



SUMMARY

This document is the operation manual for users of the Compact 500 Voice Evacuation System. It explains how to operate the Compact 500 and how to interpret indications. This operation manual is addressed to end users as well as technical personnel, such as service technicians.

REVISION AND APPROVAL

Rev.	Date	Nature of Changes	Approved By
02	05-07-2017	Minor corrections, typos	DD
03	14-01-2018	Backup amp test, bandwidth update	DD
04	04-06-2020	Corrections	TvdH
05	06-03-2023	Swedish key	AJH

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

Table of Contents

1. What does Compact 500 do?	3
2. Configuration settings	3
3. Standalone vs network operation	4
3.1. Standalone system	4
3.2. Network system	4
3.2.1. Global network (G-Net)	4
3.2.2. Local network (L-Net)	5
4. Front Panel	6
4.1. LED indicators	6
4.1.1. POWER	6
4.1.2. EVAC	6
4.1.3. FAULT	7
4.1.4. POWER SUPPLY	7
4.1.5. SYSTEM FAULT	7
4.1.6. NETWORK	7
4.1.7. Zone indicators	8
4.2. Manual controls	9
4.2.1. SILENCE	9
4.2.2. LAMP TEST	9
4.2.3. ZONE selection	9
4.2.4. RESET	9
4.2.5. FUNCTION button	9
5. Integrated fireman mic	10
6. KEY switch for Swedish market	11
7. Technical specifications	12
8. Marking	14

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

Thank you for choosing 4EVAC as your Voice Evacuation System solution.

4EVAC Compact 500 is all-in-one Voice Evacuation System box. The box contains a completely integrated Voice Evacuation System, capable of both standalone and network operation. 4EVAC Compact 500 is certified in accordance with EN54-16 and EN54-4, which are harmonized standards under Construction Products Regulation, mandatory in the European Union.

1. What does Compact 500 do?

Compact 500 is a small form factor Voice Evacuation System which covers full compliance with standards for voice alarm installations, offering features typical for public-address applications at the same time. The primary task of the Compact 500 is to deliver reliable and intelligible transmission of voice alarm messages to the public in emergency situations, such as fire. The secondary task of the Compact 500 is to provide public-address functionalities, such as background music, public announcements or general paging.

Compact 500 is extremely scalable due to its network capabilities and creates a distributed architecture where each unit remains fully operational, even during network failure.

2. Configuration settings

Compact 500 is supplied with a pre-installed micro SD memory card. The memory card contains a complete Compact 500 system configuration file, including audio messages.

The configuration file includes user-defined settings, such as:

- network components,
- zoning,
- audio message files ,
- volume levels,
- hardware related settings,
- system behavior for various triggers, etc.

The configuration file should be prepared in the C500 Manager. The 4EVAC Manager is a GUI software package running on Windows OS. More information about the C500 Manager can be found in the software manual "C500 Manager guide".

 **NOTE:** Please make sure that the configuration file is prepared with the version of the C500 Manager compatible with the firmware of the Compact 500.

The installation file of the latest 4EVAC Manager and the manual are available at our website: www.4EVAC.com

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

3. Standalone vs network operation

4EVAC Compact 500 is capable of both standalone and network operation.

3.1. Standalone system

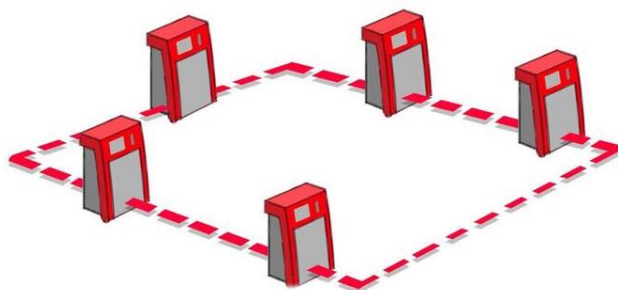
A standalone Compact 500 comprises of a single C500 main unit, which incorporates:

-  Mandatory indications and manual controls
-  System status outputs: EVAC, FAULT, RESET
-  6 monitored EVAC inputs
-  Monitored SILENCE and RESET input
-  8 x GPI
-  8 x GPO
-  Up to 6 loudspeaker lines with EOL monitoring
-  100W or 200W maximum power per line
-  2 analog balanced audio inputs
-  Integrated Fireman Microphone with priority
-  Access key-lock to enable/disable front panel functionality
-  6 programmable zone selection buttons
-  Integrated power supply with battery

3.2. Network system

3.2.1. Global network (G-Net)

G-Net is a redundant network ring where multiple C500 main units may be connected into one system. It is used for reliable data synchronization between all connected devices and for multi-channel live audio transmission with very low latency.

