apollo

APOLLO POCKET GUIDE

VISUAL ALARM DEVICE DESIGN & APPLICATIONS

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Consult datasheets for further technical information

apollo-fire.co.uk/search/?query=VAD

Information in this guide is given in good faith, but Apollo Fire Detectors cannot be held responsible for any omissions or errors. The company reserves the right to change specifications of products at any time without prior notice.

Please use this guide in conjunction with LPCB CoP 0001 Code of Practice For Visual Alarm Devices Used for Fire Warning and BS 5839-1 and any other local applicable standards.

INTRODUCTION

Apollo has developed a range of addressable loop powered products which cover all three Visual Alarm Device (VAD) categories “Wall”, “Ceiling” and “Open” that are fully certified to BS EN 54-23.

For power-limited loops, consider Apollo’s Sounder Control Unit with Conventional VADs. Or go wireless with Apollo’s REACH Wireless, a battery-powered hybrid wireless solution.

VADs are required where risk assessment dictates that a Visual Alarm Device is required as a primary means of evacuation. Apollo’s range of Visual Indicators are still available for areas where a visual warning is required as a secondary means of notification.

For guidance on installation of VADs please refer to your local codes of practice such as BS 5839-1, LPCB CoP0001.

BS EN 54-23 EXPLAINED

BS EN 54-23 is the part of the BS EN 54 European product standard which addresses Visual Alarm Devices (VADs). The four main requirements are:

- The illumination level
- The flash rate
- The flash colour
- The installation category, i.e. the area covered by the flash.

The **illumination level** is required to be at least 0.4 lux in the whole area covered by the VAD.

The **flash rate** is set at 0.5 Hz to 2 Hz and all devices are synchronised (Apollo devices maximum flash rate is 1Hz).

The **flash colour** is red or white only.

The **Installation Category** is a new concept and refers to the shape of the area illuminated by the VAD. The shape is determined by the mounting surface onto which the VAD is installed.

The three categories are:

- Ceiling mounted – Category 'C'
- Wall mounted – Category 'W'
- Open class – Category 'O'

Other considerations when designing VADs into a system include:

- Size of the room
- Ambient light
- Direct or indirect viewing of the device
- Usage and occupation
- Environmental conditions

APOLLO TECHNOLOGY

High quality optical components are paramount when creating efficient VADs. Apollo has designed a range of highly efficient lenses to ensure our new VADs are certified to BS EN 54-23.

Apollo's extensive in-house test facilities have enabled our engineers to make accurate measurements and perform situational testing of the lenses.

Apollo uses a VADER system that enables us to do in-house light coverage volume testing (specifically BS EN 54-23 clause 5.3.1) on all VAD products. A two turntable setup is used to perform the measurements at the correct alpha and beta rotations with a calibrated light meter the appropriate distance away.

All measurement data is fed back to the control PC, which has a specially designed in-house software program, to enable the engineer to create a 3D plot of the coverage volume whilst recording all results.

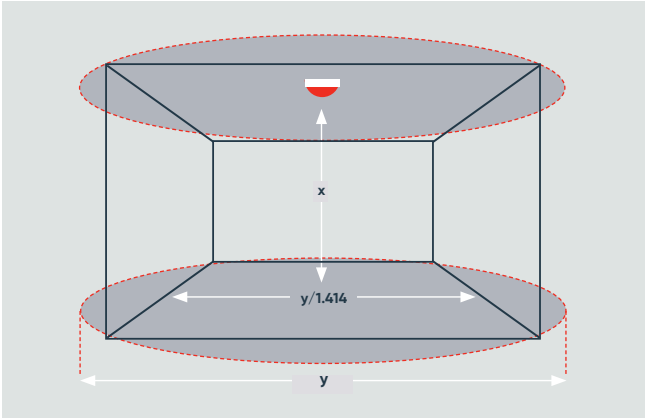
APPLICATIONS

Typical situations where VADs would be required to comply with the UK Equalities Act*, the Building Regulations and other Codes of Practice, such as BS 5839-1, LPCB CoP 0001 Code of Practice for Visual Alarm Devices Used for Fire warning include:

- Visual warning for persons with impaired hearing, including bedrooms, sleeping accommodation, hotels and student accommodation
- Areas of high ambient noise, noise levels exceeding 85 dB or where people wear ear defenders
- Staff restricted warning systems
- Nursing homes or hospitals
- Certain public assembly buildings
- Broadcast studios
- All sanitary accommodation (not just WCs)
- Anywhere where people with impaired hearing are likely to be alone, such as isolated offices.

