DETECTOR SYSTEMS

UXO DETECTORS
ELECTROMAGNETIC DETECTORS
GENERAL DESCRIPTION

The MIL-D1 is a portable, high-sensitivity metal detector designed to detect all metals in conductive and non-conductive soils, including laterite. The metal detector consists of a detection head, a telescopic handle, an electronics unit, a canvas carry-bag and a high-impact polypropylene case. The detection head is light, and the wiring is protected from damage. The electronic unit can be carried over the shoulder, attached to the belt, or as an integral part of the telescopic handle.

The manufacturer says that the MIL-D1 does not require any daily manual calibration; optimum sensitivity is ensured over all types of terrain due to CEIA’s Automated Soil Compensation System. The detector is manufactured in compliance with the ISO-9001 standard and has been designed to satisfy the most stringent operational requirements for both humanitarian and military demining.

Main features are as follows:

> State of the Art Digital Metal Detector.
> High detection distance in all soil types.
> Precision target detection and localization with double tone pin-pointing.
> Detection of all metals, magnetic and non magnetic.
> Static and dynamic detection, independent of speed.
> Capability to compensate complex soils, optimised by a simple auto-learn procedure.
> Robust and reliable, consistent performance over time.
> Long battery life.
> Control unit may be integrated with the telescopic pole or worn separately.
> Open construction of the search head for easier visibility of the target area.
> Easy-to-use control panel.
> Auto-diagnostic system.
> Flash-supported software upgrade.
CEIA offers a single, proven, state-of-the-art model (MIL-D1) optimised to provide comprehensive detection capability across the entire spectrum of metals and soil types. A backlit LCD display on the control panel is available as an option. A handheld remote programmer allows for MIL-D1 flash memory upgrades under any conditions. MD Scope software for PCs is available for troubleshooting and annual verification of MIL-D1 calibration.

**WORKING METHODOLOGY**

Location of metal objects is optimised by a two-tone audible pinpointing system, which allows the position of the detected mass to be identified accurately. When the metal detector approaches a metal mass, the system produces a signal of acoustic intensity proportional to the metal mass. The metal mass is pinpointed at the position of the centre of the search head at the moment in which the audible signal tone changes. An audible signal is transmitted either through an internal speaker or external monaural headphone.

CEIA’s Automated Soil Compensation System ensures an above-average sensitivity in all types of soil. During soil compensation (conducted prior to the search operation), the detector uses digital processing of the electromagnetic response from the target soil to determine the most effective strategy. The presence of water does not affect detector performance. Soil compensation capability covers all different soils.

**POWER SUPPLY**

- ANSI STD D-IEC STD LR20
- 4 x 1.5V alkaline batteries or 4 x 1.2V Ni-MH rechargeable batteries (available on request).
- 65 hours with alkaline batteries at 20° C.
- 50 hours with alkaline batteries at 5° C.
- 35 hours with Ni-MH rechargeable batteries (7000 mA) at 20° C.

**DETECTORS IN USE**

Approximately 13,000 detectors are in service with various humanitarian aid organisations, commercial mine clearance organisations and armed forces in the following countries: Afghanistan, Austria, Bangladesh, Bosnia and Herzegovina, Burundi, Cambodia, Colombia, Croatia, Denmark, Djibouti, Egypt, Eritrea, Ethiopia, Finland, France, Hong Kong, India, Indonesia, Iraq, Italy, Jordan, Kenya, Kyrgyzstan, Laos, Lebanon, Mozambique, Malaysia, Morocco, Namibia, Pakistan, Portugal, Senegal, Serbia, Spain, South Africa, Sudan, Sweden, Switzerland, Thailand, Turkey, the U.S., Venezuela and Yemen.
FACTORY SUPPORT

> The proposed spare parts package is arranged in accordance with a life cycle management study by the manufacturer. The actual quantity/composition of spare parts package is defined by customer requirements and contract.

> Spare parts are available from either the manufacturer or from local representatives.

> An extensive programme is available for both operators and maintenance personnel.

> Factory based training is included in the purchasing package. On-site training is subject to contract.

> Instruction manuals and documentation are provided in Arabic, English, French, Italian, Portuguese and Spanish. Other languages available on request.

> The standard warranty is two years. Extended warranty periods can be arranged.

> Comprehensive factory follow-up includes services via Internet contact, mail and personal contact.

