

### 3. SETTING OF THE INSTRUMENT

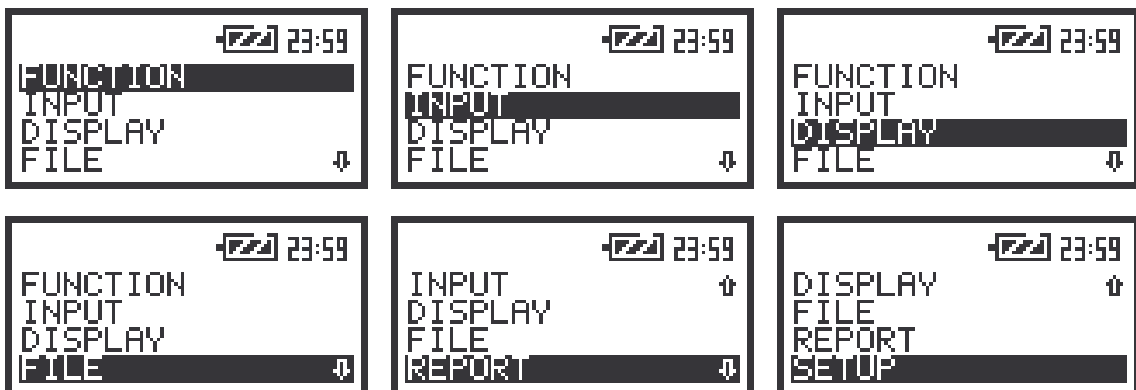
In order to perform the measurements using the instrument the user has only to plug in the preamplifier with the microphone and switch the power on.



**Notice:** The user has to press the <ZOOM IN> and <START / STOP> push-buttons in parallel in order to switch the power On/Off.

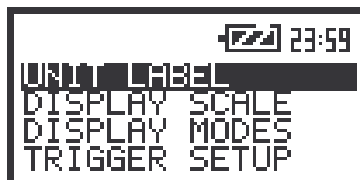
#### 3.1. BASIS OF THE INSTRUMENT'S CONTROL

The instrument is controlled by means of nine push-buttons of the keyboard. Using these push-buttons one can access all available functions. The functions are placed in the system of lists and sub-lists. The main list contains the headers of six lists which also contain sub-lists or positions (elements). The main list is opened after pressing the <MENU> push-button. This list contains the following lists: **FUNCTION**, **INPUT**, **DISPLAY**, **FILE**, **REPORT** and **SETUP**. The elements of each list are described in details in Chapter 4 and 5. Only one list can be accessed in a time, this one which name is highlighted (displayed inversely). The change of the highlighted line is done after pressing the <▲>, <▼> (or <◀>, <▶>) push-buttons.



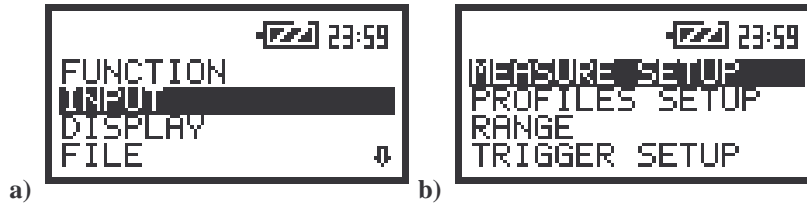
The view of the displays with the highlighted elements of the main list

After double pressing of the <MENU> push-button the list, containing four sub-lists lately accessed by the user, appears on the display. Such solution enables one to access very fast four, the most frequently used, lists without the necessity of passing the whole path.



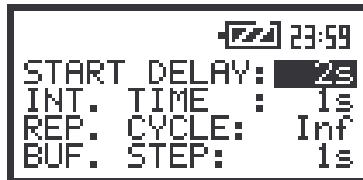
The view of the displays with the sub-lists which were lately accessed by the user (after double pressing of the <MENU> push-button)

After the selection of the desired list (the <▲> or <▼> push-buttons), the user has to press the <ENTER> push-button in order to enter it. After this new sub-lists, positions (elements) or various data specification appear on the display.



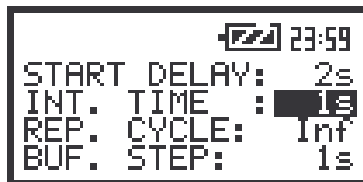
The view of the displays with the main list (a) and the elements of the *INPUT* list (b)

Next pressing of the <ENTER> push-button enables one to access mentioned above sub-lists.



The view of the display with the MEASURE SETUP sub-list opened (*path: MENU / INPUT / MEASURE SETUP*)

The desired position of a list is accessed after pressing the <▲> or <▼> push-button.



The display with the MEASURE SETUP sub-list opened; the INT.TIME position accessible

The change of the value in a selected position is performed by pressing the <◀> or <▶> push-buttons.



The displays with the INT.TIME position accessed after pressing the <◀> or <▶> push-buttons, respectively

The <ENTER> push-button is used for the confirmation of the selection in a position and for closing the opened sub-list. The sub-list is closed ignoring any changes made in a sub-list by pressing the <ESC> push-button.



The displays after three consecutive pressing of the <ESC> push-button from the MEASURE SETUP sub-list

As it was mentioned, some of the sub-lists end with the windows informing the user about the state of the instrument, available memory, not existing files or buffers, standards fulfilled by the unit, etc.



The view of the displays during and after the accessing the **FREE SPACE** window (path: *MENU / FILE*)

In order to close such window the user has to press the **<ESC>** push-button. In the instrument there are also windows which are used for entering text (i.e. the name of the file, the header for the printed reports from the measurements).



The displays during the edition of the text which has to be printed as a header in the measurement reports (path: *MENU / REPORT / TITLE*)

Below the structure of the elements of the main list is presented. The more detailed description of the **FUNCTION** and **INPUT** lists is given in Chapter 4 and the **DISPLAY**, **FILE**, **REPORT** and **SETUP** lists – in Chapter 5.

∇ **FUNCTION** (one of the main lists available after pressing the **<MENU>** push-button)

∅ **MEASUREMENT FUNCTION** (sub-list)

- § **LEVEL METER** (position); available values: [ ] / [\*]
- § **1/1 OCTAVE** (position); available values: [ ] / [\*]
- § **1/3 OCTAVE** (position); available values: [ ] / [\*]
- § **FFT** (position); available values: [ ] / [\*]

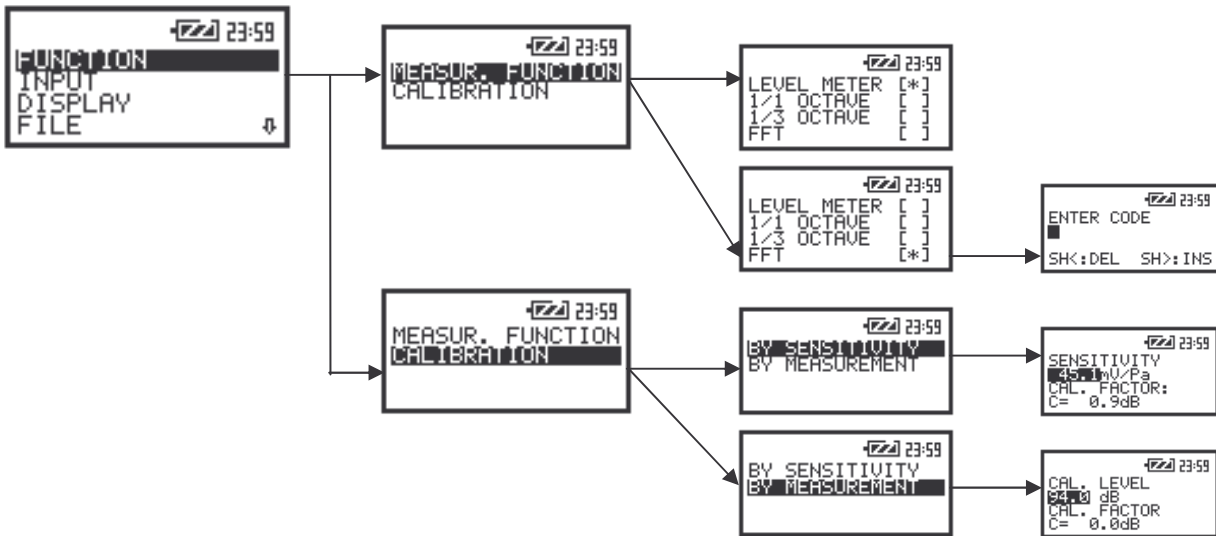
∅ **CALIBRATION** (sub-list)

§ **BY SENSITIVITY** (sub-list)

- **SENSITIVITY** (position); available values of the level: **10  $\mu\text{V} / \text{ms}^{-2}$  .. 10  $\text{V} / \text{ms}^{-2}$**
- **CAL. FACTOR** (position); it displays the calculated calibration factor

§ **BY MEASUREMENT** (sub-list)

- **CAL. LEVEL** (position); available values of the calibration level: **100  $\text{mm} / \text{s}^2$  .. 1  $\text{km} / \text{s}^2$**  in the case of vibration measurements (or **100  $\text{dB}$  .. 180  $\text{dB}$**  if the reference level was set to **1  $\mu\text{m} / \text{s}^2$**  and the **LOG** scale was selected in the **DISPLAY SCALE** sub-list)
- **CAL. FACTOR** (position); it displays after the measurement the calculated calibration factor



Control diagram of the *FUNCTION* list

v **INPUT** (one of the main lists available after pressing the <MENU> push-button)

∅ **MEASURE SETUP** (sub-list)

