CONTENTS

DSM1P-18003

1. FOREWORD

This Manual should be studied before any manipulation is made with the Detector.

<div style="border:1px solid black">

WARNINGS

PILOT®-M1 represents a functionally complete device – thus needs no maintenance from the User.

Don't try to disassemble it.

Ask qualified personnel for service and repair.

</div>

2. PRECAUTIONS

The following precautions should be taken when operating the equipment.

Entering the premise from the cold, keep the Detector in a carrying case for at least 2 hours before opening.

When setting the equipment ensure that:

- **the ventilation holes are not covered;**

- **air is allowed to circulate freely around the body;**

- **it is on a vibration free surface;**

- **it will not be exposed to strong interference from an external source;**

- **it will not be exposed to electrostatic discharges;**

- **it will not be exposed to excessive heat (higher then 70°C even when it's switched off) or to direct sunlight;**

- **avoid condensate, splashes or water from entering the inside of the Main Unit body. If a foreign body or water does enter the equipment contact your nearest dealer or service center;**

- **don't use the Main Unit in a dusty and smoky environment;**

- **don't remove the cover from the body!**

- **don't handle the cables with wet hands!**

- **don't pull out the plugs by pulling on the cables - hold the plug!**

- **In addition, never place heavy objects on the equipment!**

3. RECOMMENDATIONS

The portable Explosive Vapor Detector (EVD) **«PILOT®-M1»** is intended for detection of charges of explosives in non-tight volumes and traces of explosives on a surface of surveyed objects. Detection is carried out by sampling air from internal volumes of surveyed objects or from their surfaces and the analysis of tests on contents of characteristic components of explosive vapor.

The detector is capable to detect traces of explosives based on nitroglycerine (NG), EGDN, trinitrotoluene (tol, trotyl, TNT), PENT (tetranitrapentaerythrit, pentaerythrittetranitrate, Pentrit, PENT), hexogen (RDX), oktogen (HMX), tetryl (Tetril) and nitrocellulose powders, engaging mixing explosives on their ground: Semtex and other plastic and elastic explosives on the basis of RDX, PENT or their mixture, B-type compositions (ТГ-20, ТГ-40, ТГ-60, ТГ-80, МС, ТГАФ)*, C-type (С1, С2, С3, С4, ПВВ-4*, ПВВ-5А*, ПВВ-7*, ПВВ-12М*, ЭВВ-11*, ЭВВ-32*, and etc.), H-6, HBX, Minol-2, Amatol (amatol, аммонит № 6-ЖВ*), Primacord, Primasheet, Tetritol, Tritonal, Cordit N, A-IX-1, A-IX-2, A-IX-20, octols*, ocfols* and etc.

* - explosives of Russian origin.

4. OPERATIONAL PRINCIPLE

The proper sample collection is governing condition for any trace detector. The versatile EVD is capable of analyzing either trace particle or vapor samples, allowing the operator to apply an adequate sampling technique for the substance suspected.

For example, most explosives do not have a strong vapor presence and in the real world are very difficult to detect by vapor. Therefore, the most reliable collection and analysis method for those substances is particle collection.

The EVD operational principle is based on Drift Spectrometry method - free ions mobility in an alternating electric field. Explosives vapor detection is realized by assay collection from the suspect object surface or its inner space and subsequent analysis of these samples for the presence of typical components. Sample collection is accomplished by means of air suction from object's surface or through the holes, chinks and slots in its body. It can be done directly or by means of additional pump. Assay for analysis can be obtained by wiping the inspected surface with sampling swabs as well.

Explosives particles collected by swab or its adsorbed vapor are ionized and directed into a drift-box with alternating electric field. Then distinctive ions typical to explosives are separated and registered.

The obtained analysis data is processed by build-in CPU and displayed on LCD.

Special sample Heater (supplied) provides ultimate possibilities:

– Explosives detection not only from a gaseous but also solid phase (microparticles).

– Less volatile matters detection like RDX, PENT and compositions on their base (plastic and elastic explosives).

– Minimization of environment influence (humidity, temperature and air turbulence) on detection facility.

– Simultaneous sample collection in various places by means of dedicated Sampler Unit or swabs

Moreover, supplementary Gauze Sampler Unit (air pump) allows operator to collect samples even in a dusty and smoky environment when a direct usage of the Main Unit is not recommended.

SPECIAL WARNING!

«Pilot®-M1» EVD is a high sensitive device.

• *don't store the Detector in ammunition, explosives and weapon rooms;*

• *don't use the Detector in a premise where explosives are stored;*

• *don't allow personnel with direct contact with explosives from any operation with the Detector;*

• *don't collect samples and place the detector in the inspection zone, if there's alarm signal of maximum intensity indicating high concentration of vapor or microparticle explosives;*

• *don't use the detector over the sources, which intensively emit moisture vapors, acids, alkalis, solvents or oily vapors (for example when cooking on electric or gas heaters).*

Remember that contamination of the detector's internal and/or external surfaces with (for example) oily substances and deposition of microparticle explosives on them will cause permanent false alarms.

For troubleshooting you should return the detector to the manufacturer to repair the device at User's cost.
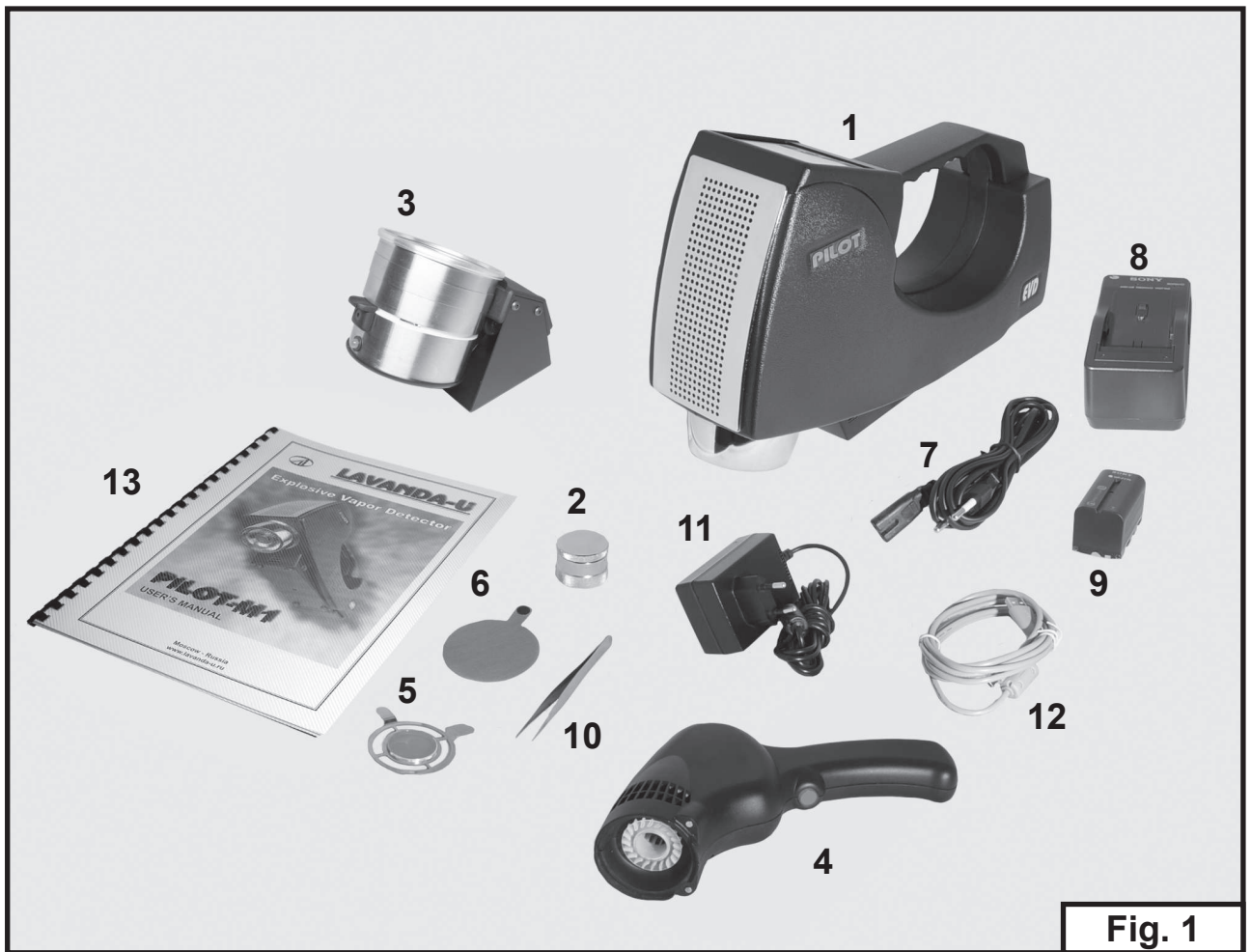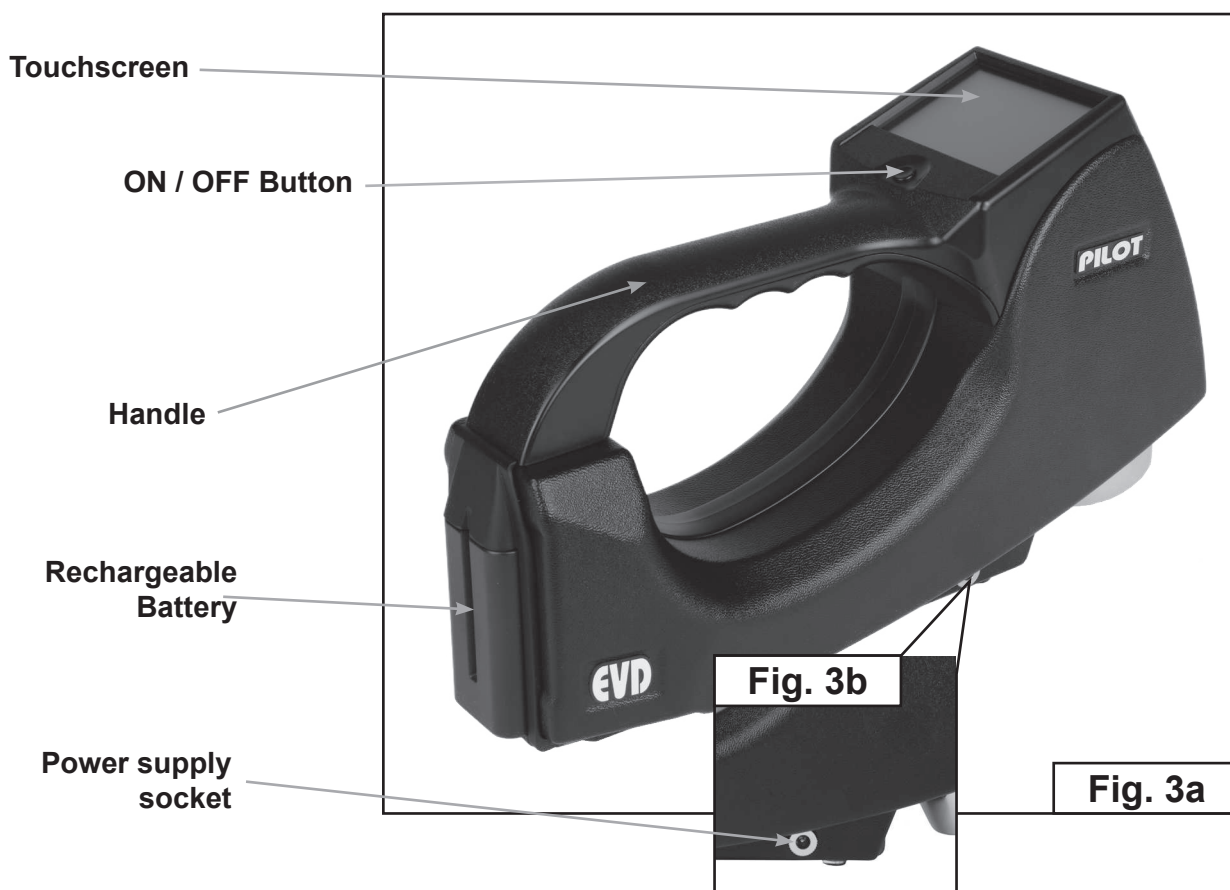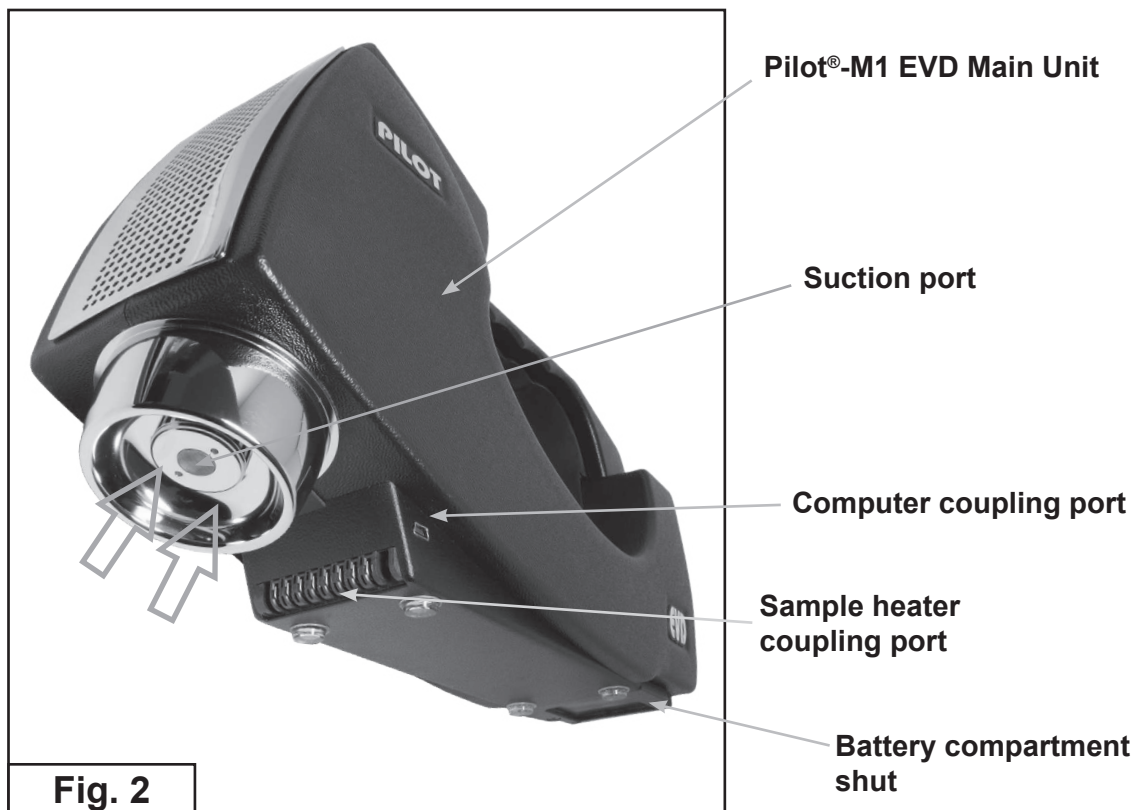
5. EVD. COMPLETE SET

Fig. 1

1. EVD, Main Unit	1	10. Tweezers	1
2. Test unit (Imitator)	1	11. AC / DC Adapter	1
3. Sample Heater	1	12. USB cable	1
4. Self-contained Gauze Sampler Pump	1	13. User's Manual	1
5. Metallic Gauze Sampler	3	14. Carrying case*	1
6. Special Swab Sampler	30	15. Software*	1
7. Power cable for the Charger	1		
8. Charger	1		
9. Rechargeable Battery	2		

 * - not shown on Fig. 1.

