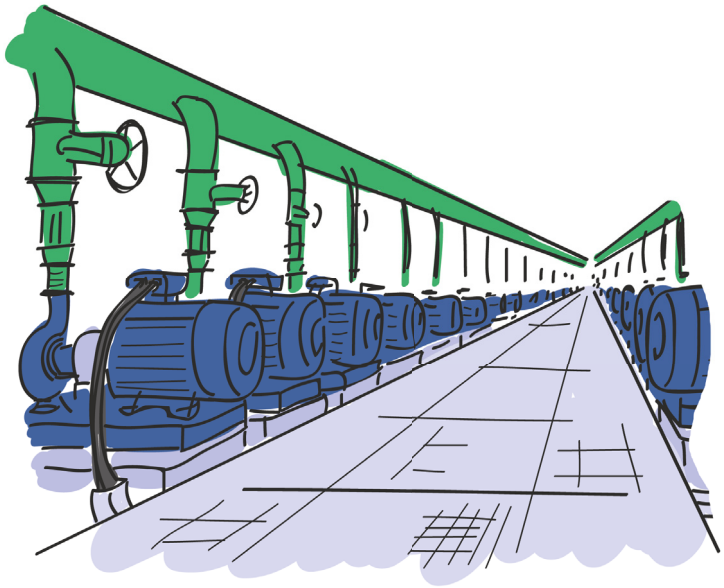
A4900 Vibrio Ex

Step by Step

MASTER THE LANGUAGE OF YOUR MACHINERY



Content

Specification according to 94/9/EC (ATEX) directive:

II 2 G Ex ib IIC T4 Gb

II Non-mining
2 ZONE A
G Gas atmosphere
Ex ib Principe of protection - Intrinsic Safety EN 60079-11 , Zone 1
IIC Gas group - Hydrogen
T4 Temperature class 135 °C
Gb Equip. Protection level – Zone 1 (high protection)

IP65, -20 °C ≤ Ta ≤ 50 °C

IP65 INGRESS PROTECTION, dust tight and against water jets
-20°C≤Ta≤50°C ambient temperature range

Zones Categories

Zone 0 (gases and vapours)
Explosive atmosphere is present continuously, for long periods or frequently.

Zone 1
Explosive atmosphere is likely to occur under normal operation, occasionally.

Zone 2
Explosive atmosphere is unlikely to occur in normal operation and, if it does, will persist for a short period only.

The **A4900 - Vibrio Ex** unit is certified for use in explosive risk areas zones 1 and 2 with all gas group.
It means:

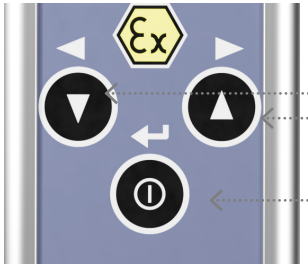
IIA (acetone, ethanol, ...),
IIB (formaldehyde, ether, ...),
IIC (hydrogen, acetylene, ...).

The following conditions must be complied with:

1. **The accelerometer type must be AC90x or AC91x.**
2. **Batteries type must be of Energizer L91 (1.5V / LiFeS technology).**
3. **The instrument cannot be used in zone 0.**
4. **Changing of batteries cannot be done in an explosive risk area.**
5. **The USB communication cable cannot be used in explosive risk area.**
6. **The operator must be grounded (earthed) and the unit must be grounded (earthed through the operator).**

Top Panel

Buttons



Batteries

Batteries type must be of **Energizer L91** (1.5V/LiFeS technology).

Changing of batteries cannot be done in an explosive risk area.