- § **START DELAY** (position); available values of the delay before starting the execution of the measurements: **1s .. 60s**
- § **INT. TIME** (position); available values of the integration time: **1s .. 24h**
- § **REP. CYCLE** (position); available values for the measurement cycles which has to be repeated: **Inf, 1 .. 1000**
- § **BUF. STEP** (position); available values of the step with which the measurement results are saved in an instrument's buffer: **2ms .. 1h**

∅ **PROFILES SETUP** (sub-list)

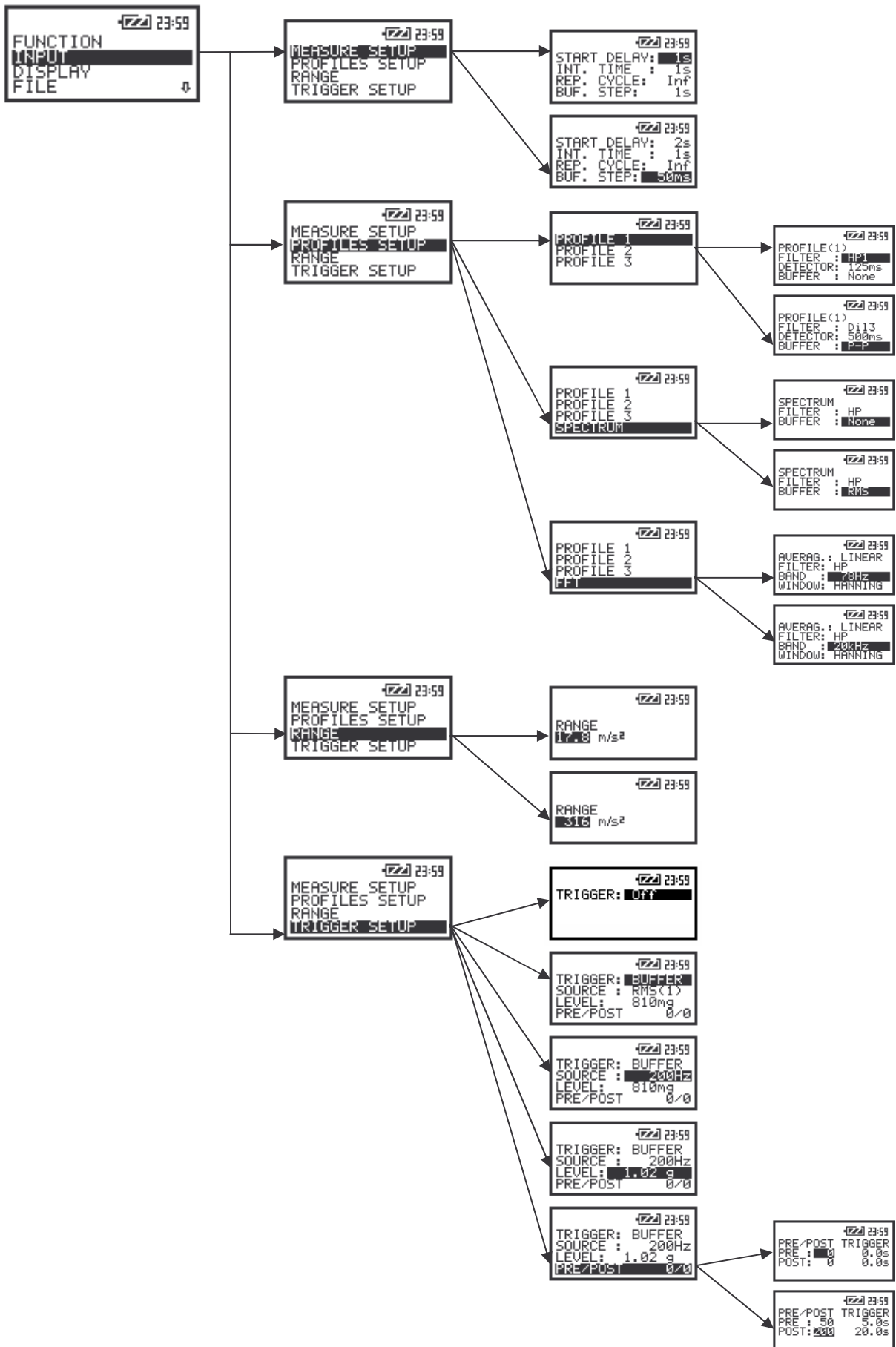
§ **PROFILE 1** (sub-list)

- α **FILTER** (position); available types of the digital weighting filter used in the first profile during the performed measurements: **HP1, HP3, HP10, Vel1, Vel3, Vel10, VelMF, DiI1, DiI3, DiI10**; Human Vibration Filters are also available as an option (activation in the *SETUP* list): **W-Bxy, W-Bz, H-A, W-Bc, KB, Wk, Wd, Wc, Wj**
- α **DETECTOR** (position); available values of the detector time constant used in the first profile: **100ms, 125ms, 200ms, 500ms, 1.0s, 2.0s, 5.0s, 10.0s**
- α **BUFFER** (position); available types of measurement results which has to be saved in the instrument's buffer from the first profile: **None, PEAK, P-P, MAX, RMS**

§ **PROFILE 2** (sub-list)

- α **FILTER** (position); available types of the digital weighting filter used in the second profile during the measurements: **HP1, HP3, HP10, Vel1, Vel3, Vel10, VelMF, DiI1, DiI3, DiI10**; Human Vibration Filters are also available as an option (activation in the *SETUP* list): **W-Bxy, W-Bz, H-A, W-Bc, KB, Wk, Wd, Wc, Wj**
- α **DETECTOR** (position); available values of the detector time constant used in the second profile: **100ms, 125ms, 200ms, 500ms, 1.0s, 2.0s, 5.0s, 10.0s**
- α **BUFFER** (position); available types of measurement results which has to be saved in the instrument's buffer from the second profile: **None, PEAK, P-P, MAX, RMS**

