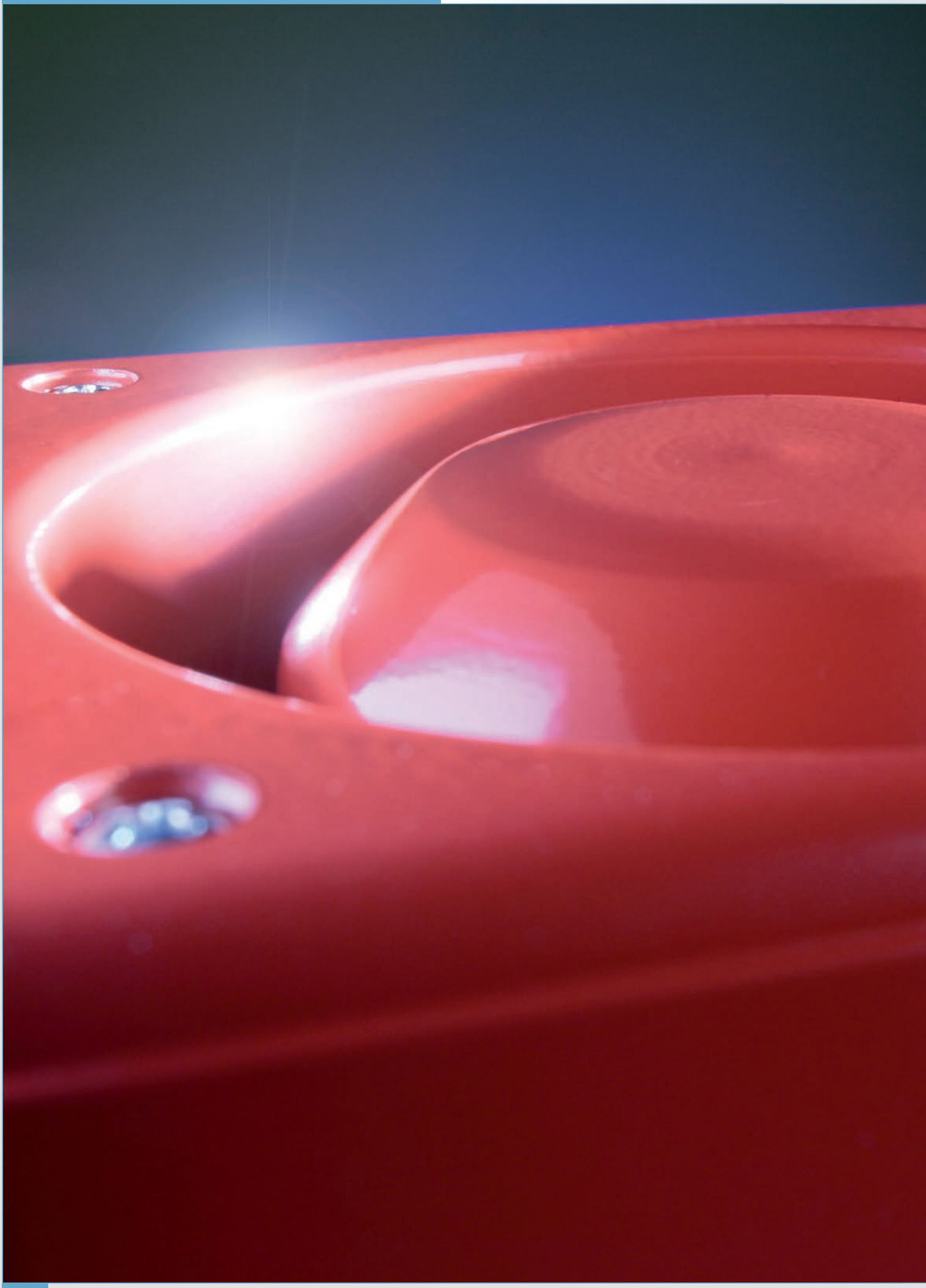
PD 2100-LED-M



PMF 2015-M







SOUND WAVES ARE A LANGUAGE THAT EVERYBODY UNDERSTANDS!

USE OUR RANGE OF AUDIBLE SIGNALING DEVICES FOR ALL INDUSTRIAL AREAS OF APPLICATION

A baby's cry, cars sounding their horns, the front door bell – acoustic signals are part of our life right from the very beginning. All over the world. Everybody who hears a loud acoustic signal feels called upon to act in some way, regardless of the situation.

On the basis of these conditions, the use of acoustic signaling devices is also of great advantage in the industrial sector. Malfunctions are reported immediately, dangerous situations are displayed without delay. Benefit from our wide range of acoustic signaling devices, which are guaranteed to draw the necessary attention in your company - when it really matters.

ALL AUDIBLE SIGNALING DEVICES AT A GLANCE

	Type	Maximum covering distance for a 65 dB ambient noise level in in metres (m) [1]					Sound pressure level	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		10	100	250	500	1500				GL MED	GOST	UL	EN 54-3 VdS	RS	
	SOUNDERS														
	**DS 5**						105 dB (A)	IP 66 IP 67	133.5 x 133.5 x 143	●	●	●	●	●	120
	DS 10						110 dB (A)			●			●		
	**DS 5-DN**						105 dB (A)	IP 66 IP 67	133.5 x 133.5 x 143						122
	**PA 1**						100 dB (A)	IP 66 IK 08	86 x 109.5 x 80.6	● [2]	●	●	●	●	124
	**PA 5**						105 dB (A)	IP 66 IK 08	135 x 163.4 x 132	● [2]	●	●	●	●	
	**PA 10**						110 dB (A)	IP 66 IK 08	170 x 214 x 156	● [2]	●	●	●	●	126
	**PA 20**						120 dB (A)	IP 66 IK 08	170 x 214 x 181	● [2]	●	●	●	●	
	**PA 130**						130 dB (A)	IP 54	285 x 490 x 595		●				130
	SAFETY-RELATED SOUNDERS														
	**DS 5-SIL**						105 dB (A)	IP 66 IP 67	133.5 x 133.5 x 143		●			○	132
	DS 10-SIL						110 dB (A)				●			○	

● available
○ in preparation
[2] option

Type	Maximum covering distance for a 65 dB ambient noise level in in metres (m) [1]					Sound pressure level	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
	10	100	250	500	1500				GL MED	GOST	UL	EN 54-3 VdS	RS	
ELECTRONIC BUZZERS														
 **P 22 DBZ**						80 dB (A) @ 10 cm	IP 40	Ø 29 x 62						134
P 28 DMC948						91 dB (A)	IP 65	Ø 35.8 x 38.2						
 **P 28 DMC201**						91 dB (A)								
P 28 DMC301						91 dB (A)								
P 28 DMB530						91 dB (A)								

[1] The specification for the alarm signal reception range assumes an existing ambient noise level of 65 dB (A). In accordance with applicable regulations, the calculated alarm range for the sound level 65 dB (A) was given + 10 dB (A) = 75 dB (A).

● available
○ in preparation

Note:
Using sounders with a sound pressure level of ≥ 120 dB (A) can lead to hearing damage. People must not be permitted to stay in the near vicinity of the sounder. All specified sound pressure levels are based on a measurement distance of 1 m, provided that nothing different is specified.

Further information can be found on the Internet:
www.pfannenberg.com · www.pfannenberg-spareparts.com
Keep up to date. Subscribe to our newsletter now:
newsletter.pfannenberg.com

SOUNDERS 105/110 dB(A)
DS 5 / DS 10

The sounders from the DS 10 / DS 5 series can be used for tough demands under industrial conditions and as universal alarms. The sounders, which are suitable for use both indoors and outdoors, generate warning signals in 31 different tones can be selected with the aid of an internal switch. Optionally, a maximum of 3 additional tones can be switched to by means of an external controller. In addition to the factory settings, the tone combination can be individually selected by means of on-site programming (tone 32).
Custom versions are available for special applications. The GL version is especially resistant to shock and vibration.

• volume control (DS 5)

DS 5 / DS 10

r = 32 m / r = 56 m — max. covering distance

IP 66 IP 67 — Protection system

+ 55 °C / - 40 °C — Operating temperature

Acoustic penetration

EN 54-3

VdS G28609

10 Years — Warranty

Electrical data	DS 5					
Rated voltage	230 V AC	115 V AC	24 V AC	12 V DC	24 V DC	48 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range	195 – 253 V	95 – 127 V	19 – 29 V	10 – 15 V	19 – 29 V	41 – 53 V
Nominal current consumption	30 mA	60 mA	280 mA	280 mA	280 mA	280 mA
Electrical data	**DS 10**					
Rated voltage	230 V AC	115 V AC	24 V AC	12 V DC	24 V DC	48 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range	195 – 253 V	95 – 127 V	19 – 29 V	10 – 15 V	19 – 29 V	41 – 53 V
Nominal current consumption	60 mA	120 mA	420 mA	30 mA	420 mA	420 mA

Mechanical data		DS 5	DS 10
Sound pressure level		105 dB (A)	110 dB (A)
Sound level reduction		by - 20 dB via potentiometer (optional)	
Alarm tones		32 / 2-stage alarm	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 66, IP 67	
Duty cycle		100%	
Material		die-cast aluminium GD-Al Si12 Cu	
Surface coating		epoxy resin paint RAL 3000, flame red	
Cable bushing		2 x M20 (1 x chrome-plated brass cable fitting, 1 x chrome-plated brass blanking plug)	
Clamping range of the cable fitting		8 – 12 mm	
Connecting terminals		max. 2.5 mm²	
Weight	AC	2.15 kg	
	DC	1.95 kg	

Options / Accessories

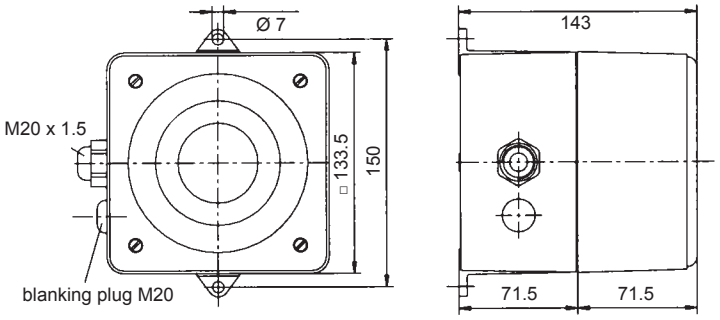
External tone selection (2 variants) for controlling several tones over great distances:
1: for all voltages = potential-free NO function
2. for 12 V / 24 V = voltage input

GOST

GL 30457-83-HH

C UL US

Dimensions



Tone table

Tone	Description - Basic tone (preset: tone 2)		Stage 2	3	4
0	no tone		1	5	4
2 [1]	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	1200 Hz / 500 Hz, 1 s, EN54-3	3	2	4
15	Slow whoop, evacuation alarm Netherlands NEN 2575	1200 Hz / 500 Hz, 3.5 s, 0.5 s, EN54-3	19	14	2
23	Siren	2400 Hz / 500 Hz, 3 s, const.	27	12	2
24	Siren	1200 Hz / 300 Hz, 3 s, const.	13	23	19
26	Pulsating tone, industrial alarm Germany	1000 Hz / 150 Hz, 10 s, 40 s, 10 s	1	30	9
31	Sweeping, France NFC48-265	1600 Hz / 1400 Hz, 1 s, 0.5 s	3	14	4
32	selection of available tone combinations in stages 2, 3 and 4				
36	Sweeping	1500 Hz / 700 Hz, 1.5 s, 1.5 s	7	10	4
45	Sweeping	1200 Hz / 500 Hz, 3 s, 3 s	1	4	9
54	Continuous tone, Finland (all-clear signal)	1500 Hz	1	4	10
55	Continuous tone, PFEER gasalarm	1200 Hz	1	5	3
57	Continuous tone, UK BS5839-1	950 Hz	1	3	5
60	Continuous tone	825 Hz, EN54-3	27	9	26
63	Continuous tone	725 Hz	1	17	9
67	Continuous tone, Germany KTA3901 (all-clear signal)	500 Hz	27	9	26
88	Interrupted tone	950 Hz, 1 s, 1 s	1	4	3
90	Interrupted tone	825 Hz, 0.5 s, 0.5 s	1	24	15

Tone	Description - Basic tone (preset: tone 2)		Stage 2	3	4
92	Interrupted tone	800 Hz, 0.25 s, 1 s	19	7	4
93	Interrupted tone (fast), electromechanical horn	800 Hz, 4 ms, 4 ms	1	3	4
97	Interrupted tone	725 Hz, 0.7 s, 0.3 s	1	11	9
98	Interrupted tone, Sweden SS031711 (emergency signal)	700 Hz, 0.125 s, 0.125 s	2	3	4
100	Interrupted tone, industrial alarm Germany	680 Hz, 0.875 s, 0.875 s	1	4	26
108	Interrupted tone	500 Hz, 0.5 s, 0.5 s	1	24	12
112	Interrupted tone, ISO8201 (emergency evacuation signal)	950 Hz, 0.5 s, 0.5 s, 1.5 s	1	4	3
116	Interrupted tone, IMO (leave ship)	950 Hz, 1 s, 1 s, 3 s, 1 s	20	9	26
117	Interrupted tone, IMO SOLAS III/50 + SOLAS III/6.4 (general alarm)	825 Hz, 2.5 s, 2.5 s, 7 s	9	21	26
125	Alternating tone	1400 Hz / 1200 Hz, 20 ms, 20 ms	4	9	27
127	Alternating tone	1075 Hz / 825 Hz, 0.5 s, 0.5 s	1	16	12
128	Alternating tone	1025 Hz / 825 Hz, 0.25 s, 0.25 s	1	2	4
131	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	1000 Hz / 800 Hz, 0.25 s, 0.25 s, EN54-3	27	13	23
142	Alternating tone	900 Hz / 500 Hz, 0.25 s, 0.25 s	1	14	5
146	Alternating tone, France NFS 32-001 (fire alarm)	554 Hz / 440 Hz, 0.1 s, 0.4 s, EN54-3	3	10	4

[1] factory setting

Ordering details

Article numbers		DS 5			DS 10		
Version	**Rated voltage**	230 V AC	115 V AC	24 V DC	230 V AC	115 V AC	24 V DC
Standard		231 06 10 0 000	231 06 15 0 000	231 06 80 0 000	231 11 10 0 000	231 11 15 0 000	231 11 80 0 000
GL		231 06 10 0 001	231 06 15 0 001	231 06 80 0 001	231 11 10 0 001	231 11 15 0 001	231 11 80 0 001
LSR (volume control)		231 06 10 0 151	231 06 15 0 151	231 06 80 0 151			
TAS (external tone selection via closed function of the control voltage)		231 06 10 0 152	231 06 15 0 152	231 06 80 0 152	231 11 10 0 152	231 11 15 0 152	231 11 80 0 152

Article numbers for other voltages and versions on request

Conformity to standards

DIN EN 54-3: 2001 + DIN EN 54-3/A1: 2001	Fire alarm systems - part 3: fire alarm devices; Audible signaling devices and annex A1
EN 50 130-4: 1996	Stability of system components for fire and burglar alarm systems
EN 61 000-6-2	EMV, stability for industrial areas
EN 61 000-6-3	EMV, emission standard for residential commercial, and light-industrial environments
EN 60 947-1: 2003	Low voltage switchgear standard
EN 60 529: 2000	Protection system by enclosure (IP code)
DIN EN ISO 7731	Ergonomic – alarms for public areas and workplaces – acoustic alarms
DIN 33 404/3: 1982	Alarms for workplaces, unified emergency signal
ISO 8201: 1987	Evacuation alarm
DIN EN 981: 1997	System of acoustic and visual alarm signals and information signals
ISO 11 429: 1996	System of acoustic and visual alarm signals and information signals

SOUNDER 105 dB(A)
DS 5-DN

- sounder with 2 externally controllable volume levels
- wherever sounders need to be operated virtually 24 hours a day for alarm purposes, e.g. in port areas, container terminals, conveyor belts in coal mines or for supplying power stations, it is important to disturb local residents as little as possible. This is especially the case in the evening and at night, when the ambient noise level is also lower.
- can also be used to avoid startled reactions by starting the alarm with a reduced sound level and increasing it in steps (soft alarm)
- the sound level can be reduced by an external controller or via a floating contact
- the reduction may be preselected during the installation in accordance with local conditions (0 to - 20 dB)

max. covering distance

Protection system

Operating temperature

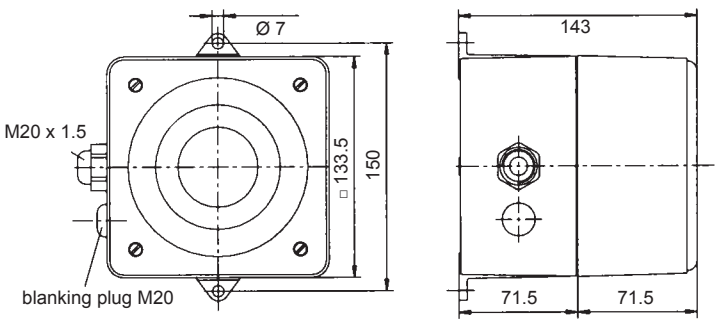

Acoustic penetration

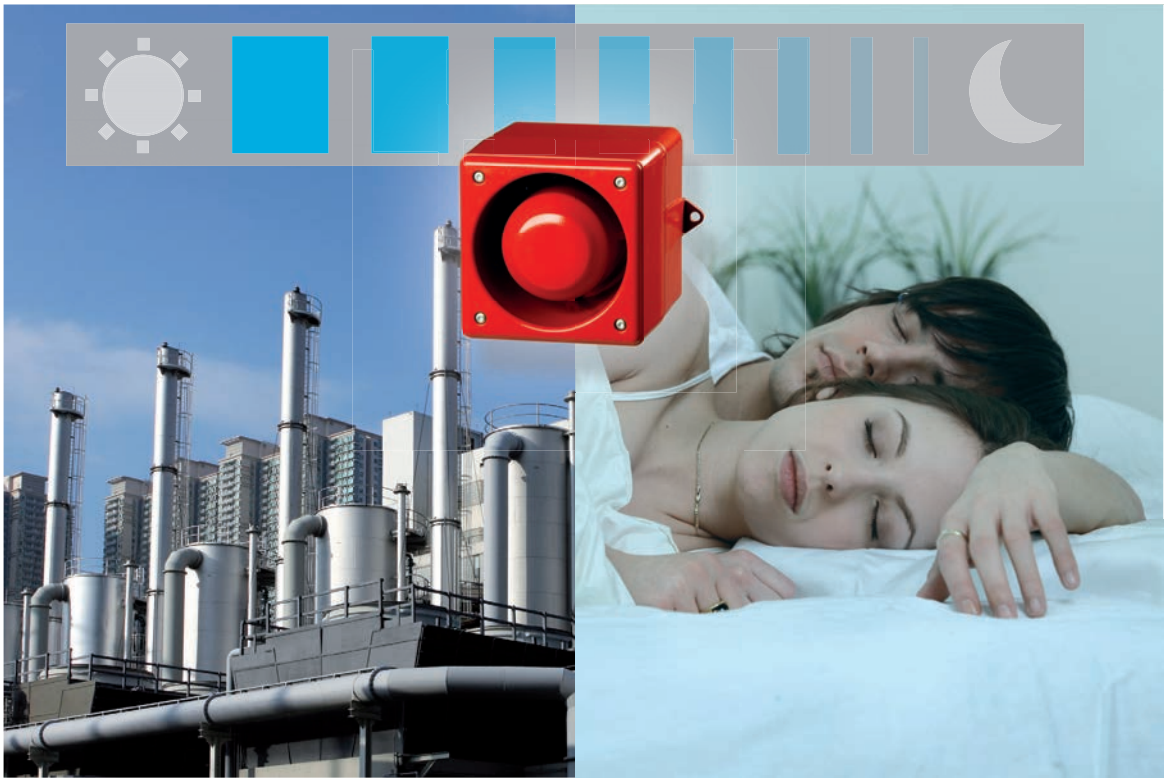
Warranty

Electrical data	DS 5-DN					
Rated voltage	230 V AC	115 V AC	24 V AC	12 V DC	24 V DC	48 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range	195 – 253 V	95 – 127 V	19 – 29 V	10 – 15 V	19 – 29 V	41 – 53 V
Nominal current consumption	30 mA	60 mA	280 mA	280 mA	280 mA	280 mA

Mechanical data		DS 5-DN
Sound pressure level		105 dB (A)
Sound level reduction		externally adjustable up to - 20 dB via potentiometer
Alarm tones		32 / 2-stage alarm (see tone table page 121)
Operating temperature		- 40 °C ... + 55 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 66, IP 67
Duty cycle		100%
Material		die-cast aluminium GD-Al Si12 Cu
Surface coating		epoxy resin paint RAL 3000, flame red
Cable bushing		2 x M20 (1 x chrome-plated brass cable fitting, 1 x chrome-plated brass blanking plug)
Clamping range of the cable fitting		8 – 12 mm
Connecting terminals		max. 2.5 mm²
Weight	AC	2.15 kg
	DC	1.95 kg

Dimensions





Ordering details

Article numbers		DS 5-DN		
Version	**Rated voltage**	230 V AC	115 V AC	24 V DC
Standard		231 06 10 0 163	231 06 15 0 163	231 06 80 0 163
TAS (external tone selection via closed function of the control voltage)		231 06 10 0 162	231 06 15 0 162	231 06 80 0 162

Article numbers for other voltages and versions on request

Options / Accessories

External tone selection (2 variants) for controlling several tones over great distances:
1: for all voltages = potential-free NO function
2. for 12 V / 24 V = voltage input

GOST

Conformity to standards

EN 61 000-6-2	EMV, stability for industrial areas
EN 61 000-6-3	EMV, emission standard for residential commercial, and light-industrial environments
EN 60 947-1: 2003	Low voltage switchgear standard
EN 60 529: 2000	Protection system by enclosure (IP code)
DIN EN ISO 7731	Ergonomic – alarms for public areas and workplaces – acoustic alarms
DIN 33 404/3: 1982	Alarms for workplaces, unified emergency signal
ISO 8201: 1987	Evacuation alarm
DIN EN 981: 1997	System of acoustic and visual alarm signals and information signals
ISO 11 429: 1996	System of acoustic and visual alarm signals and information signals

PATROL SOUNDERS 100/105 dB(A)
PA 1 / PA 5

PATROL - the new generation of sounders.

Three dimensional innovation;

- safe; an incorrect installation is virtually impossible
- easy; significantly shorter assembly and installation times
- economical; extremely high efficiency and good penetration of acoustical obstacles significantly reduce the required number of sounders

reddot design award
winner 2013

PA 1	PA 5									
r = 18 m	r = 32 m	IP 66	IK 08	+ 55 °C / - 40 °C			EN 54-3	VdS	UL	10 Years
max.covering distance		Protection system	Impact-proof housing	Operating temperature	Acoustic penetration		24–48 V DC	24–48 V DC		Warranty

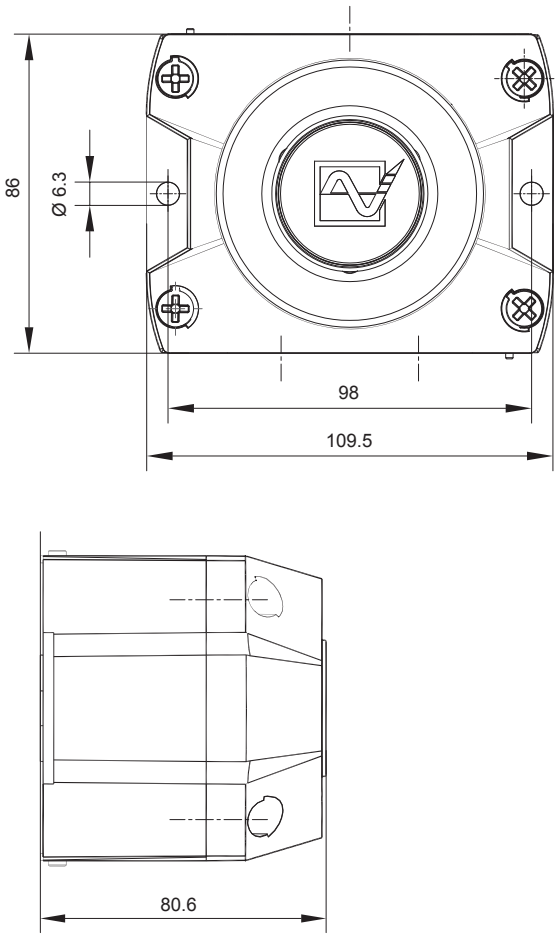
Electrical data	PA 1			
Rated voltage	230 V AC	115 V AC	24 V AC	10 – 57 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	
Operating range	195 – 253 V	95 – 127 V	18 – 30 V	10 – 57 V
Nominal current consumption	9 – 15 mA	8 – 30 mA	59 – 120 mA	6 – 80 mA
Electrical data	**PA 5**			
Rated voltage	230 V AC	115 V AC	24 V AC	10 – 57 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	
Operating range	195 – 253 V	95 – 127 V	18 – 30 V	10 – 57 V
Nominal current consumption [1]	9 – 15 mA	8 – 30 mA	59 – 120 mA	6 – 80 mA

[1] power consumption dependent on operating voltage

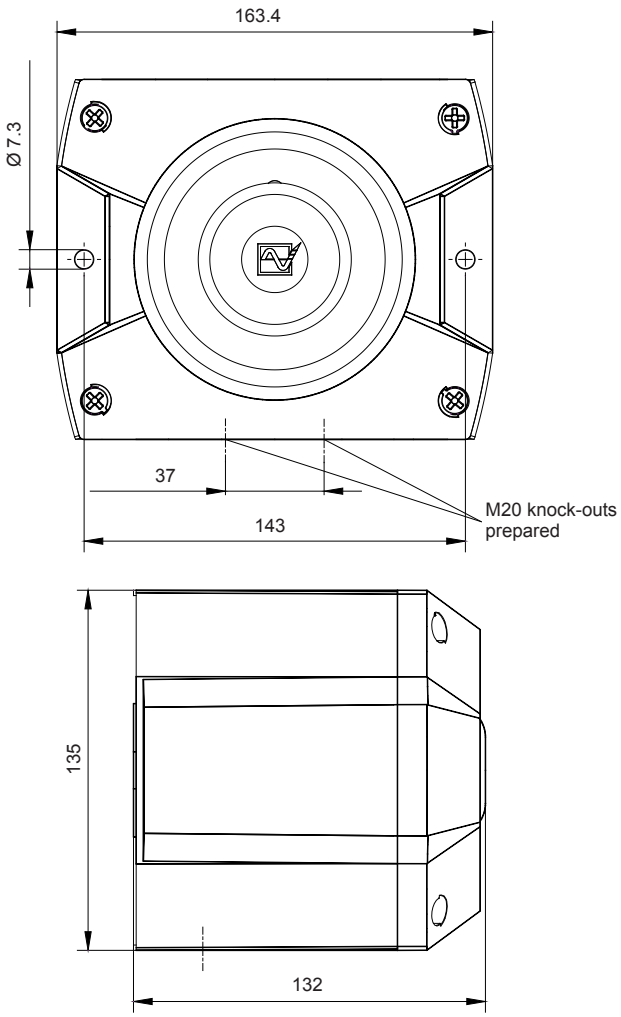
Mechanical data		PA 1	PA 5
Sound pressure level		100 dB (A)	105 dB (A)
Sound level reduction		max. - 16 dB via potentiometer	
Alarm tones		80 (see tone table page 128/129)	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 66	
Protection class		II	
Duty cycle		100%	
Material		PC / ABS blend	
Colour		similar to RAL 3000 (flame red) / RAL 7035 (light grey) / RAL 9003 (signal white)	
Cable entry		3 x M20 knock-outs on side, 1 knock-out on back	5 x M20 knock-outs on side, 1 knock-out on back
Integrated seal with cable entry		6 – 13 mm (feed-through grommet)	
Connecting terminals		2.5 mm² fine wire with cable end sleeve, AWG 16	
Weight	AC	405 g	778 g
	DC	270 g	643 g

Dimensions

PA 1



PA 5



Ordering details

Article numbers		PA 1			PA 5		
Version	Rated voltage	230 V AC	115 V AC	10-57 V DC	230 V AC	115 V AC	10-57 V DC
Standard	housing red	233 10 10 0 000	233 10 15 0 000	233 10 63 0 000	233 50 10 0 000	233 50 15 0 000	233 50 63 0 000
GL/MED	housing red	233 10 10 0 001	233 10 15 0 001	233 10 63 0 001	233 50 10 0 001	233 50 15 0 001	233 50 63 0 001
Standard	housing grey	233 10 10 0 055	233 10 15 0 055	233 10 63 0 055	233 50 10 0 055	233 50 15 0 055	233 50 63 0 055
GL/MED	housing grey	233 10 10 0 056	233 10 15 0 056	233 10 63 0 056	233 50 10 0 056	233 50 15 0 056	233 50 63 0 056

Article numbers for other voltages and versions on request

Options / Accessories

GL MED CNBOP

Enclosure fitting | Surface gasket | Tamper-proof sealing | Panel mounting kit | SSM (only for 24 V DC)

See page 129 for further information

Conformity to standards

The acoustic parameters conform to the European standard DIN EN ISO 7731;
"Ergonomic – alarm signals for public areas and workplaces – acoustic alarm signals".

The requirement for an acoustic alarm signal can be found in the harmonised standards:
EN 60204-1 Electrical equipment of machines
EN 60825-1 Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837

PATROL SOUNDERS 110/120 dB(A)
PA 10 / PA 20

PATROL - the new generation of sounders.

Three dimensional innovation;

- safe; an incorrect installation is virtually impossible
- easy; significantly shorter assembly and installation times
- economical; extremely high efficiency and good penetration of acoustical obstacles significantly reduce the required number of sounders

reddot design award
winner 2013

PA 10	PA 20									
r = 56 m	r = 178 m	IP 66	IK 08	+ 55 °C / - 40 °C			EN 54-3	VdS	UL	10 Years
max. covering distance		Protection system	Impact-proof housing	Operating temperature	Acoustic penetration		24–48 V DC 115–230 V AC	24–48 V DC 115–230 V AC		Warranty

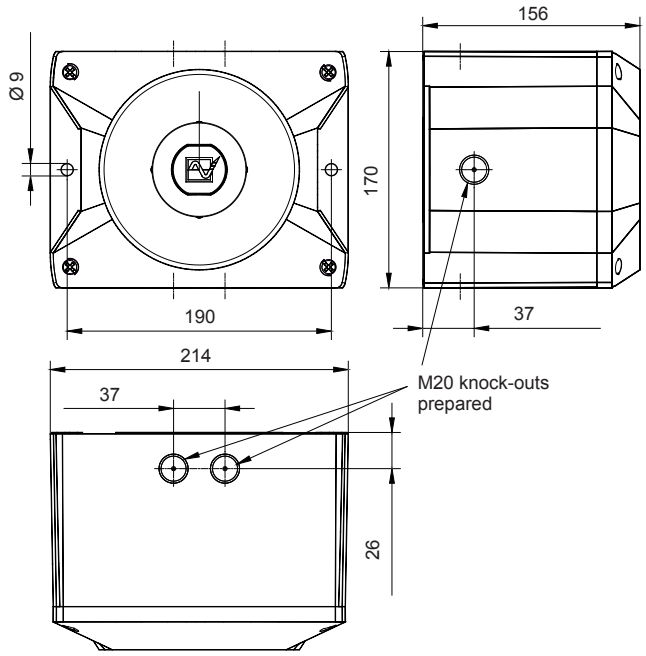
Electrical data	PA 10		
Rated voltage	95 – 265 V AC	24 V AC	10 – 60 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	
Operating range	95 – 265 V	20 - 30 V	10 – 60 V
Nominal current consumption	20 – 115 mA	250 – 900 mA	60 – 485 mA
Electrical data	**PA 20**		
Rated voltage	95 – 265 V AC	24 V AC	10 – 60 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	
Operating range	95 – 265 V	20 - 30 V	10 – 60 V
Nominal current consumption [1]	75 – 330 mA	500 – 1,800 mA	120 – 880 mA

[1] power consumption dependent on operating voltage

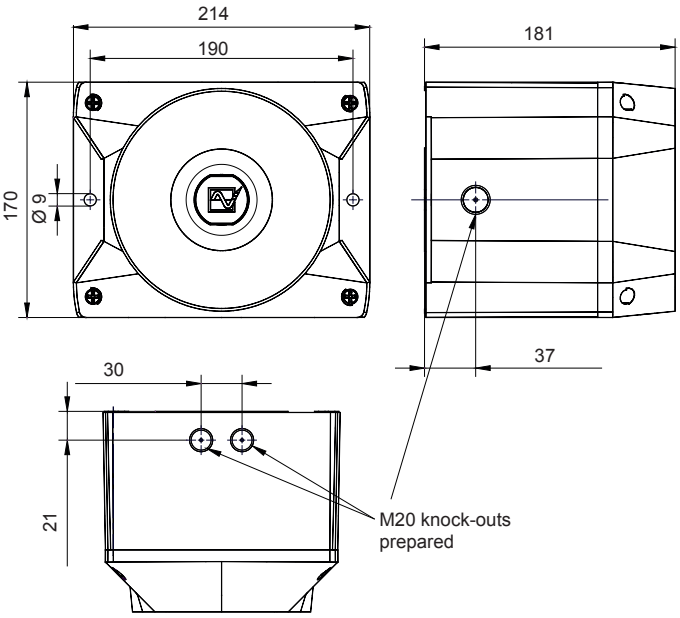
Mechanical data		PA 10	PA 20
Sound pressure level		110 dB (A)	120 dB (A)
Sound level reduction		max. - 12 dB via potentiometer	
Alarm tones		80 (see tone table page 128/129)	
Duty cycle		100%	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 66	
Protection class		II	
Material		PC / ABS blend	
Colour		similar to RAL 3000 (flame red) / RAL 7035 (light grey) / RAL 9003 (signal white)	
Cable entry		5 x M20 knock-outs on side, 1 knock-out on back	
Integrated seal with cable entry		6 – 13 mm (feed-through grommet)	
Connecting terminals		2.5 mm² fine wire with cable end sleeve, AWG 16	
Weight	AC	1,060 g	1,200 g
	DC	1,050 g	1,090 g

Dimensions

PA 10



PA 20



Ordering details

Article numbers		PA 10			PA 20		
Version	**Rated voltage**	95-265 V AC	24 V AC	10-60 V DC	95-265 V AC	24 V AC	10-60 V DC
Standard	**housing red**	233 60 64 0 000	233 60 30 0 000	233 60 63 0 000	233 70 64 0 000	233 70 30 0 000	233 70 63 0 000
GL/MED	**housing red**	233 60 64 0 001	233 60 30 0 001	233 60 63 0 001	233 70 64 0 001	233 70 30 0 001	233 70 63 0 001
Standard	**housing grey**	233 60 64 0 055	233 60 30 0 055	233 60 63 0 055	233 70 64 0 055	233 70 30 0 055	233 70 63 0 055
GL/MED	**housing grey**	233 60 64 0 056	233 60 30 0 056	233 60 63 0 056	233 70 64 0 056	233 70 30 0 056	233 70 63 0 056

Article numbers for other voltages and versions on request

Options / Accessories

GL **MED** **CNBOP**

Enclo-sure fitting | **Surface gasket** | **Tamper-proof sealing** | **Panel mount-ing kit** | **SSM** (only for 24 V DC)

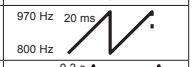
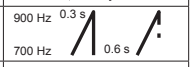
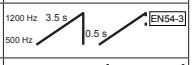
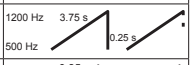
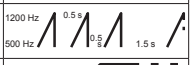
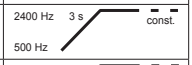
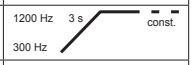
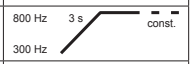
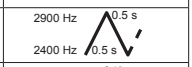
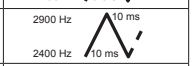
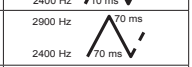
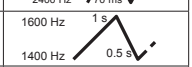
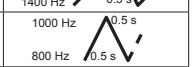
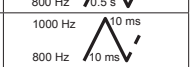
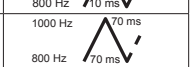
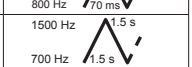
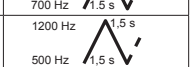
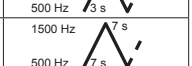
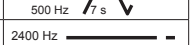
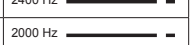
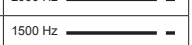
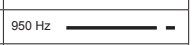
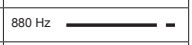
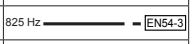
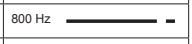
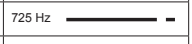
See page 129 for further information

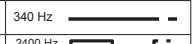
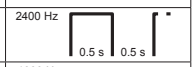
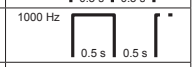
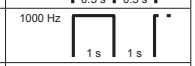
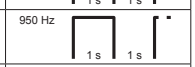
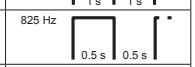
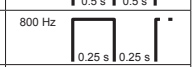
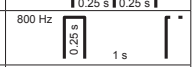
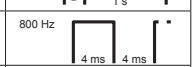
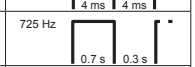
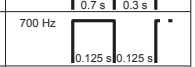
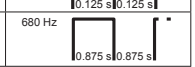
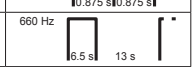
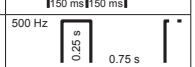
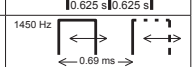
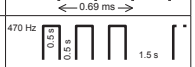
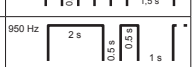
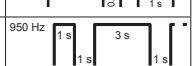
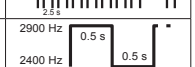
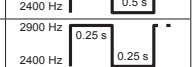
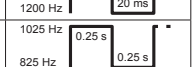
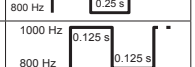
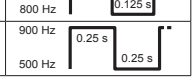
Conformity to standards

The acoustic parameters conform to the European standard DIN EN ISO 7731;
"Ergonomic – alarm signals for public areas and workplaces – acoustic alarm signals".

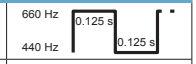
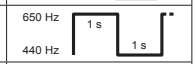
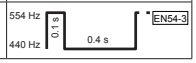
The requirement for an acoustic alarm signal can be found in the harmonised standards:
EN 60204-1 Electrical equipment of machines
EN 60825-1 Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837

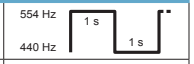
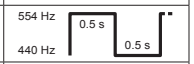
Tone table PA 1 / PA 5 / PA 10 / PA 20

Tone	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	Pulsating tone, 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	
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	

Tone	Description	
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	
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)	
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	

Tone table PA 1 / PA 5 / PA 10 / PA 20

Tone	Description	
143	Alternating tone, industrial alarm Germany	
144	Alternating tone	
146	Alternating tone, France NFS 32-001 (fire alarm)	

Tone	Description	
147	Alternating tone, Sweden SS031711	
148	Alternating tone, Sweden SS031711	
152	Alternating tone (two tone chime)	

Control of the tones

Tone selection switch/DIP-Switch (setting of basic tone)							External tone selection		
							C1	C2	C1+C2
1	2	3	4	5	6	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

Tone selection switch/DIP-Switch (setting of basic tone)							External tone selection		
							C1	C2	C1+C2
1	2	3	4	5	6	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

ACCESSORIES

Ordering details

Article numbers		PA 1	PA 5	PA 10 / PA 20
Enclosure fitting	For connection (daisy-chaining) of several sounders of the PATROL series	283 00 00 0 003		
Surface gasket	Sealing of the sounder installation surface when, e.g. cable entry is executed from the back.	283 00 00 0 004	283 00 00 0 005	283 00 00 0 006
Tamper-proof sealing (pack of 4)	Anti-tamper sealing for fasteners of the PATROL devices after installation in order to prevent manipulation of the devices.	283 00 00 0 002		
Panel mount installation kit PATROL	The PATROL devices are also suitable for panel mounting. This kit consists of a plug connector for the electrical contact, as well as all installation materials.	283 00 00 0 007	283 00 00 0 008	283 00 00 0 009

SOUNDER 130 dB(A)
PA 130

- secure alarming in the loudest environments and over large areas
- also dimensioned for use as warning devices in civil defence
- with just one sounder, reaction to the most diverse alarm situations is possible by means of remote control of up to 9 of currently 80 pre-installed tones
- integrated self-monitoring, test function and malfunction message relay
- maintenance-free
- power-saving standby mode with automatic self-test function
- suitable for indoor and outdoor operation
- switchable 4.7 kOhm terminal resistor for cable monitoring

optionally available:

- voice transmisssion possible via audio input
- can be mounted in a cluster by means of stable mast holder

max. covering distance

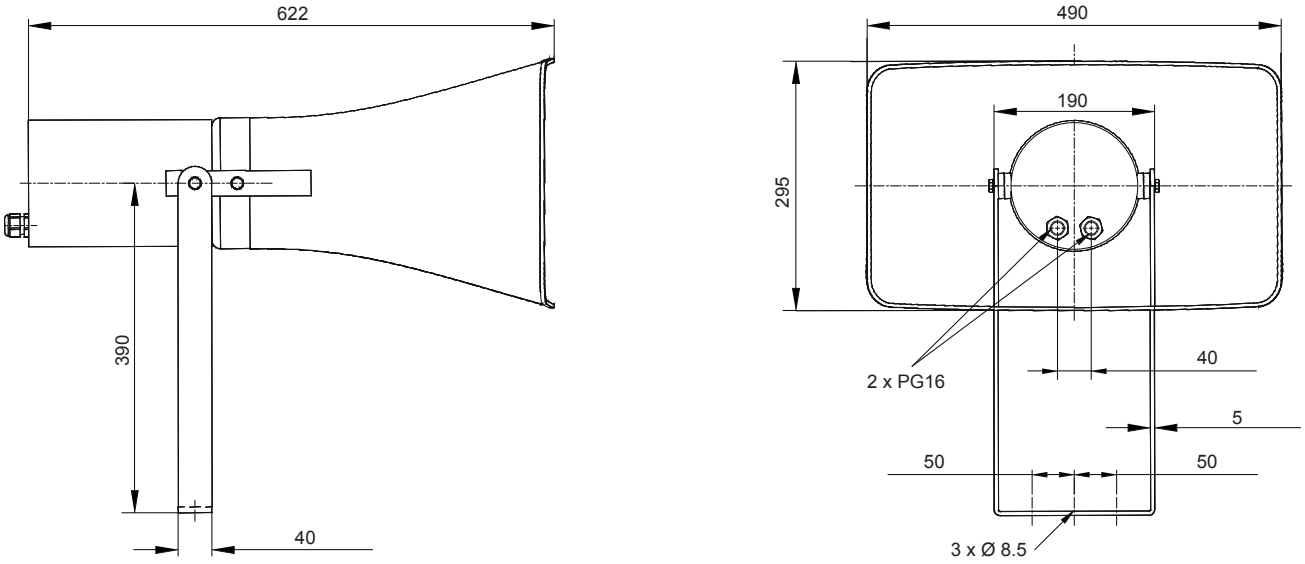
Protection system

Operating temperature

Electrical data		PA 130	
Rated voltage		230 V AC	20-60 V DC
Rated frequency		50 / 60 Hz	
Operating range		- 25% / + 15%	20 V – 60 V
Nominal current consumption		1 A	4 A
	in standby mode	< 15 mA	< 40 mA
Malfunction message relay/auxiliary relay		0.5 A, 50 V / NO or NC potential free, configurable	

Mechanical data		PA 130
Sound pressure level		130 dB (A)
Alarm tones		80, incl. DIN tone
Remote controlled tones		9 tones, externally controllable
Operating temperature		- 20 °C ... + 50 °C
Storage temperature		- 20 °C ... + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 54
Material	housing - horn	MOPLEN plastic, light grey
	housing - circuitry	aluminium, painted in light grey
Cable entry		2 x PG16 for simple series connection of up to 4 sounders
Type of connection		2 x 2.5 mm^2
Weight	AC	7.45 kg
	DC	5.85 kg

Dimensions



Ordering details

Article numbers	PA 130	
Rated voltage	230 V AC	20–60 V DC
	230 26 10 0 000	230 26 91 0 000

Options / Accessories

GOST

SOUNDERS 105/110 dB(A)
DS 5-SIL / DS 10-SIL

- integrated safety tough demands under industrial conditions
- to signal dangerous situations in safety-relevant application such as process and plant safety, e.g.
  - leaks / gas warning
  - high-pressure / overfilling

  and machine safety, e.g. as
  - start-up warning
  - excess rotation speed warning
  - machine stop delay warning
- by means of integrated self-monitoring of the devices the normative required, regular inspection of warning devices is ensured
- the warning devices can be implemented in Safety Instrumented Systems (SIS) up to **SIL 2/PLd**

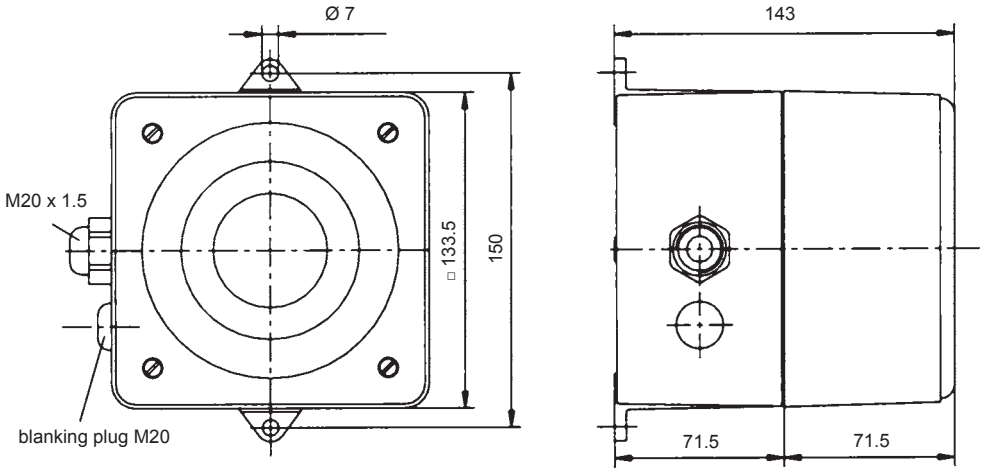
We would be more than happy to provide all safety-technical key data.

