



## HD2060 PORTABLE MULTI-FREQUENCY AND MULTI-LEVEL CALIBRATOR FOR VIBRATION TRANSDUCERS

The calibrator HD2060 generates mechanical vibration amplitude controlled with precision and frequency stabilized by a quartz. Coupling a transducer to the vibrating base of the calibrator it is possible to check its sensitivity to acceleration, velocity or displacement. The presence of a rechargeable internal battery, the weight and the small dimensions as well as the low sensitivity to environmental parameters make it easy to use the calibrator in the field. The calibrator is equipped with a feedback system capable of accurately maintaining the amplitude level set, regardless of the load associated with the mass of the transducer (within the limits stated in the technical specifications).

The mechanical vibrations generated by the calibrator are very stable over the time, with a typical drift of 1 % per year. In order to maintain the accuracy, we recommend the annual calibration at DELTA OHM metrological laboratories. The calibrator notifies the user about the need to make the periodic check by displaying alternately the signs "cal" and "exp" on the display.

The backlit display provides a clear indication of acceleration, frequency and the reaching of the set level. In case of exceeding the maximum permissible load or in case of low battery, the calibrator alerts the user by displaying an error message and the operation of the vibrating base is turned off. The automatic stop of the vibration after the set time and the automatic shutdown function prevent the discharge of the battery.

The calibrator is equipped with screws and accessories for mounting the transducers, with external power supply for charging the battery and with calibration report.

### Applications:

- In-the-field calibration of acceleration, velocity and displacement transducers.
- Calibration of acceleration sensors used for the measurement of vibrations transmitted to men in the workplace, according to the standard ISO 8041:2005.
- Calibration of acceleration sensors used to evaluate buildings vibration.

### Main specifications:

- Two frequencies of emission: 15,915 Hz at 1 m/s<sup>2</sup> and 0,1 g  
159,155 Hz at 10 m/s<sup>2</sup> and 1 g
- Low distortion accelerations, independent from the mass of the transducer
- Absence of dispersed magnetic field
- Backlit display with the indication of the acceleration level stabilization
- Internal rechargeable battery which allows 2 hours of continuous operation at 15.915 Hz and 7 hours of continuous operation at 159.155 Hz.