* The UK Equality Act 2010 legally protects people from discrimination in the workplace and in wider society. Always refer to a buildings risk assessment (required under the Regulatory Reform (Fire Safety) Order) for guidance of where VADs are required.

CEILING CATEGORY VADS



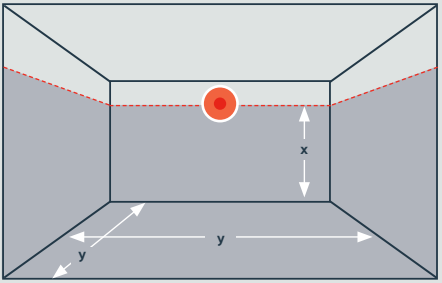
The coverage volume code should be presented as C – x – y.

- **x** is the maximum mounting height
- **y** is the diameter in metres of the cylindrical coverage volume

If the VAD is approved to be installed at 3 m and has a coverage diameter of 8.5 m it would be referred to as C-3-8.5.

Example: Square area coverage conversion calculation, where y = 8.5 m: y ÷ 1.414 = 6 m sq area coverage.

WALL CATEGORY VADS



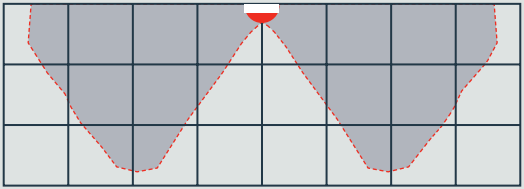
The coverage volume code should be presented as W – x – y.

- **x** is the maximum mounting height
- **y** is the width of the square volume covered (in metres) by the device

Note: the minimum mounting height for a wall category device is 2.4 m.

If the VAD is approved to be installed at 2.5m and has a coverage square 7 m x 7 m it would be referred to as W-2.5-7.

OPEN CATEGORY VADS



XP95 Sounder VAD Base – Cross section of the coverage volume.
Each square represents 1m.

Open category allows the manufacturer to specify the coverage volume and gain certification to BS EN 54-23 Category O.

The required illumination of 0.4 lux still applies.

LIGHT LEVELS & VIEWING

Ambient light levels

Ambient light can significantly increase or decrease a VADs coverage:

- The ambient light level should be the maximum anticipated at any time.
- True ambient light level may be reduced by measures such as blinds or curtains on windows.
- A lux metre complying with BS 667 may be used to determine the ambient light level.

Direct or indirect viewing of the device

The occupation and usage of the room should be considered:

- Where possible, site the VADs for direct viewing for all occupants in the area.
- If not possible, consider the minimum illumination on adjacent surfaces.
- If relying on indirect illumination the reflecting surface should be within the coverage area of the VAD.

MULTIPLICATION FACTORS

Multiplication factors should be applied based on ambient light, viewing angle and mounting position.

See the table below for the multiplication factors that should be applied to a VADs rated coverage.

Ambient light level (lux)	Ceiling mount direct view	Ceiling mount indirect view	Wall mount direct view	Wall mount indirect view
<100	2.8	1.3	5.2	1.8
100 to 200	2.4	1.2	4.4	1.7
200 to 300	1.9	1.0	3.2	1.4
300 to 400	1.4	0.8	2.3	1.2
400 to 500	1.1	0.6	1.8	1.0
500 to 600	0.9	0.5	1.3	0.9
600 to 700	0.7	0.4	1.0	0.7
700 to 800	0.5	0.3	0.	0.6

Example: If ambient light is 150 lux and the viewing angle is indirect, the coverage of a C-3-8.5 Ceiling Category VAD can be multiplied by 1.2 increasing the coverage from 8.5 m to 10.2 m.

