

Vib Meter 9080-Ex

IECEX/ATEX Intrinsically Safe Vibration Meter

Ⓢ II 2G Ex ib IIC T4 Gb (-20°C ≤ Ta ≤ +40°C)
Class I, Zone 1, IIC T4 (-20°C ≤ Ta ≤ +40°C)
Class I, Division 2, Groups A-D, T4 (-20°C ≤ Ta ≤ +40°C)

User Guide: Version 1.3

Vibration Monitoring & Analysis



Test Products International
9615 SW Allen Blvd Suite 104
Beaverton, OR 97005 USA

Tel: (800) 368-5719

Fax: (503) 520-1225

Web site: www.testproductsintl.com

CONTENTS

CONTENTS	2
DISCLAIMER	2
1 OVERVIEW	3
1.1 Special Requirement for Protective Boot.....	3
1.2 Turning the unit ON and OFF.....	3
1.3 Batteries.....	4
1.4 Service.....	4
1.5 Intrinsic safety certification	5
2 OPERATION	8
2.1 Fitting the sensor.....	8
2.2 Taking a reading.....	8
2.2.1 Vibration readings	9
2.2.2 Vibration Analysis	10
2.2.3 Frequency spectrum	11
2.2.4 Live Update Mode.....	12
2.3 Configuration menus	12
2.3.1 Setup Wizard.....	12
2.3.2 Manual Setup	13
2.3.2.1 BDU alarm settings.....	13
2.3.2.2 Run Speed.....	14
2.3.2.3 Sensor mV/g	14
2.3.4 Device Settings	14
2.3.5 Turning IEPE Power On/Off.....	14
3 ASSET MANAGEMENT	16
4 VIBTREND - TRENDING SOFTWARE	17
5 SPECIFICATIONS	18
5.1 Intrinsic Safety Circuit Terminal Parameters	18
6 REVISION HISTORY	19
7 BASIC OPERATION	20

Disclaimer

This document has been carefully prepared and checked. No responsibility can be assumed for inaccuracies. TPI Europe reserves the right to make changes without prior notice to any products herein to improve functionality, reliability or other design aspects. TPI Europe does not assume any liability out of the use of any product described herein; neither does it convey any licence under its patent rights nor the rights of others. TPI Europe products are not authorised for use as components in life support services or systems. TPI Europe should be informed of any such intended use to determine suitability of the products.

Copyright © 2018 TPI Europe Ltd.

1 OVERVIEW

The **Vib Meter 9080-Ex** is a simple to use **intrinsically safe** vibration monitoring and analysis tool that allows easy display of vibration signals. The meter automatically performs vibration analysis functions based on machine running speed to help diagnose faults such as unbalance, misalignment and looseness, as well as indicating the degree of bearing wear.



The Vib Meter 9080-Ex unit is designed to enable a user to collect vibration measurements from assets (e.g. pumps, motors, fans and bearings). The unit displays vibration frequency plots and allows vibration severity and bearing condition to be monitored, analysed and trended with the included VibTrend PC analysis software.

1.1 Special Requirement for Protective Boot

The meter is supplied with an **anti-static intrinsically safe** protective over boot that is marked with an intrinsic safety certification label.

The unit must NOT be used in a hazardous area without this boot fitted.

1.2 Turning the unit ON and OFF

Turning the meter ON is achieved simply by pressing the center  or  button. The unit has an auto dimming feature that dims the display after 10 seconds to conserve battery life. Pressing any button will bring the unit back to full brightness. In addition, the 9080EX will automatically turn OFF if not used for 1 minute (this time period can be increased up to 60 minutes using the Setup Wizard).

1.3 Batteries

The Vib Meter 9080-Ex is powered by two AA size batteries **that must be Energizer® L91 Ultimate Lithium**. The batteries can be replaced by removing the battery compartment cover (held in place by 6 screws) as shown in the photograph below:



1.4 Service

The Vib Meter 9080-Ex contains no user serviceable parts. In the unlikely case of malfunction please return the complete unit to your supplier for repair.

N.B. removal of any of the case screws (other than those securing the battery compartment cover) will invalidate the unit's intrinsic safety certification.

1.5 Intrinsic safety certification

IEC		IECEX		IECEX Certificate of Conformity	
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres <small>for rules and details of the IECEX Scheme visit www.ieceex.com</small>					
Certificate No.:	IECEX BAS 16.0131X	Issue No. 0	Certificate History:		
Status:	Current				
Date of issue:	2017-03-15	Page 1 of 3			
Applicant:	TPI Europe 13 Ardglon Industrial Estate Witchurch Hampshire RG26 7BB United Kingdom				
Equipment:	Vib Meter Type 9050-Ex				
Optional accessory:					
Type of Protection:	Intrinsic Safety				
Marking:	Ex ib IIC T4 Gb (-20°C ≤ T ≤ +40°C)				
Approved for issue on behalf of the IECEx Certification Body:	R S Sinclair				
Position:	Technical Manager				
Signature: <small>(for printed version)</small>					
Date:	15/03/2017				
<p>1. This certificate and schedule may only be reproduced in full. 2. This certificate is not transferable and remains the property of the issuing body. 3. The Status and authenticity of the certificate may be verified by visiting the Official IECEX Website.</p>					
<p>Certificate issued by: SGS Baseefa Limited Rockhead Business Park Staden Lane Buxton, Derbyshire, SK17 9RZ United Kingdom</p> 					

