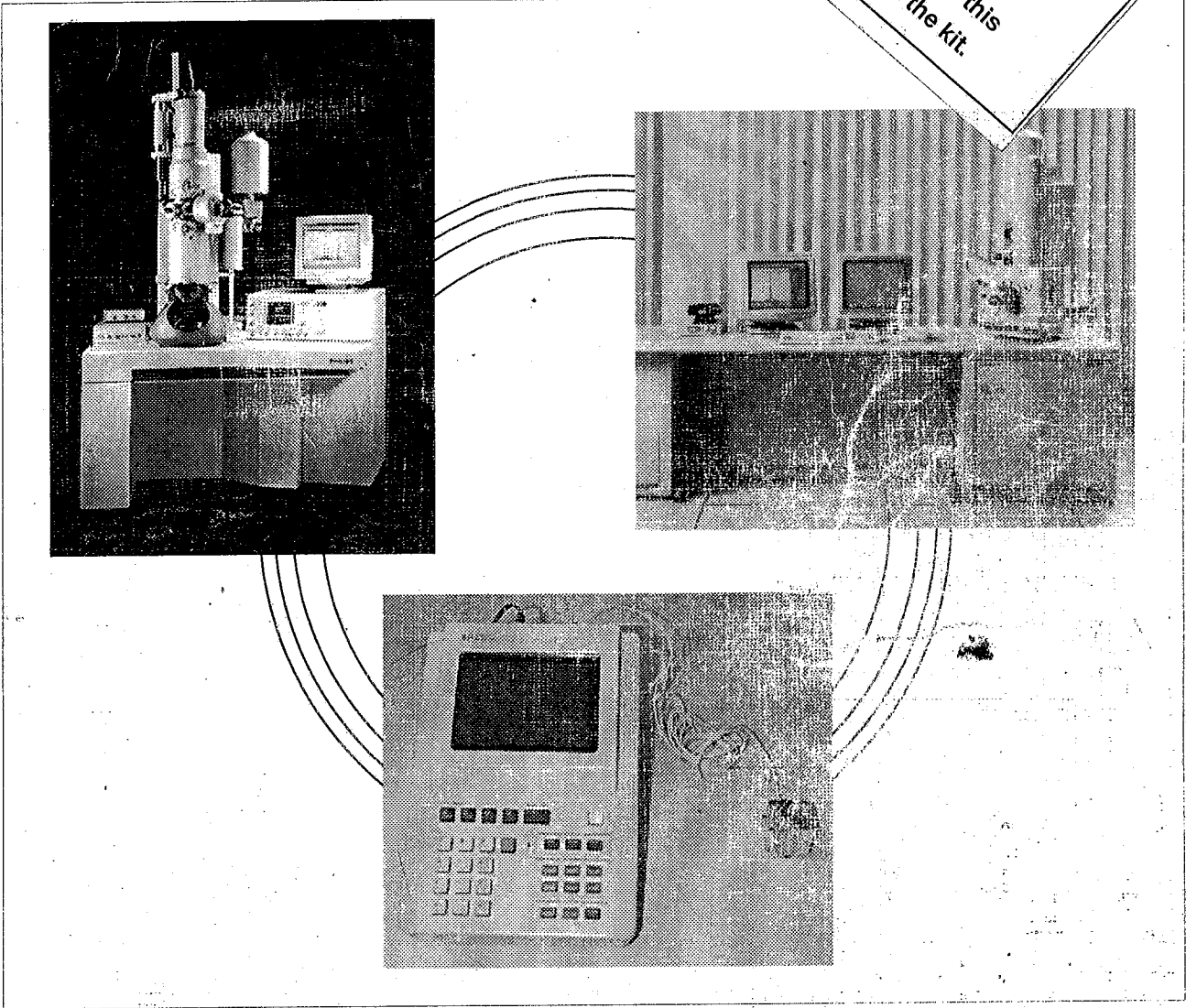


Service Training Course

Second (amended) edition
May 1997
DO NOT remove this
manual from the kit.



Site selection and pre-installation considerations for electron microscopes Quick Reference Manual

- NOTE: USE 1V / G ACCURACIOMETER
- USE ICP MICROPHONE
- PRE-INSTALLATION MANUAL TEMPLATES.

Philips
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Optics



PHILIPS

Second edition

Date: 970520
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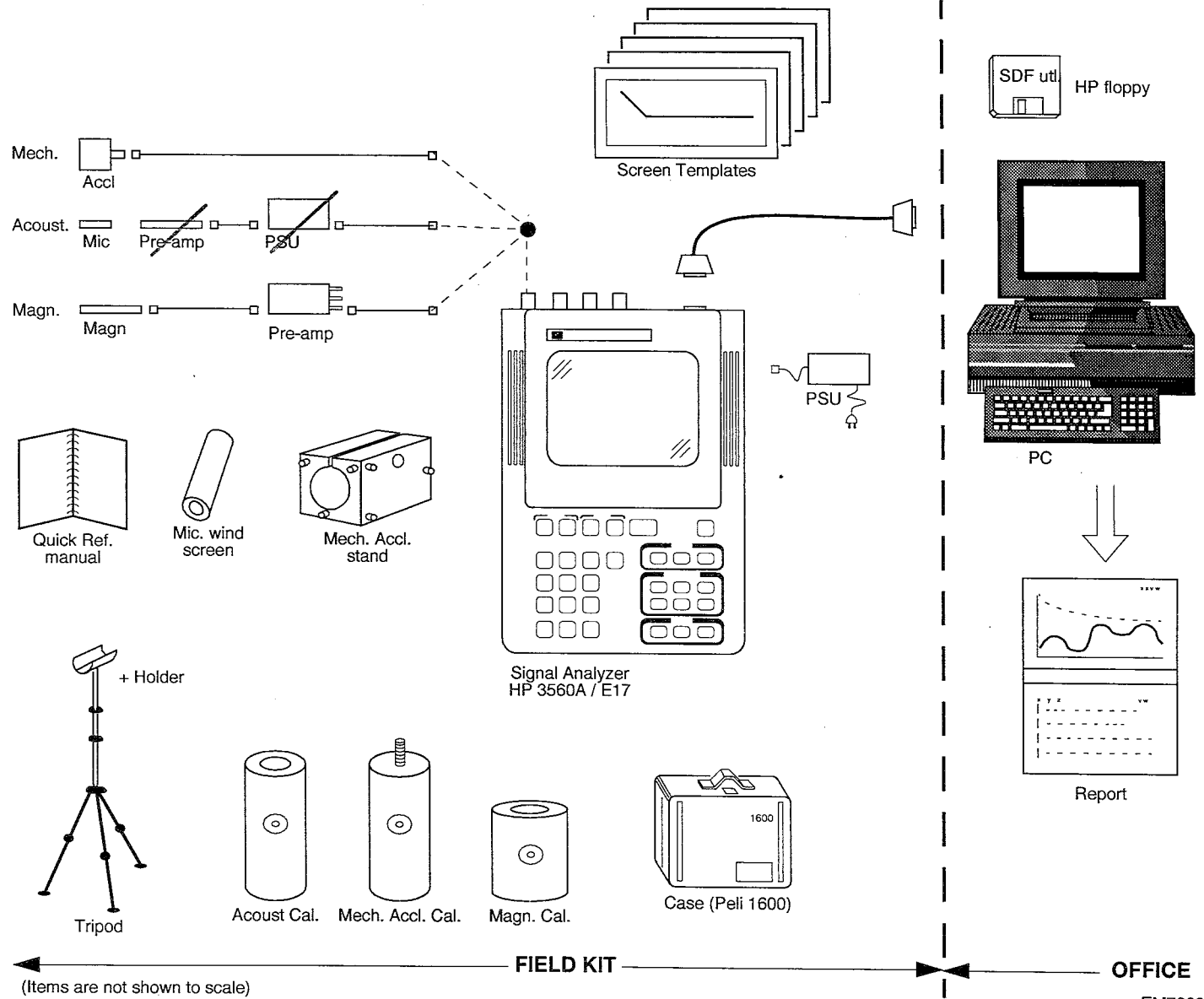
INTRODUCTION

This Quick Reference (QR) Manual is a condensed form of the Service Training Course manual: "Site selection and pre-installation considerations for electron microscopes".

The QR manual contains the information and screen templates needed to compare the HP analyzer's readings with the specifications during field measurements. It is one of the essential items of the pre-installation measurements kit and should always be replaced with the kit after use.

The two QR manuals supplied by HP, i.e. HP3560A and Standard Data Format Utilities, give detailed information of the analyzer settings, and screen data.

Fig. 2A Contents of Pre-Installation measurement kit



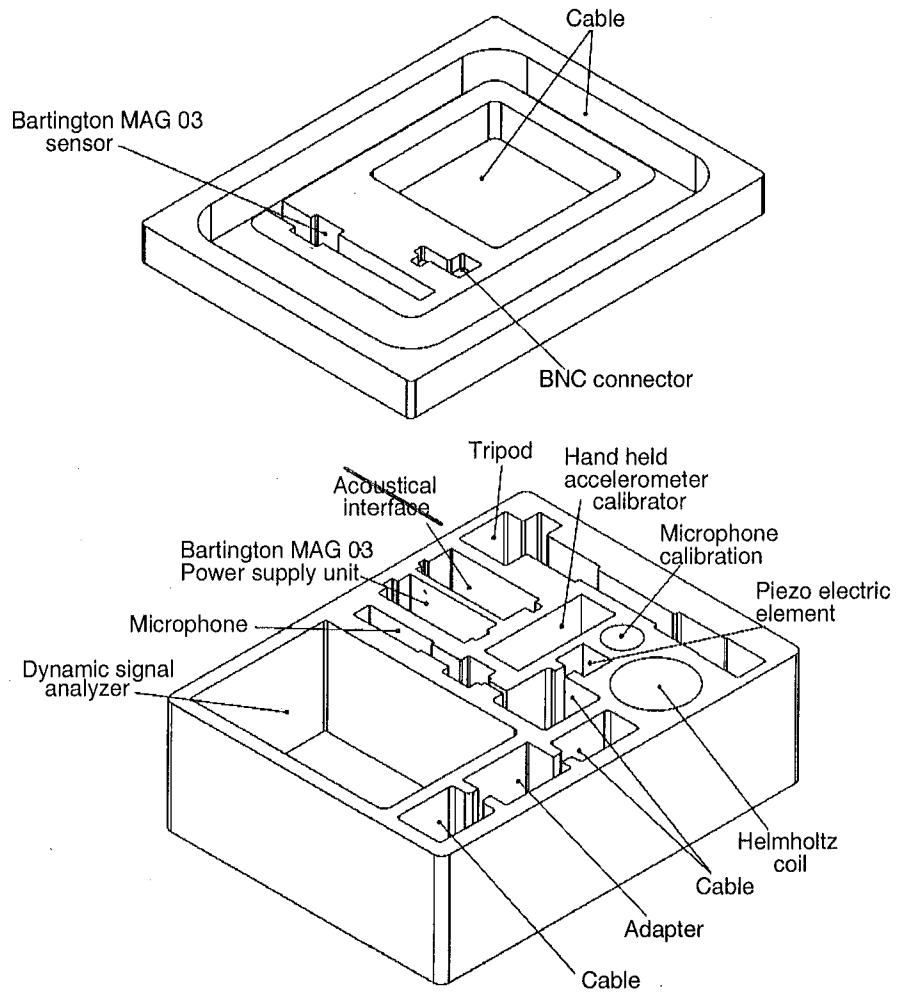
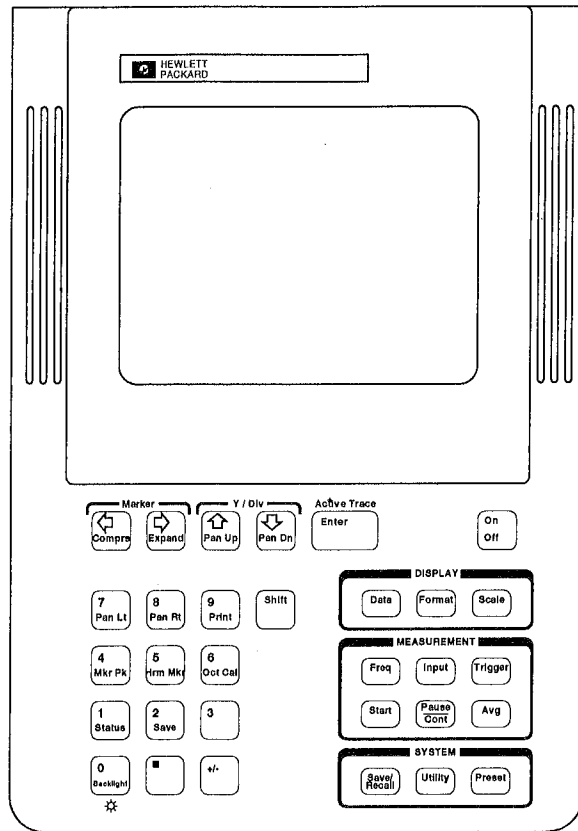


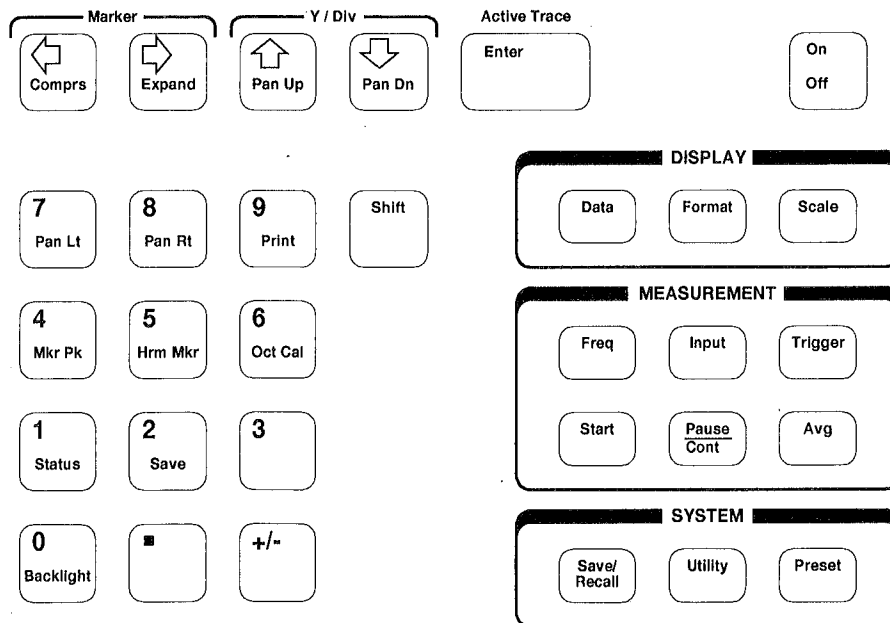
Fig. 2B Pre-installation measurement kit, case insert



EM7078

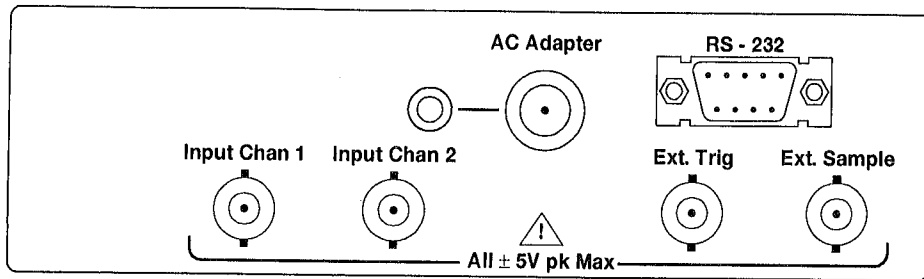
Fig. 3A HP3560A analyzer panel

Front Panel Keys



EM7079

Fig. 3B Analyzer keys



EM7080

Fig. 3C Analyzer connectors

Octave band			1/3 octave band		
Centre freq. f0 (Hz)	Approx. lower freq. f1 (Hz)	Approx. upper freq. f2 (Hz)	Centre freq. f0 (Hz)	Approx. lower freq. f1 (Hz)	Approx. upper freq. f2 (Hz)
0.5	0.45	0.6	0.5 0.63 0.8	0.45 0.6 0.7	0.6 0.7 0.9
1	0.9	1.1	1 1.25 1.6	0.9 1.1 1.4	1.1 1.4 1.8
2	1.8	2.2	2 2.5 3.15	1.8 2.2 2.8	2.2 2.8 3.5
4	3.5	4.5	4 5 6.3	3.5 4.5 5.6	4.5 5.6 7.1
8	7.1	9	8 10 12.5	7.1 8.9 11.2	8.9 11.2 14.1
16	11	22	16.0 20.0 25.0	14.1 17.8 22.4	17.8 22.4 28.2
31.5	22	44	31.5 40.4 50.0	28.2 35.5 44.7	35.5 44.7 56.2
63	44	88	63.0 80.0 100.0	56.2 70.8 89.1	70.8 89.1 112.0
125	88	177	125.0 160.0 200.0	112.0 141.0 178.0	141.0 178.0 224.0
250	177	355	250.0 315.0 400.0	224.0 282.0 355.0	282.0 355.0 447.0
500	355	710	500.0 630.0 800.0	447.0 562.0 708.0	562.0 708.0 891.0
1000	710	1420	1000.0 1250.0 1600.0	891.0 1122.0 1413.0	1122.0 1413.0 1778.0
2000	1420	2840	2000.0 2500.0 3150.0	1778.0 2239.0 2818.0	2239.0 2818.0 3548.0
4000	2840	5680	4000.0 5000.0 6300.0	3548.0 4467.0 5623.0	4467.0 5623.0 7079.0
8000	5680	11360	8000.0 10000.0 12500.0	7079.0 8913.0 11200.0	8913.0 11220.0 14130.0
16000	11360	22720	16000.0 20000.0 25000.0 31500.0	14130.0 17780.0 22400.0 28000.0	17780.0 22390.0 28000.0 35500.0

Table 4A. Centre and approximate cut-off frequencies for octave and 1/3 octave band filters

