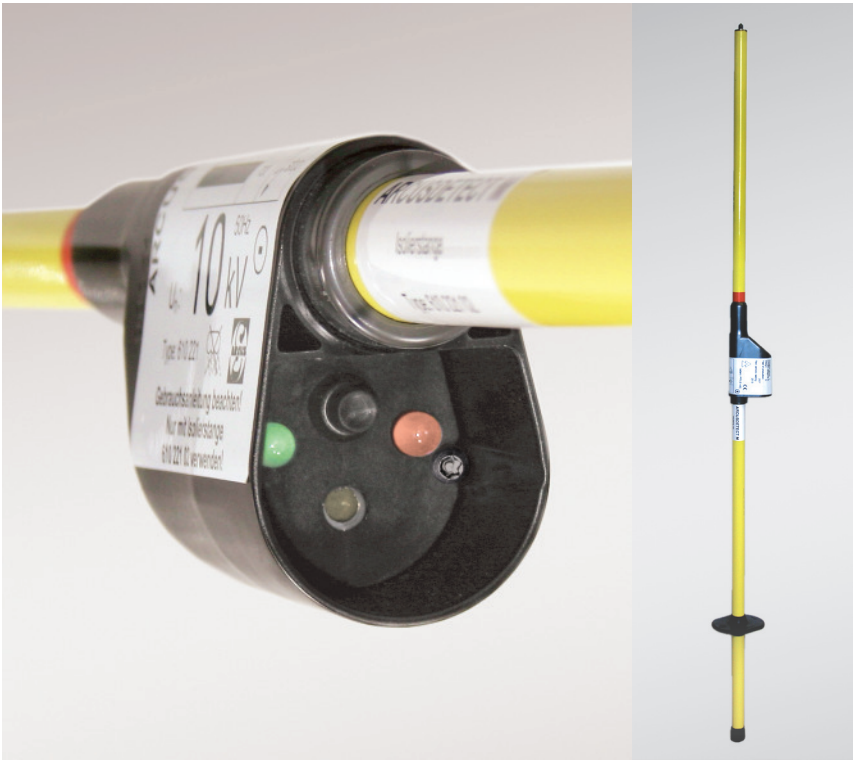
Instruction for use

GA184GB-10.13



High voltage detector
ARCUSDETECT M
16.7 Hz
for effectively single-side isolated 1-phase systems

CONTENTS

This instruction for use, specially its safety information, is to be read and to be observed by everyone before working with the high voltage detector !

Keep this instruction for use to have information available when required.
In case you will hand over the high voltage detector to another person, include the instruction for use !

FIELD OF APPLICATION AND USAGE

General

The high voltage detector is designed to state absence of voltage of electric equipment in effectively single-side isolated 1-phase systems which afterwards are to be earthed and short circuited.

The high voltage detector is to be used only for the nominal voltage or nominal voltage range and frequency of 16,7Hz !

For usage observe EN 50110-1 or standardised safety rules of your country and internal operational instructions to prevent dangers !

Use in type-tested switchgear

Use of high voltage detectors in type-tested switchgear is possible only under certain conditions as the high voltage detector was designed in accordance with the minimum distances and their sparking distance of the protector gap to DIN VDE 0101.

Please contact the manufacturer of the switchgear to find out if and where it is permitted to be used !

Use on contact wires of electric railways

This high voltage detector is not suitable for use on contact wires of electric railways !

SAFETY INFORMATION

Instruction for use: special remarks

Warning !
All warnings are marked with this symbol. Do not ignore any warning. Failure in observance may lead to injuries or death.

Attention !
All safety hints are marked with this symbol. Do not ignore any safety hint. Failure in observance may lead to damage of devices or long-term health damages.

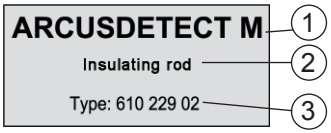
Information !
All information is marked with this symbol. Do not ignore any information. It contains important details to facilitate working and improve apprehension.

Recommendation !
All recommendations are marked with this symbol. They will contain details for optimum usage of the device.