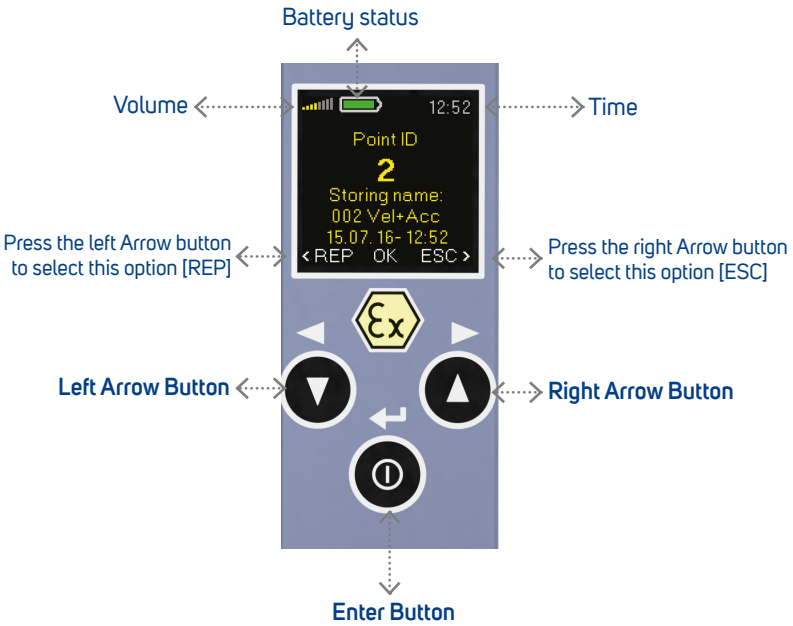
For more information see page 19.

Arrow Buttons

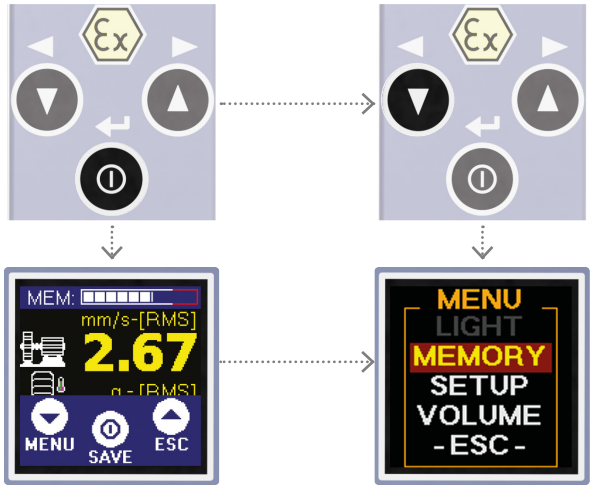
- switch between the measurement modes
- select the right or left item from the menu at the bottom
- move between items (up/down) in menu

Enter Button

- switches the instrument on/off
- confirmes the selection
- selects the middle item from the menu at the bottom
- opens the Basic menu

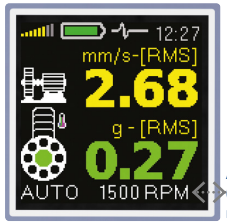


1. To open the Basic menu press the Enter button (on any measurement screen)
2. Then press the left Arrow button to open the Menu



3. You can select the following items from the menu:
   - **Memory**
     for route measurement (see page 12 - 13)
   - **Setup**
     setup of speed, alarms, units, time, etc. (see page 14)
   - **Volume**
     for headphones volume setup (see page 15)
   - **-Esc-**
     back to the measurement screen

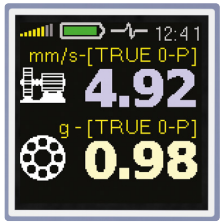
Overall values - RMS



Automatic speed detection (the speed can also be set manually ... see page 22)

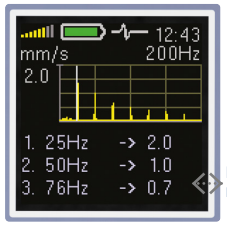
RMS vibration values:
10 - 1000 Hz in mm/s (ips)
0.5 - 16 kHz in g

Overall values - PEAK



Peak vibration values (0-P):
10 - 1000 Hz in mm/s (ips)
0.5 - 16 kHz in g

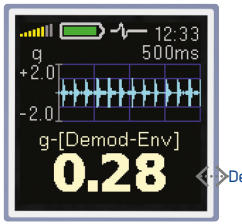
Spectrum



Displays the 3 top peaks found

FFT analysis of vibrations:
1 - 200 Hz in mm/s (ips) RMS

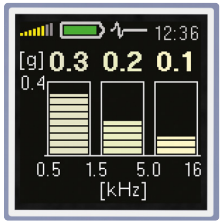
Demod time signal



Demod-Envelope value

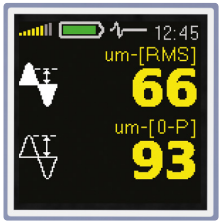
Demod time signal:
0.5 - 16 kHz in g

Frequency bands



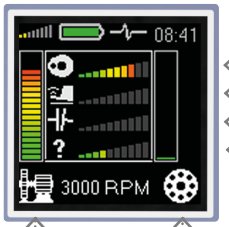
RMS vibration values:
0.5 - 1.5 kHz in g
1.5 - 5 kHz in g
5 - 16 kHz in g

