



NOISE & VIBRATION INDUSTRIAL HYGIENE SOLUTIONS

NOISE DOSIMETERS, HUMAN VIBRATION METERS, AND
SOUND LEVEL METERS

 **LARSON DAVIS**
A PCB DIVISION

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INDUSTRIAL NOISE ASSESSMENT

Industrial Hygienists and safety professionals responsible for protecting workers from dangerous levels of noise in the workplace often need to map sound levels in key parts of an industrial environment or throughout an entire plant. Sound maps – (often called sound surveys, noise surveys, or occupational noise surveys) – give health and safety professionals important information to begin the process of reducing worker noise exposure.

Task-based or job-based noise measurements are another component of industrial acoustics – the noise to which a worker is exposed in a given task is measured, and then a formula is used to calculate the overall noise exposure for the workday. An accurate, easy-to-use, IEC and ANSI compliant sound level meter is key to compiling useful sound level information. Octave bands provide information that can help identify noise source and select appropriate hearing protection.



SPARTAN™ SOUND LEVEL METER

SERIES 821

Spartan Sound Level Meter is an ideal tool for workplace noise exposure assessment and plant noise surveys. Fully compliant with IEC and ANSI standards for Class 1 or Class 2 sound level meters, Spartan supports ISO 9612:2009 measurement strategies for task or job-based measurements. Included software offers data visualization and streamlined results reporting.

- Large, responsive touch display
- Long battery life – up to 40 hours
- Built-in dosimetry tools
- Rugged design IP65 rated for dust and moisture
- Automatic data download via Bluetooth or USB options
- Flexible powering options, including wireless charging
- Optional 1/1 and 1/3 octave band analysis available
- Ready to measure in seconds with quick boot time
- Included software offers data analysis and reporting



PERSONAL NOISE EXPOSURE

Industrial Hygienists, EHS Consultants, and Safety Managers know that complying with noise exposure limits protects workers from permanent noise-induced hearing loss. Understanding actual noise levels experienced by individuals in the workplace is key to complying with guidelines established by OSHA, ISO, and other global directives. One way to determine whether an individual's noise exposure is within acceptable limits is to measure personal noise exposure with a noise dosimeter that meets IEC and ANSI noise dosimetry standards and provides exposure levels in an easy-to-understand format. Knowledge of a worker's daily noise exposure is critical information in mitigation of worker hearing loss risk, deployment of hearing conservation programs and engineering noise controls.



SPARTAN™ NOISE DOSIMETER

MODEL 730

With Spartan, control test setup, timers, and measurements for up to four virtual dosimeters on a single device wirelessly via the easy-to-read display and on-device navigation. For greater efficiency, perform these tasks wirelessly via low-energy Bluetooth from a PC or via the exclusive mobile app, LD Atlas™. Spartan facilitates faster, simpler, consistent operation designed to save time and money.

With LD Atlas, all essential tasks, including viewing real-time exposure data, exceedances, battery life, and measurement metrics, can be completed directly from your iOS® or Android® device. Monitor devices free from the worry of interfering with the work routine of the person being measured. Generate reports, including the full data file, from the mobile interface before sharing via email. Spartan Noise Dosimeters are configured with built-in wireless charging pads in a robust travel case and available in 1-, 3-, 5-, and 10-packs.

- Truly wireless using Bluetooth communication
- Programmable (on/off) LED alarm for exceedances or actions
- Built-in bump detection and motion detection
- Voice-to-text notations with LD Atlas app
- Optional Event Sound Recording (730-ESR)
- Optional 1/1 Octave Band filters (730-OB1)
- Optional Bluetooth disabling (730-NBT)



SPARTAN™ INTRINSICALLY SAFE NOISE DOSIMETER

MODEL 730IS

- All of the benefits of Spartan in an intrinsically safe design
- ATEX, UL 913, IECEx, FCC, CAN/CSA C22.2, MSHA approved

SPARTAN-IS SAFETY RATINGS/MARKINGS:



ATEX/IECEx
 II 1G Ex ia IIC T165 °C Ga ITS20ATEX205538X
 I 1M Ex ia I Ma -10 °C ≤ TAMB ≤ +50 °C
 IECEx ETL 19.0045X



CAN/USA
 Class I, Zone 0, AEx ia IIC Groups A, B, C & D,
 T165 °C Ga T165 °C
 Intertek Class I, Division 1, -10 °C ≤ TAMB ≤ +50 °C



APPROVAL NO. 18-A210001-0

PERSONAL VIBRATION EXPOSURE

Excessive exposure to vibration, whether through the whole body or confined to the hand and arm, has wide-ranging, harmful effects. For Industrial Hygienists, measuring a worker's exposure to vibration is key to avoiding vibration-related injury and illness. If measured vibration values are higher than action values specified in national and international standards, workers may be at a significant risk of injury. Low back and neck pain, vestibular issues, and hand-arm vibration syndrome are all serious consequences of human body vibration exposure. Human vibration measurement tools with built-in metrics linked to standards assist safety professionals in understanding risk and making smart decisions about exposure risks and actions or deployment of administrative or engineering controls.



HUMAN VIBRATION METER

MODEL HVM200

The HVM200 is a small, rugged human vibration meter with built-in Wi-Fi, designed to measure hand-arm, whole body, and general vibration. It includes the metrics and frequency weightings needed to measure human vibration. This three-channel meter meets the requirements of ISO 8041:2005 and measures per ISO 2631-1, -2, & -5 and ISO 5349 in support of the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), Vibration at Work Regulations 2005, and the directive 2002/44/EC. This makes the HVM200 an ideal choice to demonstrate compliance with human vibration requirements and regulations worldwide.

- Designed for hand-arm, whole body, and general vibration measurements
- Control and view data from LD Atlas mobile app
- Meets ISO criteria and EU directives
- Ergonomically designed mounting adaptors and application optimized ICP® accelerometers
- USB 2.0 and Wi-Fi
- Removable Micro SD Memory Card
- Replaceable Lithium Battery



LD ATLAS™ MOBILE APP

FOR SPARTAN & HVM200

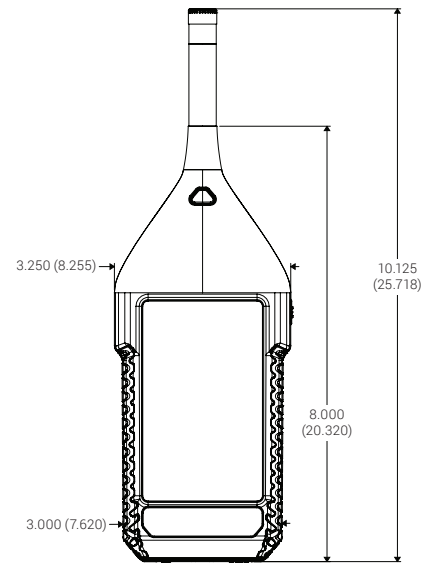
Install LD Atlas on your phone or tablet – available for both iOS and Android – and connect to your Spartan Series Sound Level Meter Series 821, Spartan Noise Dosimeter Series 730 and Human Vibration Meter Model HVM200. Use LD Atlas to easily check on the status of your meter, make setup changes for a new measurement, analyze data, listen to recorded audio files, and even create and share PDF reports.



SPECIFICATIONS

SPARTAN™ SOUND LEVEL METER

| SPECIFICATIONS | | | | |
|---------------------------------------|---|----------|--------|----------|
| Model | 721 IH | 721 IH-D | 821 IH | 821 IH-D |
| Class | 2 | 2 | 1 | 1 |
| Time History Logging | ✓ | ✓ | ✓ | ✓ |
| Measurement History | ✓ | ✓ | ✓ | ✓ |
| Dosimetry | ✓ | ✓ | ✓ | ✓ |
| OBA (1/1 and 1/3 Bands) | - | ✓ | - | ✓ |
| Dynamic Range (A-weighted typical) | 14 to 140 dB | | | |
| Time Weightings | Fast, Slow & Impulse | | | |
| Frequency Weightings | A, C & Z | | | |
| Data Storage (μSDHC card) | 8 GB standard Up to 256 GB | | | |
| Communication | USB-C, Bluetooth BLE 4.1 | | | |
| Display | 480 x 800 color with capacitive touch | | | |
| Power | Internal Lithium battery, USB-C or external 12 V | | | |
| Battery Recharge | Qi Wireless, USB-C, or external 12 V | | | |
| Runtime (internal battery @ 22 C) | 40 hours (display off) 15 hours (display on) | | | |
| External Power | 6 V to 24 V DC (600 mW w/display off) | | | |
| Ingress Protection | IP65 | | | |
| Logging | Time history: 1 s to 1 h Measurement History: 1 min to 6 h | | | |
| Metrics | Leq, Lmax, Lmin, Lpeak, Ln (6 values), Time above | | | |
| 1/1 and 1/3 Octave Metrics (Optional) | Leq, Lmax, Lmin | | | |
| Signal Output | AC/DC on 3.5 mm TRS jack | | | |
| Preamplifier | Removable PRM821 | | | |
| Operating Temperature | -30 to 60 °C | | | |
| Dimensions (H x W x D) | 10.1 x 3.3 x 1.3 inches 260 x 83 x 32 mm | | | |
| Weight | 12.1 oz (383 g) | | | |
| Filters (Optional) | | | | |
| Bandwidth | 1/1 and 1/3 Octaves | | | |
| Frequencies (base 10) | 1/1: 8 Hz to 16 kHz 1/3: 6.3 Hz to 20 kHz | | | |
| Standards Compliance | ANSI S1.11-2014 Class 1 IEC 61260:2014 Class 1 | | | |
| Standards | | | | |
| Acoustic | ANSI S1.4-2014 Class 1 IEC 61672-1:2013 Class 1 | | | |
| Noise Dosimetry | ANSI S1.25-1991 IEC 61252:2017 | | | |
| Safety | Directive 2014/35/EU IEC 61010-1:2010 RoHS Directive 2011/65/EU | | | |
| Approvals | CE, RoHS, WEEE | | | |



Outline Drawing - Front

Dimensions in inches (centimeters).



Meter Ports

SPARTAN NOISE DOSIMETER MODEL 730 AND INTRINSICALLY SAFE MODEL 730IS

| SPECIFICATIONS | |
|---|--|
| Performance | |
| Standards | ANSI S1.25-1991 (R2017), IEC 61252 Ed. 1.2 |
| Linear Operating Range | 52 – 140 dB rms A-weighted |
| Dynamic Range | 94 dB |
| Peak Range | 78 – 143 dB Peak, C-weighted |
| Peak Weightings | A, C, Z |
| RMS Weightings | A, C, Z |
| Time Weightings | Slow, Fast, Impulse |
| Frequency Range | 20 Hz to 10 kHz |
| Data Logging | Selectable 1 second or 1 minute samples |
| Logged data | L_{Aeq} , L_{Ceq} , L_{Cpeak} , L_{Zpeak} , L_{ASmax} , L_{AFmax} , TWA3, TWA5, Motion |
| Memory | 730: 32 GB internal; 730IS: 2 GB internal |
| Communications | Bluetooth Low Energy 4.1 USB 2.0 (Micro-B connector) |
| Battery | 730: Rechargeable Lithium Ion; 730IS: Rechargeable NiMH |
| Run Time | 730: 40 hours typical; 730IS: 30 hours typical |
| Charge Time | 730: 3 hours from full discharge; 730IS: 12 hours from full discharge |
| Charger | Qi-compliant wireless or USB |
| Compliance | CE, ROHS, WEEE |
| Motion | Overall motion percentage and bump |
| Languages | English, Spanish, Italian, French, Portuguese, German |
| Virtual Dosimeter | |
| Virtual Dosimeters | 4 independent with configurable LED indication |
| Exchange Rate | 3, 4, 5, 6 |
| Criterion Level | 70.0 to 100.0 dB |
| Threshold | 70.0 to 100.0 dB |
| Shift Time | 1 to 24 hours |
| Alarms | 2 independent with configurable indication |
| Measurement Results | Dose; ProjDose; L_{AVG} ; TWA(8); Proj TWA(8); Lex,8h; Lep,d; Proj Lep,d |
| Summary Measured Values (Common to all virtual dosimeters) | |
| $L_{\omega T}$ (SPL), $L_{\omega eq}$ (Leq), $L_{\omega pk}$ (Lpeak), $L_{\omega TMax}$ (Lmax), $L_{\omega TMin}$ (Lmin) where $\omega = A, C, \text{ or } Z$ frequency weighting T = F, S, or I time weighting Lpeak, Lmax, & Lmin including time of occurrence L_{C-A} : Exposure (Pa^2s & Pa^2h), Motion Exceedance count and time for 2 rms and 3 peak thresholds Overload count, duration, and percentage | |
| Mechanical | |
| Display | Color LCD 176 x 176 pixels, always on with low light sensor and front light |
| Ingress Protection | IP65 |
| Keys | Four buttons |
| Weight (including clips and windscreen) | 730: 112 g (4.2 oz.); 730IS: 130 g (4.6 oz.) |
| Dimensions | 85 x 54 x 39 mm (3.35 x 2.13 x 1.54 in.) dosimeter only |

| SPECIFICATIONS (CONTINUED) | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--------------------|------------------------|--------------------|---------------------|------|----|---|--------|------------|--------|----|---|--------|------------|--------|----|---|--------|------------|--------|----|----|--------|------------|--------|
| Microphone | ¼-inch Model 375A03 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Temperature | -10 to +50 °C (14 to 122 °F) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Humidity | Up to 90% RH, non-condensing | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/1 Octave Filters (optional) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standards | ANSI/ASA S1.11-2014; IEC 61260-1:2014 Class 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Filters | 31.5 Hz to 8 kHz | | | | | | | | | | | | | | | | | | | | | | | | | |
| Linear Operating Range | 42 to 140 dB @ 1 kHz | | | | | | | | | | | | | | | | | | | | | | | | | |
| Measured Results | L_{Zeq} (Leq), L_{ZTMax} (Lmax), L_{ZTMin} (Lmin) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Event Audio Recording (optional) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Format | 16-bit .wav | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sample Rate | 8 kHz | | | | | | | | | | | | | | | | | | | | | | | | | |
| Recording Time | Fixed: 2 s pre-trigger and 10 s post-trigger | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger Source | L_{AS} , L_{AF} , L_{CS} , L_{CF} , $L_{Aeq,1s}$, $L_{Ceq,1s}$ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trigger Level | 40 – 140 dB, selectable | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORDERING INFORMATION | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 730 | Spartan 730 noise dosimeter with one windscreen and two clips. Includes calibration certificate | | | | | | | | | | | | | | | | | | | | | | | | | |
| 730IS | Spartan 730IS intrinsically safe noise dosimeter with one windscreen and two clips. Includes calibration certificate | | | | | | | | | | | | | | | | | | | | | | | | | |
| 730-PKxx-EU* 730-PKxx-UK* 730-PKxx-US* | Complete Spartan 730 noise dosimeter kit that includes quantity 'xx' dosimeters and one USB to Bluetooth dongle. Each dosimeter includes one windscreen, two clips, and a calibration certificate.** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>'xx'</th> <th>Spartan 730 Dosimeters</th> <th>Calibrator (qty 1)</th> <th>Calibration Adapter</th> <th>Case</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>1</td> <td>CAL150</td> <td>1 x ADP109</td> <td>CCS056</td> </tr> <tr> <td>03</td> <td>3</td> <td>CAL150</td> <td>2 x ADP109</td> <td>CCS057</td> </tr> <tr> <td>05</td> <td>5</td> <td>CAL150</td> <td>2 x ADP109</td> <td>CCS058</td> </tr> <tr> <td>10</td> <td>10</td> <td>CAL150</td> <td>2 x ADP109</td> <td>CCS059</td> </tr> </tbody> </table> | 'xx' | Spartan 730 Dosimeters | Calibrator (qty 1) | Calibration Adapter | Case | 01 | 1 | CAL150 | 1 x ADP109 | CCS056 | 03 | 3 | CAL150 | 2 x ADP109 | CCS057 | 05 | 5 | CAL150 | 2 x ADP109 | CCS058 | 10 | 10 | CAL150 | 2 x ADP109 | CCS059 |
| 'xx' | Spartan 730 Dosimeters | Calibrator (qty 1) | Calibration Adapter | Case | | | | | | | | | | | | | | | | | | | | | | |
| 01 | 1 | CAL150 | 1 x ADP109 | CCS056 | | | | | | | | | | | | | | | | | | | | | | |
| 03 | 3 | CAL150 | 2 x ADP109 | CCS057 | | | | | | | | | | | | | | | | | | | | | | |
| 05 | 5 | CAL150 | 2 x ADP109 | CCS058 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 10 | CAL150 | 2 x ADP109 | CCS059 | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> - EU includes a Type C power plug for use in Europe - UK includes a Type G power plug for use in the UK - US includes a Type A power plug for use in North America | | | | | | | | | | | | | | | | | | | | | | | | | |
| 730-ESR | Option to add event sound recording | | | | | | | | | | | | | | | | | | | | | | | | | |
| 730-OB1 | Option to add 1/1 octave filters | | | | | | | | | | | | | | | | | | | | | | | | | |
| 730-NBT | Option to disable Bluetooth | | | | | | | | | | | | | | | | | | | | | | | | | |
| Accessories | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CAL150 | Class 2 calibrator, with user-selectable output 94 or 114 dB at 1 kHz, ½ in. opening with ¼ in. adaptor (ADP109) and calibration certificate included | | | | | | | | | | | | | | | | | | | | | | | | | |
| WS012-XX | Replacement windscreen for Spartan 730. Available in 1, 3, 5, 10, or 25 packs where XX is the number of windscreens | | | | | | | | | | | | | | | | | | | | | | | | | |
| 730-CLIPS | Replacement clip, quantity 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| CER-730 | ISO 17025 factory calibration and certification of Spartan | | | | | | | | | | | | | | | | | | | | | | | | | |
| CER-730-OBA | Calibration of 1/1 octave filters | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADP109 | Calibrator adaptor for ½ in. to ¼ in. opening. Used with Spartan | | | | | | | | | | | | | | | | | | | | | | | | | |
| DVX016 | USB to Bluetooth dongle used with Spartan | | | | | | | | | | | | | | | | | | | | | | | | | |

*730IS intrinsically safe version is available for these models (replace "730" with "730IS")

**Versions without CAL150 calibrator available

HUMAN VIBRATION METER MODEL HVM200

| GENERAL SPECIFICATIONS | |
|--|--|
| Input | |
| Input | ICP®, IEPE or CCP |
| Excitation Current | 2 mA |
| Input Connector | ¼-28 4-pin male |
| Input Linear Range | |
| Fc weighting | 0.2 mV to 5.0 V at 80 Hz |
| Wh weighting | 0.9 mV to 5.0 V at 16 Hz |
| Bandwidth | 0.4 Hz to 3000 Hz |
| Range | Single range |
| Calibration | TEDS or manual entry |
| Sample Rate | 7161.458 Hz |
| Measured Values | |
| Measurement Modes | Hand-arm, Whole-body, Vibration |
| Metrics by mode | |
| Vibration | RMS, Peak, Min, Max (x, y, z, & Σ) |
| Hand-arm | RMS, Peak, Min, MTVV, A(1), A(2), A(4), A(8) (x, y, z & Σ) |
| Whole-body | RMS, Peak, Min, MTVV, A(8), A(8)Exp, EP, VDV (x, y, z & Σ) |
| Frequency Weightings | |
| Vibration | Fa (0.4 Hz to 100 Hz), Fb (0.4 Hz to 1250 Hz), Fc (6.3 Hz to 1250 Hz) |
| Hand-arm | Wh |
| Whole-body | Wb, Wc, Wd, We, Wf, Wj, Wk, Wm |
| Measurement Units | m/s ² , cm/s ² , ft/s ² , in/s ² , g, dB |
| Time History (Logging) | |
| Store Interval | 1, 2, 5, 10, 20, 30 s; 1, 2, 5, 10, 20, 30 min; 1hr |
| Stored Values | RMS and peak for x, y, z & Σ |
| 1/1 and 1/3 Octave Filters (Optional) | |
| 1/1 Octave Filters | 0.5 Hz to 2000 Hz |
| 1/3 Octave Filters | 0.4 Hz to 2500 Hz |
| Weighting | Unweighted |
| Measured Values | RMS, Max |
| Compliance | IEC 61260-1:2014 Class 1 |
| | ANSI S1.11-2014 Part 1, Class 1 |
| Power Supply | |
| Internal Battery | Rechargeable Li-ion, user replaceable |
| External power | USB (PSA035) |
| Charge Time | 3.5 hours using PSA035 |
| Run Time | 12 hours (Connect to Wi-Fi) 9 hours (Access Point) |
| Communication | USB-B, Wi-Fi 802.11 b/g |
| Physical | |
| Dimensions (H x W x D) | 4.6 x 2.6 x 0.7 inches 118 x 67 x 18 mm |
| Weight (including battery) | 4.6 oz. (130 gm) |
| Environmental | |
| Operating Temperature | 14 °F to 122 °F (-10 °C to 50 °C) |
| Operating Humidity | 0 to 90% relative humidity, non-condensing |

| GENERAL SPECIFICATIONS (CONTINUED) | |
|---|--|
| Included Accessories | |
| PSA035 | 100 – 240 VAC to 5V USB power supply with adapters |
| BAT018 | Internal rechargeable lithium battery |
| Compliance | |
| ISO 8041:2005 Human response to vibration - Measuring instrumentation | |
| IEC 61010-1 (2010) Safety | |
| IEC 61326-1:2013 EMC | |
| IEC 61325-2-3:2013 EMC safety | |
| ISO 2631-1:1997 Whole-body vibration – General requirements | |
| ISO 2631-2:2003 Whole-body vibration –Vibration in buildings | |
| ISO 2631-4:2001 Whole-body vibration – Rotational motion | |
| ISO 2631-5:2004 Whole-body vibration –Vibration containing shocks | |
| ISO 5349-1:2001 Hand-transmitted vibration – General requirements | |
| ISO 5349-2:2001 Hand-transmitted vibration – Practical guidance | |
| EN 1032:2003 Mechanical vibration - Testing of mobile machinery | |
| ANSI S2.70 | |
| ORDERING INFORMATION | |
| HVM200 | 3-channel vibration meter for general and human vibration. Includes CBL217-01. Sensors not included |
| HVM200-HA-40F | Kit for hand-arm vibration includes HVM200, CCS047, CCS048-L, ADP081A, SEN040F & SWW-G4-HVM |
| HVM200-WB | Kit for whole body vibration includes HVM200, CCS047, SEN027 & SWW-G4-HVM |
| HVM200-ALL-40F | Kit for hand-arm and whole body vibration includes HVM200, CCS047, CCS048-L, ADP081A, SEN040F, SEN027 & SWW-G4-HVM |
| HVM200-0B3 | Option for 1/1 and 1/3 octave filters. Includes SWW-G4-HVM |
| HVM200-RAW | Option to record sampled waveforms for all three channels |
| SWW-G4-SDK | Software Development Kit |
| Optional Accessories | |
| CBL216 | ¼-28 4-pin to 4-pin mini connector for SEN026 |
| CBL217 | ¼-28 4-pin to ¼-28 4-pin, 5 ft. (1.5 m) cable |
| SEN020 | Triaxial accelerometer, 0.1 mV/(m/s ²), 10-32 fem thread |
| SEN026 | Triaxial accelerometer, 1 mV/(m/s ²), for ADP063 |
| SEN027 | Seat pad with triaxial accelerometer, 10 mV/(m/s ²) |
| SEN040F | Triaxial accelerometer, 0.1 mV/(m/s ²), for ADP080A, 81A and 82A |
| SEN041F | Triaxial accelerometer, 1 mV/(m/s ²), for ADP080A, 81A and 82A |
| ADP063 | Palm adapter for use with SEN026 |
| ADP080A | “T” adapter for use with SEN040F or SEN041F |
| ADP081A | Handle adapter for use with SEN040F or SEN041F |
| ADP082A | Circle clamp adapter for use with SEN040F or SEN041F |
| ADP084A | Kit including ADP080A, ADP081A, ADP082A and ADP063 |
| CCS047 | Hard shell case for HVM200 and accessories |
| CCS048-S | Small arm band for HVM200, fits arm circumference of 8 to 12.5 in. (20 to 32 cm) |
| CCS048-L | Large arm band for HVM200, fits arm circumference of 10.5 to 16.5 in. (27 to 42 cm) |
| 394C06 | Hand-held shaker, 9.81 m/s ² at 159.2 Hz |
| CER-HVM200 | Factory calibration of HVM200, does not include sensor |



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MD-0390-revG 0622