6. EVD. CONTROLS AND CONNECTORS

Pilot®-M1 EVD Main Unit

Suction port

Computer coupling port

Sample heater coupling port

Battery compartment shut

Fig. 2

Touchscreen

ON / OFF Button

Handle

Rechargeable Battery

Power supply socket

Fig. 3b

Fig. 3a

7. EVD. POWER SUPPLY

EVD can be powered both by rechargeable battery and wall outlet.

7.1. RECHARGEABLE BATTERY POWER SUPPLY

NOTE: Use only rechargeable batteries from supplied set. EVD is compatible with NP-F770 battery (7.2 V). Please contact manufacturer for details.

Battery replacement:

1. Make sure the EVD Main Unit is off and AC/DC adapter isn`t connected.

2. Open the battery compartment shut   (Fig. 4a)

3. Remove discharged battery from the battery compartment (Fig. 4b).

4. Place charged battery into the battery compartment.

5. Close the battery compartment shut.

Fig. 4a

Fig. 4b

7.2. MAINS POWER SUPPLY

1. Take an AC/DC Power Adapter (No.11 on the Fig. 1).

2. Connect AC/DC to a corresponding socket on the back side of the Main Unit body.

3. Couple AC/DC Adapter plug to the wall outlet.

Fig. 5a

Battery charging indicator

READY

NOTE: The battery is charging while EVD is supplied from wall outlet via corresponding AC/DC adapter (Fig. 5a).

Fig. 5b

BATTERY CHARGING

While th EVD is off battery charging progress is shown on the display (Fig 5b).
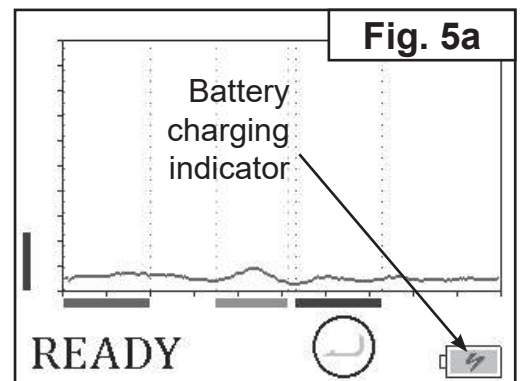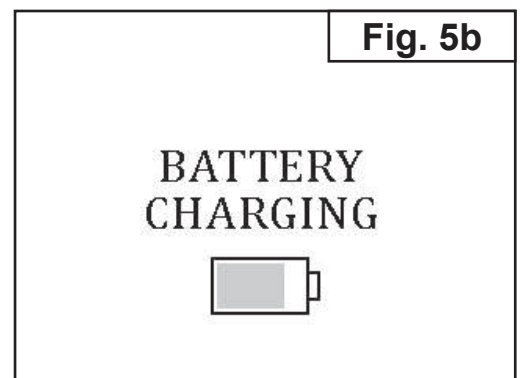
7.3. BATTERY STATUS CONTROL

The battery status is shown in lower right corner of the screen. (Fig. 6a).

Discharged battery is indicated by audio signal and «BATTERY IS LOW» message on the screen. (Fig. 6b)

Fig. 6a

battery status indicator

READY

94%

Fig. 6b

BATTERY IS LOW
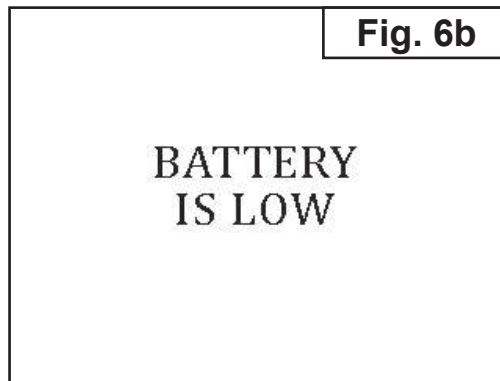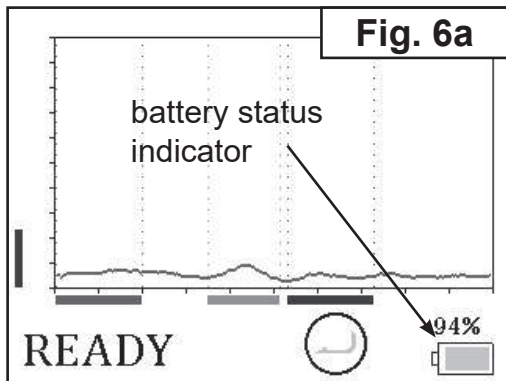
7.4. BATTERY CHARGING

1. Connect AC/DC Adapter plug to the charger (Fig. 7a).

2. Insert discharged battery into the charger until it's locked (Fig. 7b).

Fig. 7a

Fig. 7b

3. Couple AC/DC adapter plug to the wall outlet - red LED will light in confirmation.

4. After finishing the charging process green LED will light.

8. DETECTOR OPERATION

8.1. GETTING STARTED

1. Take the EVD Main Unit.

2. Provide its power supply: insert a charged battery (see page 7) or couple AC/DC adapter.

3. Place the EVD at least 50 cm far from surroundings.

4. Switch on the EVD by pressing ON/OFF button.

5. After the system test the EVD will pass to a «READY» mode (Fig. 8, 9).

6. To enter «SEARCH» mode (Fig. 10) tap (Fig. 9).

   Periodic audio signal corresponds to vapor analysis period of the method employed.

NOTE: In a complicated environment condition might be a situation when the air in that place, i.e. the gaseous background of the environment, causes a false alarm.

The system reacts by a corresponding audio signal and the LCD indication «ALARM» (Fig. 11). In such case operator should readjust a threshold detection level.

Fig. 8

WAIT 3   100%

Fig. 9

READY   82%

Fig. 10

Number of ionogram

Ionogram

SEARCH 26   81%

Fig. 11

Number of ionogram

ALARM 34   81%
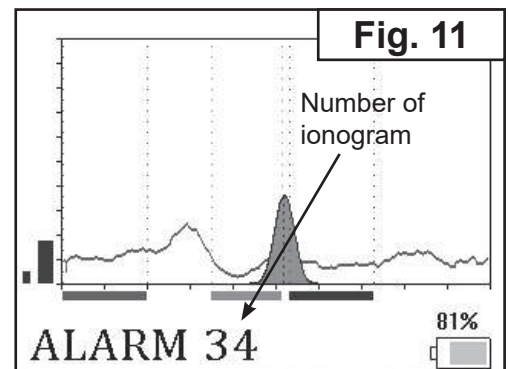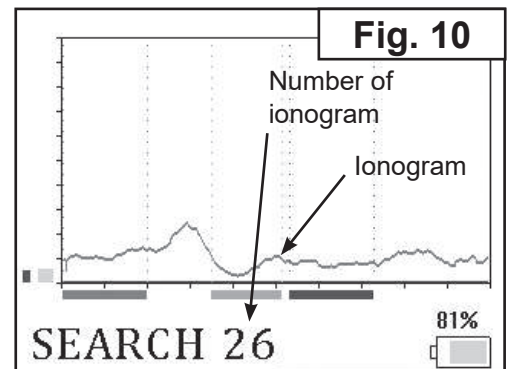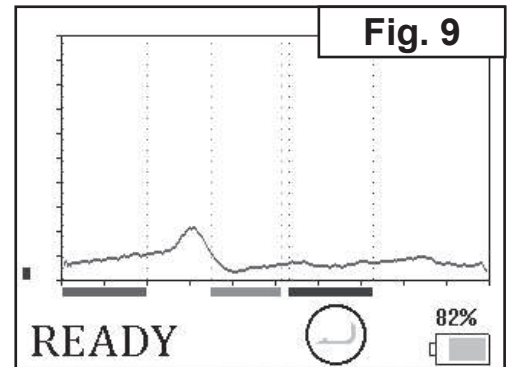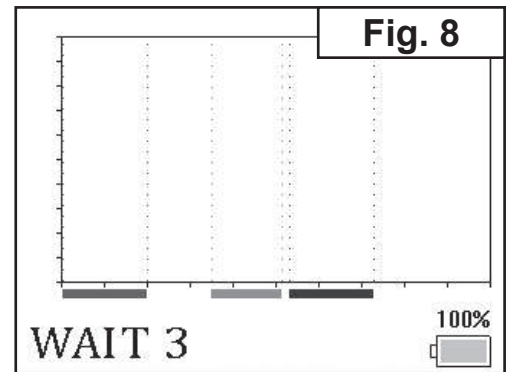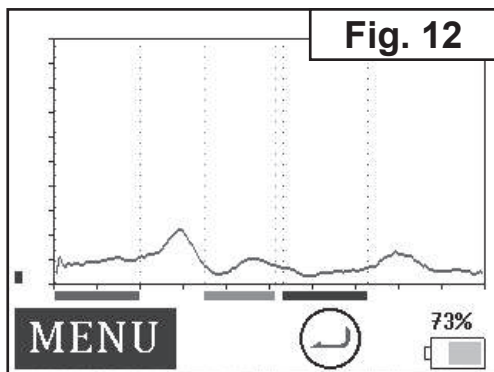
Fig. 12

8.2. THRESHOLD DETECTION LEVEL ADJUSTMENT

1. Tap the touchscreen to make **MENU** icon appear, than tap **MENU** to enter Settings Menu.
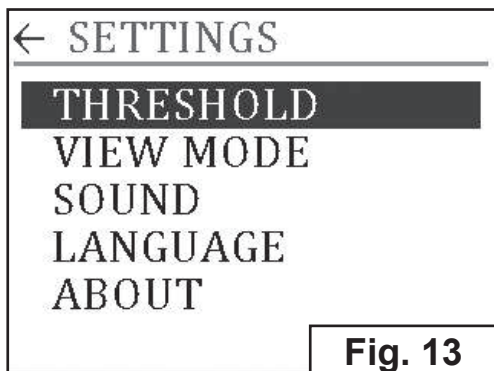
Fig. 13

2. Select «THRESHOLD» by tapping it (Fig. 13).

Fig. 14

Threshold detection level
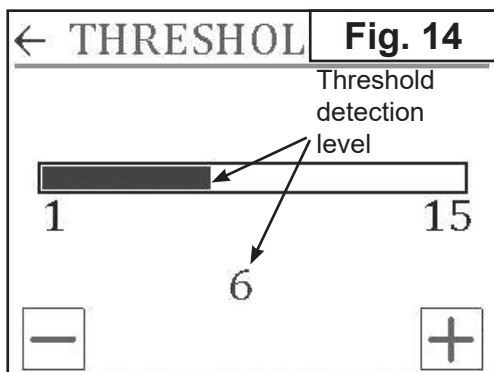
3. Adjust threshold detection level by tapping **—** or **+** (Fig. 14). Tap **←** to apply settings.

Fig. 15

Threshold detection level
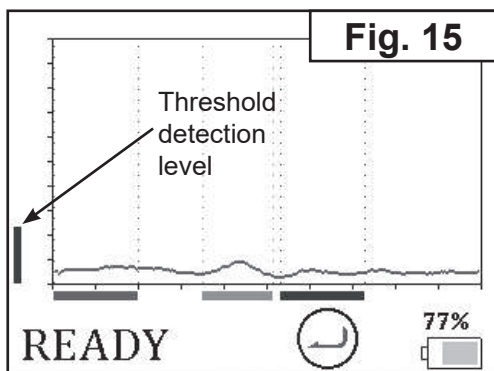
4. To exit from Settings Menu tap **←** (Fig. 13). The EVD will pass to a «READY» mode (Fig. 15).

NOTE: The EVD working capacity should be checked after threshold level adjustment!