> On-site training, supply of training aids, diagnostic software, portable remote programmer are available as accessories.

> Other services by the manufacturer include software upgrading, comprehensive technical assistance, mine simulant study and manufacturing, availability of factory test lanes.

MAINTENANCE SUPPORT

The detector is considered user-friendly and, with the proper training supplied by CEIA, the customer can completely maintain the equipment. It is not necessary to return the unit to the factory for troubleshooting or verification of calibration. The MIL-D1 electronics board is based on full digital technology, which means there is no requirement to trim or refine the performance using laboratory equipment.

TEST AND EVALUATION

> CEIA is equipped with extensive laboratory and outdoor testing facilities where the MIL D1 capabilities have been evaluated and subsequently reported.

> The MIL-D1 has been subjected to extensive testing (in terms of reliability and capability of detection) by international test organisations, UNOPS, national defence departments and humanitarian demining organisations.

Test following test results are available at the ITEP website: www.itep.ws

5. Experimental Cairo Testing and Evaluation of Mine and UXO Detectors: Faculty of Engineering, Cairo University, Giza, Egypt; 2008.
7. STEMD; Interim Report Laboratory Tests Italy. Joint Research Centre - European Commission (JRC/EC); 2006.
11. Metal Detector Trial - Colombia: Results from 2002; 2003.

REPORTED LIMITATIONS AND STRENGTHS

Limitations
Please refer to the test reports mentioned above.

Strengths
- High electrical and mechanical reliability.
- High-impact polypropylene transport case allows for transportation under the most extreme conditions.
## Technical Specifications

### Detector

1. **Brand**: CEIA  
2. **Model**: MIL-D1 / DS  
3. **Version**: 6.0  
4. **Used detection technology**: Electromagnetic induction | CW (Continuous Wave)

### Dimensional Data

5. **Working length**  
   - **min. length**: Telescopic pole 1,120 mm  
   - **max. length**: Telescopic pole 1,620 mm  
6. **Search head**  
   - **Size**: 280 mm (external diameter)  
   - **Weight**: —  
   - **Shape**: 2 x Circular  
7. **Transport case**  
   - **Weight**: 7.8 kg  
   - **With equipment (full)**: 14 kg  
   - **Dimensions**: 950 x 440 x 155 mm  
   - **Hard | Soft case (material)**: High impact polypropylene / synthetic canvas  
8. **Weight, hand-held unit**: —  
9. **Weight, carrying (operational detection set)**: 5.5 kg  
10. **Weight, additional equipment**: —  
11. **Weight distribution | Balance**: Well balanced | Optimized for continuous operation  
12. **Other specifications**: Control of working depth Knob sensitivity adjustment

### System Status and Deployment

13. **Status (Development | In production)**: In production  
14. **Detectors | Systems in use to date**: —  
15. **Other types | Models**: —  
16. **Location of use**: Cambodia, Laos, Sudan, Denmark, Egypt, France, Italy, Switzerland, USA, Yemen

### Environmental Influence

17. **Humidity (limitations)**: No influence  
18. **Temperature (limitations)**  
   - **Storage**: -55° C to +75° C  
   - **Operational**: -46° C to +65° C  
19. **Water resistant (Yes / No)**: Yes | IP68 (IEC 529)  
20. **Shock | Vibration resistant**: Yes exceeding | MIL STD 810 E  
21. **Environmental Compensation**: Auto  
22. **Operational hours | Operating endurance**  
   - **low temperature (around 0° C)**:  
   - **medium temperature (around 20° C)**:  
   - **high temperature (higher than 30° C)**:  
   - **MTBF = 27,500 according to MIL-HDBK 217**  
   - **MTBF = 22,500 according to MIL-HDBK 217**  
   - **MTBF = 18,000 according to MIL-HDBK 217**  

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GENERAL DESCRIPTION

The Ebinger Large Loop Technology UPEX 740 M is a valuable asset in the field of explosive remnants of war. It has been used for humanitarian and commercial battle area clearance operations in Afghanistan, Angola, Cambodia, France, Kosovo, Laos, the UK and Viet Nam.

Due to its size, large areas can be inspected and cleared of ammunition in a short time. A vehicle-mounted configuration has been developed which is applicable for route clearance/verification, area reduction or quality assurance. It can be mounted on virtually any heavy-duty vehicle and can provide an efficient and cost-effective detection system.