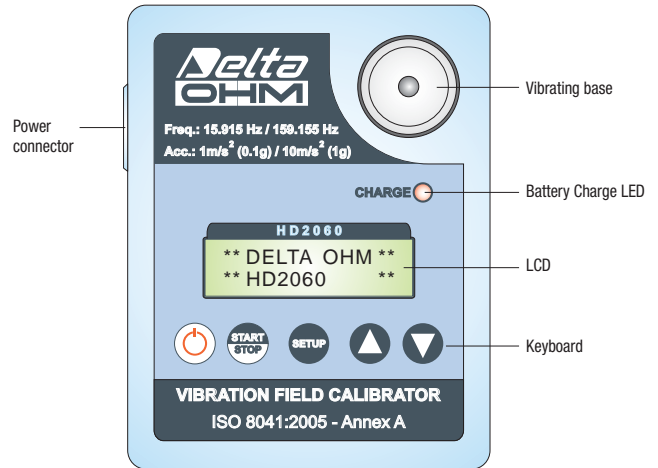


Fig. 1: Description

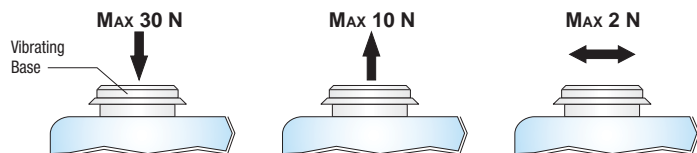
### SPECIFICATIONS

<b>Maximum load of the vibrating base</b>	Traction force: 10 N Pressure: 30 N Transverse: 2 N
<b>Mass of the transducer</b>	Maximum 150 g at 15,915 Hz Maximum 30 g at 159,155 Hz
<b>Emission frequency tolerance</b>	± 0,1%
<b>Emission amplitude tolerance</b>	± 3%
<b>Distortion</b>	Less than 3% at 15,915 Hz Less than 0,5% at 159,155 Hz
<b>Duration of individual emission</b>	Settable from 120 sec to 10 min . Automatic turn OFF
<b>Transverse acceleration</b>	Less than 10% at 15,915 Hz Less than 20% at 159,155 Hz
<b>Mounting of the transducer</b>	Threaded hole UNF 10-32 at 90° ±1°
<b>Working temperature/RH</b>	0...+40 °C / 0...85 %UR not condensing
<b>Stabilization time</b>	Less than 30 s
<b>Display</b>	Backlit with indication of: Frequency generated Acceleration generated Stabilization of the vibration Remaining battery charge Calibration deadline
<b>Power supply</b>	<b>Rechargeable</b> NiMH battery pack 1.2V x 4, capacity 1600 mA/h ( <b>BAT-40</b> ) Stabilized power supply voltage 100-240 Vac / 12 Vdc 1 A ( <b>SWD10</b> )
<b>Autonomy with full charged battery</b>	2 hours of continuous use at 15,915 Hz 7 hours of continuous use at 159,155 Hz
<b>Battery charging time</b>	4 hours at 12 Vdc 1A
<b>Auto power off</b>	After an inactive period of time equal to 3 times the time of solicitation set
<b>Dimensions</b>	115 x 93 x 63 mm
<b>Weight</b>	930 g including battery

## TRASDUCER MOUNTING

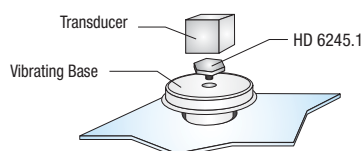
The calibrator HD2060 presents a flat circular steel fixing base (see Figure 1), resistant to abrasions, with a threaded hole in the center UNF 10-32 for the mounting of the transducers. The fixing base can freely rotate on its housing so as to avoid damage to the calibrator when mounting the sensors and applying the tightening. To fix the accelerometer using a screw it's sufficient a 1-2 Nm tightening force, compatible with a manual operation. For maximum measurements repeatability, the use of a torque wrench is recommended.

Maximum applicable forces to the fixing base are: 30 N pressure force, 10 N traction force and 2 N transverse force (see picture 2). **Applying a load which exceeds specified limits can permanently damage the HD2060 calibrator.**



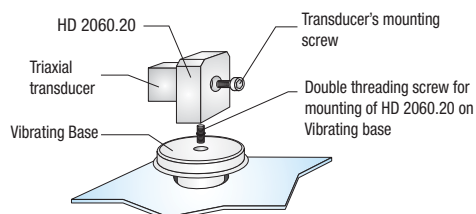
**Fig. 2: maximum load limits for vibrating base**

As an alternative to screw mounting, it's possible to fix the sensor onto vibrating base using double-sided tape, wax or quick glue; for this can be used the supplied insulated base HD6245.1 (see picture n.3) to be mounted between vibrating base and transducer. To avoid an excessive pressure on the vibrating base, we recommend to glue the transducer on the HD6245.1 adapter before screwing it to the vibrating base.



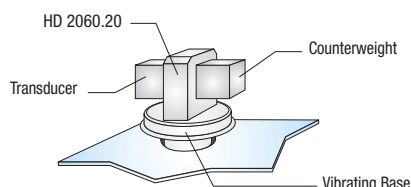
**Fig. 3: Adhesive Mounting**

To calibrate axes orthogonal to the mounting axis on triaxial accelerometers, is supplied the adapter HD2060.20, complete with UNF 10-32 dual threading screw to fix the adapter to the mounting base and screw with UNF 10-32 threading to fix the sensor to the adapter (see picture n 4).



**Fig. 4: Use of adapter HD 2060.20**

If you use the HD2060.20 adapter to calibrate at 16 Hz perpendicular axis of a triaxial accelerometer having a mass greater than 30 g, it is necessary to balance the load using a counterweight equal to that of the transducer to be mounted, as shown in figure 5.



**Fig. 5: Use of counterweights**

Calibrator must be placed on a flat horizontal surface, possibly free from external vibrations. In order to check that transmitted vibration level from supporting surface is negligible it is sufficient, after transducer has been fixed to the mounting base, to verify that acceleration on the measurement chain with calibrator turned OFF is below 1/5 of calibration level. For example, if a calibration has to be made at 15,915 Hz with 1 m/s<sup>2</sup> amplitude level, acceleration on the measurement chain when calibrator is OFF should be less than 0,2 m/s<sup>2</sup>.

During calibration solicitation it's necessary to avoid unbalances on the base, taking care of transducer's connection cable positioning, in order to minimize the transverse load. Transducer should be mounted so that the load is centered on the base.

## BATTERY CHARGE

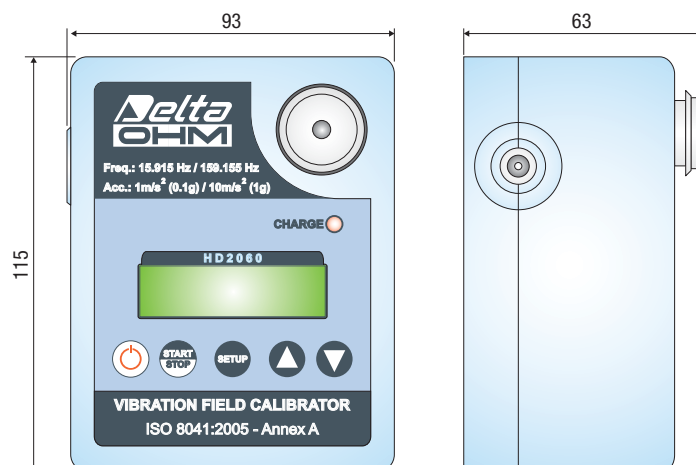
The battery symbol on the display continuously provides the charge battery status. As the battery discharges, the symbol "empties". When the charge is insufficient for correct device operation, the symbol starts blinking and it will be not possible to activate the emission of the vibrating base.

In order to charge the batteries, connect the SWD10 power supply to the input plug positioned on the calibrator's side. During battery charge, the "CHARGE" red LED is ON. The LED will turn OFF when the charge is completed. The time necessary for a full charge is about 4 hours.

Power supply has a dual function: supplies the device and charges the NiMH battery. When power supply is plugged in, the battery symbol on the display, is substituted by the symbol of a plug.

**In order to preserve over time the battery capacity, it is recommended to make a complete charge cycle at least one time every two months.**

## DIMENSIONS (mm)



## ORDERING CODES

**HD2060:** Portable calibrator for acceleration, velocity and displacement transducers. Double emission frequency 15.915 Hz (amplitudes 1 m/s<sup>2</sup> and 0.1 g) and 159.155 Hz (amplitudes 10 m/s<sup>2</sup> and 1 g). Backlit LCD display. Power supply with internal rechargeable battery or external 12Vdc power supply. Includes: support (HD2060.20) for triaxial accelerometers mounting, rechargeable internal battery (BAT-40), power supply (SWD10), carrying case and calibration report, HD6245.1 insulated base for adhesive mounting.

## Accessories

**SWD10:** Stabilized power supply 100-240 Vac / 12 Vdc 1 A.

**BAT-40:** Rechargeable NiMH battery pack 1,2 V x 4.

**HD6245.1:** Base with integrated UNF 10-32 screw. To be used for adhesive mounting

**HD2060.20:** Support for the lateral mounting of tri-axial accelerometers with 10-32 UNF mounting screw