LOOP POWERED CEILING CATEGORY VADS

The Loop Powered VADs have been developed to comply with BS EN 54-23. VADs are primary or supplementary alarm devices for use in situations where there is a risk that sounders will not be heard. This may be due to high levels of background noise or if occupants have impaired hearing. These are available for both wall and ceiling applications.

Features & benefits

- Synchronisation using the Apollo digital communication protocol
- Can be fitted to any XPERT 7 or XPERT 8 mounting base
- Automatic LED check when VAD activated to monitor for correct operation (fault signal if failed).

For further information please refer to PP2486.

Technical information

Body colour	White or Red
Flash rate	0.5Hz
Flash colour	White or Red
Coverage class	C-3-8 C-3-15
Quiescent Current draw	280µA 16mA (C-3-8) 12.0mA (C-3-8) 29.9mA (C-3-15)

55000-747 Cat C Loop Powered VAD 15m (red body, white flash)

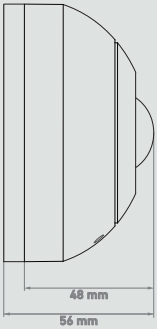
55000-742 Cat C Loop Powered VAD 8m (red body, white flash)

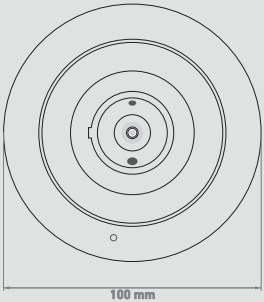
55000-748 Cat C Loop Powered VAD 15m (white body, white flash)

55000-745 Cat C Loop Powered VAD 8m (white body, white flash)

55000-738 Cat C Loop Powered VAD 8m (red body, red flash)

55000-739 Cat C Loop Powered VAD 8m (white body, red flash)





LOOP POWERED WALL CATEGORY VADS

The Loop Powered VADs have been developed to comply with BS EN 54-23. VADs are primary or supplementary alarm devices for use in situations where there is a risk that sounders will not be heard. This may be due to high levels of background noise or if occupants have impaired hearing. These are available for both wall and ceiling applications.

Features & benefits

- Synchronisation using the Apollo digital communication protocol
- Can be fitted to any XPERT 7 or XPERT 8 mounting base
- Automatic LED check when VAD activated to monitor for correct operation (fault signal if failed).

For further information please refer to PP2485.

Technical information

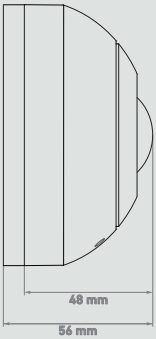
Body colour	White or Red
Flash rate	0.5Hz
Flash colour	White or Red
Coverage class	W-2.4-6
Quiescent	280µA
Current draw	16.0mA

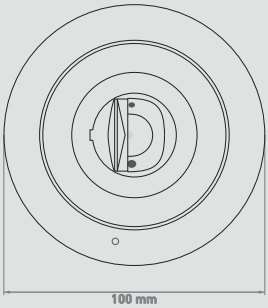
55000-741 Cat W Loop Powered VAD 6m (red body, white flash)

55000-744 Cat W Loop Powered VAD 6m (white body, white flash)

55000-736 Cat W Loop Powered VAD 6m (red body, red flash)

55000-737 Cat W Loop Powered VAD 6m (white body, red flash)





OPEN CATEGORY SOUNDER VAD BASES

The Category O Discovery Sounder VAD Bases combine an BS EN 54-23 Open Category VAD and a sounder on a mounting base. The base offers a choice of 15 evacuation tones, including the Apollo evacuation tone.

The Category O XP95 Sounder VAD Bases combine a loop powered Sounder and a VAD on a standard mounting base. The base is available with Dutch Slow Whoop (NEN2575) and DIN (DIN33404-3) tones.