DS 5-SIL	DS 10-SIL				
r = 32 m	r = 56 m	IP 66 IP 67	+ 55 °C / - 25 °C		10 Years
max. covering distance	max. covering distance	Protection system	Operating temperature	Acoustic penetration	Warranty

Electrical data		DS 5-SIL		DS 10-SIL	
Rated voltage		95 – 253 V AC	24 V DC	95 – 253 V AC	24 V DC
Rated frequency		50 / 60 Hz		50 / 60 Hz	
Operating range		95 – 253 V	19 – 29 V	95 – 253 V V	19 – 29 V
Nominal current consumption		40 mA @ 230 V	280 mA	60 mA @ 230 V	420 mA
Diagnostics channel	current consumption	30 mA @ 230 V	20 mA	30 mA @ 230 V	20 mA
	switching power	230 V / 80 mA			

Mechanical data		DS 5-SIL	DS 10-SIL
Sound pressure level		105 dB (A)	110 dB (A)
Alarm tones		32 (see tone table page 121)	
Operating temperature		- 25 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 66, IP 67	
Duty cycle		100%	
Material		die-cast aluminium GD-Al Si12 Cu	
Surface coating		epoxy resin paint RAL 3000, flame red	
Cable bushing		2 x M20 (1 x chrome-plated brass cable fitting, 1 x chrome-plated brass blanking plug)	
Clamping range of the cable fitting		8 – 12 mm	
Connecting terminals		max. 2.5 mm²	
Weight	AC	2.15 kg	
	DC	1.95 kg	

Dimensions



Ordering details

Article numbers		DS 5-SIL		DS 10-SIL	
Version	**Rated voltage**	95 – 253 V AC	24 V DC	95 – 253 V AC	24 V DC
Standard		231 06 10 0 601	231 06 80 0 601	231 11 10 0 601	231 11 80 0 601
TAS (external tone selection via closed function of the control voltage)		231 06 10 0 603	231 06 80 0 603	231 11 10 0 603	231 11 80 0 603

Article numbers for other voltages and versions on request

Options / Accessories

External tone selection for controlling several tones over great distances

GOST

Conformity to standards

The sounders fulfill the requirements to the functional safety according to:

EN 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems
EN 61511	Functional safety - Safety instrumented systems for the process industry sector

The devices can be used in safety related control systems in accordance with the following standards:

EN ISO 13849-1	Safety of machinery - Safety related parts of control systems – part 1
EN 62061	Safety of machinery - Functional safety of electrical/electronic/programmable electronic safety-related systems

The devices conform to the following standards:

EN 61310-1	Safety of machinery - Indication, marking and actuation - part 1: Requirements for visual, acoustic and tactile signals
EN ISO 7731	Ergonomic – alarms for public areas and workplaces – acoustic alarms
EN 981	Safety of machinery - System of acoustic and visual alarm signals and information signals
DIN 33404-1	Alarms for workplaces, uniform emergency signal
ISO 8201	Acoustics - Audible emergency evacuation signal

PANEL MOUNT BUZZERS
P 22 DBZ / P 28 DMC / P 28 DMB

- acoustic signaling device for 22.5 mm and 28.6 mm mounting holes
- available with 2 different types of signals in one device (continuous and pulsating tone)
- guaranteed high protection class to the housing
- also availbale wih easily adjustable volume control

P22 DBZ	P28 series	P22 DBZ	P28 series	
r = 2 m	r = 6 m	IP 40	IP 65	+ 50 °C / - 25 °C
max. covering distance	max. covering distance	Protection system	Protection system	Operating temperature

Electrical data	P 22 DBZ			
Rated voltage	24 V AC/DC	48 V AC/DC	115 V AC	230 V AC
Nominal current consumption	15 – 30 mA			

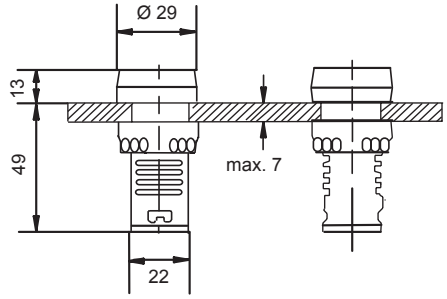
Electrical data	P 28 DMC948	P 28 DMC201	P 28 DMC301	P 28 DMB530
Rated voltage	48 V DC	110 V AC	230 V AC	30 V DC
Operating range	9 V – 48 V	30 V – 120 V	130 V – 230 V	5 V – 30 V
Nominal current consumption	5 mA @ 9 V 20 mA @ 48 V	7 mA @ 30 V 40 mA @ 120 V	20 mA @ 130 V 40 mA @ 220 V	2 mA @ 5 V 20 mA @ 30 V

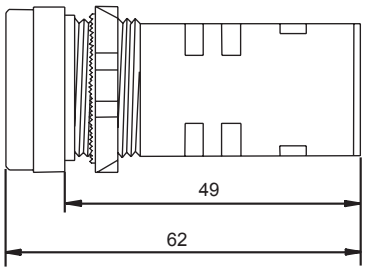
Mechanical data	P 22 DBZ	P 28 DMC948	P 28 DMC201	P 28 DMC301	P 28 DMB530
Operating mode	pulsating tone	continuous tone	continuous tone	continuous tone	continuous tone / pulsating tone
Sound pressure level	80 dB (A) @ 10 cm	91 dB (A) @ 48 V	91 dB (A) @ 120 V	91 dB (A) @ 230 V	91 dB (A) @ 30 V
Sound level reduction	–	up to 20 dB			
Duty cycle	> 50,000 hrs	> 50,000 hrs			
Operating temperature	- 25 °C ... + 50 °C	- 25 °C ... + 65 °C			
Storage temperature		- 40 °C ... + 85 °C			
Relative humidity	90% @ + 20 °C	90% @ + 40 °C			
Protection system according to EN 60529	IP 40	IP 65			
Material housing	polycarbonate (PC)	plastic “NORYL® N-190”, UL 49-VO, black			
Mounting	panel-mounting: Ø 22.5 mm	panel-mounting: Ø 28.6 mm			
Type of connection	screw terminals 1.5 mm²	quick connect blades, 6.3 mm wide, 0.8 mm thick			
Weight	30 g	40 g			

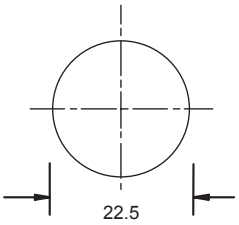
Dimensions

Panel cutouts

P 22 DBZ

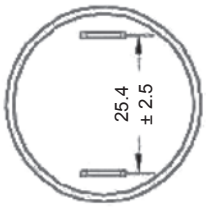




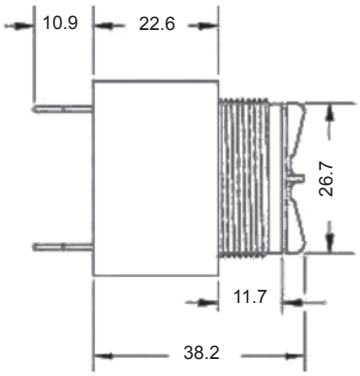


P 28 DMC948 / P 28 DMC201 / P 28 DMC301

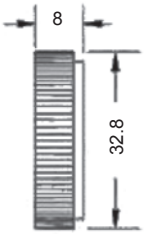
Rear view



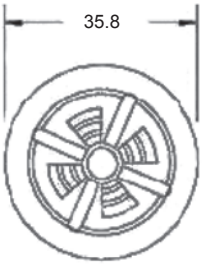
Side view

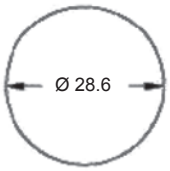


Ring



Front view

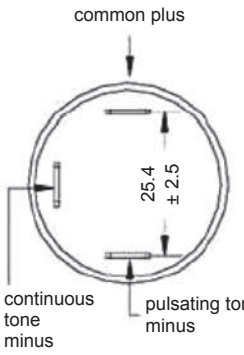




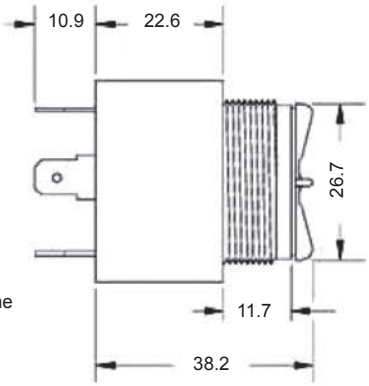
for mounting panels up to 6.3 mm thick

P 28 DMB530

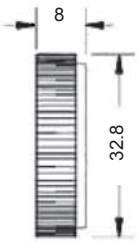
Rear view



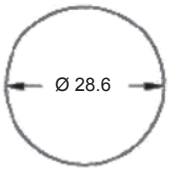
Side view



Ring



Front view



for mounting panels up to 6.3 mm thick

Ordering details

Article numbers	P 22 DBZ			
Rated voltage	24 V AC/DC	48 V AC/DC	115 V AC	230 V AC
	232 70 80 0 000	232 70 70 0 000	232 70 15 0 000	232 70 10 0 000
Article numbers	**P 28 DMC948**	**P 28 DMC201**	**P 28 DMC301**	**P 28 DMB530**
Rated voltage	48 V DC	110 V AC	230 V AC	30 V DC
	232 60 70 0 000	232 60 16 0 000	232 60 11 0 000	232 65 80 0 000

Options / Accessories

Label holder

25 x 10 mm
only for P 22 DBZ

Article number:
232 92 00 0 000

Label holder

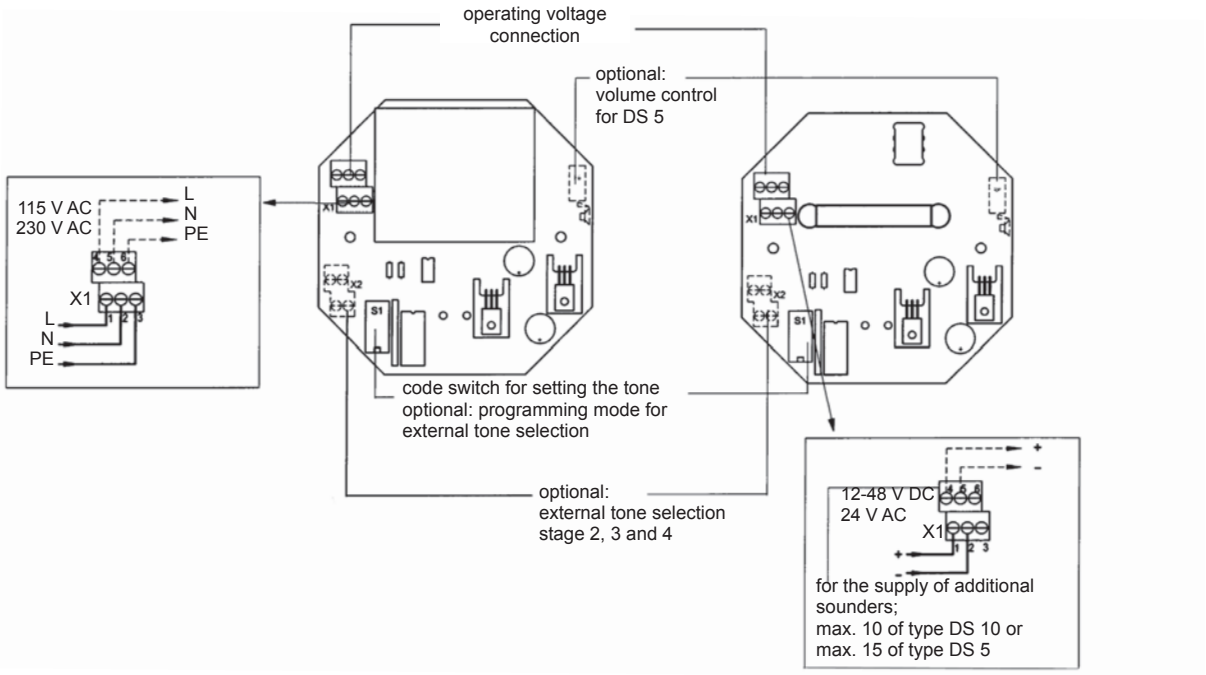
25 x 18 mm
only for P 22 DBZ

Article number:
232 91 00 0 000

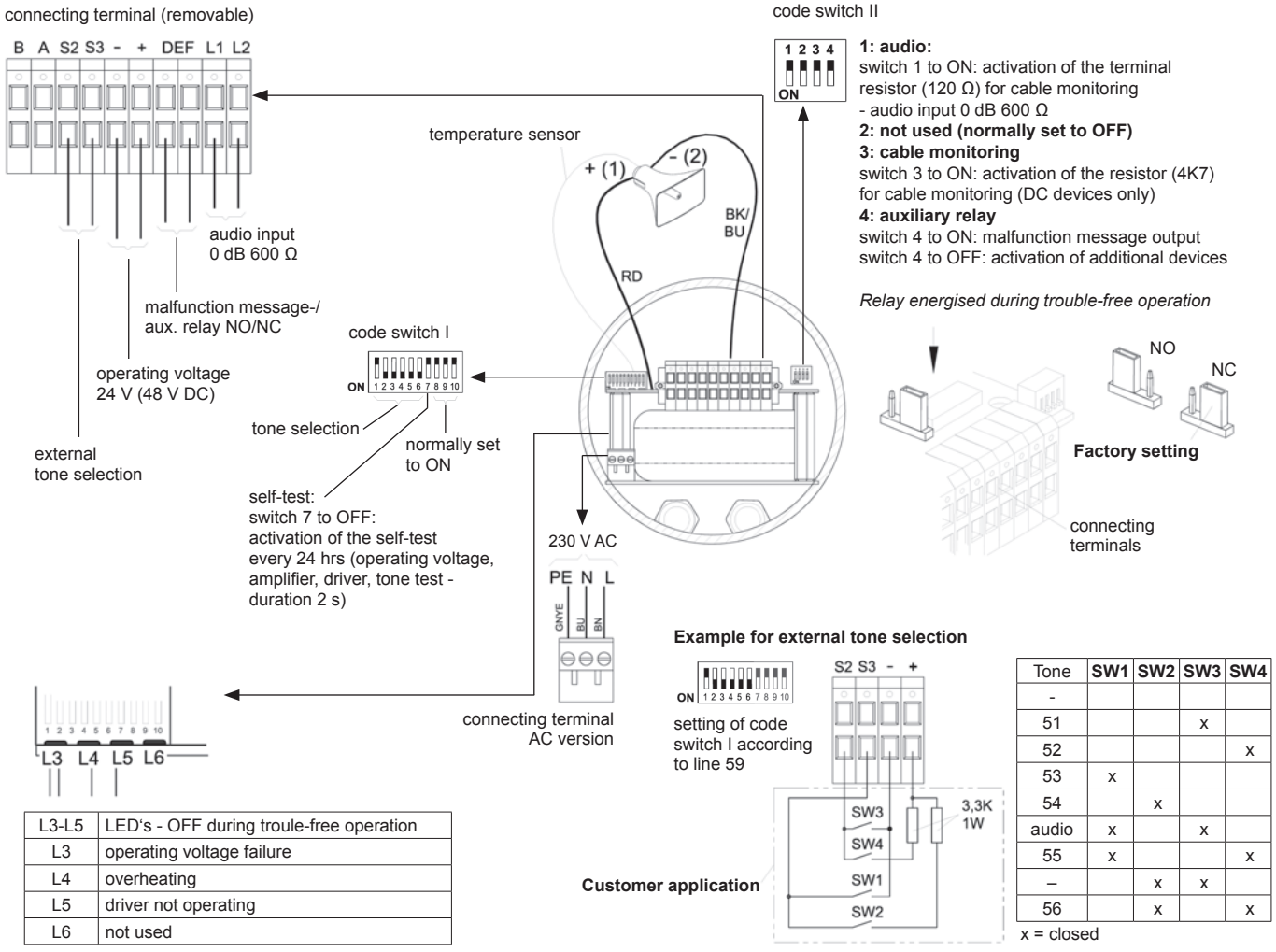
See page 87 for illustrations

CONNECTION DIAGRAMS

DS 5 / DS 10 – AC | DS 5 / DS 10 – DC



PA 130



L3-L5	LED's - OFF during troule-free operation
L3	operating voltage failure
L4	overheating
L5	driver not operating
L6	not used

Tone	SW1	SW2	SW3	SW4
-				
51			x	
52				x
53	x			
54		x		
audio	x		x	
55	x			x
–		x	x	
56		x		x

x = closed

DS 5-SIL / DS 10-SIL

X1
Sounder channel

1	PE
2	PE
3	L/+ Operating voltage
4	L/+ Operating voltage
5	N/- Operating voltage
6	N/- Operating voltage

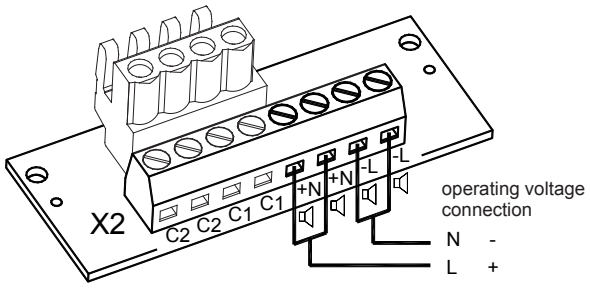
X2
optional external tone selection (option -TAS or -TAV)

1	L/+ Stage S2
2	L/+ Stage S2
3	L/+ Stage S3
4	L/+ Stage S3

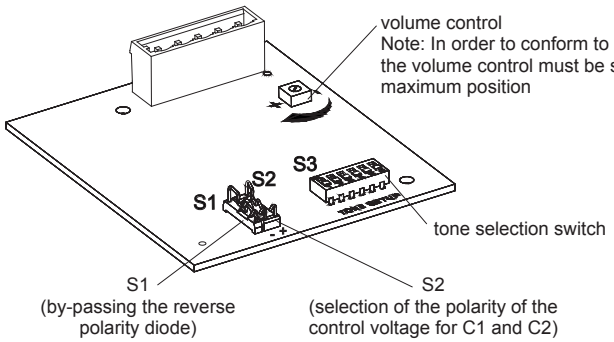
X1
Monitoring channel

1	L/+ Operating voltage
2	L/+ Operating voltage
3	N/- Operating voltage
4	N/- Operating voltage
5	Alarm relay (MOS-Relay 230V~, 80mA, 35Ω,
6	Alarm relay conductive, if function
7	Alarm relay channel is acoustically
8	Alarm relay active)

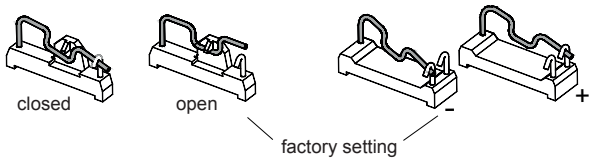
PA 1 / PA 5



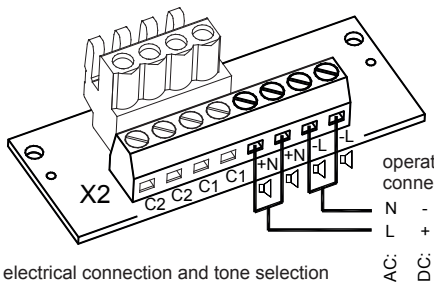
electrical connection and tone selection through external control of C1 and C2



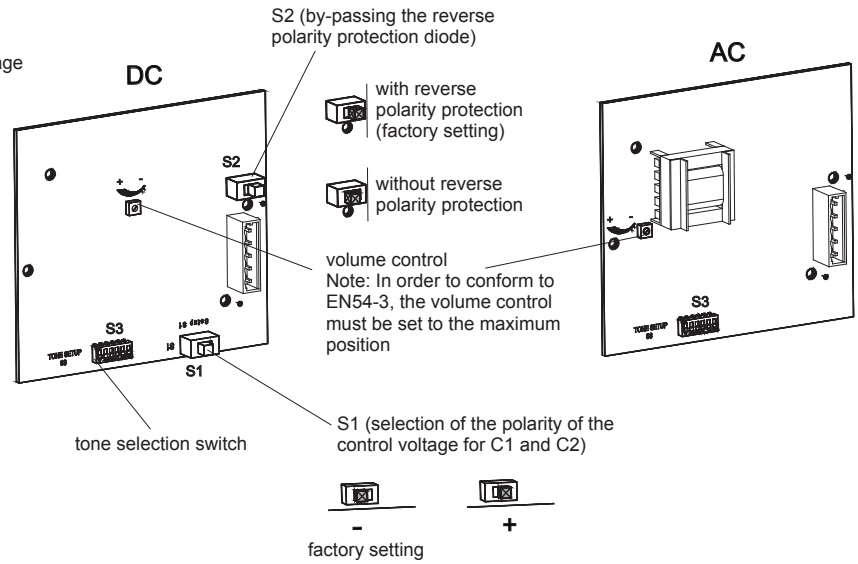
Caution:
Position of changeover switch S2 only at „-“ or „+“
„open“ position is not permitted
and leads to malfunction.



PA 10 / PA 20



electrical connection and tone selection through external control of C1 and C2



SEEING AND HEARING – DOUBLE ALARMS WARN BETTER!

VISUAL-AUDIBLE SIGNALING DEVICES OFFER DOUBLE THE AMOUNT OF SAFETY IN ONE PACKAGE

There are many industrial areas of use for signaling devices that are associated with adverse environmental conditions and higher demands, making the mutual assistance of acoustic and visual signals necessary. For example, when signals need to be noticed at great distances.

Two scenarios make this clear. Visual signals, for example, are easily recognisable in the dark. However, as soon as there is sunlight, other lights, the factory lighting or welding flashes, the observer is faced with a barely distinguishable light smog. Therefore, acoustic assistance of the visual signal is necessary.

The same applies to acoustic signals that have to penetrate through machine noise, environmental noise, voice noise, echoes, running motors and hearing protection. They are only reliable in being noticed with visual assistance.

ALL VISUAL-AUDIBLE SIGNALING DEVICES AT A GLANCE

	Type	Maximum covering distance for a 65 dB ambient noise level in in metres (m) [1]					Sound pressure level (tone) / Light power	Protection system	Dimensions (HxWxD) mm	Approvals / Standards					Page
		2.5	5	25	75	150				GL MED	GOST	UL	EN 54-3 EN 54-23	VdS	
	P 22 DBF						80 dB (A) @ 10 cm	IP 40	Ø 29 x 52						141
	SON 4						100 dB (A) 0.25 J	IP 56	86 x 86 x AC: 120 DC: 102		●		●	●	142
	SON 4L						100 dB (A)				●		●	●	
	PY X-MA-05						100 dB (A) 5 J	IP 66 IK 08	134.2 x 166 x 114			○			144
	PY X-MA-10						100 dB (A) 10 J					○			
	DSF 5						105 dB (A) 13 J	IP 66 IP 67	263.5 x 133.5 x 143		●				146
	DSF 10						110 dB (A) 13 J				●				
	PA X 1-05						100 dB (A) 5 J	IP 66 IK 08	172.4 x 109.5 x 80.6	● [2]	●	●	●	●	148
										● [2]			●		
	PA X 5-05						105 dB (A) 5 J	IP 66 IK 08	215 x 163.4 x 132	● [2]	●	●	○	○	
										○			○		
	PA X 5-10						105 dB (A) 10 J			● [2]	●	●	○	○	
										○			○		
	PA X 10-10						110 dB (A) 10 J	IP 66 IK 08	270 x 214 x 156	● [2]	●	●	○	○	150
										○			○		
	PA X 10-15						110 dB (A) 15 J			● [2]	●	●	○	○	
										○			○		
	PA X 20-10						120 dB (A) 10 J	IP 66 IK 08	270 x 214 x 181	● [2]	●	●	○	○	
										○			○		
	PA X 20-15						120 dB (A) 15 J			● [2]	●	●	○	○	
										○			○		

NEW

[1] The specification for the alarm signal reception range assumes an existing ambient noise level of 65 dB (A). In accordance with applicable regulations, the calculated alarm range for the sound level 65 dB (A) was given + 10 dB (A) = 75 dB (A).

● available
○ in preparation
[2] option

Note:
Using sounders with a sound pressure level of ≥ 120 dB (A) can lead to hearing damage. People must not be permitted to stay in the near vicinity of the sounder. All specified sound pressure levels are based on a measurement distance of 1 m, provided that nothing different is specified.

Further information can be found on the Internet:
www.pfannenberg.com · **www.pfannenberg-spareparts.com**
Keep up to date. Subscribe to our newsletter now:
newsletter.pfannenberg.com

BLINKING LED PANEL MOUNT INDICATOR WITH BUZZER P 22 DBF

- indicator lamp/buzzer combination for 22.5 mounting hole
- guaranteed high protection class to the housing
- superior shape, hence high signaling effect on all sides
- space-saving combination of buzzer and blinking LED indicator for increasing the effect of the signal
- easy to mount label holders available as an accessory
- simple electrical connection by means of screw terminals

r = 2 m
Covering distance as per EN 54

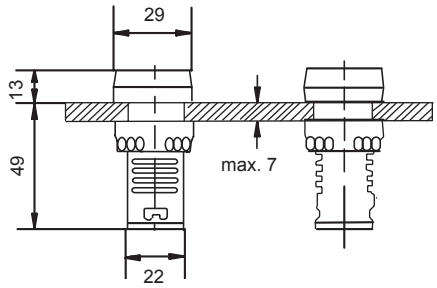
IP 40
Protection system

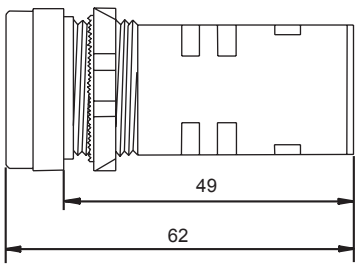
+ 50 °C
- 25 °C
Operating temperature

Electrical data	P 22 DBF			
Rated voltage	230 V AC	115 V AC	48 V AC/DC	24 V AC/DC
Nominal current consumption	max. 30 mA			

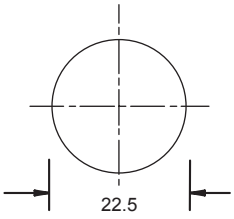
Mechanical data	P 22 DBF
Operating mode	1 Hz blinking light with buzzer (pulsating tone)
Sound pressure level	80 dB (A) @ 10 cm
Light source	LED array
Service life of light source	> 50,000 hrs
Lens colours	red
Operating temperature	- 25 °C ... + 50 °C
Relative humidity	90% @ + 20 °C
Protection system according to EN 60529	IP 65 (to housing)
Mounting	panel-mounting: Ø 22.5 mm
Type of connection	screw terminals 1.5 mm²
Weight	90 g

Dimensions





Panel cut-out



Ordering details

Article numbers					
Lens colour	Rated voltage	230 V AC	115 V AC	48 V AC/DC	24 V AC/DC
red		232 72 10 5 000	232 72 15 5 000	232 72 70 5 000	232 72 80 5 000

Options / Accessories

Label holder
25 x 10 mm
Article number:
232 92 00 0 000

Label holder
25 x 18 mm
Article number:
232 91 00 0 000

See page 87 for illustrations

FLASHING SOUNDER 100 dB(A) / 0.25 J SON 4
LED BLINKING SOUNDER 100 dB(A) SON 4L

- automatic synchronisation in system mode
- volume control
- reverse polarity protection
- up to 32 different tones
- 2 additional externally selectable tones
- ideal for fire alarm systems due to low power consumption

r = 18 m — Covering distance

IP 56 — Protection system

+ 55 °C / - 25 °C — Operating temperature

EN 54-3

VdS G209080

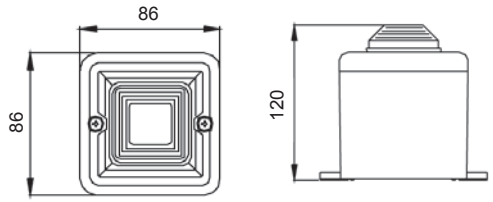
Electrical data	SON 4			
Rated voltage	230 V AC	115 V AC	24 V AC	24 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	
Operating range	± 10%	± 10%	± 10%	± 25%
Nominal current consumption	30 mA	50 mA	180 mA	150 mA

Electrical data	SON 4L					
Rated voltage	230 V AC	115 V AC	24 V AC	48 V DC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range	± 10%	± 10%	± 10%	± 25%	± 25%	± 25%
Nominal current consumption	20 mA	25 mA	60 mA	40 mA	50 mA	50 mA

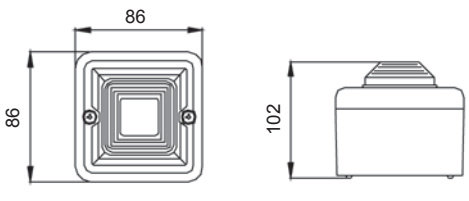
Mechanical data		SON 4	SON 4L
Sound pressure level		100 dB (A)	
Alarm tones		32 / 3-stage alarm	
Sound level reduction		by - 2 / - 6 dB	by - 9 dB
Flash energy		0.25 J	
Flashing / Blinking rate		1 Hz	2 Hz
Light source		xenon flash tube	5 high output LEDs
Lens colour		yellow, amber, red, green, blue	amber, red
Operating temperature		- 25 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 56	
Duty cycle		100%	
Material	lens	polycarbonate (PC)	
	housing	UL 94 VO & 5VA classified ABS	
Housing colour		RAL 3000 (flame red), optionally grey or white	
Cable entry		4 knock-outs prepared on the side and bottom	
Connecting terminals		0.5 – 2.5 mm²	
Weight		AC: 400 g / DC: 300 g	

Dimensions

SON 4 / SON 4L – AC



SON 4 / SON 4L – DC



Tone table SON 4

Tone	Description		Stage 2	Stage 3
1	Continuous tone	340 Hz	2	5
2	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	1000 Hz / 800 Hz, 0.25 s / 0.25 s, EN54-3	17	5
3	Slow whoop, evacuation alarm Netherlands NEN 2575	1200 Hz / 500 Hz, 3.5 s / 0.5 s, EN54-3	2	5
4	Sweeping (fast)	1000 Hz / 800 Hz, 10 ms / 10 ms	6	5
5	Continuous tone	2400 Hz	3	20
6	Sweeping	2900 Hz / 2400 Hz, 70 ms / 70 ms	7	5
7	Sweeping (fast)	2900 Hz / 2400 Hz, 10 ms / 10 ms	10	5
8	Sweeping	1200 Hz / 500 Hz, 3 s / 3 s	2	5
9	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	1200 Hz / 500 Hz, 1 s, EN54-3	15	2
10	Alternating tone	2900 Hz / 2400 Hz, 20 ms / 20 ms	7	5
11	Interrupted tone	1000 Hz, 10 ms / 10 ms	2	5
12	Alternating tone	1000 Hz / 800 Hz, 0.875 s / 0.875 s	4	5
13	Interrupted tone	2400 Hz, 10 ms / 10 ms	15	5
14	Interrupted tone	800 Hz, 0.25 s / 1 s	4	5
15	Continuous tone	800 Hz	2	5
16	Interrupted tone	660 Hz, 150 ms / 150 ms, EN54-3	18	5
17	Alternating tone, France NFS 32-001 (fire alarm)	554 Hz / 440 Hz, 0.1 s / 0.4 s, EN54-3	2	27
18	Interrupted tone, Sweden SS031711 (air raid warning)	660 Hz, 1.8 s / 1.8 s	2	5
19	Sweeping, France NFC48-265	1600 Hz / 1400 Hz, 1 s / 0.5 s	2	5
20	Continuous tone, Sweden SS031711 (all-clear signal)	660 Hz	2	5
21	Alternating tone	554 Hz / 440 Hz, 10 ms / 10 ms	2	5
22	Interrupted tone	544 Hz, 0.875 s / 0.875 s	2	5
23	Interrupted tone	800 Hz, 20 ms / 20 ms	6	5
24	Sweeping (medium), UK BS5839-1	1000 Hz / 800 Hz, 0.5 s / 0.5 s	29	5
25	Sweeping	2900 Hz / 2400 Hz, 0.5 s / 0.5 s	29	5
26	Simulated bell	1450 Hz, 0.69 ms	2	15
27	Continuous tone	800 Hz	26	5
28	Continuous tone	440 Hz	2	5
29	Sweeping (fast), UK BS5839-1	1000 Hz / 800 Hz, 70 ms / 70 ms	7	5
30	Interrupted tone, Australia AS2220, AS1610, AS1670	420 Hz, 0.625 s / 0.625 s	32	26
31	Sweeping	1200 Hz / 660 Hz, 10 ms / 10 ms	26	5
32	Slow whoop, Australian evacuation alarm AS2220	1200 Hz / 500 Hz, 3.75 s / 0.25 s	30	26

Tone table SON 4L

Tone	Description		Stage 2	Stage 3
1	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	1000 Hz / 800 Hz, 0,25 s / 0,25 s, EN54-3	8	5
2	Slow whoop, evacuation alarm Netherlands NEN 2575	1200 Hz / 500 Hz, 3,5 s / 0,5 s, EN54-3	1	8
3	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	1200 Hz / 500 Hz, 1 s, EN54-3	8	8
4	Alternating tone, France NFS 32-001 (fire alarm)	554 Hz / 440 Hz, 100 ms / 400 ms, EN54-3	9	2
5	Continuous tone	1000 Hz	1	6
7	Simulated bell	1450 Hz, 0,69 ms	1	8
7	Sweeping (fast), UK BS5839-1	1000 Hz / 800 Hz, 70 ms / 70 ms	5	1
8	Sweeping	2900 Hz / 2400 Hz, 0,5 s / 0,5 s	5	1
9	Interrupted tone, Australia AS2220, AS1610, AS1670	420 Hz, 625 ms / 625 ms	10	5
10	Slow whoop, Australian evacuation alarm AS2220	1200 Hz / 500 Hz, 3,75 s / 0,25 s	6	5

Ordering details

Article numbers		SON 4			SON 4L		
Lens colour	**Rated voltage**	230 V AC	115 V AC	24 V DC	230 V AC	115 V AC	24 V DC
amber		232 40 10 4 010	232 40 15 4 010	232 40 80 4 010	232 41 10 4 010	232 41 15 4 010	232 41 80 4 010
red		232 40 10 5 010	232 40 15 5 010	232 40 80 5 010	232 41 10 5 010	232 41 15 5 010	232 41 80 5 010

Article numbers for other voltages and versions on request

PYRA FLASHING LIGHT SOUNDERS 100 dB(A) / 5/10 J
PY X-MA-05 / PY X-MA-10

NEW

- safe - an incorrect installation is virtually impossible
- easy - significantly shorter assembly and installation times
- economical - largest possible signaling range due to effective XENON technology
- installation options with external lugs or internal holes
- choice of four different flash rates via DIP switch
- electronic constant current regulation at 24 V AC/DC devices to avoid load fluctuations
- integrated inrush current limitation and undervoltage detection
- providing full synchronization on multi-flashing light systems
- light and sounder can be controlled separately

PY X-MA-05	PY X-MA-10							
r = 11 m	r = 17 m	IP 66	IK 08	+ 55 °C / - 40 °C	Sync	UL	10 Years	
Visual covering distance		Protection system	Impact-proof housing	Operating temperature		pending	Warranty	

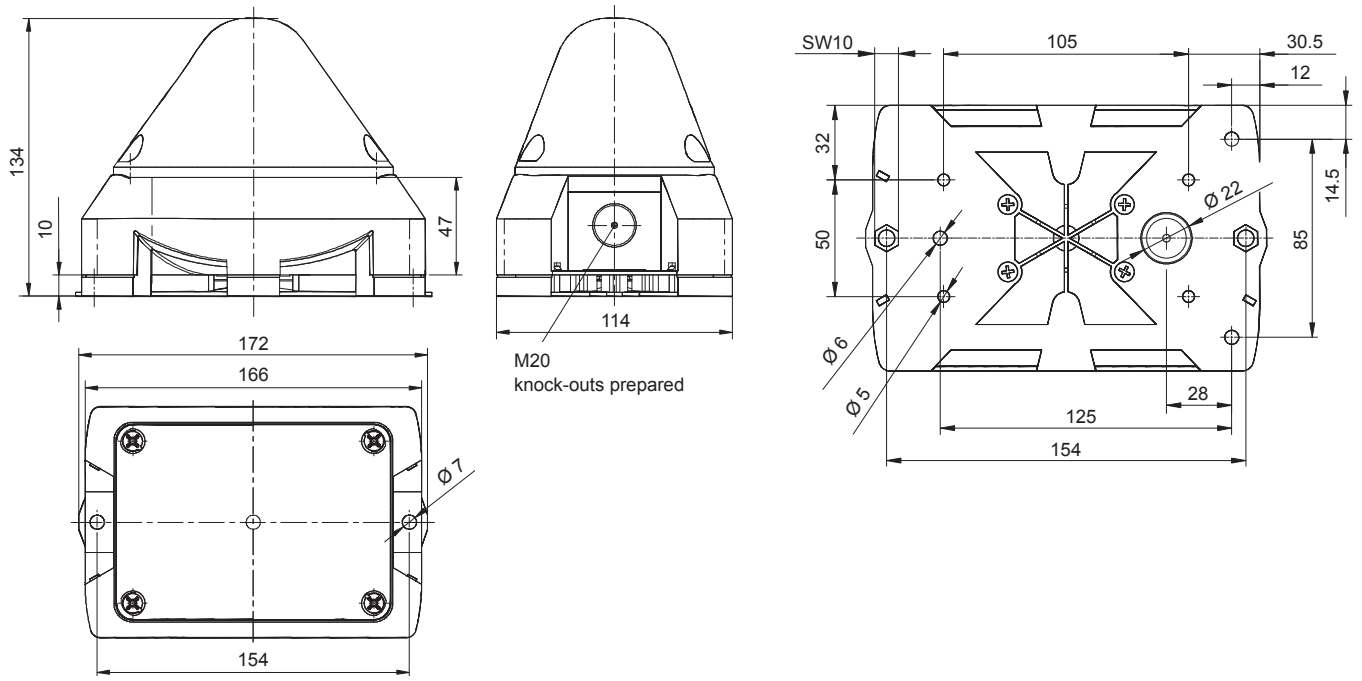
Electrical data	PY X-MA-05		
Rated voltage	230 V AC	115 V AC	24 V AC/DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz / DC
Operating range	187 – 255 V	90 – 135 V	AC: 18 – 30 V / DC: 10 – 60 V
Nominal current consumption [1]	70 – 75 mA	120 – 140 mA	AC: 660 – 720 mA DC: 280 mA @ 24 V
Electrical data	**PY X-MA-10**		
Rated voltage	230 V AC	115 V AC	24 V AC/DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz / DC
Operating range	187 – 255 V	90 – 135 V	AC: 18 – 30 V / DC: 10 – 60 V
Nominal current consumption [1]	160 – 165 mA	250 – 270 mA	AC: 1050 – 1150 mA DC: 550 – 620 mA @ 24 V

[1] power consumption dependent on operating voltage

Mechanical data		PY X-MA-05	PY X-MA-10
Sound pressure level		100 dB (A)	
Sound level reduction		max. - 20 dB via potentiometer	
Alarm tones		8	
Flash energy		5 J	10 J
Flash rate		0.1 / 0.5 / 0.75 / 1 Hz (DIP switch)	
Light intensity (DIN 5037) [1]		44 cd	118 cd
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 66	
Protection class		II	
Duty cycle		100%	
Service life of the flash tube		light emission still 70% after 8,000,000 flashes	
Material	base part	PC / ABS	
	lens flashing light	polycarbonate (PC)	
Housing colour		RAL 3000 (flame red) / RAL 7035 (light grey)	
Lens colour		clear, white, yellow, amber, red, green, blue	
Cable entry		2 x M20 on side, 1 x M20 on bottom	
Integrated seal with cable entry		6 – 13 mm	
Connecting terminals		2.5 mm² fine wire, AWG 16	
Weight	AC	620 g	660 g
	AC/DC	560 g	580 g

[1] with a clear lens

Dimensions



Tone table

Tone	Description	
2	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	1200 Hz / 500 Hz, 1 s
9	Slow whoop, fire alarm, UK BS5839-1	970 Hz / 800 Hz, 1 s
131	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	1000 Hz / 800 Hz, 0.25 s / 0.25 s
160	Continuous tone (horn)	110 Hz

Tone	Description	
161	Continuous tone	3000 Hz
162	Interrupted tone	3000 Hz, 0.5 s / 0.5 s
163	Interrupted tone	3000 Hz, 25 ms / 25 ms
164	Slow whoop	2850 Hz / 2400 Hz, 143 ms

Ordering details

Article numbers		PY X-MA-05 – housing red			PY X-MA-05 – housing grey		
Version	Rated voltage	230 V AC	115 V AC	24 V AC/DC	230 V AC	115 V AC	24 V AC/DC
clear lens		215 54 10 1 000	215 54 15 1 000	215 54 81 1 000	215 54 10 1 055	215 54 15 1 055	215 54 81 1 055
yellow lens		215 54 10 3 000	215 54 15 3 000	215 54 81 3 000	215 54 10 3 055	215 54 15 3 055	215 54 81 3 055
red lens		215 54 10 5 000	215 54 15 5 000	215 54 81 5 000	215 54 10 5 055	215 54 15 5 055	215 54 81 5 055
Article numbers		**PY X-MA-10 – housing red**			**PY X-MA-10 – housing grey**		
Version	Rated voltage	230 V AC	115 V AC	24 V AC/DC	230 V AC	115 V AC	24 V AC/DC
clear lens		215 55 10 1 000	215 55 15 1 000	215 55 81 1 000	215 55 10 1 055	215 55 15 1 055	215 55 81 1 055
yellow lens		215 55 10 3 000	215 55 15 3 000	215 55 81 3 000	215 55 10 3 055	215 55 15 3 055	215 55 81 3 055
red lens		215 55 10 5 000	215 55 15 5 000	215 55 81 5 000	215 55 10 5 055	215 55 15 5 055	215 55 81 5 055

Article numbers for other voltages and versions on request

Options / Accessories

Surface gasket

Tamper-proof sealing

See page 153 for further information

Conformity to standards

The acoustic parameters conform to the European standard DIN EN ISO 7731;
"Ergonomic – alarm signals for public areas and workplaces – acoustic alarm signals".

The requirement for an acoustic alarm signal can be found in the harmonised standards:

EN 60204-1	Electrical equipment of machines
EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837

FLASHING SOUNDERS 105/110 dB(A) / 13 J
DSF 5 / DSF 10

The powerful flashing sounders
- extremely bright and loud due to 13 joules, 105 dB (A) or 110 dB (A)
- high reliability and long service life
- 31 different sound signals can be set
- up to four externally selectable tones (optional)

Further detailed specifications for the Quadro flashing light on page 54.