Displacement



Overall RMS and Peak displacement:
2 - 100 Hz in µm (mils)
(see page 14 for setup)

FASIT (Fault Source Identification Tool)



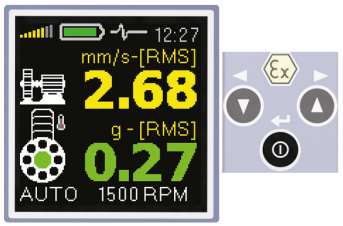
- Unbalance
- Looseness
- Misalignment
- Other failure

Bearing condition

Overall machine condition

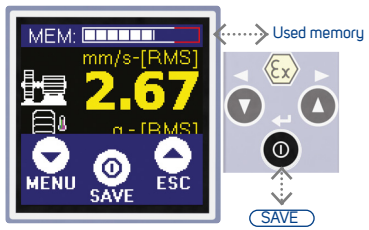
Saving Data From Measurement Screen

1.



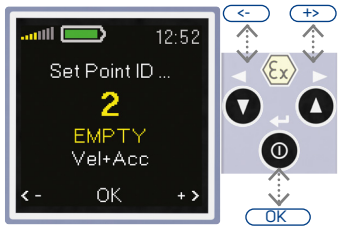
Press the Enter button on any measurement screen

2.



Press the Enter button [SAVE]

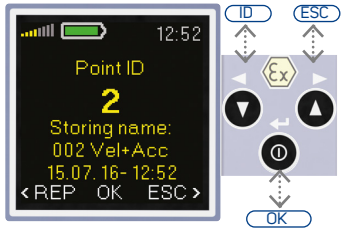
3.



Select the Point ID (1-250) with the Arrow buttons

Press the Enter button [OK] to confirm

4.



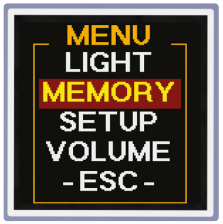
[REP] go back to the Point ID setting

[ESC] go back to the measurement

Press the Enter button [OK] to save the data

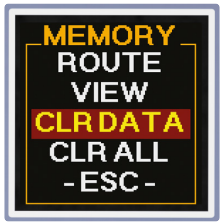
Clearing Data

1.

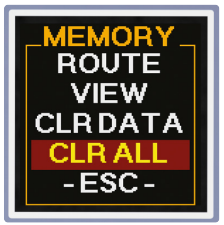


Go to **MENU/MEMORY**

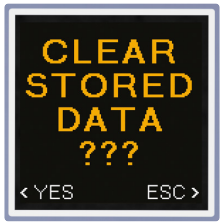
2.

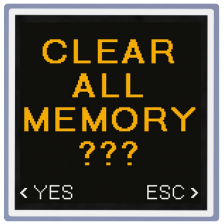


This removes all measured data. It removes route data and also the data saved manually (off-route). But the route structure (list of machines) is not removed and route can be collected again.



This clears all the data (readings and route structure) in the memory. It works like formatting.

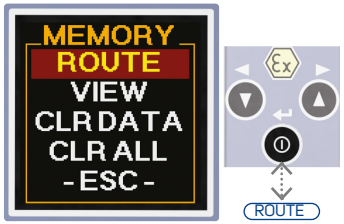




1.

Firstly the route must be loaded to the device from the DDS software

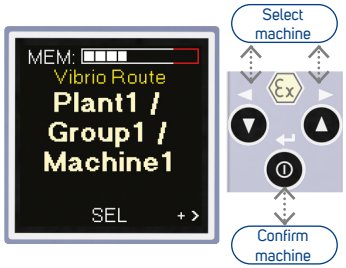
2.