8.3. WORKING CAPACITY TEST

1. Take an imitator (container with TNT vapor source).

2. Open an imitator's container (Fig. 16).

3. Tap ⟳ to enter «SEARCH» mode.

4. Draw the suction port of the Main Unit near opened imitator within 30...40 mm distance (Fig. 16).
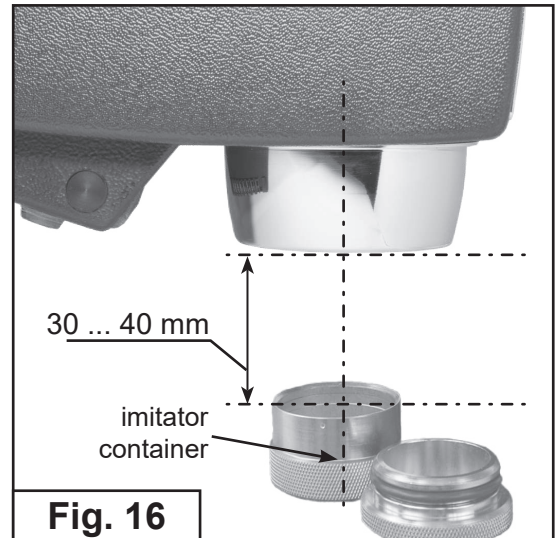
5. If the Detector operates properly the Alarm sound will be present and the LCD will indicate the word «ALARM» (Fig. 17).
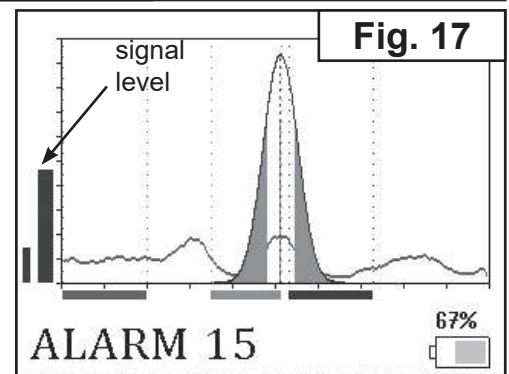
   Sound alarm and «CONTAMINATION HAZARD» (Fig. 18) message indicates high explosive concentration. In this case immediately take away detector from the object. Pilot®-M1 Detector will stop analysys procedure. Tap CONTINUE **to check last analysys results (Fig. 19).**
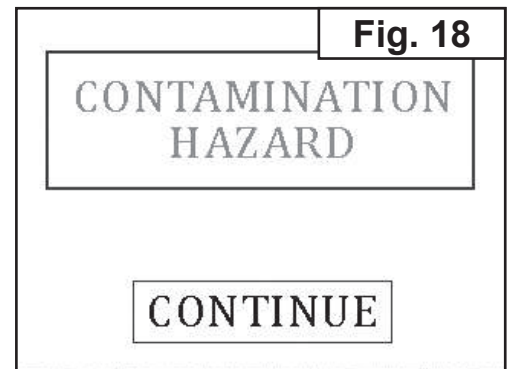
6. Close the imitator's container.

7. Tap ✕ to enter «READY» mode and wait until cleaning procedure is completed (Fig. 20).

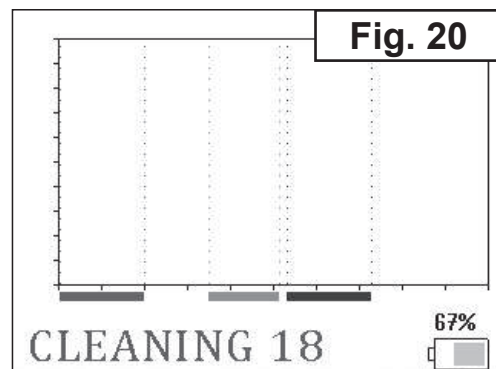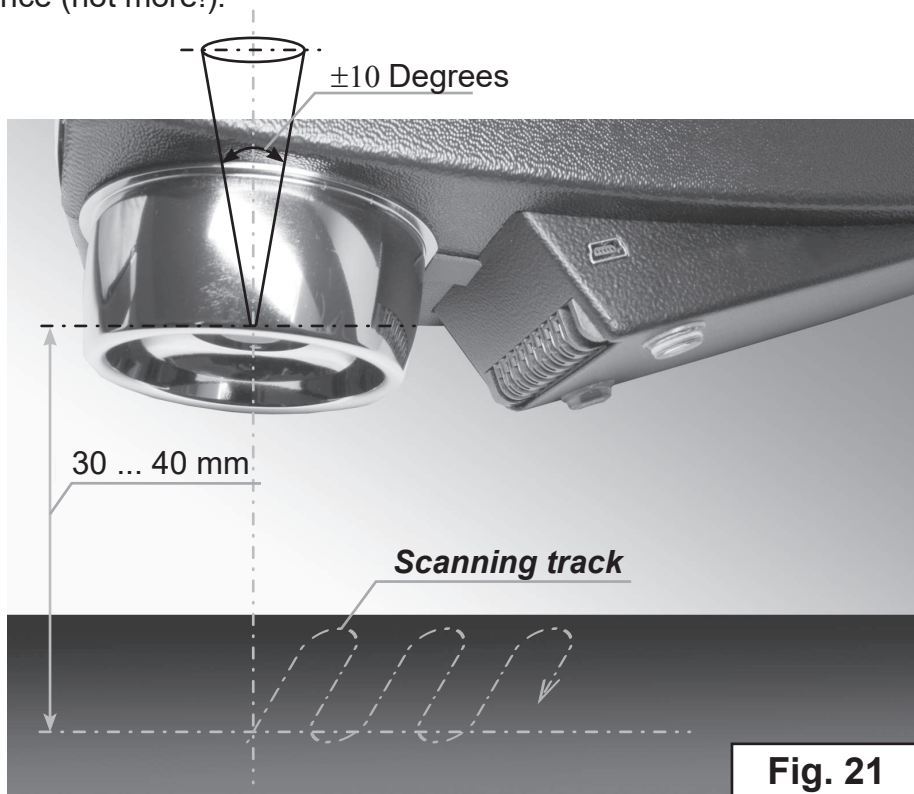8. The Detector is ready for operation.

Fig. 16

30 ... 40 mm

imitator container

Fig. 17

signal level

ALARM 15

67%

Fig. 18

CONTAMINATION HAZARD

CONTINUE

**Fig. 19**

ALARM 13

67%

Fig. 20

CLEANING 18

67%
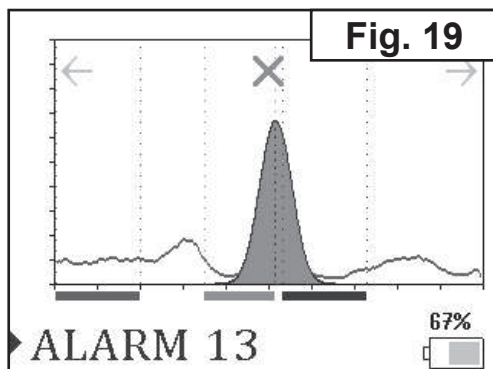
8.4. SEARCH MODE

1. Tap ⟳ to enter «SEARCH» mode.

2. Draw the suction port of the Main Unit near an inspected surface (Fig. 21) within 30-40 mm distance (not more!).

±10 Degrees

30 ... 40 mm

Scanning track

Fig. 21

3. Scan an inspected surface or an object sliding Detector smoothly without jerky motions approx. 10 mm/sec (no faster!). Hold the Detector at a right angle to the surface. The maximum deflection should be no more then ± 10 degrees (Fig. 22).

10 mm/sec

Fig. 22
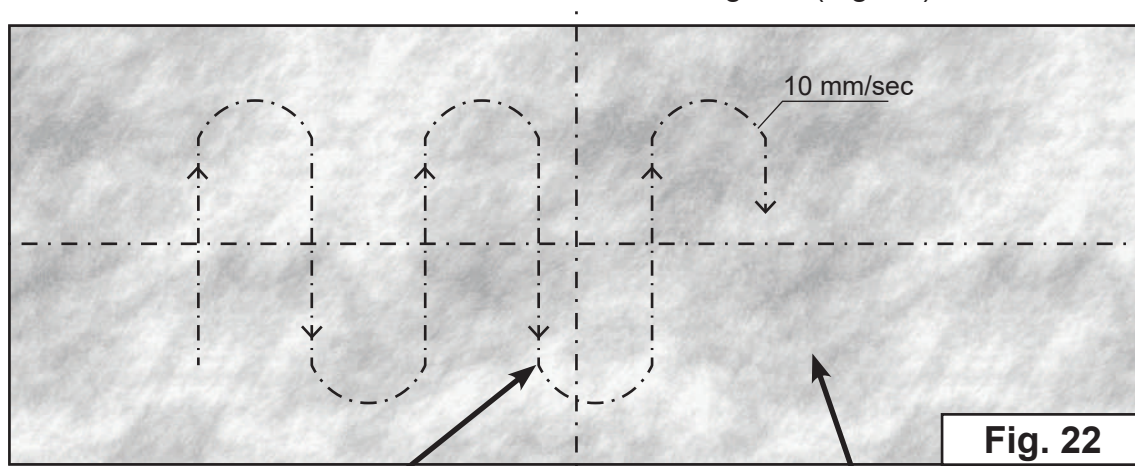
Curved scanning path and rate at the time of its investigation   **Questioned object surface**

NOTE: Shelter the place of operation from wind and draught.

Pay special attention to locks, handles, slots and cracks of an object where the explosive residue or its vapor are more probable.

Fig. 23

4. In case of explosives detection the repeated audio signal and the word «ALARM» on the LCD should appear (Fig. 24).

Fig. 24

Threshold detection level

signal level

number of ionogram

ALARM 34

81%

5. **Sound alarm and «CONTAMINATION HAZARD» (Fig. 25) message indicates high explosive concentration. In this case immediately take away detector from the object.**

    The Detector will stop analysys procedure. Tap CONTINUE **to check last analysys results.**

    Tap ← or → for ionogram swithing.

    Tap ✕ to return «READY» mode.

Fig. 25

CONTAMINATION HAZARD

CONTINUE
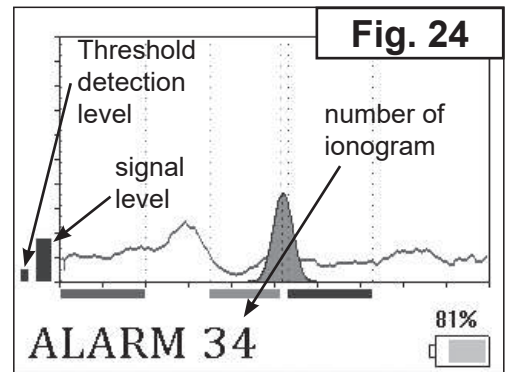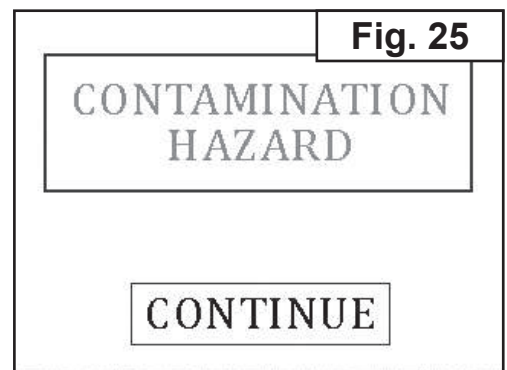
NOTE:

There can be cases of short-term loss of detector's working capacity in case of presence of objects with high concentration of explosives in vapor/microparticle form around them. It can also happen when moving the detector between the premises, from the premise outside and back or when there are temperature/humidity changes. In these cases, false alarm signal can be generated or test unit (imitator) can be ignored. Self-recovery of working capacity in such situations can take from several minutes to several tens of minutes.
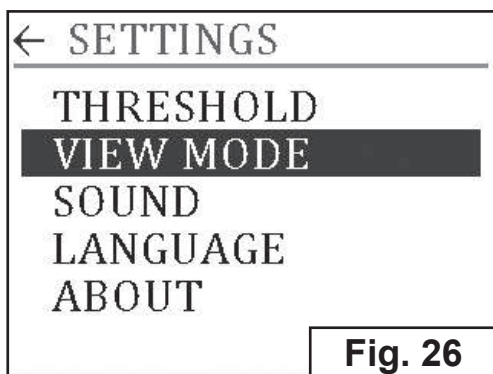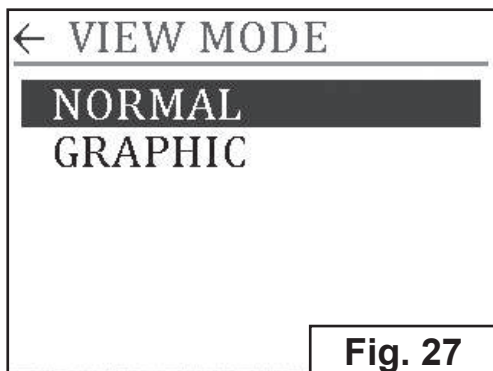
Fig. 26

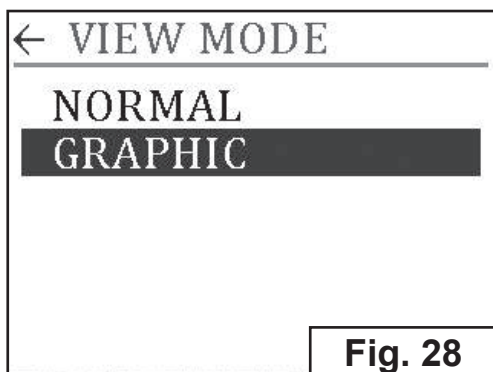

Fig. 27

Fig. 28

8.5. VIEW MODE SETTINGS

1. Tap the touchscreen to make `MENU` icon appear, than tap `MENU` to enter Settings Menu.

2. Select «VIEW MODE» by tapping it (Fig. 26).

3. Select «NORMAL» (Fig. 27) or «GRAPHIC» (Fig. 28) by tapping it. Tap `←` to apply settings. «NORMAL» ans «GRAPHIC» views are shown on Fig. 29,30.

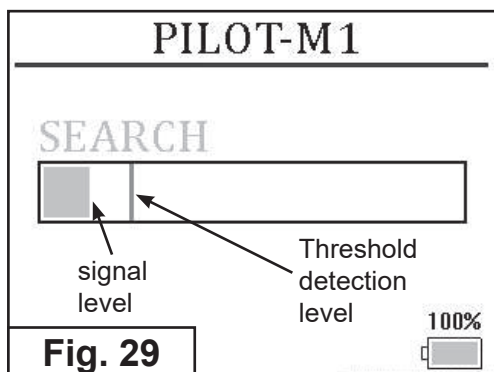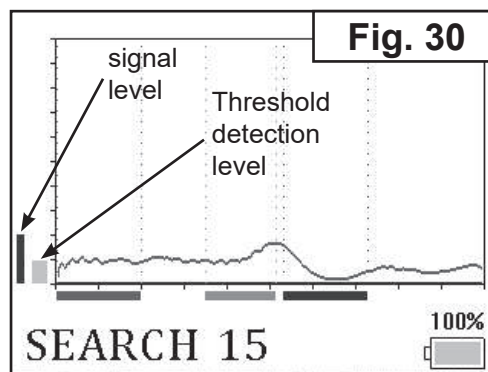4. To exit from Settings Menu tap the icon `←` again. The Detector will pass to a «READY» mode.