DSF 5	DSF 10					
r = 32 m	r = 56 m	IP 66	IP 67	+ 55 °C / - 40 °C		10 Years
Covering distance		Protection system	Protection system	Operating temperature	Acoustic penetration	Warranty

Electrical data	DSF 5			DSF 10		
Rated voltage	230 V AC	115 V AC	24 V DC	230 V AC	115 V AC	24 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz		50 / 60 Hz	50 / 60 Hz	
Operating range	195 – 253 V	95 – 127 V	19 – 29 V	195 – 253 V	95 – 127 V	19 – 29 V
Nominal current consumption	0.19 A	0.40 A	0.98 A	0.22 A	0.46 A	1.12 A

Mechanical data		DSF 5	DSF 10
Sound pressure level		105 dB (A)	110 dB (A)
Alarm tones		32 / 2-stage alarm	
Flash energy		13 J	
Lens colour		clear, yellow, amber, red, green, blue	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 66, IP 67	
Impact resistance of the flashing light		IK 08 (as per EN 50102)	
Duty cycle		100%	
Service life of light source		light emission still 70% after 8,000,000 flashes	
Material	sounder	die-cast aluminium GD-Al Si12 Cu	
	flashing light	polycarbonate (PC)	
Surface coating	sounder	epoxy resin paint RAL 3000, flame red	
Cable bushing		2 x M20 x 1.5	
Clamping range of the cable fitting		8 – 12 mm	
Connecting terminal cross-section		max. 2.5 mm²	
Mounting		do not direct the opening of the sound horn upwards	
Weight		2.6 kg	

Ordering details

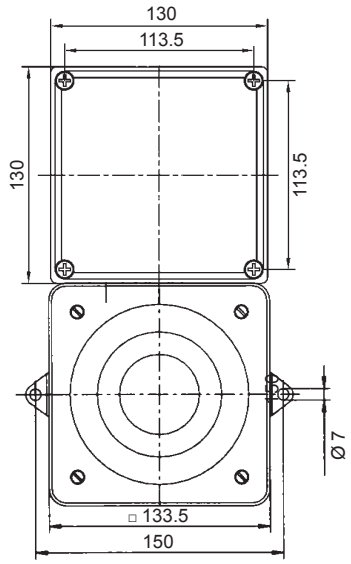
Article numbers		DSF 5			DSF 10		
Version	Rated voltage	230 V AC	115 V AC	24 V DC	230 V AC	115 V AC	24 V DC
Standard; red lens		231 07 10 5 000	231 07 15 5 000	231 07 80 5 000	231 12 10 5 000	231 12 15 5 000	231 12 80 5 000
TAS (external tone selection); red lens		231 07 10 5 152	231 07 15 5 152	231 07 80 5 152	231 12 10 5 152	231 12 15 5 152	231 12 80 5 152

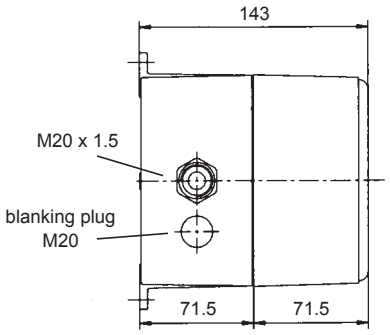
Options / Accessories

External tone selection (4 variants)

GOST

Dimensions





Tone table

Tone	Description (preset: tone 1)		Stage 2	3	4
0	no tone		1	5	4
1 [1]	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	1200 Hz / 500 Hz, 1 s, EN54-3	3	2	4
2	Interrupted tone, ISO8201 (emergency evacuation signal)	950 Hz, 0.5 s, 0.5 s, 1.5 s	1	4	3
3	Alternating tone	1025 Hz / 825 Hz, 0.25 s, 0.25 s	1	2	4
4	Continuous tone, UK BS5839-1	950 Hz	1	3	5
5	Interrupted tone	950 Hz, 1 s, 1 s	1	4	3
6	Sweeping	1200 Hz / 500 Hz, 3 s, 3 s	1	4	9
7	Alternating tone, France NFS 32-001 (fire alarm)	554 Hz / 440 Hz, 0.1 s, 0.4 s, EN54-3	3	10	4
8	Interrupted tone, Sweden SS031711 (emergency signal)	700 Hz, 0.125 s, 0.125 s	2	3	4
9	Interrupted tone (fast), horn	800 Hz, 4 ms, 4 ms	1	3	4
10	Continuous tone	500 Hz	27	9	26
11	Continuous tone	725 Hz	1	17	9
12	Continuous tone	825 Hz, EN54-3	27	9	26
13	Continuous tone	1200 Hz	1	5	3
14	Continuous tone	1500 Hz	1	4	10
15	Interrupted tone	500 Hz, 0.5 s, 0.5 s	1	24	12
16	Interrupted tone	825 Hz, 0.5 s, 0.5 s	1	24	15
17	Interrupted tone	725 Hz, 0.7 s, 0.3 s	1	11	9
18	Interrupted tone	800 Hz, 0.25 s, 1 s	19	7	4
19	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	1000 Hz / 800 Hz, 0.25 s, 0.25 s, EN54-3	27	13	23
20	Interrupted tone, IMO SOLAS III/50 + SOLAS III/6.4 (general alarm)	825 Hz, 2.5 s, 2.5 s, 7 s	9	21	26
21	Interrupted tone, IMO (leave ship)	950 Hz, 1 s, 1 s, 3 s, 1 s	20	9	26
22	Slow whoop, evacuation alarm Netherlands NEN 2575	1200 Hz / 500 Hz, 3.5 s, 0.5 s, EN54-3	19	14	2
23	Siren	2400 Hz / 500 Hz, 3 s, const.	27	12	2
24	Alternating tone	1075 Hz / 825 Hz, 0.5 s, 0.5 s	1	16	12
25	Alternating tone	900 Hz / 500 Hz, 0.25 s, 0.25 s	1	14	5
26	Alternating tone	1400 Hz / 1200 Hz, 20 ms, 20 ms	4	9	27
27	Siren	1200 Hz / 300 Hz, 3 s, const.	13	23	19
28	Sweeping	1500 Hz / 700 Hz, 1.5 s, 1.5 s	7	10	4
29	Pulsating tone, industrial alarm Germany	1000 Hz / 150 Hz, 10 s, 40 s, 10 s	1	30	9
30	Interrupted tone, industrial alarm (Germany)	680 Hz, 0.875 s, 0.875 s	1	4	26
31	Sweeping, France NFC48-265	1600 Hz / 1400 Hz, 1 s, 0.5 s	3	14	4
32	selection of available tone combinations in stages 2, 3 and 4				

[1] factory setting

Conformity to standards

DIN EN 54-3: 2001 + DIN EN 54-3/A1: 2001	Fire alarm systems - part 3: fire alarm devices; Audible signaling devices and annex A1
EN 50 130-4: 1996	Stability of system components for fire and burglar alarm systems
EN 61 000-6-2	EMV, stability for industrial areas
EN 61 000-6-3	EMV, emission standard for residential commercial, and light-industrial environments
EN 60 947-1: 2003	Low voltage switchgear standard
EN 60 529: 2000	Protection system by enclosure (IP code)
DIN EN ISO 7731	Ergonomic – alarms for public areas and workplaces – acoustic alarms
DIN 33 404/3: 1982	Alarms for workplaces, unified emergency signal
ISO 8201: 1987	Evacuation alarm
DIN EN 981: 1997	System of acoustic and visual alarm signals and information signals
ISO 11 429: 1996	System of acoustic and visual alarm signals and information signals

PATROL FLASHING SOUNDERS 100/105 dB(A) / 5/10 J
PA X 1-05 / PA X 5-05 / PA X 5-10

PATROL - the new generation of sounder/flashing light combinations.
Three dimensional innovation;

- safe; an incorrect installation is virtually impossible
- easy; significantly shorter assembly and installation times
- economical; extremely high efficiency and good penetration of acoustical obstacles significantly reduce the required number of sounders
- pre-wired sounder and light ex works
- corresponding light intensity available for every sound pressure level

reddot design award
winner 2013

PA X 1	PA X 5						PA X 1	PA X 1	PA X 1		
r = 18 m	r = 32 m	IP 66	IK 08	+ 55 °C / - 40 °C			EN 54-3	EN 54-23	VdS	UL	10 Years
Covering distance		Protection system	Impact-proof housing	Operating temperature	Acoustic penetration		24 V DC, 48 V DC	24 V DC, 48 V DC	24 V DC, 48 V DC		Warranty

Electrical data		PA X 1-05					
Rated voltage		230 V AC	115 V AC	24 V AC	48 V DC	24 V DC	12 V DC
Rated frequency		50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range		187 – 255 V	90 – 135 V	18 – 30 V	40 – 60 V	18 – 30 V	12 – 15 V
Nominal current consumption [1]		65 – 70 mA	110 – 130 mA	860 – 920 mA	190 – 150 mA	315 – 365 mA	610 – 625 mA
Electrical data		**PA X 5**					
Rated voltage		230 V AC	115 V AC	24 V AC	48 V DC	24 V DC	12 V DC
Rated frequency		50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range		187 – 255 V	90 – 135 V	18 – 30 V	40 – 60 V	18 – 30 V	12 – 15 V
Nominal current consumption [1]	5 J	65 – 70 mA	110 – 130 mA	860 – 920 mA	190 – 150 mA	315 – 365 mA	610 – 625 mA
	10 J	150 – 155 mA	250 – 260 mA	1,460 – 1,520 mA	320 – 380 mA	565 – 620 mA	1,200 – 1,220 mA

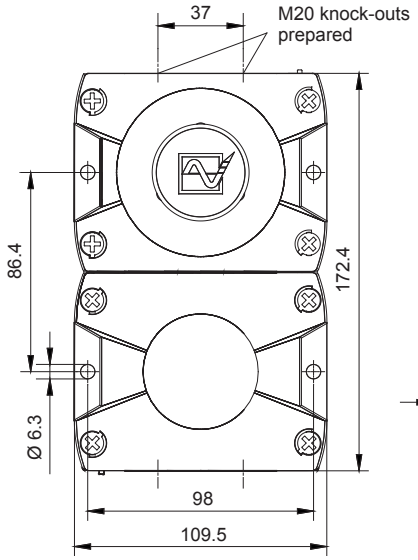
[1] power consumption dependent on operating voltage

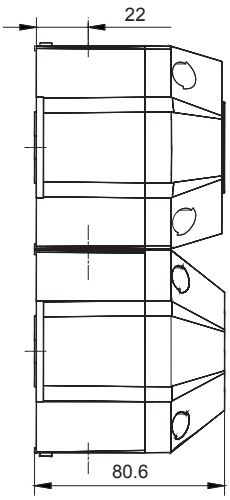
Mechanical data		PA X 1-05	PA X 5-05	PA X 5-10
Sound pressure level		100 dB (A)	105 dB (A)	105 dB (A)
Sound level reduction		max. - 16 dB via potentiometer		
Alarm tones		80 (see tone table page 152/153)		
Flash energy		5 J	5 J	10 J
Flash rate		1 Hz = 60 flashes/min.		
Light intensity (DIN 5037) [1]		44 cd	47 cd	92 cd
Operating temperature		- 40 °C ... + 55 °C		
Storage temperature		- 40 °C ... + 70 °C		
Relative humidity		90%		
Protection system according to EN 60529		IP 66		
Protection class		II		
Duty cycle		100%		
Service life of the flash tube		light emission still 70% after 8,000,000 flashes		
Material	sounder	PC / ABS blend		
	lens flashing light	polycarbonate (PC)		
Housing colour		similar to RAL 3000 (flame red) / RAL 7035 (light grey) / RAL 9003 (signal white)		
Lens colour		clear, white, yellow, amber, red, green, blue		
Cable entry		3 x M20 knock-outs on side, 1 knock-out on back		
Integrated seal with cable entry		6 – 13 mm (feed-through grommet)		
Connecting terminals		2.5 mm² fine wire with cable end sleeve, AWG 16		
Weight	AC	725 g	983 g	
	DC	560 g	800 g	

[1] with a clear lens

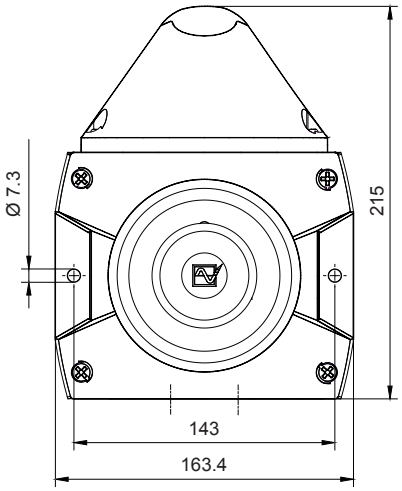
Dimensions

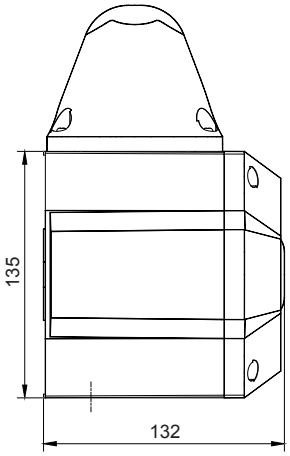
PA X 1-05





PA X 5-05





Ordering details

Article numbers		PA X 1-05 – housing red			PA X 1-05 – housing grey		
Version	**Rated voltage**	230 V AC	115 V AC	24 V DC	230 V AC	115 V AC	24 V DC
clear lens		233 11 10 1 000	233 11 15 1 000	233 11 80 1 000 [1]	233 11 10 1 055	233 11 15 1 055	233 11 80 1 055 [1]
yellow lens		233 11 10 3 000	233 11 15 3 000	233 11 80 3 000	233 11 10 3 055	233 11 15 3 055	233 11 80 3 055
amber lens		233 11 10 4 000	233 11 15 4 000	233 11 80 4 000	233 11 10 4 055	233 11 15 4 055	233 11 80 4 055
red lens		233 11 10 5 000	233 11 15 5 000	233 11 80 5 000 [1]	233 11 10 5 055	233 11 15 5 055	233 11 80 5 055 [1]

Article numbers		PA X 5-05 – housing red			PA X 5-05 – housing grey		
Version	**Rated voltage**	230 V AC	115 V AC	24 V DC	230 V AC	115 V AC	24 V DC
clear lens		233 51 10 1 000	233 51 15 1 000	233 51 80 1 000	233 51 10 1 055	233 51 15 1 055	233 51 80 1 055
yellow lens		233 51 10 3 000	233 51 15 3 000	233 51 80 3 000	233 51 10 3 055	233 51 15 3 055	233 51 80 3 055
amber lens		233 51 10 4 000	233 51 15 4 000	233 51 80 4 000	233 51 10 4 055	233 51 15 4 055	233 51 80 4 055
red lens		233 51 10 5 000	233 51 15 5 000	233 51 80 5 000	233 51 10 5 055	233 51 15 5 055	233 51 80 5 055

Article numbers for other voltages and versions on request

[1] version with EN 54-23 approval

Options / Accessories

GL **MED** **CNBOP** (PA X 1)

Enclo-sure fitting **Surface gasket** **Tamper-proof sealing**

See page 153 for further information

Conformity to standards

The acoustic parameters conform to the European standard DIN EN ISO 7731;
"Ergonomic – alarm signals for public areas and workplaces – acoustic alarm signals".

The requirement for an acoustic alarm signal can be found in the harmonised standards:

EN 60204-1	Electrical equipment of machines
EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837

PATROL FLASHING SOUNDERS 110/120 dB(A) / 10/15 J
PA X 10-10 / PA X 10-15 / PA X 20-10 / PA X 20-15

PATROL - the new generation of sounder/flashing light combinations.
Three dimensional innovation;

- safe; an incorrect installation is virtually impossible
- easy; significantly shorter assembly and installation times
- economical; extremely high efficiency and good penetration of acoustical obstacles significantly reduce the required number of sounders
- pre-wired sounder and light ex works
- corresponding light intensity available for every sound pressure level

reddot design award
winner 2013

PA X 10	PA X 20								
r = 56m	r = 178m	IP 66	IK 08	+ 55 °C / - 40 °C			UL	10 Years	
Covering distance		Protection system	Impact-proof housing	Operating temperature	Acoustic penetration			Warranty	

Electrical data		PA X 10					
Rated voltage		230 V AC	115 V AC	24 V AC	48 V DC	24 V DC	12 V DC
Rated frequency		50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range		187 – 255 V	90 – 135 V	18 – 30 V	40 – 60 V	18 – 30 V	12 –15 V
Nominal current consumption [1]	10 J	160 – 215 mA	260 – 345 mA	1,650 – 2,300 mA	360 – 490 mA	665 – 935 mA	1,335 – 1,685 mA
	15 J	210 – 265 mA	360 – 445 mA	1,650 – 2,300 mA	420 – 540 mA	765 – 1,035 mA	1,535 – 1,885 mA
Electrical data		**PA X 20**					
Rated voltage		230 V AC	115 V AC	24 V AC	48 V DC	24 V DC	12 V DC
Rated frequency		50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range		187 – 255 V	90 – 135 V	18 – 30 V	40 – 60 V	18 – 30 V	12 –15 V
Nominal current consumption [1]	10 J	215 – 335 mA	340 – 560 mA	1,900 – 3,200 mA	495 – 800 mA	845 – 1,430 mA	1,220 – 1,690 mA
	15 J	165 – 385 mA	440 – 660 mA	1,900 – 3,200 mA	545 – 850 mA	945 – 1,540 mA	1,520 – 1,890 mA

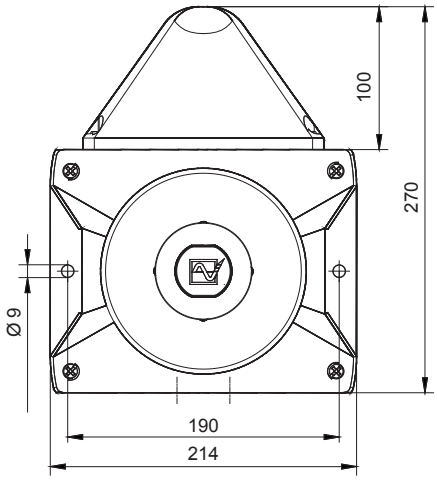
[1] power consumption dependent on operating voltage

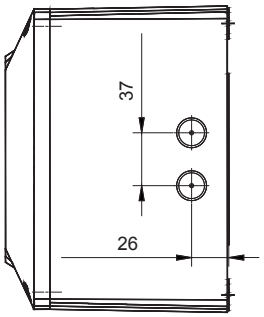
Mechanical data		PA X 10-10	PA X 10-15	PA X 20-10	PA X 20-15
Sound pressure level		110 dB (A)		120 dB (A)	
Sound level reduction		max. - 12 dB via potentiometer			
Alarm tones		80 (see tone table page 152/153)			
Flash energy		10 J	15 J	10 J	15 J
Flash rate		1 Hz = 60 flashes/min.			
Light intensity (DIN 5037) [1]		129 cd	190 cd	129 cd	190 cd
Operating temperature		- 40 °C ... + 55 °C			
Storage temperature		- 40 °C ... + 70 °C			
Relative humidity		90%			
Protection system according to EN 60529		IP 66			
Protection class		II			
Duty cycle		100%			
Service life of the flash tube		light emission still 70% after 8,000,000 flashes			
Material	sounder	PC / ABS blend			
	lens flashing light	polycarbonate (PC)			
Housing colour		similar to RAL 3000 (flame red) / RAL 7035 (light grey) / RAL 9003 (signal white)			
Lens colour		clear, white, yellow, amber, red, green, blue			
Cable entry		4 x M20 knock-outs on side, 1 knock-out on back			
Integrated seal with cable entry		6 – 13 mm (feed-through grommet)			
Connecting terminals		2.5 mm² fine wire with cable end sleeve, AWG 16			
Weight	AC	2,133 g	2,163 g	2,268 g	2,298 g
	DC	2,056 g	2,086 g	2,191 g	2,221 g

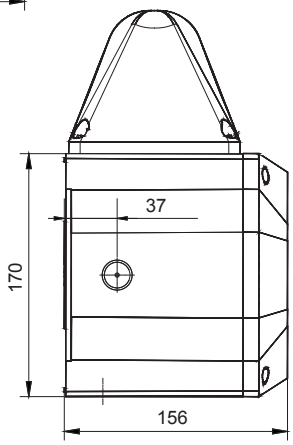
[1] with a clear lens

Dimensions

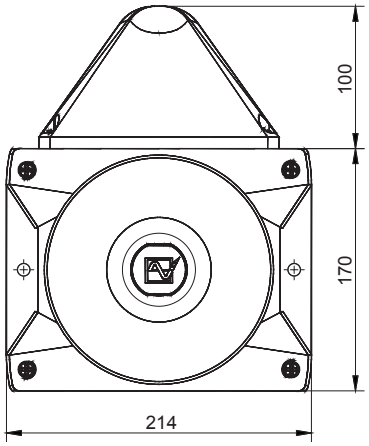
PA X 10-10 / PA X 10-15

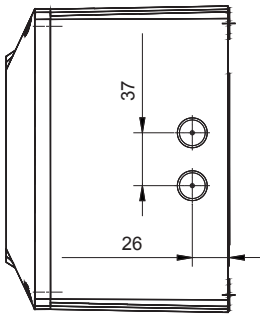


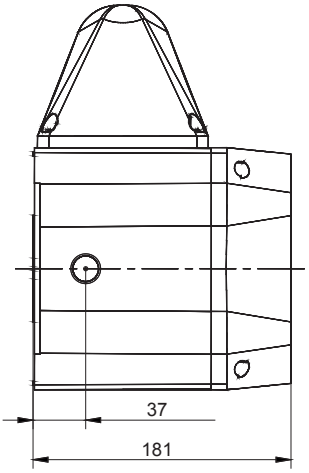




PA X 20-10 / PA X 20-15







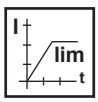
Ordering details

Article numbers		PA X 10-10			PA X 20-15		
Version	**Rated voltage**	230 V AC	115 V AC	24 V DC	230 V AC	115 V AC	24 V DC
clear lens	**housing red**	233 61 10 1 000	233 61 15 1 000	233 61 80 1 000	233 72 10 1 000	233 72 15 1 000	233 72 80 1 000
yellow lens	**housing red**	233 61 10 3 000	233 61 15 3 000	233 61 80 3 000	233 72 10 3 000	233 72 15 3 000	233 72 80 3 000
amber lens	**housing red**	233 61 10 4 000	233 61 15 4 000	233 61 80 4 000	233 72 10 4 000	233 72 15 4 000	233 72 80 4 000
red lens	**housing red**	233 61 10 5 000	233 61 15 5 000	233 61 80 5 000	233 72 10 5 000	233 72 15 5 000	233 72 80 5 000
yellow lens	**housing grey**	233 61 10 3 055	233 61 15 3 055	233 61 80 3 055	233 72 10 3 055	233 72 15 3 055	233 72 80 3 055
amber lens	**housing grey**	233 61 10 4 055	233 61 15 4 055	233 61 80 4 055	233 72 10 4 055	233 72 15 4 055	233 72 80 4 055
red lens	**housing grey**	233 61 10 5 055	233 61 15 5 055	233 61 80 5 055	233 72 10 5 055	233 72 15 5 055	233 72 80 5 055

Article numbers for other voltages and versions on request

Options / Accessories

GL **MED** **Enclosure fitting** **Surface gasket** **Tamper-proof sealing**



SSM
(only for 24 V DC)

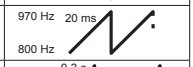
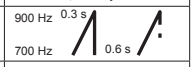
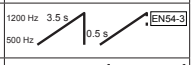
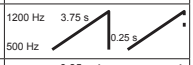
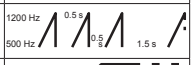
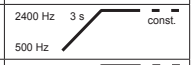
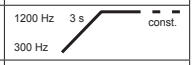
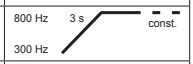
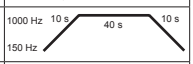
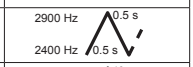
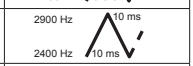
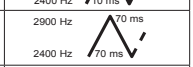
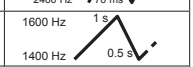
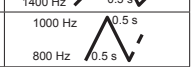
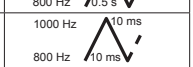
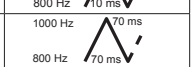
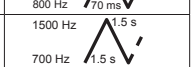
See page 153 for further information

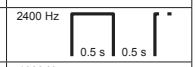
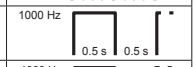
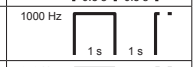
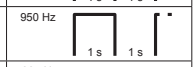
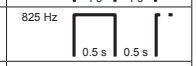
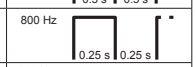
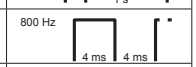
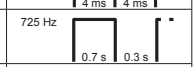
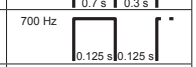
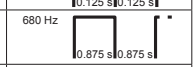
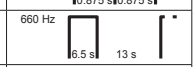
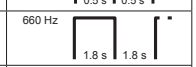
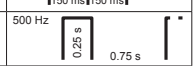
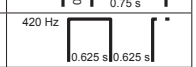
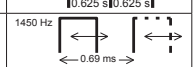
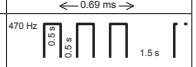
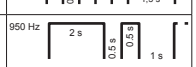
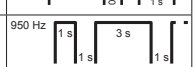
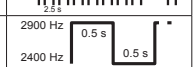
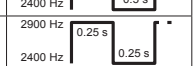
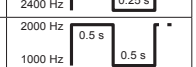
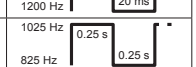
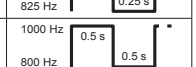
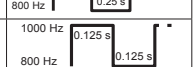
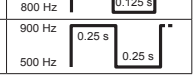
Conformity to standards

The acoustic parameters conform to the European standard DIN EN ISO 7731;
"Ergonomic – alarm signals for public areas and workplaces – acoustic alarm signals".
The requirement for an acoustic alarm signal can be found in the harmonised standards:

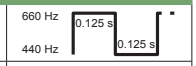
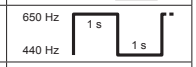
EN 60204-1	Electrical equipment of machines
EN 60825-1	Radiation safety of laser devices, identical to IEC 825 and DIN-VDE 0837

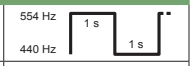
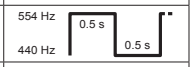
Tone table PA X 1 / PA X 5 / PA X 10 / PA X 20

Tone	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	Pulsating tone, 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	2400 Hz
53	Continuous tone	2000 Hz
54	Continuous tone, Finland (all-clear signal)	1500 Hz
55	Continuous tone, PFEER gasalarm	1200 Hz
56	Continuous tone	1000 Hz
57	Continuous tone, UK BS5839-1	950 Hz
59	Continuous tone	880 Hz
60	Continuous tone	825 Hz EN54-3
61	Continuous tone	800 Hz
63	Continuous tone	725 Hz
65	Continuous tone, Sweden SS031711 (all-clear signal)	660 Hz
66	Continuous tone	554 Hz
67	Continuous tone, Germany KTA3901 (all-clear signal)	500 Hz
68	Continuous tone	470 Hz

Tone	Description	
69	Continuous tone	440 Hz
71	Continuous tone	340 Hz
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	
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)	
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	

Tone table PA X 1 / PA X 5 / PA X 10 / PA X 20

Tone	Description	
143	Alternating tone, industrial alarm Germany	
144	Alternating tone	
146	Alternating tone, France NFS 32-001 (fire alarm)	

Tone	Description	
147	Alternating tone, Sweden SS031711	
148	Alternating tone, Sweden SS031711	
152	Alternating tone (two tone chime)	

Control of the tones

Tone selection switch/DIP-Switch (setting of basic tone)							External tone selection		
							C1	C2	C1+C2
1	2	3	4	5	6	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

Tone selection switch/DIP-Switch (setting of basic tone)							External tone selection		
							C1	C2	C1+C2
1	2	3	4	5	6	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

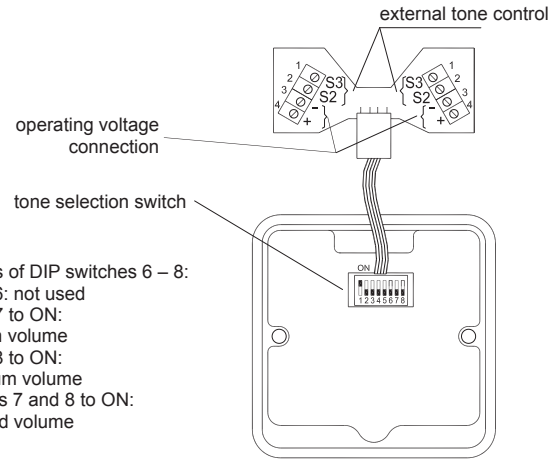
ACCESSORIES PATROL AND PYRA

Ordering details

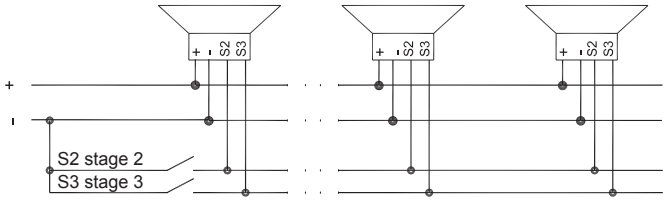
Article numbers		PA X 1-05	PA X 5-05	PA 10 X / PA 20 X	PY X-MA
Enclosure fitting	For connection (daisy-chaining) of several sounders of the PATROL series	283 00 00 0 003			–
Surface gasket	Sealing of the sounder installation surface when, e.g. cable entry is executed from the back.	283 00 00 0 004	283 00 00 0 005	283 00 00 0 006	281 11 50 0 000
Tamper-proof sealing (pack of 4)	Anti-tamper sealing for fasteners of the PATROL or PYRA devices after installation in order to prevent manipulation of the devices.	283 00 00 0 002			

CONNECTION DIAGRAMS

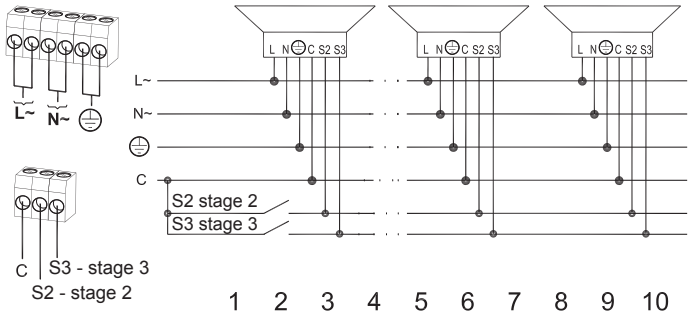
SON 4



Settings of DIP switches 6 – 8:
switch 6: not used
switch 7 to ON:
medium volume
switch 8 to ON:
maximum volume
switches 7 and 8 to ON:
standard volume

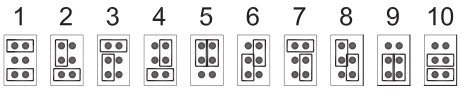


SON 4L – AC

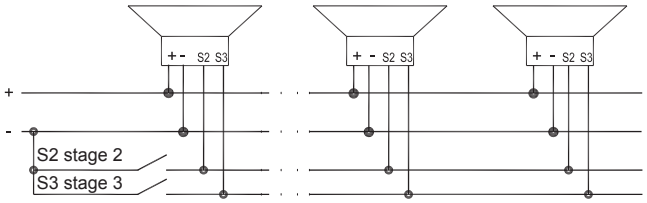


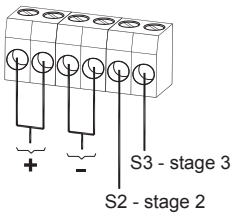
Tone

Tone selection:
to select a tone, place the jumper in the positions shown above

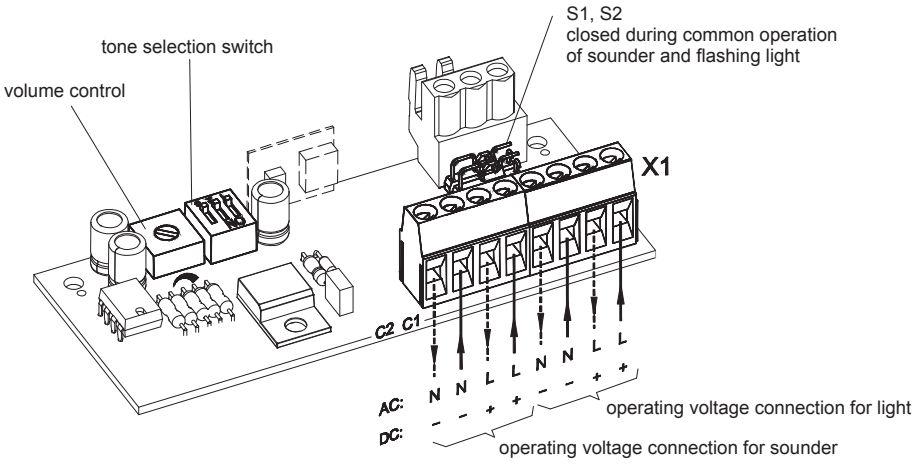


SON 4L – DC



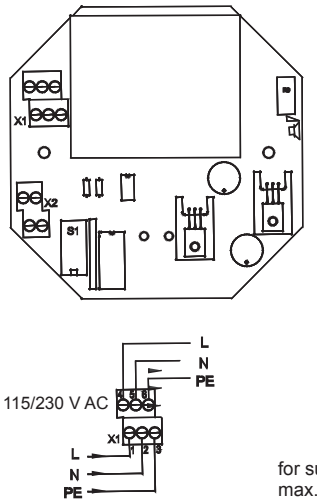


PY X-MA-05 / PY X-MA-10

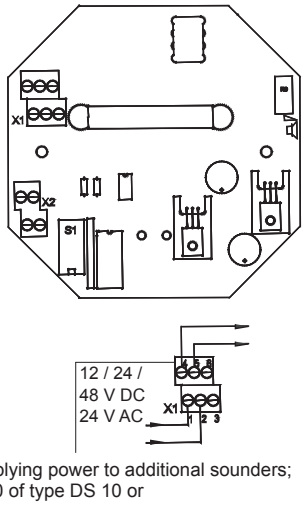


DSF 5 / DSF 10 sounder

AC



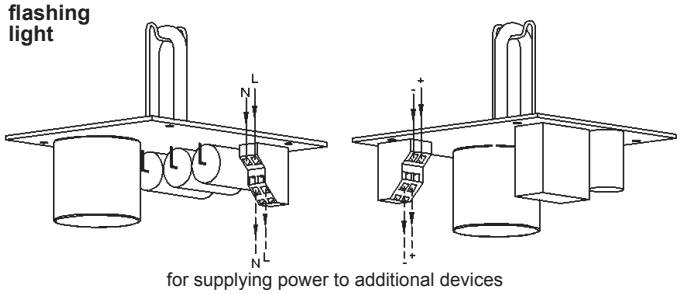
DC



for supplying power to additional sounders;
max. 10 of type DS 10 or
max. 15 of type DS 5

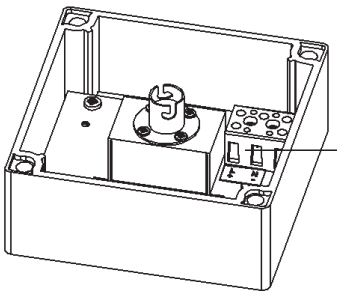
DSF 5 / DSF 10 light

flashing light



for supplying power to additional devices

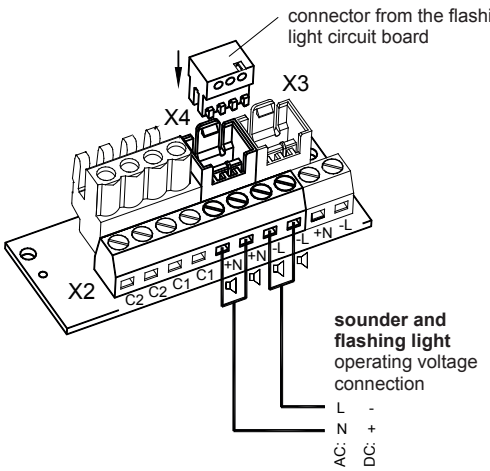
continuous light



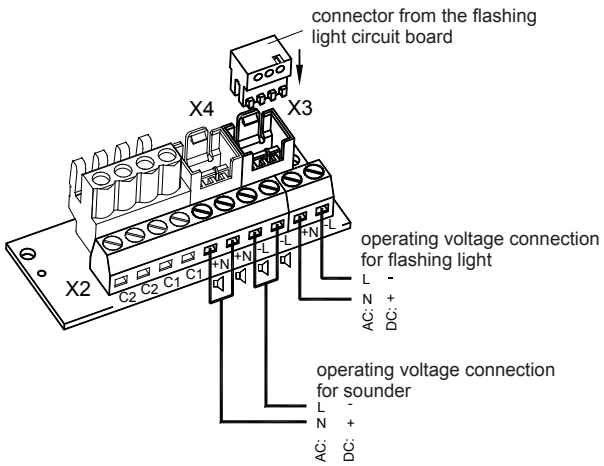
operating voltage connection

PA X 1-05 / PA X 5-05 / PA X 10-05 / PA X 10-10 / PA X 20-10 / PA X 20-15

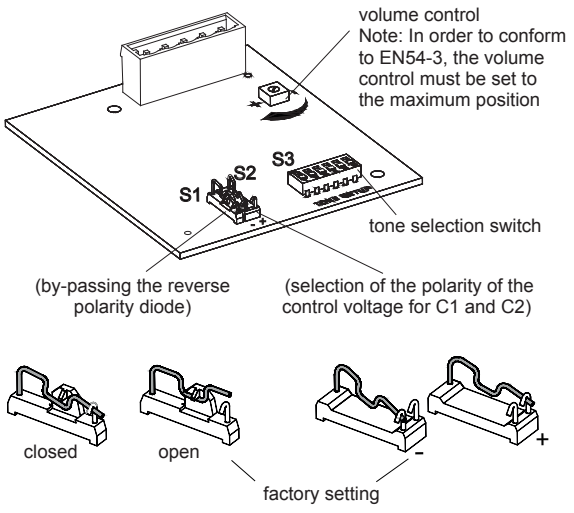
Common connection of flashing lights and sounders (delivery condition)



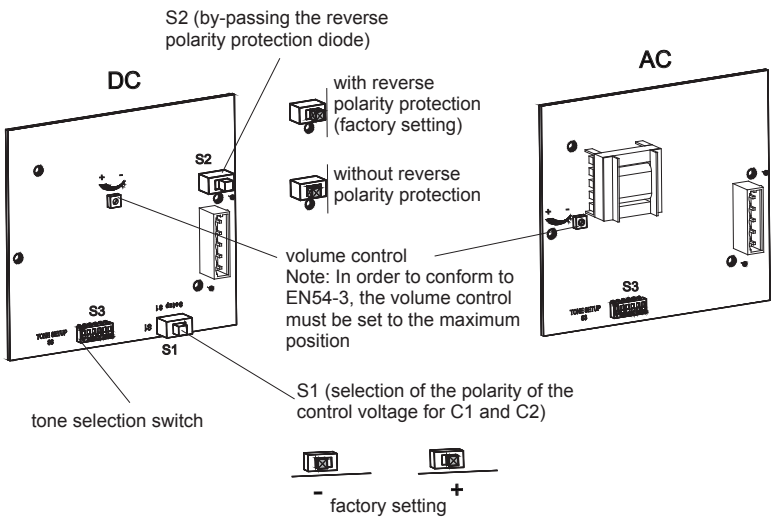
Separated connection of flashing light and sounder



PA X 1-05 / PA X 5-05



PA X 10-05 / PA X 10-10 / PA X 20-10 / PA X 20-15




BR 50

SIGNAL TOWERS – AN IMPORTANT COMPONENT OF YOUR PROCESS RELIABILITY!

BENEFIT FROM THE VERSATILE USES OF OUR RANGE OF SIGNAL TOWERS

Just imagine a simple traffic light, equipped with the shining colours red, yellow and green. Everybody knows what the colours mean; a particular situation in the road traffic process. This traffic light could theoretically also be equipped with acoustic assistance. If the light is red, a tone is heard that means ‚stop'; if it's yellow, ‚attention: get ready to go' is signalled acoustically etc.

You can assemble Pfannenberg signal lights with their stable stainless steel tubular stands individually according to this example and exactly as your machine pool demands it. One look at the signal tower and the observer knows and hears instantly which process state the machine in question is in. For example, 'start', 'warm-up phase', 'optimum operating temperature', 'overheating' etc. Signal technology can be as intelligent as that.

Our signal lights can be supplied as continuous, LED, blinking or flashing lights for safety-relevant applications and carry UL and GOST approvals in addition to the obligatory CE marking.

SIGNAL TOWER Ø 54 MM
BR 50

- modular design with sturdy housing for all indoor and outdoor applications in tough conditions
- wherever machine status needs to be displayed and warning signals given
- high protection system IP 54 (optionally IP 65)
- flexible building kit system guarantees easy handling
- up to 5 modules with 6 lens colours can be combined as desired by simply plugging together, even retrospectively
- mechanical and electronic components are uncoupled, resulting in a more stable structure that is less sensitive to vibration
- many different variations are possible, can be fixed by means of tubular stand, tube or direct mounting
- made of environmentally-friendly materials as per DIN ISO 14000
- monitored module for greater safety; the light bulb has two separate LED strands. If one strand fails, the alarm contact is activated and the second strand continues to light

IP 54	IP 65	UL	+ 50 °C - 25 °C
Protection system	Option		Operating temperature

Technical data		BR 50 (standard modules)					
Modules		continuous light		blinking light 1.5 Hz		flashing light	sounder
Colours		clear, yellow, amber, red, green, blue					
Segment stages (total)		max. 5 (order and colour can be selected individually)					
Dispersion		360°					
Light source [1]		bulb BA15d	LED	bulb BA15d	LED		
Rated power	per stage	7 W	depending on voltage	7 W	depending on voltage		
	per stage if 5 stages	5 W		5 W			
Flash energy	230 V / 115 V AC					0.6 J	
	24 V AC/DC					24 V: 1 J	
Flash frequency						approx. 1 Hz	
Sound pressure level							85 dB (A)
Alarm tones							7
Nominal current consumption (50/60 Hz)	230 V AC	35 mA	15 mA	35 mA	–	10.5 mA	15 mA
	115 V AC	64 mA	15 mA	–	–	20 mA	15 mA
	operating range	- 15% ... + 10%				- 10% ... + 15%	- 15% ... + 10%
Nominal current consumption	24 V	DC: 300 mA	DC: 30 mA	DC: 250 mA	DC: 30 mA	AC/DC: 100 mA	12 mA
	operating range	- 15% ... + 20%		10 V – 30 V		AC: 10 V – 27 V DC: 10 V – 35 V	- 15% ... + 20%
Operating temperature	with bulb	- 25 °C ... + 50 °C		- 25 °C ... + 50 °C			- 10 °C ... + 45 °C
	with LED	- 30 °C ... + 60 °C					
Relative humidity		90%					
Protection system according to EN 60529		IP 54					IP 43
Duty cycle		100%					
Service life of light source		approx. 1,500 h	approx. 50,000 h	approx. 1,500 h	approx. 50,000 h	light emission still 70% after 8,000,000 flashes	
Material	base	acrylonitrile butadiene styrene (ABS)					
	lens	polycarbonate (PC)					
	tube	stainless steel					
Tube thread		30 mm, M16 x 1,5					
Mounting		vertical or horizontal					
Mounting information		the sounder module or the monitored module is always the uppermost module; a maximum of 1 monitored module may be used per signal tower					
Weight	module	80 g		90 g		90 g	230 g
	base	mounting stand: approx. 220 g / tube mounting: approx. 200 g / direct mounting: approx. 180 g					

[1] please order light source separately

Technical data	monitored continuous light module	BR 50 AS-i Bus slave	
Modules		AS-i	AS-i-AB
Module types	monitored continuous light	LED module, sounder module, continuous light module, blinking light module	
Colours	yellow, red		
Segment stages (total)	max. 3	max. 4	max. 3
Dispersion	360°		
Light source	2 x 8 LED (not exchangeable)		
AS-i profile		S-8.F.E	S-8.A.E
AS-i specification		AS-i 3.0 / EN 50295	
Programming		DC-Jack, Ø 1.3 mm	
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 V – 31.6 V	
Operating temperature	- 30 °C ... + 60 °C		
Relative humidity	90%		
Protection system according to EN 60529	IP 54		
Duty cycle	100%		
Service life of light source	50,000 hrs @ 24 °C, 40% R.H.		
Material base	acrylonitrile butadiene styrene (ABS)		
Material lens	polycarbonate (PC)		
Mounting	vertical or horizontal		
Mounting information		the AS-i / AS-i-AB module is always used as the lowest module	
Weight	90 g	90 g	

Connection and configuration options for monitored modules

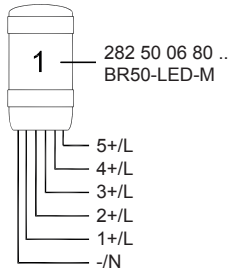
- Use of one monitored module per signal tower:
  - configuration as „top“ module (top module is monitored)
  - configuration as „bottom“ module (bottom module is monitored)
- Use of 2 monitored modules per signal tower

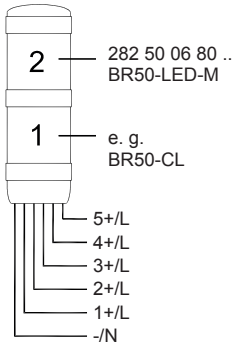
Configuration as „top“ module (top module is monitored)

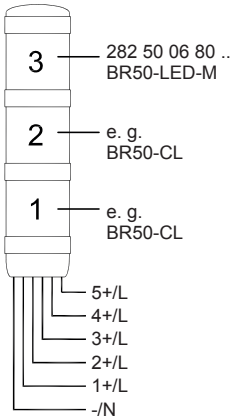
Base module + 1st stage monitored	
-/N	supply voltage (-), common connection for all stages
1+/L	supply voltage (+), activation of monitored module
2+/L	potential-free alarm output contact 1
3+/L	potential-free alarm output contact 2
4+/L	n.c.
5+/L	n.c.