Go to **MENU/MEMORY/ROUTE**

VIEW ... view off-route readings
CLR DATA ... delete all readings
CLR ALL ... delete all readings and route structure

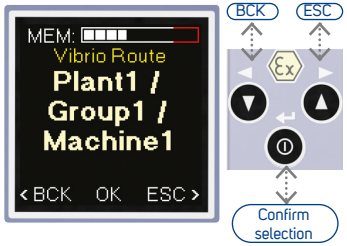
3.



Use the Arrow buttons to switch between the machines in route

Press the Enter button [SEL] to confirm the selection

4.

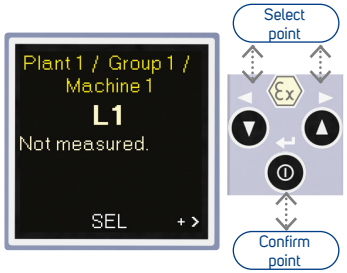


[BCK] go back to machine selection

[ESC] escape from the route

Press the Enter button [OK] to confirm the selection

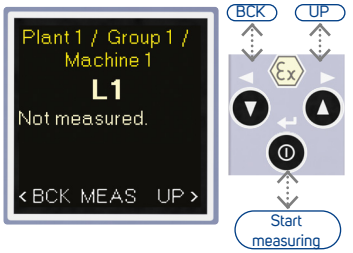
5.



Use the Arrow buttons to switch between the points in route

Press the Enter button [SEL] to confirm the selection

6.

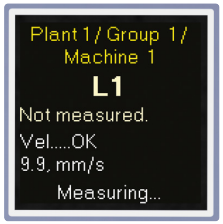


[BCK] go back to point selection

[UP] go back to machine selection

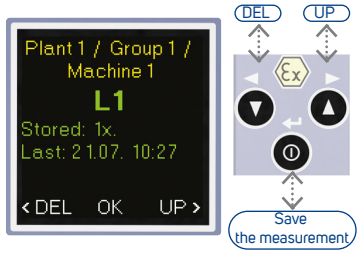
Press the Enter button [MEAS] to start measuring

7.



Measurement progress can be seen on the screen

8.



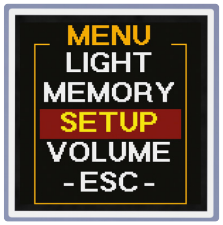
[DEL] delete the measurement

[UP] save and move to the next point

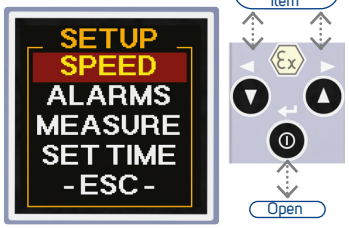
[OK] save the measurement

Setup

1.



2.



Go to **MENU/SETUP**

Speed
- Auto
- Manual
- Off

Alarms
- Adash (speed is required)
- R13 (rigid, group 1 and 3)
- F13 (flexible, group 1 and 3)
- R24 (rigid, group 2 and 4)
- F24 (flexible, group 2 and 4)

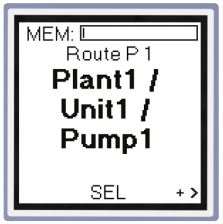
ISO 20816-3

Measure
- Units
  - Metric
  - Imperial
- Disp.val.
  - RMS/0-P
  - RMS/P-P
  - 0-P/P-P

Displacement

- RTE mode
  - Normal (black background)
  - Inverse (available for route only)

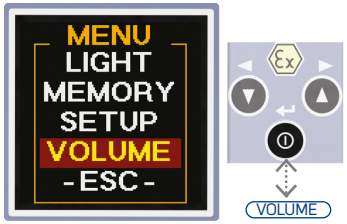
Set time — Setup of time and date



Inverse screen

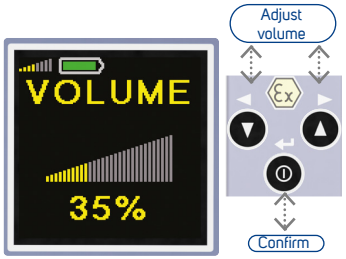
Volume, Date & Time

1.