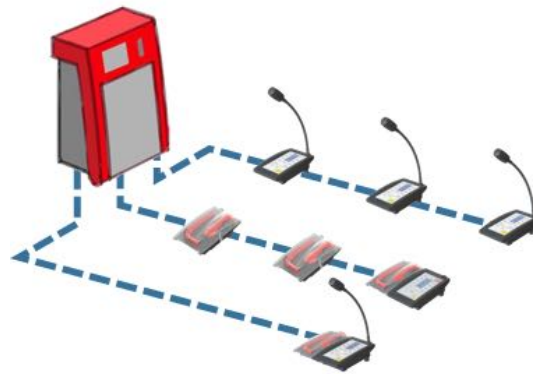


G-Net redundant ring topology

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

3.2.2. Local network (L-Net)

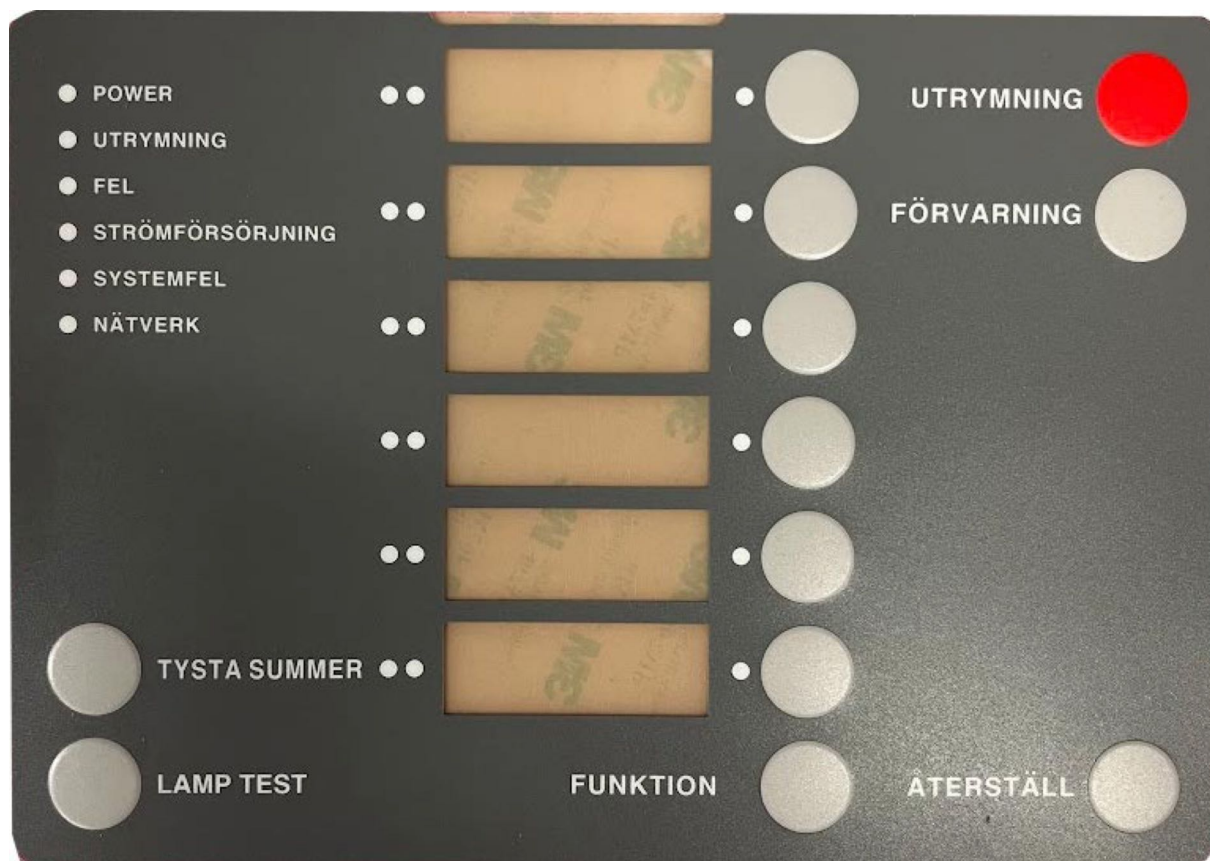
L-Net daisy-chain topology is dedicated for peripheral devices of the main unit, such as remote microphone stations. L-Net is used to expand C500 functionality to remote locations.