The system can be supplied with two different loop configurations. The number of channels can be varied between two and eight. The search process can be optimised by combining the system with a GPS to precisely locate the potential target. Colour-coded maps can be generated to facilitate the follow-on demining operation.

Main characteristics

- The sturdy electronics unit is compact, lightweight and splash-proof.
- Target acquisition is indicated by audio alarm and by galvanometer reading.
- Detection results can be stored in a data logger for plotting or further processing by software.
- Different indication characteristics can be selected to suit adverse working conditions.
- The equipment’s audio control pulses indicate the battery condition. Audible confidence clicks inform operators that equipment is functioning correctly.
- UPEX is also available for underwater use or vehicle-mounted.

WORKING METHODOLOGY

UPEX 740 M is as easy to use as a conventional mine detector. Detection signals are easy to interpret and no advanced training is required for the operators. The UPEX detector applies the eddy current pulse induction principle for the detection of metal components in ERW. The device can be adjusted to various types of non-cooperative soils and to suppress surface-bound small fragmentation.
No further technical information is given by the manufacturer.

The Ebinger UPEX 740 M in operation at the Egyptian test site and on a road

**DETECTORS IN USE**

Since 1993, more than 500 UPEX 740M units have been purchased. The detector is in service with various humanitarian demining organisations, the UN and many commercial companies.

**POWER SUPPLY**

The UPEX 740 M is powered by 8 x 1.5V C cell or alternatives; rechargeable battery pack 3.8Ah, 12V.

- Operational life of battery (8x1.5V alkaline 8Ah): 55 hours in Low, 25 hours in High.
- Operational life of rechargeable batteries (8x1.2V 3.5Ah): 38 hours in Low, 19 hours in High.

**FACTORY SUPPORT**

- All detectors are covered by a 24-month warranty. A worldwide service network ensures permanent availability of spare parts.
- Operation and maintenance training is provided at Ebinger facilities or on site.
- Additional factory support by specially trained staff is provided on request.
- Instruction and maintenance manuals are available in Arabic, English, French, German, Italian and Russian; other languages available on request.

**MAINTENANCE SUPPORT**

- There are no special requirements for technicians or workshop facilities. Most repairs can be carried out by Ebinger-trained staff on site.
- Step-by-step explanations in the manuals help to ensure easy maintenance.

**TEST AND EVALUATION**

The detector went through comprehensive internal tests. Reports displaying the performance can be provided by the manufacturer on request.

**REPORTED LIMITATIONS AND STRENGTHS**

The system has been in service for several years, but has not been tested in comparative trials. Therefore no statement of known limitations and strengths can be made.
## DETECTOR

1. **Brand**
   - EBINGER

2. **Model**
   - UPEX® 740M-V and UPEX® MM (vehicle)

3. **Version**
   - —

4. **Used detection technology**
   - AEM-PI

## DIMENSIONAL DATA

5. **Working length**
   - min. length: Depending on construction on vehicle
   - max. length: Depending on construction on vehicle

6. **Search head**
   - size: 1,000 x 2,000 mm or multiple
   - weight: Approx. 3 kg including support frame
   - shape: Rectangular

7. **Transport case**
   - weight: —
   - with equipment (full): —
   - dimensions: —
   - hard | soft case (material): —

8. **Weight, hand-held unit**
   - —

9. **Weight, carrying (operational detection set)**
   - —

10. **Weight, additional equipment**
    - —

11. **Weight distribution | balance**
    - —

12. **Other specifications**
    - Alarm and reset device inside the cabin

## DETECTION SYSTEM SPECIFICATIONS

13. **Status**
    - In production

14. **Detectors | systems in use to date**
    - 50

15. **Other types**
    - —

16. **Location of use**
    - Angola, Cambodia, Eritrea, Mozambique, Sudan

## ENVIRONMENTAL INFLUENCE

17. **Humidity (limitations)**
    - None

18. **Temperature (limitations)**
   - storage: None
   - operational: None

19. **Water resistant**
    - Yes

20. **Shock | vibration resistant**
    - Yes

21. **Environmental compensation**
    - Manual

22. **Operational hours | operating endurance**
    - Unlimited (car battery)
DETECTION OPERATION

23. Calibration | set-up
   - auto | manual Manual

24. Detection range | sensitivity details | detection performance | working depth
   - Control of working depth Test piece
   - low-metal-content mines Not suitable
   - anti-vehicle mines Designed for
   - ERW Designed for