4.2

FREQUENCY WEIGHTING (ACOUSTIC)

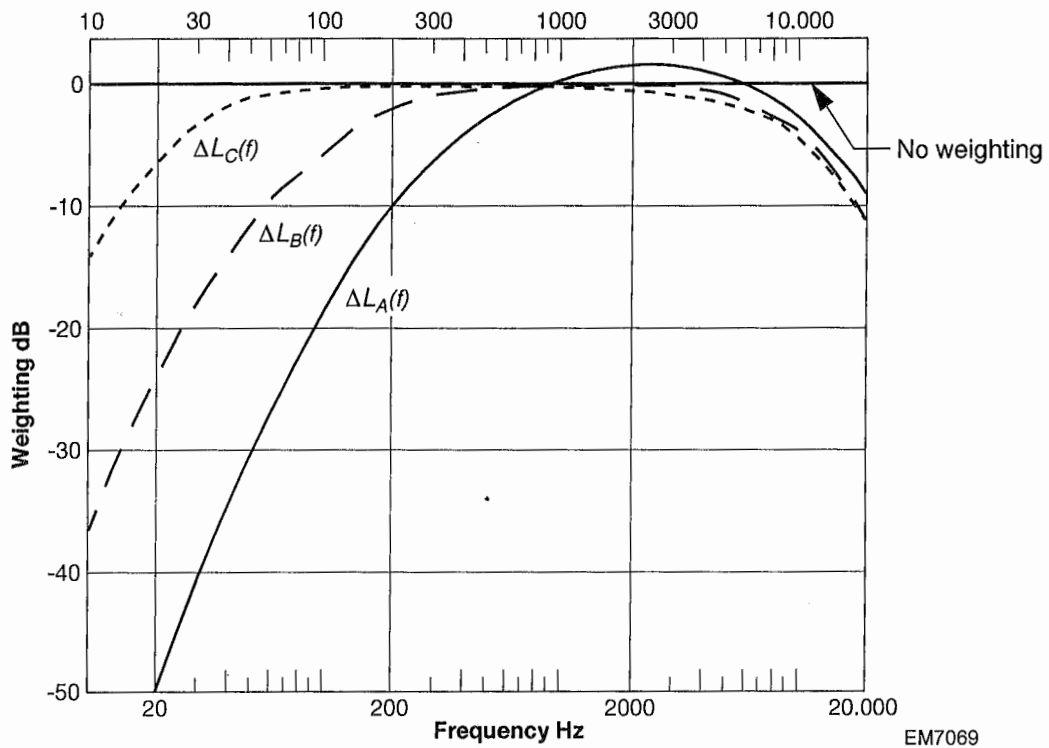


Fig. 4A Frequency weighting curves

EM7069

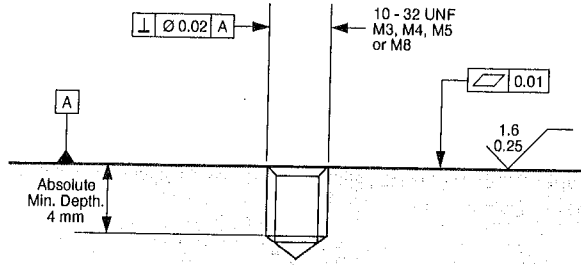
Frequency weighting characteristics (Sheet 1 of 2)			
Nominal frequency (Hz)	A-weighting (dB)	B-weighting (dB)	C-weighting (dB)
10	-70.4	-38.2	-14.3
12.5	-63.4	-33.2	-11.2
16	-56.7	-28.5	-8.5
20	-50.5	-24.2	-6.2
25	-44.7	-20.4	-4.4
31.5	-39.4	-17.1	-3.0
40	-34.6	-14.2	-2.0
50	-30.2	-11.6	-1.3
63	-26.2	-9.3	-0.8
80	-22.5	-7.4	-0.5
100	-19.1	-5.6	-0.3
125	-16.1	-4.2	-0.2
160	-13.4	-3.0	-0.1
200	-10.9	-2.0	-0.0
250	-8.6	-1.3	-0.0
315	-6.6	-0.8	-0.0
400	-4.8	-0.5	-0.0
630	-1.9	-0.1	-0.0

Table 4B. Frequency weighting data

Frequency weighting characteristics (Sheet 2 of 2) (Continued)			
Nominal frequency (Hz)	A-weighting (dB)	B-weighting (dB)	C-weighting (dB)
800	-0.8	-0.0	-0.0
1 000	0	0	0
1 250	+0.6	-0.0	-0.0
1 600	+1.0	-0.0	-0.1
2 000	+1.2	-0.1	-0.2
2 500	+1.3	-0.2	-0.3
3 150	+1.2	-0.4	-0.5
4 000	+1.0	-0.7	-0.8
5 000	+0.5	-1.2	-1.3
6 300	-0.1	-1.9	-2.0
8 000	-1.1	-2.9	-3.0
10 000	-2.5	-4.3	-4.4
12 500	-4.3	-6.1	-6.2
16 000	-6.6	-8.4	-8.5
20 000	-9.3	-11.1	-11.2

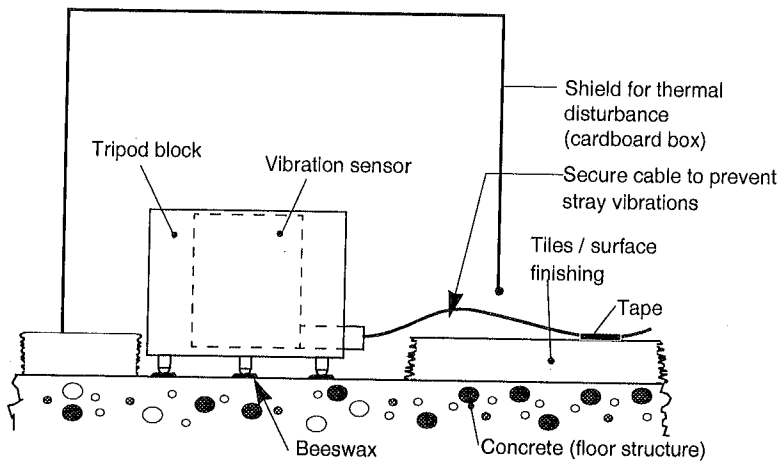
Table 4B. Frequency weighting data

MECHANICAL SENSOR MOUNTING



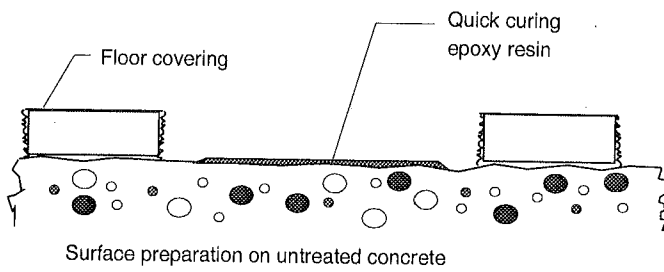
EM7089

Fig. 5A ISO 1101, stud hole tolerances



EM6966

Fig. 5B Accelerometer floor positioning



EM7093

Fig. 5C Possible surface preparation

6

ANALYZER SETTINGS AND MEASUREMENT POSITIONS

6.1

STORED ANALYZER SETTINGS

To be found under the system key: [SAVE/RECALL].

Caution! Under no circumstances put the block on RESET. This mode of operation will **completely erase the memory of the analyzer!**

Screen display: Operation -> catalogue -> <ENTER>, this give the overview of all stored statuses (S) and traces (T)*.

* S: Status; all **settings** of the various keys are stored in the analyzer memory .

* T: Trace; the **measurement** carried out is stored in the analyzer memory, together with all parameters.

The settings for various standard measurements are given in "Step 2" of each of the relevant sections following. The illustrations given represent the analyzer screen as it appears after pressing the appropriate Front Panel Key.

If the stored settings are accidentally erased (see caution above), they can be easily reprogrammed by choosing the settings shown in the tables. To select an option, use the "Comprs" and "Expand" panel keys to choose a **column**, and the "Pan Up" and "Pan Dn" keys to choose a **row** within a column:

WR

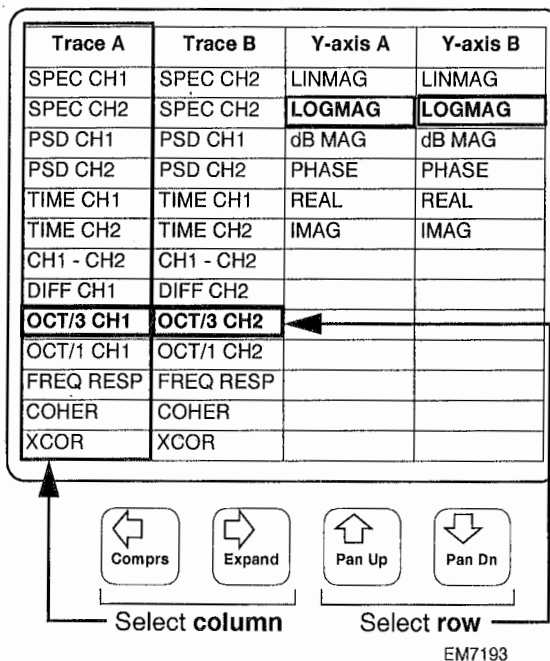


Fig. 6A Selection of analyzer options

Chosen options are highlighted, and must then be activated by pressing the <ENTER> key, see Fig. 6A for example.

Note: The <PRESET> (green) panel key resets the analyzer to the HP factory default values, and **should not be used for PEO applications.**

No label can be given to a trace register number for post-measurement handling.

Every trace should be logged on the form given in section 8, with its trace number and parameters.

The PEO catalogue is divided into the following groups of statuses:

10. Mechanical vibrations settings

20. Acoustical vibrations settings

30. Magnetic fields settings

40. *VIBRO SPOT SPECTRUM MEASUREMENTS*

Select State number .. S <ENTER>.

Operation -> Recall state -> Reg numb: number ...

-> <ENTER>.

Selected type of measurement is now loaded from memory.

Start measurement.

REMARKS:

**HP 3560A ANALYZER SCREEN TEMPLATES,
MECHANICAL VIBRATIONS. (CHAPTER 7)**

**MECHANICAL VIBRATION TEMPLATES IN THIS MANUAL ARE VALID FOR,
THE ACCELEROMETER TYPE: PCB - 351B51. SENSITIVITY 0.5 VOLT/g.**

kit one is PCB 353 B51

6.2 SETTINGS FOR MECHANICAL VIBRATIONS MEASUREMENTS

6.2.1 Standard mechanical measurement

Catalogue REG: 10 Standard measurement for mechanical vibrations, 1/3 octave band 0.5 Hz - 500 Hz (input Ch. 1).

Step 1. Mount the mechanical vibration calibrator on the accelerometer.

Step 2. Check analyzer settings:

Front Panel Key	Options			
[DATA]	Trace-A: OCT/3 CH1	Trace-B: OCT/3 CH2	Yaxis-A: LOGMAG	Yaxis-B: LOGMAG
[FORMAT]	Format: A only			
[SCALE]	X-axis: Log	Y-units: CH1: g	Volts/EU: CH1: 5 for PCB accelerometer (old) 1 for PCB accelerometer (new)	
[FREQ]	Baseband: 500Hz	Resolution: 200 lines	Filter: ON	
[INPUT]	Range1: Auto	Coupl1: ICP	Integrate: Off g	A-weight: Off
[TRIGGER]	Source: Freerun	Mode: Single		
[AVERAGE]	Type: RMS	Number: 10		

* Note - Use 1V/g Acceleration

Step 3. Start measurement: [START] [START].

Screen will display at the frequency band of 80 Hz a raised response when terminated with "p r10".

Scale check:

By pressing [SHIFT] [MkrPk] the marker will move to the response. (1000 mg).

The scale is now checked for the measurements in the mechanical vibrations application.

(Only applicable for accelerometer weighting < 84 gram).

Step 4. Remove the calibrator and mount the Accelerator measurement block. Check that the accelerometer is well positioned and the cables are connected without interfering with the measurement.

Proceed with the standard measurements (see Fig. 6B), as the settings are equal to the ones described above.

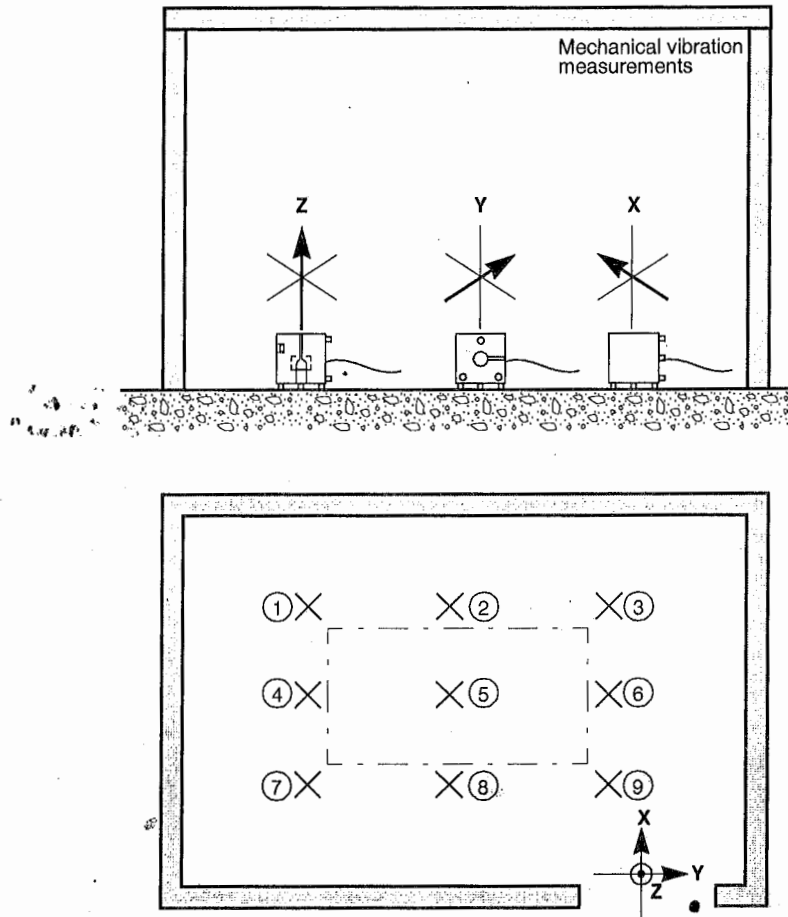
Step 5. Start measurement by [START] [START] and after 10 runs the measurement will terminate with the message on the lower line of the screen "p r10".

After each measurement, the trace can be stored as described in the last page of this chapter, "Save Traces", or given a known number, e.g. 100, 101, 102, etc.

Mechanical Measurement Positions

The mechanical vibrations have to be measured in a grid system. The centre of this grid must coincide with the proposed centre (column) position of the microscope (#5).

The mechanical vibrations have to be measured in the X, Y and Z directions. For the orientation of these directions, choose a known fixed point in the room, e.g. a door. Mark this point on the room layout of your report.



5: Column position of proposed microscope

EM7098

Fig. 6B Mechanical measurement positions

6.2.2 Measurement to determine frequency

Catalog REG: 11 Mechanical vibration measurement. Frequency: 1 Hz - 1 kHz, measured in the amplitude, to determine the frequency level if the graph is above the specification.

Step 1. If the level found is in excess of the published curves, as shown by the screen templates or the electronic templating, proceed to the setting to determine the frequency of the excess peaks.

Step 2. Check analyzer settings:

Front Panel Key	Options				
[DATA]	Trace-A: Spec CH1	Trace-B: Spec CH2	Yaxis-A: LOGMAG	Yaxis-B: LOGMAG	
[FORMAT]	Format: A only				
[SCALE]	X-axis: Log	Y-units: CH1: g	Volts/EU: CH1: 0.5 0.1 1.0 "new"		
[FREQ]	Baseband: 1 kHz	Zoom Off	Resolution: 200 lines	Window: HANN, if looking for the frequency peak	Filter: ON
[INPUT]	Range1: Auto	Coupl1: ICP	Integrate: Off g	A-weight: Off	
[TRIGGER]	Source: Freerun	Mode: Single			
[AVERAGE]	Type: RMS	Number: 10			

All others to be left unchanged.

* Note: Use 1V/g Accelerometer!

6.3 SETTINGS FOR ACOUSTICAL VIBRATION MEASUREMENTS

6.3.1 Standard acoustical measurement

Catalog REG: 20 1/3 octave band standard measurement (20 Hz - 20 kHz) for acoustical vibrations (input Ch 1).

Step 1. Place the microphone calibrator on the microphone, check if cables are well connected and the Acoustical Interface is switched ON.

Step 2. Check analyzer settings:

Front Panel Key	Options			
[DATA]	Trace-A: OCT/3 CH1	Trace-B: OCT/3 CH2	Yaxis-A: dB MAG	Yaxis-B: dB MAG
[FORMAT]	Format: A only			
[SCALE]	X-axis: Log	Y-units: CH1: SPL	Volts/EU: CH1:	
[FREQ]	Baseband: 20 kHz	Resolution: 200 lines	Filter: ON	
[INPUT]	Range1: Auto	Coupl1: AC * ICP	Integrate: Off	A-weight: Off
[TRIGGER]	Source: Freerun	Mode: Single		
[AVERAGE]	Type: RMS	Number: 10		

* New ICP Microphone!

Step 3. Start measurement by [START] [START].

Screen will display at the frequency band of 1000 Hz a raised response when terminated with "p r10".

Scale calibration:

By pressing [SHIFT] [MkrPk] the marker will move to the response.

Press [SHIFT] [OctCal] and enter the number as given on the calibrator, e.g. 94 dB SPL, and <ENTER>.

The scale is now calibrated for the measurements in the acoustical application.

Step 4. Remove the calibrator from the microphone and place the windscreen. Check if the cables are well connected, the microphone is in position and the acoustical interface box is switched ON.

Proceed with the standard acoustical measurement (see Fig. 6C), as settings are equal to the ones above.