IEC		IECEX		IECEX Certificate of Conformity	
Certificate No.:	IECEX BAS 16.0131X	Issue No. 0	Page 3 of 3		
Date of issue:	2017-03-15				
Schedule					
EQUIPMENT: Equipment and systems covered by this certificate are as follows:					
<p>The Vib Meter Type 9050-Ex is a vibration meter that can be used to take measurements of vibration using a cable connected (intrinsically safe) accelerometer. The vibration meter is capable of displaying vibration in a variety of different formats such as overall values of acceleration, velocity or displacement, frequency spectra or vibration in various frequency bands centred on multiples of a machine's running speed for example.</p> <p>The vibration meter comprises a handheld unit with processor PCB, LCD display and keypad. The keypad is used to initiate readings and navigate through the various different vibration display formats.</p> <p>The unit is battery powered using two Energizer LR1 type AA cells, which may only be changed in the non-hazardous area, that are fitted via a battery compartment lid that is attached by 6 screws to the rear of the instrument.</p> <p>The only electrical connection that can be made to the vibration meter is the connection of an intrinsically safe accelerometer via an integral BNC connector.</p> <p>The accelerometer BNC connector has the entity parameters: Uo = 21.42V Io = 75mA Po = 400mW Ci = 0 Li = 0 Co = 100nF Lo = 3mH</p>					
SPECIFIC CONDITIONS OF USE: YES as shown below:					
The elastomeric boot shall be fitted to the instrument at all times when used in the hazardous area					

IEC		IECEX		IECEX Certificate of Conformity	
Certificate No.:	IECEX BAS 16.0131X	Issue No. 0	Page 2 of 3		
Date of issue:	2017-03-15				
Manufacturer:	Synatel Instrumentation Limited Walsall Road Norton Canes Cannock Staffordshire WS11 5TB United Kingdom				
Additional Manufacturing location(s):					
<p>This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard listed below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended.</p>					
STANDARDS: The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:					
IEC 60079-0 : 2011	Explosive atmospheres - Part 0: General requirements Edition: 5.0				
IEC 60079-11 : 2011	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "T" Edition: 5.0				
This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.					
TEST & ASSESSMENT REPORTS: A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:					
<p><u>Test Report:</u> GB/BAS/EXTR16.0397/00</p> <p><u>Quality Assessment Report:</u> GB/BAS/CAR06.0055/07</p>					

EU - TYPE EXAMINATION CERTIFICATE

Equipment or Protective System Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU

- 3 EU - Type Examination Certificate Number: **Baseefa16ATEX0182X**
- 4 Product: **Vib Meter Type 9080-Ex**
- 5 Manufacturer: **Synstel Instrumentation Limited**
- 6 Address: **Walsall Road, Norton Canes, Cannock, Staffordshire, WS11 9TB**
- 7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- 8 SGS Baseefa, Notified Body number 1180, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in confidential Report No. **GB/BAS/EXTR16.0397/00**
- 9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 60079-0:2012-A11:2013 EN 60079-11:2012
except in respect of those requirements listed at item 18 of the Schedule.
- 10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.
- 11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
- 12 The marking of the product shall include the following:
Ⓜ II 2G Ex Ib IIC T4 Gb (-20°C ≤ Ta ≤ +40°C)

SGS Baseefa Customer Reference No. 1057

Project File No. 14/0312

This document is issued by the Company subject to its General Conditions for Certification Services accessible at http://www.sgs.com/Content/Conditions_and_Standards/SGS_Baseefa_Terms_and_Conditions.pdf. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. It does not necessarily indicate that the equipment may be used in particular industries or circumstances. The Company's sole responsibility is to its Client and this document does not constitute parties to a transaction nor constitute any other rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Baseefa Limited
Rockwood Business Park, Sladden Lane,
Buxton, Derbyshire SK17 9BZ.
Telephone +44 (0) 1298 706000 Fax +44 (0) 1298 706001
e-mail baseefa@sgs.com web site www.sgs.com/uk/baseefa
Registered in England No. 4305578

R. SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

Schedule

Certificate Number Baseefa16ATEX0182X

15 Description of Product

The Vib Meter Type 9080-Ex is a vibration meter that can be used to take measurements of vibration using a cable connected (intrinsically safe) accelerometer. The vibration meter is capable of displaying vibration in a variety of different formats such as overall values of acceleration, velocity or displacement, frequency spectra or vibration in various frequency bands centred on multiples of a machine's running speed for example.

The vibration meter comprises a handheld unit with processor PCB, LCD display and keypad. The keypad is used to initiate readings and navigate through the various different vibration display formats.

The unit is battery powered using two Energizer L91 type AA cells, which may only be changed in the non-hazardous area, that are fitted via a battery compartment lid that is attached by 6 screws to the rear of the instrument.

The only electrical connection that can be made to the vibration meter is the connection of an intrinsically safe accelerometer via an integral BNC connector.

The accelerometer BNC connector has the entity parameters:

U₀ = 21.42V
I₀ = 75mA
P₀ = 400mW
C₁ = 0
L₁ = 0
C₂ = 100nF
L₂ = 30H

16 Report Number

GB/BAS/EXTR16.0397/00

17 Specific Conditions of Use

- 1. The elastomeric boot shall be fitted to the instrument at all times when used in the hazardous area.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.2.7	LVD type requirements
1.2.8	Overloading of equipment (protection relays, etc.)
1.4.1	External effects
1.4.2	Aggressive substances, etc.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
A4-15871A	1 of 1	0	10/02/2017	TPI Vibration Monitor Approval Label
M-200844A	1 of 1	0	23/02/2017	I.S. Protection Circuit Assembly - Parts List
A4-200844A	1 of 1	0	28/07/2015	I.S. Protection Circuit Assembly - Schematic
A3-200845A/1	1 of 1	0	24/01/2017	I.S. Protection Circuit Assembly - Top Component Ident