Go to **MENU/VOLUME**

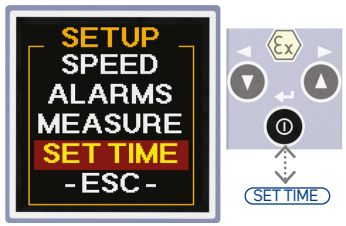
2.



Adjust the phones volume with the Arrow buttons

Press the Enter button to confirm

1.

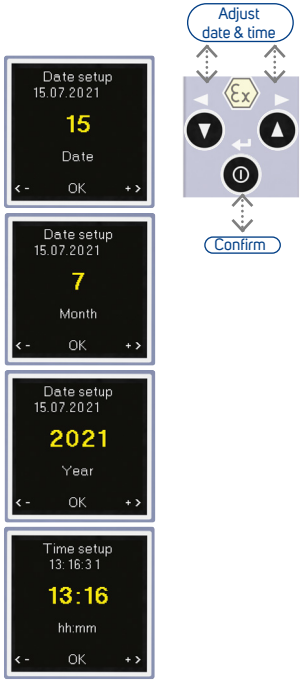


Go to **MENU/SETUP/SET TIME**

Adjust the date & time with the Arrow buttons

Press the Enter button to confirm

2.

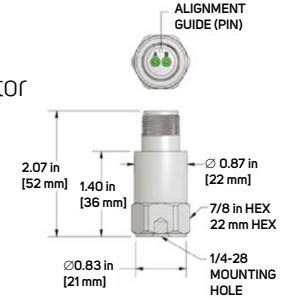


Accelerometer AC90x/AC91X

Connector PIN Polarity	
A	(+) Signal/Power
B	(-) Common

AC915-1A

2 Pin Connector



II 1 G D

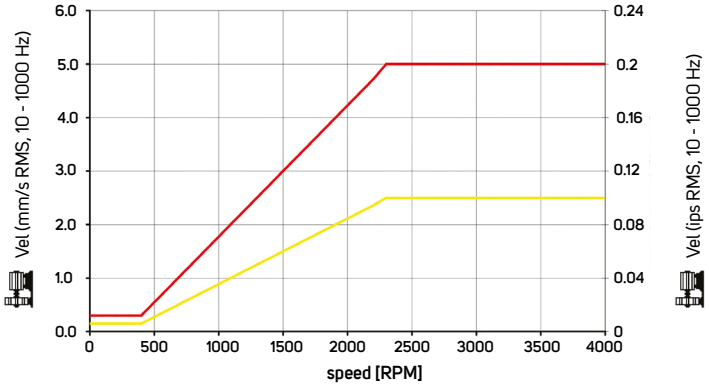
Model	Description	Vmax	Ci	Imax	Li	Pi
AC90X/AC91X Series	Accelerometer	28 V	70nF	100 mA	51 uH	1W

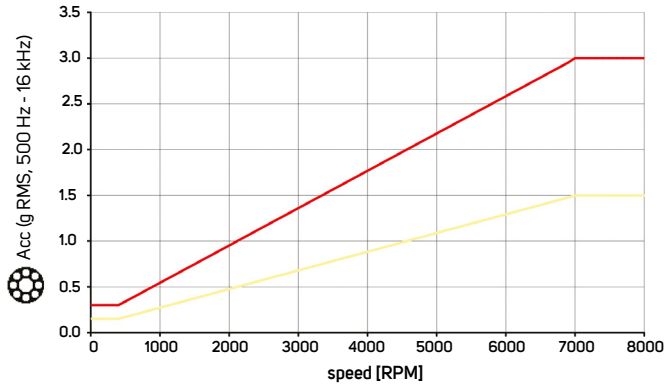
Specifications	Standard	Metric
Part Number	AC915	M/AC915
Sensitivity (±10%)	100 mV/g	
Frequency Response (± 3dB)	30-900 000 CPM	0,5-15 000 Hz
Frequency Response (± 10%)	60-60 000 CPM	1,0-10 000 Hz
Dynamic RAnge	± 50 g, peak	
Electrical		
Setting Time	<3 Seconds	
Voltage Source (IEPE)	18-28 VDC	
Constant Current Excitacion	2-10 mA	
Spectral Noise @ 10 Hz	6,5 µg/√Hz	
Spectral Noise @ 100 Hz	2 µg/√Hz	
Spectral Noise @ 1000 Hz	1,8 µg/√Hz	
Output Impendance <100 ohm		
Bias Output Voltage	10-14 VDC	
Case Isolation	>10^8 ohm	