Step 5. Press [START] [START], after 10 runs measurement will terminate with the message on the lower line of the screen: "p r10".

After each measurement, the trace can be stored as described in the last page of this chapter, "Save Traces", or given a known number, e.g. 200, 201, 202, etc.

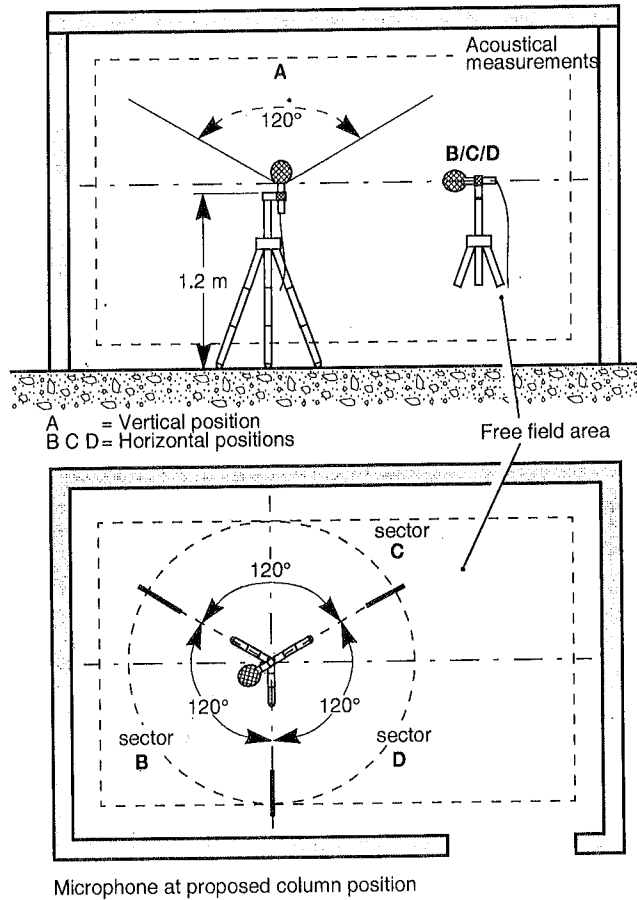
Acoustical Measurement Positions

The acoustical vibrations have to be measured with the microphone positioned in the centre of the room, preferably at the proposed position of the microscope column.

The receiving angle of the microphone is approximate 120° , seen from the centre line of the microphone.

To cover the room, four measurements have to be made, one facing upwards (A) and three measurements facing the walls (B, C and D). These four measurements in total, hemispherical, cover all sounds emitted in the room. Use a fixed reference in the room and mark this point on the report room layout.

The microscope rooms are neither anechoic, nor reverberation chambers and can be of shapes diverging from square box format. The "Near field" and the "Reverberant field" areas can overlap, and will in most cases, due to the size of the rooms. With this in mind the sound measurement of the microscope will be a compromise of frequencies, near field and type of room.



EM7099

Fig. 6C Acoustical measurement positions

6.3.2 Measurement to determine frequency

Catalog REG: 21 Acoustical measurement, Frequency: 2 Hz - 2 kHz, measured in the amplitude to determine the frequency.

Step 1. If the level found is in excess of the published curves, as shown by the screen templates or the electronic templating, proceed to the setting to determine the frequency of the excess peaks.

Step 2. Check analyzer settings:

Front Panel Key	Options				
[DATA]	Trace-A: Spec CH1	Trace-B: Spec CH2	Yaxis-A: LOGMAG	Yaxis-B: LOGMAG	
[FORMAT]	Format: A only				
[SCALE]	X-axis: Log	Y-units: CH1: SPL	Volts/EU: CH1:		
[FREQ]	Baseband: 20 kHz	Zoom Off	Resolution: 200 lines	Window: HANN, if looking for the frequency peak	Filter: ON
[INPUT]	Range1: Auto	Coupl1: <i>AE</i>	Integrate: Off	A-weight: Off	
[TRIGGER]	Source: Freerun	* <i>ICP</i> Mode: Single			
[AVERAGE]	Type: RMS	Number: 10			

All others to be left unchanged.

* New ICP Microphone!

6.4 SETTINGS FOR MAGNETIC FIELD MEASUREMENTS

6.4.1 Standard magnetic measurement

Catalog REG: 30 Standard magnetic field measurement 0-40 ms, 1kHz - 25 Hz (Time domain; input Ch. 1).

Step 1. Place the check coil on the X-Y-Z sensor; check if cables are well connected and the Power Supply Unit and the check coil are switched ON, and select Z sensor.

Step 2. Check analyzer settings:

Front Panel Key	Options			
[DATA]	Trace-A: Time CH1	Trace-B: Time CH2	Yaxis-A: Real	Yaxis-B: Real
[FORMAT]	Format: A only			
[SCALE]	X-axis: Linear	Y-units: CH1: Volts	Volts/EU: CH1: 1	
[FREQ]	Baseband: 5 kHz	Resolution: 200 lines	Filter: ON	
[INPUT]	Range1: 50 mV	Coupl1: AC	Integrate: Off	A-weight: Off
[TRIGGER]	Source: Freerun	Mode: Single		
[AVERAGE]	Type: Peak hold	Number: 10		

Step 3. Start measurement [START] [START].

Screen will display a sinewave at a frequency of 190Hz with amplitude ± 17.5 mV when terminated with "pr10".

A magnetic field is generated in the check coil. Output will be 35 mV_{p-p} (100 μ T type).

Check by selecting the other outputs, Y and Z and repositioning on the check coil for maximum signal.

Note: This measurement is carried out in the Time mode. The X-axis is from left to right: 0 second to 40ms, (1 kHz to 25 Hz), [f = 1/t].

Step 4. Remove the coil from the sensor and put the sensor in position. Note the orientation of the sensors. Check that the cables are well connected and the supply unit is switched ON.

Step 5. Start standard measurement (see Fig. 6D) by [START] [START].

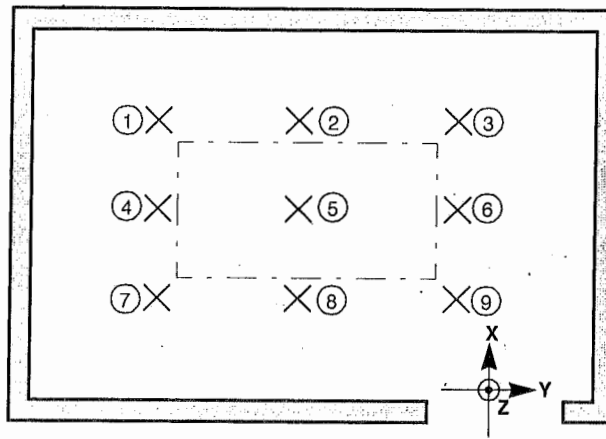
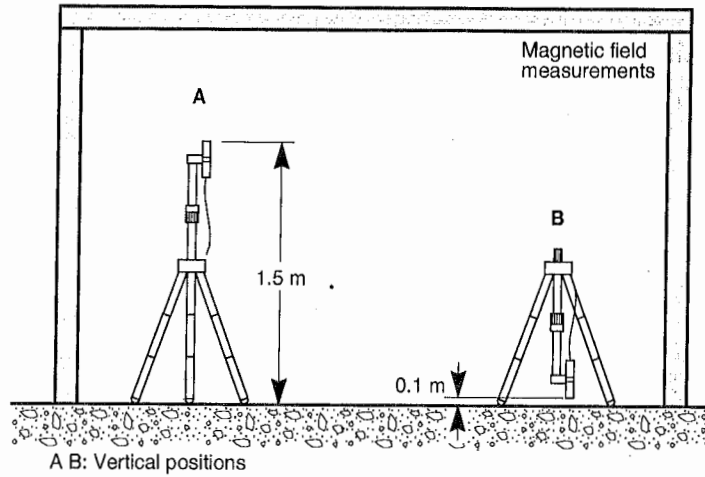
After 10 runs the measurement will terminate with the message on the lower line of the screen: "p r10".

After each measurement the trace can be stored as described on the last page of this chapter, "Save Traces", or given a known number, e.g. 300, 301, 302, etc..

Magnetic Field Measurement Positions

The magnetic fields have to be measured in a grid system. The centre of this grid must coincide with the proposed centre (column) position of the microscope (#5).

The measurements must be carried out in two levels and three directions: A – sensor placed with the extended tripod at 1.5 metre above the floor level, and B – the sensor close to the floor, 0.1 metre, with the centre pipe upside down. Directions, X, Y, and Z. For the orientation of these directions, choose a know fixed point in the room, e.g. a door. Mark this point on the room layout of your report.



5: Proposed column position

EM7100

Fig. 6D Magnetic field measurement positions

BARTINGTON O/P

1 mV

10 mV

100 mV

1 V

10 V

T

10 nT

100 nT

1 μT

10 μT

100 μT

G

100 nG

1 μG

10 nG

100 nG

1 G

(Units can be P, P-P, RMS)

6.4.2 Measurement to determine frequency

Catalog REG: 31 Magnetic field measurement, Frequency: 5 Hz - 1 kHz, measured in the amplitude to determine the frequency.

Step 1. If the level found is in excess of the published curves, proven by the screen templates or the electronic templating, proceed to the setting to determine the frequency of the excess peaks.

Step 2. Check analyzer settings:

Front Panel Key	Options				
[DATA]	Trace-A: Spec CH1	Trace-B: Spec CH2	Yaxis-A: LOGMAG	Yaxis-B: LOGMAG	
[FORMAT]	Format: A only				
[SCALE]	X-axis: Log	Y-units: CH1: Volt	Volts/EU: CH1: 1		
[FREQ]	Baseband: 1 kHz	Zoom Off	Resolution: 200 lines	Window: HANN, if looking for the frequency peak	Filter: ON
[INPUT]	Range1: Auto	Coupl1: AC	Integrate: Off	A-weight: Off	
[TRIGGER]	Source: Freerun	Mode: Single			
[AVERAGE]	Type: Peak hold	Number: 10			

All others to be left unchanged.

o/p is RMS (Each Para).

6.4.3 Measuring envelope of LF magnetic fields

Catalog REG: 32 Magnetic field measurement.
Oscilloscope low frequency mode, total timebase 32s.

Step 1. If LF variations are found during measurements (Catalog REG 30), proceed with the measurement settings given below.

Step 2. Check analyzer settings:

<i>Front Panel Key</i>	<i>Options</i>			
[DATA]	Trace-A: Time CH1	Trace-B: Time CH2	Yaxis-A: Real	Yaxis-B: Real
[FORMAT]	Format: A only			
[SCALE]	X-axis: Linear	Y-units: Volts	Volts/EU: CH1: 1.000	
[FREQ]	Baseband: 50 Hz	Resolution: 1600 lines	Window: Flattop	Filter: ON
[INPUT]	Range1: 50 mV	Coupl1: AC	Integrate: Off	A-weight: Off
[TRIGGER]	Source: Freerun	Mode: Single		
[AVERAGE]	Type: Peak hold	Number: 1		

All others to be left unchanged.

6.5

SAVE TRACES

6.5.1

Procedure for saving the traces collected

All measurement traces are to be stored under the Catalog REG number: 100 and higher. To prevent mix-up and the possibility of any pre-set statuses being erased, the measurement traces will be stored on the reg. numbers 100 and higher. Consult the catalog for traces to be left untouched in the memory.

To prepare the memory positions (100 or higher) proceed with:
[SAVE/RECALL] -> OPERATION -> SAVE TRACE -> REG numb:
feed in 100 or a higher number if stored traces have to be saved. Types of measurements can be grouped in this way, e.g 120, 200, 222, etc.
<ENTER> -> OPERATION -> SAVE TRACE, the memory is set to receive the traces stored under [SHIFT] [SAVE] in the sequence of input.

Caution! Do not use the same reg. number as the setting number(s), during the removal of traces from the memory, the state with the same number as the trace will be erased at the same time.

Start measurement [START] [START].

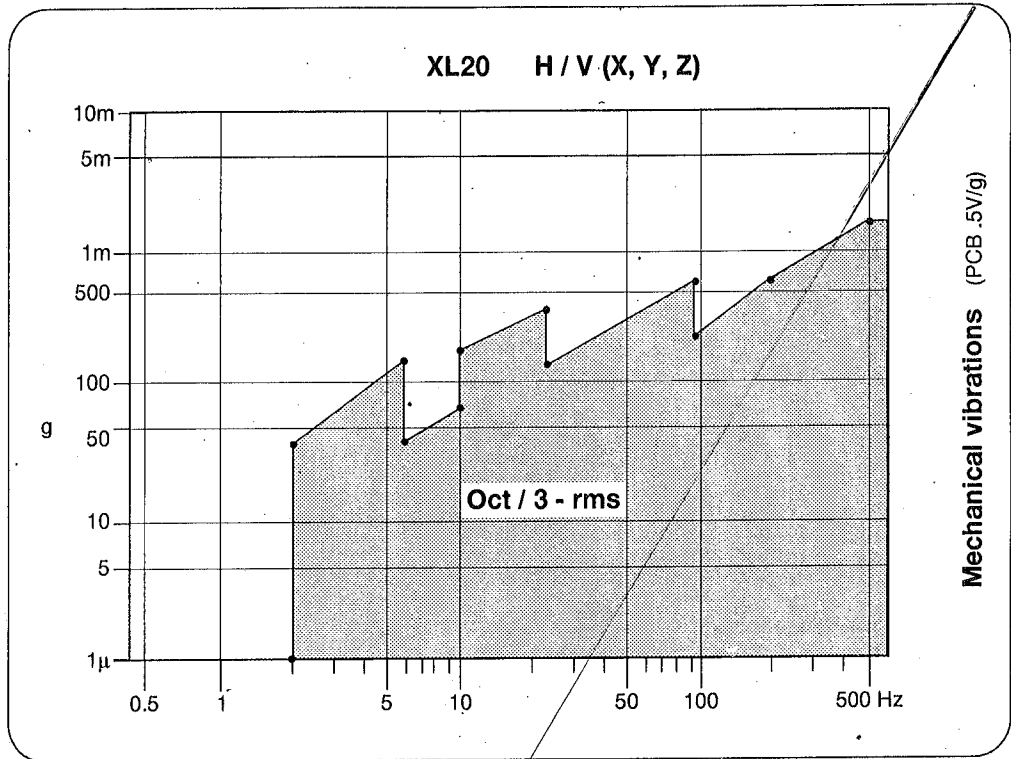
After each measurement, press in sequence the keys [SHIFT] and the shift key function [SAVE]. All traces will be stored in sequence number from T 100 upwards, or upwards from the number desired by the user. On the lower line a message will appear " ... (sequence number) saved".

The set up sequence as described above must be repeated, as the measuring sequence will be terminated if one of the keys has been activated.