Number	Sheet	Issue	Date	Description
A4-200845A/2	1 of 1	0	24/01/2017	I.S. Protection PCB - Component Side Copper
A3-200845A/7	1 of 1	0	24/01/2017	I.S. Protection Circuit Assembly - Bottom Component Ident
A4-200845A/B	1 of 1	0	24/01/2017	I.S. Protection PCB - Non-component Side Copper
A4-200881A	1 of 1	0	13/01/2017	Control PCB Block Diagram
A3-301491A	1 of 1	0	17/01/2017	TPI Bottom Case Dimensions
A3-301492A	1 of 1	0	17/01/2017	TPI Top Case Dimensions
A4-301493A	1 of 1	0	17/01/2017	TPI Battery Cover Dimensions
A4-301494A	1 of 1	0	17/01/2017	TPI BNC Housing Dimensions
A4-301495A	1 of 1	0	17/01/2017	TPI Lock Ring Dimensions
A3-301496A	1 of 1	0	17/01/2017	TPI Front Label and Keypad Dimensions
A3-301499A	1 of 1	0	17/01/2017	TPI Boot Dimensions
A4-301500A	1 of 1	0	05/02/2017	TPI Base Machining
A4-301501A	1 of 1	0	24/01/2017	TPI Top Machining
A3-301502A	1 of 1	0	01/02/2017	ATEX TPI Vibration Monitor
A4-301503A	1 of 1	0	21/02/2017	TPI Vibration Monitor Labels
400026	1 of 1	A	31/01/2017	BOM for Battery Protection
A4-400026A	1 of 1	0	12/01/2017	Battery Protection - Schematic
A4-400027A/1	1 of 1	0	12/01/2017	Battery Protection - Assy - Component layout
A4-400027A/2	1 of 1	0	12/01/2017	Battery Protection - Assy - Copper

Contract Number: 800071

Certificate: **SGSNA/17/BAS/00003**
Test Report Number: SGSNA 17/0259

Certified Product: Vib Meter
Trademark (if any): TPI
Model(s): 9080-Ex



Technical Data: Ex ib IIC T4 Gb (-20° C ≤ Ta ≤ +40° C) ; Class I, Zone 1, IIC T4 (-20° C ≤ Ta ≤ +40° C) ; Class I, Division 2, Groups A-D, T4 (-20° C ≤ Ta ≤ +40° C); The accelerometer BNC connector has the entity parameters:
Uo = 21.42V, Io = 75mW, Po = 400mW,
Ci = 0, Li = 0, Co = 100nF, Lo = 3mH

Name and Address of Applicant: TPI Europe
International Drive, RH10 6AQ, Crawley, West Sussex,
United Kingdom

Name and Address of Manufacturer: Synatel Instrumentation Limited
Walsall Road, WS11 9TB, Norton Canes, Cannock,
United Kingdom

Name and Address of Factory: Synatel Instrumentation Limited
Walsall Road, WS11 9TB, Norton Canes, Cannock,
United Kingdom

This certificate supercedes previous certificates issued with the same certificate number. Certification is valid when products are indicated on the SGS directory of certified products at www.sgs.com. The product is certified according to ISO/IEC Guide 17067, *Conformity assessment - Fundamentals of product certification, System 3*, and in accordance with

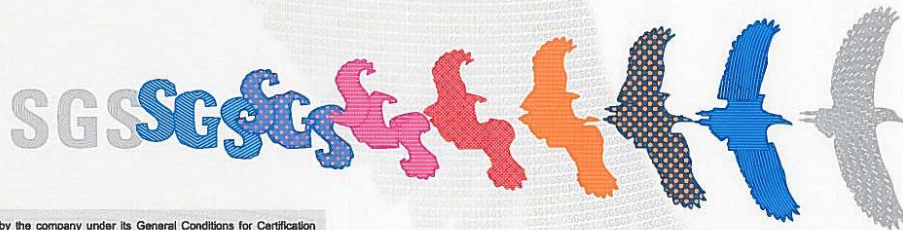
ANSI/ISA 12.12.01-2015
CAN/CSA C22.2 No.213-15
UL 60079-0, 6th Ed, Rev. July 26, 2013
UL 60079-11: 2014
CAN/CSA C22.2 No. 60079-0:15 Rev. October 2015
CAN/CSA C22.2 No. 60079-11:14

Authorized by Effective date: 18 July 2017

Paul Krauss
Certifier



Consumer and Retail Services, a division of SGS North America Inc.
620 Old Peachtree Road, Ste. 100, Suwanee, GA 30024, USA
t +1 770 570 1800 f +1 770 277 1240 www.sgs.com
Page 1 of 1



This certificate is issued by the company under its General Conditions for Certification Services accessible at www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitations of liability defined therein and in the Test Report here above mentioned which findings are reflected in this Certificate. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.


2 Operation

2.1 Fitting the sensor

The Vib Meter 9080-Ex is supplied with a cable connected accelerometer (sensor) that connects to the BNC connector on the meter. The nominal sensitivity of the sensor is 100mV/g and this is the meter's default setting for sensor sensitivity.

The Vib Meter 9080-Ex can accept any IEPE type (constant current) accelerometer but this **must be an intrinsically safe device for use in hazardous areas**. The sensor sensitivity setting of the 9080-Ex can be adjusted to accommodate different accelerometer sensitivities (see section 2.3.3.3 in Manual Setup).

2.2 Taking a reading

To take a reading, press the circle button  to turn the unit ON. Place the sensor on a **rigid** part of the machine as close as possible to the desired measurement point (e.g. bearing block) using the magnet mount.

Pressing the circle button again takes reading.