Features & benefits

- Synchronisation of "Alert" and "Evacuate" tones using the Apollo digital communication protocol
- BS EN 54-3 certified sounder
- Dual volume settings
- Unique VAD and acoustic self test
- Built in short-circuit isolator

For further information please refer to PP2476, PP2478 & PP2489.

Technical information

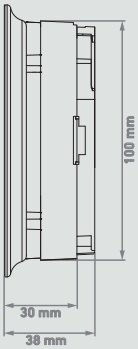
Body colour	White
Flash rate	0.5Hz
Flash colour	White
Coverage class	Open category (see datasheet for further information)

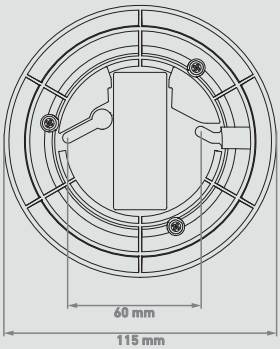
45681-700 Cat O Discovery Sounder VAD Base with Isolator (white body, white flash)

45681-705 Cat O XP95 Sounder VAD Base with Isolator (white body, white flash)

45681-707 Cat O XP95 Sounder VAD Base DIN with Isolator (white body, white flash)

45681-709 Cat O XP95 VAD Base with Isolator (white body, white flash)





FREQUENTLY ASKED QUESTIONS

What exactly is BS EN 54-23?
BS EN 54-23 is the European standard for Visual Alarm Devices, i.e. fire alarm devices, that can be seen rather than heard.

Why is it relevant to my business?
BS EN 54-23 is now part of European Law under the Construction Products Regulation.

Does Apollo have compliant Visual Alarm Devices?
Yes. Apollo has designed and developed VADs to meet BS EN 54-23 standard. The current product offering can also be found on our website: **www.apollo-fire.co.uk/search/?query=VADs**

Does BS EN 54-23 mean that Visual Alarm Devices have to be officially approved?
Yes. All such devices, commonly known as VADs, have to be tested and approved by a "Notified Body", such as BRE or VdS.

What about combined alarms which are both audible and visual?
They have to be certified to both BS EN 54-23 and BS EN 54-3, the standard for sounders.

What is Category O and does it comply with BS EN 54-23?
Category O is a fully approved VAD that has a coverage area specified by the manufacturer.

Can I still use/install the existing range of Visual Indicators?
Yes. Visual Indicators can be used as secondary or supplementary alarm indicators on new installations. Visual Indicators may also be used as spares for existing sites and for small extensions to existing installations.

How does ambient light affect VAD performance?

Refer to the LPCB CoP 0001 Code of Practice for Visual Alarm Devices Used for Fire Warning which includes a Recommended Ambient Light Level table or any other applicable national standards.

How do I identify if a VAD has BS EN 54-23 approval?

An approved product will display the light volume coverage that it can achieve and this will be third party certified. All certificates are available on the Apollo website.

Do I need to install a VAD where I would have previously installed a beacon?

Only if it is required as a means of primary evacuation. A risk assessment would establish where best to install VADs.

Do Apollo offer conventional VADs?

Yes. Apollo has a range of conventional VADs for use in conjunction with Sounder Controller Units and on Sounder Circuits. For our conventional ceiling and wall offering, please visit the Apollo website: **apollo-fire.co.uk/search/?query=VAD**

Can I install as many VADs as visual indicators on the loop?

VADs have a higher current consumption than visual indicators. We recommend that the Apollo loop calculator is used to ensure the loop loading is within limits. The loop calculator can be downloaded from Apollo website: **apollo-fire.co.uk/training-support/tools/loop-calculator/**

KEEPING YOU SAFE FROM FIRE. ALWAYS.

Our purpose is simple; to keep people safe from fire every second of every day.

We specialise in the design and manufacture of high-quality fire detection solutions that protect people from fire in over 100 countries around the world. We are proud to be a part of Halma, a FTSE 50 global group of life-saving technology companies.

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