25. Output indicator Acoustical, optical, analogic output for data recording

26. Pinpointing feature Yes

27. Adjustment of search head angle Not necessary

28. Soil influence: Adjustable

29. Best use in
   - sand Yes
   - peat Yes
   - clay Yes
   - ferruginous soil (laterite) Limited

30. Optimal sweep speed —

31. Search coil | antenna Rectangular

32. Limitations —

33. Interference (with other detectors) 12 m

POWER

34. Power supply | source Car battery

35. Operating time Unlimited

36. Power supply
   - weight —
   - no. of batteries | size | type —
   - other System supplied with power cables

COSTS

37. Price
   - for one detector More than US$ 5,000
   - reduction for higher quantity Yes

38. System price
   - with training Included
   - spare parts Included
   - extended warranty On request

39. Total —

40. Possibility to rent | lease Yes

OTHERS

41. Duration of warranty 24 months
42. Additional equipment Support frame for vehicle on request
43. Additional technical data | information Available on request
44. Compliant standards MIL-STD
GENERAL DESCRIPTION

The VMXC1 UXO detector is based on the VMH3CS mine detector and has a metal discrimination mode. Larger search heads and a special firmware for unexploded ordnance (UXO) detection, which is custom designed for different applications, offer a reliable and specific detection of ordnance, submunition and metal-cased mines with fewer false alarms from other metallic waste.

With effective ground compensation the VMXC1 is recommended if the use of magnetometers is limited in mineralised soils. Experiences in different countries with challenging ammunition problems have shown a higher detection efficiency.

Objects are indicated by audio, visual and vibrations alarm. In “metal discrimination” mode the audio and visual alarms differentiate between ferrous and non-ferrous metals, or ammunition and metallic waste if the ammunition is defined and stored in the firmware.

Data output and input offer data acquisition for computer-aided detection as well as upgrade or customisation of the detection features on site.

Three versions are offered, the VMXC1-1 with a slim search head, the VMXC1-3 with a round 30 cm diameter search head, and the VMXC1-6 with a round 60 cm diameter search head.
Main components of the VMXC1

- Detector electronics with integrated arm-rest, non-magnetic loudspeaker, power supply, battery compartment, on/off switch for two different search patterns, and vibrator. Hand grip with visual bargraph (14 elements), four robust push buttons for sensitivity control, volume control, ground compensation and pinpointing. Two-piece telescopic carrying bar with plug-in connection for search head.
- Watertight oval search head, round 30 cm diameter search head, or round 60 cm diameter search head with carrying bar and plug-in connection to the electronics unit.
- Non-magnetic test piece.
- One set (3 EA) single D-cell batteries.
- Operation manual.
- field manual.
- field backpack for storing the detector set with all accessories.
- Soft case for storing the 60-cm-search head

Optional accessories (available on request)

- Headset.
- Hard case for storing the complete detector set VMXC1-1 or VMXC1-3 with all accessories.
- Data recording and software.
- field computer VFC2.

The detector complies with environmental conditions according to MIL STD 810F, 501.4-II, 502.4-I, 502.4-II, 503.4, 506.4-III, 514.5 C1.
WORKING METHODOLOGY
The search head acts as both an emitter of electromagnetic pulses and a receiver sensing the pulsed field. If there is a metal object in the magnetic field, the following happens:

- The electronics unit detects a deviation from the previous state; thus an alarm signal is produced depending on the size and type of the metal target.
- The shape of the pulse in the VMXC1 is bipolar to reduce the effect on magnetically fuzed mines.

For worldwide use under different soil conditions, the VMXC1 can be set up for optimal detection features.

The detector has a built-in test procedure continuously checking the reliability and proper function of the detector. The pulse signal generation, signal processing, battery voltage, external connections, and – most important – the internal operation voltages are constantly monitored. Visual and acoustic alarms are produced when a fault is found.

With such reliability, the user can operate the VMXC1 easily and concentrate fully on detection tasks.

DETECTORS IN USE
The detectors are in service with various humanitarian aid organisations, commercial mine clearance organisations and several armed forces.