Normal view

Fig. 29

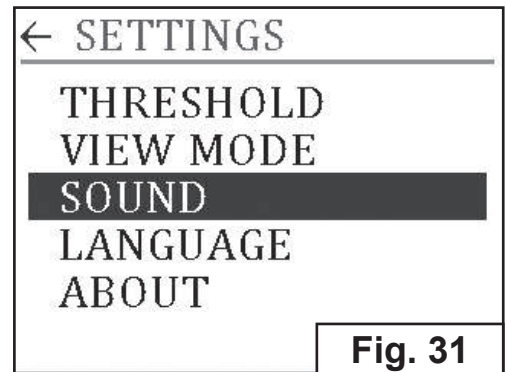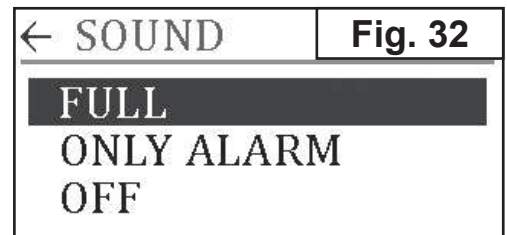**Graphic view**

Fig. 30

8.6. SOUND SETTINGS

1. Tap the touchscreen to make MENU icon appear, than tap the MENU to enter Settings Menu.
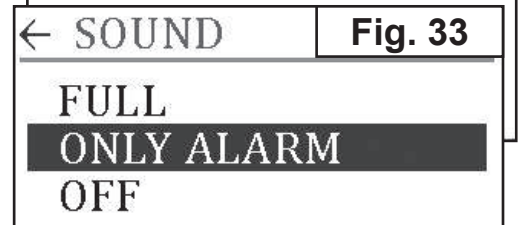
2. Select «SOUND» by tapping it (Fig. 31).

Fig. 31

3. Select «FULL» (Fig. 32), «ONLY ALARM» (Fig. 33) or «OFF» (Fig. 34) by tapping it.
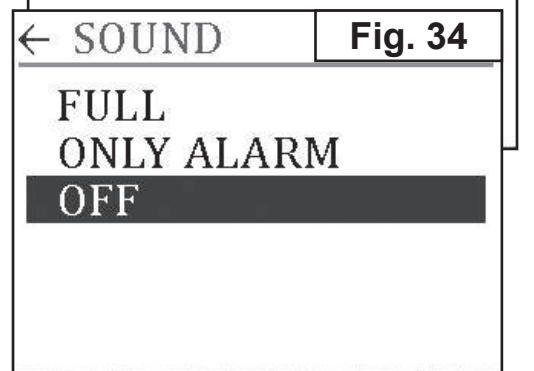
   • set «FULL» if the sound is turned on;

   • set «ONLY ALARM» if alarm audio signal only;

   • set «OFF» if the sound is turned off.

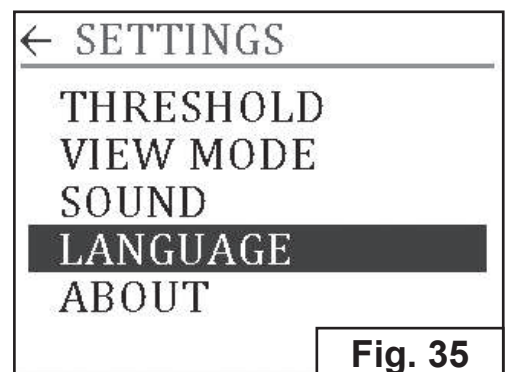   Tap ← to apply settings.

Fig. 32

Fig. 33

Fig. 34

4. To exit from Settings Menu tap the icon ←. The Detector will pass to a «READY» mode.

8.7. LANGUAGE SETTINGS

1. Tap the touchscreen to make MENU icon appear, than tap MENU to enter Settings Menu.
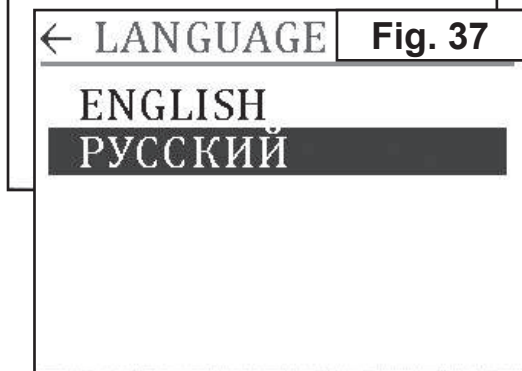
2. Select «LANGUAGE» by tapping it (Fig. 35).

Fig. 35

Fig. 36

Fig. 37

3. Select language (Fig. 36,37).

   Tap [←] to apply settings.

4. To exit from Settings Menu tap [←]. The Detector will pass to a «READY» mode.

8.8. DETAILED INFORMATION
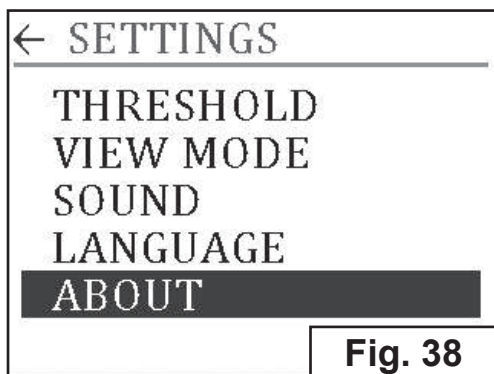
Fig. 38

1. Tap the touchscreen to make **MENU** icon appear, than tap **MENU** to enter Settings Menu.

2. Select «ABOUT» by tapping it (Fig. 38).

PILOT-M1

S/N: 00001
05/02/2016
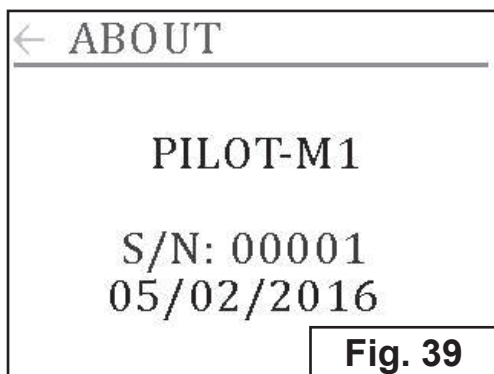
Fig. 39

3. «ABOUT» screen contains information about serial number and manufacturing date (Fig. 39).

4. Tap [←] to return Settings Menu.

5. To exit from Settings Menu tap the icon [←]. The Detector will pass to a «READY» mode.

9. SAMPLE HEATER

Special Sample Heater (Fig. 40) supplies an operator with a unique chance to detect less volatile explosive matters right on spot.

Moreover, it permits to reveal explosives from liquid and solid (i. e. micro-particles) phases.

In that case the EVD can be placed in a friendlier environment with a minimum influence of high humidity, dust, smoke, low and high temperature.

LED indicator
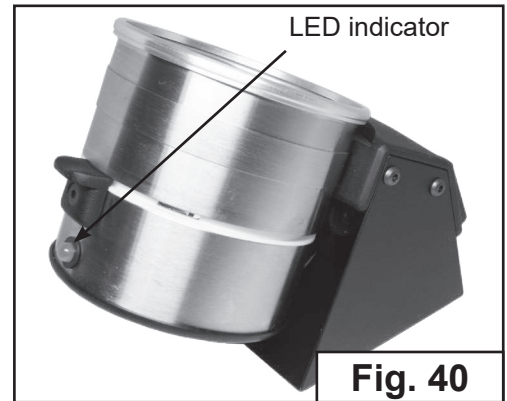
Fig. 40

9.1. SAMPLE HEATER OPERATIONS

1. Place on stable plane surface.

2. Make sure detector is off.

3. Connect the EVD to the Sample heater until it stops (Fig. 41-42).

4. Switch on the EVD (see page 9).
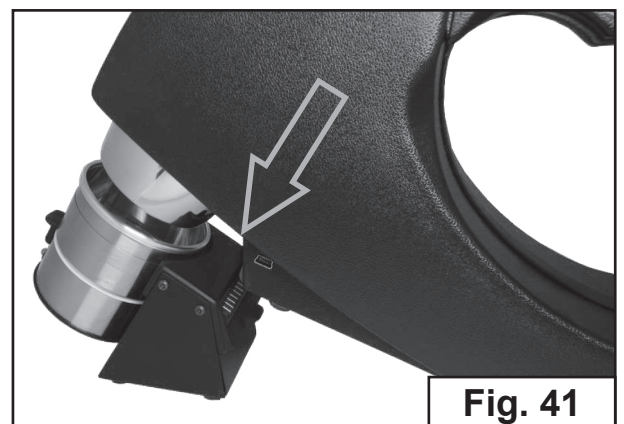
After turning on the detector checking background signal. Icon in the bottom right corner of LCD 〈SSS〉 indicates connected sample heater and Heater's LED light changes color from red to green (Fig. 43).

NOTE: In case of high signal amplitude (Fig. 44 on page 18), cleaning of the Sample Heater is recommended (see «11. Contaminated elements cleaning», page 23).

Fig. 41

Fig. 42

Fig. 43

Connected heater icon

100%

SETTING 6

17

Fig. 44

SETTING 15 100%

Fig. 45

READY 94%

Fig. 46

SETTING

CLEANING

READY 100%

6. After checking background signal the EVD will pass to an «READY» mode (Fig. 45).

NOTE: Every time starting an investigation check the Heater purity. This will help to avoid a false alarm. Carry out several null-cycle measurements (with out special swabs and other sampler units!) to confirm the device purity.

In case of long-term usage sample heater contamination may occur. It leads to false alarms. In such cases recommended periodically update background signal: In «READY» mo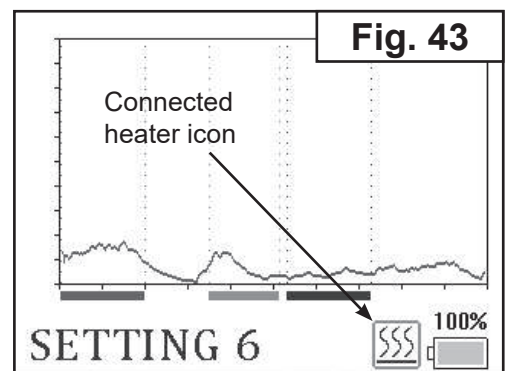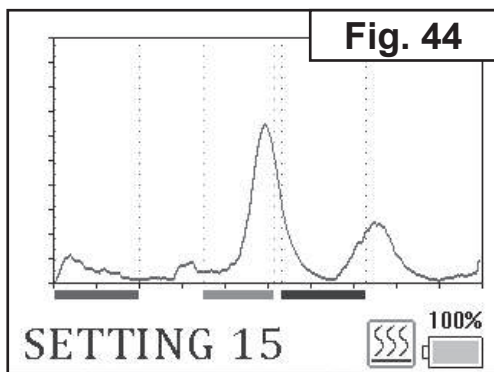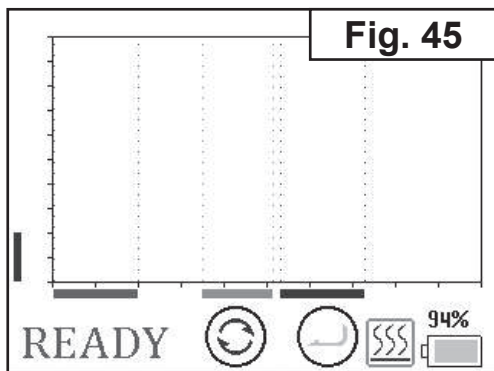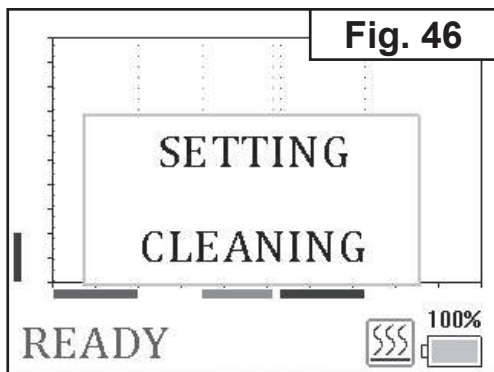de tap [↻] (Fig.45). To update the background signal tap «SETTING» (Fig. 46). Detector will update the background signal and returns to the «READY» mode.

7. To reach working chamber of the Heater turn the lower part of it downwards (shown by an arrow) (Fig. 47). Use plastic knob for this purpose.

8. Open the working module of the Heater and insert the swab (Fig. 48 on page 49) or the Metallic Gauze Sampler (Fig. 49 on page 49).