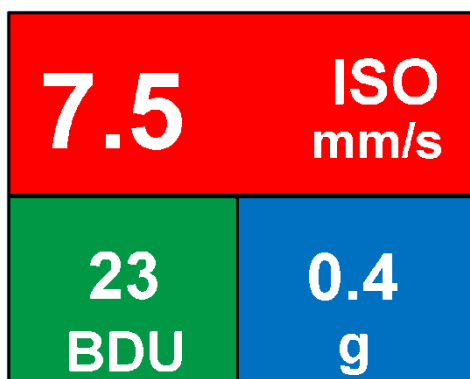
N.B. for best results the sensor should be placed gently onto the measurement point by “rolling” the magnet onto the machine.

This is in order to avoid any sudden shocks that would be seen as large acceleration peaks by the sensor could take some time (several seconds) to die away.



the
should
magnet
shocks
and

Taking
a



reading causes the overall vibration numbers screen to be displayed as shown in the example screen left.

This screen gives an overall view of the machine's vibration condition as explained in the following section.

2.2.1 Vibration readings

Once a vibration reading has been taken, the display will show three values, as shown in the example screen opposite. The values are colour coded to show their alarm status as explained in the following sections.

The three values shown in the readings screen are:

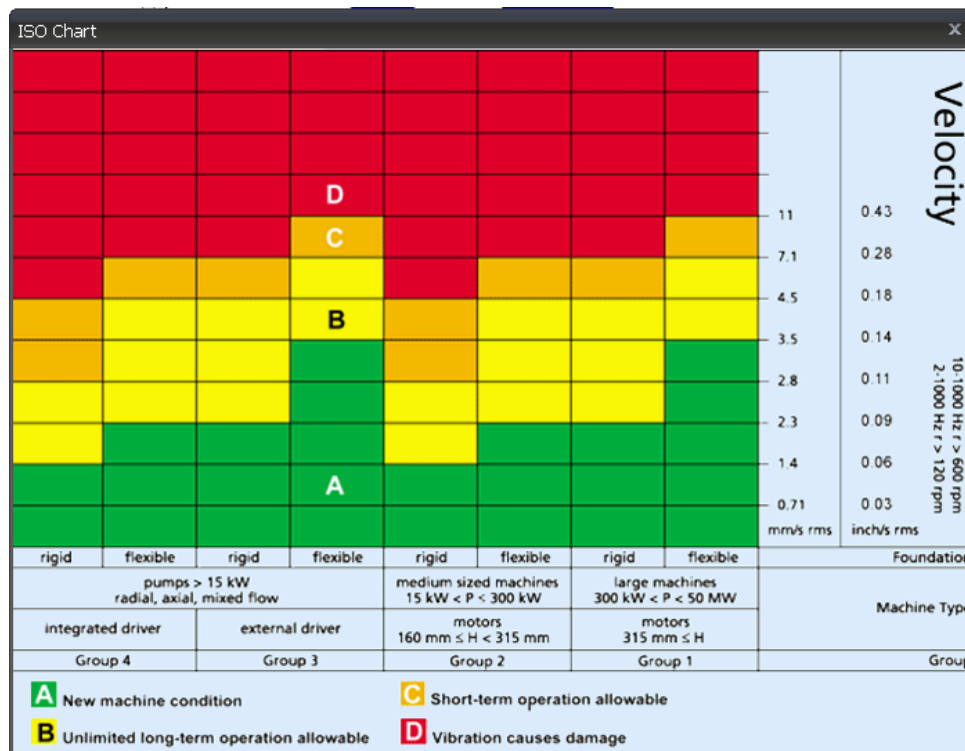
- ISO value (velocity in mm/second or inch/s)
- Bearing Noise in BDU (Bearing Damage Units)
- Total g (acceleration)

These readings are explained in more detail below with some examples of what they actually mean:

ISO value (mm/s)

The ISO value (in mm/s or inch/s) is the large number displayed at the top of the screen, which is the RMS (average) of the vibration velocity in the frequency band 10Hz (600 RPM) to 1kHz (60,000 RPM) or 2Hz (120 RPM) to 1kHz (60,000 RPM), as specified by the ISO standard¹. The correct frequency band is automatically selected by the meter based on running speed.

The ISO value background is colour coded according to the ISO 10816-1 vibration velocity level chart (see below). The colour coded background indicates the condition of the machine according to the size and type of machine selected with the **Setup Wizard** (see section 2.3.1).



¹ ISO 10816-1:1995. Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts

Bearing Noise (BDU)

Below the displayed ISO value and to the left is the value of bearing noise (high frequency vibration) in **Bearing Damage Units (BDU)**, where 100 BDU corresponds to 1g RMS (average) vibration measured above 1kHz. This is a measure of the wear state of the bearings in the equipment being monitored. The higher the number, the more worn the bearing.

It is commonly held that 1g of high frequency vibration (100 BDU) corresponds to a relatively high level of bearing noise and so can be considered indicative of a damaged bearing. In other words, it may be helpful to think of the Bearing Noise figure as being very roughly equivalent to “**percentage**” of bearing wear. By default, the bearing noise is displayed on a **Red** background if it is above 100 BDU, an **Amber** background between 50 and 100 BDU and a **Green** background below 50 BDU. However, the BDU alarm levels can be changed using the **Manual Setup** menu (see section 2.3.2.1).

Total acceleration (g)

This is the RMS (average) value of the total vibration acceleration measured by the meter over its entire frequency range (2Hz to 10kHz). This reading is shown in units of **g** (Earth’s gravitational constant, where 1g = 9.81 m/s²).

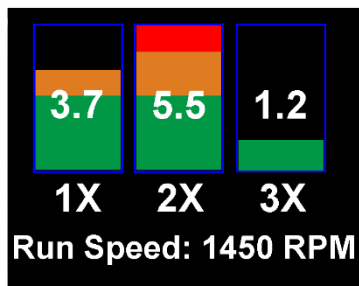
Displacement

Pressing either the left (<) or right (>) arrow button when the reading screen is displayed will cause the meter to display RMS displacement (in mm or thou) on a blue background. Pressing either left or right arrow button again will revert to display of the ISO value (mm/s or inch/s).