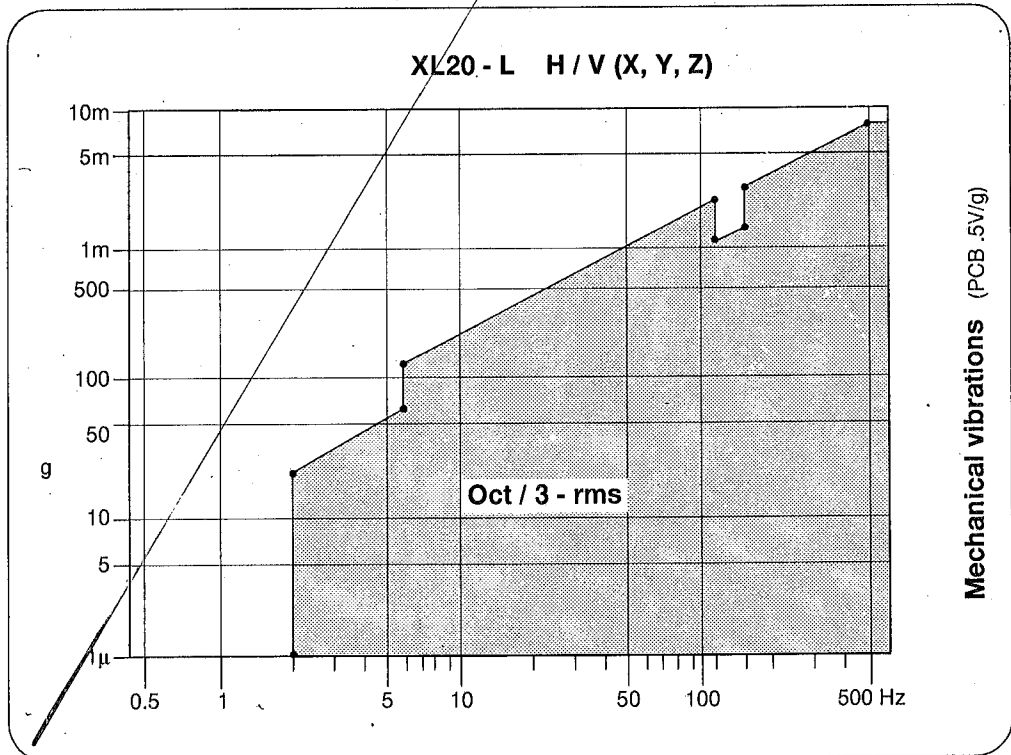
7.1

MECHANICAL VIBRATIONS

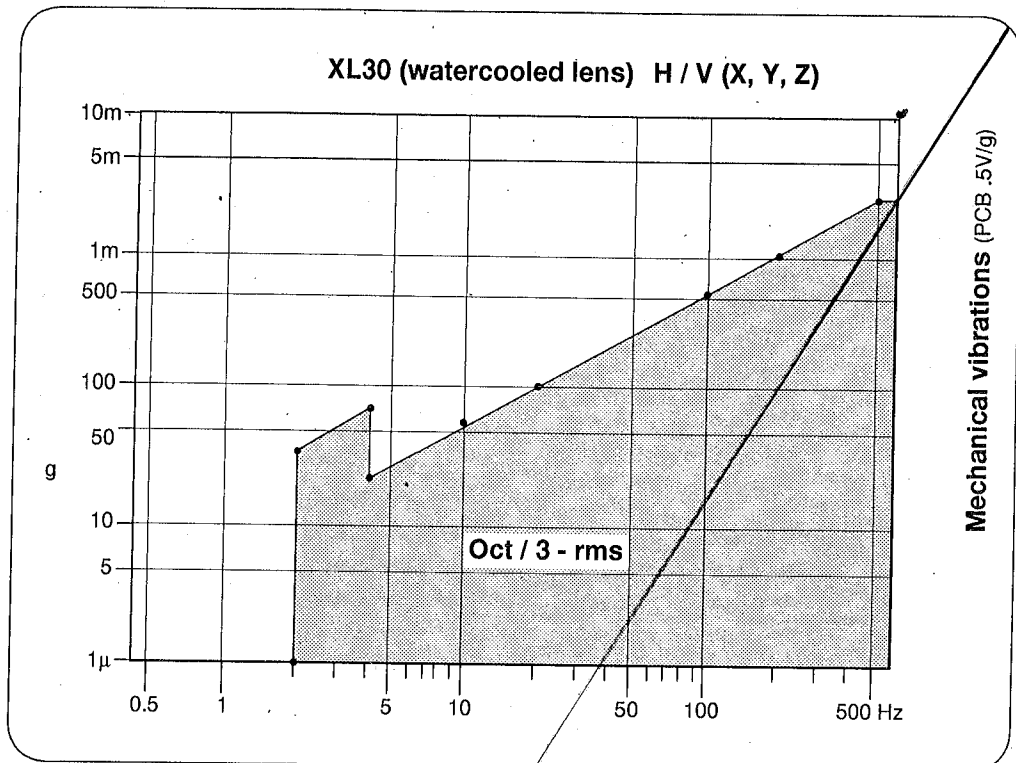
XL20, XL20-L, XL30 and XL40



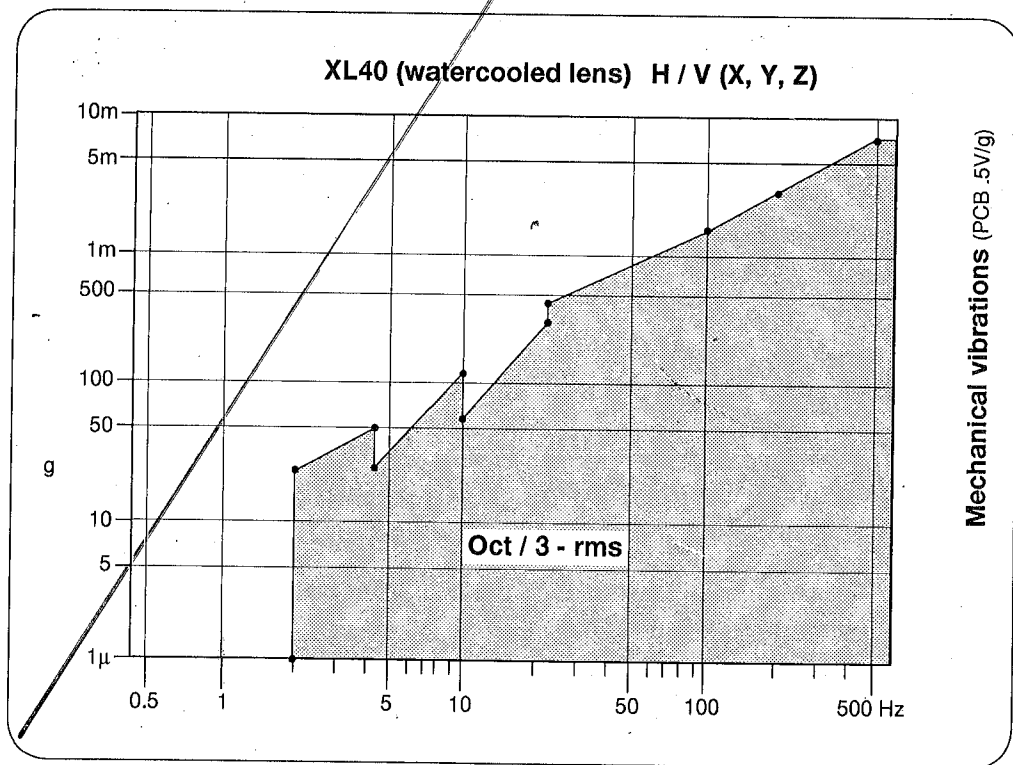
EM7101A



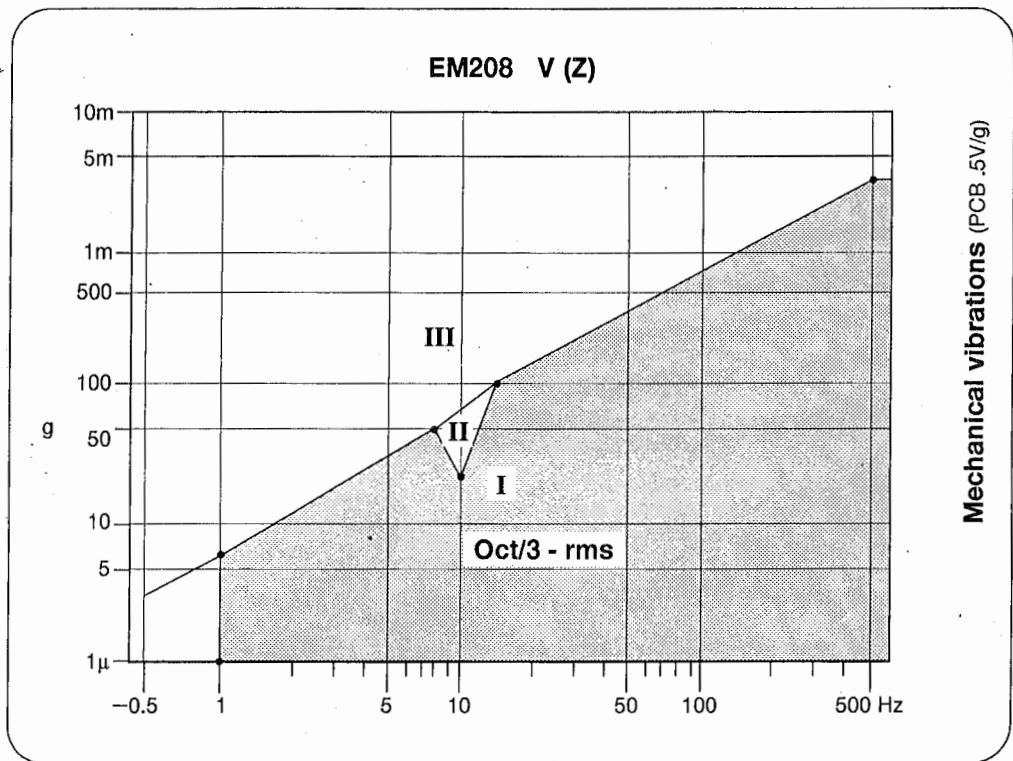
EM7102A



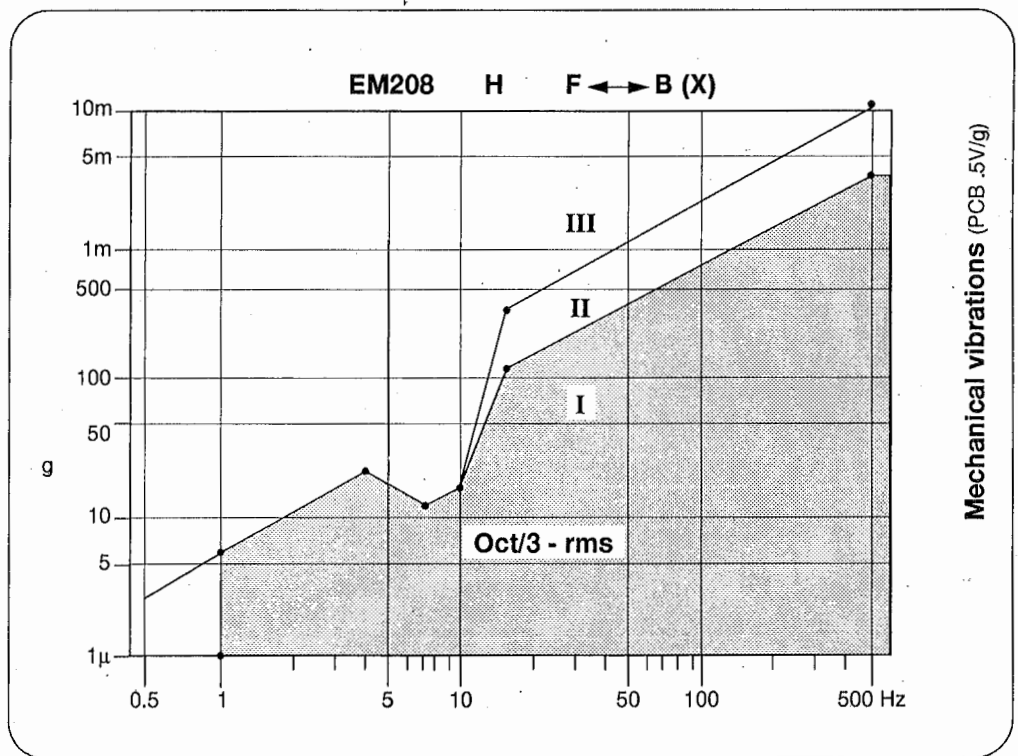
EM7103A



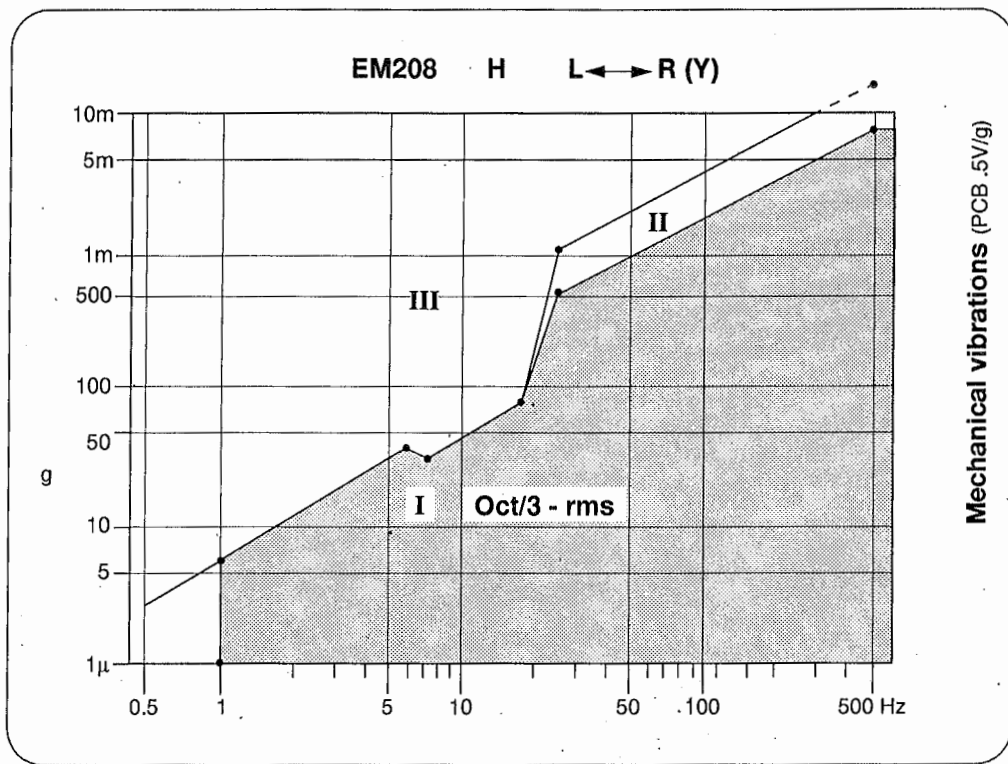
EM7104A



EM7105A

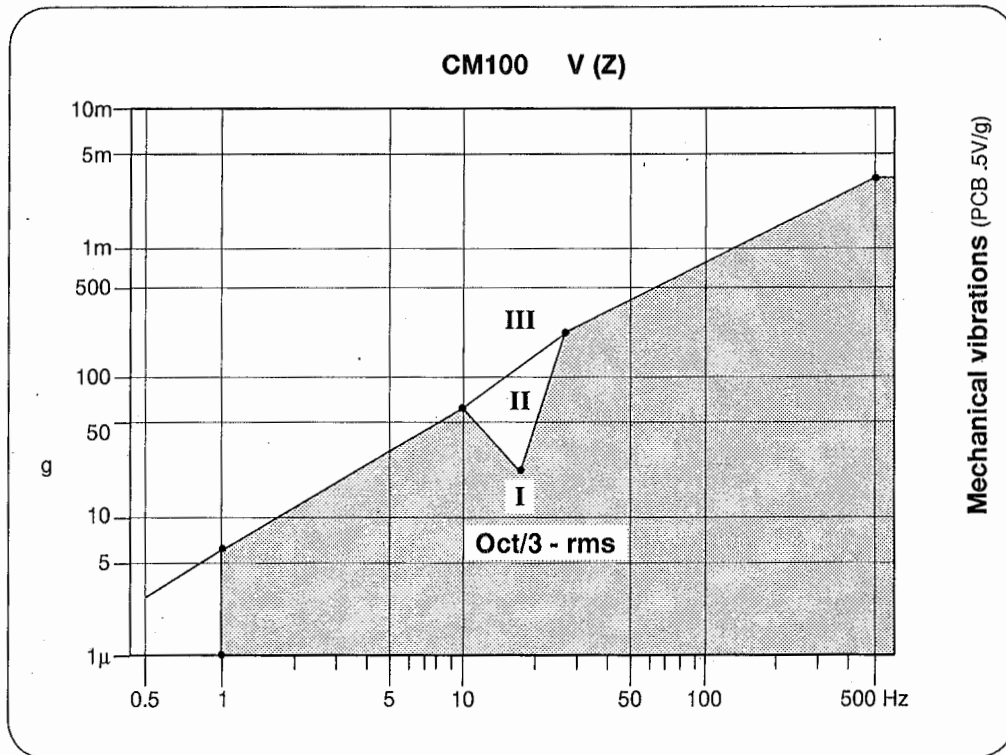