High voltage detector: special remarks

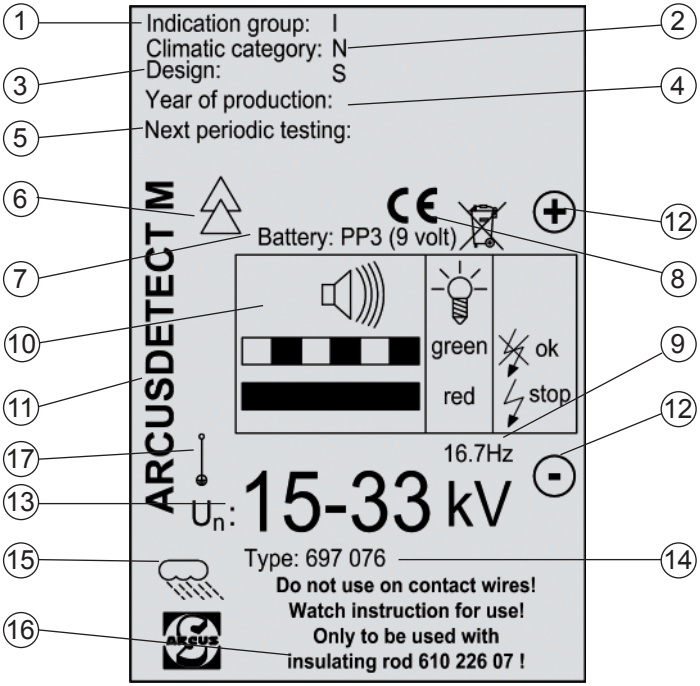
Before use of this high voltage detector, please examine labels for suitability of detector for its intended usage. For simplification symbols are explained as follows:

Label: insulating rod



1. Product name
2. Denomination of insulating rod part
3. Type number of insulating rod part

Label: head part



1. Indication of high voltage detector:
   Group I: Indication with at least two distinct active signals, which give an indication of the condition “voltage present“ and “no voltage present“.
2. Climatic conditions (usage and storage):
   Climatic category: Normal (N)
   Temperature (°C): -25 to +55
   Humidity (%): 20 to 96
3. Design: A high voltage detector with contact electrode extension is marked “Category S“. This tester may be used in substations and on overhead lines.
4. Year of production
5. Date for next periodic testing
6. Marking “suitable for live working“
7. Indication of battery type

8. Marking to Electromagnetic Compatibility (EMC) Directive 2004/108/EEC
9. Information of nominal frequency
10. Explanation of visual and audible[1)] indication
11. Product name
12. Positive and negative pole of battery
13. Information of nominal voltage
14. Type number of high voltage detector
15. Construction: for indoor and outdoor use
     indoor use  outdoor use
16. Assembly information for high voltage detector
17. Net system:  effectively single-side isolated 1-phase system

Required qualification of operating personnel

Operation and maintenance of this high voltage detector is to be carried out only by electricians or specially trained personnel following EN 50110-1 or the standardised safety rules of the respective country. Further it needs to be secured that before start of work the operating personnel was trained for this operation.

Prevention of dangers

The high voltage detector is to be used only for the nominal voltage or nominal voltage range and frequency of 16.7 Hz in effectively single-side isolated 1-phase systems stated on the head part !

Multi-part high voltage detectors are to be used only with their own insulating rod !

The high voltage detector is to be used exclusively for verification of absence of voltage !

Experienced personnel is required for verification of absence of voltage !

Directly before each use high voltage detectors are to be examined for faultless function. The built-in self-test device is destined for this purpose !

[1)] only for Sound-Light models

Prevention of dangers (continued)

High voltage detectors of construction “indoor usage“ are not to be used in case of fog. Precipitation is any kind of weather that causes forming of moisture or drops on the surface of the insulating rod !

High voltage detectors of construction “outdoor usage“ must not remain under voltage for more than 1 min. in case of precipitation !

The high voltage detector is permitted for use with precipitation only when all of its parts (head part and insulating rod) are constructed for outdoor use.

For use the high voltage detector is to be held at the handle L_H (see page 10) only. The high voltage detector is to be operated in a way that the operating person remains at required safety distance to all live switchgear parts !

Absence of voltage at the working place always is to be verified on all phases !

Additional threaded contacts (such as fork contacts for overhead lines) are prohibited in switchgear !

Use of a high voltage detector does not relieve from observance of EN 50110-1 requirements regarding necessary steps to produce and secure a de-energised condition during work on electric installations !