Specifications	AA
Clasiifications:	„Cylindrical Lithium“
Chemical System:	Lithium/Iron Disulfide (Li/FeS_2)
Designation:	ANSI 15-LF, IEC-FR6
Nominal Voltage:	1.5 Volts
Compatible With:	**EA91, E91, NH15, 1215**
Storage Temperature:	-40 °C to 60 °C (-40 °F to 140 °F)
Operating Temperature:	-40 °C to 60 °C (-40 °F to 140 °F)
Typical Weight:	14.5 grams (0.5 oz.)
Typical Volume:	8.0 cubic centimeters (0.49 cubic inch)
Max Discharge:	3.0 Amps Continuous
Max Rev Current:	2 µA
Lithium Content:	Less than 1 gram
Typical IR:	60 to 210 miliohms (depending on method)
Shelf Life :	20 years at 21 °C
Certifications:	This battery has Underwriters Laboratories component recognition (MH12454) / Certified for intrinsic safety to UL913 7th Ed., CAN/CSA-C22.2 No. 157-92

Adash Limit Values

Below you can see graphs, according to which the instrument determines acceptable vibration limits depending on machine speed





ISO 20816-3

The default setting uses the limit values for machines groups 2 and 4 with rigid foundation.

CLASSIFICATION OF VIBRATION VALUES FOR MACHINES GROUPS 1 AND 3

300 kW - 50 MW

Foundation class	RMS velocity values mm/s	in/s	border zone
Rigid **(R13)**	2.3	0.09	A/B
	4.5	0.18	B/C
	7.1	0.28	C/D
Flexible **(F13)**	3.5	0.14	A/B
	7.1	0.28	B/C
	11.0	0.43	C/D

CLASSIFICATION OF VIBRATION VALUES FOR MACHINES GROUPS 2 AND 4

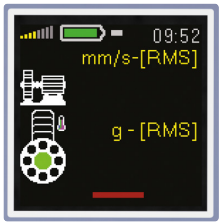
15 kW - 300 kW

Foundation class	RMS velocity values mm/s	in/s	border zone	
Rigid **(R24)**	1.4	0.06	A/B	
	2.8	0.11	B/C	**DEFAULT FACTORY SETTING**
	4.5	0.18	C/D	
Flexible **(F24)**	2.3	0.09	A/B	
	4.5	0.18	B/C	
	7.1	0.28	C/D	

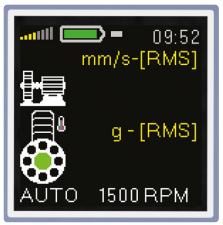
Machine Rotation Speed Detection

Adash limits require machine rotation speed information. The speed detection appears before the first vibration measurements (first screen).

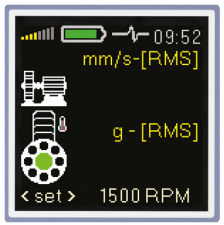
After switching the instrument on the first screen (Overall values) appears, but without the vibration values. The speed value is required for the classification of vibration measurements. The speed value is used for **Warning** and **Alert** limits calculation. The instrument runs the speed detection process (the red bar increases on the bottom of screen).



The user can switch off the automatic speed detection in **MENU/SETUP/SPEED**.



Detected speed value is displayed at the bottom. The word AUTO in front of the value informs, that automatic detection was used.

