

3. Vallon Field computer VFC2 (ruggedized PDA*)

Realtime display of the measuring graphs, storage and calculation of the survey data at site. Storage capacity 1 GB for 100 ha or more than 50,000 boreholes. Connection of SEPOS® or GPS-



Navigation possible. Data survey can also be made without navigation system, however, not as accurate.

*) Standard PDA with Vallon software. Type of PDA is subject to change.

4. Standard PC (Laptop)

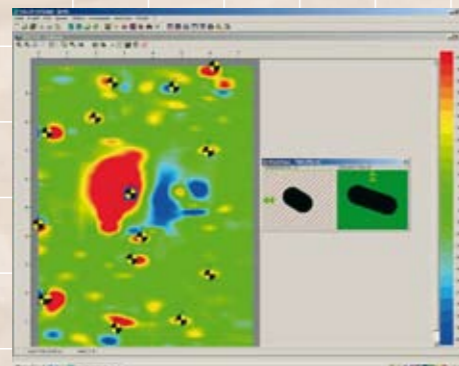
Software VALLON EVA2000® installed for data acquisition and data evaluation.



5. VALLON EVA2000®

The evaluation software VALLON EVA2000® allows the processing of the survey data. The magnetic interferences are displayed as colour field map.

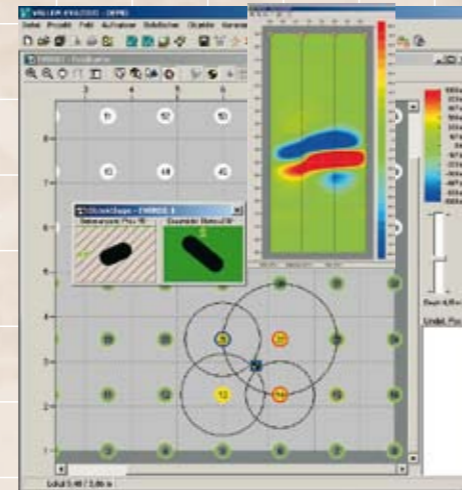
Topographic maps can be inserted true-to-scale (bmp, jpg, dxf etc.). With DGPS the local coordinates in meters and the GPS-coordinates are used. All common systems of coordinates can be displayed.



All maps can be exported (dxf).

The automatic algorithm calculates all objects in a field at the touch of a button. Object position and object depth are indicated on the object list. Filter functions facilitate the evaluation.

For borehole detection a library with borehole plans and an automatic evaluation algorithm is available.



Additional accessories

- Side handlebars when using DGPS
- Pad for carrying belt
- Rod for DGPS-antenna
- Rechargeable batteries
- Charging set
- External power supply

Technical Data

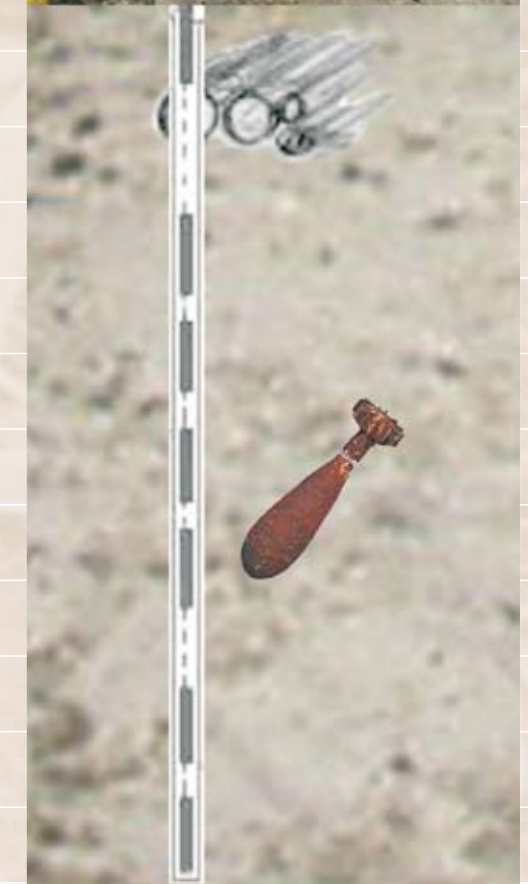
Measuring range: $x1 = \pm 2-2000 \text{ nT}$, $x10 = \pm 20-20000 \text{ nT}$
 Compensation range: $\pm 500 \text{ nT}$
 Power supply: 6 x 1.5 V round cells IECR14 C-size Alkaline or 6 x 1.2 V Ni-MH-Batteries RSH 1.8 C-size
 Distance of sensors: 500 mm
 Diameter of sensor tube: 32 mm
 Sensitivity steps: 7
 Max. sensitivity: Ferromagnetic parts (steel) are detected according to their size and magnetic condition
 Battery life: approx. 50 h with Alkaline batteries
 Compliance to environmental conditions: according to MIL STD-810E 501.3, 502.3, 503.3, 506.3, 514.4
 Operation temp: -32°C to $+60^\circ \text{C}$