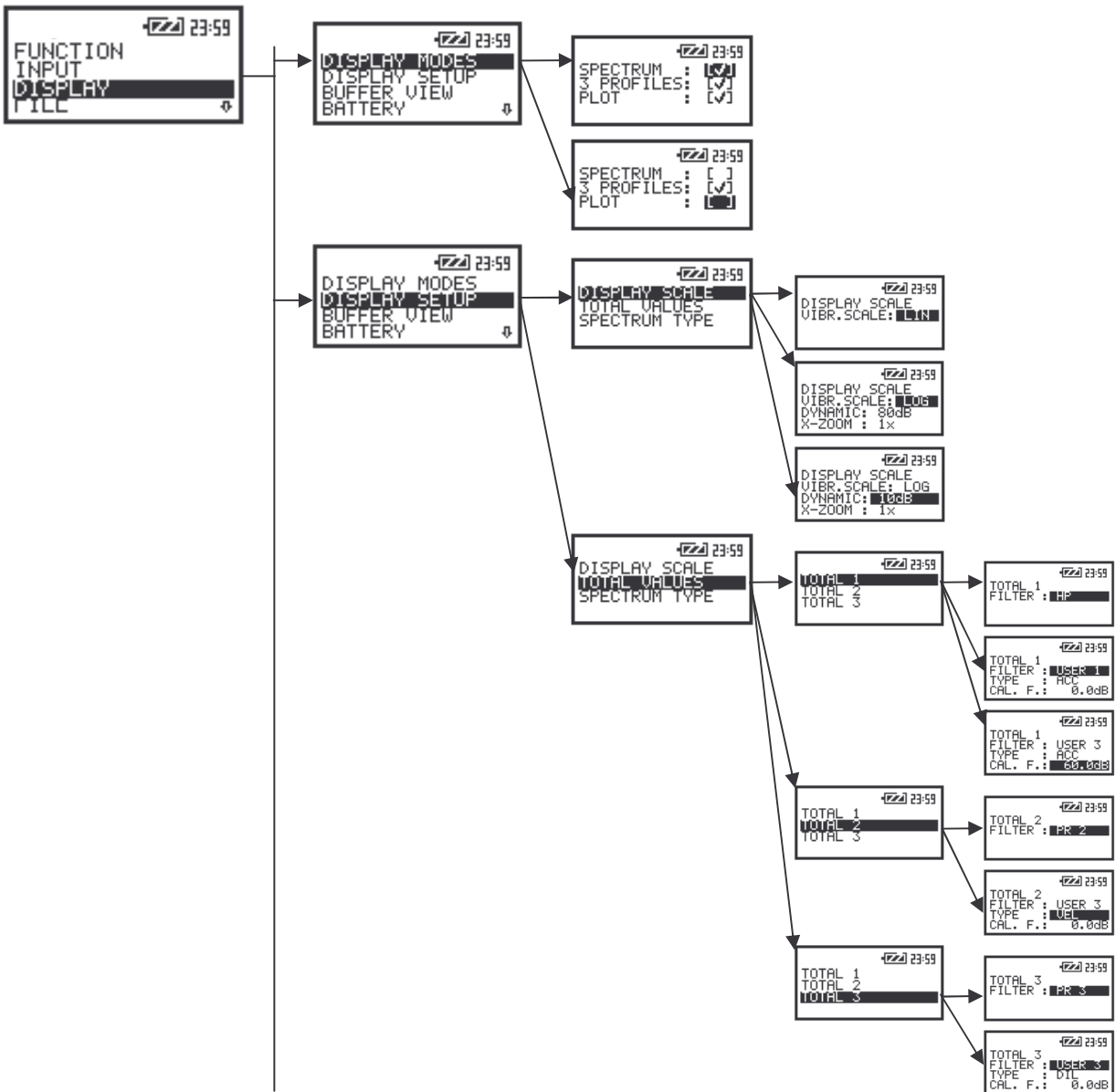
- § **PROFILE 3** (sub-list)
  - ☐ **FILTER** (position); available types of the digital weighting filter used in the third profile during the vibration measurements: **HP1, HP3, HP10, Vel1, Vel3, Vel10, VelMF, Dil1, Dil3, Dil10**; Human Vibration Filters are also available as an option (activation in the *SETUP* list): **W-Bxy, W-Bz, H-A, W-Bc, KB, Wk, Wd, Wc, Wj**
  - ☐ **DETECTOR** (position); available values of the detector time constant used in the third profile: **100ms, 125ms, 200ms, 500ms, 1.0s, 2.0s, 5.0s, 10.0s**
  - ☐ **BUFFER** (position); available types of measurement results which has to be saved in the instrument's buffer from the third profile: **None, PEAK, P-P, MAX, RMS**
- § **SPECTRUM** (sub-list); this sub-list is not available in the case of the **VLM**; it appears on the display in the case of **1/1 OCTAVE** or **1/3 OCTAVE** analyser
  - ☐ **FILTER** (position); available types of the digital weighting filter used during **1/1 OCTAVE** or **1/3 OCTAVE** analysis: **HP**
  - ☐ **BUFFER** (position); available types of measurement results which has to be saved in the instrument's buffer during **1/1 OCTAVE** or **1/3 OCTAVE** analysis: **None, RMS**
- § **FFT** (sub-list) this sub-list is not available in the case of the **VLM** and **1/1 OCTAVE** or **1/3 OCTAVE** analyser; it appears on the display in the case of the **FFT** analyser
  - ☐ **AVERAG.** (position); it informs the user about the available averaging during **FFT** analysis: **LINEAR**
  - ☐ **FILTER** (position); available types of the digital weighting filter used during the **FFT** analysis: **HP**
  - ☐ **BAND** (position); available values of the bands of the **FFT** analysis: **78Hz, 156Hz, 312Hz, 625Hz, 1.25kHz, 2.5kHz, 5kHz, 10kHz, 20kHz**
  - ☐ **WINDOW** (position), it informs the user about the available coefficients of time window: **HANNING**
- ∅ **RANGE** (position), in the case of vibration meter the user can select the range **17.8m/s<sup>2</sup>** or **316m/s<sup>2</sup>**
- ∅ **TRIGGER SETUP** (sub-list)
  - § **TRIGGER** (position); available values: **Off, SLOPE +, SLOPE -, LEVEL +, LEVEL -, BUFFER**
  - § **SOURCE:** (position); it informs the user about the source of the triggering signal:
    - ☐ **RMS(1)** - in the case of **VLM** or **FFT** function
    - ☐ **RMS(1), 125Hz, 250Hz, 500Hz, ..., 16.0kHz** - in the case of **BUFFER** selected in the **TRIGGER** position and **1/1 OCTAVE** function **RMS(1), 125Hz, 160Hz, 200Hz, ..., 20.0kHz** - in the case of **BUFFER** selected in the **TRIGGER** position and **1/3 OCTAVE** function
    - ☐ **T.LEVEL** (position); available values of the triggering level: **1.00mm/s<sup>2</sup> .. 10.0km/s<sup>2</sup>** - in the case of vibration measurements (or **60dB .. 200dB** if the reference level was set to **1 µm / s<sup>2</sup>** and the **LOG** scale was selected in the **DISPLAY SCALE** sub-list)
  - § before the triggering and after the moment in which the signal is below the desired level
    - ☐ **PRE** (position); available number of records: **0 .. 50**
    - ☐ **POST** (position); available number of records: **0 .. 200**

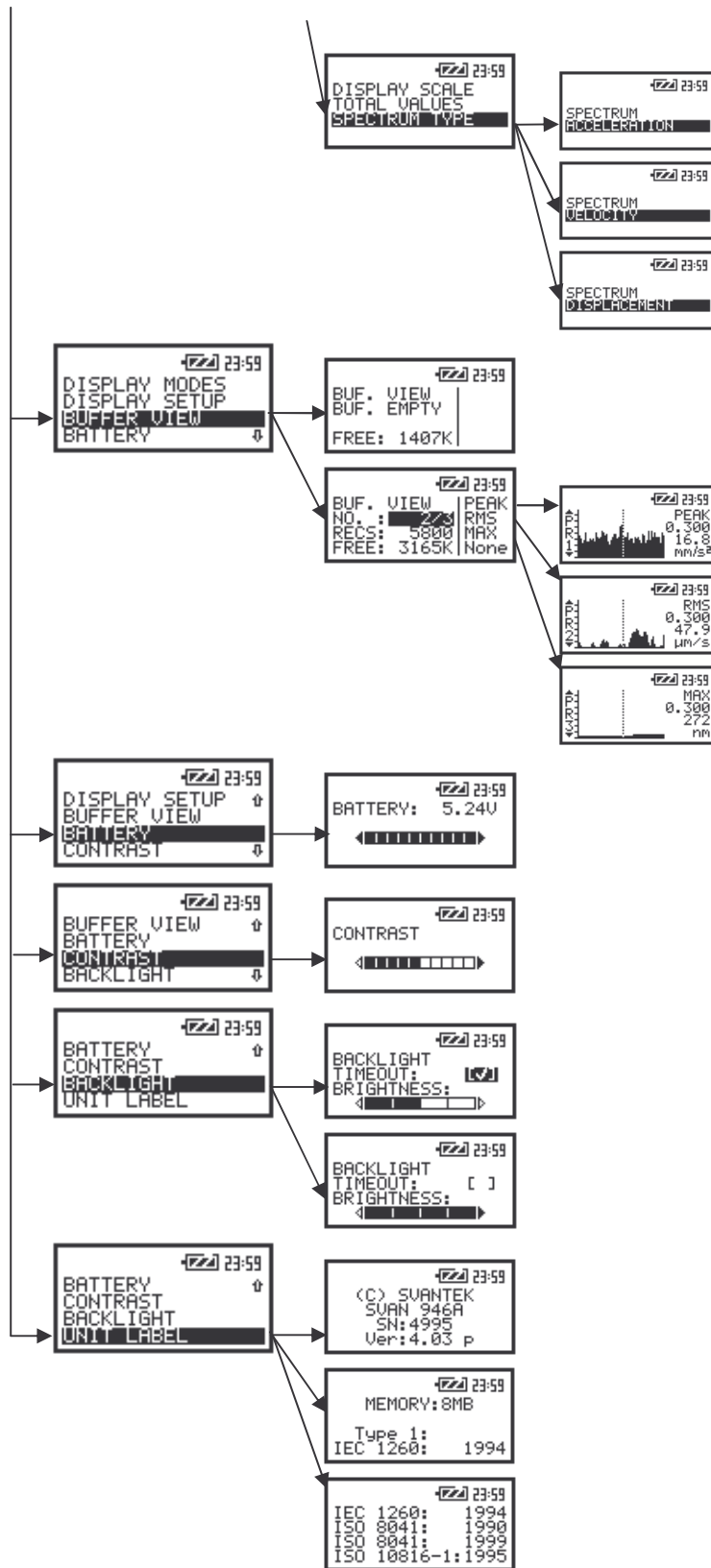


Control diagram of the INPUT list in the case of vibration measurements

- ∨ **DISPLAY** (one of the main lists available after pressing the <MENU> push-button)
  - ∅ **DISPLAY MODES** (sub-list); it enables the user to activate ([√]) or switch off ([ ]) the available modes of result's presentation
    - § **SPECTRUM** (position); available values: [√] or [ ]; this position is not active in the **VLM** mode
    - § **3 PROFILES** (position); available values: [√] or [ ]
    - § **PLOT:** (position); available values: [√] or [ ]
  - ∅ **DISPLAY SETUP** (sub-list)
    - § **DISPLAY SCALE:** (sub-list);
      - ∩ **VIBR.SCALE:** (position); available values of the scale of graphical modes of the result's presentation: **LIN** (linear), **LOG** (logarithmic)
      - ∩ **DYNAMIC:** (position); it is valid only for logarithmic scale; available values of the dynamics of graphical modes of the result's presentation: **80dB**, **40dB**, **20dB**, **10dB**
      - ∩ **X-ZOOM:** (position); it informs the user about the multiplier for the horizontal axis of the graphical modes of the result's presentation): **1x**
    - § **TOTAL VALUES:** (sub-list), available only in **1/1 OCTAVE** or **1/3 OCTAVE** analysis;
      - ∩ **TOTAL 1:** (sub-list);
        - ∨ **FILTER:** (position); available values of the weighted filters: **HP**, **USER 1**, **USER 2**, **USER3** or any other sent to the unit by means of the interface
        - ∨ **TYPE:** (position); available values if **USER 1**, **USER 2** or **USER3** was selected in the previous position: **ACC**, **VEL** and **DIL**; if the **HP** filter was selected this position is not displayed
        - ∨ **CAL. F.:** (position); accessible if **USER 1**, **USER 2** or **USER3** was selected in the **FILTER** position; if the **HP** filter was selected this position is not displayed; available values from **-60.0dB** to **60.0dB** with **0.1dB** step
      - ∩ **TOTAL 2:** (sub-list);
        - ∨ **FILTER:** (position); available values of the weighted filters: **PR 2**, **USER 1**, **USER 2**, **USER3** or any other sent to the unit by means of the interface
        - ∨ **TYPE:** (position); available values if **USER 1**, **USER 2** or **USER3** was selected in the previous position: **ACC**, **VEL** and **DIL**; if the **PR 2** filter was selected (the filter which was set in the 2<sup>nd</sup> profile) this position is not displayed
        - ∨ **CAL. F.:** (position); accessible if **USER 1**, **USER 2** or **USER3** was selected in the **FILTER** position; if the **PR 2** filter was selected (the filter which was set in the 2<sup>nd</sup> profile) this position is not displayed; values from **-60.0dB** to **60.0dB** with **0.1dB** step
      - ∩ **TOTAL 3:** (sub-list);
        - ∨ **FILTER:** (position); available values of the weighted filters: **PR 3**, **USER 1**, **USER 2**, **USER3** or any other sent to the unit by means of the interface
        - ∨ **TYPE:** (position); available values if **USER 1**, **USER 2** or **USER3** was selected in the previous position: **ACC**, **VEL** and **DIL**; if the **PR 3** filter was selected (the filter which was set in the 3<sup>rd</sup> profile) this position is not displayed
        - ∨ **CAL. F.:** (position); accessible if **USER 1**, **USER 2** or **USER3** was selected in the **FILTER** position; if the **PR 3** filter was selected (the filter which was set in the 3<sup>rd</sup> profile) this position is not displayed; values from **-60.0dB** to **60.0dB** with **0.1dB** step
      - ∩ **SPECTRUM TYPE:** (position); available values of this position: **ACCELERATION**, **VELOCITY** and **DISPLACEMENT**
  - ∅ **BUFFER VIEW** (sub-list)
    - § **NO.:** (position); available number of the files in the instrument's buffer containing the results of measurements