EM7106A

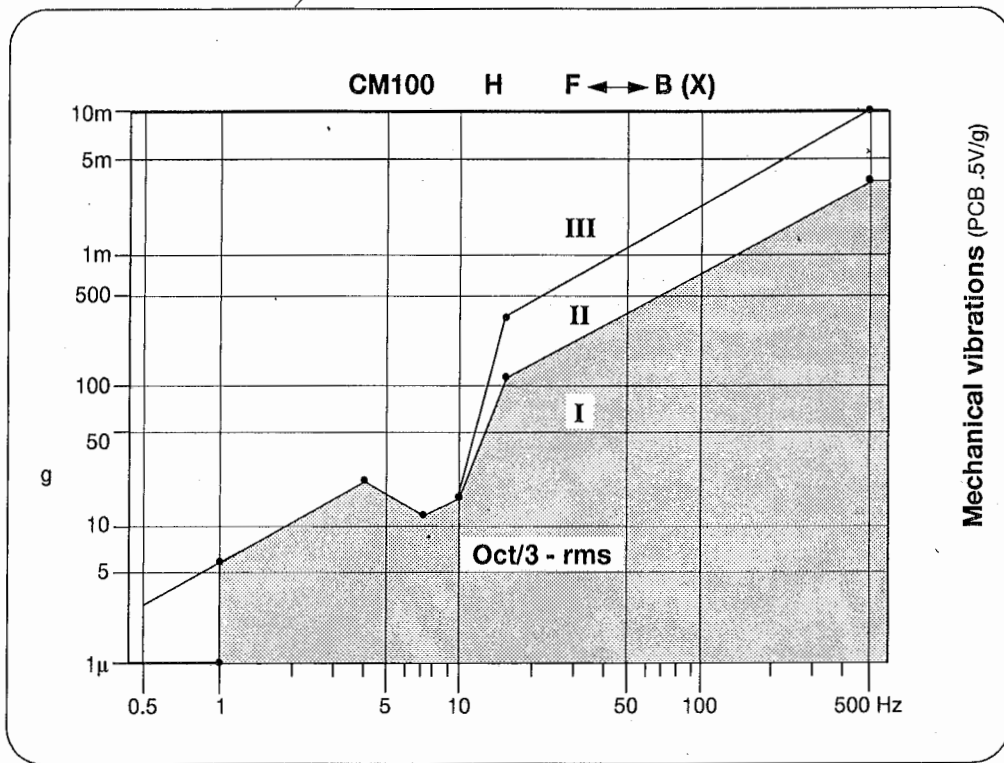


EM7107A

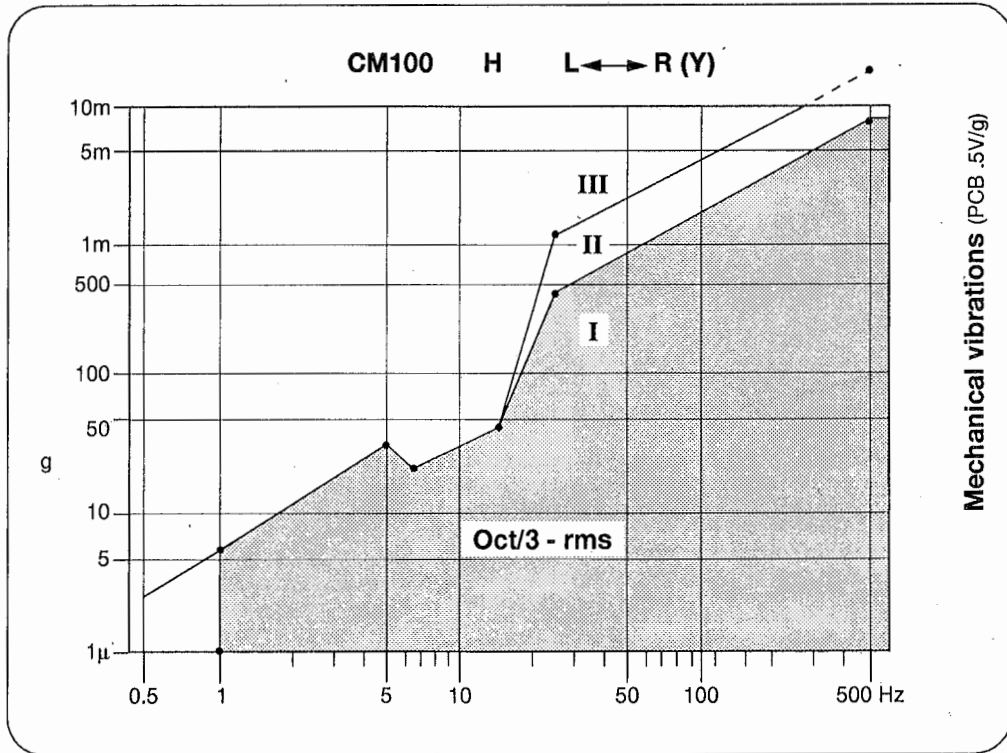
CM100 -V, H - L ↔ R, H - F ↔ B



EM7108A

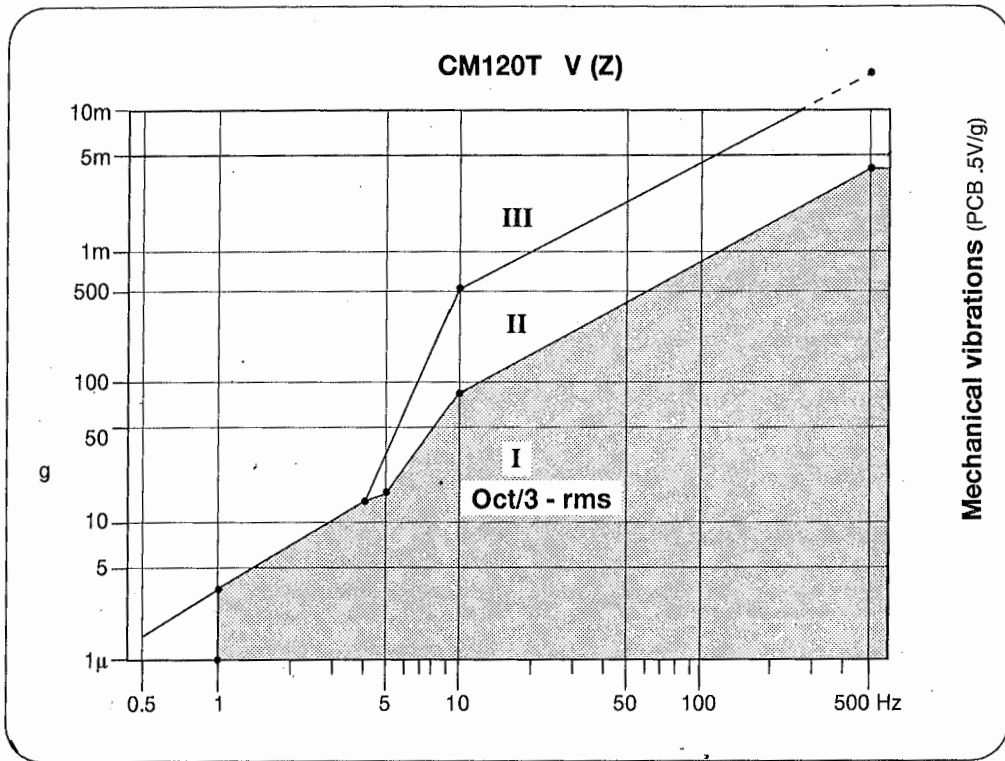


EM7109A

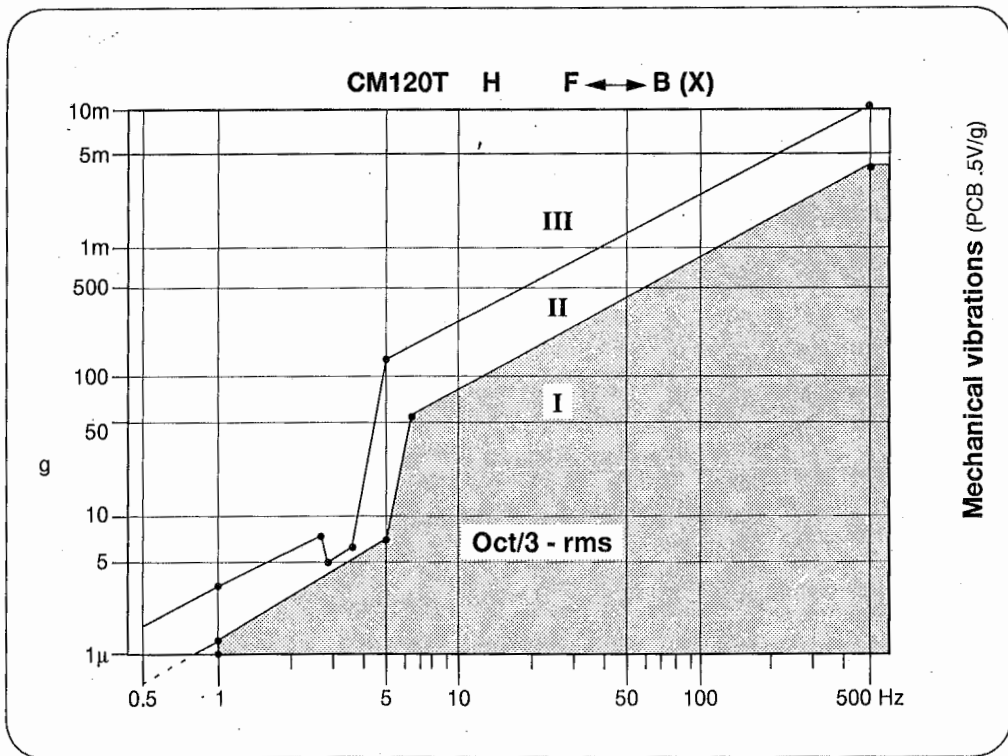


EM7110A

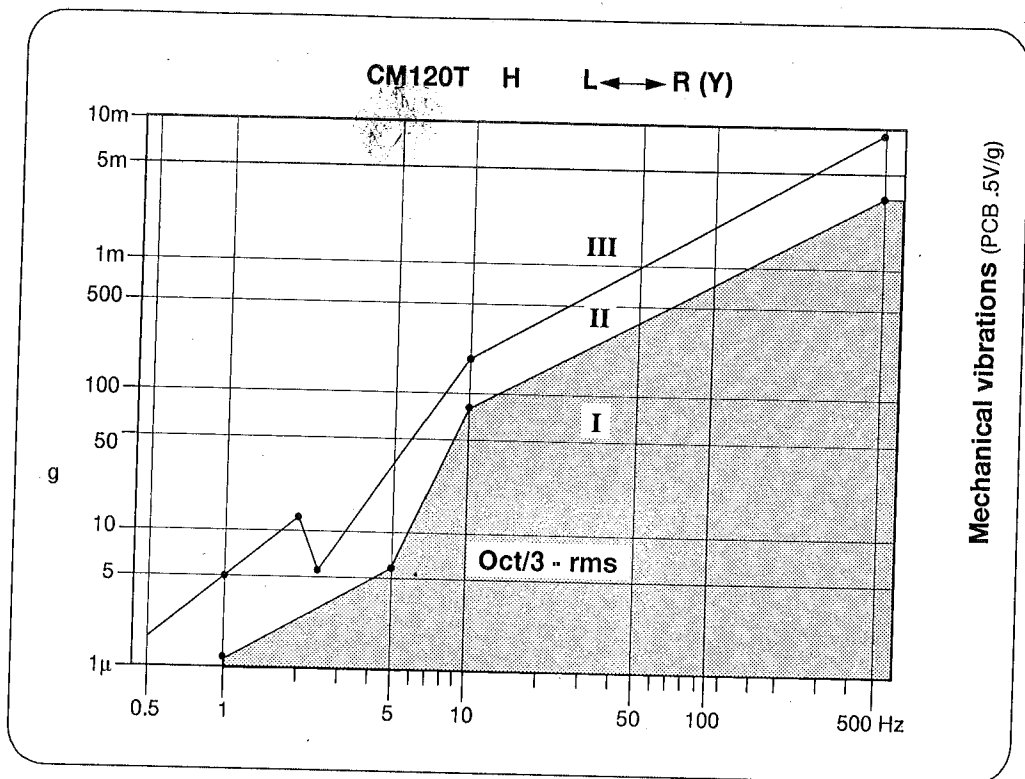
CM120-T - V, H - L↔R, H - F↔B
 (for CM120ST, divide amplitude by 1.4)