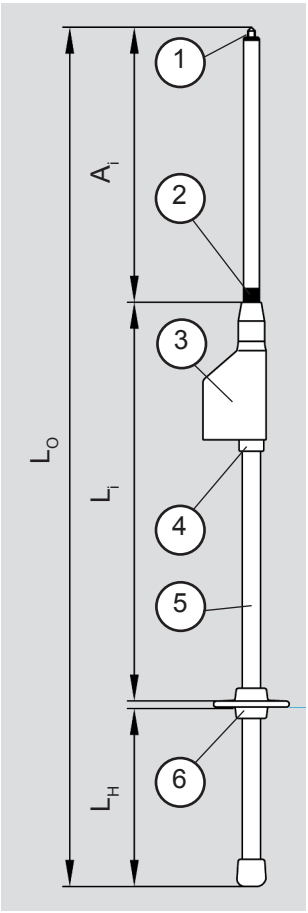
Maintain the high voltage detector well !

Periodic testing to IEC 61243-1, is to be carried out latest after 6 years. The nearest date for periodic testing can be found on the detector label. (see page 7)

Relevant regulations of the professional association are to be observed !

HIGH VOLTAGE DETECTORS IN GENERAL

The high voltage detector is a portable device for verification of presence or absence of operating voltage on the installation part to be tested.
Basically this high voltage detector corresponds to IEC 61243-1. Sole deviation is the altered threshold value for the nominal frequency 16.7 Hz and effectively single-side isolated neutral 1-phase systems.
The high voltage detector consists of several parts split up in handle L_H, insulating part L_i, and an operating head with insertion depth A_i.
At the handle section L_H the high voltage detector is to be held during voltage test.
The section between limit mark (red ring) (2) and hand guard (6) is the insulating part L_i which gives the user the necessary protective distance and sufficient insulation towards the installation part to be tested for absence of voltage.
Insertion depth A_i is located on the high voltage detector between limit mark (red ring) (2) and the contact electrode (1). It eliminates the influence of stray fields on the indicator (3).
The part of the high voltage detector between contact electrode (1) and limit mark (red ring) (2) is permitted to be positioned on earthed or live installation parts.



L_H = Handle
L_i = Insulating part
A_i = Insertion depth
L_o = Total length

1) Contact electrode
2) Limit mark (red ring)
3) Indicator
4) Adaptor
5) Insulating rod
6) Hand guard

Model with visual indication

Features of your high voltage detector:
- visual indication with 2 LEDs (red/green)
- fully-tested contact electrode (VGS)
- simple battery exchange (see page 21)

Model with audible and visual indication

Features of your high voltage detector:
- visual indication with 2 LEDs (red/green)
- acoustic indication with piezo oscillator
- fully-tested contact electrode (VGS)
- simple battery exchange (see page 21)

UNPACKING AND EXAMINATION

The high voltage detector is packed to be protected against normal impact and damage during transport. Unpack and examine the high voltage detector as follows:
- Unpack the high voltage detector and make sure you have received all parts listed on the packing list.
- Examine the high voltage detector for damages from transportation. In case packing is damaged and you have to expect damage or loss of supplied parts, this is to be noted on the delivery documents, otherwise insurance will not pay ! If shipment is packed orderly and parts are damaged or missing, please contact ARCUS Schiffmann.

Recommendation !
Stock all packing material to be available in case the high voltage detector needs to be returned to ARCUS Schiffmann.

STORAGE AND TRANSPORT

The high voltage detector is to be stored in clean and dry condition. Make sure that the high voltage detector is protected against shock, impact and damage of surface !

ASSEMBLY AND DISASSEMBLY

Warning !
The device is to be used only with its own insulating rod !
Examine labels on head part and insulating rod whether the insulating rod is suitable for its forthcoming usage !

Assembly

Fit the insulating rod into the threaded joint of the head part, then screw the insulating rod stoutly into the head part of the high voltage detector.

2-part high voltage detector

head part	lower part

3-part high voltage detector

head part	upper part	lower part

4-part high voltage detector

head part	upper part	centre part	lower part

Disassembly

Unscrew the insulating rod from the threaded joint of the head part. Disassemble multi-sectional insulating rods to obtain separate rods.