- § **RECS** (position); it informs the user how many records with the measurement results contains the selected file from the instrument's buffer)
- § **FREE** (position); it informs the user about the size of the available memory in the unit's buffer
- ∅ **BATTERY** (window); it informs the user about the state of the internal battery of the instrument
- ∅ **CONTRAST** (sub-list)
  - § **CONTRAST** (position); it enables the user to select one from eleven possibilities of the contrast of the instrument's display
- ∅ **BACKLIGHT** (sub-list)
  - § **TIMEOUT** (position), available values [√] or [ ]; if [√] is chosen it will cause the self made backlight switching off in the case when the keyboard is not used during the last 30 seconds. If it happened the first pressing of any push-button switches the backlight on.
  - § **BRIGHTNESS** (position); it enables the user to select one from five possibilities of the brightness of the instrument's backlight; the backlight is used both for the display and for the keyboard
- ∅ **UNIT LABEL** (window); it informs the user about the serial number of the unit, the internal software version, the internal memory size and the standards which the instrument fulfils

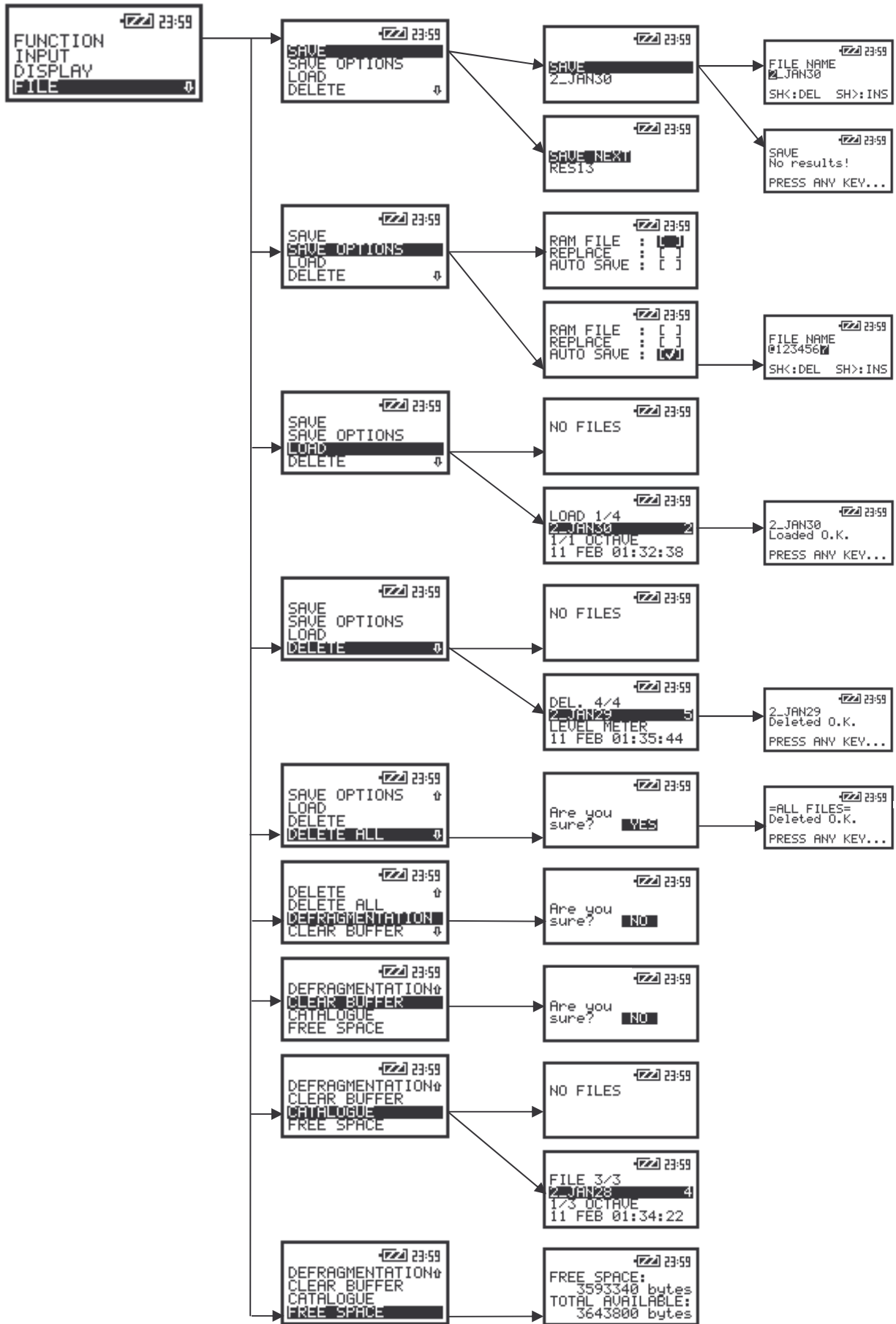




Control diagram of the *DISPLAY* list

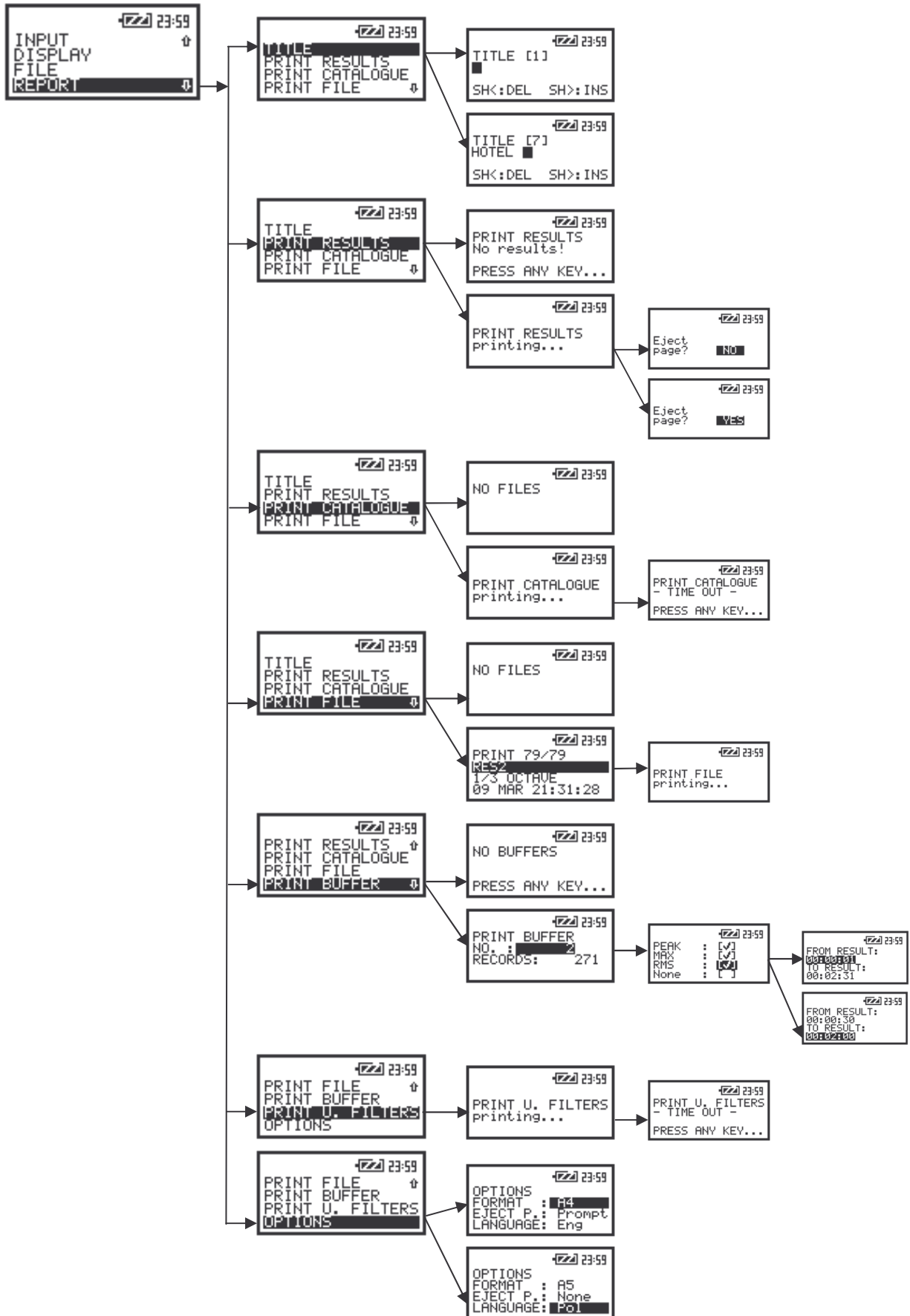
- ∇ **FILE** (one of the main lists available after pressing the <MENU> push-button)
  - ∅ **SAVE: [name of the file]** or **SAVE NEXT: [name of the file]**; the name of the file can be fully edited in the **FILE NAME** window after pressing the <ENTER> push-button in the case of **SAVE** or can be edited in the simplify way by pressing the <◀>, <▶> push-buttons together with <SHIFT> - in the case of **SAVE NEXT**; the **No results!** text is displayed in the case when the instrument did not perform any measurement
  - ∅ **SAVE OPTIONS** (sub-list)
    - § **RAM FILE:** (position); it enables the user to save the results of the measurement in the special file at RAM memory (the name of the file is defined as a "RAMfile"), this option is useful when remote reading is necessary, e.g. during the long term monitoring; the results are saved all the time in the same space of the units memory; available values: [√] or [ ]
    - § **REPLACE:** (position); it enables the user to replace the existing files in the instrument's memory by the files having the same name; available values: [√] or [ ]
    - § **AUTO SAVE:** (position); it enables the user to save the measurement results in the instrument's memory without entering **SAVE** or **SAVE NEXT** position (in order to perform this operation the **INT. TIME** should be set to at least **10 s**); available values: [√] or [ ]
  - ∅ **LOAD** (sub-list); it enables the user to verify the list of files in the memory and to load to the working buffer of the instrument the selected one; the **NO FILES** text is displayed in the case when the instrument's memory is empty
  - ∅ **DELETE** (sub-list); it enables the user to verify the list of files in the memory and to delete the selected one; the **NO FILES** text is displayed in the case when the instrument's memory is empty; the confirmation is required before the erasing of the selected file
    - § **Are you sure?**
  - ∅ **DELETE ALL** (sub-list); it enables the user to delete all files saved in the instrument's memory; the confirmation is required before the erasing of all files
    - § **Are you sure?**
  - ∅ **DEFRAGMENTATION** (sub-list); it enables the user to recover the memory which was previously used by the deleted files; the confirmation is required before the execution of this operation
    - § **Are you sure?**