Base module + 1st stage not monitored, 2nd stage monitored	
-/N	supply voltage (-), common connection for all stages
1+/L	supply voltage (+), activation of 1st stage
2+/L	supply voltage (+), activation of 2nd stage (monitored)
3+/L	potential-free alarm output contact 1
4+/L	potential-free alarm output contact 2
5+/L	n.c.

Base module + 1st/2nd stage not monitored, 3rd stage monitored	
-/N	supply voltage (-), common connection for all stages
1+/L	supply voltage (+), activation of 1st stage
2+/L	supply voltage (+), activation of 2nd stage
3+/L	supply voltage (+), activation of 3rd stage (monitored)
4+/L	potential-free alarm output contact 1
5+/L	potential-free alarm output contact 2





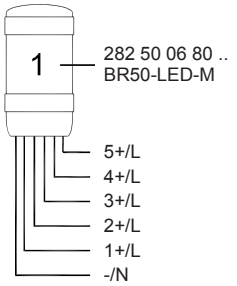


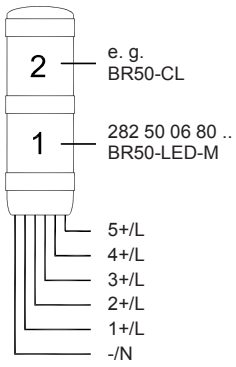
Configuration as „bottom“ module (bottom module is monitored)

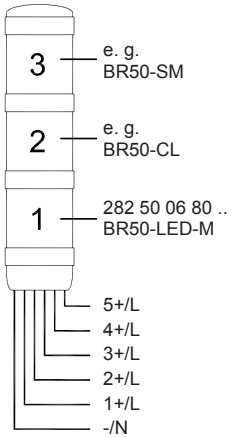
Base module + 1st stage monitored	
-/N	supply voltage (-), common connection for all stages
1+/L	supply voltage (+), activation of monitored module
2+/L	n.c.
3+/L	n.c.
4+/L	potential-free alarm output contact 1
5+/L	potential-free alarm output contact 2

Base module + 1st stage monitored, 2nd stage not monitored	
-/N	supply voltage (-), common connection for all stages
1+/L	supply voltage (+), activation of 1st stage (monitored)
2+/L	supply voltage (+), activation of 2nd stage
3+/L	n.c.
4+/L	potential-free alarm output contact 1
5+/L	potential-free alarm output contact 2

Base module + 1st stage monitored, 2nd/3rd stage not monitored	
-/N	supply voltage (-), common connection for all stages
1+/L	supply voltage (+), activation of 1st stage (monitored)
2+/L	supply voltage (+), activation of 2nd stage
3+/L	supply voltage (+), activation of 3rd stage
4+/L	potential-free alarm output contact 1
5+/L	potential-free alarm output contact 2

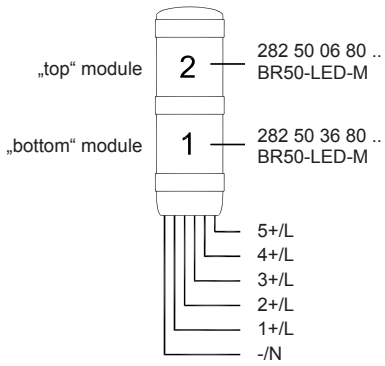


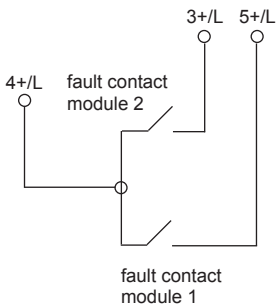




Use of 2 monitored modules per signal tower

Base module + 1st/2nd stage monitored	
-/N	supply voltage (-), common connection for all stages
1+/L	supply voltage (+), activation of 1st stage (monitored)
2+/L	supply voltage (+), activation of 2nd stage (monitored)
3+/L	alarm output module 2
4+/L	common connection alarm outputs
5+/L	alarm output module 1





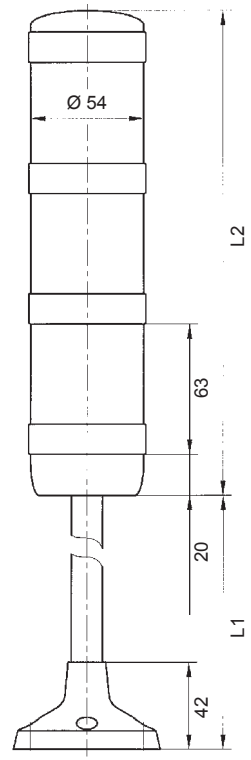
The alarm outputs of both levels have a shared contact!

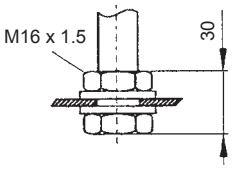
Caution: Max. 2 modules can be utilized

Dimensions

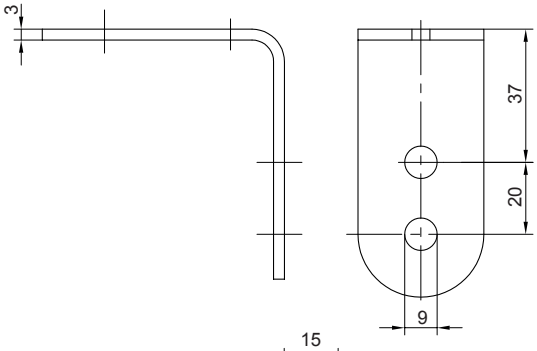
	L1 tube mounting	L1 mounting stand
Tube length 100	78	88
Tube length 250	228	238
Tube length 400	378	388

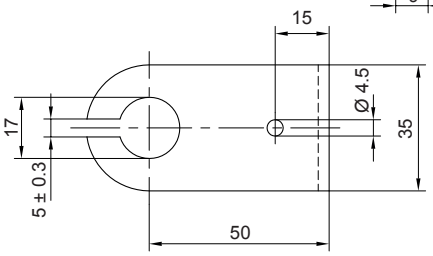
	L2
1-stage	107
2-stage	170
3-stage	233
4-stage	296
5-stage	359



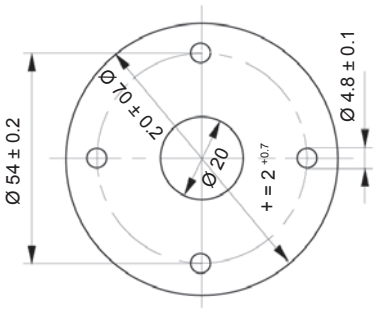


Mounting bracket





Stand mounting gasket



Bayonet connection allows fast, simple and safe mounting

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

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

Ordering details

Article numbers			BR 50 modules		
Version		Rated voltage	230 V AC	115 V AC	24 V DC
Base and end module		BR50-BC	282 50 01 0 000		
Continuous light module	clear	BR50-CL-CL	282 50 04 0 010		
	yellow	BR50-CL-YE	282 50 04 0 030		
	amber	BR50-CL-AM	282 50 04 0 040		
	red	BR50-CL-RE	282 50 04 0 050		
	green	BR50-CL-GR	282 50 04 0 060		
	blue	BR50-CL-BL	282 50 04 0 070		
Blinking light module	clear	BR50-BL-CL	282 50 05 1 010	282 50 05 1 610	282 50 05 8 010
	yellow	BR50-BL-YE	282 50 05 1 030	282 50 05 1 630	282 50 05 8 030
	amber	BR50-BL-AM	282 50 05 1 040	282 50 05 1 640	282 50 05 8 040
	red	BR50-BL-RE	282 50 05 1 050	282 50 05 1 650	282 50 05 8 050
	green	BR50-BL-GR	282 50 05 1 060	282 50 05 1 660	282 50 05 8 060
	blue	BR50-BL-BL	282 50 05 1 070	282 50 05 1 670	282 50 05 8 070
Flashing light module	clear	BR50-FL-CL	282 50 07 1 010	282 50 07 1 610	282 50 07 8 010
	yellow	BR50-FL-YE	282 50 07 1 030	282 50 07 1 630	282 50 07 8 030
	amber	BR50-FL-AM	282 50 07 1 040	282 50 07 1 640	282 50 07 8 040
	red	BR50-FL-RE	282 50 07 1 050	282 50 07 1 650	282 50 07 8 050
	green	BR50-FL-GR	282 50 07 1 060	282 50 07 1 660	282 50 07 8 060
	blue	BR50-FL-BL	282 50 07 1 070	282 50 07 1 670	282 50 07 8 070
LED module, monitored (top module)	yellow	BR50-LED-M-YE	–	–	282 50 06 8 030
	red	BR50-LED-M-RE	–	–	282 50 06 8 050
LED module, monitored (bottom module)	yellow	BR50-LED-M-YE	–	–	282 50 36 8 030
	red	BR50-LED-M-RE	–	–	282 50 36 8 050
Sounder module		BR50-SM	282 50 08 1 000	282 50 08 1 600	282 50 08 8 000
AS-i module		BR50-AS-i	282 50 14 8 300		
AS-i-AB module		BR50-AS-i-AB	282 50 17 8 300		
Information module		BR50-IM	282 50 27 0 000		
Tubular stand with plinth	100 mm	BR50-S100	282 50 15 0 010		
	250 mm	BR50-S250	282 50 15 0 020		
	400 mm	BR50-S400	282 50 15 0 040		
Tube with thread and bracket (excl. seal and cable)	100 mm	BR50-T100	282 50 16 0 010		
	250 mm	BR50-T250	282 50 16 0 020		
	400 mm	BR50-T400	282 50 16 0 040		

Light bulbs for constant light and blinking light modules must be ordered separately

www.pss-pfannenberg.com

Use our PSS Software Tool for easy configuration of the signal tower according to your individual requirements

Options / Accessories

Lamp remover
Article number:
282 50 25 0 000

Wall bracket for mounting stand
Article number:
282 50 20 0 000

Mounting kit for direct mounting
Article number:
282 50 21 0 000

Gaskets IP 65
Article number:
282 50 22 0 000
282 50 23 0 000

Light source

cULus LISTED

GOST

See pages 168/169 for further information

Ordering example

Signal tower 5-stage, IP 65	Version	Article numbers 230 V AC	24 V DC
 Sounder module	**BR50-SM**	282 50 08 1 000	282 50 08 8 000
	+		
 Flashing light module	**BR50-MG** + **BR50-FL**	282 50 22 0 000	
		282 50 07 1 050	282 50 07 8 050
	+		
 Continuous light module with bulb or LED	**BR50-MG** + **BR50-CL** + **bulb** or **LED BA 15d**	282 50 22 0 000	
		282 50 04 0 060	
		282 13 00 0 004	282 13 00 0 000
		282 13 00 0 018	282 13 00 0 011
	+		
 Blinking light module with bulb or LED	**BR50-MG** + **BR50-BL** + **bulb** or **LED BA 15d**	282 50 22 0 000	
		282 50 05 1 030	282 50 05 8 030
		282 13 00 0 004	282 13 00 0 000
		282 13 00 0 030	282 13 00 0 007
	+		
 Continuous light module with bulb or LED	**BR50-MG** + **BR50-CL** + **bulb** or **LED BA 15d** + **BR50-MG** + **BR50-BC**	282 50 22 0 000	
		282 50 04 0 010	
		282 13 00 0 004	282 13 00 0 000
		282 13 00 0 014	282 13 00 0 006
		282 50 22 0 000	
		282 50 01 0 000	
	+		
 Mounting stand (100 mm) and seal	**BR50-TG**	282 50 23 0 000	
	BR50-S100	282 50 15 0 010	

SIGNAL TOWER Ø 35 MM
BR 35

- modular design with six different colour elements and four mounting methods offers endless combination possibilities
- high protection system
- the light is amplified by the internal prisms of the impact-proof, heat-resistant and dustproof polycarbonate lens and can be easily identified from all sides
- appealing design with a diameter of just 35 mm
- the BR 35 signal tower is the attractive icing on the cake for machine and production lines
- for use in electronic production, in laboratories, in medical technology and in all other indoor applications
- the technically and economically optimum solution for every application
- registered design no. 9706583.8, utility patent no. 29716867.3

IP 54	+ 55 °C - 35 °C	+ 45 °C - 35 °C
Protection system	LED	Filament lamp

Electrical data	BR 35			
Rated voltage	230 V AC	115 V AC	24 V DC	12 V DC
Rated frequency	50 Hz / 60 Hz	50 Hz / 60 Hz		
Operating range	- 15% / + 10%	- 15% / + 10%	- 15% / + 20%	- 15% / + 20%
Capacity of light source	3 W	3 W	4 W	4 W

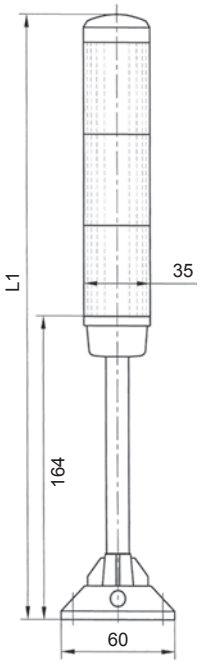
Mechanical data		BR 35
Light source	AC	BA9s, 3 W (previously installed)
	DC	BA9s, max. 4 W (previously installed)
Number of modules		max. 4
Lens colours		clear, yellow, amber, red, green, blue
Sound pressure level, sounder module		75 dB (A)
Operating temperature	LED	- 35 °C ... + 55 °C
	filament lamp	- 35 °C ... + 45 °C
Storage temperature		- 45 °C ... + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 54
Duty cycle		100%
Service life of light source		approx. 1,000 hrs
Material	housing	acrylonitrile butadiene styrene (ABS)
	lens	polycarbonate (PC)
	tube	stainless steel
Type of connection		cable length 0.5 m tube mounting; 0.65 panel mounting
Terminal cross-section		single wire: 1.5 mm², fine wire: 0.14 – 1.5 mm²
Mounting information		just one screw is sufficient for exchanging beacon filters or light source
Mounting methods		mounting stand, plinth mounting, tube mounting, panel mounting (see drawings on page 166)

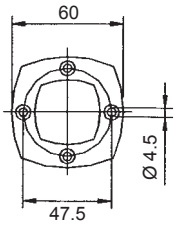
www.pss-pfannenberg.com

Use our PSS Software Tool for easy configuration of the signal tower according to your individual requirements

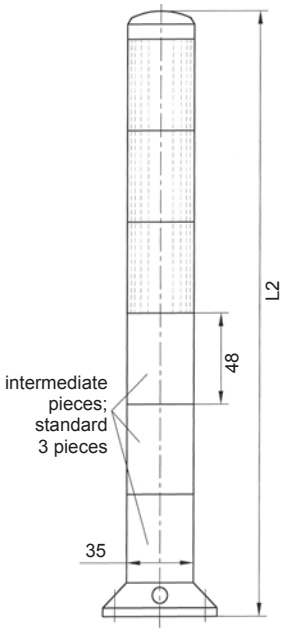
Dimensions

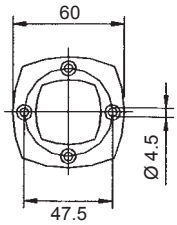
Stand mounting



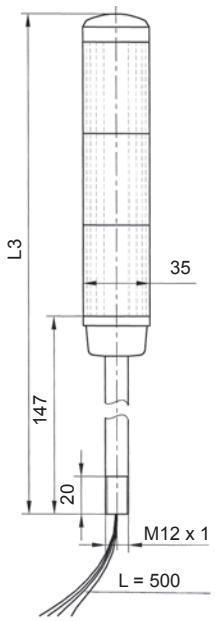


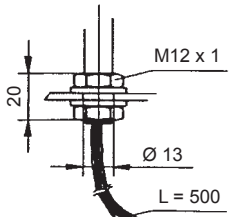
Plinth mounting



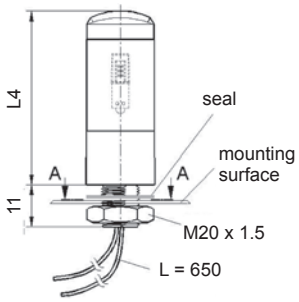


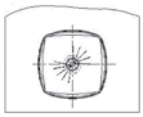
Tube mounting



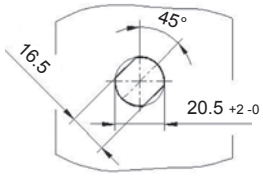


Panel mounting





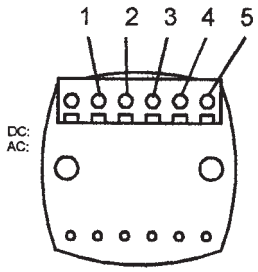
Panel cut-out



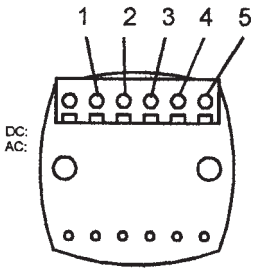
	L1	L2	L3	L4
1-stage	228	228	210	91
2-stage	276	276	258	142
3-stage	324	324	306	190
4-stage	372	372	354	238
5-stage	420	420	402	286

Connection diagrams

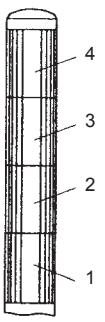
Stand mounting

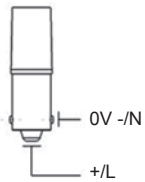


Plinth mounting



Tube mounting / Panel mounting





Wire no.	Light segment
1	1
2	2
3	3
4	4
N	-/N

Ordering details

Article numbers		BR 35 mounting stand	
Version	Rated voltage	230 V AC	24 V DC
1-stage BR 35-1-S		220 80 10 1 000	220 80 80 1 000
2-stage BR 35-2-S		220 80 10 2 000	220 80 80 2 000
3-stage BR 35-3-S		220 80 10 3 000	220 80 80 3 000
4-stage BR 35-4-S		220 80 10 4 000	220 80 80 4 000
3-stage with fixed colour order: top: red, middle: yellow, bottom: green		220 80 10 0 000	220 80 80 0 000
Article numbers		**BR 35 plinth mounting**	
Version	Rated voltage	230 V AC	24 V DC
1-stage BR 35-1-P		220 81 10 1 000	220 81 80 1 000
2-stage BR 35-2-P		220 81 10 2 000	220 81 80 2 000
3-stage BR 35-3-P		220 81 10 3 000	220 81 80 3 000
4-stage BR 35-4-P		220 81 10 4 000	220 81 80 4 000
Article numbers		**BR 35 tube mounting**	
Version	Rated voltage	230 V AC	24 V DC
1-stage BR 35-1-T		220 82 10 1 000	220 82 80 1 000
2-stage BR 35-2-T		220 82 10 2 000	220 82 80 2 000
3-stage BR 35-3-T		220 82 10 3 000	220 82 80 3 000
4-stage BR 35-4-T		220 82 10 4 000	220 82 80 4 000
Article numbers		**BR 35 panel mounting**	
Version	Rated voltage	230 V AC	24 V DC
1-stage BR 35-1-PM		220 83 10 1 000	220 83 80 1 000
2-stage BR 35-2-PM		220 83 10 2 000	220 83 80 2 000
3-stage BR 35-3-PM		220 83 10 3 000	220 83 80 3 000
4-stage BR 35-4-PM		220 83 10 4 000	220 83 80 4 000

Article numbers for other voltages on request

Options / Accessories

Mounting bracket for stand- or plinth mounting (plastic)
Article number: 282 35 20 0 020

Mounting bracket for tube mounting (metal)
Article number: 282 35 20 0 010

Assembly kit sounder module
Article number: 282 35 80 8 000

Short foot plinth-mounted device with short foot

Light source

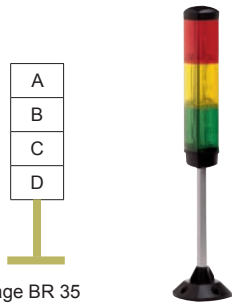
cULus LISTED

GOST

See page 169 for further information

Ordering examples

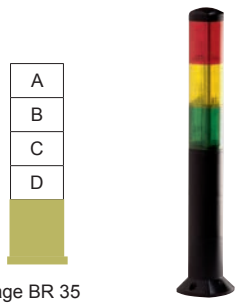
Stand mounting



3-stage BR 35
with mounting stand
24 V DC, colour order: A = red
B = yellow
C = green

Article number:
220 80 80 3 000

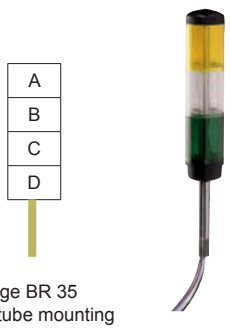
Plinth mounting



3-stage BR 35
with plinth mounting
230 V AC, colour order: A = red
B = yellow
C = green

Article number:
220 81 10 3 000

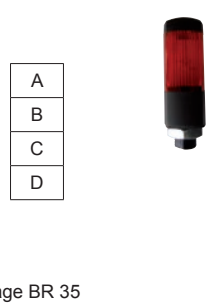
Tube mounting



3-stage BR 35
with tube mounting
24 V DC, colour order: A = yellow
B = clear
C = green

Article number:
220 82 80 3 000

Panel mounting



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

Article number:
220 83 10 1 000

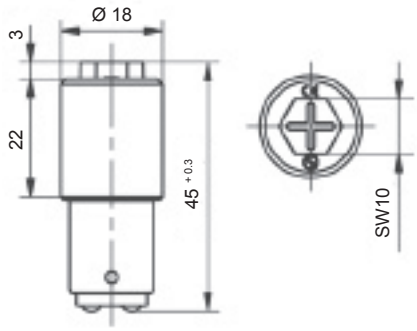
Please indicate color sequence (A/B/C/D) in your order as depicted above.

ACCESSORIES FOR BR 50

MULTI-LED BA15D FILAMENT LAMPS

Energy and cost-saving high output SMD LEDs replace filament lamps

- extremely long service life (> 50,000 hrs)
- low power consumption (e.g. 30 mA at 24 V)
- shock/vibration-resistant
- same brightness for all voltages
- resistant to environmental influences
- option ‘plus’ = extra bright



Ordering details

Article numbers		LED BA15d		
Version	Rated voltage	230 V AC [1]	115 V AC [1]	24 V AC/DC
white	standard plus	282 13 00 0 013	282 13 00 0 021	
white	standard	282 13 00 0 014	282 13 00 0 022	282 13 00 0 006
yellow	standard plus			282 13 00 0 007
yellow	standard	282 13 00 0 015	282 13 00 0 023	
red	standard plus			282 13 00 0 009
red	standard	282 13 00 0 016	282 13 00 0 024	
green	standard plus	282 13 00 0 017	282 13 00 0 025	
green	standard	282 13 00 0 018	282 13 00 0 026	282 13 00 0 011
blue	standard plus	282 13 00 0 019	282 13 00 0 027	
blue	standard	282 13 00 0 020	282 13 00 0 028	282 13 00 0 012
Article numbers		**Filament lamps BA15d**		
BR50-L	7 W	282 13 00 0 004	282 13 00 0 002	282 13 00 0 000
BR50-L	5 W	282 13 00 0 005	282 13 00 0 003	282 13 00 0 001

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

LAMP REMOVER

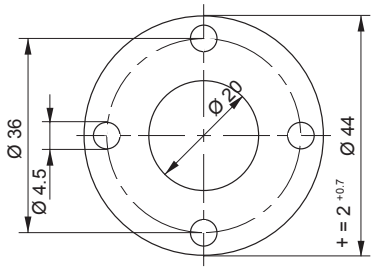
Lamp remover for simple bulb replacement.

Ordering details

Article numbers	Lamp remover
BR50-LS	282 50 25 0 000

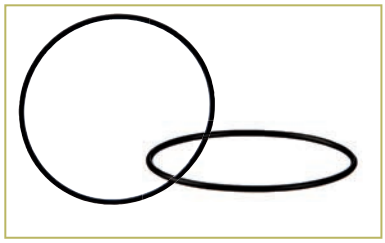
DIRECT MOUNTING SET

Gasket and mounting materials for direct mounting.



Ordering details

Article number	Direct mounting set
BR50-BG	282 50 21 0 000



OPTION IP 65

Gaskets for higher protection system IP 65.

Ordering details

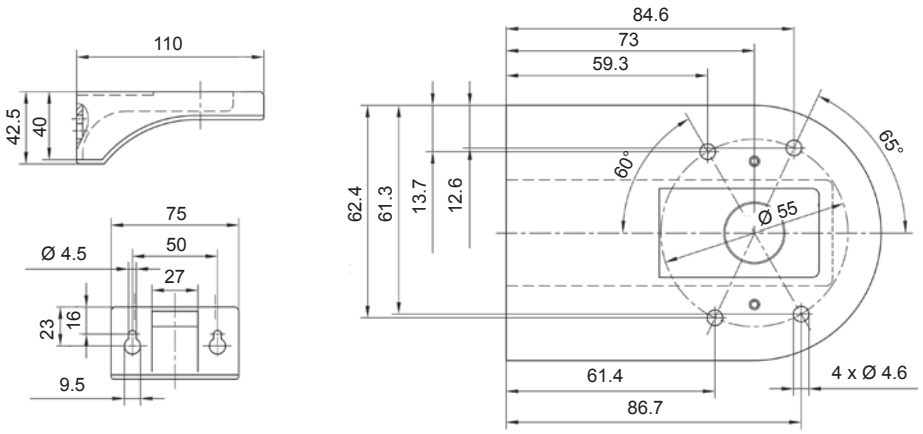
Article numbers	IP 65 gaskets
Module gasket BR50-MG (1 x per light module plus 1 x base module)	282 50 22 0 000
Tube gasket BR50-TG (for tubular stand or tube mounting only)	282 50 23 0 000

WALL BRACKET WITH HOOD

Plastic wall holder for mounting the BR 50 on a tubular stand.

Dimensions

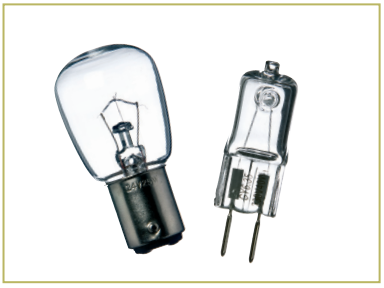
BR 50-W



Ordering details

Article number	BR50-W
Plastic wall bracket with hood	282 50 20 0 000

ACCESSORIES FOR BR 35



LIGHT SOURCE

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

Ordering details

Article numbers		LED
Colour	Rated voltage	24 V AC/DC
white		286 13 00 0 000
yellow		286 13 00 0 001
red		286 13 00 0 002
green		286 13 00 0 003
blue		286 13 00 0 004
Article numbers		**Filament lamps BA9s**
Rated voltage		pack of 5
12 V DC 4 W		288 13 00 0 003
24 V DC 4 W		288 13 00 0 002
115 V AC 3 W		288 13 00 0 001
230 V AC 3 W		288 13 00 0 000

MOUNTING BRACKET

Bracket for mounting the BR 35.

Ordering details

Article numbers		Mounting bracket
Plastic bracket for mounting on tubular stand or plinth	BR35-W	282 35 20 0 020
Metal bracket for tube mounting	BR35-A	282 35 20 0 010


BExS120E
ALARMSCHALLGEBER
NENNSPANNUNG: 24V DC
NENNSTROM: 800mA
II 2G Ex de IIC T4 für Ta -50° bis +55°C
Ex de IIB T4 für Ta -50° bis +70°C
KEMA 99ATEX7906
CE 0344
Kabeleinführung
M20x1,5
Jahr / Serien Nummer
09 / 3S22000641
"WARNUNG"
DECKELSCHRAUBEN KLASSE A4-80
NICHT ÖFFNEN, WENN EXPLOSIVE
ATMOSPHAREN VORHANDEN SIND
NUR HITZEBESTÄNDIGE KABEL UND
KABELVERSCHRAUBUNGEN (ZUGELASSEN BIS +110°C) BEI
UMGEBUNGSTEMPERATUREN ÜBER +40°C VERWENDEN
D-21035 Hamburg, Germany
www.pfannenberg.com
Pfannenberg
ELECTRO-TECHNOLOGY FOR INDUSTRY

Our Ex-series visual and acoustic signaling devices stand out with their particularly sturdy construction and insensitivity to environmental influences and chemicals.

These are information, warning and emergency signals for safety, hazard and fire alarm systems; for building, industrial and commercial automation; for disaster warnings and for hazardous areas.

ALARM SAFETY EVEN IN EXPLOSIVE AREAS

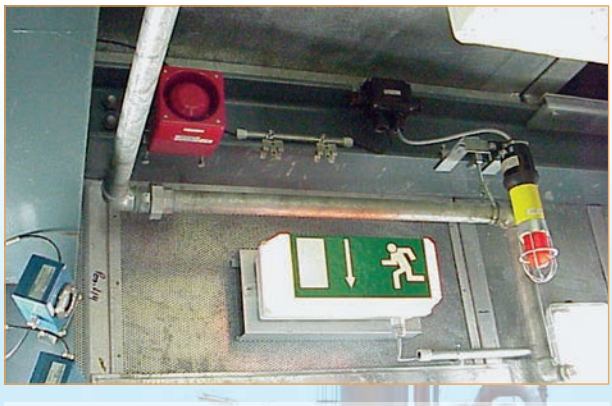
EX SIGNALING DEVICES ARE USED WHEREVER EXPLOSIVE GASES, VAPOURS AND DUSTS CAN BECOME DANGEROUS

SAFETY FOR MAN, MACHINE AND THE ENVIRONMENT

If it's about safety, Pfannenberg is always the right choice, because the Pfannenberg brand stands for 'safety for man, machine and the environment'.

Global references speak a clear language. Ex-protected visual and acoustic 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: DS 10 ATEX ⟨Ex⟩ sounder and CWB-ATEX ⟨Ex⟩ flashing light

Acoustic alarm in a gas-fired power station: BExS 120 ATEX ⟨Ex⟩ sounder

The CWB-ATEX ⟨Ex⟩ flashing light and the BExS 120 ATEX ⟨Ex⟩ sounder signal danger here without becoming a danger themselves – highly visible and highly audible

ATEX GUARANTEES YOUR SAFETY

DIRECTIVES

In the Ex-Directive 94/9/EU, the European Union has provided a basis for binding uniform requirements for characteristics with regard to the protection of systems, appliances and components against explosion. With these standards, the manufacturer can assume when designing and assessing the explosion protection that he is developing explosion-protected systems, appliances and components that conform to the Ex-Directive 94/9/EU and which are then subjected to uniform binding test procedures by an appointed body of the European Union.

A uniform classification of explosion-endangered plants is the basis for the selection, assignment and installation of systems, appliances and components. In order to protect employees, the user is obliged by Directive 1999/92/EU to assess the explosion risk of the plant, to divide the plant into danger zones and to draw up an explosion protection document or a series of documents, which fulfil the requirements contained in this directive, and to keep them up to date.

Through directives 94/9/EU and 1999/92/EU, the prerequisites have been created for a complete unification of the regulations for protection against explosion in the European Union and form a closed system, with which explosions can be effectively avoided in order to protect man, machine and environment.

SELECTING SUITABLE EX ALARM PRODUCTS

The selection of suitable alarm products is essentially governed by two factors, which can be distinguished as follows:

a) Ex environmental requirements
b) Functional requirements

EX ENVIRONMENTAL REQUIREMENTS

Groups and gases

Explosion-protected products are catalogued with regard to their different purposes of use. The first distinguishing criteria is whether usage is underground or above ground:

Group I: operating equipment for underground mining with a ‘firedamp risk’
Group II: operating equipment for all other (non-group I) areas

A further distinction is made in Group II according to the types of gases present in the operation environment and the temperature class. On the one hand, this describes the maximum surface temperature of the explosion-protected device and, on the other, the minimum ignition temperature of the gas or vapour. For secure protection against explosion, it must be ensured that the surface temperature of the device (e.g. the flashing light) is always lower than the ignition temperature of the gas.

Classification of gases and vapours into temperature classes and gas groups

	T1 ≤ 450°C	T2 ≤ 300°C	T3 ≤ 200°C	T4 ≤ 135°C	T5 ≤ 100°C	T6 ≤ 85°C
I	Methane					
IIA	Acetone Ethane Ethyl acetate Benzene Acetic acid Ammonia Carbon monoxide Methane Toluene Propane Methanol	Ethyl alcohol i-amyl acetate n-butane n-butyl alcohol	Petrol Diesel Aviation fuel n-hexane Heating oil	Acetyl aldehyde		
IIB	Town gas	Ethylene		–		
IIC	Hydrogen	Acetylene		–		CS_2

The gases are classified in groups ABC according to their flammability. This in turn generates different requirements for the enclosures of electrical equipment. For explosion-proof enclosures, these include the dimensions of the closure gap. The gas groups are upwardly compatible, i.e. devices that are suitable for use in group IIC can also be used in the groups IIB or IIA. The same compatibility applies to the temperature classes, according to which devices from temperature class T6 can also be used in all other temperature classes. However, devices from temperature class T4 are adequate for most applications.

ATEX GUARANTEES YOUR SAFETY

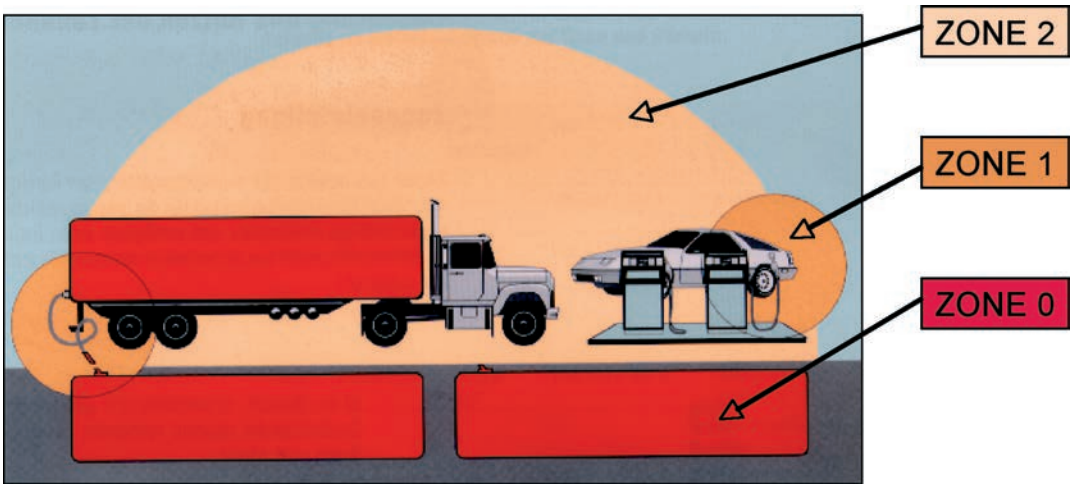
ZONES AND CATEGORIES

Potentially explosive areas are defined in section 2 of ElexV (Germany) as areas in which the atmosphere may be capable of explosion due to local and operational conditions.

It has proven to be useful to divide potentially explosive areas into zones, taking into account different hazards caused by explosive atmospheres.

Definition of the zones according to section 2 para. 4 ELX (96)

Potentially explosive areas due to combustible gases		
Zone 0	**Zone 1**	**Zone 2**
Areas in which an explosive atmosphere of gases, vapours or mists exists constantly, over long periods or frequently.	Areas in which an explosive atmosphere of gases, vapours or mists occasionally occurs.	Areas in which explosive atmospheres of gases, vapours and mists normally never occur, but if they do, then only rarely and only for short time periods.
Potentially explosive areas due to combustible dusts		
Zone 20	**Zone 21**	**Zone 22**
Areas in which an explosive dust atmosphere exists constantly, over long periods or frequently.	Areas in which an explosive dust atmosphere occasionally occurs.	Areas in which explosive dust atmospheres normally never occur, but if they do, then only rarely and only for short time periods.



The Ex devices are sub-divided analogue to the Ex zones into the following device categories

Device classification according to groups and categories:							
Group I		**Group II**					
Category M		**Category 1**		**Category 2**		**Category 3**	
		G	D	G	D	G	D
1	2	(gas) Zone 0	(dust) Zone 20	(gas) Zone 1	(dust) Zone 21	(gas) Zone 2	(dust) Zone 22

ATEX GUARANTEES YOUR SAFETY

TYPES OF PROTECTION SYSTEMS

The European standards describe eight different explosion protection methods that can be applied in order to make electrical equipment suitable for use in the various ex zones. The different types of protection vary widely with regard to the degree of complexity and some of them are not usable with mobile equipment, for example. The type of ignition protection is selected with the greatest of care for Pfannenberg devices in order to guarantee the best possible cost-benefit ratio. Pfannenberg uses the following protection systems for its alarm equipment:

Flame proof enclosure ‘d’

In the case of pressure-resistant encapsulation, the actual operating equipment is built into a pressure-resistant housing. In the event of an explosion inside, the housing prevents an ignition breakthrough into the surrounding area. The explosion is therefore restricted to the interior of the device. On account of the necessary wall thickness, devices in this protection system are of a very sturdy construction and thus also often very well suited for adverse environmental conditions.

Enhanced safety ‘e’

This type of enhanced protection is usable with only a few types of equipment/components (e.g. terminals). This type of protection is conveniently often combined with pressure-resistant encapsulation. In alarm products, this means that all essential components are housed in the pressure-resistant housing and only the connection terminals are accessible in the increased safety housing. For this reason Pfannenberg also offers most devices with an ‘e connection box’ in order to enable simple and safe electrical connections to be made. The sensitive electronic components are therefore protected against accidental damage during mounting.

Intrinsically safety ‘i’

In the ignition protection type ‘i‘, the current and voltage of all energy storage devices as well as the complete device are limited to the extent that no ignition sparks and no excessively hot surfaces can be generated. An explosive atmosphere can develop, but it will not be ignited.

ATEX - DESIGNATION OF ELECTRICAL EQUIPMENT FOR POTENTIALLY EXPLOSIVE ENVIRONMENTS!

Conditions in potentially explosive areas

Combustible substances	Temporary behaviour of the combustible substance in the Ex area	Classification of the potentially explosive areas			Required marking of the operating equipment to be used according to CENELEC		Equiment protection level (EPL) according to EN 60079-0
		CENELEC/IEC	US NEC 505	US NEC 500	Device group	Device category	
gases, vapours	continuously, for long periods or frequently	Zone 0	Class I Zone 0	Class I Division 1	II	1G	Ga
	occur occasionally	Zone 1	Class I Zone 1		II	2G or 1G	Gb or Ga
	rarely and for a short period	Zone 2	Class I Zone 2	Class I Division 2	II	3G or 2G or 1G	Gc or Gb or Ga
dusts	continuously, for long periods or frequently	Zone 20	–	Class II Division 1	II	1D	Da
	occur occasionally	Zone 21	–		II	2D or 1D	Db or Da
	rarely and for a short period	Zone 22	–	Class II Division 2	II	3D or 2D or 1D	Dc or Db or Da
methane, dust	operation where there is a risk of explosion	–	–	–	I	M1	Ma
	disconnection where there is a risk of explosion	–	–	–	I	M2 or M1	Mb or Ma

Device category and Equiment protection level (EPL)

according to EU directive 94/9/EG (ATEX)		according to IEC / CENELEC		
Device group	Device category	EPL		adequate safety
mining with a 'firedamp risk'				
I	M1	Ma		rare errors
I	M2	Mb		till disconnection the unit
areas due to combustible gases				
II	1G	Ga	Zone 0	rare errors
II	2G	Gb	Zone 1	predictable failures
II	3G	Gc	Zone 2	during normal operation
areas due to combustible dusts				
II	1D	Da	Zone 20	rare errors
II	2D	Db	Zone 21	predictable failures
II	3D	Dc	Zone 22	during normal operation
G related electrical equipment - installation in safe area				

Inspection authority

Notified body	Country	Id-Number
TÜV Nord Cert	Germany	0044
PTB	Germany	0102
DEKRA EXAM	Germany	0158
FSA	Germany	0588
BAM	Germany	0589
IBExU	Germany	0637
INERIS	France	0080
LCIE	France	0081
DEKRA B.V.	Netherlands	0344
SP	Sweden	0402
LOM	Spain	0163
BASEEFA	UK	1180
SIRA	UK	0518

NEC 500
NEC 505
IEC
CENELEC

CE 0158

Class I
Class I

II

2G

Division 1
Zone 1

Temperature classes and highest permissible surface temperatures of the equipment

Highest permissible surface temperature	USA (NEC 500)	Usability of the equipment	Temperature classes according to CENELEC/IEC NEC 505	Max. surface temperature of the equipment	Ignition temperature of the combustible substances
450 °C	T1	T1 T2 T3 T4 T5 T6	T1	450 °C	> 450 °C
300 °C	T2		T2	300 °C	> 300 °C < 450 °C
280 °C	T2A		T3	200 °C	> 200 °C < 300 °C
260 °C	T2B		T4	135 °C	> 135 °C < 200 °C
230 °C	T2C		T5	100 °C	> 100 °C < 135 °C
215 °C	T2D		T6	85 °C	> 85 °C < 100 °C
200 °C	T3				
180 °C	T3A				
165 °C	T3B				
160 °C	T3C				
135 °C	T4				
120 °C	T4A				
100 °C	T5				
85 °C	T6				

Classification of gases and vapours into explosion groups and temperature classes

Classification into temperature classes / gas groups (extract)						
	T1	T2	T3	T4	T5	T6
I	Methane	–	–	–	–	–
IIA	Acetone Acetic acid Ammonia Propane *	Ethyl alcohol n-butane n-butyl alcohol	Petrols Heating oil Diesel	Acetaldehyde Ethyl ether	–	–
IIB	Town gas	Ethylene *		–	–	
IIC	Hydrogen *	Acetylene *		–	–	Carbon bisulphide

* typical ignitable gas

Protective systems

Protective system	Marking		Protection principle	Zone	Standard	Applications
	Standard	Alternate				
general requirements	–		–	–	IEC 60079-0 EN 60079-0	all applications
flame proof enclosure	Ex d	Ex db	transmission of an explosion to the outside is excluded	1	IEC 60079-1 EN 60079-1	switchgear, controllers, motors, command and alarm devices, power electronics
increased safety	Ex e	Ex eb	avoidance of sparks and high temperatures	1	IEC 60079-7 EN 60079-7	junction and terminal boxes, enclosures, motors, beacons, terminals
intrinsically safety	Ex ia Ex ib Ex ic	Ex ia Ex ib Ex ic	limitation of the energy of sparks and temperatures	0 1 2	IEC 60079-11 EN 60079-11	measurement, control and regulating equipment, sensors, actuators, instrumentation
pressurized	Ex px Ex py Ex pz	Ex pxb Ex pyb Ex pzc	Ex atmosphere is kept away from the source of ignition	1 1 2	IEC 60079-2 EN 60079-2	power and control cabinets, motors, measurement and analysis devices, computers
encapsulation	Ex ma Ex mb Ex mc	Ex ma Ex mb Ex mc	Ex atmosphere is kept away from the source of ignition	0 1 2	IEC 60079-18 EN 60079-18	relay and motor coils, circuitry, solenoid valves, connecting systems
oil immersion	Ex o	Ex ob	Ex atmosphere is kept away from the source of ignition	1	IEC 60079-6 EN 60079-6	transformers, relays, start-up controllers, switching devices
powder filling	Ex q	Ex qb	transmission of an explosion to the outside is excluded	1	IEC 60079-5 EN 60079-5	transformers, relays, capacitors
type 'n' protection	Ex nA [1] Ex nC [1] Ex nR [1]	Ex nAc Ex nCc Ex nRc	various protection principles for Zone 2	2	IEC 60079-15 EN 60079-15	all applications for Zone 2

[1] nA = non-sparking, nC = sparking equipment (suitable protection), nR = vapour-proof enclosure

When using the alternate symbols the EPL can be omitted.