2.2.2 Vibration Analysis

Pressing the down arrow button brings up a display similar to that shown below, which shows the readings of vibration velocity (mm/s or inch/s), or displacement (mm or thou) if selected, broken down into each of 3 bands.

The display shows the vibration level in frequency ranges that are all based on multiples (1X, 2X and 3X) of the specified **Run Speed** of the machine as displayed beneath the 3 bar graphs.



N.B. in order to perform a vibration analysis it is important that the running speed of the machine is entered correctly. This can be done with the “Setup Wizard” as described in Section 2.3.1 of this user guide, or by using the strobe attachment (see Section 5.1)

The frequency ranges of the VA bands are based on the following multiples of running speed²:

² Multiples of running speed are sometimes referred to as “orders”

1X = Unbalance:

The level of vibration in the frequency band based on the running speed is usually indicative of how well balanced the machine is. A **large** vibration at the running speed usually indicates that the machine is out of balance. However even a very well balanced machine will typically show some vibration at the running speed but this figure should ideally be quite low (e.g. typically less than about 2 mm/sec for a medium sized machine).

2X = Misalignment:

A high level of vibration in the frequency band centred at twice the running speed is a possible indication of misalignment. This is based on the fact that shaft misalignment can result in a double peak in the waveform due to there being two different centres of gravity (one from each shaft). In other words the accelerometer picks up a peak as each centre of gravity passes by and hence there will be two positive and two negative peaks each revolution of the shaft. This will typically give rise to a vibration signal at **double** the running speed of the machine.

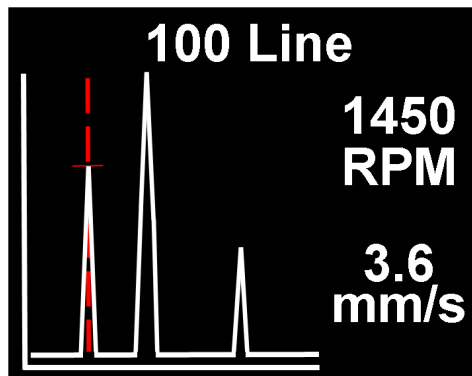
3X = Looseness:

High vibration in the frequency band centred at 3 times running speed is a possible indication that something may be loose (e.g. loose mounting bolts, weak foundations etc.) as it is not usual to see third order vibration in a machine unless there is some structural looseness that is being “excited” by the vibration of the machine.

2.2.3 Frequency spectrum

Pressing the down arrow button once brings up a display similar to that shown opposite, where the vibration levels are as a frequency spectrum in the range from 1kHz.

The heights of the peaks indicate the RMS vibration level (in mm/s or inch/s) at each frequency point in the spectrum.



more
shown
0 to

The readings to the right of the screen show the frequency (in Hz or RPM) and the RMS vibration level (in mm/s or inch/s) at the position of the cursor (red dotted line). The cursor position can be moved by use of the left (<) and right (>) arrow buttons.

Pressing the down arrow button increases the resolution of the frequency axis from 100 Lines (i.e. 10Hz or 600 RPM resolution) to 800 Lines (i.e. 1.25Hz or 75 RPM resolution). Increasing the resolution effectively **zooms** into the frequency spectrum. In order to display the full spectrum at the higher resolution the display must be **scrolled** using the left and right arrow buttons.

2.2.4 Live Update Mode

It is possible to have the meter continuously display readings that are taken at intervals of approx. 1 second.

Live Update is selected from the **Configuration menu**, which is entered by holding down the circle button for approx. 2 seconds

It is possible to use live update with the basic readings screen, the VA bands screen or 100 line frequency spectrum. Pressing the circle button at any time during live update will capture a full (800 line) resolution reading.

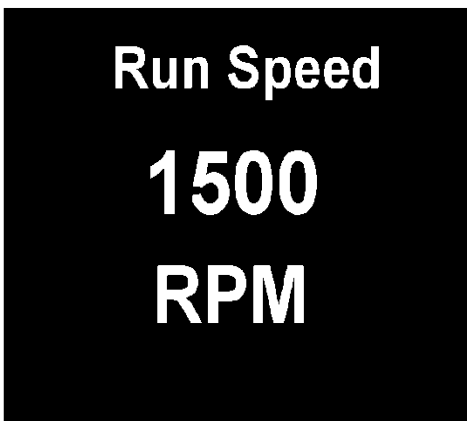
2.3 Configuration menus

The configuration menu is entered by pressing and holding down the circle button for **2 seconds**.

Moving up and down the menu is achieved by pressing the left (up) and right (down) buttons which causes the menu item to be highlighted. Pressing the circle button will select the highlighted menu item. Left and right arrow buttons can be used to move backward and forward through the menus.



2.3.1 Setup Wizard



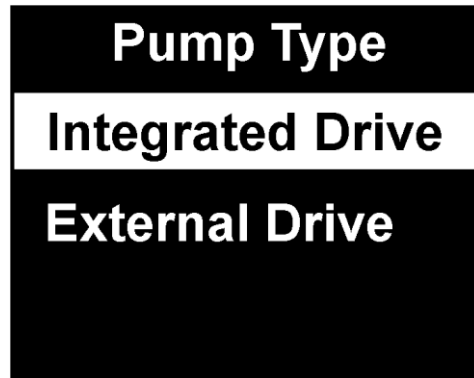
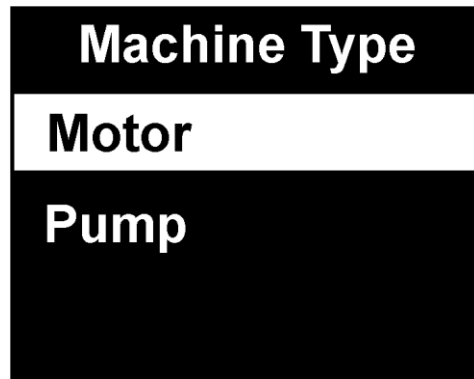
Selecting the Setup Wizard opens a dialogue that allows the machine running speed to be entered and the ISO alarm levels to be set automatically according to the size and type of machine to be monitored.

The first Setup Wizard screen to be displayed shows the currently selected running speed in the pre-selected units (Hz or RPM).

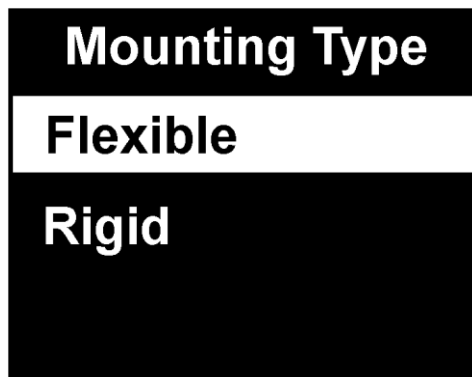
Changing the running speed is achieved by pressing the up arrow button (to increase run speed) or down arrow button (to decrease run speed).

Pressing the circle button again brings up the next screen which allows the machine type (motor or pump) to be selected.

If a **motor** is selected the size must be selected (under or over 300kW) or if a **pump** is selected, it must be specified whether it has an integrated or external drive unit.



Selecting the machine type and size allows the ISO alarm levels to be set accordingly, as does specifying the type of mounting (rigid or flexible).



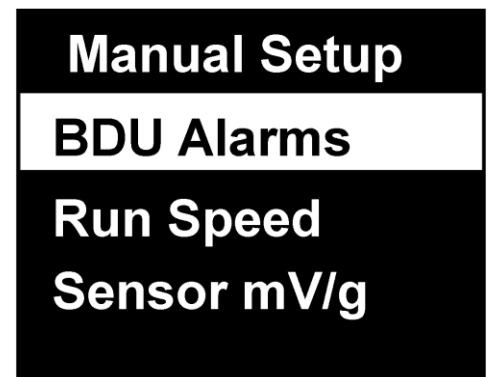
As a basic “rule of thumb”, unless a machine is bolted down to a concrete floor, its mounting should be considered as being **flexible**.

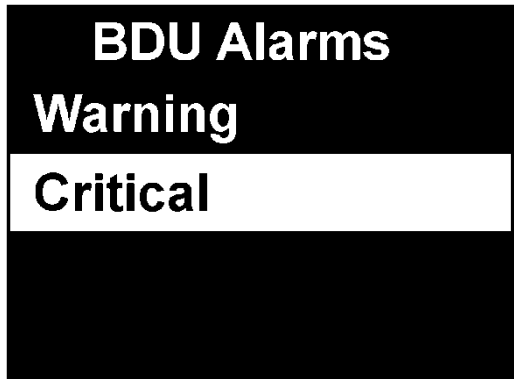
Most motors and pumps are mounted on some kind of frame or structure and as such should definitely be considered as flexibly mounted.

2.3.2 Manual Setup

2.3.2.1 BDU alarm settings

Selecting **BDU Settings** allows the alarm levels at which the BDU readings change colour to be altered by the user. Normal levels are displayed on a **Green** background.





The BDU threshold values are designated as Warning (where readings turn **Amber**) and Critical (where readings turn **Red**).

Both these threshold values can be set independently using the up and down arrow buttons.

The default BDU thresholds are 50 for **Warning** and 100 for **Critical**. These levels are typical for medium sized machine bearings operating at run speeds in the region of 1000 to 3000 RPM. Larger bearings or higher run speeds may need increased BDU threshold values to identify worn or bad bearings.

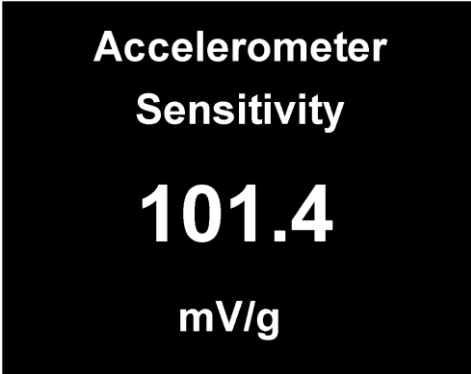


2.3.3.2 Run Speed

Run speed can also be set manually via the up and down arrow buttons.

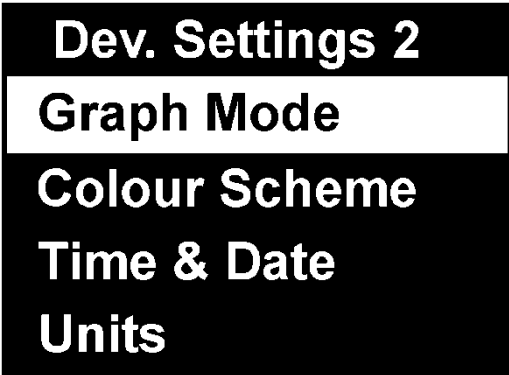
2.3.3.3 Sensor mV/g

Accelerometer sensitivity (in mV/g) can be manually set using the up and down arrow buttons to allow use of any desired sensitivity sensor within the range 1mV/g to 1000mV/g. This enables the resolution and range of the meter to be set by the user.