The text **Defragmentation ...unnecessary PRESS ANY KEY** is displayed when the instrument's memory was empty before trial of the defragmentation.
  - ∅ **CLEAR BUFFER** (position); it enables the user to delete all files saved in the buffer of the instrument; the confirmation is required before the erasing of all files from the buffer memory
    - § **Are you sure?**
  - ∅ **CATALOGUE** (sub-list); it enables the user to verify the list of files in the memory; the **NO FILES** text is displayed in the case when the instrument's memory is empty
  - ∅ **FREE SPACE** (window); it informs the user about the size of the available memory for saving the measurement results in the files and the **TOTAL AVAILABLE** bytes of the memory (the number displayed in the **FREE SPACE** increased by the memory which was previously used by the deleting files)



Control diagram of the *FILE* list

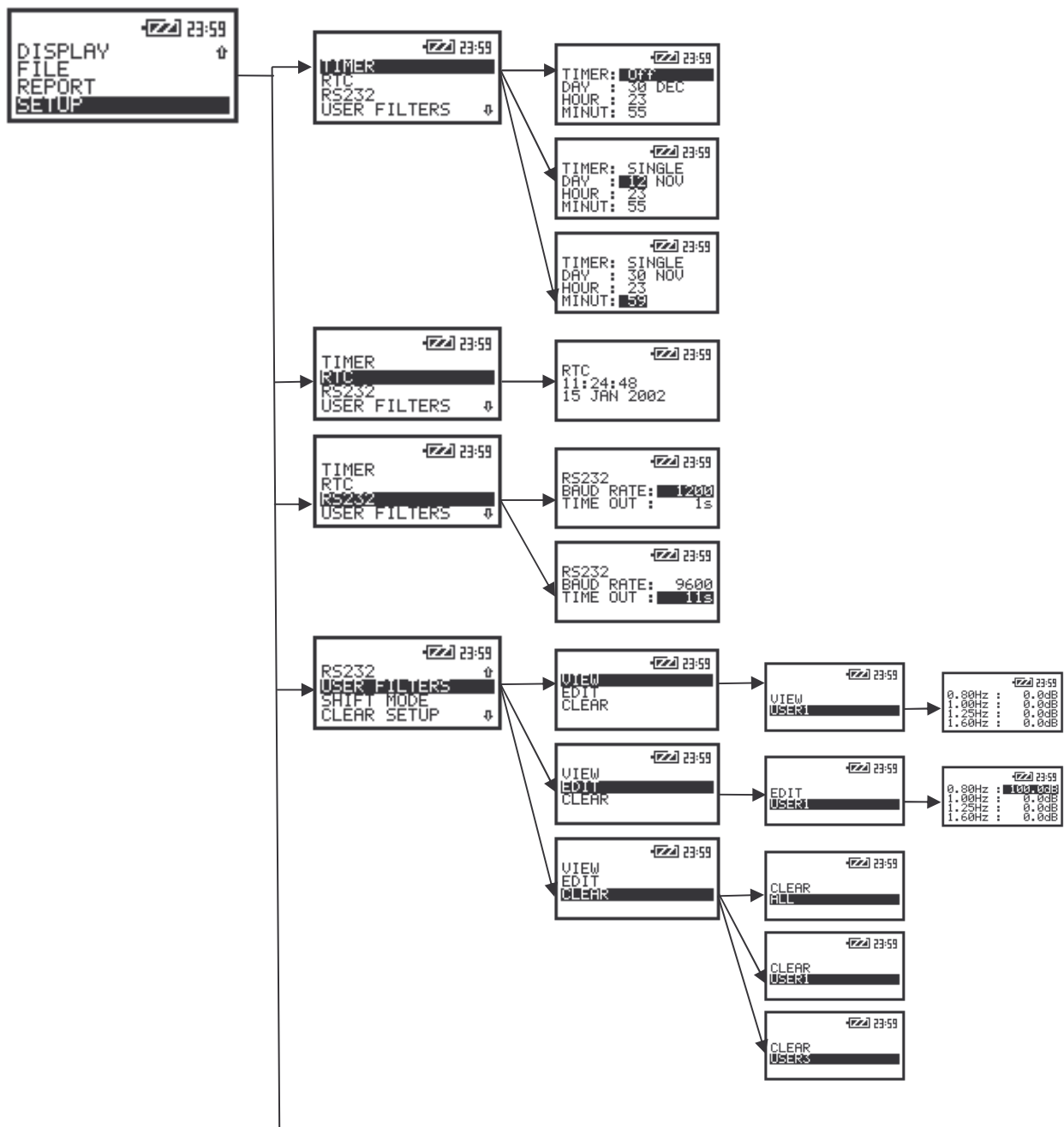
- ∇ **REPORT** (one of the main lists available after pressing the <MENU> push-button)
  - ∅ **TITLE** (position); it enables the user to edit the text which will be placed in the header of the printed report from the measurements
  - ∅ **PRINT RESULTS** (position); it enables the user to print out on a printer connected directly to the instrument the measurement results; the **No results!** text is displayed in the case when the instrument did not perform any measurement
  - ∅ **PRINT CATALOGUE** (position); it enables the user to print out on a printer connected directly to the instrument the catalogue of the files stored in the memory
  - ∅ **PRINT FILE** (sub-list); it enables the user to print out on a printer connected directly to the instrument the selected file with the measurement results; the **NO FILES** text is displayed in the case when the instrument did not save any file
  - ∅ **PRINT BUFFER** (sub-list); it enables the user to print out on a printer connected directly to the instrument the measurement results in a selected file from the buffer; the **NO BUFFERS** text is displayed in the case when the instrument did not perform any measurement and the buffer is empty
    - § **NO.** (position); available numbers of all files saved in the buffer of the instrument's memory
    - § **RECS** (window); it informs the user about the number of records which contains the selected file from the buffer
      - α **None, PEAK, P-P, MAX** or **RMS** (position for the 1<sup>st</sup> profile); available values: [√] or [ ]
      - α **None, PEAK, P-P, MAX** or **RMS** (position for the 2<sup>nd</sup> profile); available values: [√] or [ ]
      - α **None, PEAK, P-P, MAX** or **RMS** (position for the 3<sup>rd</sup> profile); available values: [√] or [ ]
      - α **None** or **RMS** (position for **1/1 OCTAVE** or **1/3 OCTAVE** so-called spectra); available values: [√] or [ ]
    - ∇ **FROM RESULT** (sub-list); the selection of the starting time from which the measurement results saved in the file of the buffer has to be printed
    - ∇ **TO RESULT** (sub-list); the selection of the ending time to which the measurement results saved in the file of the buffer has to be printed
  - ∅ **PRINT U. FILTERS** (sub-list); it enables the user to print out on a printer connected directly to the instrument the values of the user filters introduced in the instrument: **USER 1, USER 2, USER 3** or any other sent to the unit by means of the interface
  - ∅ **OPTIONS** (sub-list)
    - § **FORMAT:** (position); available values of the format of the print out: **A4** or **A5**
    - § **EJECT P.:** (position); available values for the paper ejection in a printer connected directly to the instrument: **None, Prompt** or **Auto**
    - § **LANGUAGE:** (position); available values for the language in which the report has to be printed: **Eng** or **Pol**