Signal outputs:
 1. Analog data output 0 to $\pm 6.1 \text{ V}$
 2. Digital output RS 232 for online data acquisition with Vallon data-loggers via cable or Bluetooth
 3. Headset
 Inputs:
 1. External battery power supply 9 Volts
 2. SEPOS® navigation system
 Weight of detector: approx. 4 kg (with batteries)
 Shipping weight with case: approx. 20 kg (with cable drum and 25 m cable)
 Dimensions-case: 80 x 52 x 31 cm

All technical data are subject to change without prior notice.
 Issue 12/2007

Ferrous Locator EL 1303D2

Universal set for the detection of UXO's on land, in the water and in boreholes



- High detection sensitivity
- Day / night indication meter
- Quick setting-up
- Ease of operation
- Lightweight
- Data output
- No sensor adjustment required

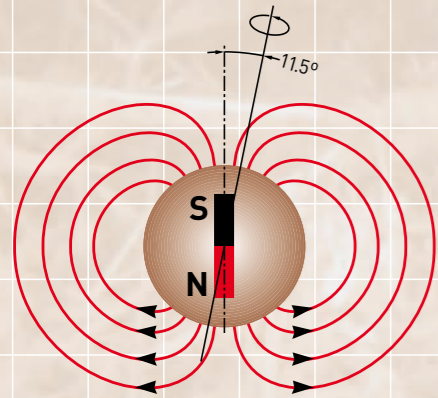
General

The Ferrous Locator EL 1303D2 is an easily portable and robust instrument which is highly recommended for practical explosive ordnance disposal due to its light weight.

During conventional detection, the measuring data are read off on the indication meter. By connecting a data logger, the measuring data can be stored, displayed as graphs and evaluated subsequently.

Measuring Principle

The magnetic field of the earth is homogeneous with regards to the field strength and the direction of



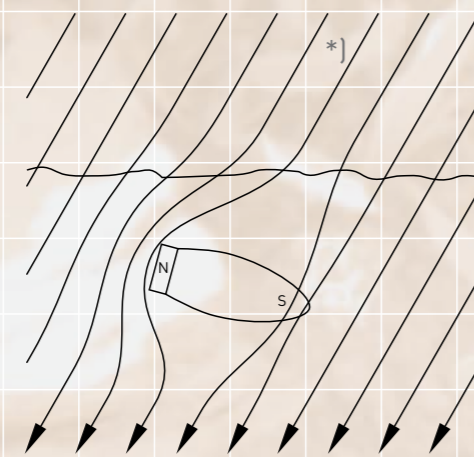
the field strength. If a ferromagnetic object is brought into this homogeneous field, the own field of the object is superposing the local homogeneous magnetic field of the earth.

With increasing distance from the object the field distortion is decreasing.

The extent of the distortion depends on several factors. The most important ones are the size of the object to be detected and its permeability. The larger the object to be detected, the larger the detection distance.

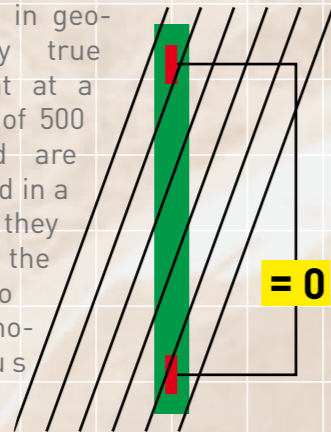
If the buried object is magnetized, i.e. it has an own magnetic field, the field lines are reacting according to the polarity of the object. The north pole of the object displaces the field lines of the earth, whereas

the south pole of the object attracts the field lines. In general, the total disturbance of magnetized objects



is larger than the disturbance of objects having no own field. But very rarely, the total disturbance might even be smaller depending on the orientation of the object.