2.3.4 Device Settings

There are two pages of Device Settings menus. To advance to the second page the down arrow button should be used. Selecting a menu option is achieved by the up and down arrow buttons and by pressing the circle button.



The **Auto Off Time** can be set from 1 minute up to a maximum value of 60 minutes, in increments of 1 minute.

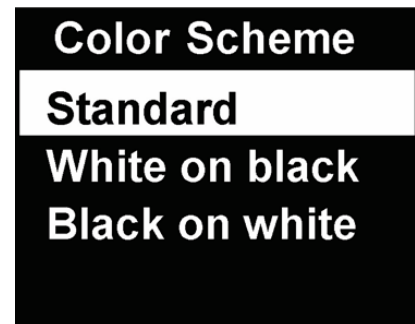
The **Brightness** level can be set anywhere between 1 (least brightness) up to 10 (full brightness).

The operating **Language** can be selected from any one of a number of different languages depending on the exact model.

The **Graph Mode** can be set to display the frequency spectrum as either a **Line** graph or a **Bar** graph.

The display **Color Scheme** can be configured as standard (full colour) or monochrome, e.g. for convenient viewing in direct sunlight.

Time & Date setting can be achieved using the up, down, left and right arrow buttons.



Selecting **Units** from the Advanced Settings menu allows the velocity readings to be displayed in either mm/s or inch/s.

Run Speed units can be displayed in units of Hertz³ (Hz), revolutions per minute (RPM) or cycles per minute (CPM).

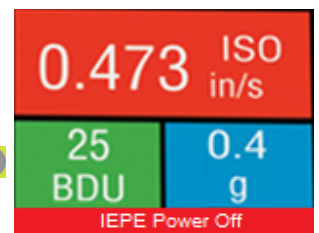
Lock Device immediately locks the 9080EX to prevent unauthorized use. To unlock the 9080EX turn the 9080EX on and press the center key for several seconds until you are prompted to enter the unlock code. The default unlock code is 375.

Lock Settings locks out the ability to get into the menu to change settings without the unlock code. In this mode the 9080EX will still take readings but the menu is inaccessible unless the unlock key is entered. To unlock and turn off this feature turn the 9080EX on and press the center key for several seconds until you are prompted to enter the unlock code. The default unlock code is 375.

Information displays the firmware version of the 9080EX and the serial number.

2.3.5 Turning IEPE power off and on


The IEPE accelerometer power can be turned off for applications like self-powered accelerometers. Pressing and holding down the Left Arrow key will toggle between IEPE power off and power on. When the IEPE power is off the 9080 will inform the user as below.



Note: When IEPE power is off the 9080 will not read properly when using an accelerometer that requires power including the accelerometer that came with the 9080. The default setting for IEPE power from the factory is on.

³ Hertz are equivalent to, and also sometimes referred to as, cycles per second (CPS).

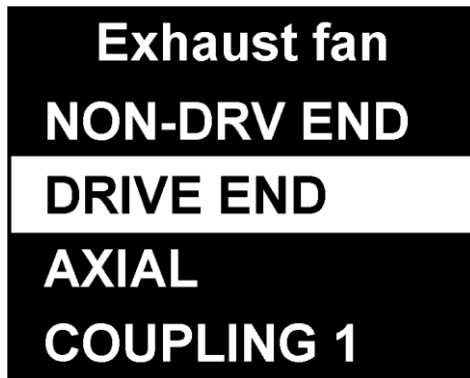
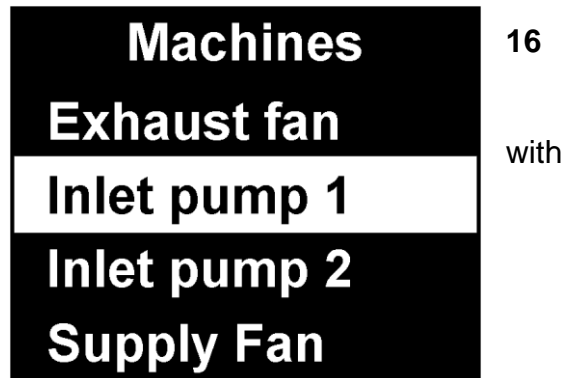
3 Asset Management

Pressing the Asset Manager button (factory key,  located just below the down arrow button) brings up the Machines menu.

Machines have user-defined names **up to characters long**.

Scrolling the list of machines is achieved the up and down arrow buttons.

Selecting a machine is done with the circle button, which then brings up a list of **measurement points** for that machine.

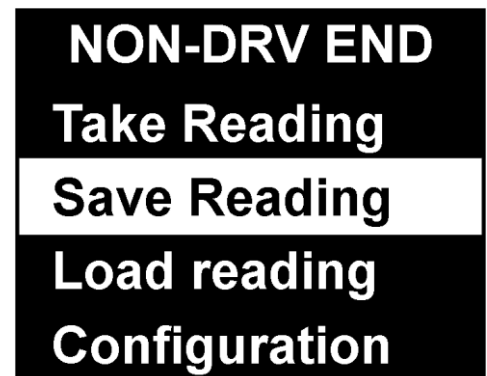


Measurement points also have user-defined names up to 16 characters long.

The list of measurement points can also be scrolled by using the up and down arrow buttons and each measurement point can be selected using the circle button.

The various options for each measurement point (MP) are then displayed:

1. Take Reading – takes a new reading and saves it to this MP
2. Save Reading – saves the previously taken reading to this MP
3. Load Reading – loads a previous reading (e.g. for re-display)
4. Configuration - allows the run speed and alarm levels to be set independently for each individual MP.



Machines and their measurement points are downloaded from **VibTrend**, the supplied trending and asset management software for PC using the supplied USB docking cradle.

The exact list of machines to be downloaded is determined by the user in VibTrend.