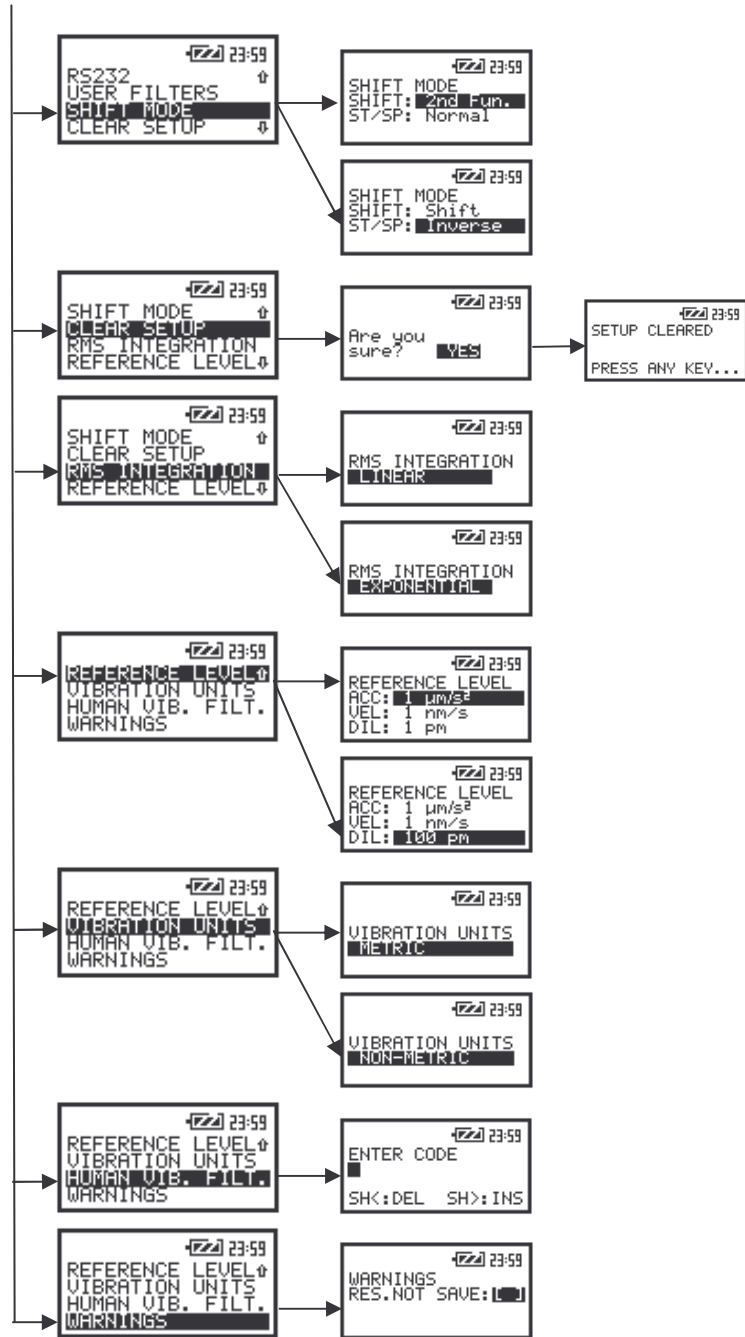


Control diagram of the *REPORT* list

- ∇ **SETUP** (one of the main lists available after pressing the **<MENU>** push-button)
  - ∅ **TIMER** (sub-list) it enables the user to set time of the self switching on of the instrument
    - § **TIMER** (position); it enables the user to switch off the timer (**Off**) or to switch it on in two different modes: **SINGLE** or **EVERYDAY**
    - § **DAY** (position); it enables the user to set the day of the self switching on of the instrument (up to 30 days ahead of the current date set in the RTC unit)
    - § **HOUR** (position); it enables the user to set hour of the self switching on of the instrument
    - § **MINUT** (position); it enables the user to set minute of the self switching on of the instrument
  - ∅ **RTC** (sub-list)
    - § **RTC** (position); it enables the user to set the internal real time clock of the instrument
  - ∅ **RS232** (sub-list)
    - § **BAUD RATE:** (position); available values of the transmission speed in the RS 232 serial interface: **1200, 2400, 4800, 9600, 19200, 38400, 57600** or **115200**
    - § **TIME OUT:** (position); available values of the reaction time: **1s .. 60s**
  - ∅ **USER FILTERS** (sub-list)
    - § **VIEW**
      - **VIEW** enables the user to select which filter should be viewed; the available options are **USER1, USER2, USER3** and any other transmitted to the instrument from a PC by means of the interface  
After pressing the **<ENTER>** push-button another sub-list opens containing the values of filters used in **1/1 OCTAVE** or **1/3 OCTAVE** analysis and saved under the name **USER1, USER2, USER3** or any other
    - § **EDIT**
      - **EDIT-** enables the user to select which filters should be edited; the available options are as follows: **USER1, USER2, USER3** or any other transmitted to the instrument from a PC by means of the interface  
After pressing the **<ENTER>** push-button another sub-list opens containing the values of the filters used in **1/1 OCTAVE** or **1/3 OCTAVE** analysis; the user can set the values of correcting coefficients for all **1/3 OCTAVE** filters:
        - ∇ **0.80 Hz:** available values of 0.8 Hz centre frequency filter: **-100.0dB ... 100.0dB**
        - ∇ ...
        - ∇ ...
        - ∇ **20.0kHz:** available values of 20 kHz centre frequency filter: **-100.0dB ... 100.0dB**
    - § **CLEAR (position)**
      - **CLEAR** enables the user to select which filters should be cleared; the available options are as follows: **ALL, USER1, USER2, USER3** or any other
  - ∅ **SHIFT MODE** (sub-list)
    - § **SHIFT:** (position); available modes of the **<SHIFT>** push-button: **Shift** or **2nd Fun.**
    - § **ST/SP:** (position); available modes of the **<START / STOP>** push-button: **Normal** or **Inverse**
  - ∅ **CLEAR SETUP** (position); it enables the user to return to the factory made settings of the instrument; the confirmation has to be done before the execution of this function
    - § **Are you sure?**
  - ∅ **RMS INTEGRATION** (sub-list)
    - § **RMS INTEGRATION:** (position); available values of detector's type: **LINEAR** or **EXPONENTIAL**
  - ∅ **REFERENCE LEVEL** (sub-list); this list contains the following positions:
    - § **ACC:** - it enables the user to set the reference level of the acceleration for the logarithmic scale (the results expressed in **dB** - decibels), available levels are from **1 µm/s<sup>2</sup>** to **100 µm/s<sup>2</sup>**

- § **VEL:** - it enables the user to set the reference level of the velocity for the logarithmic scale (the results expressed in **dB** - decibels), available levels are from **1 nm/s** to **100 nm/s**
- § **DIL:** - it enables the user to set the reference level of the displacement for the logarithmic scale (the results expressed in **dB** - decibels), available levels are from **1 pm** to **100 pm**
- ∅ **VIBRATION UNITS** (sub-list)
  - § **VIBRATION UNITS** (position); it enables the user to set **METRIC** (e.g. **m/s<sup>2</sup>**, **m/s**, **m**) or **NON-METRIC** units (e.g. **g**, **ips**, **mil**)
- ∅ **HUMAN VIB. FILT.** (sub-list); this list enables the user to introduce the code for Human Vibration Option; when the option is already available in the instrument this position is taken out from the **SETUP** list
- ∅ **WARNINGS** (sub-list)
  - § **RES.NOT SAVE:** (position); it enables the user to switch on or off the warning that the results of the measurement were not saved in the memory; available values: **[√]** or **[ ]**





Control diagram of the *SETUP* list in the case of vibration measurements

### 3.2. POWERING OF THE INSTRUMENT

The **SVAN 946A** is powered from the internal rechargeable NiMH battery 4.8 V / not less than 1.6 Ah. The instrument is equipped with the external power (110 V / 220 V mains) adapter. For the external power operation and recharging the battery, this adapter should be connected to the **Power** socket located on the bottom cover of the instrument. The battery has to be charged until the switch off of the red diode named **CHARGING** placed on the instrument's keyboard. In order not to decrease the battery lifetime at least **once for ten charging the battery has to be fully discharged** (up to self switch off of the instrument)!



**Notice:** The battery is also recharged during the instrument's operation with the external power. The internal power supply circuit protects the battery from the overcharging. Nevertheless, it is not recommended to keep the external power continuously plugged into the **Power** socket.

The fully charged battery ensures more than 10 hours of the continuous work of the instrument (with the backlight off). The operation time is decreased about 20 % with the backlight switched on. The battery condition can be checked by means of the **BATTERY** function. It is also presented continuously on the display by means of the „battery” icon.



a)

b)

The display in 3 PROFILES mode with the battery icon (a) and in the BATTERY position opened (b)

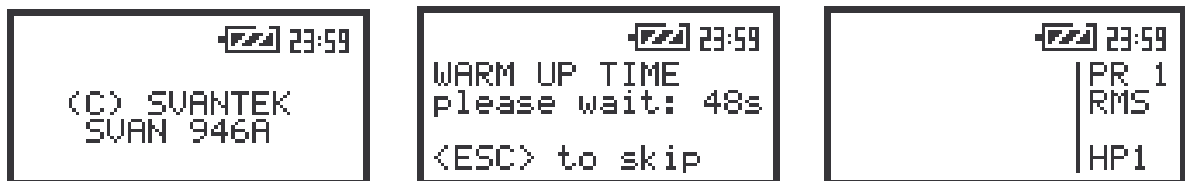


**Notice:** It is strongly recommended to use in this case as soon as possible the external power adapter. In the other case the instrument after a while will be switched off by itself!