NOTES:

- *Place the swab in the middle of the working area with the used side UPWARDS - towards Detector's suction port.*

- *Don't touch heating element of the Heater barehanded. Use tweezers (supplied).*

- *Sample analysis is available within 1…2 hours from the moment of sample collection.*

Fig. 47
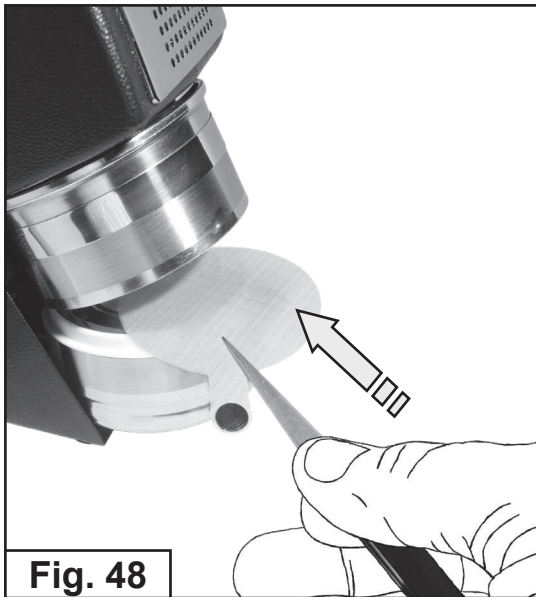
Fig. 48

Fig. 49
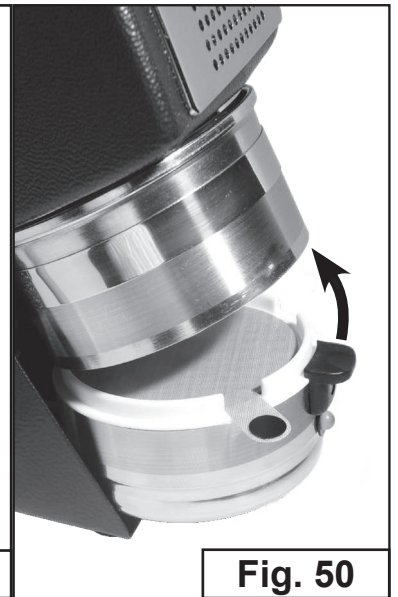
Fig. 50

9. Close the working module (Fig. 50).

10. Tap ⟳ to enter «SEARCH» mode (Fig. 51). In case of explosive detection ALARM signal should appear (Fig. 52).

NOTE: If «CONTAMINATION HAZARD» (see Fig 24, 25 on page 13) warning appears immediately remove Metallic Gauze Sampler or swab sampler from sample heater! The EVD will run «self-cleaning» procedure with countdown timer.

11. After this the EVD keeps operating in result viewing mode.

12. Remove the swab or Metallic Gauze Sampler from sample heater.

13. Tap ← or → for ionogram swithing (Fig. 53).

    Tap ✕ to return «READY» mode.

14. Turn off the detector. Unplug AC/DC adapter if it is necessary.

Fig. 51

SEARCH 11   94%

Fig. 52

ALARM 13   94%

Fig. 53

SEARCH 19   94%

19

Fig. 54

Fig. 55

Fig. 56
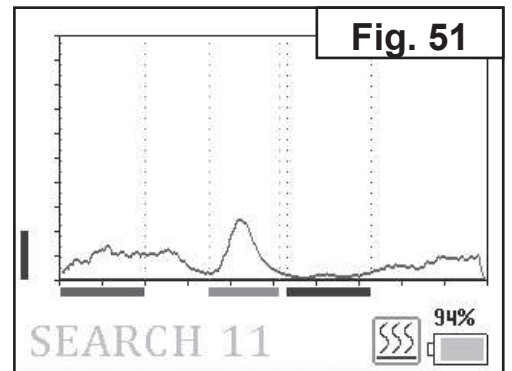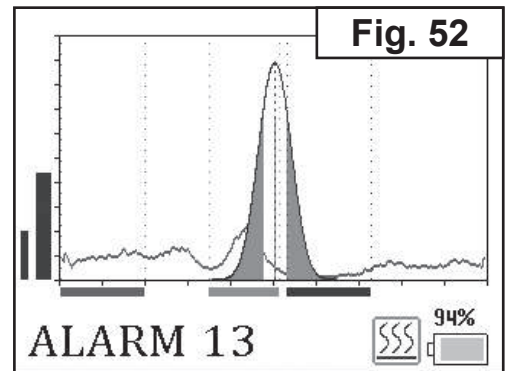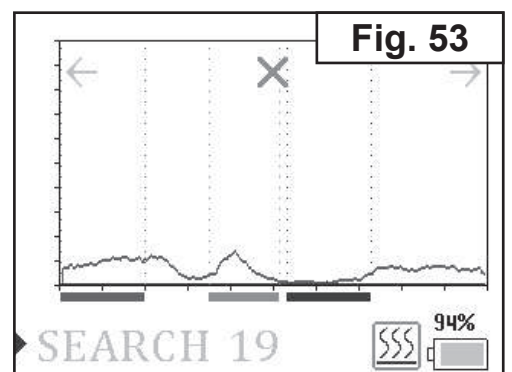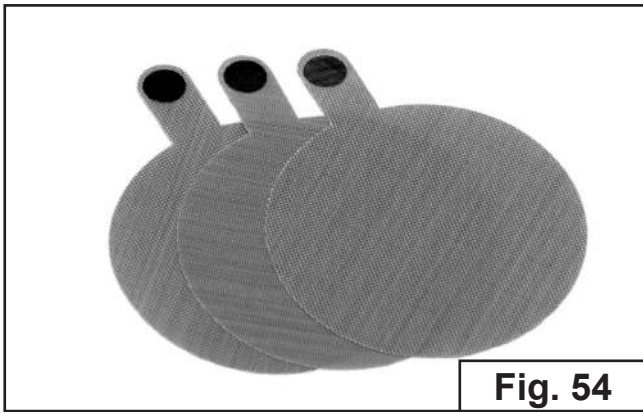
9.2. SAMPLE COLLECTION USING SPECIAL SWABS

1. Take the swab from the package (Fig. 54). Use tweezers (supplied) for better accuracy.

2. Wipe smoothly the questioned surface: Press the swab slightly with your index finger to the surface to be examined and carry out several circular motions (Fig. 55).

3. Examine thoroughly the used side of the swab and remove apparent particles to prevent the Detector's contamination (Fig. 56).

4. Examine the swab with Pilot-M1 Detector in a «SEARCH» mode (refer to «8.1. Detector operation. Getting started», page 9).

5. If no «ALARM» signal was received in this mode, put the swab into the Heater (refer to «9.1. Sample Heater operations», page 17).
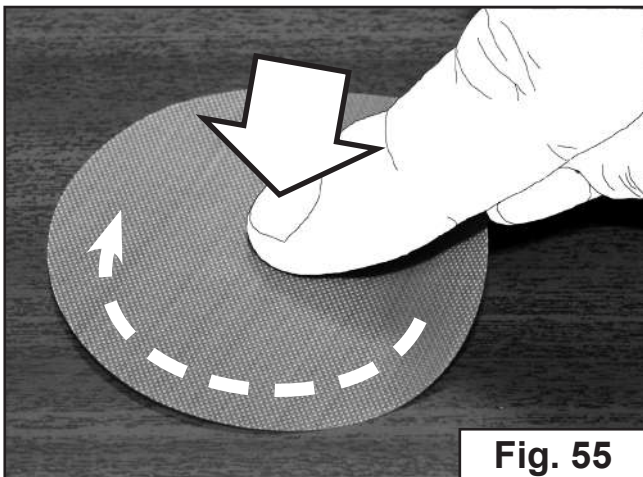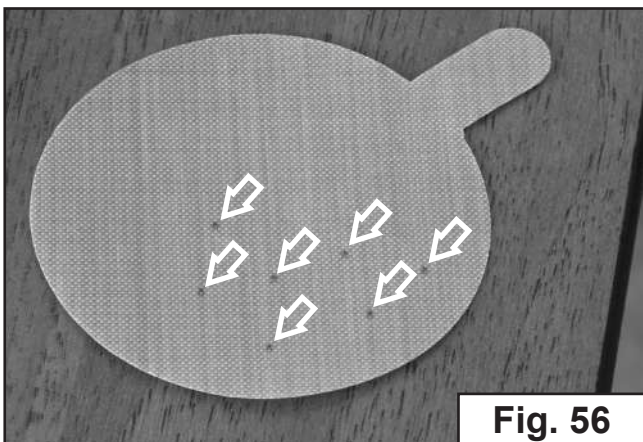
NOTE: to avoid system contamination keep used swabs separatly from pure (non-used) ones!

It is prohibited to store used swabs inside the carring case!

10. GAUZE SAMPLER PUMP

Gauze Sampler Pump together with a Metallic Gauze Sampler set (Fig. 57) is intended for collecting samples (micro-particles) in a **dusty and smoky environment**.

The Sampler Pump is powered by build-in rechargeable battery.

10.1. SAMPLE COLLECTION USING GAUZE SAMPLER PUMP

1. Take the Metallic Gauze Sampler (Fig. 59).

2. Insert the lug of the Sampler into the notch of the Gauze Sampler Pump. Then turn it to the suction port of the Pump (Fig. 58) and fix the Gauze Sampler (Fig. 60).

3. Switch on the Sampler Pump. Green LED is blinking, the noise of the impeller can be heard.

   NOTE: LED indicator (Fig. 61) on the Sampler Pump blinks red if its build-in battery is discharged (see page 22).

4. Draw the Sampler Pump near an inspected surface within 20-30 mm distance (Fig. 62 on page 22). Scan an inspected surface or an object sliding it smoothly without jerky motions.

   NOTE: Sample collection time should be not less then 20 sec.

5. After inspection switch off the Sampler Pump by pressing «On/Off button».

6. Remove Gauze Sample from the Sampler Pump.

Gauze Sampler Pump · ON / OFF button · Metallic Gauze Sampler · Impeller

Fig. 57

notch

Fig. 58

Fig. 59

Key

Fig. 60

LED indicator

Fig. 61

20...30 mm.

Fig. 62

Fig. 63

Fig. 64

From AC/DC adapter

Battery charging socket
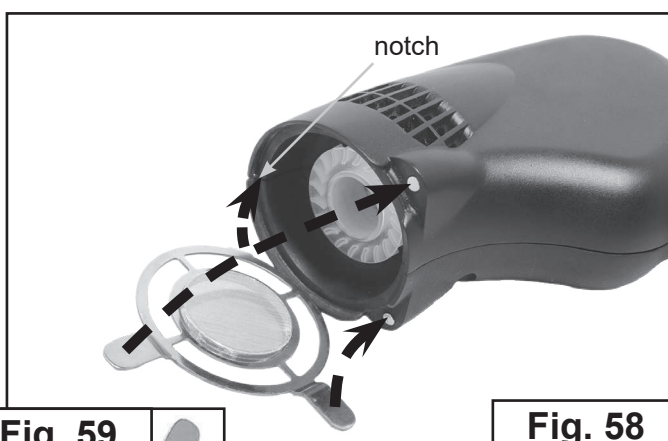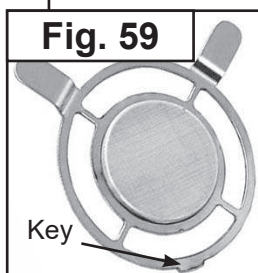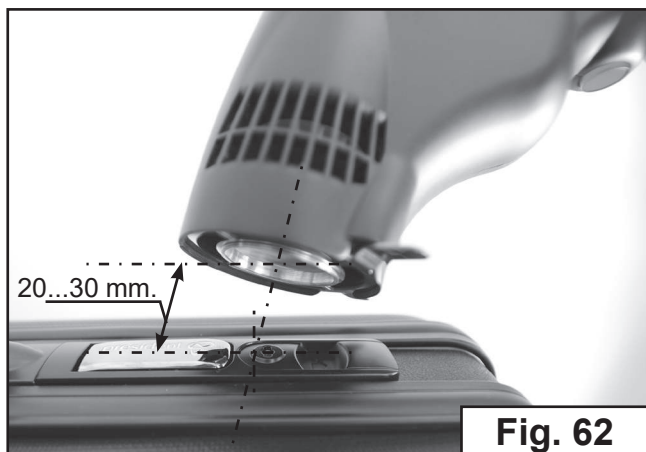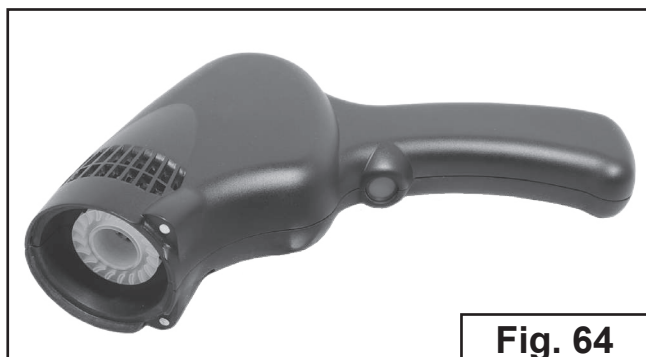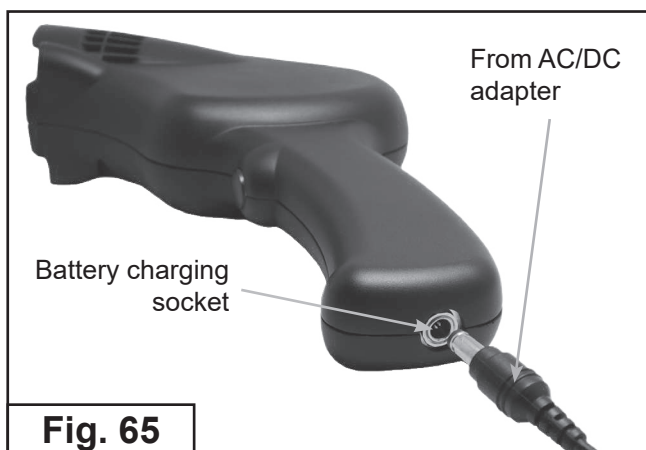
Fig. 65

7. Examine the Gauze Sampler with Pilot®-M1 Detector (Fig. 63) in a «SEARCH» mode (refer to «8.1. Detector operation. Getting started», page 9).

8. If no «ALARM» signal was received in this mode, put the Gauze Sampler into the Heater (refer to «9.1. Sample Heater operations», page 17).
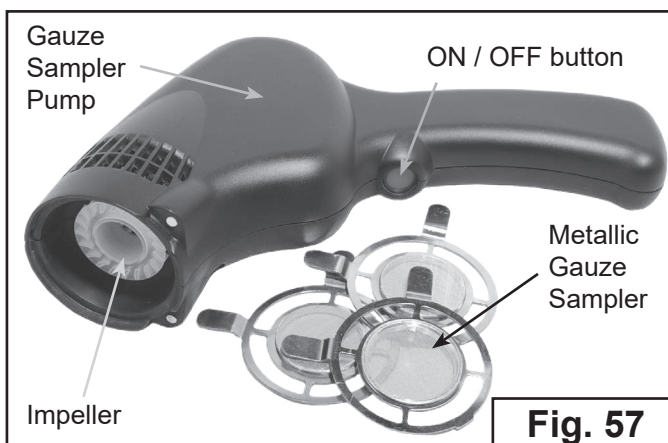
9. In case of explosives detection wash out the Gauze Sampler with rectified alcohol and blast it with hot air. Check its purity by means of Pilot®-M1 Detector. In case of explosives detection Gauze Sampler should be cleaned. (refer to «11. Contaminated elements cleaning», page 23).

NOTE: it is prohibited to store contaminated Gauze Samples inside the carring case.

10.2. SAMPLER PUMP BATTERY CHARGING

Use AC/DC Adapter (supplied) for charging Sampler Pump build-in battery.

1. Switch off the Sampler Pump (Fig. 64).

2. Couple the AC/DC Adapter plug to the corresponding jack of the Pump on the bottom of the Pump (Fig. 65).

3. Couple the AC/DC Adapter plug to the wall outlet. The LED on the Pump body blinks red twice then lights red continuously.

4. After 4-hours charging the green LED confirms the charging completion.

NOTE: Fully charged battery provides at least 8-hours of continuous operation.

11. CONTAMINATED ELEMENTS CLEANING

Use medical or isopropyl alcohol (isopropanol) for cleaning contaminated elements (metallic gauze sampler, special (swab) sampler, working area of the Heater).

Utilize clean cotton wool and napkins (not supplied) as a wiper tissue. Use tweezers (supplied) as a tissue holder.

Wet the cotton swabs or napkins with medical or isopropyl alcohol, wipe gently contaminated elements (metallic gauze sampler, special (swab) sampler, working area of the Heater) as shown by an arrow (Fig. 66,67,70) and blow out by hot air flow with temperature 150°...160°C (Fig. 68,69).

Switch on the Detector and the Heater and check the result of cleaning procedure (see page 20).

Fig. 66

Fig. 67

Air gun*
*- not supplied

Fig. 68

TAir gun*
*- not supplied

Fig. 69

Fig. 70
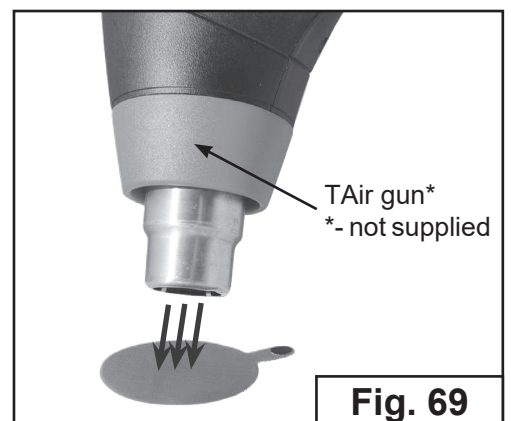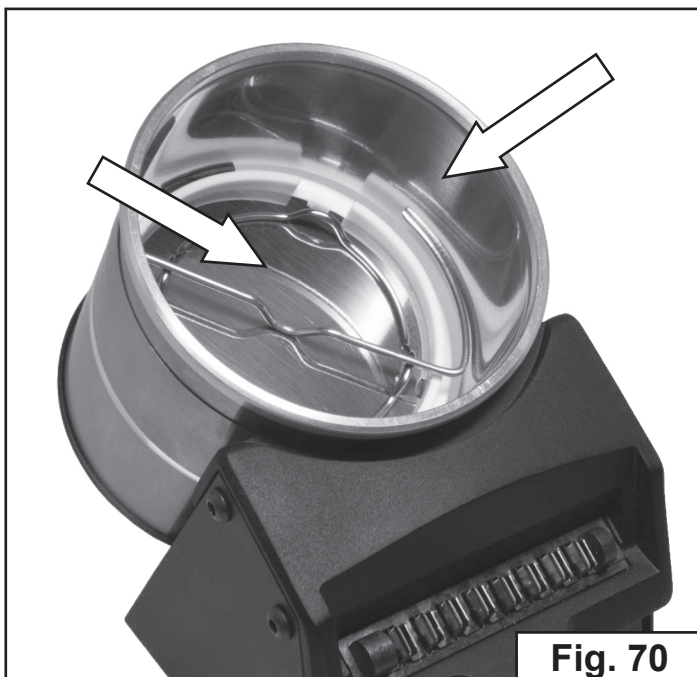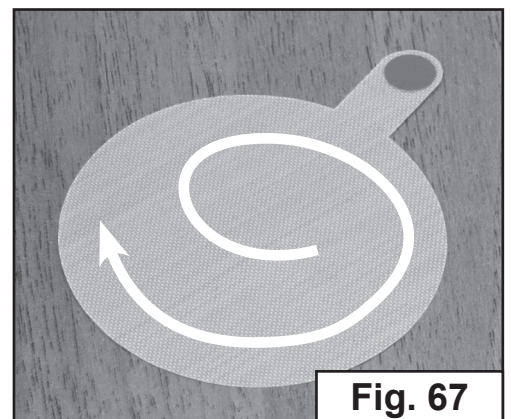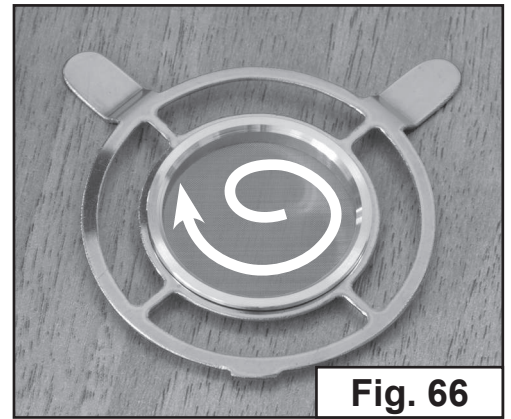
Fig. 71

Fig. 72

In case of strong contamination of the Detector is recommended:

1. Use syringe (not supplied) for 1 minute to clean the center of suction port (Fig. 71).

   Turn on the EVD to check its functionality (see page 9).

2. Hoover the suction port for 5-10 seconds. (vacuum cleaner isn`t supplied) (Fig. 71)

   Turn on the EVD to check its functionality (see page 9).

Fig. 73

SETTING

CLEANING

READY   100%

Fig. 74

SEARCH 19   94%
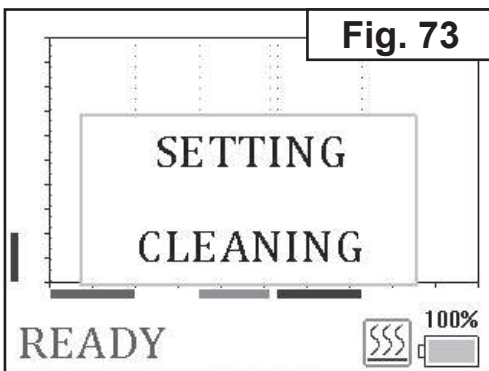
For simultaneous **Detector and sample heater cleaning procedure** (Fig. 42 on page 17) in «READY» mode tap ⟳ . To start «selfcleaning» procedure tap «CLEANING» item (Fig. 73). Cleaning procedure takes 2 minute and after this the Detector returns to the «READY» mode (Fig.74).
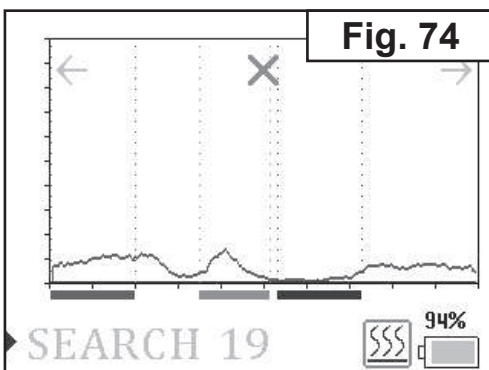
It is possible to run cleaning procedure several times if necessary.

12. PILOT-M1 SOFTWARE

Pilot®-M1 software is intended for saving and reviewing data transferred from Pilot®-M1 Detector to PC.

Pilot®-M1 software is supplied on a CD.

Supplied set:

1. Pilot®-M1 software.

2. User`s Manual.

12.1. MINIMAL SYSTEM REQUIREMENTS

For optimum program operation:

- Processor: 1.8 GHz or faster;

- Operational system: Windows XP/7/8;

- RAM: 2 GB;

- Free USB 2.0 (or higher) port;

- Monitor;

- Mouse;

- Keyboard.

12.2 PROGRAM SETUP

NOTE: Accomplish and close all active applications before Pilot®-M1 software setup on your PC.

- insert storage drive with Pilot®-M1 Software into PC.

- select executive command in Main menu.

- type command line **D:\Setup.exe** in opened window, (here **D:** - symbol for storage drive in that particular PC) (Fig. 75).

- press OK button and follow Setup program instructions.
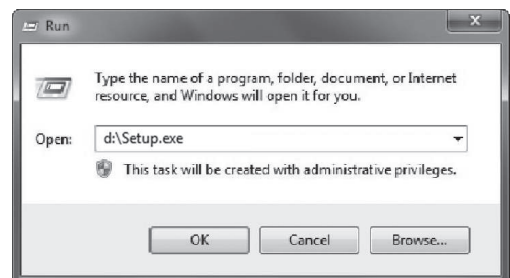
Fig. 75

12.3. DETECTOR CONNECTION

1. Turn off your Pilot®-M1.

2. Connect Pilot®-M1 to PC via USB cable (supplied).

3. Switch on Pilot®-M1 Detector.

4. Operational system will install Pilot®-M1 driver automatically.

12.4. PROGRAM OPERATION

To run program select **PilotM1.exe** file in a corresponding folder (on default – **C:\Program Files\PilotM1**) or select **PilotM1** in main menu **START/Program**

Program main window elements (Fig. 76):
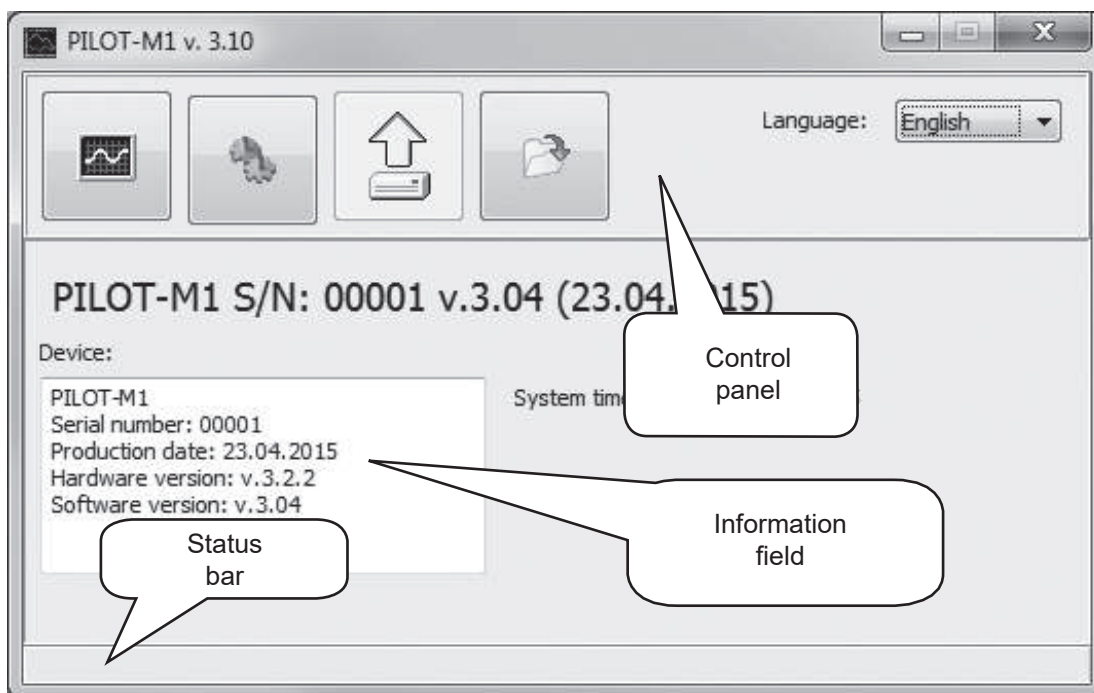
Fig.76. Program main window

The program is controlled by buttons on the control panel.

Buttons on control panel might be on two states: allowed or denied. «Denied» buttons are colored in grey and do not respond to mouse click.

Buttons functions:

- View current ionogram;

- Settings;

- browse files on detector;

- browse files on PC;

Language: English ▼ - Language options.

12.5. CURRENT IONOGRAM MODE

Press [icon] button to view current ionogram (Fig. 77).
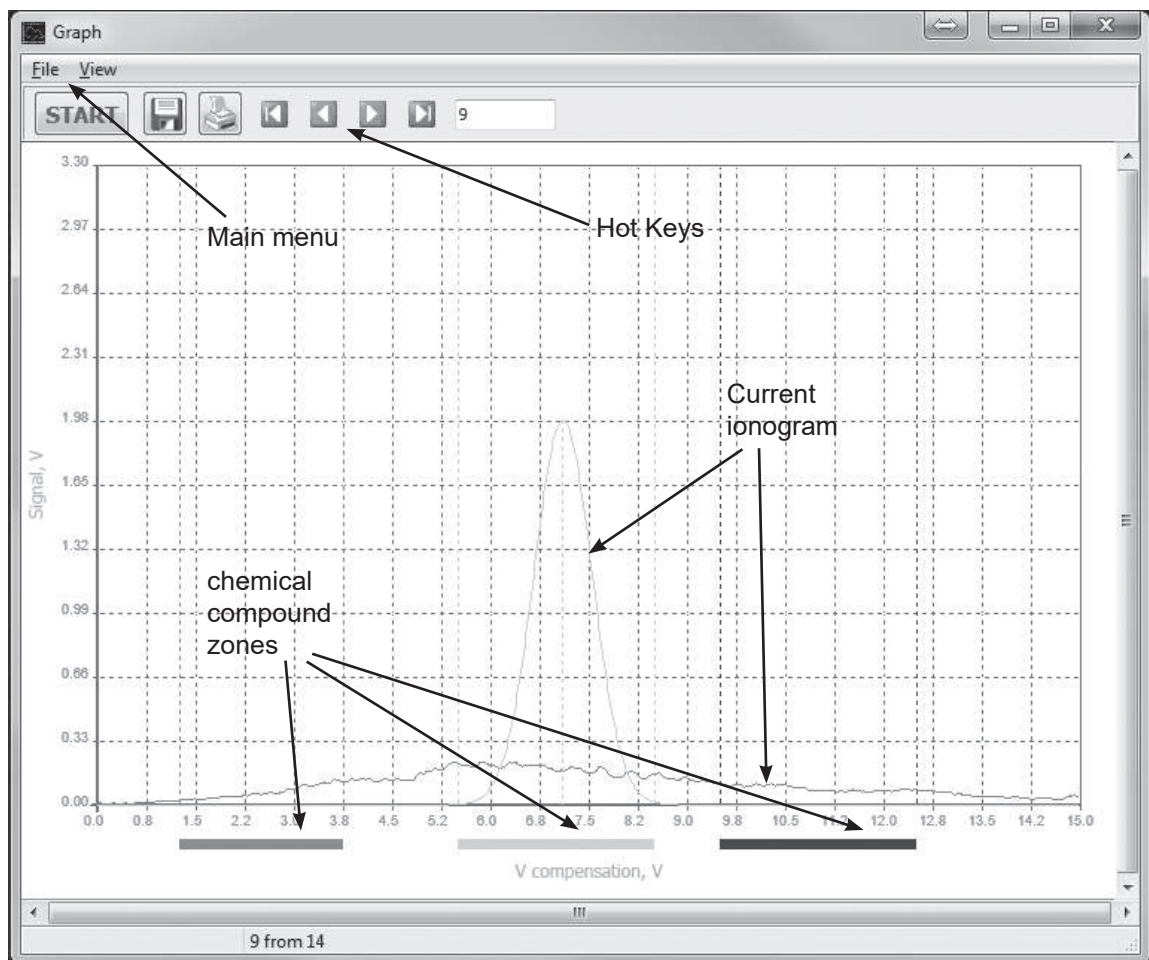
Fig. 77. Current ionogram window

Hot keys function:

START - Start current ionogram mode;

STOP - Stop current ionogram mode;

- Save current ionogram;

- Open ionogram preview and print settings;

- Jump to the first ionogram;

- Jump to the previous ionogram;

- Jump to the next ionogram;

- Jump to the last ionogram.

To adjust ionogram scale press and hold SHIFT button and select the area you want to scale with the mouse. To reset scale settings click right mouse button while SHIFT button is pressed or press *«View»* → *«View all»*.

Main menu commands:
–   *«File»* → *«Save»* - save current ionogram as file.
–   *«View»* → *«Show toolbar»* - show / hide hotkeys toolbar;
–   *«View»* → *«Grid»* - show / hide scale grid;
–   *«View»* → *«Detection zones»* - show / hide detection zones;
–   *«View»* → *«View all»* - reset ionogram scale to default settings.

To adjust detection zones see **«12.8 Detection zone adjustment»** page 33.

12.6. BROWSE FILES ON DETECTOR

Press [button] button to browse files on detector (Fig. 78).
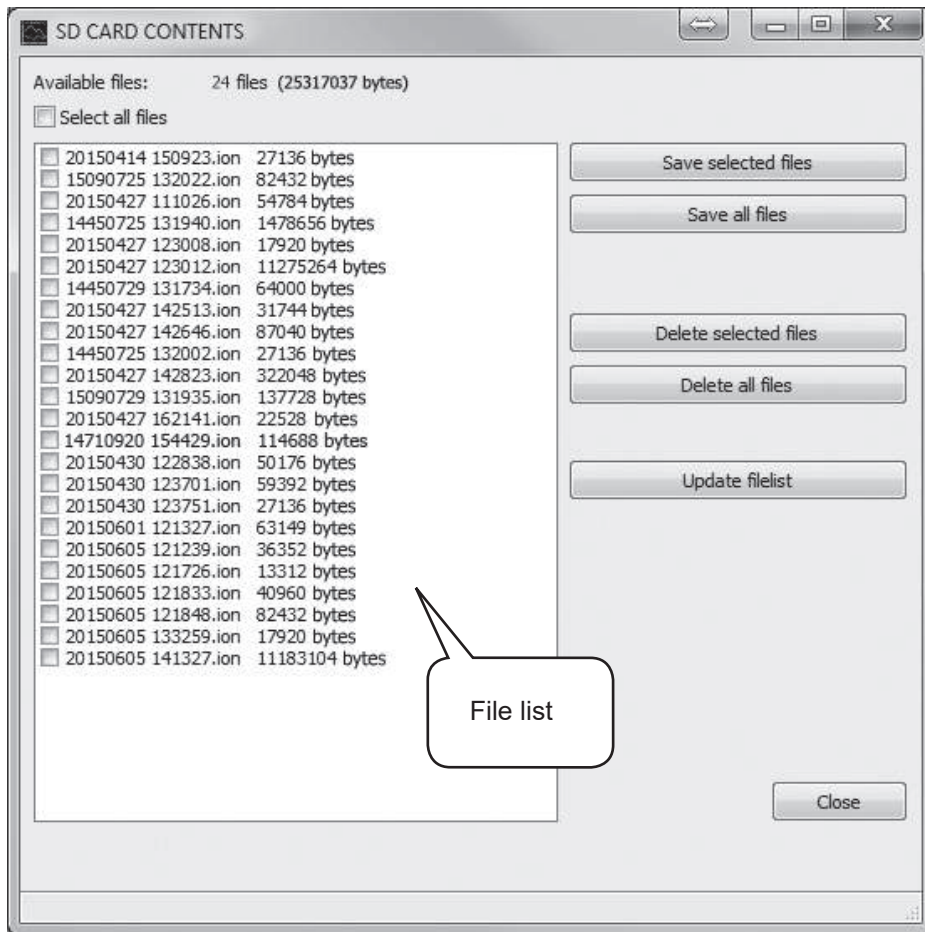
Fig. 78. Browse file on detector

Select ionogram to view in file list. Click OK for confirmation in the opened dialog window (Fig. 79).
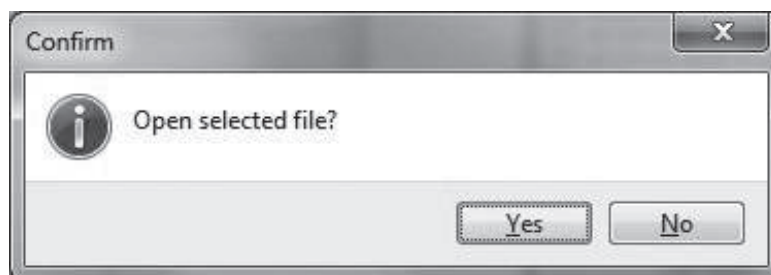
Fig. 79

Saved ionogram window (Fig. 80):
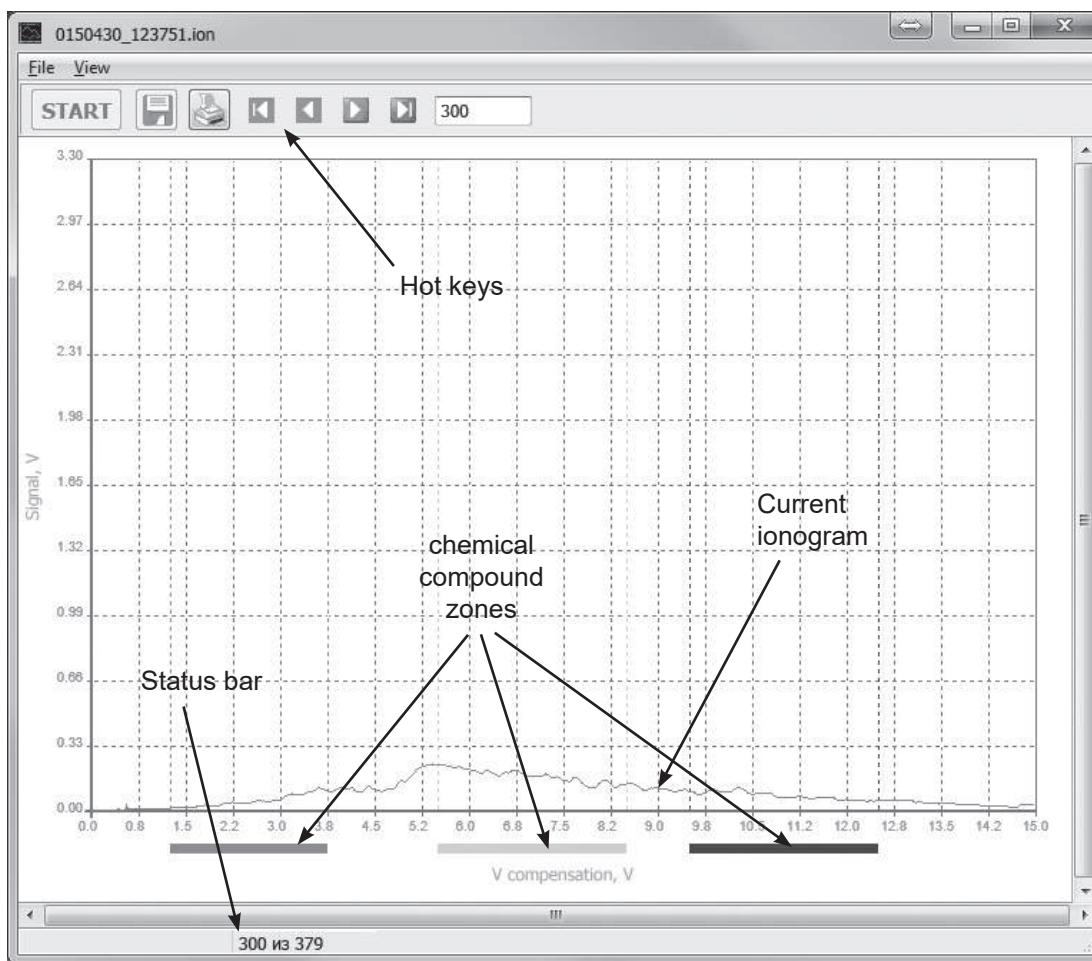
Fig. 80

Hot keys function:

 - ionogram preview and print;

 - jump to the first ionogram in file;

 - jump to the previous ionogram in file;

 - jump to the next ionogram in file;

 - jump to the last ionogram in file;

 - ionogram number;

Press button to open ionogram preview and print settings (Fig. 81 on Page 31).
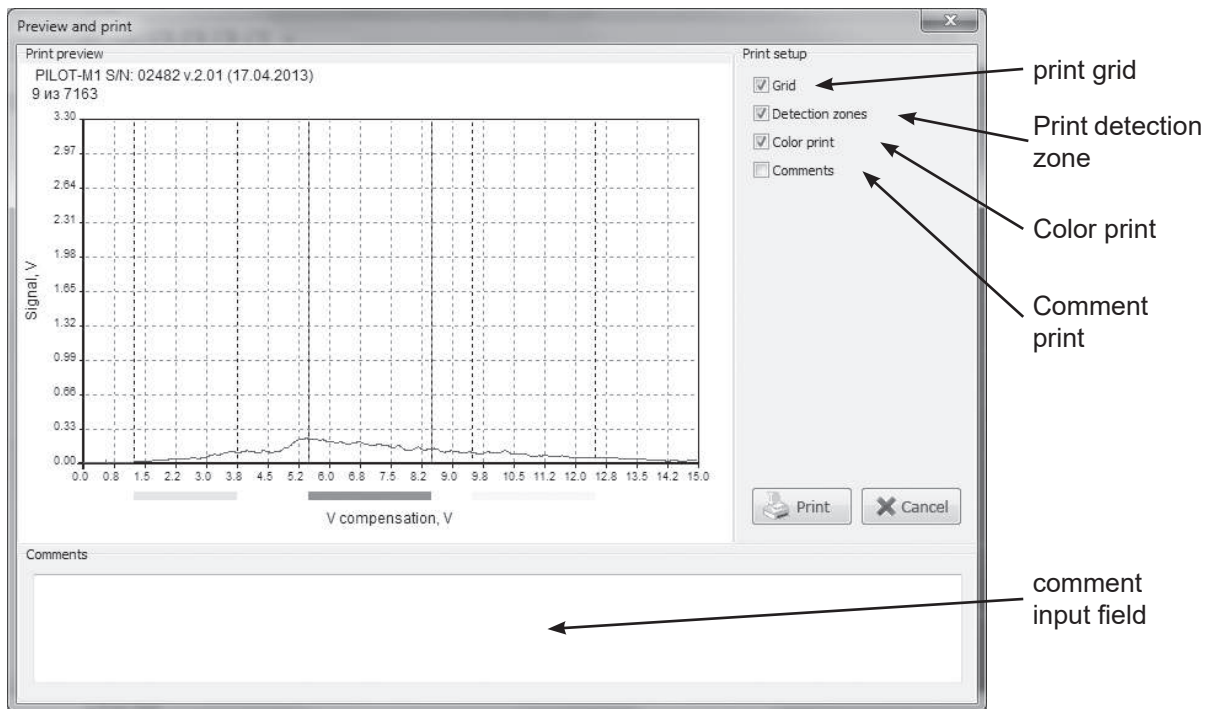
Fig. 81. Ionogram preview and printer settings window

To open next ionogram close preview and print window and select another ionogram from file list.

To save several ionograms select them by clicking on checkboxes (Fig. 82) and press **«Save selected files»**.

To save all ionogram files press **«Save all files»**.

Click OK for confirmation in the opened dialog window (Fig. 83 on page 32).
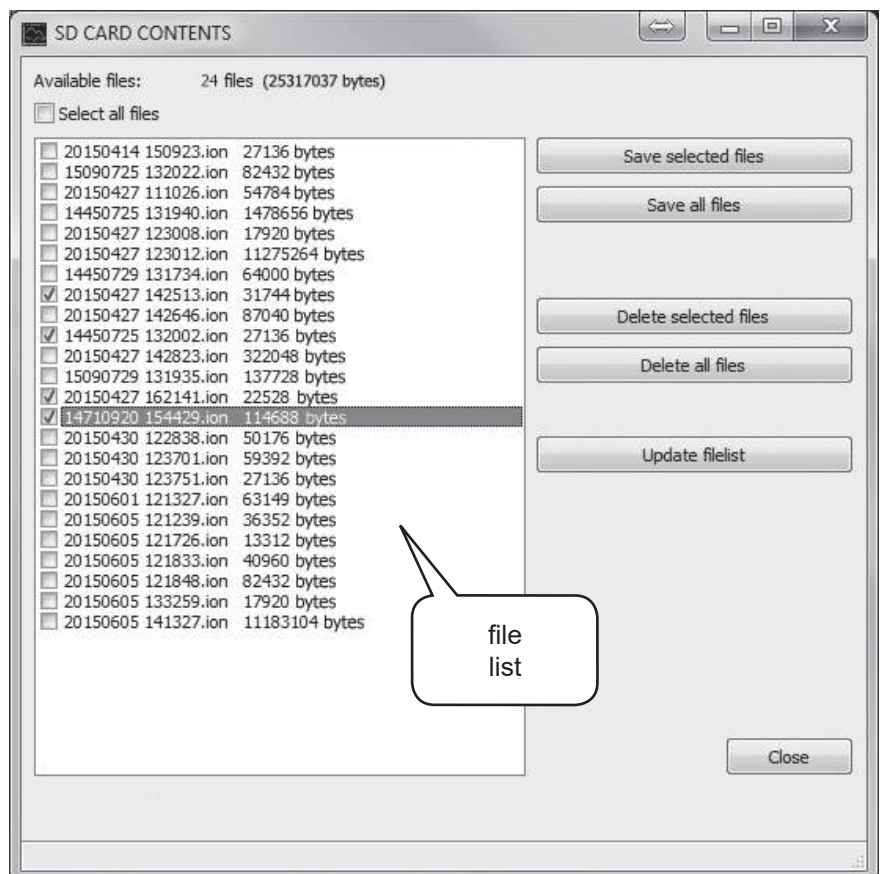
Fig. 82
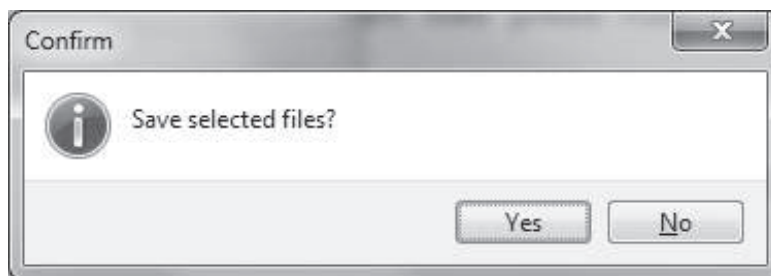
Fig. 83

Files will be saved in **Data** folder. (**C:\Program Files\PilotM1** on default).

Saving progress window:
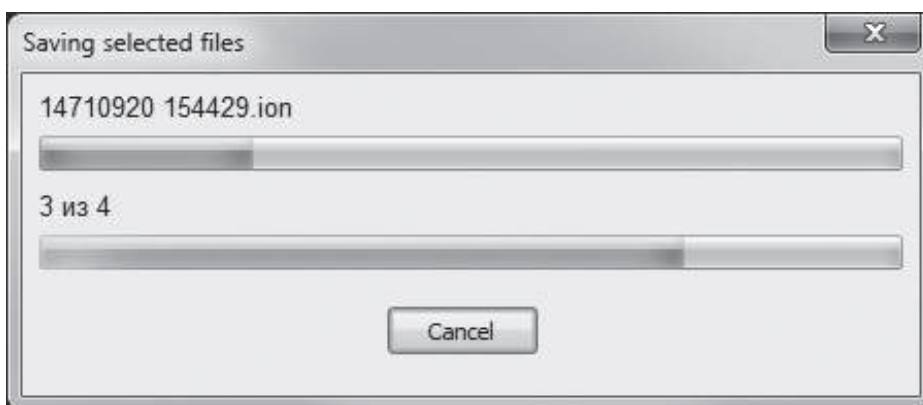
Fig. 84

To delete ionogram files select them by clicking on checkboxes and press **«Delete selected files»**. To delete all ionogram files press **«Delete all files»**.

12.7. BROWSE FILES ON PC

Press [icon] button to browse files on PC (Fig. 85).
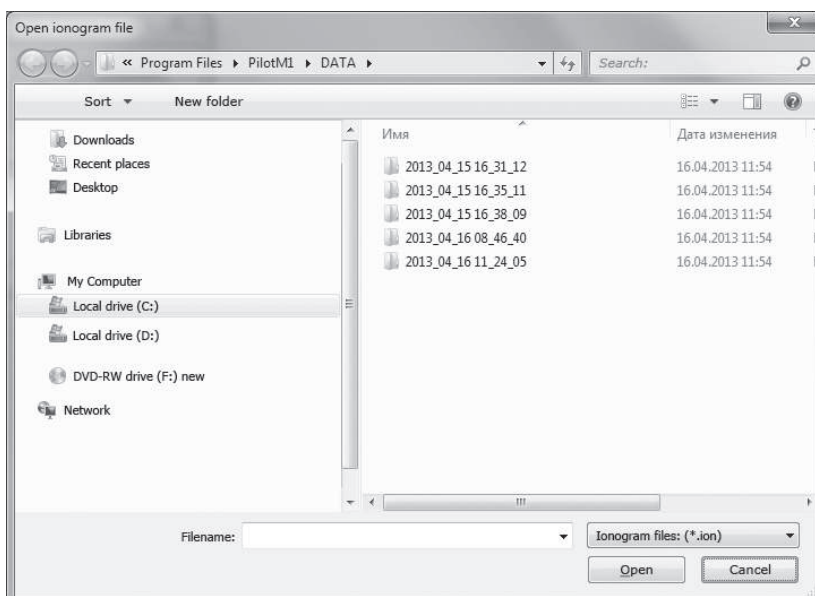
Fig. 85

Select ionogram file in open dialog window (Fig. 82 on Page 31) and press «Open» button.

Interface of opened window is similar to Saved ionogram window: Fig.78 (see page 29 «12.6. Browse files on detector»).

To open next ionogram close saved ionogram window and press [ ] button to select next file on PC.

12.8. DETECTION ZONE ADJUSTMENT

Press [ ] button to enter Settings Menu. Settings Menu allows to adjust color zones size and position on horizontal axis of the display.

Color zones are intended for preliminary explosive type (chemical compound) identification.

Press «Set» to save changes.

Press «Set time / date» to synchronize Detector clock with your computer time and date settings.
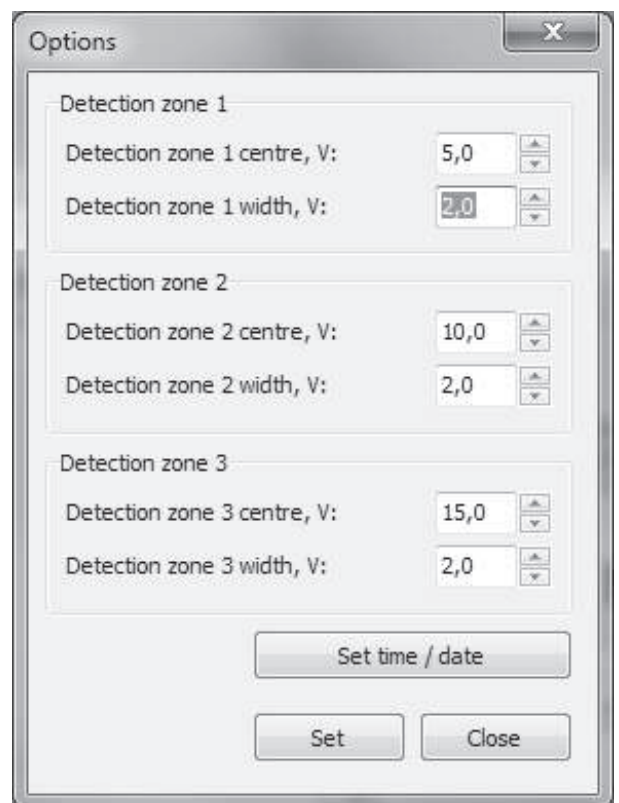
Fig. 86

12.9. SELECT LANGUAGE

Select one of item from the combobox Language: English ▼ to set preferred language.

13. TECHNICAL SPECIFICATIONS

Explosives substances under identification	NG, TNT, EGDN, RDX, PENT and etc.
TNT Threshold Sensitivity (under +20°C, 80% humidity)	not less 10^{-13} g/cm3
Warm-up time	no more 10 sec.
Analysis time	no more 1 sec.
Indication:	Audio & LCD
Power Supply: - AC (via 12 V adapter - supplied) - DC (1 rechargeable batteries - supplied)	100…240 V / 50…60 Hz 7.2V
One battery pack continuous operation time - without the use of sample heater - with the use of sample heater	not less 5 h not less 3 h
Operation conditions: - Temperature - Relative humidity	0C…+50°C up to 85% (under +35°C)
Survive after strong environment effect: - Temperature - Relative humidity	-40°C…+50°C 88% (under +35°C)
Storage conditions*: - Temperature - Relative humidity	0°C…+40°C 80% (under +25°C)
Main Unit: - Dimensions - Weight (with battery)	310x190x90 mm. 1.8 kg.
Total weight in carrying case	no more 7.5 kg.

*NOTE: Don't store the Detector in interiors with an aggressive atmosphere or near the explosives storage.

14. TROUBLESHOOTING GUIDE

Malfunction	Probable cause	Malfunction repair
Detector		
Detector does not operate after switching on (LCD is blank - no info on thescreen)	1. No line voltage in the mains. 2. AC/DC adapter is not connected to Detector and/or a wall outlet;. 3. AC/DC adapter is defective. 4. The rechargeable battery is discharged. 5. The detector is defective.	1. Verify the mains voltage.. 2. Check up connection of the AC/DC adapter plug to Detector's power supply socket. 3. Replace AC/DC adapter. 4. Replace or charge the battery. 5. Refer to guarantee certificates, page 36.
The detector does operate but an ALARM message on LCD (together with a corresponding audio signal) is presented or arises periodically	1. The detector is contaminated by explosive substance.	1. Wipe suction port of Detector with alcohol or isopropanol. 2. See «11. Contaminated elements cleaning» page 23. 3. Place Sample Heater on a steady surface. Place Detector on sample heater. Connect sample heater via communication cable to the Detector. Switch on Detector and run SELFCLEANING procedure (page 24). It is possible to run this procedure several times. If ALARM message is still presented after 5 self-cleaning procedures - call your nearest dealer for Detector support manning.
Sample heater		
LED indicator is not alight and no pictogram ⟨⟨⟨ on LCD after connecting communication cable.	1. Communication cable is not connected to Detector.	1. Check up connection of the communication cable plug to Sample Heater coupling port.
	2. The Sample Heater is defective.	2. Refer to guarantee certificates, page 36.
Gauze sampler pump		
Gauze sampler pump does not operate after switching on (LED indicator is not alight, the impeller does not rotate.	1. The rechargeable battery is discharged.	1. Charge the battery.(see «10.2. Sampler pump battery charging»).
	2. The Gauze sampler pump is defective.	2. Refer to guarantee certificates, page 36.
After connecting the Gauze Sampler Pump to the mains via AC/DC adapter no red LED confirmation of battery charging	1. No line voltage in the mains. 2. AC/DC adapter is defective. 3. AC/DC adapter is not connected to Gauze Sampler Pump and/or a wall outlet. 4. The Gauze sampler pump is defective.	1. Verify the mains voltage. 2. Replace AC/DC adapter. 3. Check up connection of the AC/DC adapter plug to Gauze Sampler Pump's power supply socket. 4. Refer to guarantee certificates, page 36.
Charger		
Charger does not operate after connecting power supply (LED indicators is off).	1. No line voltage in the mains.	1. Verify the mains voltage.
	2. AC/DC adapter is not connected to Charger and/or a wall outlet.	2. Check up connection of the AC/DC adapter plug to Charger's power supply socket;
	3. The Charger is defective.	3. Refer to guarantee certificates, page 36.

15. STORAGE

Pilot®-M1 Detector should be stored in a dry premise under the temperature 0°C…+40°C and relative humidity 80% (under +25°C).

The pollution content for corrosive chemical agents should not be higher then is allowed for sanitary approved `pure atmosphere`.

The explosives storage is not allowed in the same premise.

16. TRANSPORTATION

Pilot®-M1 Detector can be transported in the following way in a standard packing:

• In a pressurized cabin by air;
• Luggage van by rail;
• In a luggage compartment by car.

The package with an instrument should be firmly fixed at the time of transportation
to avoid relocation, dropping and shocks

17. GUARANTEE CERTIFICATES

The manufacturer guarantees conformity of a product to all characteristics specified in the maintenance instruction under condition of observance by the consumer of all stated instructions and recommendations on service, operation, to transportation and storage.

The guarantee does not cover such cases as:

• Damages caused by force majeure;
• Failure to follow instructions in this Manual;
• Mechanical damages of the device or guarantee labels, seals;
• Independently executed construction changes to the device;
• Incompleteness of the device;
• Damages caused by animals or insects;
• Strong contamination by explosive materials.

The product is certificated. The certificate of conformity in system of certification of civil aircraft.

Factory number	
The manufacturer	Lavanda - U Ltd. Building 27, House 56, Entuziastov highway, MOSCOW, 111123, RUSSIAN FEDERATION
The Delivery date	
The expiry date of guarantee	