Additional conditions

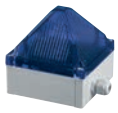
Conditions	Marking
Equipment usable without restriction	–
Observe special conditions for use	X
Ex component with partial certification, not capable of operation alone; CE conformity is only certified after installation in complete equipment	

Group A, B, C, D

AEx d	IIC	T6	Gb
Ex de	IIC	T6	Gb
Ex de	IIC	T6	

PTB 01 ATEX 1234 X

ALL EX SIGNALING DEVICES AT A GLANCE

	Type	Suitable for use in zones						Maximum covering distance as per EN 54-23 in metres (m) [1]					Light intensity / Sound pressure level	Protection system	Approvals / Standards					Page
		0	1	2	20	21	22	5	25	50	100	125			GL	GOST	UL	EN 54-3 VdS	IEC	
	VISUAL SIGNALING DEVICES																			
	**Quadro F12-3G/3D**			●			●						7.5 J	IP 66 IK 08		●				180
	Quadro-LED Flex-3G/3D			●			●						9 cd	IP 66 IK 08		●				182
	**BR 50-LED 3G/3D**			●			●							IP 65		●				184
	**CWB-ATEX**		●	●		●	●						5 J	IP 66	●	●				186
	**BExBG 15**		●	●		●	●						15 J	IP 66 IP 67		●				188
	BExBG 10		●	●		●	●						10 J			●				
	BExBG 05		●	●		●	●						5 J			●				
	BExBG L1		●	●		●	●						9 cd			●				190
	**IS-mB1**	●	●	●									6 cd	IP 65		●				192
	AUDIBLE SIGNALING DEVICES SOUNDERS																			
	**DS 10 3G/3D**			●			●						110 dB (A)	IP 66 IP 67	●	●		●		194
	DS 5 3G/3D			●			●						105 dB (A)		●	●		●		
	**BExS 120 d/e**		●	●									117 dB (A)	IP 66 IP 67		●		●[2]	●[2]	196
	BExDS 120 d/e		●	●		●	●											●[2]		
	BExS 110 d/e		●	●									110 dB (A)			●		●[2]	●[2]	198
	BExDS 110 d/e		●	●		●	●											●[2]		
	**IS-A105N**	●	●	●									105 dB (A)	IP 66		●				200
	**IS-mA1**	●	●	●									100 dB (A)	IP 65		●				202

● available
○ in preparation

[2] only d version

	Type	Suitable for use in zones						Maximum covering distance for a 65 dB ambient noise level in metres (m)[1]					Sound pressure level / Light intensity	Protection system	Approvals / Standards						Page
															GL			EN 54-3			
		0	1	2	20	21	22	5	25	50	100	125			MED	GOST	UL	VdS	IEC		
	AUDIBLE SIGNALING DEVICES LOUDSPEAKERS																				
	**BExL 25 d/e**		●	●									117 dB (A)	IP 66 IP 67		●					204
	BExL 15 d/e		●	●									113 dB (A)			●					
	COMBINED VISUAL-AUDIBLE SIGNALING DEVICES																				
	**BExCS 110-05D**		●	●									110 dB (A) 5 J	IP 67		●					206
	BExDCS 110-05D		●	●		●	●									●					
	BExCL 15-05D		●	●									113 dB (A) 5 J			●					208
	**IS-mC1**	●	●	●									100 dB (A) / 6 cd	IP 65		●					210
	ACCESSORIES																				
	**Zener barriers**																				212

[1] The specification for the alarm signal reception range assumes an existing ambient noise level of 65 dB (A). In accordance with applicable regulations, the calculated alarm range for the sound level 65 dB (A) was given + 10 dB (A) = 75 dB (A).

● available
○ in preparation

Note:
Using sounders with a sound pressure level of ≥ 120 dB (A) can lead to hearing damage. People must not be permitted to stay in the near vicinity of the sounder. All specified sound pressure levels are based on a measurement distance of 1 m, provided that nothing different is specified.

Further information can be found on the Internet:
www.pfannenberg.com · www.pfannenberg-spareparts.com
Keep up to date. Subscribe to our newsletter now:
newsletter.pfannenberg.com

FLASHING LIGHT 7.5 J
Quadro F12-3G/3D ATEX

The Quadro F12 3G/3D flashing light is designed for tough demands under industrial conditions and is usable as a visual alarm. The flashing light, which is suitable for use both indoors and out, generates bright light impulses with a high attention-drawing effect.

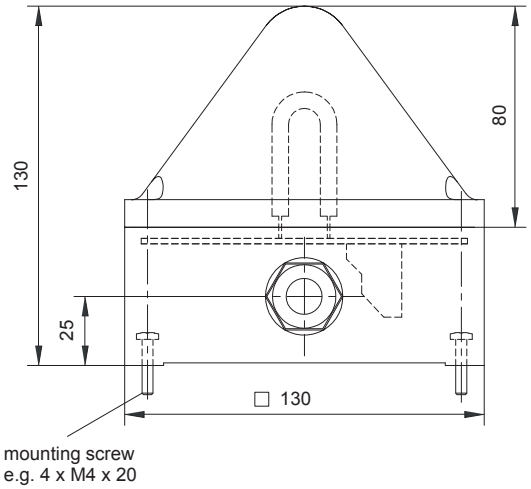
- for use in potentially explosive areas in Zone 2 as per EN 60079-10 and Zone 22 as per EN 61241-10
- the requirements of the EN 60079-0, EN 60079-15, EN 61241-0, EN 61241-0 (2007) and EN 61241-1 (2005) standards are fulfilled
- usable for gases in the temperature classes T1, T2, T3 and T4, as well as for non-conductive dusts, provided that the surface temperature of the equipment does not exceed + 105 °C

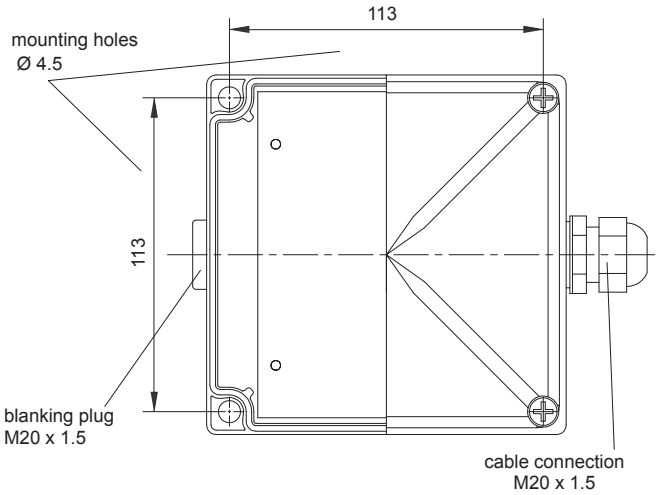
r = 15 m	IP 66	IK 08	+ 45 °C / - 20 °C	10 Years
Covering distance as per EN 54	Protection system	Impact-proof housing	Operating temperature	Warranty

Electrical data	Quadro F12-3G/3D ATEX		
Rated voltage	230 V AC	115 V AC	24 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	
Operating range	195 – 253 V	95 – 127 V	18 – 30 V
Nominal current consumption	90 mA	140 mA	360 mA
Initial current limited to	< 7 A / 150 µs	< 7 A / 150 µs	< 5 A / 2 ms

Mechanical data		Quadro F12-3G/3D ATEX
Explosion protection		II 3G Ex nR IIC T4 - 20 °C ≤ Ta ≤ + 45 °C II 3D Ex tD A22 IP66 T105 °C - 20 °C ≤ Ta ≤ + 45 °C
Category (area of use)		3G (Zone 2) 3D (Zone 22)
Conformity to standards		Guideline 94/9/EG (ATEX 100a)
Testing body		Pfannenberg
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.
Flash rate		0.83 Hz = 50 flashes/min.
Flash energy		7.5 J
Light intensity (DIN 5037)	clear lens	84 cd
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 20 °C ... + 45 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		100%
Protection system according to EN 60529		IP 66; mounting arbitrary
Impact resistance as per EN 50102		IK 08
Protection class		II
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	polycarbonate (PC), RAL 7035 (optionally RAL 3000)
Connecting terminals		cage clamp terminal 0.08 – 2.5 mm²
Cable entry		2 x M20 sideways (1 x blanking plug, 1 x cable connection)
Weight		600 g

Dimensions





Ordering details

Article numbers		Quadro F12-3G/3D ATEX	
Lens colour	**Rated voltage**	230 V AC	24 V DC
clear		210 41 10 1 008	210 41 80 1 008
yellow		210 41 10 3 008	210 41 80 3 008
amber		210 41 10 4 008	210 41 80 4 008
red		210 41 10 5 008	210 41 80 5 008

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Manufacturer's declaration

We hereby declare that the explosion-protected means of alarm with the type designation **Quadro F12 3G/3D** has been developed and manufactured in accordance with the requirements as per EN 50014.

This declaration is based on compliance with the following regulations and standards:

DIN EN 60079-0	Electrical equipment for areas at risk of gas explosions – Part 0: General requirements
DIN EN 60079-15	Electrical equipment for areas at risk of explosions – Part 15: type of protection type 'n'
DIN EN 61241-0	Electrical equipment for use in areas with combustible dust – General requirements
DIN EN 61241-1	Electrical equipment for use in areas with combustible dust – protection by enclosure 'tD'
DIN EN 60598-1	Lights – Part 1: General requirements and tests
DIN EN 60947-1	Low-voltage switchgear – Part 1: General specifications
DIN EN 60529	Types of protection by enclosure (IP code)
DIN EN 50102	Types of protection by enclosure for electrical equipment against external mechanical stresses (IK code)
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards, noise immunity for industrial areas
DIN EN 61000-6-3	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards, interference emission for residential areas, business and commercial areas as well as small companies
DIN EN 981	Machine safety - System of acoustic and visual alarm signals and information signals
ISO 11429	System of acoustic and visual alarm signals and information signals
UVV-BGV A3(VBG4)	Electrical plants and equipment
GSGV	German Appliance Safety Act

The Quadro F12 3G/3D flashing lights are approved for use in potentially explosive areas in Zones 2 and 22 as per 94/9/EU.

LED MULTI-FUNCTION LIGHT
Quadro-LED Flex-3G/3D

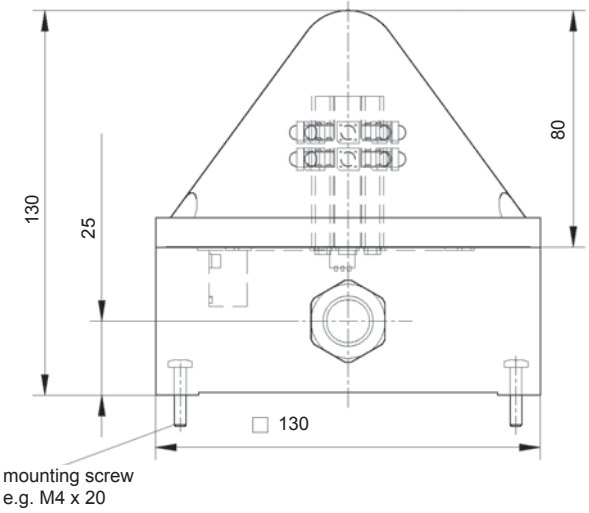
- designed for tough requirements under industrial conditions
- suitable for indoor and outdoor use
- suitable for use in potentially explosive areas in Zones 2 and 22
- extremely insensitive to shock and vibration
- maintenance-free service life exceeding 50,000 hrs
- internally and externally selectable operating mode as standard; one device for 4 different alarms:
  – continuous light
  – blinking light
  – flashing light
  – rotating light (non-wearing)
- 24 V AC/DC devices as standard with soft-start module
- can be operated directly via 24 V transistor PLC output, no additional relay control necessary
- inexpensive and flexible; wide range power supplies as standard

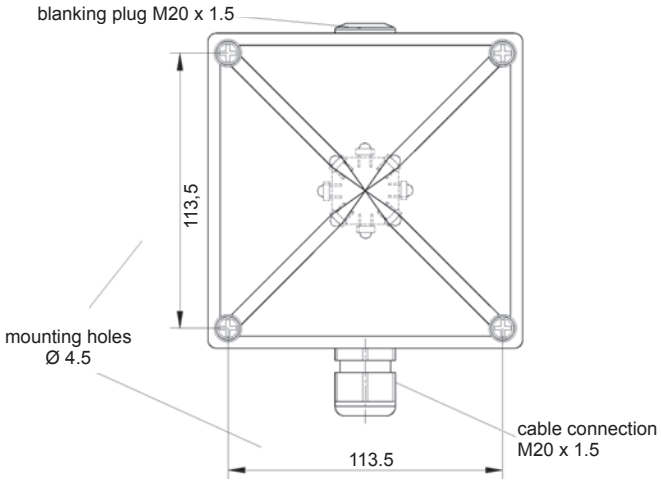
r = 5 m	IP 66	IK 08	+ 55 °C / - 20 °C	10 Years
Covering distance as per EN 54	Protection system	Impact-proof housing	Operating temperature	Warranty

Electrical data		Quadro-LED Flex 3G/3D ATEX	
Rated voltage		115 V / 230 V AC	24 V AC/DC
Rated frequency		50 / 60 Hz	50 / 60 Hz
Operating range	AC	95 – 253 V	15 – 40 V
	DC		10 – 60 V
Current consumption in continuous light mode		60 mA	250 mA

Mechanical data		Quadro-LED Flex 3G/3D ATEX			
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)			
Conformity to standards		Guideline 94/9/EG (ATEX 100a)			
Testing body		Pfannenberg			
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 (internally and externally selectable)		continuous light	blinking light	flashing light	rotating all-round light
Light alternation frequency			1.5 Hz	1 Hz	2.5 Hz
Light source		8 x 2 LEDs (3 chip version)			
Light intensity (DIN 5037)	clear lens	9 cd			
Lens colours		clear, white, yellow, amber, red, green, blue			
Operating temperature		- 20 °C ... + 50 °C (T6) / - 20 °C ... + 55 °C (T5)			
Storage temperature		- 40 °C ... + 70 °C			
Relative humidity		100%			
Protection system according to EN 60529		IP 66; mounting arbitrary			
Impact resistance as per EN 50102		IK 08			
Protection class		II			
Duty cycle		100%			
Service life of light source		> 50,000 hrs			
Material	lens	polycarbonate (PC)			
	housing	polycarbonate (PC), light grey RAL 7035			
Connecting terminals		cage clamp terminal 0.08 – 2.5 mm²			
Cable entry		2 x M20 x 1.5 (1 x blanking plug, 1 x cable connection)			
Weight		500 g			

Dimensions





Operating modes

S1			Selection via internal DIP switch	
1	2	3		
OFF	OFF	OFF	OFF	
OFF	OFF	ON	all-round light	2.5 Hz
OFF	ON	OFF	continuous light	
OFF	ON	ON	blinking light	1.5 Hz
ON	OFF	OFF	flashing light	1 Hz
ON	OFF	ON	all-round light	2.5 Hz
ON	ON	OFF	continuous light	
ON	ON	ON	blinking light	1.5 Hz

S1 -	X1 -				Selection via external control	
1	1	2	3	4		
(S1-2 = OFF, S1-3 = OFF)						
OFF	-/N	+/L			OFF (standby)	
OFF	-/N	+/L		+/L	all-round light	2.5 Hz
OFF	-/N	+/L	+/L		continuous light	
OFF	-/N	+/L	+/L	+/L	blinking light	1.5 Hz
ON	-/N	+/L			flashing light	1 Hz
ON	-/N	+/L		+/L	all-round light	2.5 Hz
ON	-/N	+/L	+/L		continuous light	
ON	-/N	+/L	+/L	+/L	blinking light	1.5 Hz

Ordering details

Article numbers		Quadro-LED Flex 3G/3D ATEX	
Lens colour	Rated voltage	115 V / 230 V AC	24 V AC/DC
yellow		211 04 64 3 009	211 04 63 3 009
amber		211 04 64 4 009	211 04 63 4 009
red		211 04 64 5 009	211 04 63 5 009

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Manufacturer's declaration

We hereby declare that the explosion-protected means of alarm with the type designation **Quadro-LED Flex 3G/3D** has been developed and manufactured in accordance with the requirements as per EN 60079.

This declaration is based on compliance with the following regulations and standards:

DIN EN 60079-0	Electrical equipment for areas at risk of gas explosions – Part 0: General requirements
DIN EN 60079-15	Electrical equipment for areas at risk of explosions – Part 15: type of protection type 'n'
DIN EN 61241-0	Electrical equipment for use in areas with combustible dust – General requirements
DIN EN 61241-1	Electrical equipment for use in areas with combustible dust – protection by enclosure 'tD'
DIN EN 60598-1	Lights – Part 1: General requirements and tests
DIN EN 60947-1	Low-voltage switchgear – Part 1: General specifications
DIN EN 60529	Types of protection by enclosure (IP code)
DIN EN 50102	Types of protection by enclosure for electrical equipment against external mechanical stresses (IK code)
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards, noise immunity for industrial areas
DIN EN 61000-6-3	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards, interference emission for residential areas, business and commercial areas as well as small companies
DIN EN 981	Machine safety - System of acoustic and visual alarm signals and information signals
ISO 11429	System of acoustic and visual alarm signals and information signals
UVV-BGV A3(VBG4)	Electrical plants and equipment
GSGV	German Appliance Safety Act

The Quadro-LED Flex 3G/3D multifunction lights are approved for use in potentially explosive areas in Zones 2 and 22 as per 94/9/EU.

SIGNAL TOWER
BR 50-LED 3G/3D

BR 50 for Ex applications in the categories 3G and 3D for zones 2 and 22.

- extremely long service life (> 50,000 hrs)
- the light is amplified by the internal prisms of the impact-proof, heat-resistant and dustproof polycarbonate lens and can be easily recognized from all sides
- the technically and economically optimum solution for every application

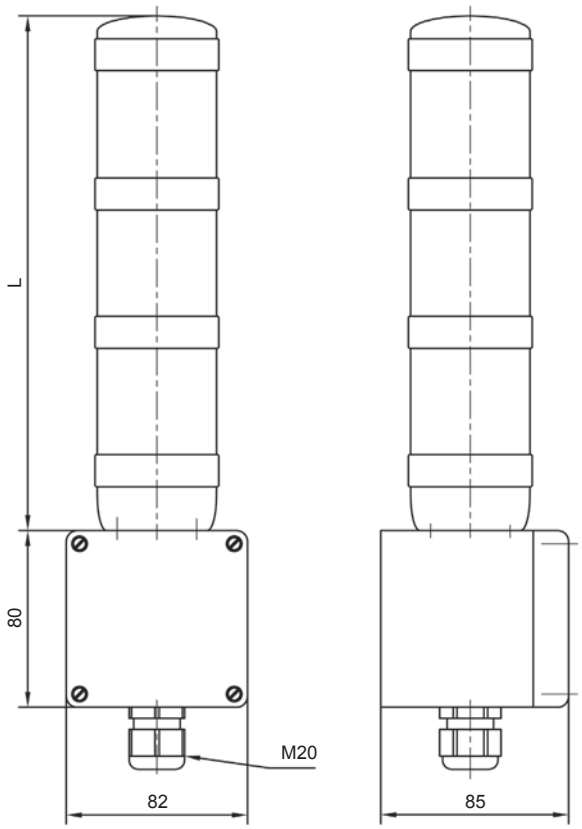
IP 65
Protection system

+ 50 °C
- 20 °C
Operating temperature

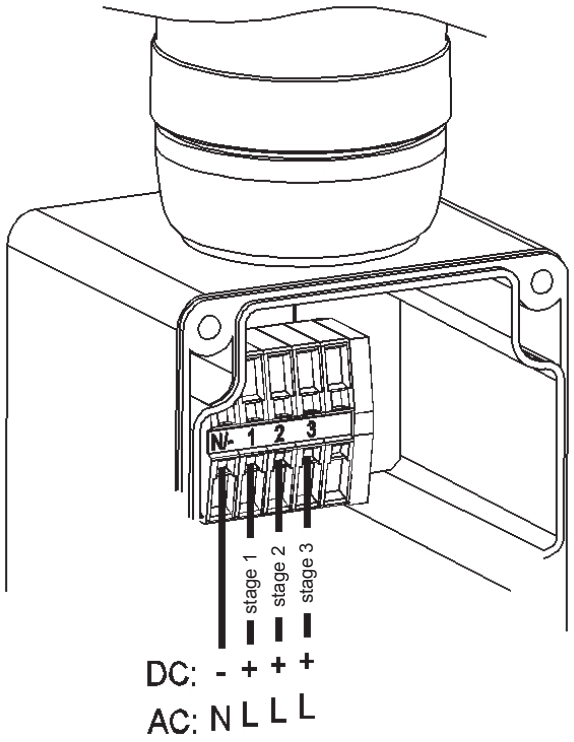
Electrical data		BR 50-LED 3G/3D			
Version		1-stage	2-stage		3-stage
Colour order		red	red / green	yellow / green	red / yellow / green
Nominal current consumption	230 V AC 50/60 Hz	9 mA	16 mA	16 mA	24 mA
	24 V AC 50/60 Hz	60 mA	90 mA	80 mA	130 mA
	24 V DC	50 mA	80 mA	70 mA	120 mA
Operating range	230 V AC 50/60 Hz	195 – 253 V			
	24 V AC 50/60 Hz	18 – 28 V			
	24 V DC	18 – 28 V			

Mechanical data		BR 50-LED 3G/3D
Explosion protection		II 3G Ex nA II T5 X - 20 °C ≤ Ta ≤ + 50 °C II 3D tDA22 IP65 T85°C X - 20 °C ≤ Ta ≤ + 50 °C
Category (area of use)		3G (Zone 2), 3D (Zone 22)
Testing body		Pfannenberg
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
Storage temperature		- 40 °C … + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 65
Duty cycle		100%
Service life of light source		> 50,000 hrs
Material	lens	polycarbonate (PC)
	housing	acrylonitrile butadiene styrene (ABS)
	connector housing	polycarbonate (PC), light grey RAL 7035
Mounting		arbitrary
Connecting terminals		cage clamp terminal 0.08 – 2.5 mm²
Cable entry		M20 bottom side

Dimensions



Connection diagram



	L
1-stage	107
2-stage	170
3-stage	233
Mounting holes H 50 mm x W 70 mm Ø 4.2	

Ordering details

Article numbers	BR 50-LED 3G/3D	
Version	230 V AC	24 V AC/DC
1-stage red	220 93 10 1 000	220 93 40 1 000
2-stage red/green	220 93 10 2 300	220 93 40 2 300
2-stage yellow/green	220 93 10 2 301	220 93 40 2 301
3-stage red/yellow/green	220 93 10 3 000	220 93 40 3 000

Options / Accessories

GOST

Manufacturer's declaration

We hereby declare that the explosion-protected means of alarm with the type designation **BR 50-LED 3G/3D** has been developed and manufactured in accordance with the requirements as per EN 60079-0.

This declaration is based on compliance with the following regulations and standards:
DIN EN 60079-15 Electrical equipment for areas at risk of explosions – type of protection type 'n'
DIN EN 50281-1-1 Electrical equipment for use in areas with combustible dust

The BR 50-LED 3G/3D signal towers are approved for use in potentially explosive areas in Zones 2 and 22 as per 94/9/EU.

FLASHING LIGHT 5 J
CWB-ATEX

The flashing lights from the CWB-ATEX series are explosion-protected equipment and serve as visual alarms in potentially explosive workplaces in Zones 1, 2, 21 and 22

- housing made of aluminium, therefore usable in all chemical and petrochemical plants as well as offshore plants
- high protection system and stable mechanical construction allow use under the toughest operating conditions
- various mounting brackets and a protective cage are available as accessories

r = 11 m
Covering distance as per EN 54

IP 66
Protection system

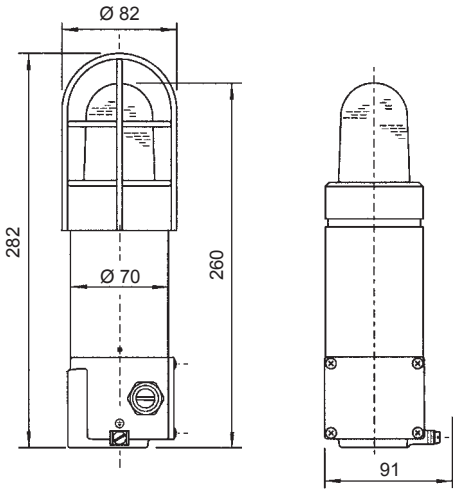
+ 50 °C
- 40 °C
Operating temperature

GL approval

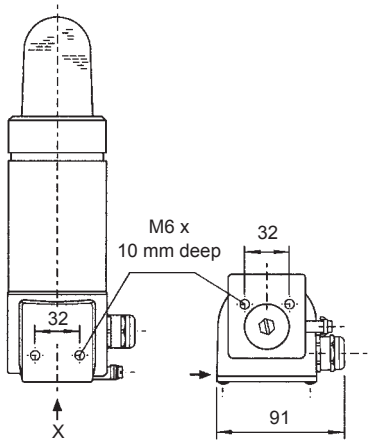
Electrical data	CWB-ATEX					
Rated voltage	230 V AC	110–127 V AC	24–42 V AC	60–80 V DC	12–48 V DC	24 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz			
Operating range	± 10%	± 10%	± 10%	± 10%	± 10%	± 10%
Nominal current consumption	0.08 A	0.11 A	0.5 – 0.3 A	0.11 – 0.13 A	0.5 – 0.3 A	0.4 A

Mechanical data		CWB-ATEX
Type of protection		'd' flame proof enclosure for light housing 'e' enhanced safety for terminal box
Explosion protection		II 2 G Ex d e IIC T6 Gb II 2 G Ex d e IIC T5 Gb II 2 D Ex tb IIIC T85°C Db IP66 (T6) II 2 D Ex tb IIIC T100°C Db IP66 (T5)
Category (area of use)		2G (Zone 1) / 3G (Zone 2) 2D (Zone 21) / 3D (Zone 22)
Certificate of conformity		LCIE 02 ATEX 6113
Testing body		LCIE
Flash energy		5 J
Flash rate		approx. 1 Hz
Lens colours		clear, yellow, amber, red, green, blue
Temperature class	T6	T_{amb}: - 40 °C ... + 40 °C
	T5	T_{amb}: - 40 °C ... + 50 °C
Storage temperature		- 20 °C ... + 80 °C
Relative humidity		90%
Protection system according to EN 60529		IP 66 (when used for design purpose)
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	polycarbonate (PC)
	protective cage	stainless steel
	housing	aluminium alloy yellow; plinth black
Type of connection		screw terminals
	terminal area	(max.) 2 x 4 mm² (single wire); 2 x 2.5 mm² (fine wire)
Cable entry		1 x cable gland M20 x 1.5, chrome-plated, clamping range 6 –13 mm 1 x blanking plug, M20 x 1.5
Weight		approx. 1.24 kg

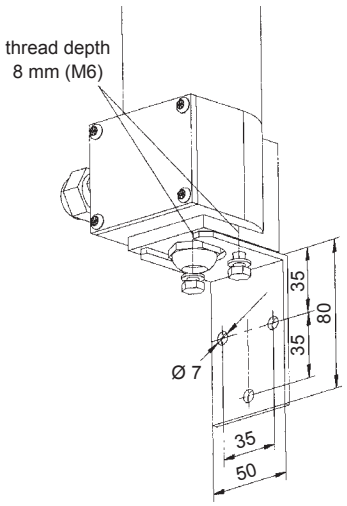
Dimensions



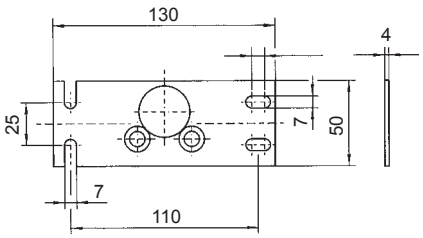
Direct mounting to wall/floor



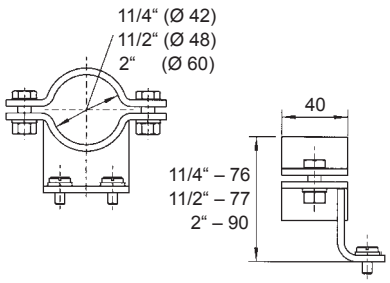
Standard bracket



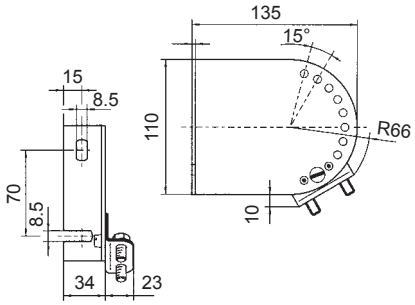
Mounting plate



Pipe clamp



Mounting bracket



Ordering details

Article numbers		CWB-ATEX			
Lens colour	**Rated voltage**	230 V AC	110–127 V AC	60–80 V DC	24–42 V AC / 12–48 V DC
yellow		310 06 10 3 000	310 06 13 3 000	310 06 58 3 000	310 06 90 3 000
amber		310 06 10 4 000	310 06 13 4 000	310 06 58 4 000	310 06 90 4 000
red		310 06 10 5 000	310 06 13 5 000	310 06 58 5 000	310 06 90 5 000

Article numbers for other colours on request

Options / Accessories

Pipe clamps
Stainless steel
Article number:
R1 1/4“: 38108101000
R1 1/2“: 38108101200
R2“: 38108102000

Mounting bracket
Stainless steel
Article number:
38108100100

Mounting plate
Stainless steel
Article number:
38108100000

Standard bracket set
Stainless steel
Article number:
38108100150

Stainless steel
Article number:
38108100200

GOST

Manufacturer’s declaration

We hereby declare that the explosion-protected flashing light with the type designation **Ex-CWB-ATEX** has been developed and manufactured in accordance with EN 60079-0.

This declaration is based on compliance with the following regulations and standards:

EN 60079-0	Electrical equipment for areas at risk of explosions – General requirements	94/9/EG	CE conformity
EN 61241-0	Electrical equipment for use in areas with combustible dust	EN 60079-1	Pressure-resistant encapsulation ”d“
EN 60529	Types of protection by enclosure (IP code)	EN 60079-7	Enhanced safety ”e“
EN 60400 / IEC 61	Lamp sockets for tube-shaped fluorescent lamps and starter sockets	EN 60598	Lights
2004/108/EG	‘Electromagnetic compatibility’		

The flashing light is approved for use in potentially explosive areas in Zones 1, 2, 21 and 22 as per 94/9/EU.

FLASHING LIGHTS 5/10/15 J
BExBG05 / BExBG10 / BExBG15 ATEX

The flashing light is ideal for almost all mounting requirements: side, ceiling and floor mounting

- categories 2G (Zones 1 and 2), 2D (Zones 21 and 22)
- extremely bright at up to 15 joules flash energy
- large connection box for simple mounting
- also available with connection box in increased safety version
- very sturdy, manufactured from seawater-resistant aluminium and stainless steel protection cage
- BExBG05 can be mounted in all operating positions

5 Joules	10 Joules	15 Joules		
r = 11 m	r = 17 m	r = 23 m	IP 67	+70 °C / - 50 °C
Covering distance as per EN 54	Covering distance as per EN 54	Covering distance as per EN 54	Protection system	Operating temperature

Electrical data AC	BExBG05		BExBG10		BExBG15	
Rated voltage	230 V AC	115 V AC	230 V AC	115 V AC	230 V AC	115 V AC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Operating range	± 10%	± 10%	± 10%	± 10%	± 10%	± 10%
Nominal current consumption	55 mA	140 mA	110 mA	250 mA	170 mA	360 mA

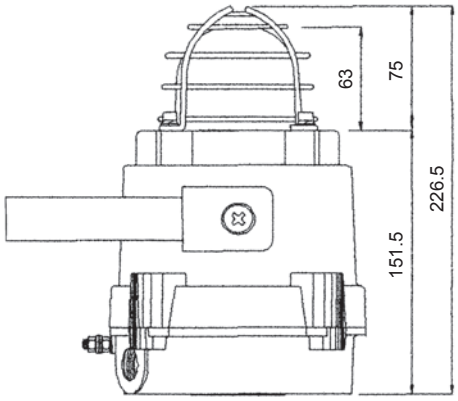
Electrical data DC	BExBG05			BExBG10			BExBG15	
Rated voltage	48 V DC	24 V DC	12 V DC	48 V DC	24 V DC	12 V DC	48 V DC	24 V DC
Operating range	± 25%	± 25%	± 25%	± 25%	± 25%	± 25%	± 25%	± 25%
Nominal current consumption	180 mA	300 mA	750 mA	340 mA	660 mA	1450 mA	480 mA	860 mA

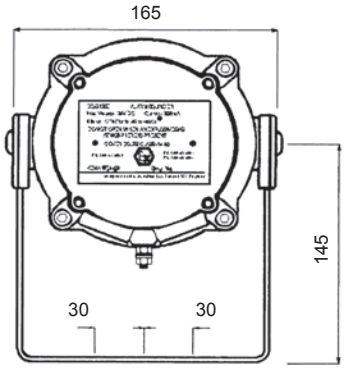
Mechanical data		BExBG05D/BExBG05E	BExBG10D/BExBG10E	BExBG15D/BExBG15E
Type of protection		Ex d IP 67 / Ex de IP 66		
Explosion protection [1]		II2G Ex d IIC T4, T5 or T6 II2G Ex de IIC T4, T5 or T6 II2D Ex tD A21 IP67 T85, T100 or T115	II2G Ex d IIC T4 or T5 II2G Ex de IIC T4 or T5 II2D Ex tD A21 IP67 T95, T110 or T125	
Category (area of use)		2G (Zone 1, 2) 2D (Zone 21, 22)		
Certificate of conformity		KEMA 01 ATEX 2030		
Testing body		KEMA		
Flash energy		5 J	10 J	15 J
Flash rate		60 flashes/min., stabilised		
Lens colours		clear, yellow, amber, red, green, blue		
Temperature class T		T4 / T115°C @ Ta - 50 °C ... + 70 °C T5 / T100°C @ Ta - 50 °C ... + 55 °C T6 / T85°C @ Ta - 50 °C ... + 40 °C	T4 / T125°C @ Ta - 50 °C ... + 70 °C T110°C @ Ta - 50 °C ... + 55 °C T5 / T85°C @ Ta - 50 °C ... + 40 °C	
Storage temperature		- 50 °C … + 70 °C		
Relative humidity		90%		
Duty cycle		100%		
Service life of the flash tube		light emission still 70% after 8,000,000 flashes		
Material	lens	glass		
	housing	die-cast aluminium, resistant to salt water, marine grade LM6, red (RAL 3000)		
	protective cage and bracket	stainless steel		
Type of connection		1 x 4 mm² or 2 x 2.5 mm²		
Cable entry [1]		2 x M20, of which one open, optionally PG13.5 or 1/2" NPT		
Weight	Exd	2.45 kg		
	Exde	2.75 kg		

[1] Ex cable gland not included

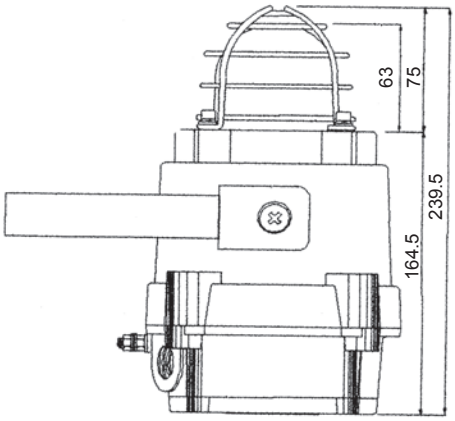
Dimensions

Ex d | **Ex de**





mounting holes 3 x 7 mm Ø



Ordering details

Article numbers		BExBG05-E		BExBG05-D	
Lens colour	**Rated voltage**	230 V AC	24 V DC	230 V AC	24 V DC
yellow		311 30 10 3 000	311 30 80 3 000	311 31 10 3 000	311 31 80 3 000
amber		311 30 10 4 000	311 30 80 4 000	311 31 10 4 000	311 31 80 4 000
red		311 30 10 5 000	311 30 80 5 000	311 31 10 5 000	311 31 80 5 000
Article numbers		**BExBG10-E**		**BExBG10-D**	
Lens colour	**Rated voltage**	230 V AC	24 V DC	230 V AC	24 V DC
yellow		311 20 10 3 000	311 20 80 3 000	311 21 10 3 000	311 21 80 3 000
amber		311 20 10 4 000	311 20 80 4 000	311 21 10 4 000	311 21 80 4 000
red		311 20 10 5 000	311 20 80 5 000	311 21 10 5 000	311 21 80 5 000
Article numbers		**BExBG15-E**		**BExBG15-D**	
Lens colour	**Rated voltage**	230 V AC	24 V DC	230 V AC	24 V DC
yellow		311 10 10 3 000	311 10 80 3 000	311 11 10 3 000	311 11 80 3 000
amber		311 10 10 4 000	311 10 80 4 000	311 11 10 4 000	311 11 80 4 000
red		311 10 10 5 000	311 10 80 5 000	311 11 10 5 000	311 11 80 5 000

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Manufacturer's declaration

We hereby declare that the explosion-protected flashing light with the type designation **BExBG05 … 15 d or e ATEX** has been developed and manufactured in accordance with section 5.1.2 of EN 50014.

This declaration is based on compliance with the following regulations and standards:

94/9/EG	CE conformity
EN 50014	Electrical equipment for areas at risk of explosions – General requirements
EN 50018	Pressure-resistant encapsulation 'd'
EN 50019	Enhanced safety 'e'
EN 50281-1-1	Electrical equipment for use in areas with combustible dust
EN 60529	Types of protection by enclosure (IP code)
89/336/EWG	'Electromagnetic compatibility'

The Ex-BExBG05 - 15 d or e flashing lights are approved for use in potentially explosive areas in Zones 1, 2, 21 and 22 as per 94/9/EU.

LED LIGHT
BExBG L1D ATEX

The LED light is ideal for almost all mounting requirements: side, ceiling and floor mounting

- categories 2G (Zones 1 and 2), 2D (Zones 21 and 22)
- large connection box for simple mounting
- also available with connection box in increased safety version
- very sturdy, manufactured from seawater-resistant aluminium and stainless steel protection cage
- can be mounted in all operating positions
- a total of 9 different operating modes can be set
- 2 additional operating modes can be controlled externally

Covering distance as per EN 54

Protection system

Operating temperature

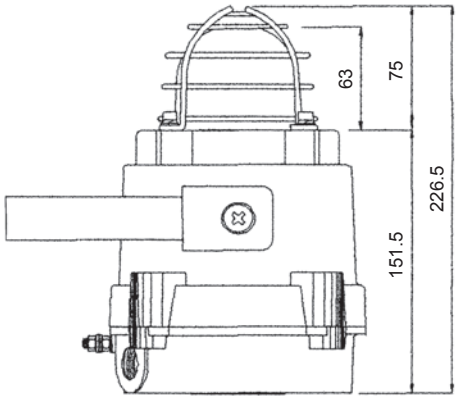
Electrical data	BExBG L1D
Rated voltage	230 V AC
Rated frequency	50 / 60 Hz
Operating range	± 10%
Nominal current consumption	70 mA

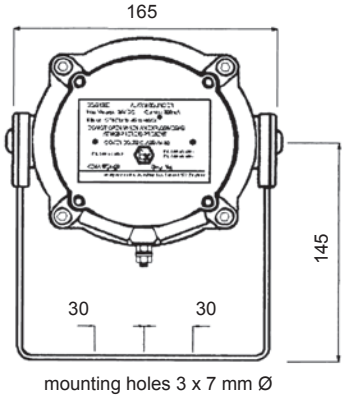
Mechanical data		BExBG L1D
Type of protection		Ex d IP 67
Explosion protection [1]		II 2G EEx d IIC T4 or T5 II 2G EEx de IIC T4 or T5 II 2D T135°C or T100°C
Category (area of use)		2G (Zone 1, 2) 2D (Zone 21, 22)
Certificate of conformity		KEMA 01 ATEX 2006 X
Testing body		KEMA
Light source		32 LEDs
Lens colours		yellow, amber, red, green, blue
Temperature class T		T4 / T135°C @ Ta - 50 °C ... + 55 °C T5 / T100°C @ Ta - 50 °C ... + 40 °C
Storage temperature		- 50 °C … + 70 °C
Relative humidity		90%
Duty cycle		100%
Service life of the flash tube		> 50,000 hrs
Material	lens	glass
	housing	die-cast aluminium, resistant to salt water, marine grade LM6, red (RAL 3000)
	protective cage and bracket	stainless steel
Type of connection		1 x 4 mm² or 2 x 2.5 mm²
Cable entry [1]		2 x M20, of which one open, optionally PG13.5 or 1/2“ NPT
Weight		2.75 kg

[1] Ex cable gland not included

Dimensions

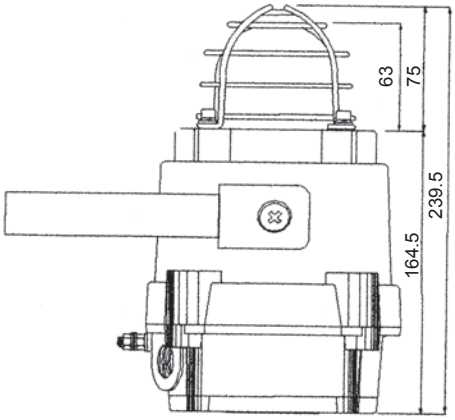
EEx d





mounting holes 3 x 7 mm Ø

EEx de



Operating modes

Mode	internal	external	
	stage 1	stage 2	stage 3
1	all on	9	8
2	rotation 3 LED fast “ON“	7	1
3	rotation 6 LED fast “ON“	8	1
4	rotation 3 LED slow “ON“	9	1
5	rotation 6 LED slow “ON“	6	1

Mode	internal	external	
	stage 1	stage 2	stage 3
6	double flash 1 Hz	9	1
7	single flash 2 Hz	3	1
8	double flash 2 Hz	3	1
9	alternating flash 1:1 2 Hz	3	1

Ordering details

Article numbers		BExBG L1D
Lens colour	Rated voltage	230 V AC
amber		311 51 10 4 000

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Manufacturer’s declaration

We hereby declare that the explosion-protected LED light with the type designation **BExBG L1D ATEX** has been developed and manufactured in accordance with section 5.1.2 of EN 50014.

This declaration is based on compliance with the following regulations and standards:

94/9/EG	CE conformity
EN 50014	Electrical equipment for areas at risk of explosions – General requirements
EN 50018	Pressure-resistant encapsulation ‘d’
EN 50019	Enhanced safety ‘e’
EN 50281-1-1	Electrical equipment for use in areas with combustible dust
EN 60529	Types of protection by enclosure (IP code)
89/336/EWG	‘Electromagnetic compatibility’

The BExBG L1D ATEX LED light is approved for use in potentially explosive areas in Zones 1, 2, 21 and 22 as per 94/9/EU.