HANDLING

Handling of high voltage detectors is permitted only for electricians or personnel with electrotechnical training to EN 50110-1.
Also one needs to secure that before start of work the operating personnel was instructed about the task !

This high voltage detector must only be used on the nominal voltage or nominal voltage range and frequency of 16.7 Hz in effectively single-side isolated 1-phase systems as stated on the housing !

The high voltage detector of construction “indoor usage“ is to be used only under dry conditions !

Multi-part high voltage detectors are to be used only with their own insulating rod !

Before each usage examine the high voltage detector for visible damages or soiling. In case parts are damaged that limit function or labels are illegible, do not use this high voltage detector !

Before each usage examine the high voltage detector for faultless function. For this purpose your high voltage live line tester is provided with a built-in self-testing device. After positive function control you may start with the actual voltage test.

Always hold the high voltage detector at the handle L_H when using it !

As stray fields or stray voltages may occur at angular or complex conductor arrangements, clear indication is to be tested !

A position for usage of the high voltage detector is not stipulated.

A faultless voltage test of a switchgear part consists of the following steps:

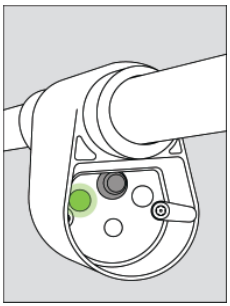
- *test of high voltage detector for faultless function (1st self-test)*
- *voltage test of switchgear part*
- *repeated test of high voltage detector for faultless function (2nd self-test)*

Before each usage examine the high voltage detector for faultless function. For this purpose your high voltage detector is provided with a built-in self testing device. After positive function control you may start with the actual voltage test.
The correct procedure of voltage test with your detector is described in the following chapter.

INDICATION SIGNALS AND SELF-TEST

Model with visual indication

Switch on your high voltage detector and start with the self-test.

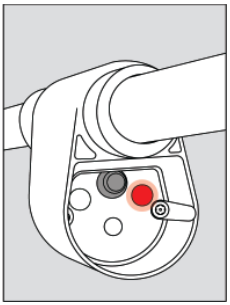


Pict.
Positive self-test

Press the pushbutton and hold it down for 2 seconds to activate the high voltage detector.
Red LED is on. Green LED starts blinking.
Release the pushbutton.
Self-test is successfully accomplished when red LED is off and green LED lights up (see picture to the left) !
Now start the voltage test!

Warning !
In case green LED will not blink during self-test, the high voltage detector must be withdrawn from any further usage !
(*"Help in case of malfunction"* see page 18 ff.)

Now start with voltage test.



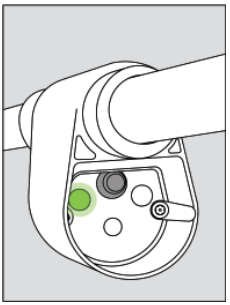
Pict.
Tester shows presence of voltage

Approach the switchgear part to be tested, under observance of the safety distance.
Only carry out the voltage test when the green light is on.
It signals “test readiness“ after positive self-test.
Place contact electrode on the switchgear part to be tested.
If green LED remains on, no voltage is present.
If red LED is on, voltage is present.

A clear indication “voltage present“ in general is secured when the conductor-earth voltage of the switchgear part to be tested is min.78% of the nominal voltage for which the high voltage detector is calibrated.
A clear indication “no voltage present“ in general is secured when the conductor-earth voltage of the switchgear part to be tested is less than 17% of the nominal voltage for which the high voltage detector is calibrated. .

Recommendation !
Please note that the detector switches off automatically after around 1 min ! For deactivation of detector briefly press the push-button.

Carry out 2nd self-test for faultless function.



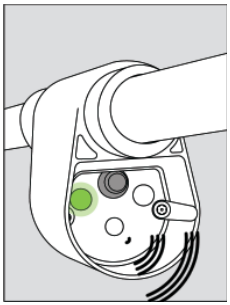
Pict.
Positive self-test

Remove the high voltage detector from the tested switchgear part.
For 2nd self-test briefly switch off and on tester.
Press the pushbutton and hold it down for 2 seconds to activate the high voltage detector.
One LED shows red light. Green LED starts blinking.
Release the pushbutton.
Self-test is successfully accomplished when red LED is off and green LED lights up (see picture to the left) !