The backlight of the display and the keyboard can be activated by means of the <> > push-button. For saving the power of the battery, in the normal "day-light" operation it is recommended to **keep the backlight off**. The user can set the **TIMEOUT** position in the **BACKLIGHT** sub-list of the **DISPLAY** list which will cause the self made backlight switching off in the case when the keyboard is not used during the last 30 seconds. If it happened the first pressing of any push-button switches the backlight on.

### 3.3. INITIAL SETUP OF THE INSTRUMENT

The instrument passes the self-test after switching on (in this time the producer and the name of the instrument is displayed on the display) and then it enters one of the available mode of the vibration measurements (depending on which mode was used during the switch off of the unit). The default display mode for result's presentation is one profile (see Chapter 4 for details).



a)

b)

c)

The view of the displays after switching on the instrument (a, b); in VLM (c)

To start the measurements the user has to press **<START /STOP>** push-button. The result of the measurement is displayed, in so-called one profile mode, using well visible big characters. Under the result the analogue-like indicator is presented. On the left side of the display, the profile from which comes the measurement (**PR 1**, **PR 2** or **PR 3**), the function name (**RMS**, **PEAK**, **P-P** or **MTVV** and additionally when the Human Vibration option is available - **VDV**). In the fourth line the type of the weighted filter selected in a profile is displayed (**HP1**, **HP3**, **HP10**, **Vel1**, **Vel3**, **Vel10**, **VelMF**, **Dil1**, **Dil3**, **Dil10** and additionally when the Human Vibration option is available in the instrument: **W-Bxy**, **W-Bz**, **H-A**, **W-Bc**, **KB**, **W<sub>k</sub>**, **W<sub>d</sub>**, **W<sub>c</sub>** or **W<sub>j</sub>**).



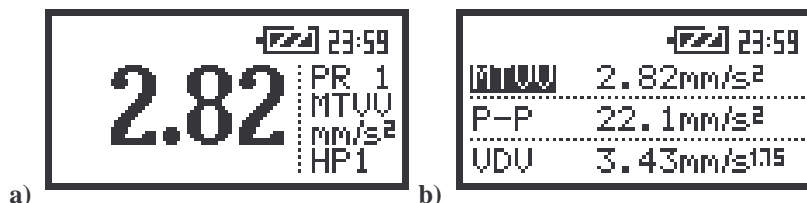
The view of the display in one profile (a) and 3 PROFILES display mode with the vibration measurement results expressed in METRIC (b) and NON-METRIC units (a, c)

The results of the measurements can be presented in one profile, in **3 PROFILES** and in **PLOT** (these are the available display modes set by the producer; cf. the description of the **DISPLAY MODES** sub-list of the **DISPLAY** list). It is possible to change the display mode pressing the **<^>** or **<v>** push-buttons together with the **<SHIFT>** one. In so-called **3 PROFILES** display mode the results of the measurement from all profiles are displayed simultaneously. The default settings (set up by the producer) for the profiles are as follows: (path: **MENU / INPUT / PROFILES SETUP / PROFILE1 (2,3)**)

- PROFILE 1** - **HP1** weighting filter (**FILTER: HP1**), **1.0 s** RMS detector (**DETECTOR: 1.0s**), the results of the measurements are not stored in the buffer's file (**BUFFER: None**);
- PROFILE 2** - **HP3** weighting filter (**FILTER: HP3**), **1.0 s** RMS detector (**DETECTOR: 1.0s**), the results of the measurements are not stored in the buffer's file (**BUFFER: None**);
- PROFILE 3** - **HP10** weighting filter (**FILTER: HP10**), **1.0 s** RMS detector (**DETECTOR: 1.0s**), the results of the measurements are not stored in the buffer's file (**BUFFER: None**).

The user can change all mentioned above settings using **PROFILE x** sub-list of the **INPUT** list. The instrument remembers all changes. The return to the default settings (set up by the producer) is possible after the execution of the **CLEAR SETUP** position available in the **SETUP** list (path: **MENU / SETUP / CLEAR SETUP**).

The instrument can be used not only as the vibration level meter (**VLM**) but also as **1/1 OCTAVE**, **1/3 OCTAVE**, **FFT** analyser etc. In order to distinguish the **VLM** mode of the unit from the others which are available in one profile display mode the continuous vertical line separates the measurement result from its description and in **3 PROFILES** display mode two continuous horizontal lines are used to separate the measurement results from different profiles. In other modes than **VLM** the mentioned above lines are dotted.



The view of the display in one profile (a) and 3 PROFILES display mode (b) with the measurement results which are not from the VLM mode



**Notice:** See Chapters 4 and 5 for more details concerning different settings.

More data about the instrument's state are given by means of the icon's row visible in the top of the display. The meanings of the icons are as follows:

- "**Bell**" is displayed as a **WARNING** in several situations. When the "**Bell**" icon is visible the user has to pay attention to the state of the instrument. Typically some user's action is required (e.g. on the low battery state, on too high input signal - **OVERLOAD** etc.).



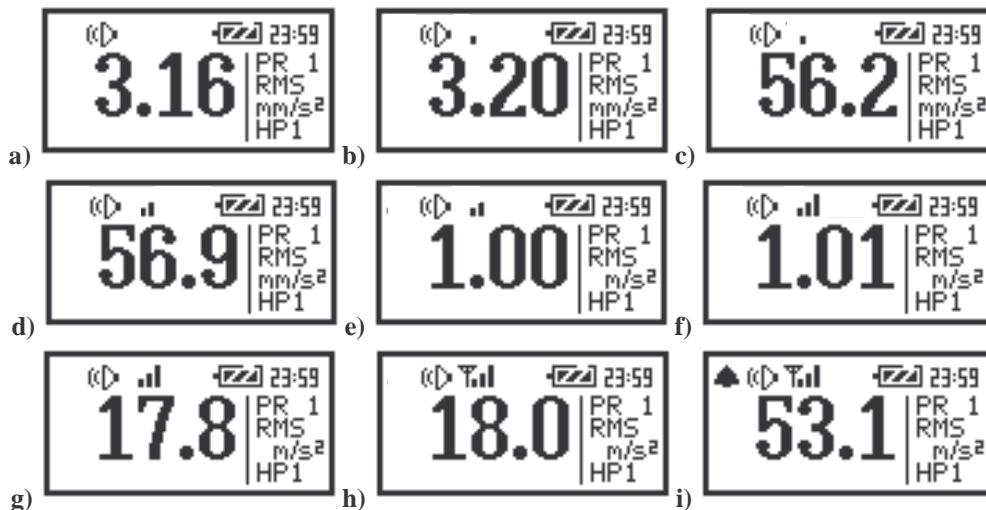
The view of the display with the "Bell" icon

- "**Loudspeaker**" icon is displayed when the measurement is started and executed.



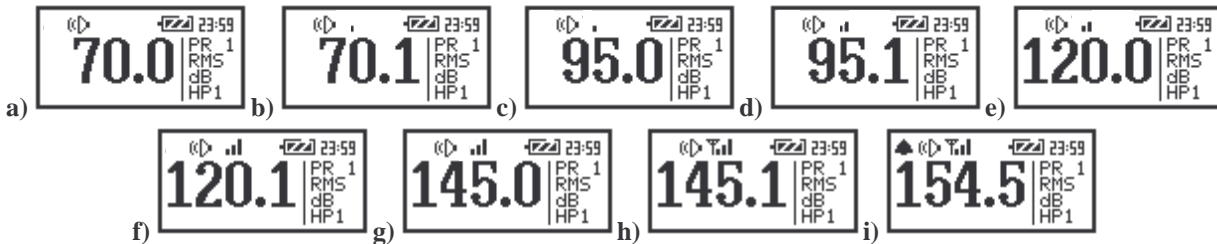
The view of the display with the "Loudspeaker" icon

- "**Vertical bars**" icon corresponds to the current **input signal level** (it is related to the maximum measured value over the last second). The sign  $\Upsilon$  means that the level of the signal was from 0.1 dB to 10 dB higher than the current measurement range. For example, for the **VLM** mode, in which two ranges are available ( $17.8 \text{ m/s}^2$ , which for the reference level equal to  $1 \mu\text{m/s}^2$  corresponds to 145 dB and  $316 \text{ m/s}^2$  range, which for the same reference level corresponds to 170 dB), the result of the measurement is in the first case from  $18.0 \text{ m/s}^2$  (145.1 dB) to  $56.23 \text{ m/s}^2$  (155 dB) and in the second case from  $320 \text{ m/s}^2$  (170.1 dB) to  $1 \text{ km/s}^2$  (180 dB). The indicator of the overload (the "**Bell**" icon) appears when the signal overpasses more than 7.5 dB the measurement range (cf. Fig. below). When  $17.8 \text{ m/s}^2$  range, linear scale and metric units are selected in the proper lists the displays are as follows:



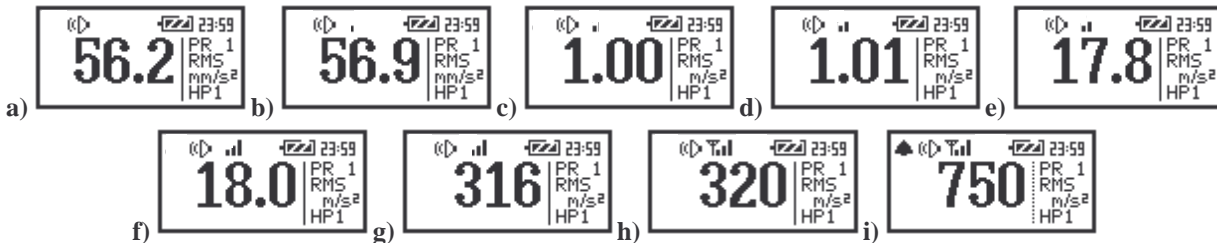
The view of the displays in the **VLM** (path: MENU / FUNCTION / MEASUR. FUNCTION / LEVEL METER) mode when  $17.8 \text{ m/s}^2$  range (path: MENU / INPUT / RANGE), **LINEar** scale (path: MENU / DISPLAY / DISPLAY SETUP / DISPLAY SCALE / LIN) and **METRIC** units (path: MENU / SETUP / VIBRATION UNITS / METRIC) are selected; the results, depending on the level of the input signal, are presented without the "Vertical bars" icon (a); with one "Vertical bar" (b), (c); with two "Vertical bars" (d), (e); with three "Vertical bars" (f), (g); with three "Vertical bars" and the  $\Upsilon$  sign (h); with the indicator of the overload (i)

In the case when 17.8 m/s<sup>2</sup> range, logarithmic scale and the reference level equal to 1 μm/s<sup>2</sup> are selected in the proper lists the displays are as follows:



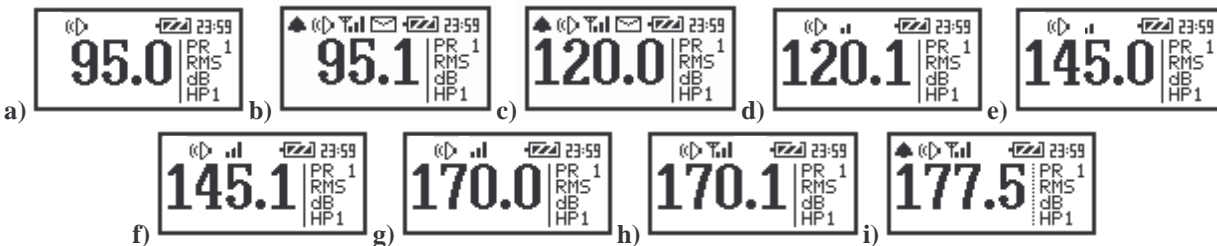
The view of the displays in the VLM mode when 17.8 m/s<sup>2</sup> range (path: MENU / INPUT / RANGE), LOGarithmic scale (path: MENU / DISPLAY / DISPLAY SETUP / DISPLAY SCALE / LOG) and the reference level equal to 1 μm/s<sup>2</sup> are selected (path: MENU / SETUP / REFERENCE LEVELS); the results, depending on the level of the input signal, are presented without the “Vertical bars” icon (a); with one “Vertical bar” (b), (c); with two “Vertical bars” (d), (e); with three “Vertical bars” (f), (g); with three “Vertical bars” and the Y sign (h); with the indicator of the overload (i)

In the case when 316 m/s<sup>2</sup> range, linear scale and metric units are selected in the proper lists the displays are as follows:



The view of the displays in the VLM mode when 316 m/s<sup>2</sup> range (path: MENU / INPUT / RANGE), LINear scale (path: MENU / DISPLAY / DISPLAY SETUP / DISPLAY SCALE / LIN) and METRIC units are selected (path: MENU / SETUP / VIBRATION UNITS / METRIC); the results, depending on the level of the input signal, are presented without the “Vertical bars” icon (a); with one “Vertical bar” (b), (c); with two “Vertical bars” (d), (e); with 3 “Vertical bars” (f), (g); with three “Vertical bars” and the Y sign (h); with the indicator of the overload (i)

In the case when 316 m/s<sup>2</sup> range, logarithmic scale and the reference level equal to 1 μm/s<sup>2</sup> are selected in the proper lists the displays are as follows:



The view of the displays in the VLM mode when 316 m/s<sup>2</sup> range (path: MENU / INPUT / RANGE), logarithmic scale (path: MENU / DISPLAY / DISPLAY SETUP / DISPLAY SCALE / LOG) and the reference level equal to 1 μm/s<sup>2</sup> (path: MENU / SETUP / REFERENCE LEVEL) are selected; the results, depending on the level of the input signal, are presented without the “Vertical bars” icon (a); with one “Vertical bar” (b), (c); with two “Vertical bars” (d), (e); with three “Vertical bars” (f), (g); with three “Vertical bars” and the Y sign (h); with the indicator of the overload (i)

As it was shown above the number of the “Vertical bars” on the display depends on the level of the measured signal and the selected range. This number depends also on the calibration factor. The limits of the signal causing the different icon’s indication for the calibration factor equal to 0 dB are presented in the Table 3.1. Non-zero value of this factor causes the shift of the limits given in the table.

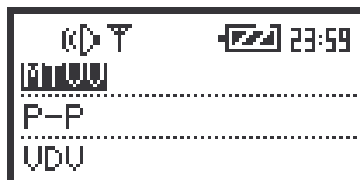


**Notice:** The “Bell” icon is used as an indicator of an overload.

**Table 3.1. The limits of the signal causing the different icon’s indication in the case of vibration measurements (values expressed in decibels are calculated with the assumption that the reference level (path: MENU / SETUP / REFERENCE LEVEL) is equal to 1  $\mu\text{m/s}^2$ )**

| INDICATOR    | VLM, 1/1 OCTAVE, 1/3 OCTAVE or FFT ANALYSIS                          |  |
|--------------|--|--|
|              | 17.8 m/s <sup>2</sup> range<br>145 dB range                          | 316 m/s <sup>2</sup> range<br>170 dB range                           |
| “Bell”       | $\geq 53.1 \text{ m/s}^2$<br>$\geq 154.5 \text{ dB}$                 | $\geq 750 \text{ m/s}^2$<br>$\geq 177.5 \text{ dB}$                  |
| ☐ + 3 “Bars” | $\geq 18.0 \text{ m/s}^2$<br>$\geq 145.1 \text{ dB}$                 | $\geq 320 \text{ m/s}^2$<br>$\geq 170.1 \text{ dB}$                  |
| 3 “Bars”     | 1.01 m/s <sup>2</sup> – 17.8 m/s <sup>2</sup><br>120.1 dB – 145.0 dB | 18.0 m/s <sup>2</sup> – 316 m/s <sup>2</sup><br>145.1 dB – 170.0 dB  |
| 2 “Bars”     | 56.9 mm/s <sup>2</sup> – 1.00 m/s <sup>2</sup><br>95.1 dB – 120.0 dB | 1.01 m/s <sup>2</sup> – 17.8 m/s <sup>2</sup><br>120.1 dB – 145.0 dB |
| 1 “Bar”      | 3.20 mm/s <sup>2</sup> – 56.2 mms <sup>2</sup><br>70.1 dB – 95.0 dB  | 56.9 mm/s <sup>2</sup> – 1.00 m/s <sup>2</sup><br>95.1 dB – 120.0 dB |
|              | $\leq 3.16 \text{ mm/s}^2$<br>$\leq 70.0 \text{ dB}$                 | $\leq 56.2 \text{ mm/s}^2$<br>$\leq 95.0 \text{ dB}$                 |

- “Tree” icon is displayed in a flashing mode together with the “Loudspeaker” when the measurement is started, the trigger is switched on and the level of the signal is too low to start the registration.



The view of the display with the “Tree” and “Loudspeaker” icon

- “Envelope” icon is presented when the current **measurement results are logged** in the instrument’s buffer. Together with this icon the “Loudspeaker” icon is always displayed. In the case when the “Envelope” icon starts flashing, it means that the whole buffer of the instrument is filled. The new measurement result is not saved in it. If the user wants to save these results, he has to execute first the **CLEAR BUFFER** function from the **FILE** (path: MENU / FILE / CLEAR BUFFER) list which removes from the buffer memory all results saved there.



a)



b)



c)

The view of the display with the icons: “Envelope” (a); “Battery” (b) and with internal real time clock (c)

- “**Battery**” icon corresponds to the internal **battery state**. This icon is also used for the indication of the current state (the current filling) of the internal battery during the charging process.

- “**Clock**” icon displays the internal clock state (**the current time**) when the colon is flashing or the current time of the measurement (set in the **INT. TIME**). In the latter case the colon is displayed without flashing. The current time of the measurement is displayed after the start of the measurement. When the **2nd Func.** (path: *MENU / SETUP / SHIFT MODE*) mode is selected (cf. the description of the **SHIFT MODE** sub-list of the **SETUP** list) instead of the clock the text **2n dF** is flashing. This flashing lasts from the pressing of the **<SHIFT>** push button till the pressing of any other one.



**Notice:** The time of the measurement is displayed **in minutes and seconds** in the range from **1 sec. to 39 minutes and 59 seconds**. After this limit the hours and minutes are shown (i.e. 00:40).



**Notice:** In all modes of the instrument the “**Battery**” and the “**Clock**” icons are always displayed on the display.



**Notice:** **THE USER DYNAMICALLY MODIFIES THE DEFAULT SETUP. The last set-up of the instrument (during the power off) is stored and is available after power on.**