POWER SUPPLY
VMXC1 is powered by three 1.5V mono-cells IEC R20 (ANSI std. D) or rechargeable RSH 4 KR 35/62. The operational life of batteries is said to be approximately 27 to 33 hours depending on the age, quality and capacity of the batteries.
FACTORY SUPPORT

- Vallon runs a worldwide servicing network with all current spare parts in stock. Spare parts can be delivered with a corresponding maintenance manual directly to the customer for on-site repair.
- Operation and maintenance training are offered either in the Vallon facilities or at the customer’s location.
- Operation and maintenance manuals are available in different languages.
- Warranty is 24 months.

MAINTENANCE SUPPORT
There are no special requirements for technicians or workshop facilities. All tools needed are standard and available in most workshops. For each detector a maintenance manual is available, with step-by-step explanations.

TEST AND EVALUATION
The manufacturer allows access to test reports on request.

REPORTED LIMITATIONS AND STRENGTHS
There are no limitations for terrain, soil and vegetation.

The VMXC1 packed in a transport case
### DETECTOR

1. **Brand**: VALLON
   
2. **Model**: VMXC1
   
3. **Version**: –
   
4. **Used detection technology**: Metal detector | Pulse induction  
   Metal discrimination

### DIMENSIONAL DATA

5. **Working length**
   - **min. length**: Approx. 92 cm (short version | with oval search head)  
   - **max. length**: Approx. 92 cm (short version | with 30 cm search head)  
   - **max. length**: Approx. 98 cm (short version | with 60 cm search head)  
   - **max. length**: 126 cm (long version | with oval search head)  
   - **max. length**: 126 cm (long version | with 30 cm search head)  
   - **max. length**: 132 cm (long version | with 60 cm search head)

6. **Search head**
   - **Size**: 17 x 31 cm (oval search head); 30 cm Ø  
   - **Size**: (30 cm search head); 60 cm Ø (60 cm search head)
   - **Weight**: Approx. 0.63 kg (oval search head)  
   - **Weight**: Approx. 0.8 kg (30 cm search head)  
   - **Weight**: Approx. 1.1 kg (60 cm search head)
   - **Shape**: Oval (oval search head); Round (30 cm search head); Round (60 cm search head)

7. **Transport case**
   - **Weight**: Field backpack (for oval search head)  
     approx. 0.3 kg (standard accessory)  
     Field backpack (for 30 cm search head)  
     approx. 1.25 kg (optional accessory)  
     Hard case (for oval search head)  
     approx. 5 kg (optional accessory)
   - **Weight**: Field backpack (for oval search head)  
     approx. 3.4 kg (standard accessory)  
     Field backpack (for 30 cm search head)  
     approx. 4.2 kg (optional accessory)  
     Hard case (for oval search head)  
     approx. 9 kg (optional accessory)
   - **Weight**: Field backpack (for 30 cm search head)  
     approx. 3.4 kg (standard accessory)  
     Field backpack (for 30 cm search head)  
     approx. 4.2 kg (optional accessory)  
     Hard case (for oval search head)  
     approx. 9 kg (optional accessory)
   - **Weight**: Field backpack (for 30 cm search head)  
     approx. 3.4 kg (standard accessory)  
     Field backpack (for 30 cm search head)  
     approx. 4.2 kg (optional accessory)  
     Hard case (for oval search head)  
     approx. 9 kg (optional accessory)
   - **Weight**: Field backpack (for oval search head)  
     approx. 2.5 kg (with oval search head)  
     Field backpack (for 30 cm search head)  
     approx. 2.7 kg (with 30 cm search head)  
     Field backpack (for 30 cm search head)  
     approx. 2.7 kg (with 30 cm search head)  
   - **Weight**: Field backpack (for oval search head)  
     approx. 2.5 kg (with oval search head)  
     Field backpack (for 30 cm search head)  
     approx. 2.7 kg (with 30 cm search head)  
     Field backpack (for 30 cm search head)  
     approx. 2.7 kg (with 30 cm search head)
   - **Weight**: Hard case (for 30 cm search head)  
     approx. 7.2 kg (optional accessory)
   - **Weight**: Soft case (for 60 cm search head)  
     approx. 1.7 kg (optional accessory)
   - **Weight**: Hard case (for 30 cm search head)  
     approx. 11.4 kg (optional accessory)
   - **Weight**: Soft case (for 60 cm search head)  
     approx. 2.8 kg (optional accessory)
   - **Weight**: Hard case 65 x 50 x 25 cm  
     (optional for 30 cm search head)
   - **Weight**: Hard case 66 x 70 x 11 cm  
     (optional for 60 cm search head)