L-Net daisy chain topology

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

4. Front Panel



Compact 500 front panel

4.1. LED indicators

4.1.1. POWER

Indicates the operating status of the C500.

-  Continuous: system is powered and ready
-  Blinking fast: system is booting, not ready for full operation

4.1.2. EVAC

Indicates that the system is in the Voice Alarm state, where at least one zone in the system is occupied by an emergency audio signal, i.e. a pre-recorded EVAC MESSAGE or LIVE EVAC, when a fireman mic is being used.

-  Continuous: EVAC state

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

4.1.3. FAULT

Indicates that the system is in the FAULT state (general fault indicator), where at least one device in the system is reporting a fault.



Continuous: when a local fault is detected



Blinking slow: when a local device is healthy and at least one remote device is reporting fault state

4.1.4. POWER SUPPLY

Indicates a power supply fault of the local C500 unit, where at least one of following faults is reported:



Continuous: mains fault



Blinking slow: battery-related fault:

- Loss of battery
- Loss of charger
- Battery resistance too high
- Temperature fault
- Charger communication fault

4.1.5. SYSTEM FAULT

Indicates system fault of the C500 main unit, where:

- The CPU or program execution is stopped or malfunctioning,
- Corruption of storage memory containing config settings and audio files (SD card).
- Front panel is not communicating with main board

Where a system fault is caused by a CPU or memory fault, the C500 remains in "safe state", where critical functions (including audio transmission, reaction on control inputs, etc.) are stopped until the fault is removed.



Continuous:

- CPU / program fault
- front panel fault



Blinking slow:

- SD card fault
- Config file not compatible
- Wrong ID setting

4.1.6. NETWORK

Indicates when any device or link in the network is missing.



Blinking slow:

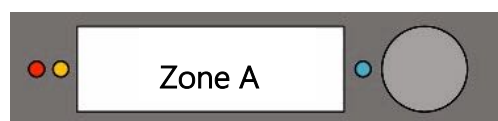
Global ring is broken (any place in the ring)

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

-  Continuous:
At least one device from the network is missing.

4.1.7. Zone indicators

Zone indicators are strictly related to the corresponding zone button. If a button is not attached to any zone, then zone indicators for this button are disabled.



Manual zone control

4.1.7.1. Red

Indicates that the zone is in EVAC condition, where the zone is occupied by one of following audio signals:

-  Continuous: LIVE EVAC
-  Blinking slow: EVAC Message.

4.1.7.2. Yellow

Indicates that the zone is transmitting an ALERT message, and/or is in fault state

-  Continuous: Zone fault (fault of any line / amplifier included in this zone)
-  Blinking slow: Zone is transmitting ALERT Message.

4.1.7.3. Blue

Zone busy / zone selection.

-  Continuous: indicates that the zone is manually selected via zone selection button on local panel
-  Blinking fast: the zone is occupied by audio signal, but is in SILENCE mode (triggered by SILENCE input or manual SILENCE button)
-  Blinking slow: indicates that the zone is currently transmitting an audio signal (except BGM).

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

4.2. Manual controls

4.2.1. SILENCE

Press to mute the sound of the buzzer in the entire system.

4.2.2. LAMP TEST

Press to verify visual (LEDs) and audible indications (buzzer) of the front panel of local C500.

4.2.3. ZONE selection

Press to select a zone. Press again to deselect.

NOTE: Zone selection will clear automatically after timeout defined in the configuration settings.

4.2.4. RESET

Press to clear your current zone selection.