IS-MINI LED BLINKING LIGHT
IS-mB1

Very economical visual alarm

- certified for use in Ex-Zones 0, 1 and 2!
- compact design with a diameter of just 88 mm
- blinking light operated via certified zener barriers or galvanic isolators
- super-bright LEDs in red, green, blue and yellow/amber
- very well suited for fire alarm systems and direct control due to low power consumption

See pages 212 and 213 for suitable zener barriers

Covering distance as per EN 54

Protection system

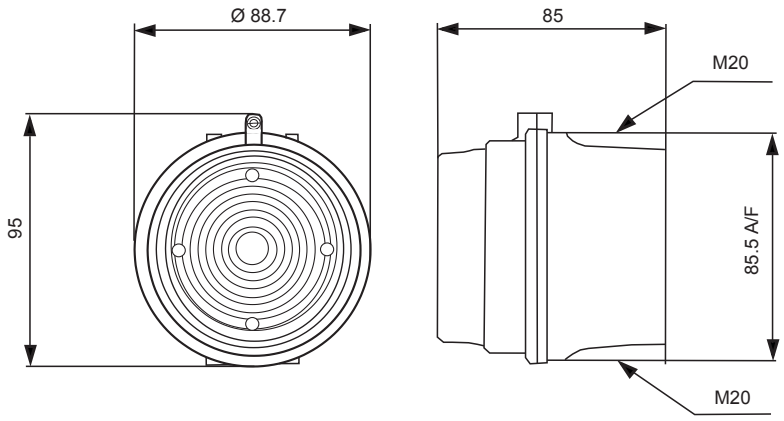
Operating temperature

Electrical data	IS-mB1
Rated voltage	24 V DC
Operating range	16 – 28 V
Nominal current consumption	25 mA [1]

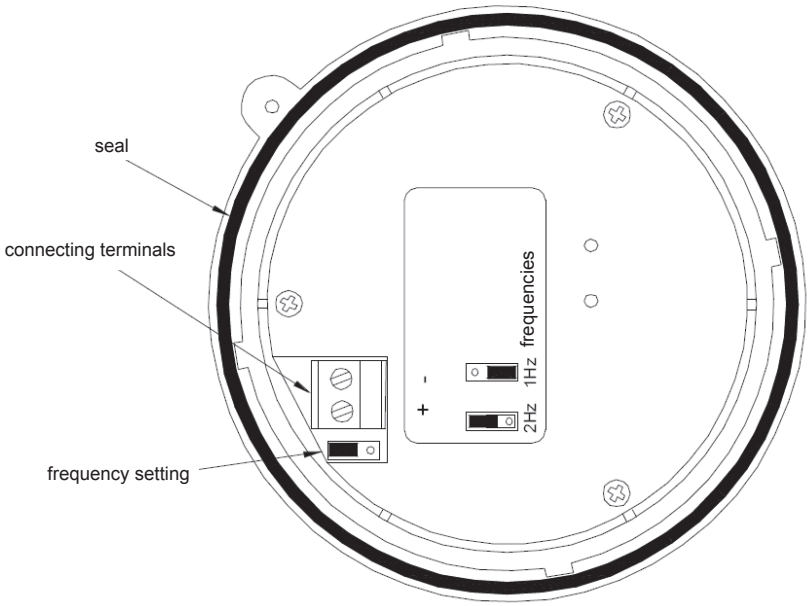
[1] typical for connection to 24 V DC via 28 V / 300 Ω zener barrier.
Power must be connected via a zener barrier (max. 28 V DC, 93 mA DC, 0.66 W) or a galvanic isolator, specified by the system certificate (see page 213)

Mechanical data		IS-mB1
Type of protection		"ia" inherently safe
Explosion protection		II 1G EEx ia IIC T4
Category (area of use)		1G (Zone 0) 2G (Zone 1) 3G (Zone 2)
Certificate		SIRA 05 ATEX2084 X
Testing body		SIRA
Flash rate		can be set to 2 Hz or 1 Hz
Lens colour		clear, with red, yellow/amber, blue or green LEDs
Temperature class T		T4 @ Ta - 40 °C ... + 60 °C
Storage temperature		- 40 °C … + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 65
Duty cycle		100%
Material	lens	polycarbonate (PC)
	housing	ABS, self-extinguishing UL94V0 & 5VA, similar to RAL 3000 (flame red)
Connecting terminals		0.5 – 2.5 mm²
Cable entry		2 x M20 (knock-outs prepared)
Weight		210 g

Dimensions



Connection diagram



Ordering details

Article numbers		IS-mB1
Colour	Rated voltage	24 V DC
yellow/amber		310 08 80 4 000
red		310 08 80 5 000
green		310 08 80 6 000
blue		310 08 80 7 000

Options / Accessories

GOST

Zener barrier

See pages 212/213 for further information

Manufacturer's declaration

Developed and manufactured in accordance with the following regulations and standards:

EN 50014 Electrical equipment for areas at risk of explosions – General requirements
EN 50020 Electrical equipment for areas at risk of explosions – intrinsically safety 'i'
EN 50284 Special requirements for the design, testing and marking of electrical equipment in appliance group II, category 1G

SOUNDERS 105/110 dB(A)
DS 5 / DS 10 3G/3D ATEX

Gas and dust protection

- the industrial sounder for tough applications. Proven 100,000 times over in shipping. ‘When nothing else works, this still does!‘ ‘Heavy duty’ but still light!
- for use as an acoustic alarm in potentially explosive workplaces of category 3G (Zone 2) and 3D (Zone 22)
- category for gas and dust protection
- IP 67 for safe operation under extreme environmental conditions
- individual selection of 32 different tones

optionally:

- 4-stage external tone selection (options: TAS, TAV)
- all tones can be individually combined with one another when externally controlled (programming function, tone 32)

DS 5 3G/3D	DS 10 3G/3D					
r = 32 m	r = 56 m	IP 66 IP 67	+ 55 °C / - 25 °C	VdS G28609	EN 54-3	10 Years
max. covering distance	max. covering distance	Protection system	Operating temperature			Warranty

Electrical data	DS 5 3G/3D				
Rated voltage	230 V AC	115 V AC	24 V AC[1]	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz		
Operating range	195 – 253 V	95 – 127 V	19 – 29 V	19 – 29 V	10 – 15 V
Nominal current consumption	0.03 A	0.06 A	0.28 A	0.28 A	0.28 A
Electrical data	**DS 10 3G/3D**				
Rated voltage	230 V AC	115 V AC	24 V AC[1]	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz		
Operating range	195 – 253 V	95 – 127 V	19 – 29 V	19 – 29 V	10 – 15 V
Nominal current consumption	0.06 A	0.12 A	0.42 A	0.42 A	0.3 A

[1] Temperature class T3

Mechanical data	DS 5 3G/3D	DS 10 3G/3D
Explosion protection	II 3G Ex nA II T4 (all voltages except 24 V AC) II 3G Ex nA II T3 (only 24 V AC) II 3D Ex tD A22 IP 67 T135°C	
Category (area of use)	3G (Zone 2), 3D (Zone 22)	
Testing body	Pfannenberg	
Sound pressure level	105 dB (A) ± 3 dB (A)	110 dB (A) ± 3 dB (A)
Alarm tones	32 / 2-stage alarm	
Temperature class	T4 / T3 @ - 25 °C ... + 55 °C	
Storage temperature	- 40 °C ... + 70 °C	
Protection system according to EN 60529	IP 66, IP 67	
Duty cycle	100%	
Material	die-cast aluminium GD-Al Si12 Cu	
Surface coating	epoxy resin paint RAL 3000, flame red	
Cable bushing	2 x M20 x 1.5 (1 x plastic cable gland, 1 x plug)	
Clamping range of the cable fitting	6 – 13 mm	
Connecting terminal cross-section	min. 0.08 mm² ... max. 2.5 mm² AWG 28 - 12 (AWG12 THHN, THWN)	
Weight	AC: 2.15 kg / DC: 1.95 kg	

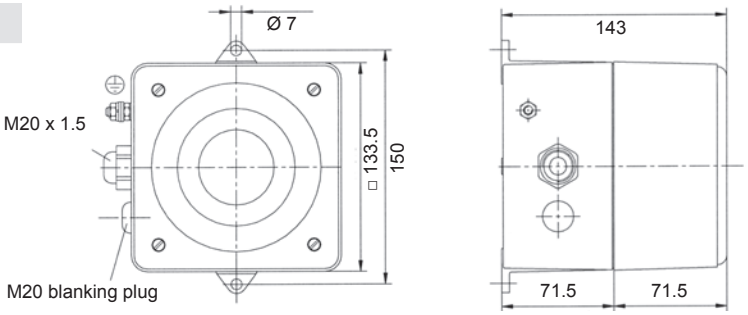
Options / Accessories

External tone selection control /
4-stage external tone selection
TAV: control by means of external voltage input (12 V and 24 V DC only)
TAS: control by means of control voltage

GOST

GL
30457-83-HH

Dimensions



Tone table

Tone	Description - Basic tone (preset: tone no. 1)		Stage 2	3	4	Tone	Description - Basic tone (preset: tone no. 1)		Stage 2	3	4
0	no tone		1	5	4	18	Interrupted tone	800 Hz, 0.25 s, 1 s	19	7	4
1 [1]	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	1200 Hz, 500 Hz, 1 s, EN54-3	3	2	4	19	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	1000 Hz, 800 Hz, 0.25 s, 0.25 s, EN54-3	27	13	23
2	Interrupted tone, ISO 8201 (emergency evacuation signal)	950 Hz, 0.5 s, 0.5 s, 1.5 s	1	4	3	20	Interrupted tone, IMO SOLAS III/50 + SOLAS III/6.4 (general alarm)	825 Hz, 2.5 s, 2.5 s, 7 s	9	21	26
3	Alternating tone	1025 Hz, 825 Hz, 0.25 s, 0.25 s	1	2	4	21	Interrupted tone, IMO (leave ship)	950 Hz, 1 s, 1 s, 3 s, 1 s	20	9	26
4	Continuous tone, UK BS5839-1	950 Hz	1	3	5	22	Slow whoop, evacuation alarm Netherlands NEN 2575	1200 Hz, 500 Hz, 3.5 s, 0.5 s, EN54-3	19	14	2
5	Interrupted tone	950 Hz, 1 s, 1 s	1	4	3	23	Siren	2400 Hz, 500 Hz, 3 s, const.	27	12	2
6	Sweeping	1200 Hz, 500 Hz, 3 s, 3 s	1	4	9	24	Alternating tone	1075 Hz, 825 Hz, 0.5 s, 0.5 s	1	16	12
7	Alternating tone, France NFS 32-001 (fire alarm)	554 Hz, 440 Hz, 0.1 s, 0.4 s, EN54-3	3	10	4	25	Alternating tone	900 Hz, 500 Hz, 0.25 s, 0.25 s	1	14	5
8	Interrupted tone, Sweden SS031711 (emergency signal)	700 Hz, 0.125 s, 0.125 s	2	3	4	26	Alternating tone	1400 Hz, 1200 Hz, 20 ms, 20 ms	4	9	27
9	Interrupted tone (fast), horn	800 Hz, 4 ms, 4 ms	1	3	4	27	Siren	1200 Hz, 300 Hz, 3 s, const.	13	23	19
10	Continuous tone	500 Hz	27	9	26	28	Sweeping	1500 Hz, 700 Hz, 1.5 s, 1.5 s	7	10	4
11	Continuous tone	725 Hz	1	17	9	29	Pulsating tone, industrial alarm Germany	1000 Hz, 150 Hz, 10 s, 40 s, 10 s	1	30	9
12	Continuous tone	825 Hz, EN54-3	27	9	26	30	Interrupted tone, industrial alarm (Germany)	680 Hz, 0.875 s, 0.875 s	1	4	26
13	Continuous tone	1200 Hz	1	5	3	31	Sweeping, France NFC48-265	1600 Hz, 1400 Hz, 1 s, 0.5 s	3	14	4
14	Continuous tone	1500 Hz	1	4	10	32	selection of available tone combinations in stages 2, 3 and 4				
15	Interrupted tone	500 Hz, 0.5 s, 0.5 s	1	24	12						
16	Interrupted tone	825 Hz, 0.5 s, 0.5 s	1	24	15						
17	Interrupted tone	725 Hz, 0.7 s, 0.3 s	1	11	9						

[1] factory setting

Ordering details

Article numbers		DS 10 3G/3D			DS 5 3G/3D		
Version	**Rated voltage**	230 V AC	115 V AC	24 V DC	230 V AC	115 V AC	24 V DC
Standard		231 11 10 0 007	231 11 15 0 007	231 11 80 0 007	231 06 10 0 007	231 06 15 0 007	231 06 80 0 007
TAS		231 11 10 0 155	231 11 15 0 155	231 11 80 0 155	231 06 10 0 155	231 06 15 0 155	231 06 80 0 155

Article numbers for other voltages and versions on request

Manufacturer's declaration

We hereby declare that the explosion-protected means of alarm with the type designation **DS 10 3G/3D, DS 5 3G/3D**
fullfils the requirements of the EN 60079-0, EN 60079-15, EN 61241-0 and EN 61241-1 standards in their latest editions.
This declaration is based on compliance with the following regulations and standards:

DIN EN 60079-0	Electrical equipment for areas at risk of gas explosions - General requirements
DIN EN 60079-15	Electrical equipment for areas at risk of gas explosions - Type of protection "n"
DIN EN 61241-0	Electrical equipment for use in areas with combustible dust - General requirements
DIN EN 61241-1	Electrical equipment for use in areas with combustible dust - part 1: protection by enclosure 'tD'
DIN EN 61000-6-2	Generic standard, interference immunity for industrial areas
DIN EN 61000-6-3	Generic standard, interference emission for residential areas
DIN EN 50130-4	Electromagnetic compatibility; product family standard: requirements for the interference immunity of system components for fire and burglar alarms and well as social alarm systems
DIN EN ISO7731	Ergonomic – alarms for public areas and workplaces – acoustic alarms
UVV-BGV A3 (VBG4)	Electrical plants and equipment
DIN EN 54-3	Fire alarm systems – Part 3: fire alarm devices; Acoustic alarms
DIN EN 981	Machine safety - System of acoustic and visual alarm signals and information signals
DIN EN 50262	Metric cable glands for electrical installations
DIN IEC 60038	IEC standard voltages
DIN 33404/3	Alarm signals for workplaces; acoustic alarm signals; uniform emergency signal; technical safety requirements, tests
DIN EN 60947-1	Low-voltage switchgear – Part 1: General specifications
DIN EN 60950-1	Safety of information technology equipment
DIN EN 60529	Types of protection by enclosure (IP code)
9. GPSG	Appliance and product safety act

Guideline 94/9/EG (ATEX 100a)
DIN EN 60079-0 / DIN EN 60079-15 / DIN EN 61241-0 / DIN EN 61241-1

The DS 10 3G/3D, DS 5 3G/3D sounders are approved for use in potentially explosive areas in Zones 2 and 22 as per 94/9/EU.

SOUNDERS 117 dB(A)
BExS 120 d/e / BExDS 120 d/e

- 32 different tones can be set; UKOOA/PFEER conform
- 117 dB (A) ± 3 dB (A) sound pressure
- 3 externally selectable tones – positive and negative control possible in the case of DC devices
- quartz-stabilised tone synchronisation
- adjustable volume (except 12 V DC)
- ATEX and optionally IECEx approval
- housing made of die-cast aluminium LM6, horn made of ABS
- stainless steel mounting bracket for 360° positioning
- categories 2G and 3G (Zones 1 and 2)
- also available as categories 2D & 3D (Zones 21 & 22) for dust zones
- amendment 2; extended approval/temperature range + 70 °C

r = 126m	IP 66 IP 67	+ 70 °C / - 50 °C	EN 54-3	VdS G209081
max. covering distance	Protection system	Operating temperature	Exd 24 V DC	Exd 24 V DC

Electrical data	BExS 120 d/e / BExDS 120 d/e				
Rated voltage	230 V AC	115 V AC	48 V DC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz			
Operating range	± 10%	± 10%	± 25%	± 25%	± 25%
Nominal current consumption	90 mA	180 mA	420 mA	800 mA	850 mA

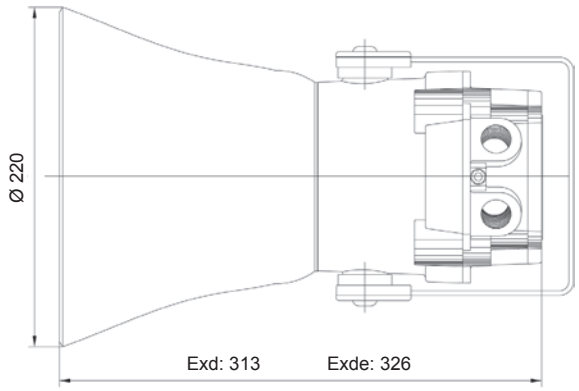
Mechanical data		BExS 120 d/e	BExDS 120 d/e
Protection system		“d” = IP 67; or “e” = IP 66	
Explosion protection		II 2G Ex d IIC T4 / II 2G Ex de IIC T4 II 2G Ex d IIB T4 / II 2G Ex de IIB T4	II 2G/D Ex d IIC T4 100°C / II 2G/D Ex de IIC T4 100°C II 2G/D Ex d IIB T4 115°C / II 2G/D Ex de IIB T4 115°C
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
Testing body		KEMA	KEMA
Sound pressure level		117 dB (A) ± 3 dB (A)	117 dB (A) ± 3 dB (A)
Temperature class T		IIC: T4 @ - 50 °C ... + 55 °C Ta IIB: T4 @ - 50 °C ... + 70 °C Ta	T4 @ - 50 °C ... + 55 °C Ta
Sound level reduction		by - 9 dB	
Storage temperature		- 50 °C … + 70 °C	
Relative humidity		90%	
Duty cycle		100%	
Material	housing	die-cast aluminium LM6, similar to RAL 3000 (flame red)	
	horn	ABS self-extinguishing, similar UL 94 VO & 5VA FR ABS, Ex II 2D anti-static ABS, black	
Connecting terminals	Exd	1 x 4 mm² or 2 x 2.5 mm²	
	Exde	2 x 2.5 mm²	
Cable entry		2 / 1 x closed, 1 x open (M20), optionally PG13.5 or 1/2“ NPT	
Weight	Exd	AC: 3.88 kg / DC: 3.42 kg	
	Exde	AC: 4.14 kg / DC: 3.38 kg	

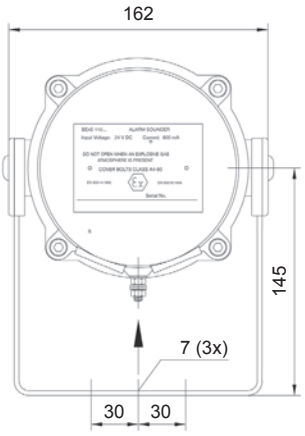
Options / Accessories

GOST

IECEx No SIM 04.0001 — Exd BExDS

Dimensions





Tone table

Tone	Description - Basic tone	Stage 2	Stage 3
1	Continuous tone	31	11
2	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
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	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	Simulated 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	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm	11	1
32	Slow whoop, Australian evacuation alarm AS2220	26	1

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

Ordering details

Article numbers	BExS 120D		BExS 120E		BExDS 120D	BExDS 120E
Rated voltage	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	230 V AC
	320 76 10 0 000	320 76 80 0 000	320 78 10 0 000	320 78 80 0 000	320 89 10 0 000	320 81 10 0 000

Article numbers for other voltages on request

SOUNDERS 110 dB(A)
BExS 110 d/e / BExDS 110 d/e

- 32 different tones can be set; UKOOA/PFEER conform
- 110/117 dB (A) ± 3 dB (A) sound pressure
- 3 externally selectable tones – positive and negative control possible in the case of DC devices
- quartz-stabilised tone synchronisation
- adjustable volume (except 12 V DC)
- ATEX and optionally IECEx approval
- housing made of die-cast aluminium LM6, horn made of ABS
- stainless steel mounting bracket for 360° positioning
- categories 2G and 3G (Zones 1 and 2)
- also available as categories 2D & 3D (Zones 21 & 22) for dust zones
- amendment 2; extended approval/temperature range + 70 °C

r = 56m	IP 66 IP 67	+ 70 °C / - 50 °C	EN 54-3	VdS G209081
max. covering distance	Protection system	Operating temperature	Exd 24 V DC	Exd 24 V DC

Electrical data	BExS 110 d/e / BExDS 110 d/e				
Rated voltage	230 V AC	115 V AC	48 V DC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz			
Operating range	± 10%	± 10%	± 25%	± 25%	± 25%
Nominal current consumption	56 mA	110 mA	130 mA	250 mA	195 mA

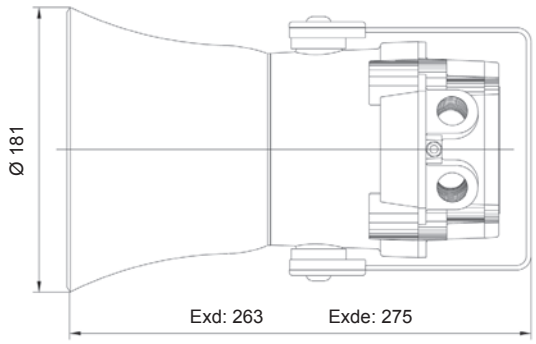
Mechanical data		BExS 110 d/e	BExDS 110 d/e
Protection system		“d” = IP 67; or “e” = IP 66	
Explosion protection		II 2G Ex d IIC T4 / II 2G Ex de IIC T4 II 2G Ex d IIB T4 / II 2G Ex de IIB T4	II 2G/D Ex d IIC T4 100°C / II 2G/D Ex de IIC T4 100°C II 2G/D Ex d IIB T4 115°C / II 2G/D Ex de IIB T4 115°C
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
Testing body		KEMA	KEMA
Sound pressure level		110 dB (A) ± 3 dB (A)	110 dB (A) ± 3 dB (A)
Temperature class T		IIC: T4 @ - 50 °C ... + 55 °C Ta IIB: T4 @ - 50 °C ... + 70 °C Ta	T4 @ - 50 °C ... + 55 °C Ta
Storage temperature		- 50 °C … + 70 °C	
Relative humidity		90%	
Duty cycle		100%	
Material	housing	die-cast aluminium LM6, similar to RAL 3000 (flame red)	
	horn	ABS self-extinguishing, similar UL 94 VO & 5VA FR ABS, Ex II 2D anti-static ABS, black	
Connecting terminals	Exd	1 x 4 mm² or 2 x 2.5 mm²	
	Exde	2 x 2.5 mm²	
Cable entry		2 / 1 x closed, 1 x open (M20), optionally PG13.5 or 1/2“ NPT	
Weight	Exd	AC: 3.42 kg / DC: 3.16 kg	
	Exde	AC: 3.68 kg / DC: 3.42 kg	

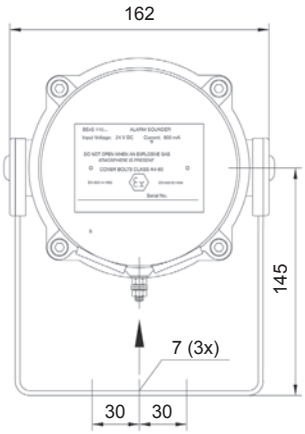
Options / Accessories

GOST

IECEx No SIM 04.0001 — Exd BExDS

Dimensions





Tone table

Tone	Description - Basic tone	Stage 2	Stage 3
1	Continuous tone	31	11
2	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
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	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	Simulated 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	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm	11	1
32	Slow whoop, Australian evacuation alarm AS2220	26	1

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

Ordering details

Article numbers	BExS 110D		BExS 110E		BExDS 110D	BExDS 110E
Rated voltage	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	230 V AC
	320 80 10 0 000	320 80 80 0 000	320 82 10 0 000	320 82 80 0 000	320 75 10 0 000	320 85 10 0 000

Article numbers for other voltages on request

SOUNDER 105 dB(A)
IS-A105N

These sounders are used in workplaces where dangerous, explosive atmospheres are to be expected

- free selection of 49 different tones UKOOA/PFEER conform
- high sound pressure level of 105 dB (A), can be reduced by up to 15 dB (A) via a potentiometer
- up to 2 tones can be selected externally in order to signal different alarms
- works on DC voltages between 10 and 28 V DC, rated voltage 24 V DC
- can also be used outdoors thanks to housing made of self-extinguishing ABS and IP 66 protection system
- categories 1G, 2G and 3G (Zones 0, 1 and 2)

See pages 212 and 213 for suitable zener barriers

max. covering distance

Protection system

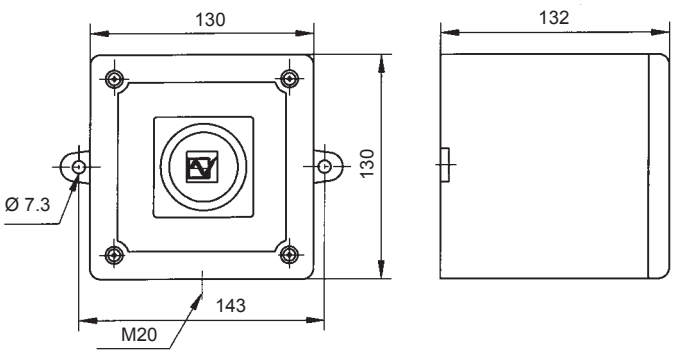
Operating temperature

Electrical data	IS-A105N
Rated voltage	24 V DC
Operating range	10 – 28 V
Nominal current consumption	25 mA (typical for connection to 24 V DC via 28 V / 300 Ω zener barrier)

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 213)

Mechanical data	IS-A105N
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
Testing body	SIRA
Sound pressure level	up to 105 dB (A) ± 3 dB (A) can be reduced by up to 15 dB (A) via an internal potentiometer
Alarm tones	49 different tones can be set via DIP switch, of which 2 tones are externally selectable
Storage temperature	- 40 °C … + 70 °C
Relative humidity	90% @ + 50 °C
Duty cycle	100%
Material	ABS self-extinguishing, similar UL 94 VO
Colour	similar to RAL 3000 (flame red), optionally grey RAL 7038 or white RAL 9010
Connecting terminals	0.5 – 2.5 mm²
Cable entry	20 mm
Weight	0.75 kg

Dimensions



Tone table

Tone	Description - Frequency		Stage 2	Stage 3
1	Continuous tone	340 Hz	2	5
2	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	1000 Hz / 800 Hz, 0.25 s / 0.25 s, EN54-3	17	5
3	Slow whoop, evacuation alarm Netherlands NEN 2575	1200 Hz / 500 Hz, 3.5 s / 0.5 s, EN54-3	2	5
4	Sweeping (fast)	1000 Hz / 800 Hz, 10 ms / 10 ms	6	5
5	Continuous tone	2400 Hz	3	20
6	Sweeping	2900 Hz / 2400 Hz, 70 ms / 70 ms	7	5
7	Sweeping (fast)	2900 Hz / 2400 Hz, 10 ms / 10 ms	10	5
8	Sweeping	1200 Hz / 500 Hz, 3 s / 3 s	2	5
9	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	1200 Hz / 500 Hz, 1 s, EN54-3	15	2
10	Alternating tone	2900 Hz / 2400 Hz, 20 ms / 20 ms	7	5
11	Interrupted tone	1000 Hz, 10 ms / 10 ms	2	5
12	Alternating tone	1000 Hz / 800 Hz, 0.875 s / 0.875 s	4	5
13	Interrupted tone	2400 Hz, 10 ms / 10 ms	15	5
14	Interrupted tone	800 Hz, 0.25 s / 1 s	4	5
15	Continuous tone	800 Hz	2	5
16	Interrupted tone	660 Hz, 150 ms / 150 ms, EN54-3	18	5
17	Alternating tone, France NFS 32-001 (fire alarm)	554 Hz / 440 Hz, 0.1 s / 0.4 s, EN54-3	2	27
18	Interrupted tone, Sweden SS031711 (air raid warning)	660 Hz, 1.8 s / 1.8 s	2	5
19	Sweeping, France NFC48-265	1600 Hz / 1400 Hz, 1 s / 0.5 s	2	5
20	Continuous tone, Sweden SS031711 (all-clear signal)	660 Hz	2	5
21	Alternating tone	554 Hz / 440 Hz, 10 ms / 10 ms	2	5
22	Interrupted tone	544 Hz, 0.875 s / 0.875 s	2	5
23	Interrupted tone	800 Hz, 20 ms / 20 ms	6	5
24	Sweeping (medium), UK BS5839-1	1000 Hz / 800 Hz, 0.5 s / 0.5 s	29	5
25	Sweeping	2900 Hz / 2400 Hz, 0.5 s / 0.5 s	29	5
26	Simulated bell	1450 Hz, 0.69 ms	2	15
27	Continuous tone	800 Hz	26	5
28	Continuous tone	440 Hz	2	5
29	Sweeping (fast), UK BS5839-1	1000 Hz / 800 Hz, 70 ms / 70 ms	7	5
30	Continuous tone	300 Hz	2	5
31	Sweeping	1200 Hz / 660 Hz, 10 ms / 10 ms	26	5
32	2-tone bell sound	800 Hz / 650 Hz, 0.25 s / 0.25 s / 2 s	26	15
33	Interrupted tone	745 Hz, 10 ms / 10 ms	2	5
34	Alternating tone, Singapore	2000 Hz / 1000 Hz, 0.5 s / 0.5 s	38	45
35	Interrupted tone, Australian alert	420 Hz, 0.625 s / 0.625 s	36	5
36	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm	1200 Hz / 500 Hz, 1 s / 1 s	35	5
37	Continuous tone	1000 Hz	9	45
38	Continuous tone	2000 Hz	34	45
39	Interrupted tone	800 Hz, 0.25 s / 1 s	23	17
40	Alternating tone, France NFS 32-001 (fire alarm)	554 Hz / 440 Hz, 0.1 s / 0.4 s, EN54-3	31	27
41	Motor siren	1200 Hz, const.	2	5
42	Motor siren	800 Hz, const.	2	5
43	Continuous tone, PFEER gasalarm	1200 Hz	2	5
44	Motor siren	2400 Hz, const.	2	5
45	Interrupted tone, PFEER (general alarm)	1000 Hz, 1 s / 1 s	38	34
46	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	1200 Hz / 500 Hz, 1 s, EN54-3	47	37
47	Interrupted tone, PFEER (general alarm)	1000 Hz, 1 s / 1 s	46	37
48	Interrupted tone, Australia AS2220, AS1610, AS1670	420 Hz, 0.625 s / 0.625 s	49	5
49	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm	1200 Hz / 500 Hz, 1 s / 1 s	26	37

Ordering details

Article number	IS-A105N
24 V DC	320 33 80 0 000

Options / Accessories

GOST

Manufacturer's declaration

Developed and manufactured in accordance with EN 50014 (general requirements), EN 50020 (intrinsically safety), EMC Directive 89/336/EEC.

IS-MINI SOUNDER 100 dB(A)
IS-mA1

Very economical acoustic alarm
- certified for use in Ex-Zones 0, 1 and 2!
- compact design with a diameter of just 88 m
- sounder operated via certified zener barriers or galvanic isolators
- 49 loud tones at 100 dB (A)
- very well suited for fire alarm systems and direct control due to low power consumption
- self-synchronising sounder for clear tone perception
- 2 different externally controllable tones
- volume control
- also available as mining-certified device (IM1 EEx ia)

See pages 212 and 213 for suitable zener barriers

r = 18 m
max. covering distance

IP 65
Protection system

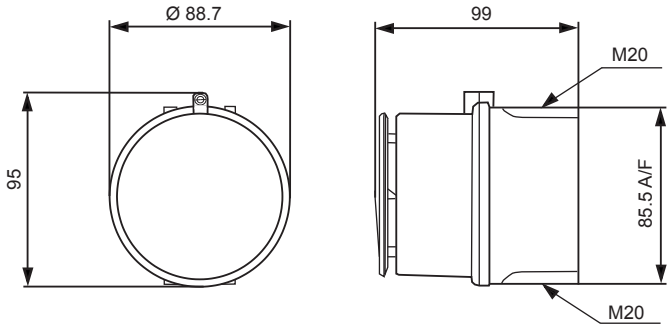
+ 60 °C
- 40 °C
Operating temperature

Electrical data	IS-mA1
Rated voltage	24 V DC
Operating range	16 – 28 V
Nominal current consumption	25 mA (typical for connection to 24 V DC via 28 V / 300 Ω zener barrier)

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 213)

Mechanical data	IS-mA1
Type of protection	"ia" inherently safe
Explosion protection	II 1G EEx ia IIC T4 - 40 °C ... + 60 °C Ta
Category (area of use)	1G (Zone 0) / 2G (Zone 1) / 3G (Zone 2)
Certificate	SIRA 05 ATEX2084 X
Testing body	SIRA
Sound pressure level	100 dB (A)
Sound level reduction	by - 20 dB
Storage temperature	- 40 °C … + 70 °C
Relative humidity	90%
Protection system according to EN 60529	IP 65
Duty cycle	100%
Material	ABS, self-extinguishing UL94VO & 5VA, similar to RAL 3000 (flame red)
Connecting terminals	0.5 – 2.5 mm²
Cable entry	2 x M20 (knock-outs prepared)
Weight	230 g

Dimensions



Tone table

Tone	Description - Frequency	Stage 2	Stage 3
1	Continuous tone	2	5
2	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)	17	5
3	Slow whoop, evacuation alarm Netherlands NEN 2575	2	5
4	Sweeping (fast)	6	5
5	Continuous tone	3	20
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	2	5
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
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	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	Simulated bell	2	15
27	Continuous tone	26	5
28	Continuous tone	2	5
29	Sweeping (fast), UK BS5839-1	7	5
30	Continuous tone	2	5
31	Sweeping	26	5
32	2-tone bell sound	26	15
33	Interrupted tone	2	5
34	Alternating tone, Singapore	38	45
35	Interrupted tone – Australian alert	36	5
36	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm	35	5
37	Continuous tone	9	45
38	Continuous tone	34	45
39	Interrupted tone	23	17
40	Alternating tone, France NFS 32-001 (fire alarm)	31	27
41	Motor siren	2	5
42	Motor siren	2	5
43	Continuous tone, PFEER gasalarm	2	5
44	Motor siren	2	5
45	Interrupted tone, PFEER (general alarm)	38	34
46	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP	47	37
47	Interrupted tone, PFEER (general alarm)	46	37
48	Interrupted tone, Australia AS2220, AS1610, AS1670	49	5
49	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm	26	37

Ordering details

Article numbers	IS-mA1
Rated voltage	24 V DC
	320 34 80 0 000

Options / Accessories

GOST

LOUDSPEAKERS 117/113 dB(A)
BExL 25 d/e / BExL 15 d/e

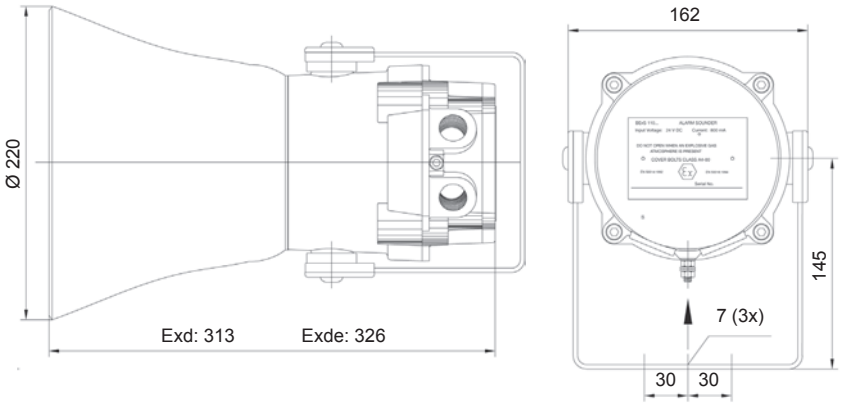
- EEx d IIC T4 / EEx de IIC T4
- KEMA certified
- ATEX approval, optionally IEC and GOST approvals
- housing made of die-cast aluminium LM6, horn made of ABS
- categories 2G and 3G (Zones 1 and 2)
- also available as category 2D/3D for dust zones 21 and 22
- chromated polyester powder coating, resistant to moisture and salt spray, good resistance to most acids, alkalis and oils

BExL 15	BExL 25		
r = 79 m	r = 126 m	IP 66 IP 67	+ 70 °C / - 50 °C
max. covering distance	max. covering distance	Protection system	Operating temperature

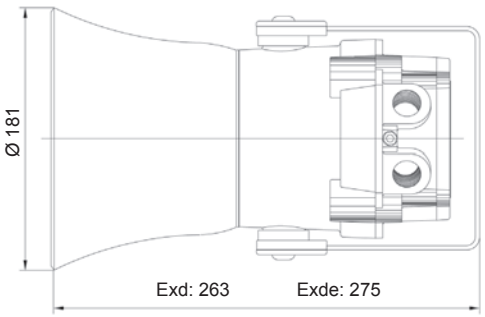
Mechanical data		BExL 25 d/e	BExL 15 d/e
Protection system		"d" = IP 67; or "e" = IP 66	
Explosion protection		II 2G Ex d IIC T4 / II 2G EEx de IIC T4 II 2G Ex d IIB T4 / II 2G EEx de IIB T4	
Category (area of use)		2G (Zone 1) 3G (Zone 2)	
Certificate of conformity		KEMA 99 ATEX 7906	
Testing body		KEMA	
Sound pressure level		117 dB (A) ± 3 dB (A) @ 25 W	113 dB (A) ± 3 dB (A) @ 15 W
Rated power	sine wave	25 W	15 W
Transformer	type	100 V power – 25 W / 12.5 W / 6 W / 2 W taps (Z = 400 Ω / 800 Ω / 1.67 kΩ / 5 kΩ)	100 V power – 15 W / 7.5 W / 3 W / 1 W taps (Z = 666.87 Ω / 1.34 kΩ / 3.34 kΩ / 10 kΩ)
Impedance	type	8 Ω or 16 Ω	
Dispersion		130° @ 1 kHz / 32° @ 4 kHz	120° @ 1 kHz / 32°@ 4 kHz
Frequency range		300 Hz – 8,000 Hz	400 Hz – 8,000 Hz
Temperature class T		IIC T4 @ - 50 °C ... + 55 °C Ta IIB T4 @ - 50 °C ... + 70 °C Ta	
Storage temperature		- 50 °C … + 70 °C	
Relative humidity		90%	
Duty cycle		100%	
Material	housing	die-cast aluminium LM6, similar to RAL 3000 (flame red)	
	horn	ABS self-extinguishing, similar UL 94 VO & 5VA FR ABS, Ex II 2GD anti-static ABS, black	
Connecting terminals		1 x 4 mm^2 or 2 x 2.5 mm^2	
Cable entry		2 / 1 x closed, 1 x open (M20), optionally PG13.5 or 1/2" NPT	
Weight	transformer	"d": 3.95 kg / "e": 4.21 kg	"d": 3.45 kg / "e": 3.10 kg
	impedance	"d": 3.56 kg / "e": 3.82 kg	"d": 3.71 kg / "e": 3.36 kg

Dimensions

BExL 25 d/e

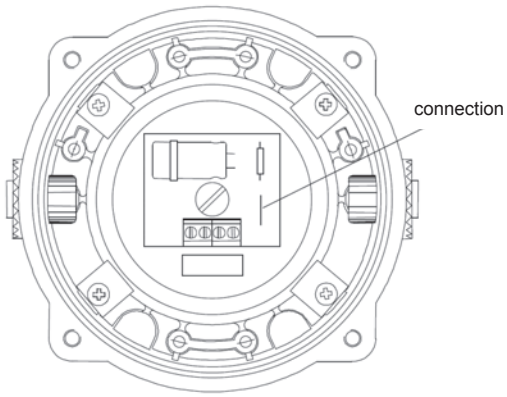


BExL 15 d/e

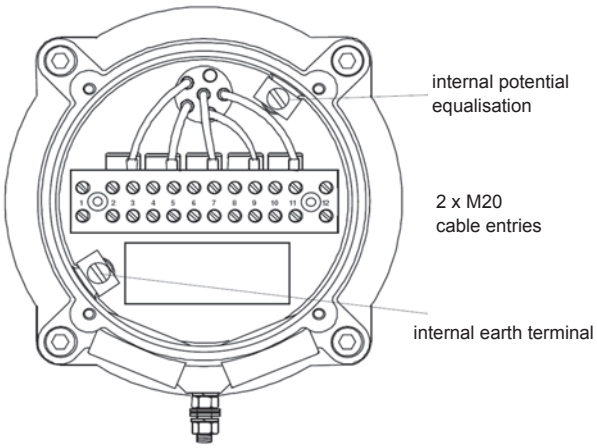


Connection diagram

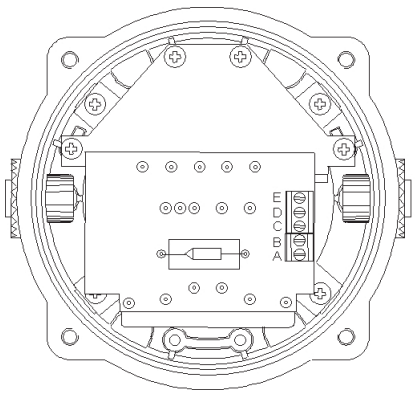
EEx d, 8 Ω and 16 Ω



EEx e, 8 Ω and 16 Ω



100 V



Connections	BExL 25 d (25 W)	BExL 15 d (15 W)
A–B	25 W	15 W
A–C	12.5 W	7.5 W
A–D	6 W	3 W
A–E	2 W	1 W

Ordering details

Article numbers	BExL 25 d	BExL 25 e	BExL 15 d	BExL 15 e
8 Ω	320 93 00 0 910	320 95 00 0 910	320 97 00 0 910	320 99 00 0 910
16 Ω	320 93 00 0 911	320 95 00 0 911	320 97 00 0 911	320 99 00 0 911
100 V transformer	320 93 00 0 912	320 95 00 0 912	320 97 00 0 912	320 99 00 0 912

Options / Accessories

GOST

FLASHING SOUNDERS
BExCS 110-05D / BExDCS 110-05D

Combination devices for visual and acoustic alarms
- stainless steel protective cage and stainless steel mounting bracket for 360° positioning
- extremely intensive light reflection due to 5 joules xenon flash
- 32 different tones incl. DIN tone, UKOOA/PFEER conformant, 2 externally controllable tones (via plus or minus in DC version) (see page 199 for tone table)
- acoustic and visual signal can be controlled separately
- synchronised flash frequency (1 Hz) or alternating flash mode in system operation
- highly resistant to corrosion and suitable for the toughest environments
- adjustable volume (except 12 V DC version)
- flashing light is insensitive to vibration, impact and shock

r = 56 m — max. covering distance

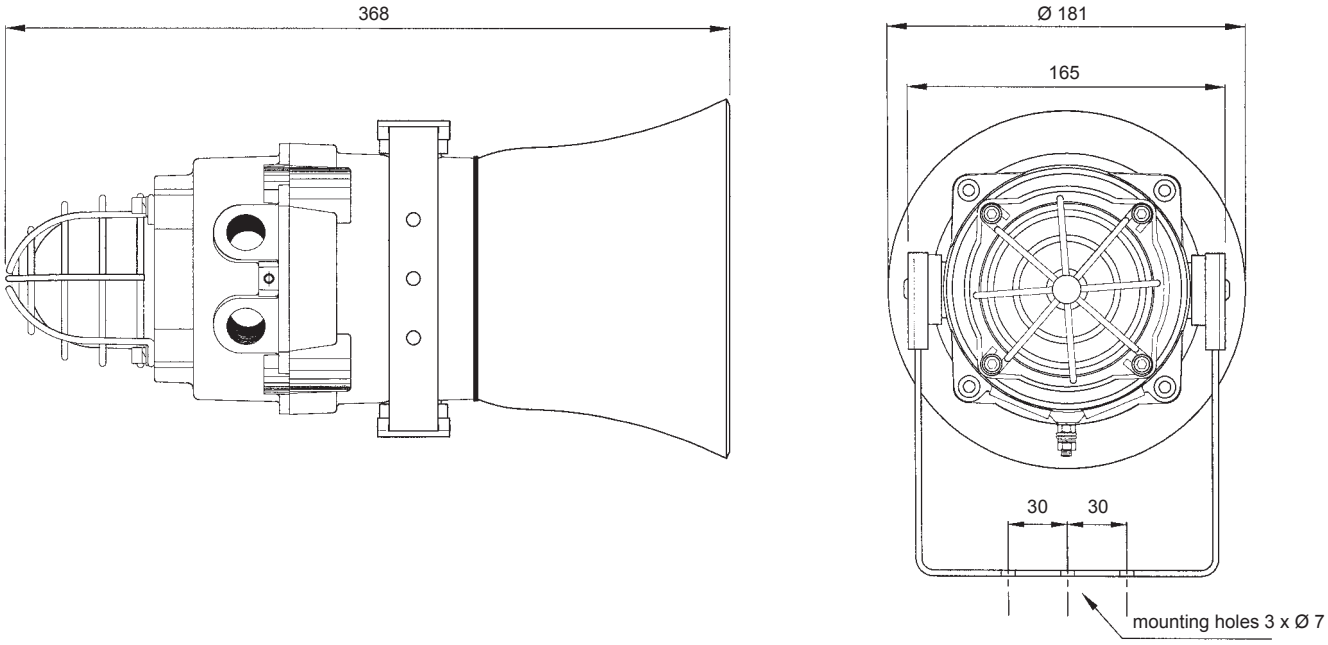
IP 67 — Protection system

+ 70 °C / - 50 °C — Operating temperature

Electrical data	BEx(D)CS 110-05D sounder				
Rated voltage	230 V AC	115 V AC	48 V DC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz			
Operating range	± 10%	± 10%	± 25%	± 25%	± 25%
Nominal current consumption	56 mA	110 mA	130 mA	250 mA	195 mA
Electrical data	**BEx(D)CS 110-05D flashing light**				
Rated voltage	230 V AC	115 V AC	48 V DC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz			
Operating range	± 10%	± 10%	42 – 54 V	20 – 28 V	10 – 14 V
Nominal current consumption	55 mA	140 mA	180 mA	270 mA	750 mA

Mechanical data		BExCS 110-05D	BExDCS 110-05D
Explosion protection		II 2G Ex d IIB T4 - 50 °C ... + 70 °C Ta	II 2GD Ex d IIB T4 T100°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 03 ATEX 2545 X	KEMA 01 ATEX 2223 X
Testing body		KEMA	KEMA
Sound pressure level		110 dB (A)	
Sound level reduction		- 9 dB	
Flash energy		5 J	
Flash rate		approx. 1 Hz = 60 flashes/min.	
Lens colours		clear, yellow, amber, red, green, blue	
Storage temperature		- 50 °C … + 70 °C	
Relative humidity		90%	
Protection system according to EN 60529		IP 67	
Duty cycle		100%	
Service life of the flash tube		light emission still 70% after 8,000,000 flashes	
Material	lens	glass	
	housing	die-cast aluminium LM6, similar to RAL 3000 (flame red)	
	horn	ABS self-extinguishing, similar UL 94 VO & 5VA FR ABS, Ex II 2D anti-static ABS, black	
Connecting terminals		0.5 ... 4.0 mm²	
Cable entry		2 / 1 x closed, 1 x open (M20), optionally PG13.5 or 1/2“ NPT	
Weight	AC	5.0 kg	
	DC	4.8 kg	

Dimensions



Ordering details

Article numbers		BExCS 110-05D		
Lens colour	**Rated voltage**	230 V AC	115 V AC	24 V DC
red		320 74 10 5 000	320 74 15 5 000	320 74 80 5 000

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Manufacturer's declaration

We hereby declare that the explosion-protected flashing light with the type designation **BExCS 110-05 D, BExDCS 110-05D** has been developed and manufactured in accordance with section 5.1.2 of EN 50014.