8. **Weight, hand-held unit**: 2.5 kg (with oval search head)  
   2.7 kg (with 30 cm search head)  
   2.9 kg (with 60 cm search head)

9. **Weight, carrying (operational detection set)**
   - **Weight**: 2.5 kg (with oval search head)  
   - **Weight**: 2.7 kg (with 30 cm search head)  
   - **Weight**: 2.9 kg (with 60 cm search head)

10. **Weight, additional equipment**: Head set 110 g

11. **Weight distribution | Balance**: –

12. **Other specifications**: –

### SYSTEM STATUS AND DEPLOYMENT

13. **Status (Development | In production)**: In production

14. **Detectors | Systems in use to date**: Not given

15. **Other types | Models**: VMH3 | VMH3CS | VMH1 | VMX1 | VMX3

16. **Location of use**: Worldwide

### ENVIRONMENTAL INFLUENCE

17. **Humidity (limitations)**: According to MIL STD 810F

18. **Temperature (limitations)**
   - **Storage**: -51° C to +71° C
   - **Operational**: -31° C to +63° C
### DETECTION OPERATION

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### Detection range | Sensitivity details | Detection performance | Working depth

- Small metal content mines (type of mine)
- Anti-tank mines (type of mine)
- ERW (please specify)

- Depending on their size, material and the local interference as well as implemented firmware
- Depending on their size, material and the local interference
- Depending on their size, material and the local interference

#### Output indicator
- Sound, visual bargraph, vibration

#### Pinpointing feature
- Yes

#### Adjustment of search head angle
- With a joint

#### Soil influence
- Adjustable

#### Best use in
- Sand
- Peat
- Clay
- Ferruginous soil (laterite)

- Yes
- Yes
- Yes
- Yes

#### Optimal sweep speed
- standard 0.2-1.5 m/s; pinpoint mode: 0-0.2 m/s

#### Search coil | Antenna
- Oval shape with 17 x 31 cm
- Round shape with 30 cm Ø
- Round shape with 60 cm Ø
- Stick Probe with 4 cm Ø and 44.5 cm length

#### Limitations
- No

#### Interference (with other detectors)
- 2 detectors with oval search head should have a minimum distance of 2 m to each other

### POWER

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#### Power supply
- weight |
- no. of batteries | size | type
- rechargeable |
- other

- 3 ea. 1.5V standard batteries D-size
- 3 ea. 1.24V rechargeable batteries KR35/62

### COSTS

<table>
<thead>
<tr>
<th>Price</th>
<th>for one detector on request</th>
<th>Upon request</th>
</tr>
</thead>
<tbody>
<tr>
<td>reduction for higher quantity</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System price</th>
<th>with training</th>
<th>Upon request worldwide</th>
</tr>
</thead>
<tbody>
<tr>
<td>spare parts</td>
<td>Upon request</td>
<td></td>
</tr>
<tr>
<td>extended warranty</td>
<td>Upon request</td>
<td></td>
</tr>
</tbody>
</table>

### OTHERS

| Duration of warranty | 24 months |
| Additional equipment | Headset, hard case, 30 cm search head, 60 cm search head, data recording and software |

<table>
<thead>
<tr>
<th>Additional technical data</th>
<th>information</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Compliant standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN EN ISO 9001:2000</td>
</tr>
<tr>
<td>MIL STD 810F, 501.4-II, 502.4-I, 502.4-II, 503.4, 506.4-III, 514.5 C1</td>
</tr>
</tbody>
</table>
GENERAL DESCRIPTION

The Vallon VMX3 Metal and UXO Detector has been designed for the detection of buried metal-cased mines and non-exploded ordnance in larger depths. The special UXO firmware ignores small metal parts. Ease of operation and a robust mechanical design ensure very reliable operation for professional ordnance clearing in battlefield operations, in military training programmes and in humanitarian demining.

Along with its digital signal processor the VMX3 uses an advanced pulse-field function specially improved by Vallon. It can also work in mineralized soils, such as laterite, magnetite and magmatite as well as in shallow salt and fresh water and under the electromagnetic influence of main power lines without greatly affecting sensitivity. The VMX3 is specially recommended in strong ferruginous soils where the standard ferrous locators (fluxgate sensors) are not working.