Warning!
In case green LED will not blink during self-test, the high voltage detector must be withdrawn from any further usage ! (*"Help in case of malfunction"* see page 18 ff.)
The previous voltage test is void and is to be repeated with a faultless high voltage detector.

Model with audible and visual indication

Switch on your high voltage detector and start with the self-test.

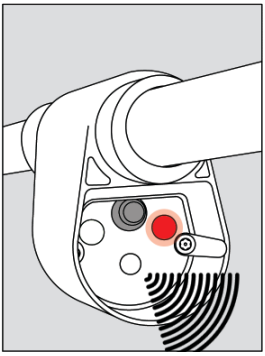


Pict.
Positive self-test

Press the pushbutton and hold it down for 2 seconds to activate the high voltage detector.
Red LED is on - at the same time you hear a permanent sound. Green LED starts blinking.
Release the pushbutton.
Self-test is completed successfully when red LED is off, green LED lights up and you hear an inter-mittend sound. (see picture to the left)
Now start the voltage test !

Warning !
In case green LED will not blink and no continuous sound will be heard, the high voltage detector must be withdrawn from any further usage ! (*"Help in case of malfunction"* see page 18 ff.)

Now start with voltage test.



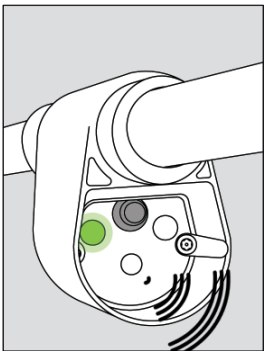
Pict.
Tester shows presence of voltage

Approach the switchgear part to be tested, under observance of the safety distance.
Only carry out the voltage test when the green LED is on and if you hear an intermittend sound. Both signals “test readiness“ after positive self-test.
Place contact electrode on the switchgear part to be tested. If green LED remains on and you hear an intermittend sound, no voltage is present. If red LED is on and the intermittend sound changes into a permanent sound, voltage is present.

A clear indication “voltage present“ in general is secured when the conductor-earth voltage of the switchgear part to be tested is min.78% of the nominal voltage for which the high voltage detector is calibrated.
A clear indication “no voltage present“ in general is secured when the conductor-earth voltage of the switchgear part to be tested is less than 17% of the nominal voltage for which the high voltage detector is calibrated.

Recommendation !
Please note that the detector switches off automatically after around 1 min !
For deactivation of detector briefly press the push-button.

Carry out 2nd self-test for faultless function.



Pict.
Positive self-test

Remove the high voltage detector from the tested switchgear part.
For 2nd self-test briefly switch off and on detector.
Press the pushbutton and hold it down for 2 seconds to activate the high voltage detector.
One LED shows red light – at the same time you hear a permanent sound. Green LED starts blinking.
Release the pushbutton.
Self-test is successfully accomplished when red LED is off, green LED lights up and an intermittend sound can be heard (see picture to the left) !

Warning!
In case green LED will not blink and no continuous sound will be heard, the high voltage detector must be withdrawn from any further usage ! (*"Help in case of malfunction"* see page 18 ff.)
The previous voltage test is void and is to be repeated with a faultless high voltage detector.

HELP IN CASE OF MALFUNCTION

In case of malfunction please only change battery !
Repair of electronics or of mechanic damages is to be effected by ARCUS Schiffmann only !

Malfunction of audible indication[1)]	**Possible reason**	**Remedy**
Permanent sound after self-test.	Battery is nearly empty.	Change battery (see page 21)
No sound.	Battery empty.	Change battery (see page 21)
	Battery falsely fitted.	Fit battery properly (see page 21)
With new battery no sound during self-test.	Electronics defect.	Return high voltage detector to ARCUS Schiffmann. No guarantee when electronics was interfered with by third parties.
With new battery permanent sound after self-test.	Electronics defect.	Return high voltage detector to ARCUS Schiffmann. No guarantee when electronics was interfered with by third parties.