EM7111A

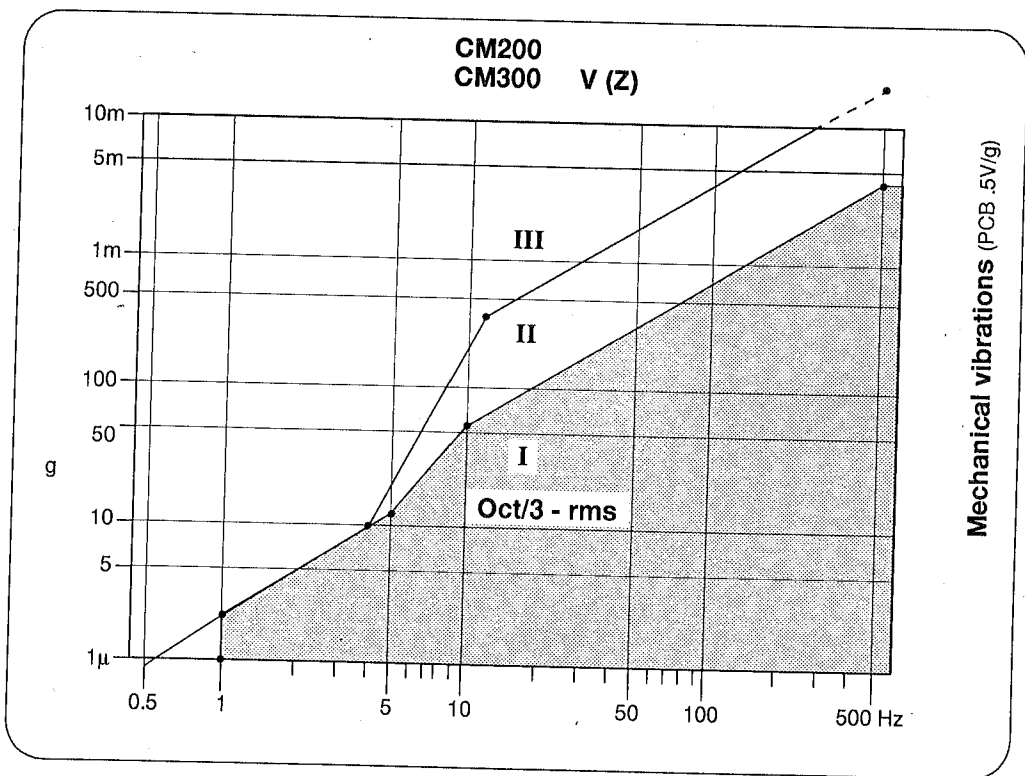


EM7112A

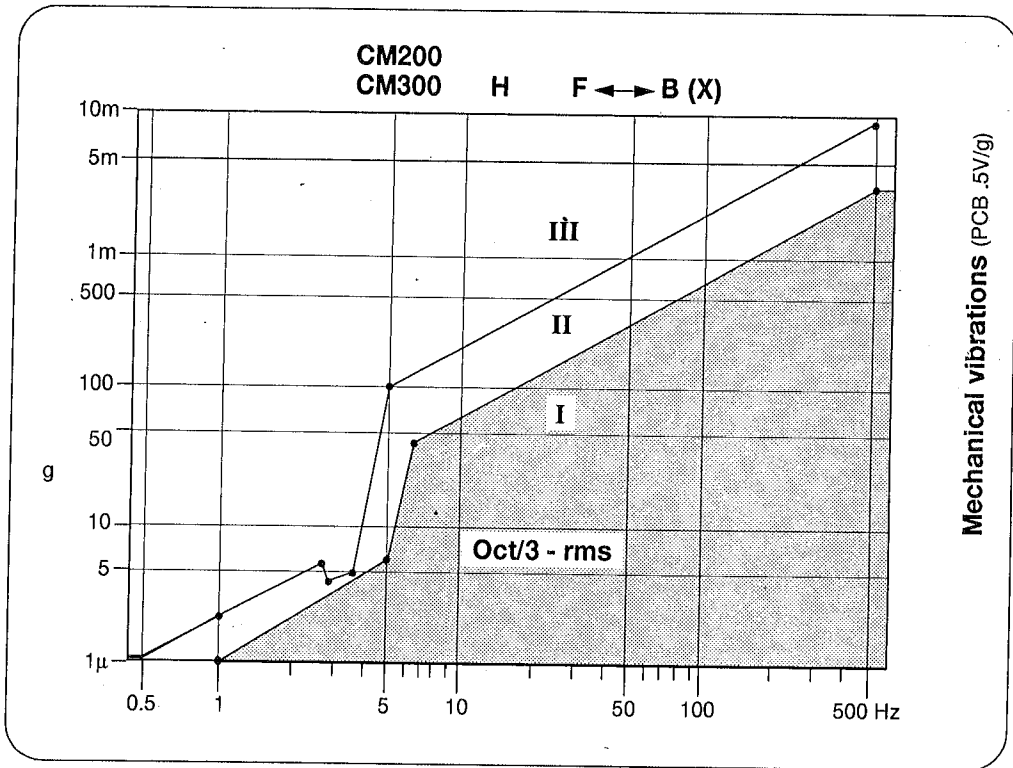


EM7113A

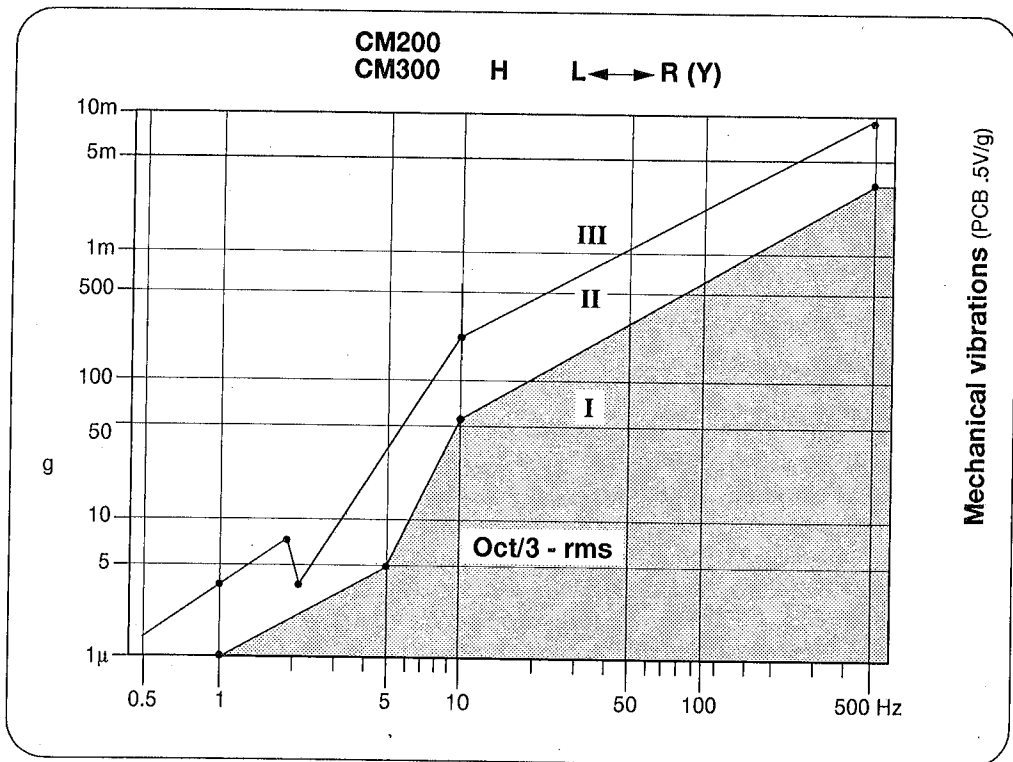
CM200/CM300 -V, H - L ↔ R, H - F ↔ B



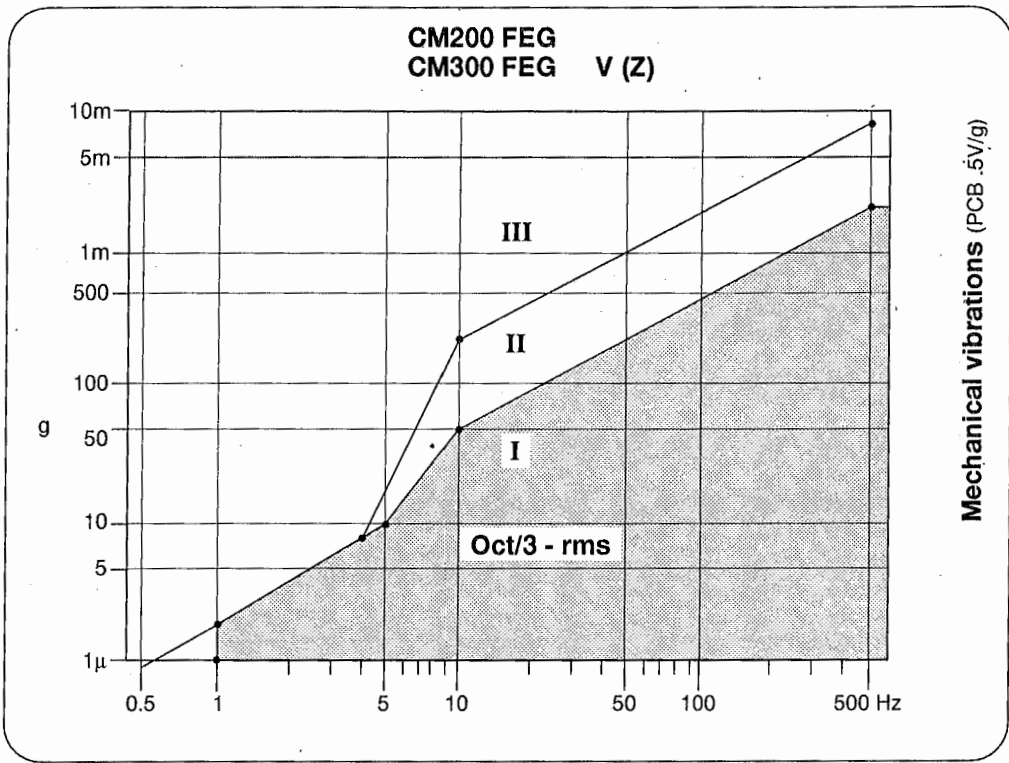
EM7114A



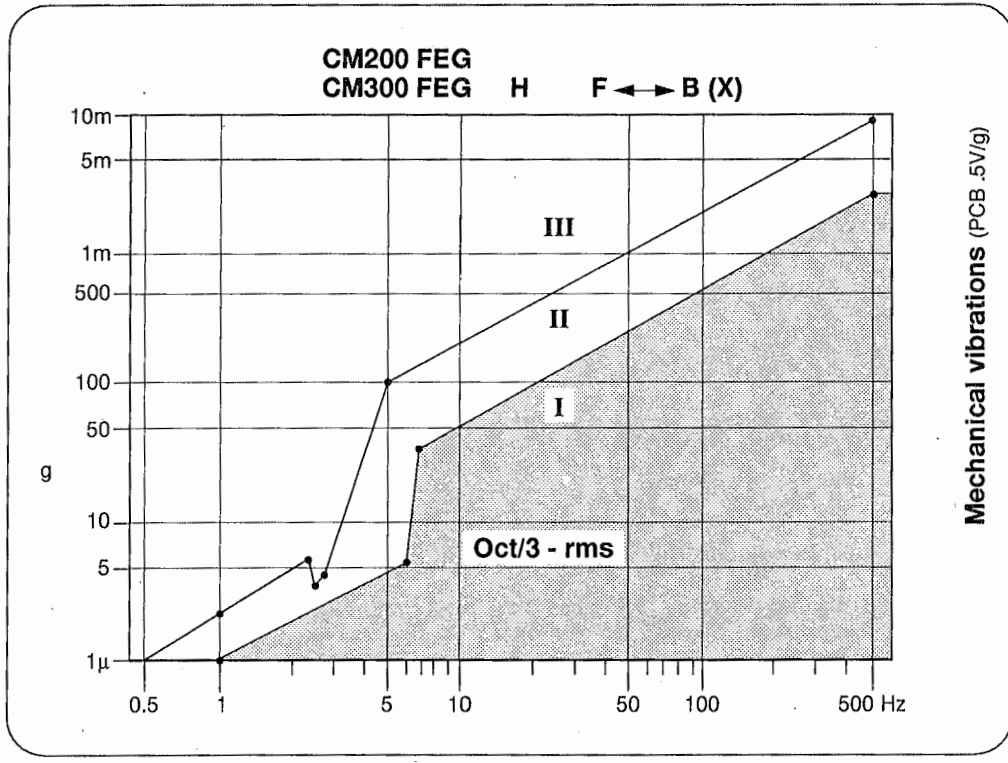
EM7115A



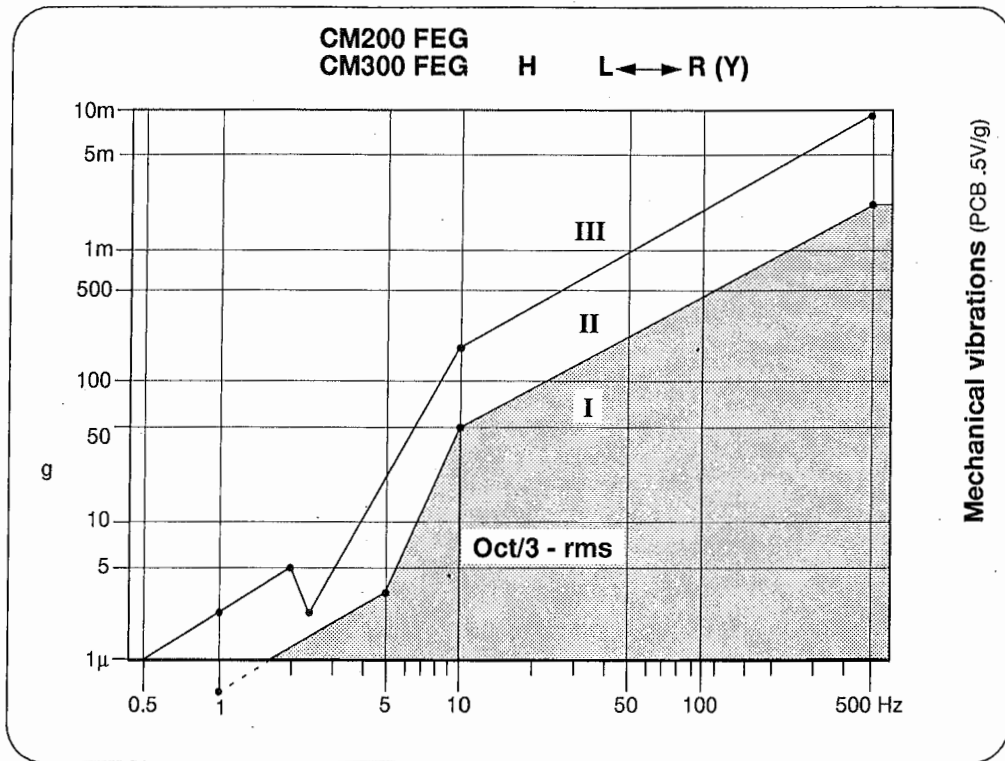
EM7116A



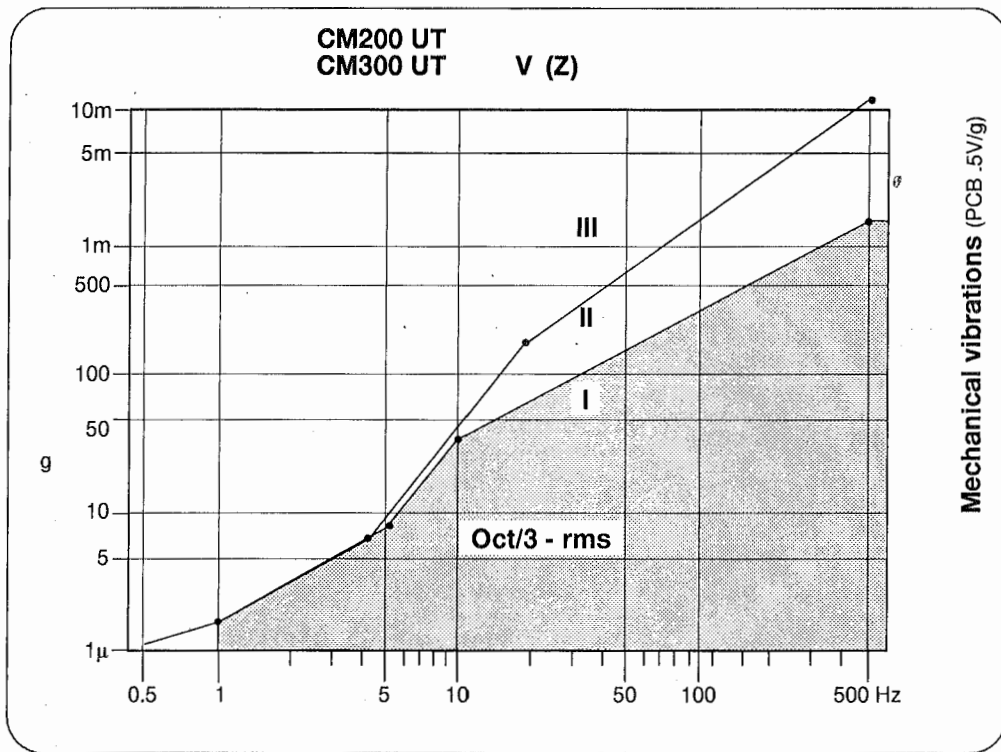
EM7117A



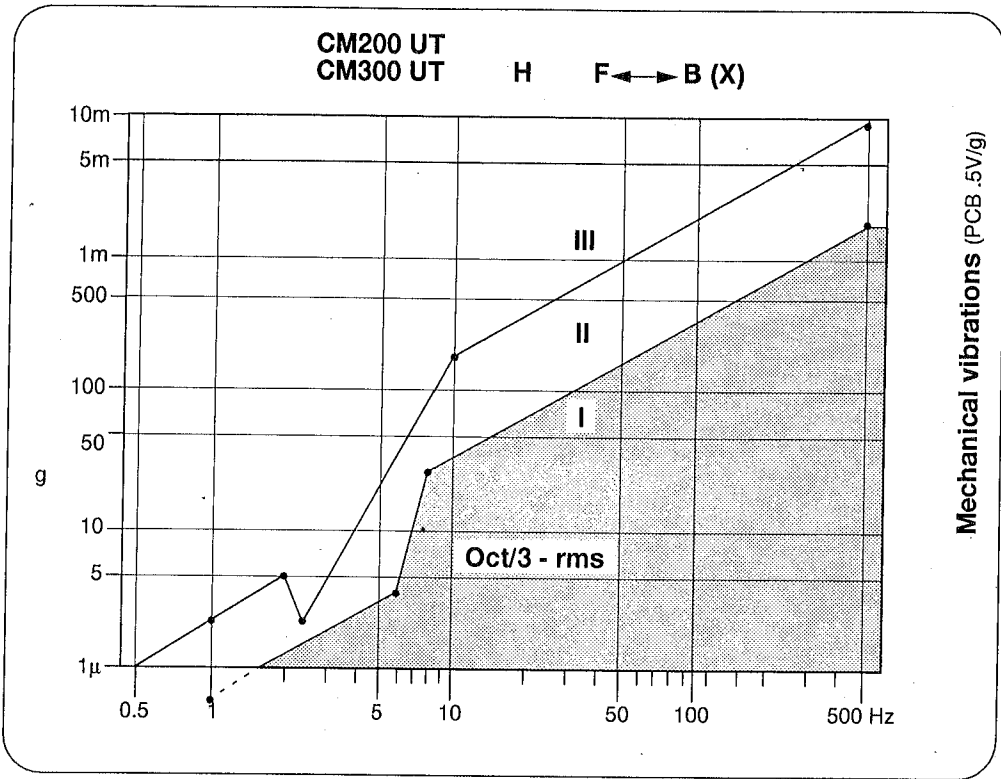
EM7118A



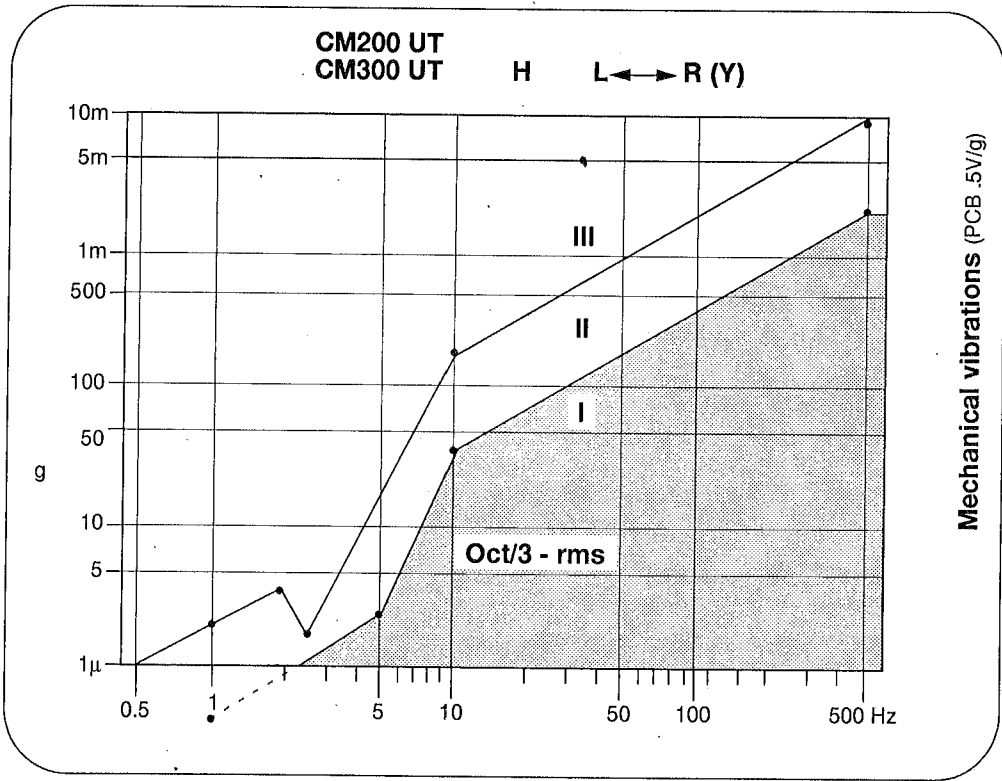
EM7119A



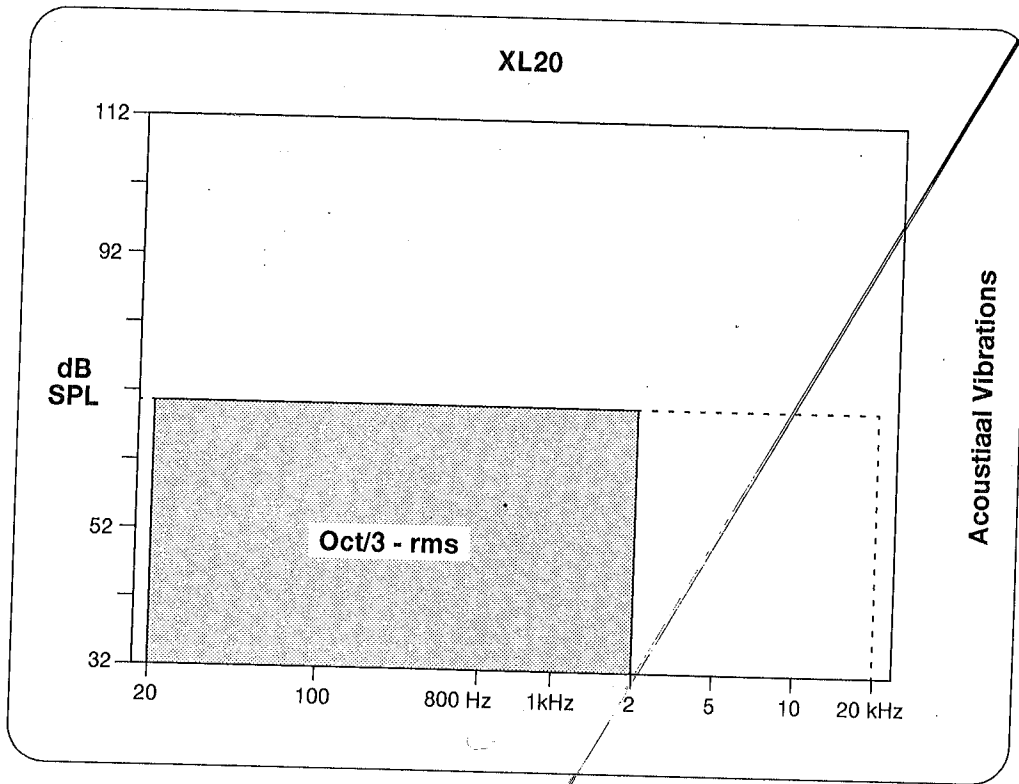
EM7322-1



EM7322-2

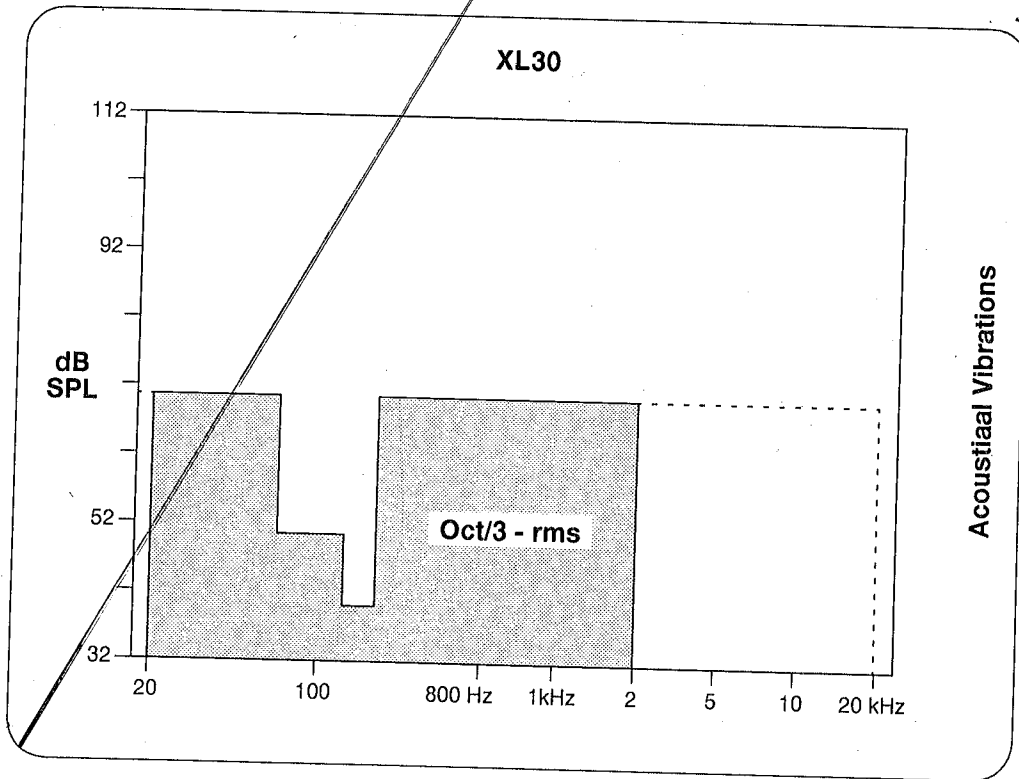


EM7322-3