The detector can be connected to Vallon data loggers. Data input allows for further upgrades of the detector firmware, and data output enables measured data to be recorded and evaluated using Vallon EVA2000 software, running on a laptop or personal computer.
Main components are

> Large search head with telescopic pole.
> Detector electronics with integrated non-magnetic loudspeaker, power supply and battery compartment. Watertight sockets for the search head and head-set/data input or data output via RS 232 on the front panel of the housing as well as visual indication of operational readiness, programme selector with integrated on/off switch, “COMP” key for automatic fine adaptation to mineralised soil and control knob for setting the volume and detection sensitivity.
> Non-magnetic test piece.
> Carrying bag for electronics unit.
> Carrying belt for electronics unit.
> Handle, armrest and supplementary arm-belt.
> Headset.
> One set (4 EA) single cell batteries 1.5V IEC R 20/D-cell alkaline.
> Operation and field manuals.
> Soft case, which can be used as backpack.

The detector complies to environmental conditions according to MIL STD 810F, 501.4-II, 502.4-I, 502.4-II, 503.4, 506.4-III, 514.5 C1.

WORKING METHODOLOGY

The search head continuously emits electromagnetic pulses as the operator sweeps close to the surface.

The search head acts as both an emitter and a receiver sensing the pulsed field. If there is a metal object in the magnetic field, the following happens:

> The electronics unit detects a deviation from the previous state: thus an alarm signal is produced depending on the size of the metal target.
> The shape of the pulse in the VMX3 is bipolar to reduce the effect on magnetically fuzed mines.

For use worldwide under different soil conditions, the VMX3 is provided with a programme to set the optimal detection features. The correct programme setting and the wide range of detection sensitivity allow detection of plastic mines with big metal content in mineralised soil and also near to 50 Hz/60 Hz-power lines.

The detector has a built-in test procedure to continuously check reliability and functioning during operation. The pulse signal generation, signal processing, battery voltage, external connections and – most important – the internal operation voltages are constantly monitored. Visual and acoustic alarms are produced when a fault is found.

The detector’s high reliability allows the user to operate the VMX3 easily and concentrate fully on detection tasks.
DETECTORS IN USE
The detectors are in service with commercial mine clearance organisations and several armed forces (including NATO members).

POWER SUPPLY
- VMX3 is powered by four 4 x 1.5V mono-cell IECLR 20 (ANSI STD. D cell) or rechargeable KR35/62.
- Operational life of battery is 40 to 50 hours depending on age, quality and capacity of the batteries.

The VMX3 packed in a transport case
FACTORY SUPPORT

> Vallon runs a worldwide servicing network with all current spare parts in stock. Spare parts can be delivered with a corresponding maintenance manual directly to the customer for on-site repair.
> Operation and maintenance training are offered either in the Vallon facilities or at a location required by the customer.
> Operation and maintenance manuals are available in different languages.
> Warranty for 24 months.

MAINTENANCE SUPPORT

There are no special requirements for technicians or workshop facilities. All tools needed are standard and available in most workshops. For each detector a maintenance manual is available, with step-by-step explanations for repairs.

TEST AND EVALUATION

The manufacturer allows access to test reports on request.

REPORTED LIMITATIONS AND STRENGTHS

There are no limitations for terrain, soil and vegetation.
### DETECTOR

<table>
<thead>
<tr>
<th></th>
<th>VALLON VMX3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brand</td>
<td>VALLON</td>
</tr>
<tr>
<td>2. Model</td>
<td>VMX3</td>
</tr>
<tr>
<td>3. Version</td>
<td>–</td>
</tr>
<tr>
<td>4. Used detection technology</td>
<td>Metal detector</td>
</tr>
</tbody>
</table>

### DIMENSIONAL DATA

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Working length</td>
<td></td>
</tr>
<tr>
<td></td>
<td>min. length</td>
</tr>
<tr>
<td></td>
<td>max. length</td>
</tr>
<tr>
<td>6. Search head</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Size</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
</tr>
<tr>
<td></td>
<td>Shape</td>
</tr>
<tr>
<td>7. Transport case</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight</td>
</tr>
<tr>
<td></td>
<td>With equipment (full)</td>
</tr>
<tr>
<td></td>
<td>Dimensions</td>
</tr>
<tr>
<td></td>
<td>Hard</td>
</tr>
<tr>
<td></td>
<td>Soft case (material)</td>
</tr>
<tr>
<td>8. Weight, hand-held unit</td>
<td>1.9 kg (weight of search head with rod)</td>
</tr>
<tr>
<td></td>
<td>1.8 kg (weight of electronics with batteries)</td>
</tr>
<tr>
<td>9. Weight, carrying (operational detection set)</td>
<td>1.9 kg + 3.7 kg</td>
</tr>
<tr>
<td>10. Weight, additional equipment</td>
<td>Head set 110 g</td>
</tr>
<tr>
<td>11. Weight distribution</td>
<td>–</td>
</tr>
<tr>
<td>12. Other specifications</td>
<td>–</td>
</tr>
</tbody>
</table>