Help with malfunction of visual indication →

[1)] only for Sound-Light models

Malfunction of visual indication	Possible reason	Remedy
Green LED lights up when tester is switched on or before self-test.	Extension part defect.	Return high voltage detector to ARCUS Schiffmann. No guarantee when electronics was interfered with by third parties.
No green LED after self-test.	Battery is nearly empty.	Change battery (see page 21)
No light.	Battery empty.	Change battery (see page 21)
	Battery falsely fitted.	Fit battery properly (see page 21)
With new battery no light signal during self-test.	Electronics defect.	Return high voltage detector to ARCUS Schiffmann. No guarantee when electronics was interfered with by third parties.
Red LED after self-test despite new battery.	Electronics defect.	Return high voltage detector to ARCUS Schiffmann. No guarantee when electronics was interfered with by third parties.
Red or green LED does not light up.	LED defect.	Return high voltage detector to ARCUS Schiffmann. No guarantee when electronics was interfered with by third parties.
Mechanical damage.	Unappropriate handling.	Return high voltage detector to ARCUS Schiff-mann.

ROUTINE MAINTENANCE AND UPKEEP

The detector is to be treated carefully and protected against damage and soiling (colour, metal dust, etc.) to maintain its insulation properties. The high voltage detector is to be stored in clean and dry condition.

Cleaning

For cleaning use a watered cloth. Mind that the device is totally dry before use !

Before each use

The high voltage detector is to be examined by a trained person for detectable damages and soiling ! In case parts are damaged and function is affected or labels are illegible, withdraw the high voltage detector from further use !

Once a year

To keep the insulation properties we recommend to treat the high voltage detector once a year with ARCUS Silicon Grease (Type No. 625 004).

Latest after 6 years (periodic testing)

Periodic testing to IEC 61243-1, is to be carried out latest after 6 years.
The nearest date for periodic testing can be found on the detector label.
(see page 7)

SPARE PARTS AND ACCESSORIES

List of spare parts

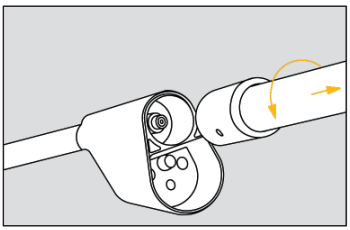
Name of part		Type number
O-ring (battery cover)	(change see page 23)	69 0021
O-ring (cylinder bolt)	(change see page 23)	69 0022
Battery (Lithium)	(change see page 21)	71 8263
ARCUS Silicon Grease		625 004

Storage case, carrying bag, wall bracket upon request.

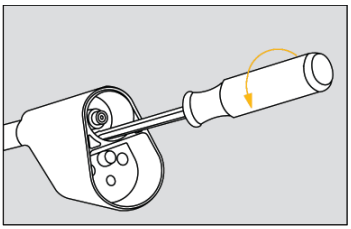
Change of battery

As the battery consumption depends on several factors it is impossible to state an exact battery life time.
For change of battery you will only need a slotted screw spanner.

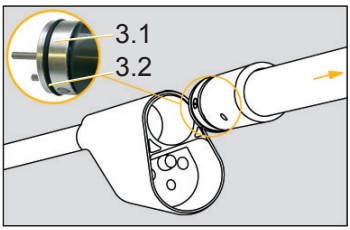
Battery should be changed only in a clean and dry room ! If this is impossible secure that dirt, moisture, and other foreign matter will not be enclosed in the housing when battery is changed !



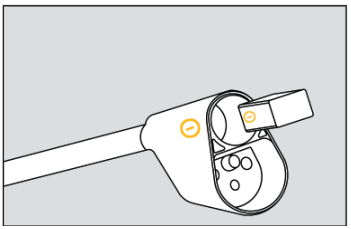
Pict. 1



Pict. 2



Pict. 3



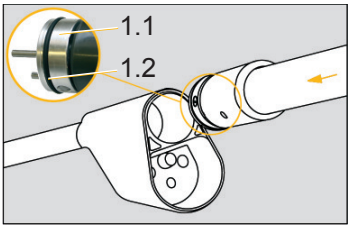
Pict. 4

- Unscrew insulating rod from head part (see picture 1).
- Loosen both cylinder bolts from battery cover (see picture 2)
- Remove both cylinder bolts. Pay attention not to damage the two small black O-rings at the cylinder bolts !
  Screw insulating rod stoutly back into head part.
- Carefully pull insulating rod with battery cover (3.1) from head part.
  Pay attention not to damage the black O-ring (3.2) of the battery cover (3.1). (see picture 3) !
- Remove used battery and fit-in new battery with correct polarity. (see picture 4)

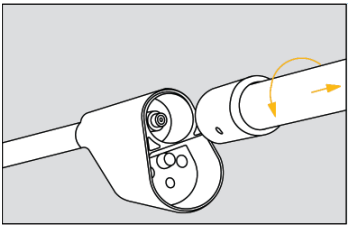
Before assembly of high voltage detector examine all O-rings thoroughly for damages ! Damaged O-rings have to be changed !