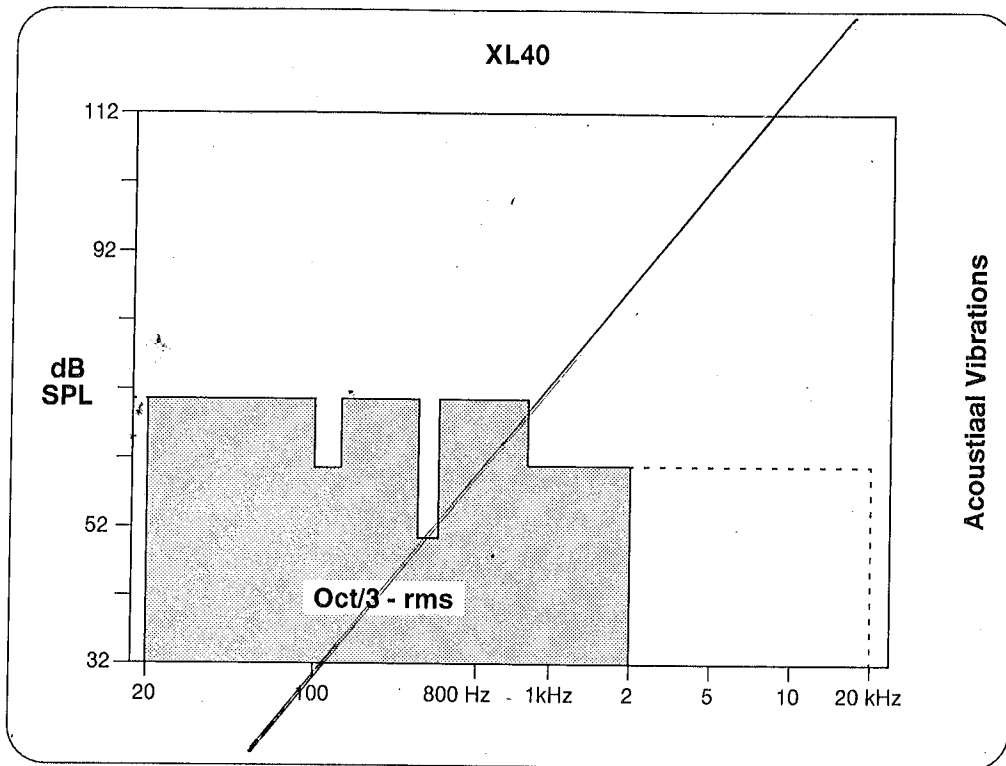


EM7120

XL30, incl. FEG, ESEM and XL50

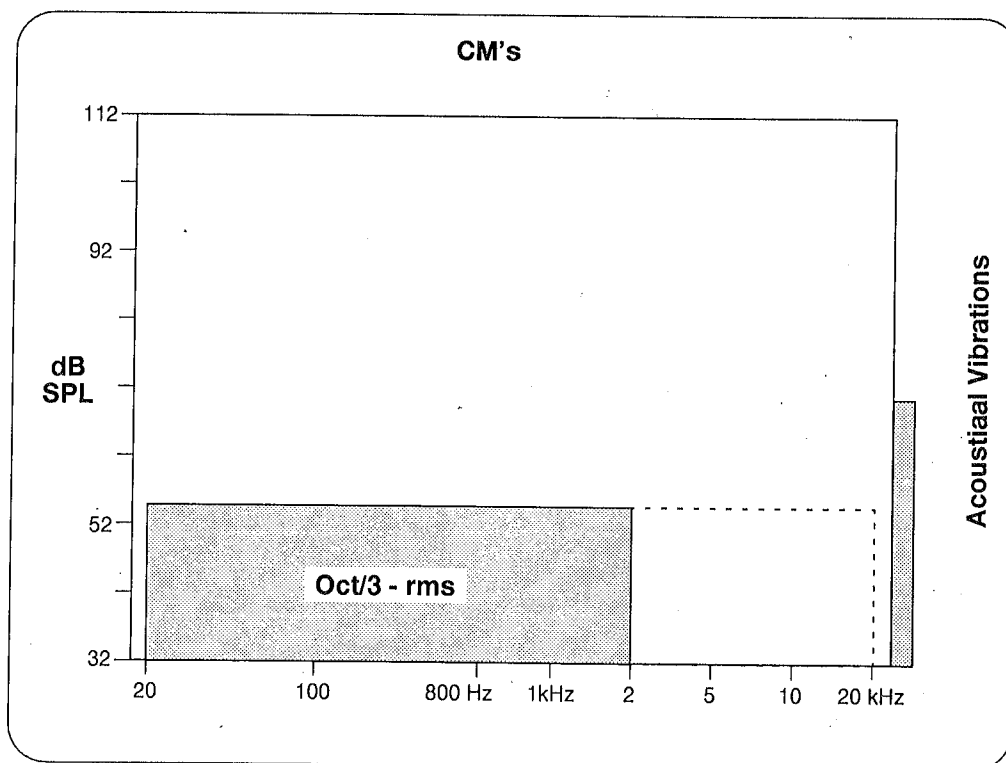


EM7121



EM7122

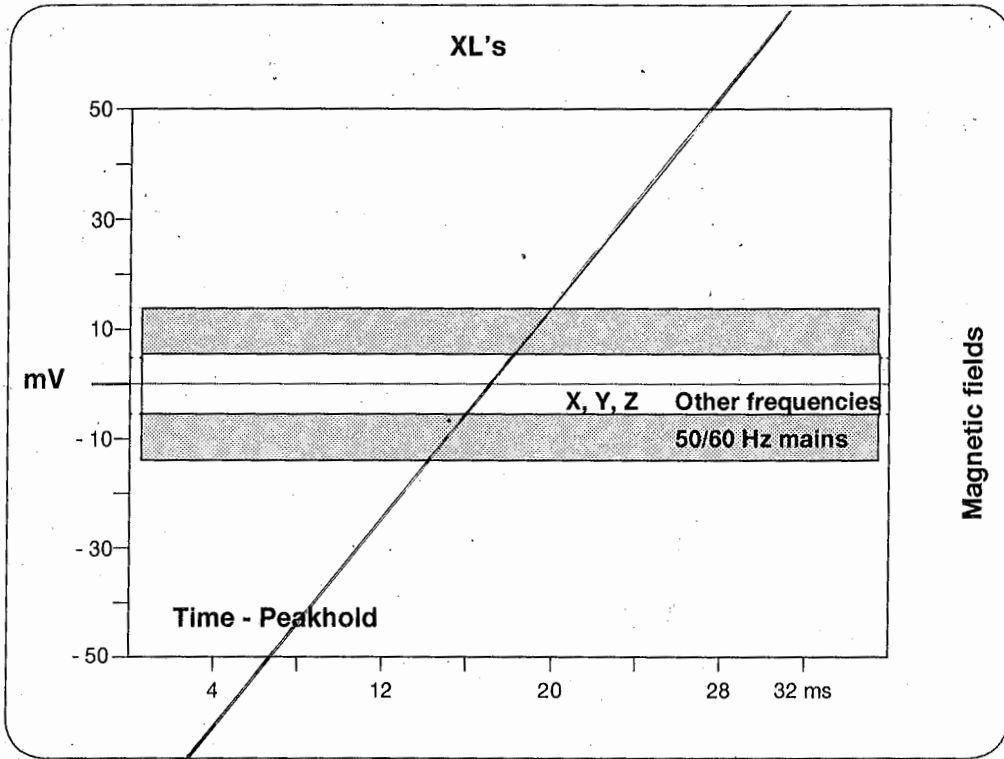
CM's



EM7123A

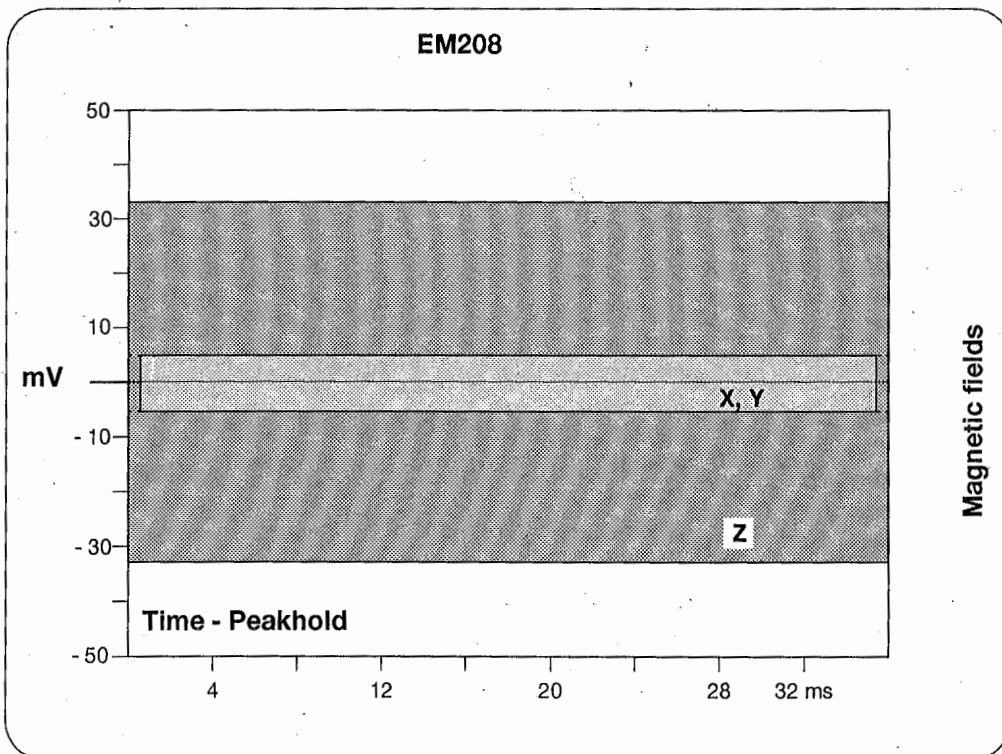
7.3 ELECTROMAGNETIC FIELDS, 10nT = 1mV (100μT sensor)

XL's

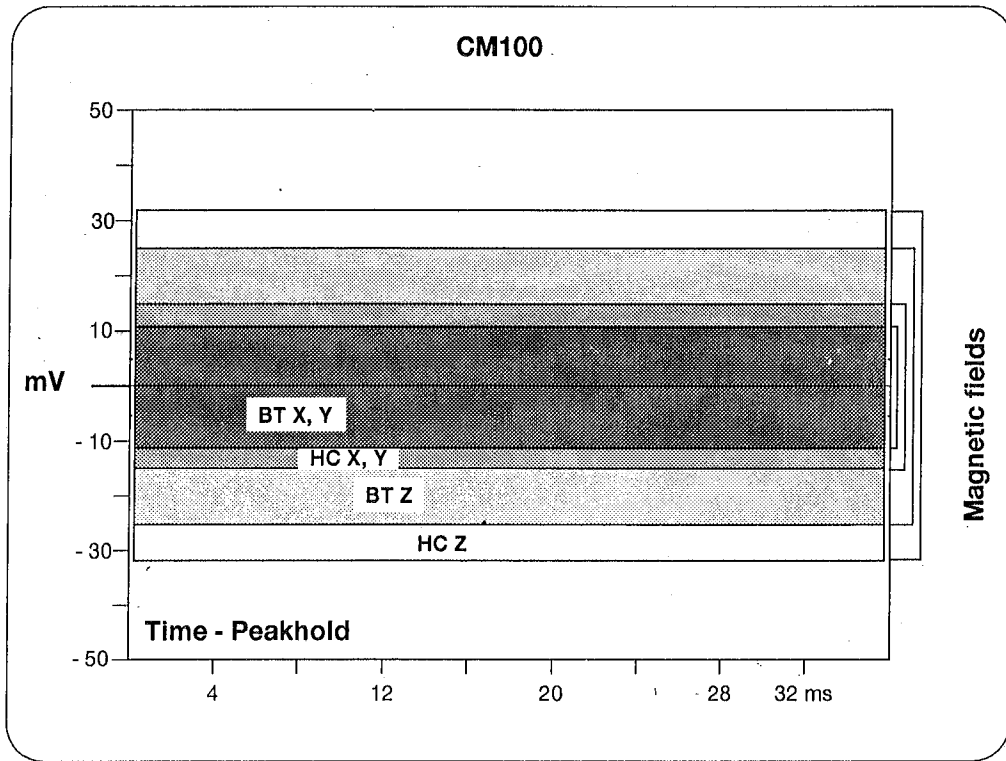


EM7124

EM208

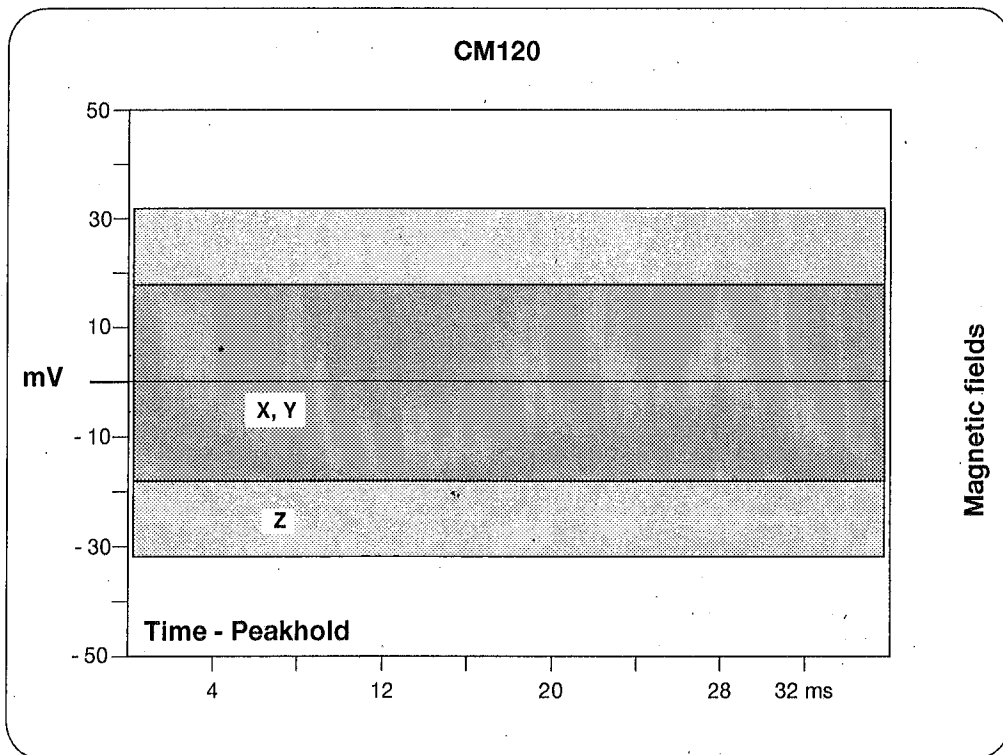


CM100

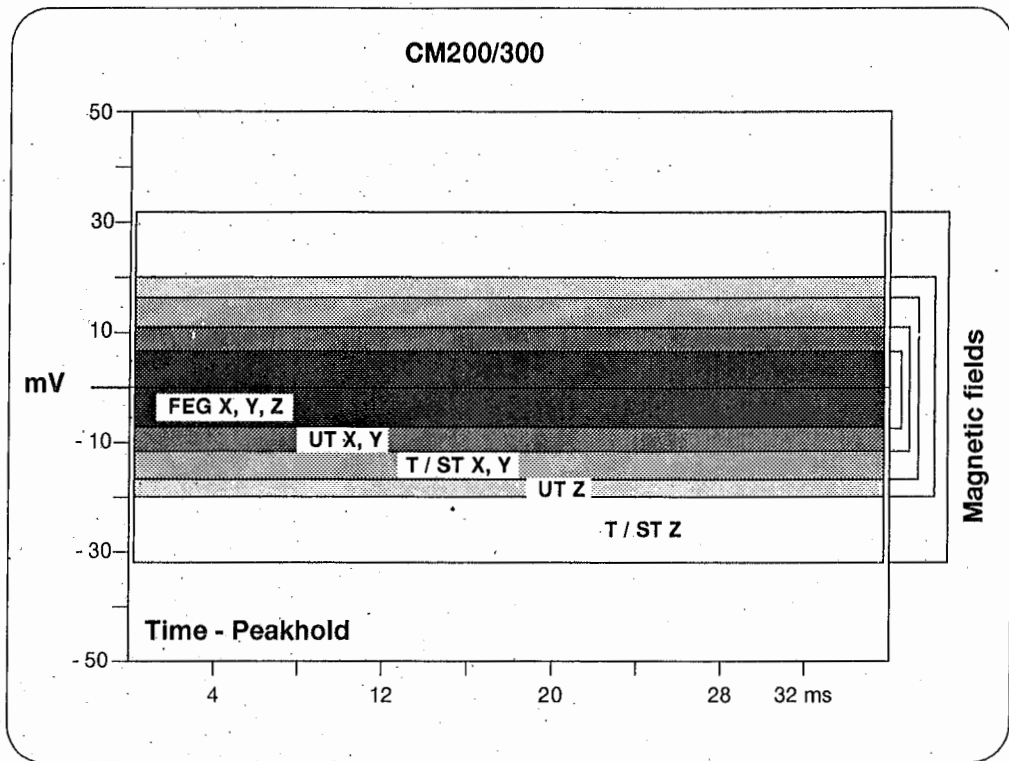


EM7126

CM120



EM7127



EM7128

8.1 USING THE HP 3560A ANALYSER

The vibration measurements are made with the HP 3560A analyser, which can store all the recorded spectra in memory (up to 2048 spectra).