### SYSTEM STATUS AND DEPLOYMENT

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Status (Development</td>
<td>In production)</td>
</tr>
<tr>
<td>14. Detectors</td>
<td>Systems in use to date</td>
</tr>
<tr>
<td>15. Other types</td>
<td>Models</td>
</tr>
<tr>
<td></td>
<td>VMM3 with UXO search head</td>
</tr>
<tr>
<td>16. Location of use</td>
<td>Worldwide</td>
</tr>
</tbody>
</table>

### ENVIRONMENTAL INFLUENCE

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17. Humidity (limitations)</td>
<td>According to MIL STD 810F</td>
</tr>
<tr>
<td>18. Temperature (limitations)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storage</td>
</tr>
<tr>
<td></td>
<td>Operational</td>
</tr>
<tr>
<td>19. Water resistant (Yes / No)</td>
<td>Yes up to 4 m</td>
</tr>
<tr>
<td>20. Shock</td>
<td>Vibration resistant</td>
</tr>
<tr>
<td>21. Environmental Compensation</td>
<td>Auto</td>
</tr>
<tr>
<td>22. Operational hours</td>
<td>Operating endurance</td>
</tr>
<tr>
<td></td>
<td>low temperature (around 0°C)</td>
</tr>
<tr>
<td></td>
<td>medium temperature (around 20°C)</td>
</tr>
<tr>
<td></td>
<td>high temperature (higher than 30°C)</td>
</tr>
</tbody>
</table>
DETECTION OPERATION

23. Calibration | Set-up
   - Auto | Manual
   - Duration
   - Automatic
   - A few seconds

24. Detection range | Sensitivity details | Detection performance | Working depth
   - Control of working depth
   - Sensivity adjustment
   - Small metal content mines (type of mine)
   - Designed for UXO, only plastic mines with big metal content or mines with metal case depending on their size, material and the local interference
   - Anti-tank mines (type of mine)
   - Designed for UXO, only plastic mines with big metal content or mines with metal case depending on their size, material and the local interference
   - ERW (please specify)
   - Depending on their size, material and the local interference

25. Output indicator
   - Sound (loudspeaker or headset)
   - Yes

26. Pinpointing feature
   - With a joint
   - Yes

27. Adjustment of search head angle
   - Adjustable
   - Yes
   - Yes
   - Yes
   - Yes

28. Soil influence
   - Yes

29. Best use in
   - Sand
   - Yes
   - Peat
   - Yes
   - Clay
   - Yes
   - Ferruginous soil (laterite)
   - Yes

30. Optimal sweep speed
   - 0.2 – 1.5 m/s

31. Search coil | Antenna
   - Round shape with 615 mm diameter
   - No

32. Limitations
   - 2 detectors should have a distance of 5 meter to each other

33. Interference (with other detectors)
   - –

POWER

34. Power supply | Source
   - Battery

35. Operating time
   - See point 22

36. Power supply
   - weight
   - –
   - no. of batteries | size | type
   - 4 ea. 1.5V standard batteries D-size
   - 4 ea. 1.24V rechargeable batteries KR35/62
   - rechargeable
   - –
   - other

37. Price
   - for one detector on request
   - Upon request
   - reduction for higher quantity
   - Yes

38. System price
   - with training
   - Upon request worldwide
   - spare parts
   - Upon request
   - extended warranty
   - Upon request

39. Total
   - –

40. Possibility to rent/lease
   - Upon request

OTHERS

41. Duration of warranty
   - 24 months

42. Additional equipment
   - Headset, data recording, software

43. Additional technical data | information
   - DIN EN ISO 9001:2000
   - MIL STD 810F, 501.4-II, 502.4-I, 502.4-II, 503.4, 506.4-III, 514.5 C1

44. Compliant standards
   - –