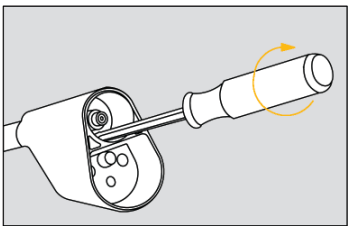
In your high voltage detector three O-rings protect the electronics against moisture and soil ingress from outside (see page 23).

Assembly of high voltage detector after change of battery or O-rings



Pict 1


Pict. 2


Pict. 3

- Slip insulating rod with battery cover (1.1) carefully into head part until stop (pict.1). Pay attention not to damage the black O-ring (1.2) of the battery cover (1.1).
- Unscrew insulating rod from head part. The battery cover remains in the head part due to its torsion prevention (pict.2).

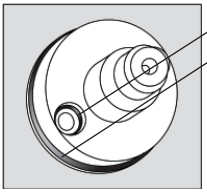
- Tighten battery cover to head part with both cylinder bolts (pict.3). Make sure that the two small black O-rings are positioned correctly inside the counter bore.
- Screw insulating rod stoutly back into head part.

Attention !
Old and used batteries are hazardous waste! Do not dispose in domestic waste but e.g. into a collection point.

Change of O-ring

In your high voltage detector three O-rings protect the electronics against moisture and soil ingress from outside.

O-rings should be changed only in a clean and dry room !
If this is impossible secure that dirt, moisture, and other foreign matter will not be enclosed in the housing when O-ring is changed.



2x O-ring (cylinder bolts)
1x O-ring (battery cover)

See page 21 for appropriate disassembly of high voltage detector for exchange of O-rings (pict.1-3).
In no case remove O-rings with sharp tool !
Carefully clean new O-rings with a cloth.
Examine O-rings for damages before use !
Also clean O-ring groove carefully with a cloth.
Grease O-rings with ARCUS Silicon Grease (Type No. 625 004) slightly.
Silicon grease facilitates movement of the O-rings in the groove to find its optimum position.
Secure complete positioning of O-rings in their O-ring groove.
On page 22 you will find description of assembly of high voltage detector (pict.1-3).

WASTE DISPOSAL

Observe local regulations for disposal of high voltage detector and packing.
ARCUS Schiffmann will not be reliable for unsuitable disposal.
For queries concerning used materials please contact ARCUS Schiffmann.

TECHNICAL DATA

Design:	S
Indication group:	I
Field of application:	see labels of high voltage detector
Frequency range:	16.7 Hz
Climatic category:	N
Humidity:	20 - 96%
Temperature range:	-25 °C to +55 °C
Type of battery:	9V (Lithium)
Standard:	Basically this high voltage detector corresponds to IEC 61243-1. Sole deviation is the altered threshold value for the nominal frequency 16.7 Hz and effectively single-side isolated neutral 1-phase systems.

ANNEXURE

CE Conformity Declaration

ARCUS high voltage detectors fulfil the requirements of the EU Directive: EMC Directive 2004/108/EEC.

Conformity of the high voltage detector with above directive is confirmed by the CE mark.

Product liability and guarantee

This instruction for use was written with greatest care and examined before publishing.

Basis for guarantee is the proven observation of this instruction for use for storage, assembly, operation, maintenance and care.
Valid are the “General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry“.

Phone
General
+49 (0) 89 / 436 04-0

Fax
General
+49 (0) 89 / 431 68 88

Fax
Sales Department
+49 (0) 89 / 436 04 73

Internet
www.ARCUS-Schiffmann.com
info@ARCUS-Schiffmann.com

Seat of the Company
Truderinger Str. 199
D-81673 Munich

ARCUS ELEKTROTECHNIK
ALOIS SCHIFFMANN GMBH