4.2.5. FUNCTION button

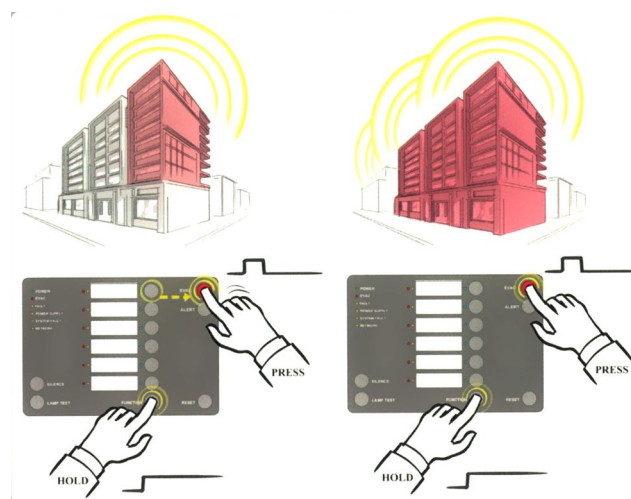
Press and hold the FUNCTION button to enable Access level 2. In access level 2 you are able to manually change the status of the system by triggering voice alarm message or resetting the system.

NOTE: Press FUNCTION button first and hold it down while pressing another button.

4.2.5.1. FUNCTION + EVAC / FUNCTION + ALERT

Use this combination in order to trigger the EVAC or ALERT message on the previously selected zones.

If no zones are selected, this will trigger EVAC or ALERT to all zones accessible from local front panel.



Triggering manual EVAC

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

4.2.5.2. FUNCTION + SILENCE

Use this combination to trigger the silence instruction to the previously selected zones. If no zones are selected, this silences on all zones accessible from local front panel.

NOTE: If any EVAC input is active during manual zone silence the activation trigger will override SILENCE mode.

4.2.5.3. FUNCTION + RESET

Use this combination to reset the Compact 500 system. In a network system this will reboot the entire network. If the reset was triggered successfully, all local LED indicators should start a fast-blinking sequence during reboot.

4.2.5.4. FUNCTION + LAMP TEST

Use this combination to trigger the backup amplifier test. This test sequence will simulate an amplifier fault for each local amplifier channel, one by one, forcing the backup amplifier to engage and take over the channel where the fault is simulated. The sequence will be displayed on the front panel ZONE LEDs.

NOTE: the backup amplifier test can be triggered only if C500 has backup amplifier enabled.

5. Integrated fireman mic

The front panel of the C500 is equipped with a Fireman Microphone. Take out the handheld microphone and press the PTT button and enable LIVE EVAC signal transmission to all zones available on the local panel. This signal is a top priority audio stream and will override any other type of audio signal in the system.

If any zone was previously selected, you will start transmitting to selected zones only.

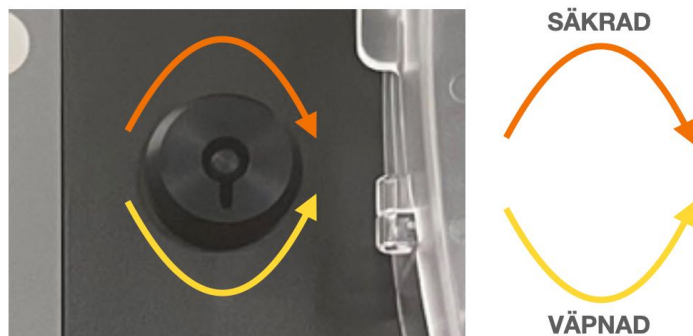
Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

6. KEY switch for Swedish market

The C500 may be optionally equipped with a security key-switch on the front panel.



The key switch disables/enables the FUNCTION button and the PTT button of the fireman mic. Thus the access level is protected with an additional step.



The key switch is under surveillance, so in case of electrical or mechanical failure, the key switch fault is reported,

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

7. Technical specifications

Standalone system

Number of zones	max. 6 local zones
Maximum total loudspeaker load	600 W RMS (420W RMS pure sinewave according to EN54-16)
Power amplifiers	6 x 100 W, modular (2 channels per module), bridgeable up to 3 x 200 W
Standby power amplifiers	2 x 100 W / 1 x 200 W dedicated backup amplifiers
Loudspeaker line monitoring	
Built-in	20kHz AC monitoring with EOL module, short/open/impedance deviation
Loopdrive	loop DC monitoring with short-circuit isolators, short/open/earth leakage, EN54-17 certified
Loudspeaker type	with 100V step-down transformer
Voice messages	
Storage	max. 16 audio files x 1 minute each, micro-SD card with content monitoring
Message player	Max. 2 simultaneous local message playback
Controls and indications	
General controls / indications	Lamp test button, silence button, power, evac, general fault LED indicators
Fault indications	Power supply, system fault, network, zone fault
Zone controls / indications	6 x configurable zone selection button, zone EVAC/FAULT/BUSY LED indicators
Evac manual control	EVAC message, ALERT message, SILENCE, RESET, fireman mic with PTT button
Fireman microphone	Integrated Fireman Mic with priority and electrical monitoring
Power supply equipment	Built-in power supply system, EN 54-4 certified.
AC supply	110 – 230 V AC, 50/60Hz
AC current consumption	max. 5.3A @115V AC / 2.65A @230V AC
Inrush current	20A @115V AC, 40A @230V AC
Power supply protection	Overload current limiting, over voltage shutdown, over temperature shutdown.
Battery requirements	
Type	Sealed, rechargeable lead-acid battery for stationary use
Capacity	10 – 55 Ah
Charging time (80% capacity)	< 24 h
Rated voltage	24 V DC (2 x 12V)
Battery dimensions	2 batteries, each of max. 230 x 138 x 207 mm (LxWxH)
Battery weight	max. total 32.6 kg
Inputs	
2 x BGM	2 x independent balanced analogue in, line-level mono, 22kΩ input impedance
6x EVAC in, 1x SILENCE in, 1x RESET in	monitored logic inputs, 4.7kΩ +10kΩ EOL resistors
8 x GPI	unmonitored logic inputs (pull-down, configurable active low/hi)
Outputs	
EVAC out, FAULT out	Potential-free relay output (configurable NO/NC)
GPO	8 x Open collector output (configurable NO/NC)
Loudspeaker out	6 x 100V transformer output, 20 kHz AC monitoring with EOL
Amplifiers	
Type	Class D
Protection	over load shutdown, over temperature shutdown
Backup amplifiers	2 dedicated backup channels, auto backup at end stage failure, auto restore
Efficiency	80% @ rated power
Output voltage	max. 100V RMS

4EVAC Compact 500 operation manual

Author:

DD

Rated power	100W per channel, 200W bridged
Output bandwidth	50 Hz – 20 kHz
SNR	>80 dB
THD + N	0.1% @ rated power
Audio	
Frequency response	
Local BGM	50 Hz – 20 kHz
Messages, network streaming	100 Hz – 12 kHz
Analog input- output latency	< 10 ms (stand-alone system)
Network audio stream format	24 kHz sampling, ADPCM compressed
Message file input format	24 kHz, 16 bit, mono WAV
DSP features	HP/LP filter, multipoint parametric EQ, delay
Mechanical	
Dimensions (HxWxD)	80 x 52 x 28 cm
Weight (full config, without batteries)	29 kg
Housing material	Steel / ABS
IP rating	IP 30
Mounting	Wall-mounted box

Network system

Max. number of devices in the network	255
Max. number of zones	255
Max. total system output power	102 kW
Number of simultaneous network audio channels	2
Network audio transmission latency	0.3 ms per device
Local network	
Architecture	Master-slave, up to 16 slave devices per C500 main unit
Connection	3 x L-Net port, RJ-45, powered daisy chain, digital audio & control data
Cabling	X-over FTP CAT5e (or higher)
Current consumption	max. 500 mA (up to 8 slave devices) per L-Net port,
Max. length of local bus	
default	250 m
with twisted-pair extender	500 m
Global network	
Architecture	Peer-to-peer, up to 255 C500 main units
Connection	2 x G-Net port, RJ-45, powered redundant ring, digital audio & control data
Cabling	X-over FTP CAT5e (or higher) / multimode optical fiber
Current consumption	max. 500 mA per port, reserved only for network extenders
Max. distance between devices	
default	250 m
with copper extenders	750 m
with fiber extenders	2500 m

All information provided in this document is subject to change without notice. 4EVAC may also make improvements and/or changes in the products described in this information at any time without notice.

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

8. Marking

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
OD16.48 4EVAC Compact CE Declaration of Performance	Author:	DD
	Design revision:	V2.0
	Document revision	7



Declaration of Performance

No. 0560-CPR-152190001/01

1. Unique identification code of the product-type:	Compact 500
2. Type, batch or serial number or other identification	<i>see Page 3 of this document, see marking on the product components</i>
3. Intended use:	Distributed networked voice evacuation system / public address / fire safety
4. Manufacturer:	Hacousto Holland b.v. Industrieweg 87, 2651BC Berkel en Rodenrijs Netherlands
5. <i>not applicable</i>	
6. System or systems of assessment:	System 1
7. Construction product covered by a harmonised standard:	EN 54-4:1997/A1:2002/A2:2006 EN 54-16:2008
Notified Body:	Telefication B.V. Edisonstraat 12A, 6902PK Zevenaar Netherlands
with the Notified Body number	0560
performed	Determination of the product-type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product, Initial inspection of the manufacturing plant and of FPC, Continuous surveillance, assessment and evaluation of FPC, Audit testing of samples taken before placing the product on the market
under system	System 1
and issued Certificate of Constancy of Performance	0560-CPR-152190001/01
8. <i>not applicable</i>	
9. Declared performance:	

EN 54-4:1997/A1:2002/A2:2006 Fire Detection and Fire Alarm Systems – Power Supply Equipment

Essential characteristics	Performance	Harmonised technical specification EN54-4:1997/A1:2002/A2:2006
General requirements	Pass	4
Functions	Pass	5, 9.2, 9.3
Materials, design and manufacture	Pass	6
Performance of power supply	Pass	4, 5, 6
Operational reliability	Pass	4, 5, 6, 7, 8
Documentation	Pass	7
Marking	Pass	8
Durability of operational reliability: Cold (operational)	Pass	9.5
Durability of operational reliability: Damp heat steady state (operational)	Pass	9.6
Durability of operational reliability: Damp heat steady state (endurance)	Pass	9.14
Durability of operational reliability: Impact (operational)	Pass	9.7
Durability of operational reliability: Vibration, sinusoidal (operational)	Pass	9.8
Durability of operational reliability: Vibration, sinusoidal (endurance)	Pass	9.15
Durability of operational reliability: EMC immunity	Pass	9.9

EN 54-16:2008 Fire Detection and Fire Alarm Systems – Voice Alarm Control and Indicating Equipment

Essential characteristics	Performance	Harmonised technical specification EN54-16:2008
General requirements	Pass	4
General requirements for indications	Pass	5
The quiescent condition	Pass	6
Reception and processing of fire signals	Pass	7.1
Indication of the voice alarm condition	Pass	7.2
Audible warning	Pass	7.3
Phased evacuation	Pass	7.5
Silencing and reset of the voice alarm condition	Pass	7.6, 7.7
Voice alarm condition output	Pass	7.9
Reception and processing of fault signals	Pass	8.1
Indication of faults in specified functions	Pass	8.2

Hacousto Holland bv
Industrieweg 87
2651BC Berkel & Rodenrijs



4EVAC Compact 500 operation manual

Author:

DD

Hacousto Holland bv
Industrieweg 87
2651BC Berkel & Rodenrijs



OD16.48 4EVAC Compact CE Declaration of Performance

Author:

DD

Design revision:

V2.0

Document revision

7

Indication of faults related to voice alarm zones	Pass	8.4
System fault	Pass	8.5
Audible indication	Pass	8.6
Reset of fault indications	Pass	8.7
Transmission of the fault warning condition	Pass	8.8
Voice alarm manual control	Pass	10
Interface to external control devices	Pass	11
Emergency microphone(s)	Pass	12
General design requirements	Pass	13.1
Documentation	Pass	13.2
Mechanical design requirements	Pass	13.3
Electrical and other design requirements	Pass	13.4
Integrity of transmission paths	Pass	13.5
Accessibility of indications and controls	Pass	13.6
Indications by means of light emitting indicators	Pass	13.7
Indication colours	Pass	13.9
Audible indications	Pass	13.10
Indicator testing	Pass	13.11
Audio performance	Pass	13.12
Message store	Pass	13.13
Redundant power amplifiers	Pass	13.14
Additional design requirements for software controlled VACIE	Pass	14
Marking	Pass	15
Output power	Pass	16.4
Signal to noise ratio	Pass	16.5
Frequency response of VACIE without microphone(s)	Pass	16.6
Frequency response of VACIE with microphone(s)	Pass	16.7
Cold (operational)	Pass	16.8
Damp heat steady state (operational)	Pass	16.9
Damp heat steady state (endurance)	Pass	16.10
Impact (operational)	Pass	16.11
Vibration, sinusoidal (operational)	Pass	16.12
Vibration, sinusoidal (endurance)	Pass	16.13
Supply voltage variation (operational)	Pass	16.14
EMC immunity: mains supply voltage variations	Pass	16.15 a)
EMC immunity: mains supply voltage dips and interruptions	Pass	16.15 b)
EMC immunity: Electrostatic discharge(operational)	Pass	16.15 c)
EMC immunity: Radiated electromagnetic fields (operational)	Pass	16.15 d)
EMC immunity: Conducted disturbances induced by electromagnetic fields (operational)	Pass	16.15 e)
EMC immunity: Fast transient bursts (operational)	Pass	16.15 f)
EMC immunity: Slow high energy voltage surge (operational)	Pass	16.15 g)

10. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9.
This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.
Signed for and on behalf of the manufacturer by:

A.J van der Hout – BU manager Hacousto Holland bv (4EVAC)

29/10/2019

(place and date of issue)

(signature)

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD

Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
OD16.48 4EVAC Compact CE Declaration of Performance	Author:	DD
	Design revision:	V2.0
	Document revision	7

COMPACT VACIE CPR No. 0560-CPR-152190001/01 – system components

Type designation	Description
4E-SW6	6-channel switching zone expander with EOL surveillance
4E-GPIO	In / out expander
4E-FSC	Multimode optical fibre interface
4E-FMWB	Wall-box fireman's microphone station
4E-FMTC	Dual mode commercial / firemen's microphone station with touchscreen
4E-FMT	Fireman's microphone station with touchscreen
4E-FM	Fireman's microphone station
4E-CMT	Commercial microphone station with touchscreen
4E-CMP	Commercial microphone station with pushbuttons
Loopdrive	Loudspeaker loop surveillance system with short circuit isolators
LDB	Loopdrive Booster
4E-EOL	End Of Line device

COMPACT VACIE – options with requirements

EN54-16	Option
§ 7.3	Audible warning
§ 7.5	Phased evacuation
§ 7.6.2	Manual silencing of the voice alarm condition
§ 7.7.2	Manual reset of the voice alarm condition
§ 7.9	Voice alarm condition output
§ 8.4	Indication of fault related to voice alarm zones
§ 10	Voice alarm manual control
§ 11	Interface to external control device(s)
§ 12	Emergency microphone(s)
§ 13.14	Redundant power amplifiers

Hacousto Holland bv
Industrieweg 87
2651BC Berkel & Rodenrijs



4EVAC Compact 500 operation manual

Author:

DD

Ancillary Functions:

Multiple background music/audio
channels and zone paging

Included (Not mandatory)

Notified body (Test and Certification):

Telefication bv
Edisonstraat 12A
6902 PK Zevenaar
The Netherlands
Notified body number: 0560

Issued:

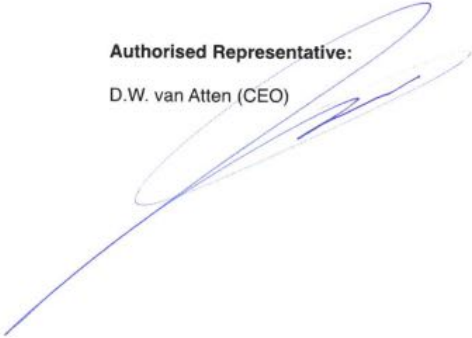
05.03.2017

First placed on the market by:

Hacousto Holland bv (4EVAC)
Industrieweg 87
2651BC Berkel en Rodenrijs
The Netherlands
Telephone: +31 10 5115000
Fax: +31 10 5117520
Email: info@4evac.com

Authorised Representative:

D.W. van Atten (CEO)



Hacousto Holland bv Industrieweg 87 2651BC Berkel & Rodenrijs		
4EVAC Compact 500 operation manual	Author:	DD



4EVAC is a trade name of:

Hacousto Holland bv
Industrieweg 87
2651BC Berkel & Rodenrijs
The Netherlands

www.4EVAC.com