This declaration is based on compliance with the following regulations and standards:

94/9/EG	CE conformity
EN 50014	Electrical equipment for areas at risk of explosions – General requirements
EN 50018	Pressure-resistant encapsulation 'd'
EN 50281-1-1	Electrical equipment for use in areas with combustible dust

LOUDSPEAKER/FLASHING LIGHT COMBINATION BExCL 15-05D

Combination device for visual and acoustic alarms
- extremely intensive light reflection due to 5 joules xenon flash
- synchronised flash frequency or alternating flash mode in system operation
- acoustic and visual signal can be controlled separately
- highly resistant to corrosion and suitable for the toughest environments
- adjustable volume
- stainless steel protective cage and stainless steel mounting bracket for 360° positioning

max. covering distance

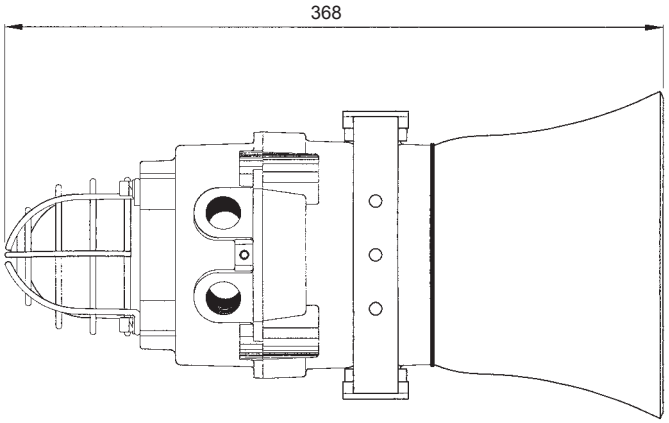
Protection system

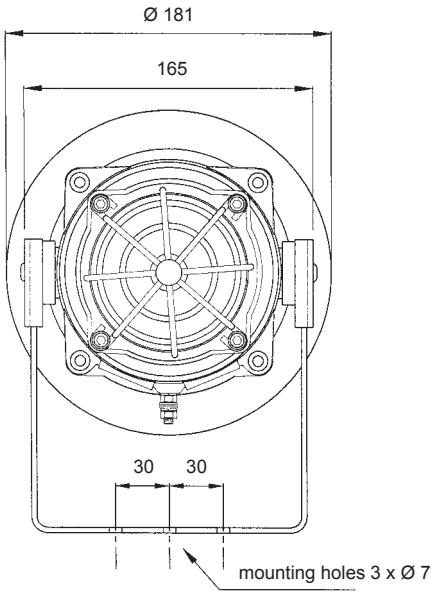
Operating temperature

Electrical data	BExCL 15-05D				
Rated voltage	230 V AC	115 V AC	48 V DC	24 V DC	12 V DC
Rated frequency	50 / 60 Hz	50 / 60 Hz			
Operating range	± 10%	± 10%	42 – 54 V	20 – 28 V	10 – 14 V
Nominal current consumption	55 mA	140 mA	180 mA	270 mA	750 mA

Mechanical data		BExCL 15-05D
Explosion protection		II 2G Ex d IIB T4
Category (area of use)		2G (Zone 1) / 3G (Zone 2)
Certificate of conformity		KEMA 03 ATEX 2545
Testing body		KEMA
Sound pressure level		113 dB (A) ± 3 dB (A) @ 15 W
Rated power	sine wave	15 W
Transformer	type	100 V power – 15 W / 7.5 W / 3 W / 1 W taps (Z = 666.87 Ω / 1.34 kΩ / 3.34 kΩ / 10 kΩ)
Impedance	type	8 Ω or 16 Ω
Dispersion		120° @ 1 kHz / 32° @ 4 kHz
Frequency range		400 Hz – 8,000 Hz
Flash energy		5 J
Flash rate		approx. 1 Hz
Lens colours		clear, yellow, amber, red, green, blue
Temperature class T		IIB: T4 @ - 50 °C ... + 70 °C Ta
Storage temperature		- 50 °C … + 70 °C
Protection system according to EN 60529		IP 67
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 8,000,000 flashes
Material	lens	glass
	housing	die-cast aluminium LM6, RAL 3000 (flame red)
	horn	ABS self-extinguishing, similar UL 94 VO & 5VA FR ABS, Ex II 2D anti-static ABS
Connecting terminals		0.5 ... 4.0 mm²
Cable entry		2 / 1 x closed, 1 x open (M20), optionally PG13.5 or 1/2“ NPT
Weight		5 kg

Dimensions





Ordering details

Article numbers		BExCL 15-05D	
Lens colour	**Version**	230 V AC	24 V DC
red	**8 Ω**	320 91 10 5 910	320 91 80 5 910
red	**16 Ω**	320 91 10 5 911	320 91 80 5 911
red	**100 V transformer**	320 91 10 5 912	320 91 80 5 912

Article numbers for other colours and voltages on request

Options / Accessories

GOST

Manufacturer's declaration

We hereby declare that the explosion-protected means of alarm with the type designation **BExCL 150-05 D** has been developed and manufactured in accordance with section 5.1.2 of EN 50014.

This declaration is based on compliance with the following regulations and standards:

94/9/EG	CE conformity
EN 50014	Electrical equipment for areas at risk of explosions – General requirements
EN 50018	Pressure-resistant encapsulation 'd'
EN 50281-1-1	Electrical equipment for use in areas with combustible dust

IS-MINI LED BLINKING SOUNDER IS-mC1

Very economical visual and acoustic alarm
- certified for use in Ex-Zones 0, 1 and 2!
- compact design with a diameter of just 88 mm
- alarm operated via certified zener barriers or galvanic isolators
- 49 loud tones at 100 dB (A); super-bright LEDs in red, green, blue and yellow/amber for all applications
- volume control
- can be operated as combination unit or separately
- very well suited for fire alarm systems and direct control due to low power consumption
- self-synchronising sounder for clear tone perception
- 2 different externally controllable tones

See pages 212 and 213 for suitable zener barriers

r = 18 m — max. covering distance

IP 65 — Protection system

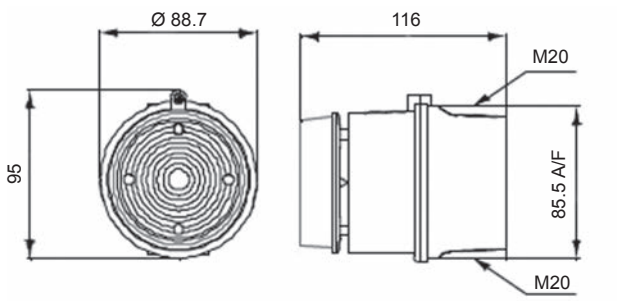
+ 60 °C / - 40 °C — Operating temperature

Electrical data	IS-mC1
Rated voltage	24 V DC
Operating range	16 – 28 V
Nominal current consumption	48 mA (typical for connection to 24 V DC via 28 V / 300 Ω zener barrier)

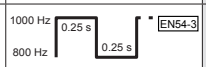
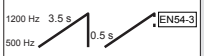
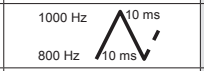
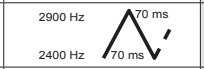
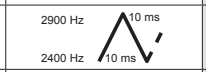
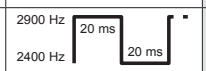
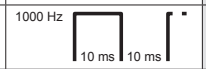
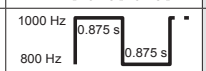
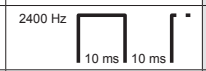
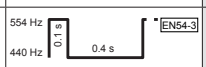
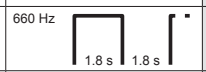
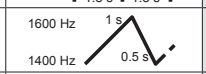
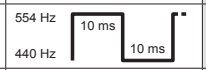
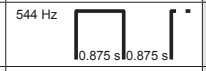
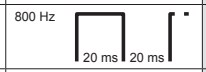
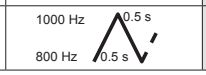
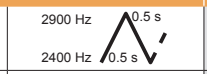
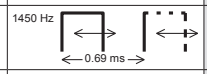
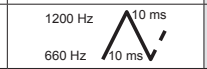
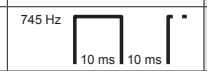
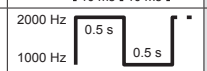
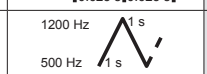
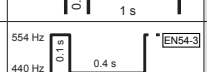
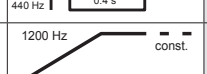
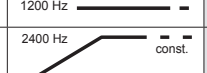
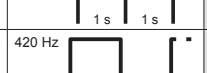
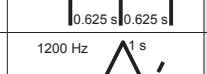
Power must be connected via a zener barrier (max. 28 V DC, 93 mA DC, 0.66 W) or a galvanic isolator, specified by the system certificate (see page 213)

Mechanical data		IS-mC1
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 / Testing body		SIRA 05 ATEX2084 X / SIRA
Sound pressure level		100 dB (A)
Sound level reduction		by - 20 dB
Flash rate		can be set to 2 Hz or 1 Hz
Lens colour		clear, with red, yellow/amber, blue or green LEDs
Storage temperature		- 40 °C … + 70 °C
Relative humidity		90%
Protection system according to EN 60529		IP 65
Duty cycle		100%
Material	housing	ABS, self-extinguishing UL94VO & 5VA, similar to RAL 3000 (flame red)
	lens	polycarbonate (PC)
Connecting terminals		0.5 – 2.5 mm²
Cable entry		2 x M20 (knock-outs prepared)
Weight		280 g

Dimensions



Tone table

Tone	Description - Frequency		Stage 2	Stage 3
1	Continuous tone		2	5
2	Alternating tone, UK BS5839-1 (fire alarm, railway crossing)		17	5
3	Slow whoop, evacuation alarm Netherlands NEN 2575		2	5
4	Sweeping (fast)		6	5
5	Continuous tone		3	20
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		2	5
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
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		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	Simulated bell		2	15
27	Continuous tone		26	5
28	Continuous tone		2	5
29	Sweeping (fast), UK BS5839-1		7	5
30	Continuous tone		2	5
31	Sweeping		26	5
32	2-tone bell sound		26	15
33	Interrupted tone		2	5
34	Alternating tone, Singapore		38	45
35	Interrupted tone – Australian alert		36	5
36	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm		35	5
37	Continuous tone		9	45
38	Continuous tone		34	45
39	Interrupted tone		23	17
40	Alternating tone, France NFS 32-001 (fire alarm)		31	27
41	Motor siren		2	5
42	Motor siren		2	5
43	Continuous tone, PFEER gasalarm		2	5
44	Motor siren		2	5
45	Interrupted tone, PFEER (general alarm)		38	34
46	Sawtooth, DIN tone 33404-3 Germany (emergency signal), PFEER PTAP		47	37
47	Interrupted tone, PFEER (general alarm)		46	37
48	Interrupted tone, Australia AS2220, AS1610, AS1670		49	5
49	Sweeping, IMO 3d, Germany KTA3901 evacuation alarm		26	37

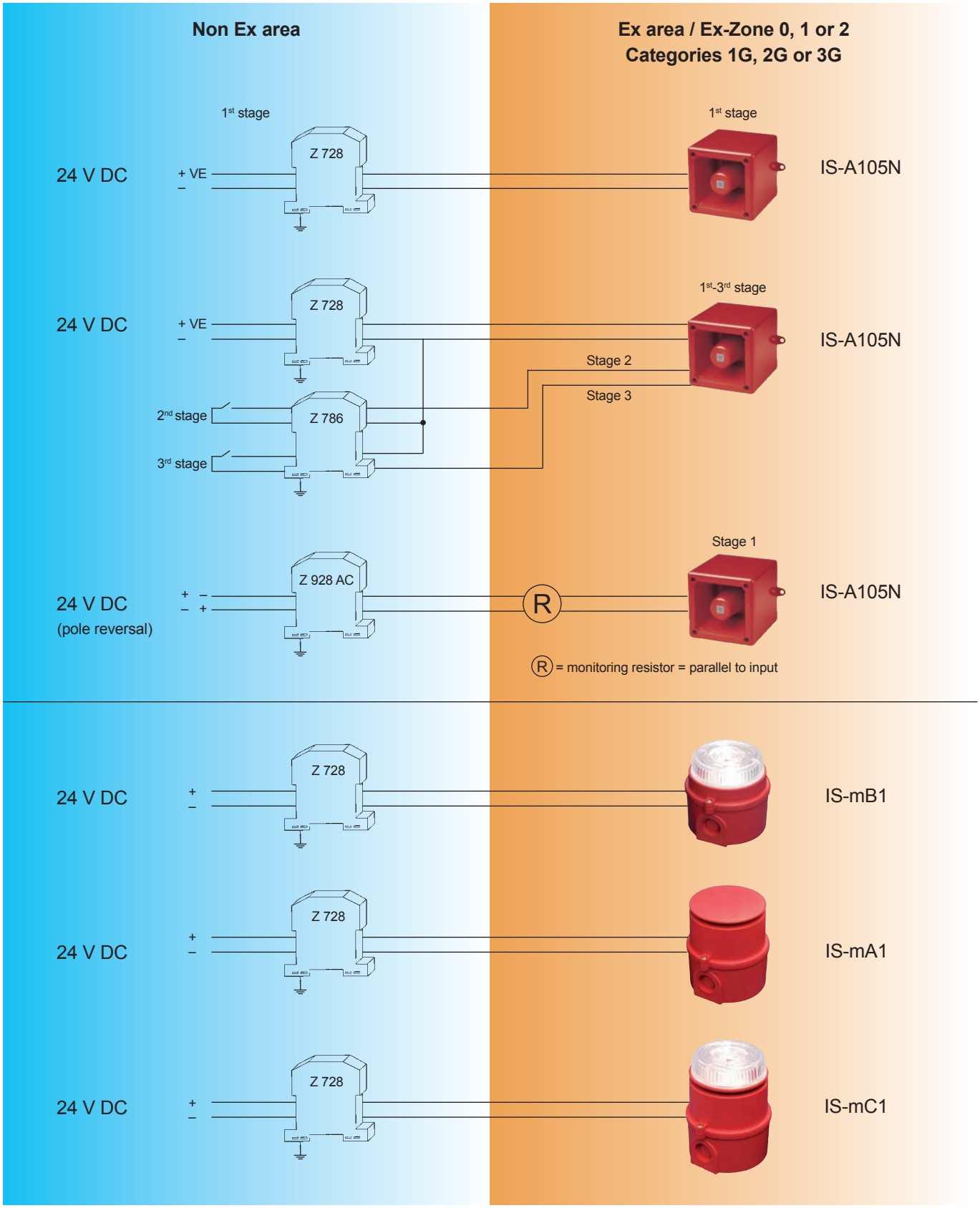
Ordering details

Article numbers		IS-mC1
Colour LED	Rated voltage	24 V DC
yellow/amber		320 35 80 4 000
red		320 35 80 5 000
green		320 35 80 6 000
blue		320 35 80 7 000

ACCESSORIES

ZENER BARRIERS

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



Technical data for Zener barriers

Type	Version	Rated data		Ex characteristic values for (Eex ia) IIC							Technical data			
		V	Ω	U_z (V)	R_{min} (Ω)	I_k (I_0) (mA)	P_{max} (W)	C_{max} (µF)	L_{max} (mH)	L/R Ratio	max. longitudinal resistance (Ω)	U in at 10 µA (V)	U in max. (V)	rated safety current (mA)
Z 728	Zener barrier + Ve BAS 01 ATEX 7005	28	300	28	301	93	0.65	0.083	3.05	56	327	26.5	28	50
Z 928	Zener barrier AC BAS 01 ATEX 7005	28	300	28	301	93	0.65	0.083	3.05	56	327	26	27.6	50
Z 786	Diode barrier BAS 01 ATEX 7005	28	Diode A1 A2 B	28 28 28	– – –	– – –	– – –	0.083 0.083 0.083	– – –	– – –	36 + 0.9 V 36 + 0.9 V –	26.5 26.5 –	28 28 –	50 50 –

Note: A1 and A2 - separate channels, B - two channels connected in parallel with ground connection

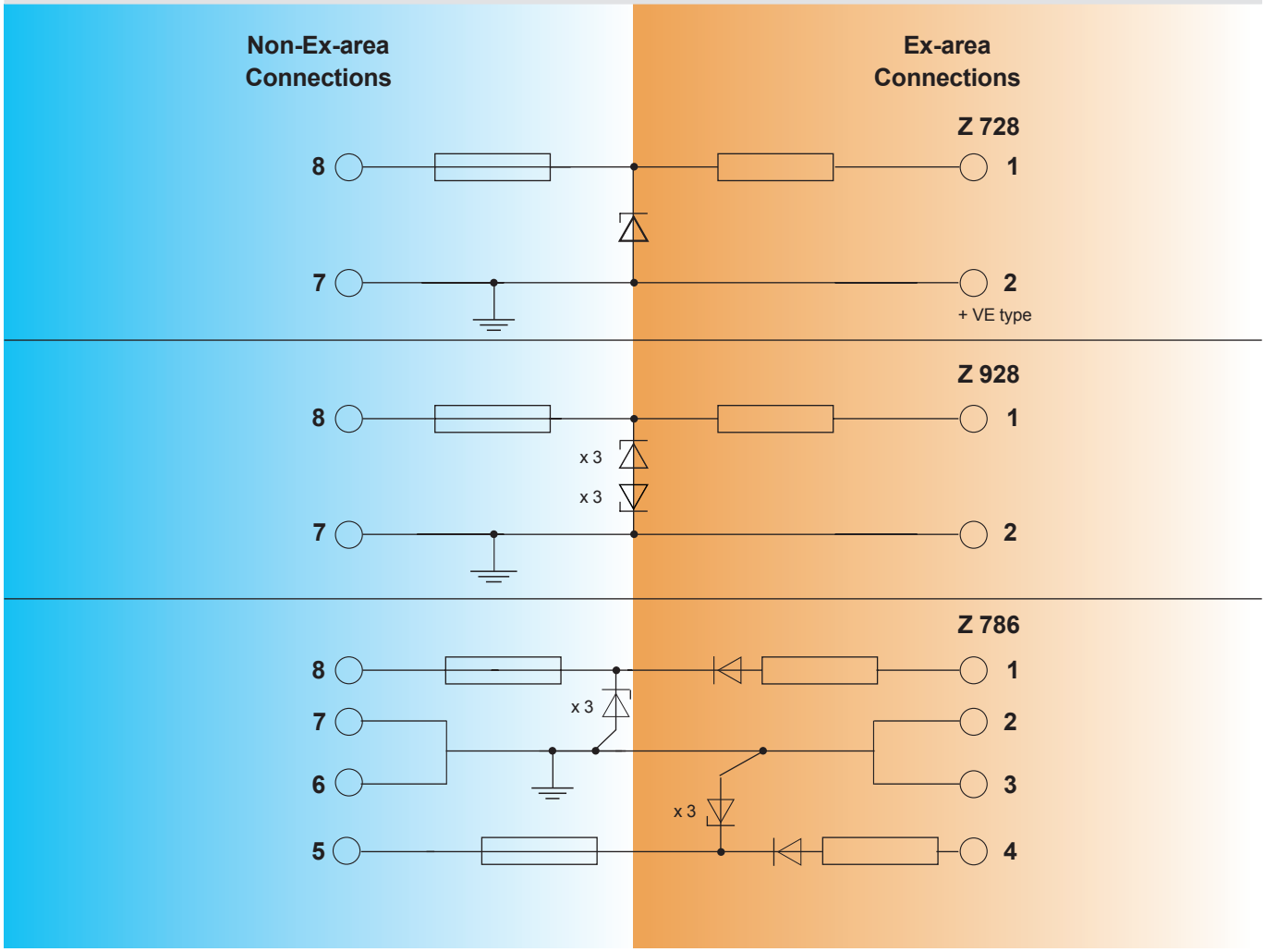
Mechanical data

Design		terminal housing made of makrolon, flammability class UL 94 V-0
Height x Width x Depth	mm	110 x 12.5 x 115
Mounting		snap fitting to 35 mm DIN rail conforming to DIN EN 50022
Connection		self-opening apparatus terminals; max. wire cross-section 2 x 2.5mm²
Ambient temperature		- 20 °C … + 60 °C

Ordering details

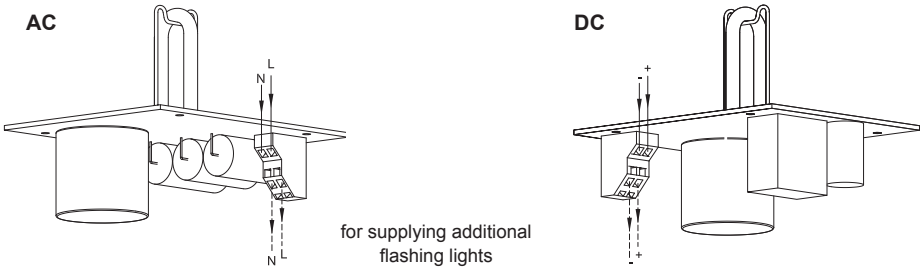
Article numbers	Z 728	Z 928	Z 786
	381 09 80 0 000	381 09 30 0 000	381 09 80 0 001

Block circuit diagrams

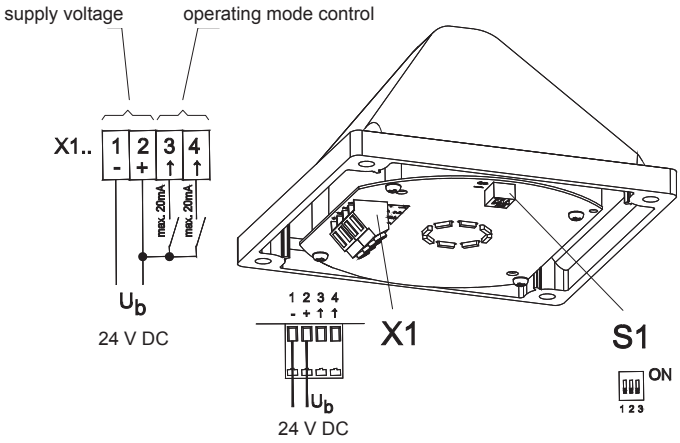


CONNECTION DIAGRAMS

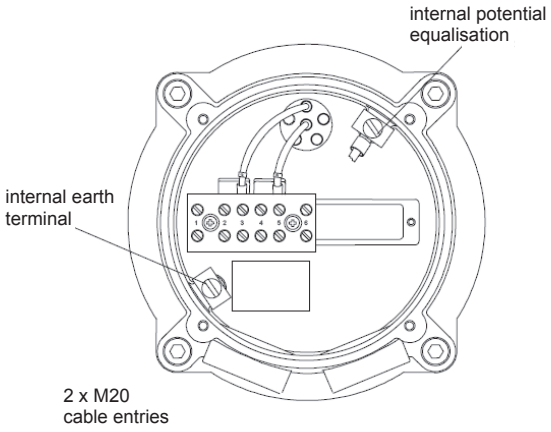
Quadro F12-3G/3D ATEX



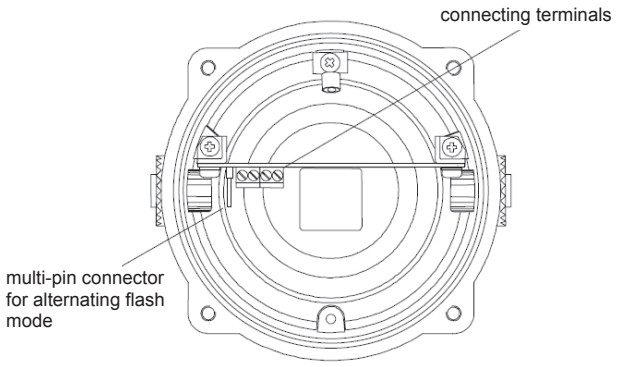
Quadro-LED Flex-3G/3D



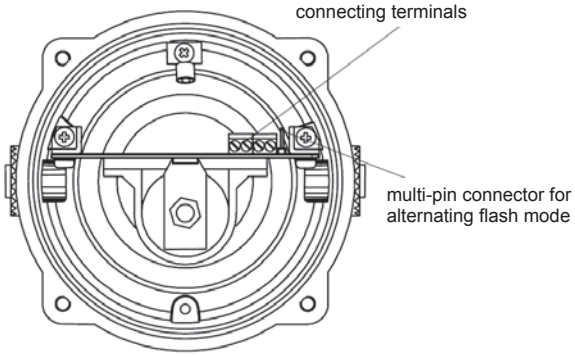
BExBG 15 / BExBG 10 / BExBG 05 – EEx e



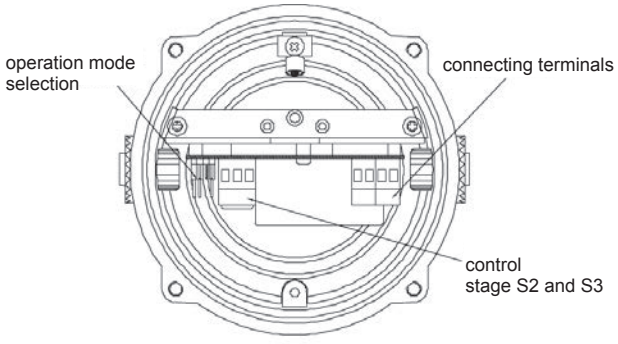
BExBG 05 – EEx d



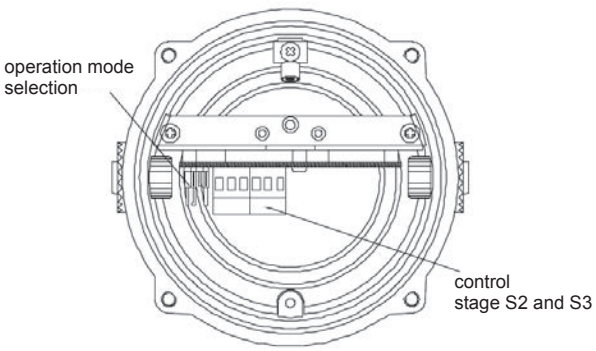
BExBG15 / BExBG 10 – EEx d



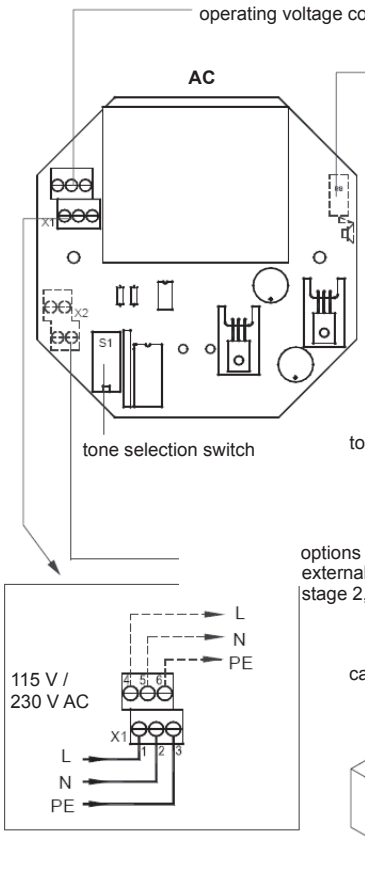
BExBG L1D – AC



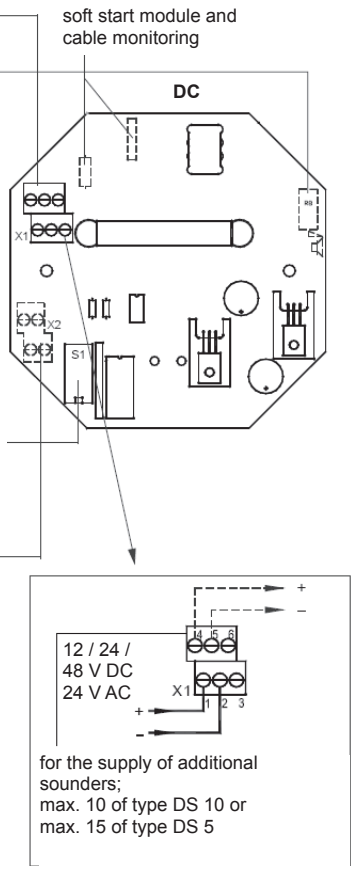
BExBG L1D – DC



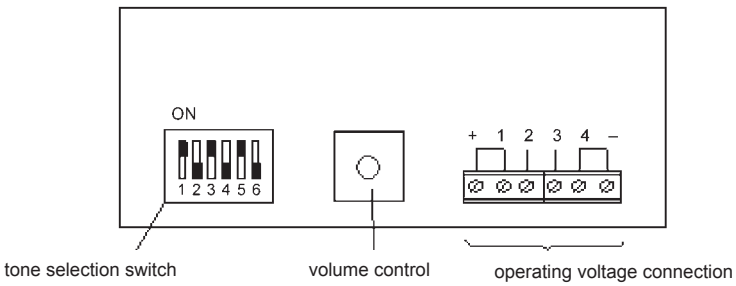
DS 5 3G/3D / DS 10 3G/3D – AC



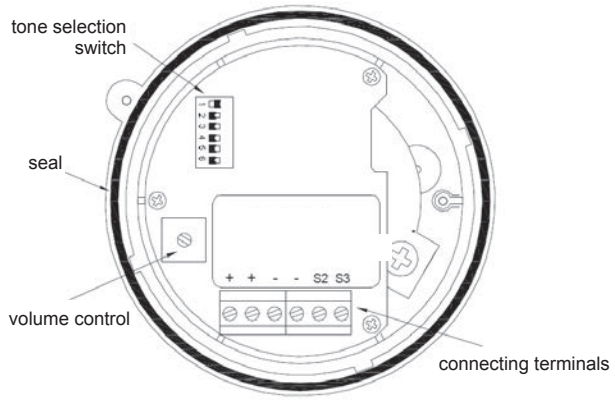
DS 5 3G/3D / DS 10 3G/3D – DC



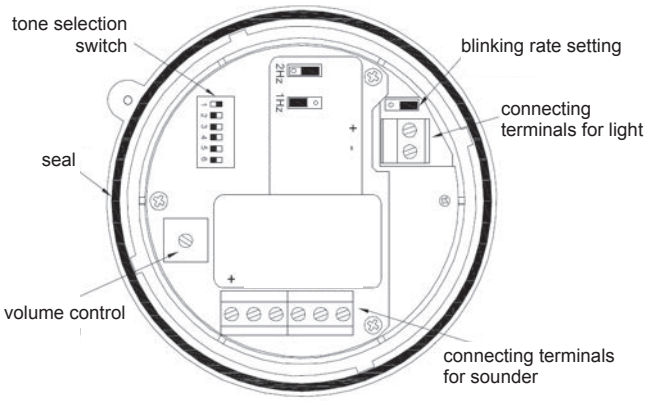
IS-A105N



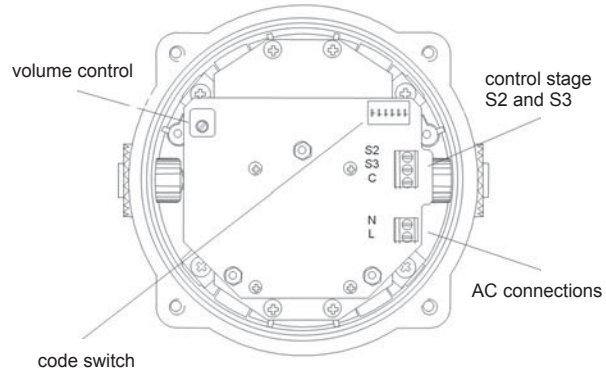
IS-mA1



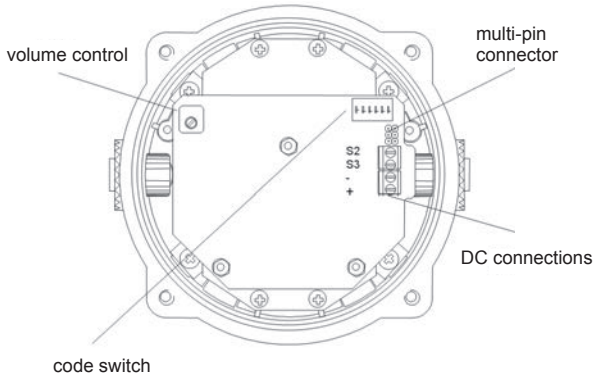
IS-mC1



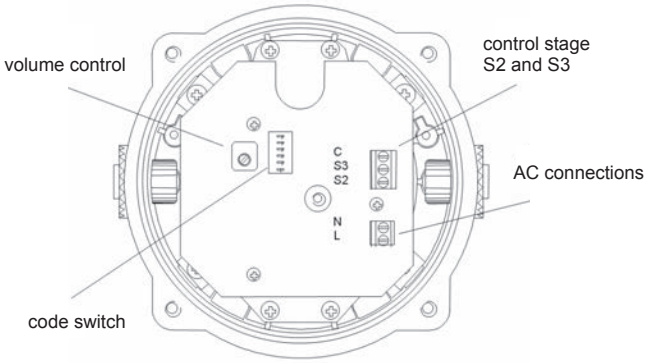
BExS 110d – AC



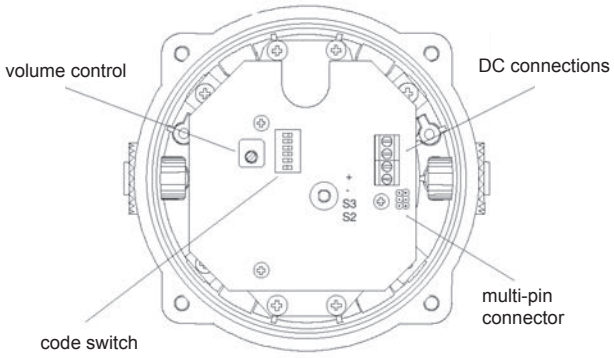
BExS 110d – DC



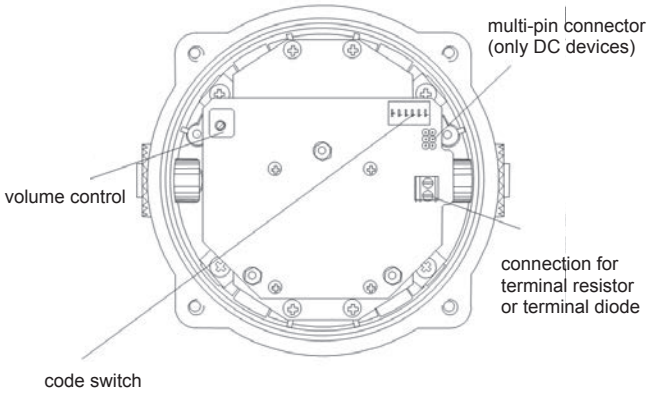
BExS 120d – AC



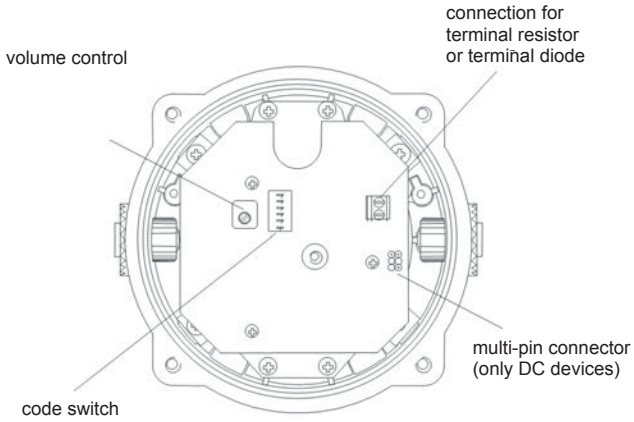
BExS 120d – DC



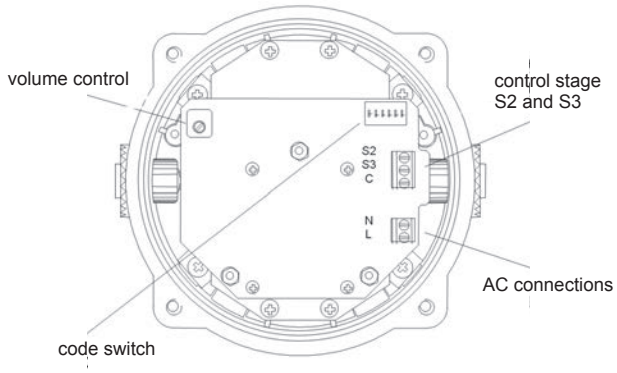
BExS 110e – DC



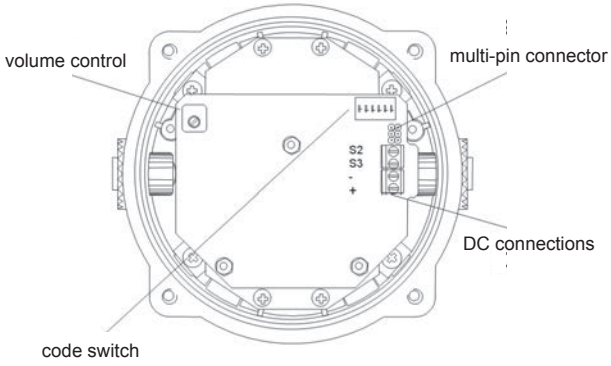
BExS 120e – DC



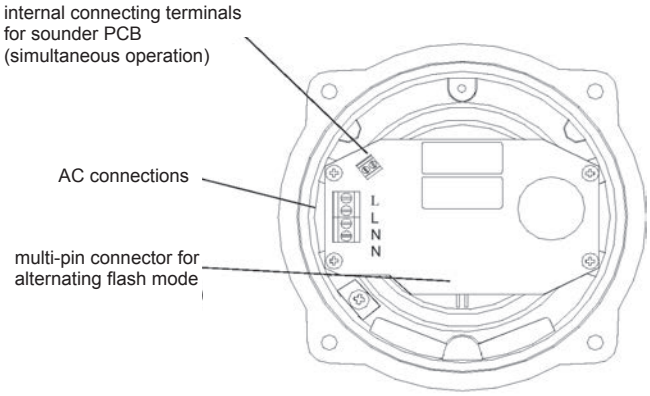
BExCS 110-05D sounder – AC



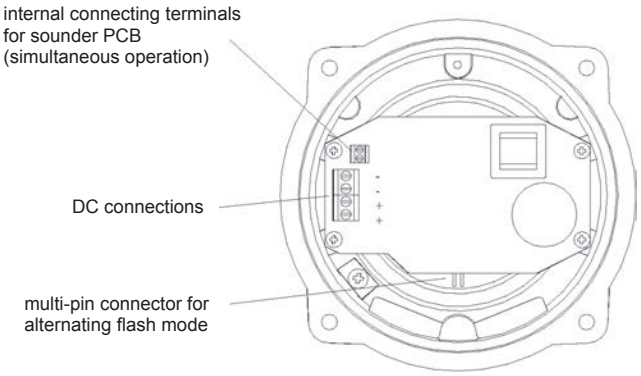
BExCS 110-05D sounder – DC



BExCS 110-05D flashing light – AC

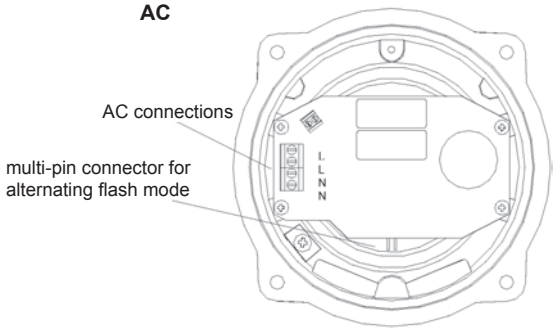


BExCS 110-05D flashing light – DC

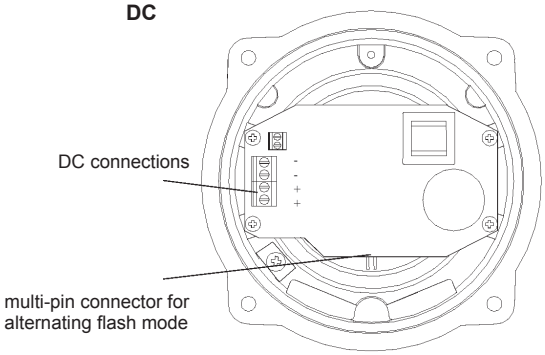


BExCL 15-05D flashing light

AC

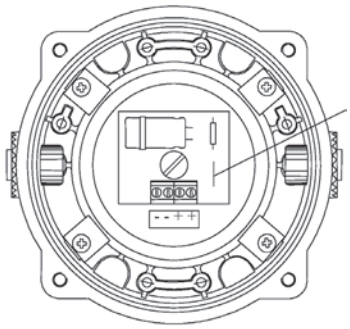


DC

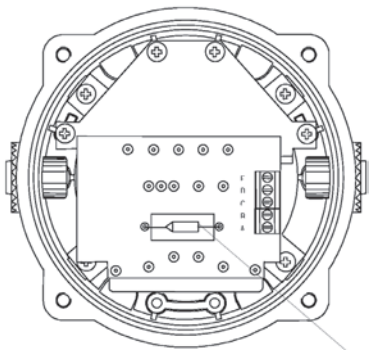


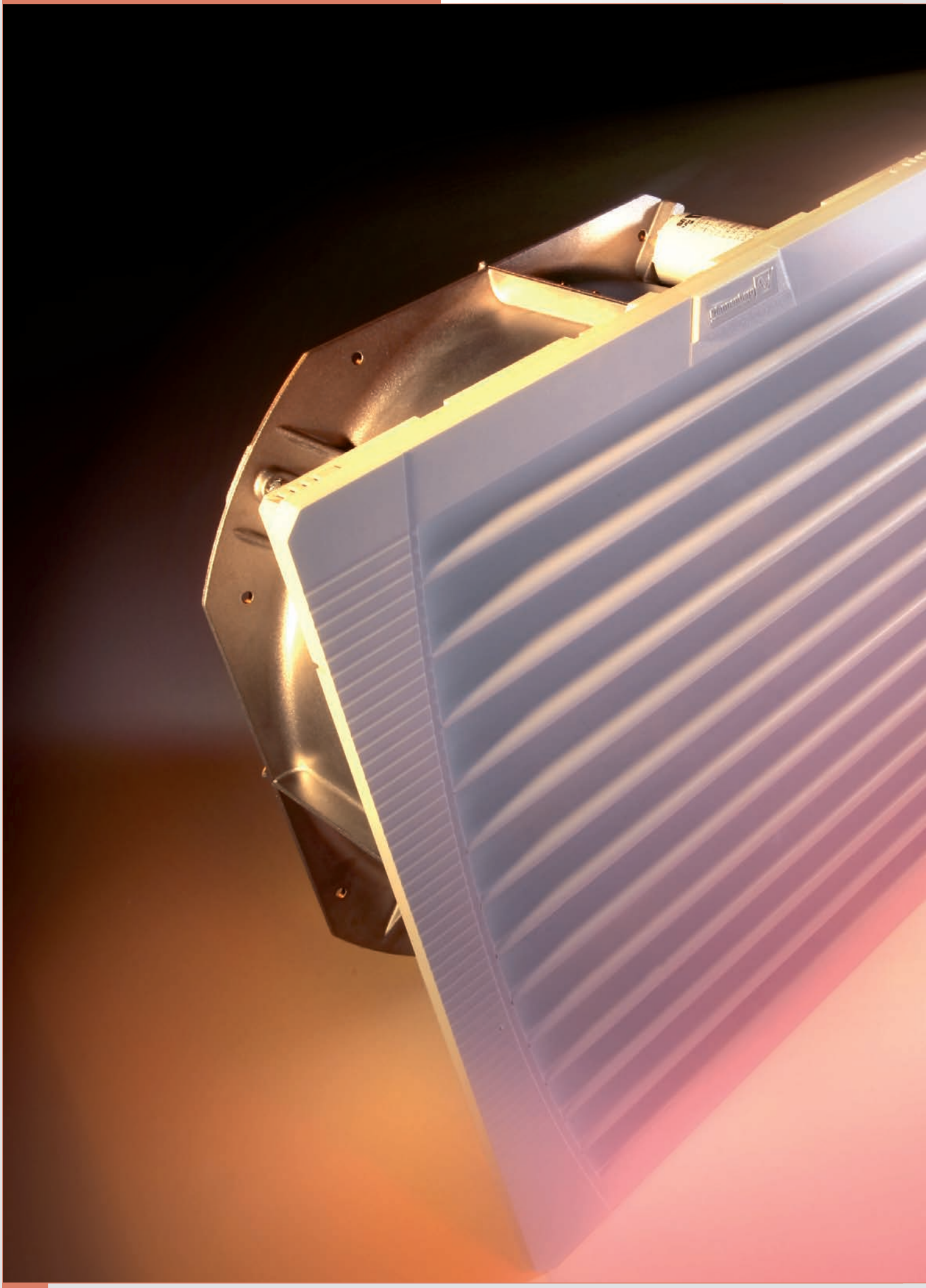
BExCL 15-05D loudspeaker

8 Ω / 16 Ω



100 V





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 of electrical enclosures" on +49 40 734 12 156.

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

EFFICIENT COOLING AND HEATING

COOLING UNITS, FILTERFANS, HEAT EXCHANGERS, HEATERS, THERMOSTATS, HYGROSTATS AND CHILLERS

CUT-OUT COMPATIBILITY

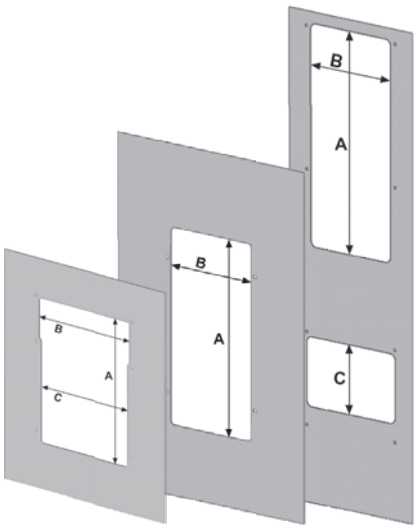
Components in the enclosure are often updated and the requirements to thermal management change. An air/air heat exchanger which was previously the optimal solution is not suitable any more. The exchange with an active **ECOOL** cooling unit or an air/water heat exchanger can be carried out easily and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

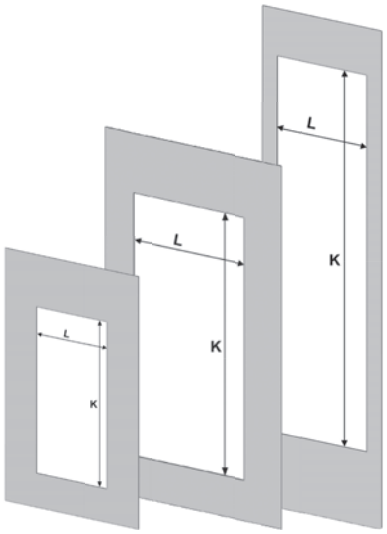
Cooling unit *Air/water heat exchanger* *Air/air heat exchanger*

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 9341C DTx 9141	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

OVERVIEW OF COOLING UNITS

Type	Cooling capacity*	Rated voltage	Cut-out dimensions (height x width)
... FOR PARTIALLY RECESSED MOUNTING IN THE DOOR OR SIDE			
ECOOL DTI 6801	4000 W	400 V 3~	1510 x 450 mm
ECOOL DTI 6501	2500 W	400 V 3~	
ECOOL DTI 6401	2000 W	230 V / 400 V 3~	
ECOOL DTI 6301	1500 W	115 V / 230 V / 400 V 2~	
ECOOL DTI 6201	1000 W	115 V / 230 V / 400 V 2~	
DTI 9341C	1500 W	115 V / 230 V / 400 V 2~	900 x 380 mm
DTI 9141	950 W	115 V / 230 V / 400 V 2~	
DTI 9041	870 W	115 V / 230 V / 400 V 2~	577 x 350 mm
DTI 9031	510 W	115 V / 230 V / 400 V 2~	495 x 265 mm
DTI 9021	320 W	115 V / 230 V	289 x 304 mm
DTFI 9021	320 W	115 V / 230 V / 400 V 2~	291 x 291 mm

... FOR OUTER MOUNTING ON THE DOOR OR SIDE			
ECOOL DTS 6801	4000 W	400 V 3~	700 x 315 / 220 x 315 mm
ECOOL DTS 6501	2500 W	400 V 3~	
ECOOL DTS 6401	2000 W	230 V / 400 V 3~	
ECOOL DTS 6301	1500 W	115 V / 230 V / 400 V 2~	
ECOOL DTS 6201	1000 W	115 V / 230 V / 400 V 2~	
DTS 9341C	1500 W	115 V / 230 V / 400 V 2~	662 x 320 mm
DTS 9141	950 W	115 V / 230 V / 400 V 2~	
DTS 9041	870 W	115 V / 230 V / 400 V 2~	472 x 285/272 mm
DTS 9031	510 W	115 V / 230 V / 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 dimensions (depth x width)
... FOR TOP MOUNTING			
ECOOL DTT 6801	4000 W	400 V 3~	392 x 692 mm
ECOOL DTT 6601	3000 W	400 V 3~	
ECOOL DTT 6401	2000 W	115 V / 230 V / 400 V 2~	390 x 490 mm
ECOOL DTT 6301	1500 W	115 V / 230 V / 400 V 2~	
ECOOL DTT 6201	1000 W	115 V / 230 V / 400 V 2~	260 x 475 mm
ECOOL DTT 6101	500 W	115 V / 230 V	

* (L35/L35) in accordance with EN 14511: at +35 °C ambient temperature and +35 °C temperature inside enclosure

OVERVIEW OF AIR/WATER HEAT EXCHANGERS

Type	Cooling capacity	Rated voltage	Cut-out dimensions (height x width)
... FOR PARTIALLY RECESSED MOUNTING IN THE DOOR OR SIDE			
ECOOL PWI 6502	5000 W	115 V / 230 V / 400 V	1510 x 450 mm
ECOOL PWI 6302	3000 W	115 V / 230 V / 400 V	
ECOOL PWI 6302C	4000 W	115 V / 230 V / 400 V	900 x 380 mm
ECOOL PWI 6152	1500 W	115 V / 230 V / 400 V	
ECOOL PWI 6102	1000 W	115 V / 230 V	577 x 350 mm
ECOOL PWI 6052	500 W	115 V / 230 V	
... FOR OUTER MOUNTING ON THE DOOR OR SIDE			
ECOOL PWS 6502	5000 W	115 V / 230 V / 400 V	700 x 315 / 220 x 315 mm
ECOOL PWS 6302	3000 W	115 V / 230 V / 400 V	
ECOOL PWS 6302C	4000 W	115 V / 230 V / 400 V	662 x 320 mm
ECOOL PWS 6152	1500 W	115 V / 230 V / 400 V	
ECOOL PWS 6102	1000 W	115 V / 230 V	472 x 285/272 mm
ECOOL PWS 6052	500 W	115 V / 230 V	

OVERVIEW OF AIR/AIR HEAT EXCHANGERS

Type	Specific cooling capacity	Rated voltage	Cut-out dimensions (height x width)
... FOR PARTIALLY RECESSED MOUNTING IN THE DOOR OR SIDE			
ECOOL PAI 6203	100 W/K	115 V / 230 V	1510 x 450 mm
ECOOL PAI 6173	85 W/K	115 V / 230 V	
ECOOL PAI 6133	65 W/K	115 V / 230 V	900 x 380 mm
ECOOL PAI 6103	50 W/K	115 V / 230 V	
ECOOL PAI 6073	35 W/K	115 V / 230 V	
ECOOL PAI 6043	20 W/K	115 V / 230 V	577 x 350 mm
... FOR OUTER MOUNTING ON THE DOOR OR SIDE			
ECOOL PAS 6203	100 W/K	115 V / 230 V	700 x 315 / 220 x 315 mm
ECOOL PAS 6173	85 W/K	115 V / 230 V	
ECOOL PAS 6133	65 W/K	115 V / 230 V	662 x 320 mm
ECOOL PAS 6103	50 W/K	115 V / 230 V	
ECOOL PAS 6073	35 W/K	115 V / 230 V	
ECOOL PAS 6043	20 W/K	115 V / 230 V	472 x 285/272 mm

OVERVIEW OF CHILLERS

Type	Cooling capacity	Rated voltage	Dimensions (height x width x depth)
ECOOL CC CHILLER			
CC 6601	6500 W	400 V / 460 V 3 ~	984 x 601 x 670 mm
CC 6501	5000 W	400 V / 460 V 3 ~	
CC 6401	3500 W	400 V / 460 V 3 ~	
CC 6301	2400 W	115 V / 230 V	626 x 600 x 480 mm
CC 6201	1700 W	115 V / 230 V	
CC 6101	1100 W	115 V / 230 V	

EB CHILLER			
EB 400 (water)	40000 W	400 V / 460 V 3 ~	1410 x 1680 x 790 mm
EB 400 (oil)	40000 W	400 V / 460 V 3 ~	
EB 190 (water)	19000 W	400 V / 460 V 3 ~	1410 x 1230 x 790 mm
EB 190 (oil)	19000 W	400 V / 460 V 3 ~	
EB 75 (water)	7500 W	400 V / 460 V 3 ~	1337 x 705 x 750 mm
EB 75 (oil)	7500 W	400 V / 460 V 3 ~	

OVERVIEW OF FILTERFANS 4.0

Type	Airflow rate [1] IP 54 / IP 55	Rated voltage	Cut-out dimensions (height x width) [2]
ECOOL PF FILTERFANS *			
PF 11.000	25 / - m³/h	115 V / 230 V AC 12 V / 24 V / 48 V DC	92 x 92 mm
PF 22.000	61 / 56 m³/h		125 x 125 mm
PF 32.000	110 / 100 m³/h		177 x 177 mm
PF 42.500	156 / 145 m³/h		223 x 223 mm
PF 43.000	256 / 233 m³/h		
PF 65.000	480 / 505 m³/h	115 V / 230 V AC	291 x 291 mm
PF 66.000	640 / 770 m³/h	400/460 V 3 ~ 115 V / 230 V AC	
PF 67.000	845 / 925 m³/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 PTF FILTERFANS FOR TOP MOUNTING			
PTF 60.500	500 / 350 m³/h	115 V / 230 V AC	291 x 291 mm
PTF 60.700	700 / 550 m³/h		
PTF 61.000	1000 / 750 m³/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

OVERVIEW OF HEATERS

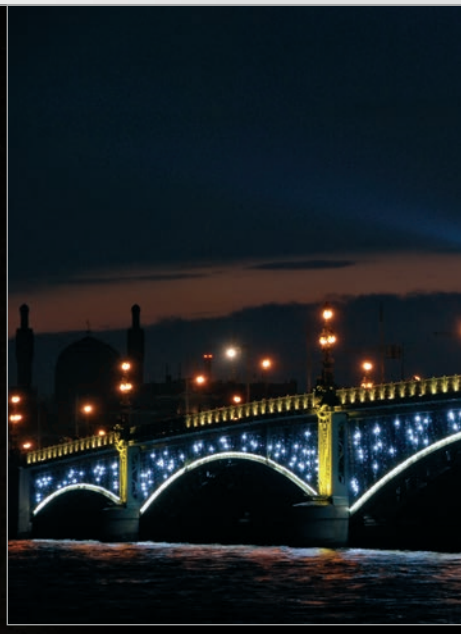
Type	Heating performance	Rated voltage	Dimensions (height x width x depth)
FLH RADIANT HEATERS			
FLH 010	10 W	110 V - 250 V AC	100 x 70 x 50 mm
FLH 015	15 W	110 V - 250 V AC	100 x 70 x 50 mm
FLH 030	30 W	110 V - 250 V AC	100 x 70 x 50 mm
FLH 045	45 W	110 V - 250 V AC	100 x 70 x 50 mm
FLH 060	60 W	110 V - 250 V AC	175 x 70 x 50 mm
FLH 075	75 W	110 V - 250 V AC	175 x 70 x 50 mm
FLH 100	100 W	110 V - 250 V AC	175 x 70 x 50 mm
FLH 150	150 W	110 V - 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	100 x 150 x 164 mm
FLH-T 600	600 W	115 V / 230 V AC	100 x 150 x 164 mm
FLH-T 800	800 W	115 V / 230 V AC	100 x 150 x 164 mm
FLH-T 1000	1000 W	115 V / 230 V AC	100 x 150 x 164 mm
PFH COMPACT FAN HEATERS			
PFH 200	200 W	115 V / 230 V AC	142 x 88 x 133 mm
PFH 300	300 W	115 V / 230 V AC	142 x 88 x 133 mm
PFH 400	400 W	115 V / 230 V AC	142 x 88 x 133 mm
PFH 500	500 W	115 V / 230 V AC	142 x 88 x 133 mm
PFH 650	650 W	115 V / 230 V AC	142 x 88 x 133 mm
PFH 800	800 W	115 V / 230 V AC	142 x 88 x 133 mm
PFH 1000	1000 W	115 V / 230 V AC	142 x 88 x 133 mm
PFH 1200	1200 W	115 V / 230 V AC	142 x 88 x 133 mm

OVERVIEW OF THERMOSTATS AND HYGROSTATS

Type	Operating temperature range	Type of contact	Switching point tolerance	Dimensions (HxWxD)
FLZ THERMOSTATS AND HYGROSTATS				
FLZ 510 Thermostat	- 40 … + 80 °C / - 40 … + 176 °F	changeover	± 3	59.5 x 37 x 47.5 mm
FLZ 520 Thermostat		N.C.	± 4	72 x 40 x 36 mm
FLZ 530 Thermostat		N.O.	± 4	72 x 40 x 36 mm
FLZ 541 Thermostat	- 40 … + 80 °C / - 40 … + 176 °F	N.C. / N.O.	± 4	80.5 x 59 x 38 mm
FLZ 542 Thermostat		N.C. / N.C.	± 4	80.5 x 59 x 38 mm
FLZ 543 Thermostat		N.O. / N.O.	± 4	80.5 x 59 x 38 mm
FLZ 600 Hygrostat	0 … + 60 °C / + 30 … + 140 °F	changeover	approx. 5%	64 x 37 x 46 mm
FLZ 610 Hygrostat	- 20 … + 60 °C / - 4 … + 140 °F	changeover/relay	approx. 2 K ± 1 K approx. 4% R.H. ± 1%	80.5 x 59 x 38 mm

OVERVIEW OF ENCLOSURE LIGHTING SYSTEMS

Type	Light intensity	Rated voltage	Type of connection	Additional connections	Dimensions (HxWxD)
STANDARD LAMP SYSTEMS					
PLS 008 Mini	450 Lm	230 V AC	mains cable with plug included		430 x 120 x 50 mm
PLS 013 Mini	640 Lm	230 V AC			320 x 95 x 50 mm
PLS 014 Mini	700 Lm	230 V AC	cable (1.5 m)		320 x 95 x 50 mm
			GST 18/3 plug	GST 18/3 socket door contact integrated door end switch	



Illumination is naturally also technology. In its purest form, however, it is much more. Namely art. Or, to put it better: a real philosophy, because with light, you can take your building into a completely new dimension.

That is what makes perfect illumination an ideal image tool. Present your building or structure in the right light. You can see for yourself how that looks in Paris, for example, where we illuminated a famous tower by a certain Gustave Eiffel, or in St. Petersburg, where the TV Tower and Trinity Bridge (Troitskiy-Most) are lit up by 9,500 Pfannenberg flashing lights.

THE FOURTH DIMENSION FOR YOUR STRUCTURE!

BENEFIT FROM OUR KNOW-HOW IN THE FIELD OF LIGHT ARCHITECTURE

ART ILLUMINATION

A COMPLETELY DIFFERENT SIDE OF PFANNENBERG: ART ILLUMINATION

The beauty of the application and the durability and sturdiness of Pfannenberg flashing lights are the driving forces here. Let yourself be captivated by a few selected examples of Pfannenberg's artistic side.

Quadro R-ST

In June 2008, St. Petersburg became the scene of a fantastic art illumination installation. The TV Tower and the Trinity Bridge were illuminated as part of the International Economic Forum.

The project, which was based on the unique illumination of the Eiffel Tower in Paris, was carried out by a local company under the auspices of the city authorities. 9,500 Pfannenberg Quadro R-ST flashing lights were used for the project, selected because of their sturdy design that guarantees a long service life under adverse conditions.

St. Petersburg, Russia
TV Tower and Trinity Bridge



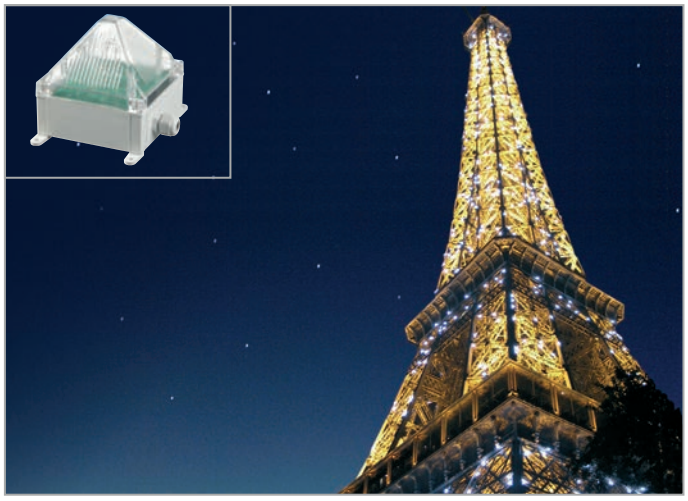


Quadro R

Pfannenberg put the Eiffel Tower back in the spotlight on 21 June 2003. Millions of people all over the world have admired the flashing lights that illuminate one of the most famous landmarks in the world.

20,000 flashing lights, specially manufactured by Pfannenberg GmbH, were installed by experienced mountaineers in order to light up the Eiffel Tower.

Each light has a service life of at least 10 years and can light up over 10 million times during that time. Thanks to their special design, they withstand summer and winter, storm and hail and illuminate the Eiffel Tower daily between 7 pm and midnight every hour on the hour for 10 minutes, as well as on special occasions.



Paris, France
Eiffel Tower

DO YOU REQUIRE FURTHER INFORMATION?

Just call us about any project: your ideas and our experience are sure to lead to great success!

Global Product Management: +49 40 73412-226 or -223

PSL 060

At the Expo 2000, the façade of the French Pavilion was turned into a spectacular eye-catcher. Etienne Jules Meray's photo 'The Walking Man', taken in 1880, was recreated as a large, moving light construction in keeping with the exhibition's slogan: 'Transport, Mobility and Movement'.

The 26 steps of the movement were illuminated in quick succession by Pfannenberg flashing lights. Like in a film, the lights ran along the 100 metre long walkway in 2 seconds and brought the man to life, day and night.

Hanover, Germany
Expo 2000

AB-PN

Pfannenberg's extremely bright and extremely strong flashing lights were used to illuminate the Pont de Normandie.

The frequencies of the flashing lights can be programmed in various stages and the light sequences adjust themselves to the level of traffic on the bridge: a lot of traffic – fast sequences, little traffic – slow sequences.

Due to the varying light sequences, the light installation has become a real attraction that draws in and captivates tourists.

Le Havre - Honfleur, France
Pont de Normandie

Quadro R-ST

In honour of the Sino-European Economic Conference in Hamburg in 2004, the organisers wanted to create a special accent and had the Council House lit up in blue. As the icing on the cake, the tower was lit by Pfannenberg Eiffel Tower flashing lights, thus captivating the observers with the famous Champagne sparkle.

Many citizens and visitors described the project, which could be seen from afar, as innovative and, as the light artist Michael Batz, who arranged the lights, said: "on a par with large cities such as Paris or New York".

Hamburg, Germany
Council House

FLASHING LIGHTS 10 J
Quadro R / Quadro R-ST

Quadro R

- art illumination inside and outside buildings, even under the toughest of conditions
- with instant sparkling effect

Quadro R-ST (additional)

- equipped with industrial plug connectors for simple mounting
- one plug connector each for input and output, thus the devices can be connected in a row

IP 66	IP 67	IK 08	+ 55 °C - 40 °C
Protection system	Protection system	Impact-proof housing	Operating temperature

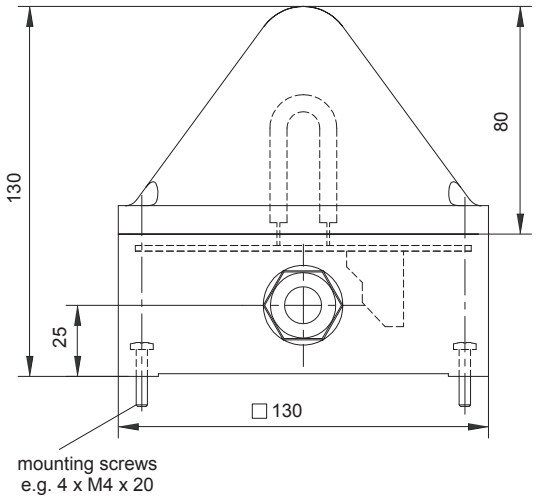
Electrical data	Quadro R	Quadro R-ST
Rated voltage	230 V AC	230 V AC
Rated frequency	50 / 60 Hz	50 / 60 Hz
Operating range	195 V – 253 V	195 V – 253 V
Nominal current consumption	85 mA	85 mA

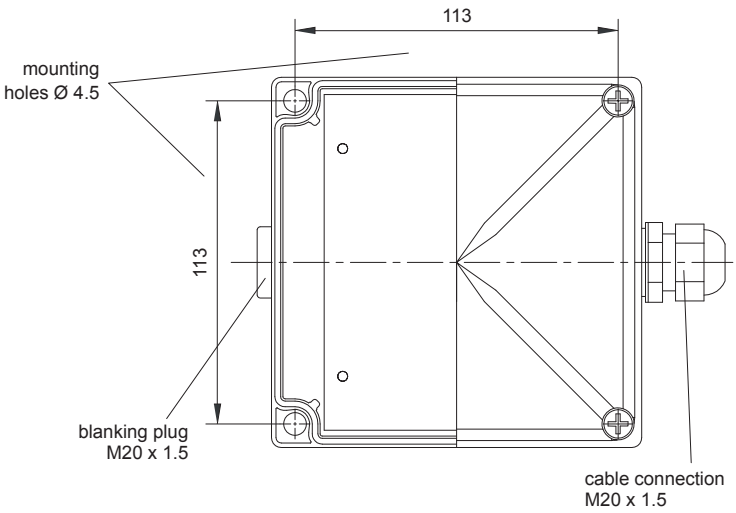
Mechanical data		Quadro R	Quadro R-ST
Flash rate		22 – 28 flashes/min.	
Flash energy		10 J	
Light intensity (DIN 5037) [1]		124 cd	
Lens colours		clear, white, yellow, amber, red, green, blue	
Operating temperature		- 40 °C ... + 55 °C	
Storage temperature		- 40 °C ... + 70 °C	
Relative humidity		100%	
Protection system according to EN 60529		IP 66, IP 67, mounting arbitrary	
Impact resistance as per EN 50102		IK 08	
Protection class		II	
Duty cycle		100%	
Service life of the flash tube		light emission still 70% after 10,000,000 flashes	
Material	lens	polycarbonate (PC)	
	housing	polycarbonate (PC), RAL 7035	
Type of connection		screw clamps 2.5 mm²	2 x plug connectors (input/output)
Cable entry		2 x M20	
Mounting	external lugs	113 x 153 mm – M5 or 127.1 x 127.1 mm – M5	
	internal holes	113 x 113 mm	
Weight		600 g	

[1] with a clear lens

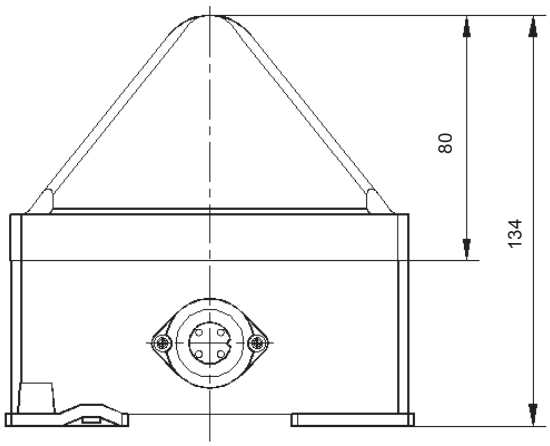
Dimensions

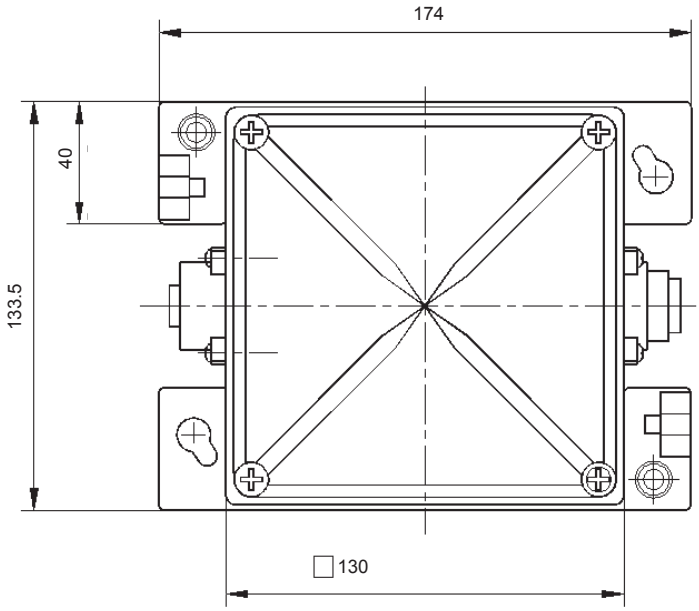
Quadro R





Quadro R-ST





Ordering details

Article numbers		Quadro R	Quadro R-ST
Lens colour	**Rated voltage**	230 V AC	230 V AC
clear		291 23 10 1 005	291 24 10 1 000

Article numbers for other colours on request

Options / Accessories

GOST

FLASHING LIGHT 10 J
Quadro A-DMX

- DMX-Controller for the individual controlling of each individual light in the system by means of a DMX-Bus system
- can be directly controlled by means of the standard DMX-Master
- rugged plug connectors for power supply and DMX-Bus (inlet and outlet)

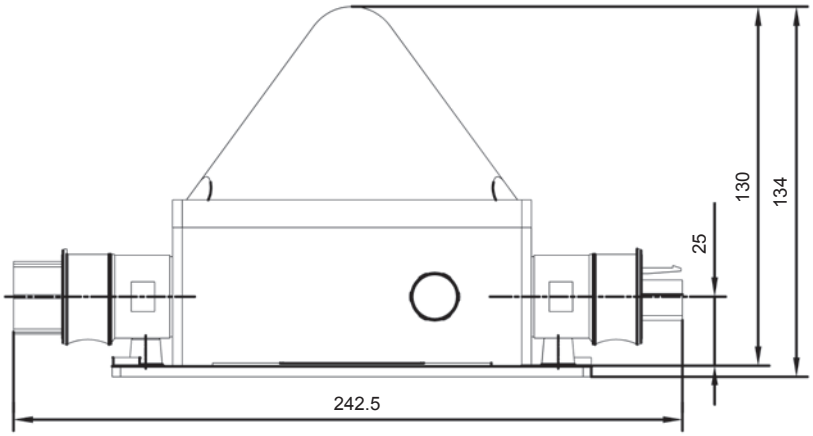
Protection system | Protection system | Impact-proof housing | Operating temperature

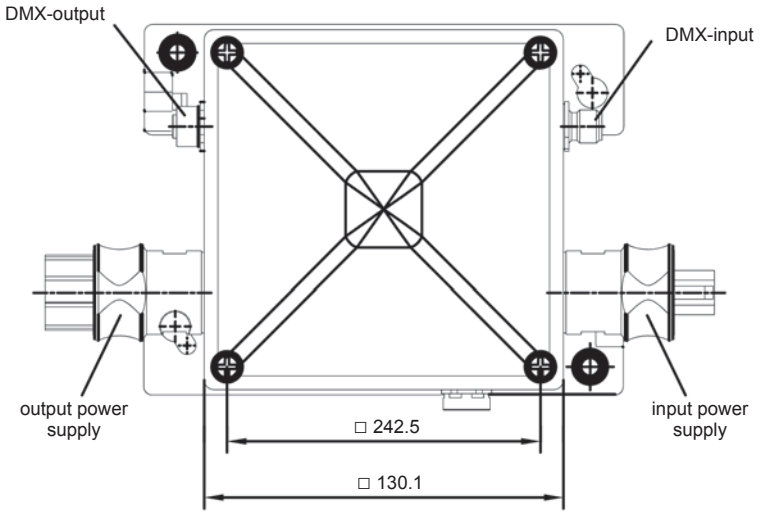
Electrical data	Quadro A-DMX
Rated voltage	230 V AC
Rated frequency	50 / 60 Hz
Operating range	195 V – 253 V
Nominal current consumption	280 mA @ 1 Hz
Initial current limited to	< 1 A

Mechanical data		Quadro A-DMX
Flash rate		≤ 2 Hz
Flash energy		10 J
Light intensity (DIN 5037) [1]		124 cd
Lens colours		clear, white, yellow, amber, red, green, blue
Operating temperature		- 30 °C ... + 60 °C
Storage temperature		- 40 °C ... + 70 °C
Relative humidity		100%
Protection system according to EN 60529		IP 66, IP 67, mounting arbitrary
Impact resistance as per EN 50102		IK 08
Protection class		II
Duty cycle		100%
Service life of the flash tube		light emission still 70% after 10,000,000 flashes
Material	lens	polycarbonate (PC)
	housing	polycarbonate (PC), RAL 7035
Type of connection		2 x plug connectors for operation voltage 2 x plug connectors for Bus-connection
Cable entry		2 x M20
Mounting	external lugs	113 x 153 mm – M5 or 127.1 x 127.1 mm – M5
	internal holes	113 x 113 mm
Weight		600 g

[1] with a clear lens

Dimensions





Ordering details

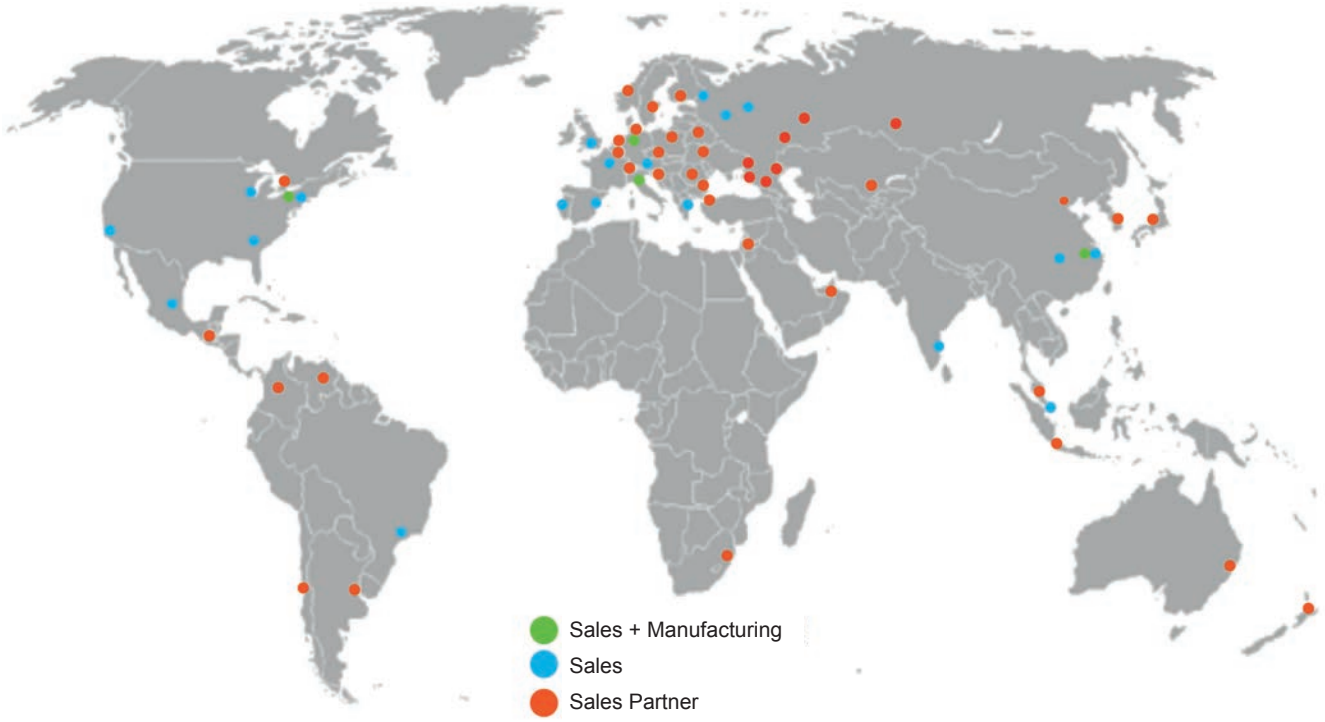
Article numbers		Quadro A-DMX
Lens colour	**Rated voltage**	230 V AC
clear		291 25 10 1 000

Article numbers for other colours on request

Options / Accessories

GOST

PFANNENBERG – WORLDWIDE EXPERTISE IN THERMAL MANAGEMENT AND SIGNALING TECHNOLOGY



Pfannenberg Group Holding GmbH
Werner-Witt-Straße 1
21035 Hamburg
Phone: +49 40 7 34 12 - 0
Telefax: +49 40 7 34 12 - 101
info@pfannenberg.com

Factories:

Pfannenberg GmbH
Werner-Witt-Straße 1
21035 Hamburg
Germany

Pfannenberg Inc.
68 Ward Road
Lancaster, N.Y. 14086
USA

Pfannenberg Italia s.r.l.
Via la Bionda, 13
43036 Fidenza (PR)
Italy

Pfannenberg (Suzhou) Pte Ltd
5-1-D, No. 333 Xingpu Rd., SIP
Suzhou 215021, Jiangsu
P.R. China

SUPPORT ORGANISATIONS – INTERNATIONAL

Asia
Pfannenberg Asia Pacific Pte Ltd
61 Tai Seng Avenue
B1-01 UE Print Media Hub
Singapore 534167
Phone: +65 6293 9040
Telefax: +65 6299 3184
info@pfannenberg.com.sg

Australia
Control Logic Pty Ltd
25 Lavarack Avenue, Eagle Farm
Queensland 4009
Phone: +61 7 36231212
Telefax: +61 7 36231211
michaelb@control-logic.com.au

Austria
Pfannenberg GmbH
Markus Zenz
Mobile: +43 664 245 1333
markus.zenz@pfannenberg.com

Belgium
I E x T n.v.
Heiveldekens 8
2550 Kontich
Phone: +32 3 458 2741
Telefax: +32 3 458 2761
info@iext.be

Brazil
Pfannenberg do Brasil
Indústria e Comércio Ltda.
Rod. SP-73, 4509
NR Condominio - Galpão 11
Indaiatuba, SP - 13347-390
Phone: +55 19 3935 7187
Telefax: +55 19 3935 7187
info@pfannenberg.com.br

Bulgaria
EUROTRADE-X LTD.
2, Konstantin Velichkov str. - office 2
RILON CENTER
4000 Plovdiv
Phone: +359 32 260911
Telefax: +359 32 260935
office@eurotrade-x.com

Canada
Pfannenberg Inc.
68 Ward Road
Lancaster, N.Y. 14086, USA
Phone: +1 716 685 6866
Telefax: +1 716 681 1521
info@pfannenbergusa.com

China
Pfannenberg (Suzhou) Pte Ltd
First Floor, Unit D, Block 5
Modern Industrial Park
No. 333 Xingpu Rd.,
Suzhou Industrial Zone
Suzhou 215021, Jiangsu Province
Phone: +86 512 6287 1078
Telefax: +86 512 6287 1077
info@pfannenberg.cn

Colombia
Ingepro Ltda.
Compania Importadora Comercial
Av. Eldorado No. 84A-55
Local 118 A.A.
95406 Santa Fe de Bogota D.C.
Phone: +57 1 410 2621
Telefax: +57 1 295 2581

Croatia
Elektro Partner d.o.o.
Slavonska Avenija 24/6
10000 Zagreb
Phone: +385 1 618 4793
Telefax: +385 1 618 4795
elektropartner@zg.t-com.hr

Czech Republic
Weidmüller, s.r.o.
Lomnickeho 5/1705
140 00 Praha 4
Phone: +420 244 001 400
Telefax: +420 244 001 499
office@weidmueller.cz

Denmark
GasDetect
Stensgårdvej 2
5500 Middelfart
Phone: +45 4242 5070
info@gas.dk

Estonia / Finland
Autrosafe OY
Uranuksenkuja 10
01480 Vantaa, FIN
Phone: +358 9 2709 0120
Telefax: +358 9 2709 0129
autrosafe@autrosafe.fi

France
AE & T Applications Electroniques
& Techniques
4, Impasse Joliot Curie - BP 25
64110 Jurancon
Phone: +33 5 5906 0600
Telefax: +33 5 5906 4463
info@aet.fr

Greece
Pfannenberg Italia s.r.l.
Via La Bionda, 13
43036 Fidenza (PR), I
Phone: +39 0524 516 711
Telefax: +39 0524 516 790
info@pfannenberg.it

Gulf Region
Golden Sands Trading Co LLC
Post Box 26820
Level 35, Citadel Tower
Business Bay
Dubai
Phone: +971 4 457 2122
Telefax: +971 4 457 2144
vasu2000@emirates.net.ae

Honduras
Cilasa
Angel Mena
Barrio Los Andes
7 Calle, 14 Y15 Ave. N.O.
San Pedro Sula
Phone: +504 557 1146
angel.mena@iecilasa.com

Hungary
Weidmüller Kft.
Gubacsi út 6
1097 Budapest
Phone: +36 1 382 7700
Telefax: +36 1 382 7701
info@weidmueller.hu

India
Pfannenberg India
30/53 Kalaimagal Nagar II Main Road
Ekkaduthangal
Chennai 600 032
Phone: +91 98410 45814
jaya.u@pfannenberg.com.sg

Indonesia
PT Guna Elektro
GAE Electrical & Mechanical Products
Jl. Arjuna Utara 50
Jakarta Barat 11510
Phone: +62 21 565 5010
Telefax: +62 21 568 5030
info@gae.co.id

Ireland
Pfannenberg (UK) Ltd.
Unit 6C Aspen Court
Bessemer Way
Centurion Business Park
Rotherham S60 1FB, UK
Phone: +44 1709 36 4844
Telefax: +44 1709 36 4211
info@pfannenberg.co.uk

Israel
ATEKA LTD.
Simtat Ha Tavor 4
Industrial Area Segula
Petach-Tikva 49691
Phone: +972 073 200 1311
Telefax: +972 3 924 3273
marketing@ateka.co.il

Italy
Pfannenberg Italia s.r.l.
Via La Bionda, 13
43036 Fidenza (PR)
Phone: +39 0524 516 711
Telefax: +39 0524 516 790
info@pfannenberg.it

Japan
Pfannenberg Asia Pacific Pte Ltd
61 Tai Seng Avenue
B1-01 UE Print Media Hub
Singapore 534167
Phone: +65 6293 9040
Telefax: +65 6299 3184
info@pfannenberg.com.sg

Kazakhstan
Electric Light
Auezova str. 84, office 310
050008 Almaty
Phone: +7 727 245 3535
Telefax: +7 727 245 3581
wgm@wgm.kz

Korea
Pfannenberg Asia Pacific Pte Ltd
61 Tai Seng Avenue
B1-01 UE Print Media Hub
Singapore 534167
Phone: +65 6293 9040
Telefax: +65 6299 3184
info@pfannenberg.com.sg

Malaysia
A-Comk Techniques Sdn Bhd.
1257-0-6 Capitol Industrial Centre,
Batu 6-3/4, Jalan Sungai Besi, 57100
Kuala Lumpur, West Malaysia
Phone: +603 9056 3502
Telefax: +603 9056 3504
sales@acomk.com

Mauritius
Mubelo Electrical Ltd
Office 26, Gateway building
St. Jean Road
Quatre Bornes
Phone: +230 4670 989
Telefax: +230 465 4051
mubelo.electrical@orange.mu

Netherlands
Electromach bv
Jan Tinbergenstraat 193
7559 SP Hengelo
Phone: +31 74 2 472 472
Telefax: +31 74 2 435 925
info@electromach.nl

New Zealand
Carrel Electrade Ltd
661 Great South Road
Penrose, Auckland 1061
Phone: +64 9 525 1753
Telefax: +64 9 525 1756
sales@carrel-electrade.co.nz

Norway
Marin Supply A S
Banklokka 12
3183 Horten
Phone: +47 3308 3308
Telefax: +47 3308 3309
info@marinsupply.no

Philippines
GSPECS Industrial Corporation
179-W 24th avenue
East Rembo
Makati City, Philippines 1216
Phone/Telefax: +632 738 0328
sales@gspecs.com.ph

Poland
Pfannenberg GmbH
Andrzej Kushka
Phone: +48 667 414 147
andrzej.kushka@pfannenberg.com
Olga Kozłowska
Phone: +48 665 414 199
Telefax: +48 227 230 662
olga.kozlowska@pfannenberg.com

Automatech Sp.z o.o.
Biuro-Warszawa
ul. Ewy 2
05-816 Opacz-Kolonia
Phone: +48 22 7532 480
Telefax: +48 22 7532 490
biuro.warszawa@automatech.pl

Portugal
Pfannenberg Italia s.r.l.
Via La Bionda, 13
43036 Fidenza (PR), I
Phone: +39 0524 516 711
Telefax: +39 0524 516 790
info@pfannenberg.es

Romania
R.T.S. Electro
11, Petru Rares Street
011101 Bucharest 1
Phone: +40 21 260 1021
Telefax: +40 21 222 3097
office@rtselectro.ro

Russia
Pfannenberg OOO
Novoroschinskaya ul., 4
office 1030-1
196 084 St. Petersburg
Phone: +7 812 612 8106
Telefax: +7 812 612 8106
info@pfannenberg.ru

Slovakia
Elektris s.r.o.
Elektrarenska 1
831 04 Bratislava
Phone: +421 2 4920 0111
Telefax: +421 2 4920 0199
bratislava@elektris.sk

Slovenia
Elektrospoji d.o.o.
Stegne 27
1000 Ljubljana
Phone: +386 1 511 3810
Telefax: +386 1 511 1604
info@elektrospoji.si

South Africa
Voltex (Pty) Ltd
T/A Phambili Interface
5 Bundo Road, Sebenza
Edenvale, 1610
Phone: +27 11 452 1930
Telefax: +27 11 452 6455
alockyer@weidmuller.co.za

Spain
Pfannenberg Italia s.r.l.
Via La Bionda, 13
43036 Fidenza (PR), I
Phone: +39 0524 516 711
Telefax: +39 0524 516 790
info@pfannenberg.es

Sweden
Pfannenberg GmbH
Jim Larsen
Mobile: +46 708 878 181
jim.larsen@pfannenberg.com

Weidmüller AB
Box 31025
200 49 Malmö
Phone: +46 7714 30044
Telefax: +46 4037 4860
kundservice@weidmuller.se

Switzerland
Carl Geisser AG
Hungerbüelstrasse 22
8500 Frauenfeld
Phone: +41 44 806 6500
Telefax: +41 44 806 6501
info@carlgeisser.ch

Thailand
ND Electric Company
338/139 Soi Lat Phrao 80
Lat Phrao Rd., Wang Thong Lang
Bangkok 10310
Phone: +66 2539 6430
Telefax: +66 2539 4655
info@ndelectric.co.th

Turkey
Endaks
Endustriyel Aksesuarlar LDT.STI.
Perpa Ticaret Merkezi
A Blok Kat 5 No. 292
34384 Okmeydani - Istanbul
Phone: +90 212 222 2275
Telefax: +90 212 220 1047
info@endaks.com

Ukraine
TEKO INTERFACE TOB
1) Ul Urlitzkogo 13
09100 Bila Zerkwa
Phone: +38 04563 46580
Telefax: +38 04563 46581

2) Ul. Lebanewskogo 6
03058 Kiev
Phone: +38 044 374 0640
Telefax: +38 044 374 0642

United Kingdom
Pfannenberg (UK) Ltd.
Unit 6C Aspen Court
Bessemer Way
Centurion Business Park
Rotherham S60 1FB
Phone: +44 1709 36 4844
Telefax: +44 1709 36 4211
info@pfannenberg.co.uk

United States of America
Pfannenberg Inc.
68 Ward Road
Lancaster, N.Y. 14086
Phone: +1 716 685 6866
Telefax: +1 716 681 1521
info@pfannenbergusa.com

Venezuela
SOMERINCA, C.A.
Qta Corazon de Jesus
4ta Transversal c/c El Carmen.
Los Dos Caminos
Caracas 1070 A
Phone: +58 212 235 1081
Telefax: +58 212 239 9341
klocmoeller@cantv.net

Pfannenberg
ELECTRO-TECHNOLOGY FOR INDUSTRY

Pfannenberg Group Holding GmbH
Werner-Witt-Straße 1 • 21035 Hamburg, Germany
P. O. Box 80 07 47 • 21007 Hamburg, Germany
Phone +49 40 73412 0 • Fax +49 40 73412 101
info@pfannenberg.com • www.pfannenberg.com

075000224

Deliveries are made on the basis of the General Terms and Services of the ZVEI (Central Association of Electrical Engineering and Industry) Subject to technical amendments and misprints. This paper has been manufactured from chlorine-free bleached cellulose.