There will also always be a machine downloaded named '**off route**' that contains 10 MPs. This is done to allow users to save readings for upload to VibTrend where they can then be saved to a new or existing machine.

4 VibTrend - Trending Software

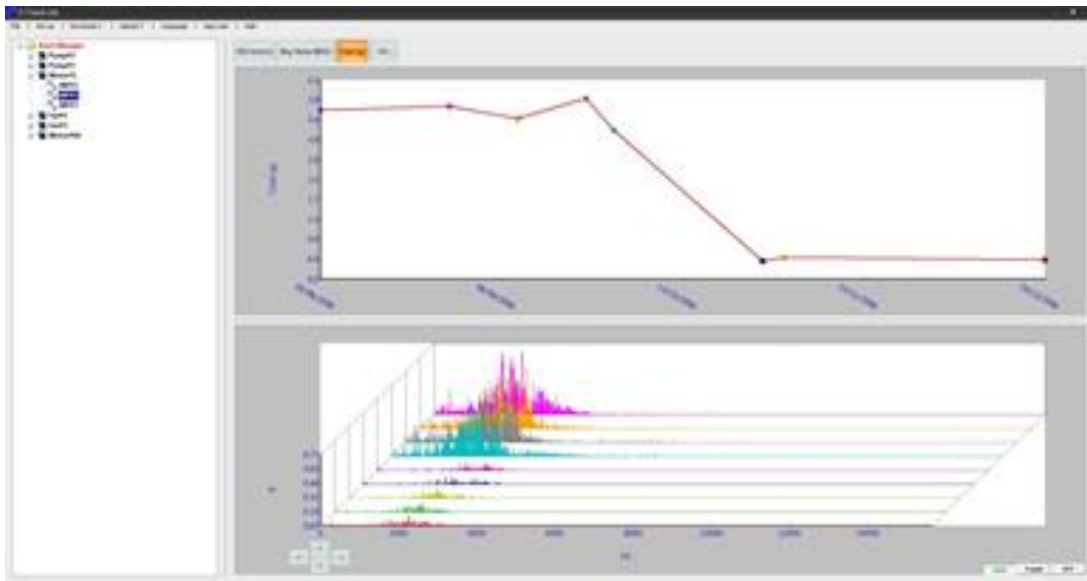
VibTrend is the PC based software that allows users to view trends of vibration readings taken with the Vib Meter 9080-Ex, in a way that enables predictions to be made about machine condition.

VibTrend is available for download free of charge from:

<http://tpi.pocketvibradownload.com/>

VibTrend is very intuitive and very easy to drive and its full functionality is described in more detail in its built-in Help Guide.

In brief, VibTrend allows display of vibration data in a variety of different ways including vibration frequency spectra, bearing noise and ISO trend plots, waterfall diagrams (see figure below) and can generate reports either manually or automatically (e.g. by sending out **email alerts**).



5 Specifications

Size	200 mm x 60mm x 26mm
Weight	280g (not including magnet)
Environmental	
Water, Sand & Dust:	IP67 Waterproof
Operating:	32°F to 122°F (0°C to 50°C)
Storage:	-4°F to 158°F (-20°C to 70°C)
Power supply	2 x Energizer® L91 Lithium AA batteries
Battery life	Auto power OFF - typically 20 hours continuous operating time depending on brightness setting.
Frequency range	2 Hz to 1 kHz (ISO) 1 kHz to 10 kHz (BDU)
Max frequency resolution	1.25 Hz @ 800 lines FFT setting
	Acceleration in g Velocity in mm/s (or inch/s) Bearing noise in BDU (bearing damage units) Displacement (mm, microns, inch)
Displayed Frequency Units	Hertz (Hz), RPM or CPM
Input range	User selectable with accelerometer sensitivity
Dynamic range	96 dB (0.01g resolution)
VA diagnostic bands (RPM = run speed)	Unbalance 1x RPM Alignment 2x RPM Looseness 3x RPM
Accessories	<ul style="list-style-type: none"> · A9081A PC docking cradle – USB connection · A9087 Nylon carrying case · A9092 Intrinsically safe 2 pin accelerometer · A9094 Curly cable for 2 pin intrinsically safe accelerometer · A9073 Magnet with ¼ x 28 stud for accelerometer · A9084 VibTrend Pro activation key · A9095 Boot for 9080Ex
Optional Accessories	<ul style="list-style-type: none"> · A9075 Hard carrying case

5.1 Intrinsic Safety Circuit Terminal Parameters

The 9080-Ex has the following terminal parameters and is designed to work with a compatible BNC connected intrinsically safe accelerometer:

$$U_0 = 21.42V$$
$$I_0 = 0.075A$$
$$P_0 = 0.402W$$

6 Revision History

ISSUE	PAGES	DATE	NOTES
1.0	19	Feb 2017	First Issue to BASEEFA - JKA
1.1	20	May 2017	IS Certificates added - JKA
1.2	20	August 2018	Consolidated labels ATEX/IECEX/NA

7 Basic operation

Colour coded display shows ISO reading, bearing quality in Bearing Damage Units (BDU) and RMS acceleration (g)

ISO and BDU values are alarm colour coded in Green, Amber and Red

Additional screens show displacement (mm or microns), frequency spectrum with cursor, and diagnostics for unbalance, misalignment and looseness

Standard BNC connector for IEPE accelerometers - allows for any desired sensitivity

Power On/Off (left) and Menu (right) buttons.

Press **Circle** button to take readings - left, right, up and down arrows to navigate display

Asset manager button for downloading routes to the 9080-Ex or transferring machine readings to PC for **TRENDING**

Accesses menu for adding readings to machines (assets)

VibTrend Professional:
unlimited no. of machines