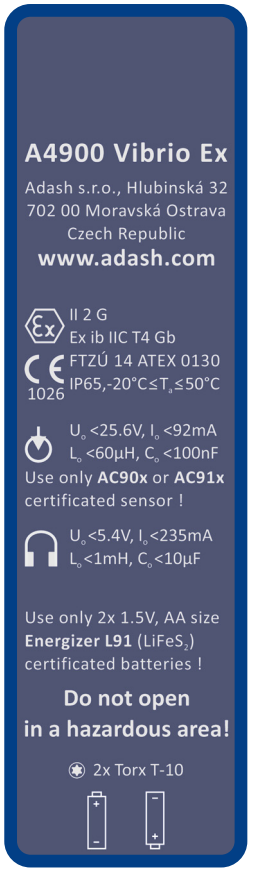


If the automatic detection is not successful, then the last speed value appears with word <set>. When no button is used in 4 sec, then the displayed value is accepted. Using left/right arrow buttons change the speed to correct value. Set the speed and press middle enter button.

Sensor & Headphones Limitations

In explosion risk areas use only the authorized L91 batteries and accelerometer AC90x or AC91x!

In explosion risk area you can use headphones with an impedance of 4-32 Ohm and a maximum inductance of 1 mH!



Technical Specifications

Input:	1 x ICP® powered accelerometer
Input range:	60 g PEAK with standard 100 mV/g sensor (e.g. 600 g PEAK for 10 mV/g sensor, the sensitivity is editable in the unit)
Measurements:	Velocity RMS: 10 - 1 000 Hz [mm/s, ips] Velocity PEAK: 10 - 1 000 Hz [mm/s, ips] Acceleration RMS: 500 - 16 000 Hz [g] Acceleration Peak: 500 - 16 000 Hz [g] Velocity time: 1 - 1 000 Hz [mm/s, ips], 2048 samples * Velocity spectrum: 1 - 200 Hz [mm/s, ips], 200 lines Velocity spectrum: 1 - 1 000 Hz [mm/s, ips], 800 lines * Acceleration time: 1 - 16 000 Hz [g], 2048 samples* Acceleration spectrum: 1 - 16 000 Hz [g], 800 lines* Acceleration Demod-Envelope RMS: 500 - 16 000 Hz [g] Acceleration Demod-Envelope Peak: 500 - 16 000 Hz [g]* Acceleration Demod-Envelope time: 500 - 16 000 Hz [g], 2048 samples Acceleration Demod-Envelope spectrum: 500 - 16 000 Hz [g], 800 lines, range 400 Hz* Displacement RMS: 2 - 100 Hz [µm, mil] Displacement 0-Peak: 2 - 100 Hz [µm, mil] Displacement Peak-Peak: 2 - 100 Hz [µm, mil]
Other functions:	Vibration stethoscope
Memory:	4 MB for data 120 960 overall values 900 measurements of 800 line spectra or 2048 sample time signals may be stored
Data storing:	Off-Route Route with DDS software for Vibrio M (free download)
Interface:	USB C - 3.0, 2.0 compatible
Software:	Free version of DDS software (limited database size)
Display:	Colour graphic OLED display 128 x 128 pixels, diagonal 1.5“ (38 mm)
Output:	1 x AC signal 8 Ω / 0,5 W for external headphones (signal listening)
Power:	2xAA 1.5V batteries (alkaline, NiMH, Lithium - 4 hours of operation)
Temperature:	Operating: -5°C to 55°C
Dimensions:	150 x 60 x 35 mm
Weight:	330 g (without cable, sensor and magnet) 540 g (including cable, sensor and magnet)
Accessories:	vibration sensor, coiled cable to connect vibration sensor, magnetic base for vibration sensor, headphones with 3.5 mm jack, USB cable, measuring tip for manual pressure on the sensor, transport case, USB flash disc with the manual

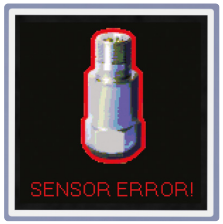
*available in DDS software for A4900 Vibrio Ex

Errors Indications

Errors are indicated on an instrument display.

If there is a problem with cable or sensor, the display will show **SENSOR ERROR**. If we get an SENSOR ERROR, we need to check connecting cable (broken or short circuit) and sensor.

If there is another internal fault, the display will show **UNIT ERROR** If the error constantly repeats itself, contact your supplier or manufacturer.



If the input signal voltage is too high (over +/-12 V range), the instrument cannot process it and the overload error is displayed. The instrument is not capable of using such signal. Error **OVER LOAD** is indicated on an instrument display.

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