The EL1303D2 is a differential magnetometer, i.e. two sensors are arranged in geometrically true alignment at a distance of 500 mm and are connected in a way that they measure the value zero in a homogeneous field.



Each sensor passing a ferrous object is differently affected. The indication deflects to plus or minus depending on the position of the object.

The measuring accuracy is guaranteed over long time under normal field operation and all weather conditions.

Sensor adjustment is not necessary!

**) Field lines of the northern hemisphere*

Main Components

The EL1303D2 comes with a splash-watertight universal case housing the complete set with cable drum:

- Electronics with batteries
- Control panel with indication meter
- Sensor tube (adjusted for lifetime)
- Carrying belt
- Headset
- Additional weight
- Ring screw
- Operation Manual
- Cable drum with 25 m cable



The robust and easily accessible operating and indicating elements correspond to the standards of a ferrous locator used under all weather conditions:

- 7 steps sensitivity switch
- Volume control
- Compensation key
- Integrated loudspeaker
- TEST-key



The watertight electronics contains pluggable printed boards. The cable connection is integrated in the carrying bar.

- Data output analog and digital (RS232)
- Socket for external power supply



- Mode selector for:
 - linear indication in the measuring range x1 or x10,
 - logarithmic indication in all sensitivity steps
- Battery check on load
- Data recording via:
 - cable RS 232 or wireless Bluetooth®

Bluetooth® is a registered trade mark of Bluetooth SIG, Inc., 500 108th Avenue NE, Suite 250, Bellevue, WA 98004, USA

A separately sealed battery compartment for 6 round cells IEC R 14 is arranged in the rear of the electronics.



The batteries are stored in such a position that they neutralize each other magnetically.

An extremely rigid integrated plug-in connection connects both detector parts electrically and mechanically.

The borehole or flushing pipe technology is mainly used where the typical surface detection is not sufficient



because of the requested detection depth or impossible due to service pipes, scrap metals or other magnetic waste hidden in the first meters of the surface. In normal or rocky soil holes are drilled up to 15 m depth and in sandy soil the holes are made by the flushing pipe technology. The sensor tube is lowered into the borehole and lifted up slowly.

Optional accessories for computer-aided detection

For an exact calculation of the position and depth of objects with software VALLON EVA2000® the data acquisition must be as accurate as possible.

This includes also a constant survey speed which is very difficult in practise. Our solution is SEPOS®.

1. Detection on Land

The SEPOS® navigation system consists of a SEPOS®-detector and SEPOS®-marks, which are integrated in the SEPOS®-rope in a distance of 100 cm. The SEPOS®-marks correct each 100 cm the walking speed, that means 1 correction per meter.

The SEPOS®-detector is fixed at the lower end of the sensor tube. Whilst walking along the tracks, the data acquisition is started automatically when the SEPOS®-



detector passes the first SEPOS®-mark respectively is stopped at the last SEPOS®-mark.

Thus the track length is automatically determined, even if the operator has different walking speeds. With normal walking speed 20 resp. 40 measuring points per second are recorded, this corresponds to a measuring point distance of approx. 5 resp. 2.5 cm.

2. Detection in Boreholes

The sensors passing a bomb are affected in different ways. In combination with VFC2 the measuring graphs are displayed in real time. The SEPOS® navigation system is consisting of a SEPOS®-detector and the SEPOS®-marks which are integrated in the sensor cable in a distance of 25 cm each.

The SEPOS®-detector is positioned around the borehole and the sensor tube is lowered into the borehole. The SEPOS®-marks correct the lifting speed each 25 cm, that means 4 times per meter. Now the sensor tube is lifted to the surface. When the first SEPOS®-mark of the sensor cable passes

the SEPOS®-detector, the data acquisition is started automatically.

Finally the sensor tube passes the SEPOS®-detector and the data acquisition stops automatically. Thus the depth of the borehole is automatically determined, even if the sensor tube has been lifted with different speeds.

During normal operation 20 resp. 40 measuring points per second are recorded, this corresponds to a distance of the measuring values of approx. 5 cm resp. 2.5 cm with normal lifting speed.