These spectra can be downloaded to a PC or Laptop. Connect the analyzer to the PC using one of the two cables supplied (9-pins or 25-pins). Using the supplied HP software SDF Utilities for HP 3560A Opt E17, it is possible to display and analyse the spectra on the PC. First copy all the files on the floppy disk to a directory on the hard disk and start the programs from there, as described below.

Step 1. Setup analyser for downloading

- Connect the special cable to the analyser and to the serial port of the PC, preferably COM1.
- Press "ON" to switch on the analyser.
- Press "Save/Recall" from the keyboard section "SYSTEM".
- Select "Operation" using the Left/Right arrows.
- Select "XFER ONE" using the Up/Down arrows.
- Select "REG Numb" using the Left/Right arrows.
- Type in the register number to be downloaded.
- Press "ENTER" to confirm.
- Switch back to "OPERATION" using the Marker buttons.

Step 2. Make a directory on the hard disk in **DOS**, e.g.:

```
c:\> md hpanal
```

Step 3. Change to new directory:

```
c:\> cd hpanal
```

Step 4. Copy all the programs from the floppy disk supplied "SDF utilities" into the new directory:

```
c:\> copy a:\*. * c:\hpanal
```

Step 5. Check analyzer <Utility> setting is:

```
RS232  Baud   -> 9600
        Prty   -> None
        Bits   -> Eight
        Handsh -> CTS
```

Step 6. Start the data transfer by giving the following DOS command:

```
c:\hpanal> 60_sdf
```

At this point an asterisk will start rotating in the lower left-hand part of the screen, indicating that data is being transferred.

The information is transmitted to the PC in SDF format (System Data File = ASCII) using the extension DAT. E.g. "99.DAT". This means that memory location 99 is stored in file "99.DAT".

Step 7. When data transfer is complete, the data may be viewed by giving the following command in DOS:

```
c:\hpanal> viewdata
```

The screen shown in Fig. 8A then appears.

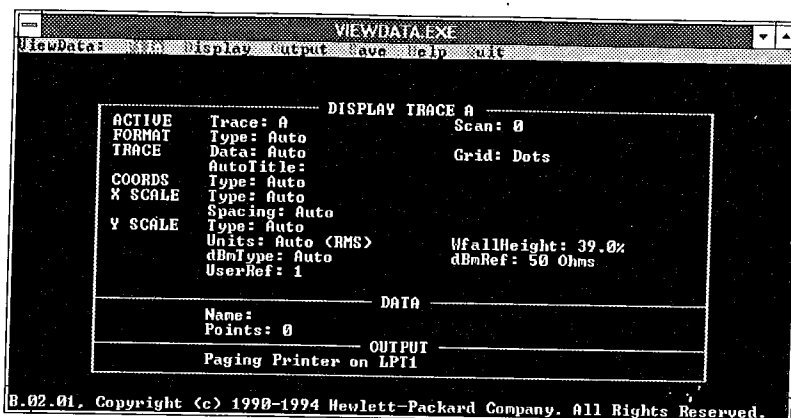


Fig. 8A Viewdata screen

Step 8. Specific data can now be displayed from a chosen file. To select a file, first press <Enter> to choose the "File" option. The screen shown in Fig. 8B then appears.

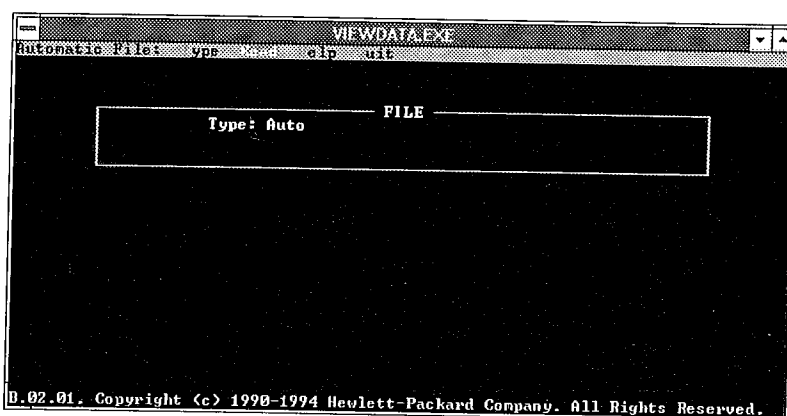


Fig. 8B File screen

Step 9. Select the "Read" option to produce a screen similar to that shown in Fig. 8C (the file names will be different to those shown).

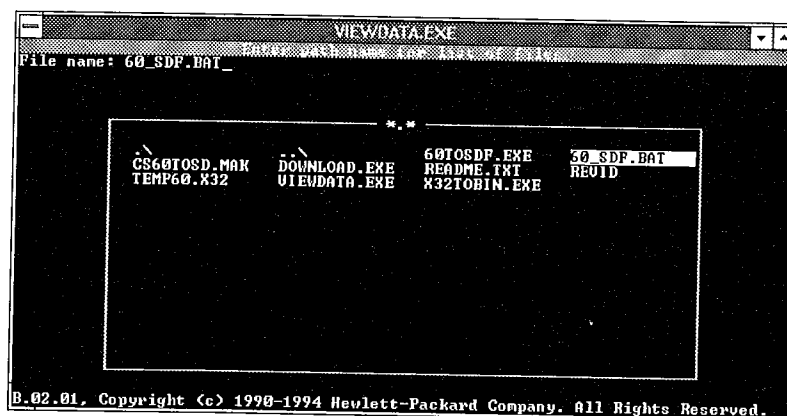


Fig. 8C File name selection screen

Step 10. Select the desired file by using the cursor keys to choose the file name, then pressing <Enter>. The file will now be loaded for further viewing and possible modification.

Step 11. Before a file can be viewed, the default display trace parameters must be checked and possibly modified, as follows:

Choose option "Display" from the menu bar (see Fig. 8A); the screen shown in Fig. 8D appears:

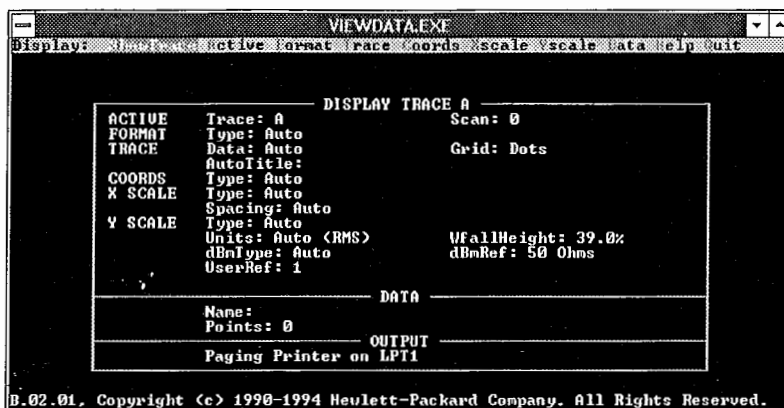


Fig. 8D Display screen

Step 12. The parameter settings displayed should be checked carefully against the ones shown below. If any parameter is different, it must be modified (see Step 13 onwards):

Mechanical vibration measurements (HP setting 10)

DISPLAY TRACE A

ACTIVE	TRACE A	SCAN: 0
Format	Type: Auto	
TRACE	Data: Auto	Grid: Dots
	Autotitle :	
COORDS	Type: Log	
X-SCALE	Type: Auto	
	Spacing: auto	
Y-SCALE	Top: 0.005	Bottom: 5E-07
	Units: Volts(RMS)	WfallHeight: 100%
	dBmType: Auto	dBmRef: 50 Ohms
	UserRef: 1	

Acoustic measurements (HP setting 20)

DISPLAY TRACE A

ACTIVE	TRACE A	SCAN: 0
Format	Type: Auto	
TRACE	Data: Auto	Grid: Dots
	Autotitle :	
COORDS	Type: dB	
X-SCALE	Type: Auto	
	Spacing: Auto	
Y-SCALE	Top: 112	Bottom: 32
	Units: Auto(RMS)	WfallHeight: 100%
	dBmType: Auto	dBmRef: 50 Ohms
	UserRef: 1	

S

Magnetic field measurements (HP setting 30)

```
DISPLAY TRACE A
ACTIVE TRACE A SCAN: 0
Format Type: Auto
TRACE Data: Auto Grid: Dots
Autotitle:
COORDS Type: Auto
X-SCALE Type: Auto
Spacing: Auto
Y-SCALE Top: 0.05 Bottom: -0.05
Units: Auto(Peak) WfallHeight: 100%
dBmType: Auto dBmRef: 50 Ohms
UserRef: 1
```

Step 13. Example of modifying a parameter.

The "WfallHeight" shown under parameter Y-scale must be 100%. To change this parameter, first select "Y-scale" from the menu bar. The screen shown in Fig. 8E appears.

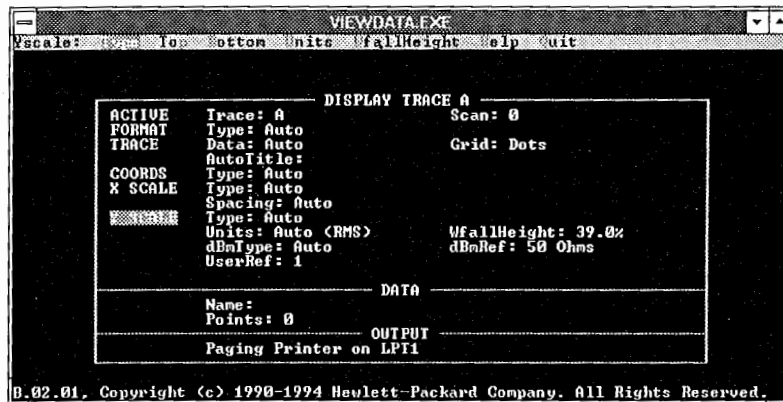


Fig. 8E Yscale screen

Step 14. Choose option "WfallHeight" from the menu bar to produce the screen of Fig. 8F.

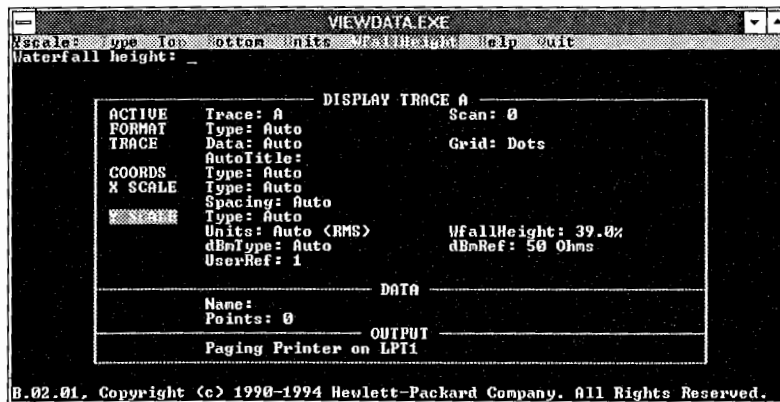


Fig. 8F Yscale Waterfall height correction screen

- Step 15. At the cursor, type "100" and press <Enter>. The WfallHeight parameter is changed to 100%.
- Step 16. Return to the display menu (using "Quit" or the <Esc> key) and modify all other parameters as required, in the manner described above.
- Note:** To set Yscale Units to "Volts", first select menu option "Units", then "Power".
- Step 17. To view the actual trace, select "ShowTrace" from the display menu.
- Step 18. Traces may be printed and manipulated in several ways (e.g. multile traces on one printout, trace labelling, etc.). Refer to the HP analyzer handbook for details.

8.2

REPORTING TEST RESULTS FROM THE ANALYZER

Traces are transferred from the analyzer to the PC for post report handling; the following data must then be added to the traces:

- Date and time of measurements
- Place and position of measurement
- Equipment being used incl. serial numbers of sensors
- Maximum allowed level of the various parameters.

Add PC print-outs to the pre-installation survey report.

8.2.1 Pre-Installation measurements

Please copy this page for each type of measurement made, and indicate below by means of a cross which type of measurement is represented:

- Mechanical vibrations
- Acoustic vibrations
- Magnetic fields

Note: 1 square represents 1 metre x 1 metre

On the above plan, please mark the following:

- Measurement reference point in room
- X-Y-Z direction w.r.t reference point
- Proposed position of microscope column
- Measuring points.

Measurements	Area Position	Date/Time	Trace Reg. No.
Mechanical Vibrations			
Acoustical Vibrations			
Magnetic Fields			

Table 8A. Pre-installation measurement positions

8.3

PRE-INSTALLATION REPORT

During the survey not only environmental measurements have to be made, but other items have to be checked for specific details. See the latest pre-installation manual for the type of microscope to be installed.

The Pre-Installation Report Form shown in this chapter has to be seen as a guideline, local modifications and changes are to be made according to the judgement of the NSO's.

8.3.1 Pre-Installation Survey

Customer name:

Address:

Telephone:

Fax:

Microscope type:

Date of the survey:

Time:

Location:

Building:

Room number:

General:

- Pre-Installation manual discussed with future user.
- Location and surrounding area inspected w.r.t. Electron Optics Equipment.
- Transport route.
- Door opening(s).
- Room temperature and ventilation.
- Air, N₂, SF₆ gas supplies.
- SF₆ gas ventilation. (Only for CM200/300 installations)
- Water supply.
- Mains supply and Earth.
- Room lighting.
- Dark room and Film available.
- Any existing equipment removed from room(s).
- Room(s) renovation complete.
- Additional points:
 - Valve cocks in water lines.
 - Flow meter(s).
 - Pressure/Temperature meters.
 - Water filter.
 - Mains master switch.
 - Socket for Aux. equipment.
 - Pressure regulators for gases.

Pre-Installation measurements carried out:

- Mechanical vibrations.
- Acoustical vibrations.
- Magnetic fields.

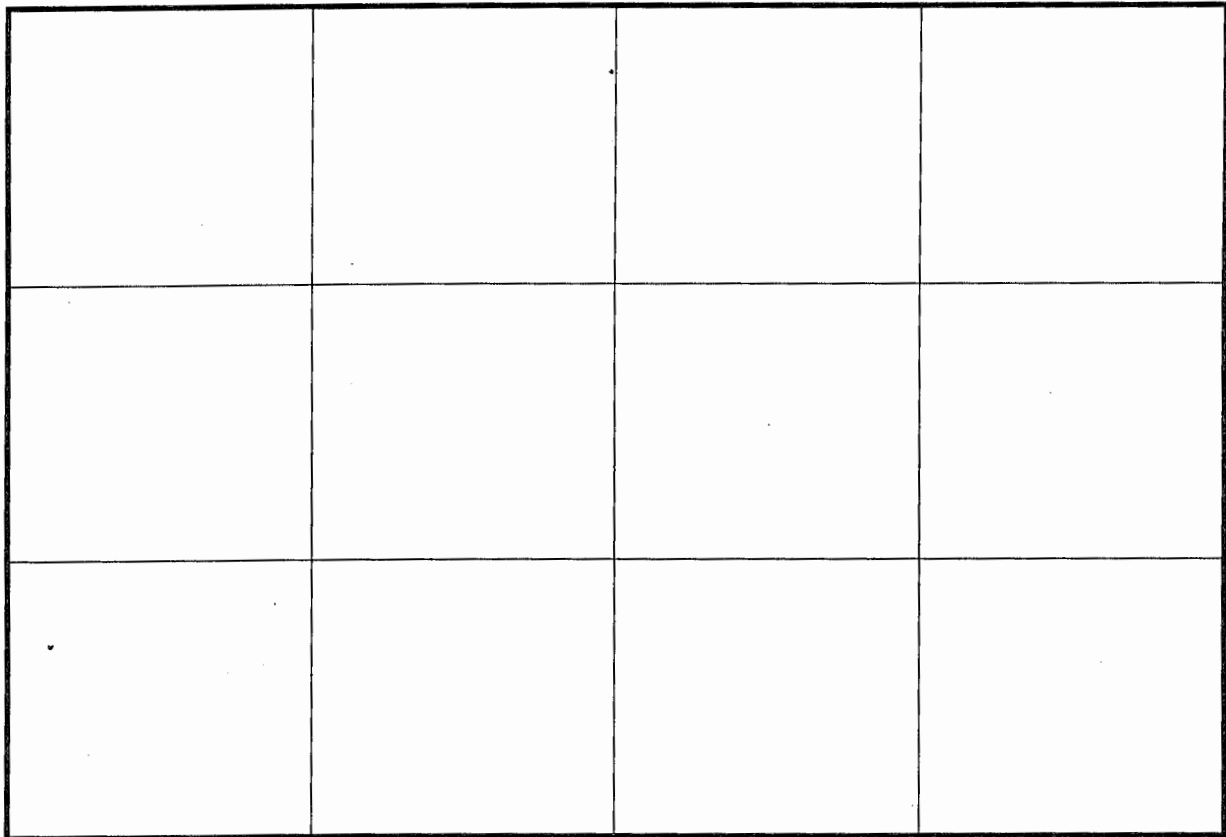
See attached reports.

- Checklist from Pre-Installation Manual: 4822 870*, points on this list OK and room is acceptable for installation.

* Please enter code number of Pre-Installation manual used.

- Room layout accepted.

Room layout:



Note: 1 square represents 1 metre x 1 metre

On the above plan, please mark the following:

- Electrical, water and gas connections.
- Door(s) and window(s).
- Lighting.
- Proposed microscope position.

Summary:

- READY**
- NOT READY**
- Data requires further analysis.
- Additional testing required.
- Additional site preparation required.

.....
.....
.....
.....

- NEEDS RECONSIDERATION**

Specify:

.....
.....
.....
.....

- MAJOR REBUILD OR MODIFICATION OF THE ROOM IS NEEDED**
- OTHER LOCATION MUST BE FOUND**

The site survey and any Pre-Installation information is provided as a Customer convenience and is not to be considered as architectural or construction document.

Date of survey:

Time:

Signatures:

Customer:

Phillips Service Engineer: