PRICE LIST
HEALTH & SAFETY IN THE WORKPLACE

01 / 2014

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

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Sales conditions 01/2014

INTRODUCTION Any commercial/business relation between Delta Ohm S.r.l. and the customer is exclusively governed by the following conditions of sale which replace and supersede any other agreement.

LIABILITY Delta Ohm S.r.l. shall not be liable for any direct or indirect damages arising from late or non delivery of the product, nor for the non-correspondence of the goods to the specifications published in the catalogue or for any other event.

TECHNICAL INFORMATION We reserve the right to change without notice the technical specifications and dimensions to fit the product's requirement.

MINIMUM AMOUNT The minimum amount per invoice, less the discount, is **EUR 260**. For orders of lower amounts, **EUR 40 NET** will be charged as costs of invoicing management.

ORDERS Only written orders received by e-mail or fax are accepted. Orders will be processed according to the customer's requirements, production plan permitting.

PRICES The prices here reported are meant "**NET**", VAT excluded, where expected, EX-WORKS, Incoterms 2010. Delta Ohm S.r.l. reserves the right to make any change without prior notice.

SHIPMENT AND DELIVERY Our Prices **DO NOT include** shipping charges, which are borne by the customer. Upon specific requests, shipping charges can be quoted and reported in the invoice, if agreed and accepted in writing. The late delivery of our products does not create any right or remedies to the customer.

CERTIFICATES ISO9001 Calibration Reports and ACCREDIA Certificates are upon payment and are not included in the price of the instrument, therefore they **have to be requested when ordering**, otherwise the instrument must be returned to our factory to be calibrated or certified. Once Certificates or Reports are issued, **it is not allowed to change the name of the addressee unless a new certification is performed upon payment**. If not required, the calibration points are at the discretion of the laboratory. Original certificates are included in the parcel with the instrument and in no case it will be possible to send them by e-mail or fax.

PAYMENTS In case of delayed payment, Delta Ohm Srl reserves the right to charge default interests of 5% above the "Prime Rate", in force at the date of billing.

RISK AND PROPERTY For goods shipped, the risk passes to the customer upon delivery to the carrier. The customer is responsible for procuring insurance. It is advisable to check the integrity of the parcel at receipt of the goods.

RIGHT OF WITHDRAWAL As required by the Legislative Decree 15 January 1992, n.50, the customer has the right to terminate the contract. The Customer wishing to exercise the "right of withdrawal" must send a written notice within 7 days from receipt of the goods by registered mail with return receipt to: Delta Ohm Srl, Via Marconi No. 5, 35030 Caselle di Selvazzano (PD), Italy. For the application of the right to withdraw, the integrity of products and packaging is essential. The cost of return shipment shall be borne by the customer. Delta Ohm S.r.l. returns the sum, except for any costs which are charged to the customer. **Goods shipped by unauthorized carriage forward will be rejected**.

REQUEST TO RETURN OF GOODS The request for return of goods must be sent to Delta Ohm Srl within 7 days from receipt of the goods by specifying the reason and quoting the Commercial Invoice. Delta Ohm Srl reserves the right to **charge EUR 40.00 (EUR 60.00 for sound level meters, vibration meters, instruments for the environmental analysis)** for inspection and re-packaging In any case, it is necessary to wait for the Return Merchandise Authorization (RMA) number from Delta OHM, which must also appear on the shipping documents. The goods must be shipped prepaid within one week of notification of the RMA number and must be intact, in its original packaging and complete with accessories. **Goods without any of the above requirements will be rejected**.

CHANGES AND CANCELLATIONS We will accept changes or cancellations of orders in progress after the written request ıe customer and written confirmation from Delta Ohm Srl, which reserves the right to charge the Customer the costs incurred in :paration of the instruments, normally equal to the 20% of the amount reported on the order or the invoice.

COMPLAINTS Any shipping errors or omissions of material should be reported promptly to Delta Ohm S.r.l., quoting the invoice number, within **7 days** from receipt.

WARRANTY Delta Ohm Srl is required to respond to the "factory warranty" only in cases provided by Presidential Decree May 24, 1988 224. Each instrument is sold after rigorous inspections, if any manufacturing defect is found, it is necessary to contact the distributor where the instrument was purchased. During the warranty period (24 months from date of invoice), all manufacturing defects found will be repaired free of charge. **Misuse, wear, neglect, theft and damage during transport are excluded**. **Solutions, probes, electrodes and microphones are not guaranteed** as the improper use, even for a few minutes, may cause irreparable damages. Delta Ohm Srl will repair those products that show technical defects of construction according to the terms and conditions of the warranty card included in the manual of the product. Warranty is not applied if changes, tampering or unauthorized repairs are found on the product, or for a use different from the one described in the technical documentation, or for lack or inefficient maintenance.

OUT OF WARRANTY REPAIRS EUR 40.00 (EUR 60.00 for sound level meters, vibration meters, instruments for environmental analysis) is charged for **technical inspection** of instruments sent for repair and not covered by warranty and for **request for quote or repair on instruments that do not show any anomaly**.

ORIGIN CERTIFICATE, consular visa, are not included, will be charged at cost

COMPETENCE For any dispute, refer to Padua jurisdiction. The Italian law is applied, according to the Vienna Convention (1980).

DATA TREATMENT INFORMATION Under art.13 of Lgs. Decree 30 June 2003, n.196, concerning "Personal data protection", Delta Ohm S.r.l., with headquarters in Via Marconi 5, Caselle di Selvazzano, 35030 Padova, informs you, as "Owner" of the data treatment, of the following: personal data are collected and processed with the only aim of answering to your requests. Data supplied are recorded on protected data media and on paper forms. Personal data will not be disclosed, they will be communicated to the banks for the execution of the payment. Please take note that Delta Ohm Srl will not be able to process the order if required data are not supplied. Responsible for the processing of personal data is Mr. Masut (info@deltaohm.com).

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ACOUSTICS

SOUND LEVEL METERS - MATRIX OF APPLICATIONS

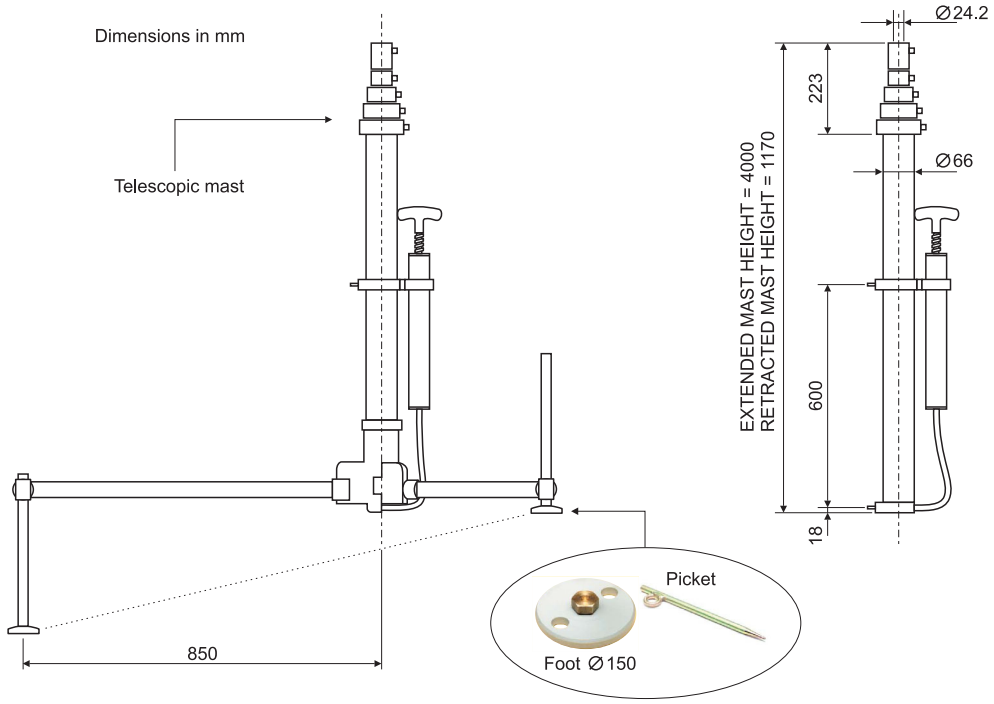
Model	Class	Linearity [dB]	Configuration	VEHICLES	WORK	MACHINES	ACOUSTIC INSULATION	MONITORING	ACOUSTIC POLLUTION	BUILDING	PAGE
HD2010UC	1 or 2	80	HD2010UC.Kit1 or HD2010UC.Kit2	●	●	●					6-7-12-13
HD2010UC	1 or 2	80	HD2010UC.Kit1 or HD2010UC.Kit2 + Advanced Data Logger	●	●	●		●			
HD2010UC/A	1 or 2	80	HD2010UC/A.Kit1 or HD2010UC/A.Kit2	●	●	●		●			8-9-14-15
HD2010UC/A	1 or 2	80	HD2010UC/A.Kit1 or HD2010UC/A.Kit2 + 1/3 Octave	●	●	●	●	●			
HD2010UC/A	1 or 2	80	HD2010UC/A.Kit1 or HD2010UC/A.Kit2 + Reverberation	●	●	●		●		●	
HD2010UC/A	1 or 2	80	HD2010UC/A.Kit1 or HD2010UC/A.Kit2 + 1/3 Octave + Reverberation	●	●	●	●	●		●	
HD2110L	1	110	HD2110L kit1	●	●	●		●			10-11
HD2110L	1	110	HD2110L kit1 + 1/3 Octave	●	●	●	●	●	●		
HD2110L	1	110	HD2110L kit1 + Reverberation	●	●	●		●		●	
HD2110L	1	110	HD2110L kit1 + 1/3 Octave + Reverberation	●	●	●	●	●	●	●	
HD2110L	1	110	HD2110L kit1 + 1/3 Octave + FFT	●	●	●	●	●	●		
HD2110L	1	110	HD2110L kit1 + 1/3 Octave + FFT + Reverberation	●	●	●	●	●	●	●	

HD2010UC class 1 - INTEGRATING SOUND LEVEL METER

I.N.RI.M. approved according to IEC 61672:2002

CODE	DESCRIPTION	EURO
HD2010UC.Kit1 	**Class 1 integrating sound level meter** kit with 4MB memory. Measurement range **30dB – 140 dB**, linear range **80 dB**. **Pre-polarized condenser ½" microphone**, **detachable**, optimized for free field measurements. **The kit DOES NOT INCLUDE the acoustic calibrator.** *Included:* o HD2010UC Class 1 sound level meter, o UC52/1 pre-polarized ½" condenser microphone and HD SAV windscreen, o HD2010PNE2 preamplifier, o HD2110USB cable (alternatively, on request, HD2110RS serial cable for RS232 connection), o **Noise Studio software** (*) and carrying case, o **ACCREDIA calibration certificate**, according to IEC 61672.	1430
OPTIONS AVAILABLE FOR HD2010UC.Kit1		
HD2010.O0	"**Memory module**": 4 MB expansion memory. **HD2010.O2 "Advanced Data Logger" option is required**.	50
HD2010.O2	"**Advanced Data Logger**": sound level profiles automatic recording, full statistical analysis, capture and analysis of sound events with trigger function, simultaneous data logging of profiles, reports and events. "Navigator" program for reviewing stored data.	460
HD2010.OR	"**Heated preamplifier**": replacement of the standard preamplifier HD2010PNE2 with the heated version HD2010PNE2W. The heated preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration and 5m integrated extension cable (10m on request).	40
	Version with 10m integrated cable.	75
ACCESSORIES AVAILABLE FOR HD2010UC.Kit1		
HD2020	Sound level calibrator class 1 according to IEC 60942:2003 with LCD display. Frequency 1000 Hz, levels 94 dB and 114 dB. **ACCREDIA calibration certificate included.**	600
HD2010PNE2	Preamplifier for UC52/1 microphones, equipped with CTC device for electrical calibration and driver for cable up to 10 m.	210
HD2010PNE2W	Heated preamplifier for UC52/1 microphones, with 5m integrated extension cable (10m on request). The preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration.	250
	Version with 10m integrated cable.	285

(*) ***"Noise Studio" software:***
Supplied with all the kits, it allows the instrument setup and to download and display, graphically or in a table form, the measures stored in the instrument. The displayed data can be printed and exported in Excel® and PDF formats. Optional software modules for specific applications are available (see pages 16-17). The modules extend the program basic functions and can be activated with license and hardware key (not included). A demo version of the application modules is included in the software.

CODE	DESCRIPTION	EURO
	ACCESSORIES AVAILABLE FOR HD2010UC.Kit1	
HDWME	Outdoor protection with windscreen, rain shield and bird spike. **Combinable with the HD2010PNE2W preamplifier.** Included: • windscreen HD SAV3 • bird spike HD WME1 • rain shield HD WME2 • stainless steel support HD WME3	550
CPA/5	5 m extension cable.	75
CPA/10	10 m extension cable.	100
VTRAP	Tripod with 1550 mm maximum height.	130
VTRAP.H4	Tripod with 4 m maximum height. Max. load 10 kg	1715
		
HD2110/SA	Support to fix the preamplifier to the tripod.	42
HD40.1	Portable serial thermal printer, SWD10 power supply included.	265
HD2110RS	RS232–M12 serial cable for PC or HD40.1 printer connection.	42
HD2110USB	USB–M12 serial cable for PC connection.	42
SWD10	Stabilized mains power supply 100-240 Vac/12 Vdc 1 A.	44
HD2010MC	Module for data logging and data download to MMC or SD type memory cards, 2 GB SD card included.	165

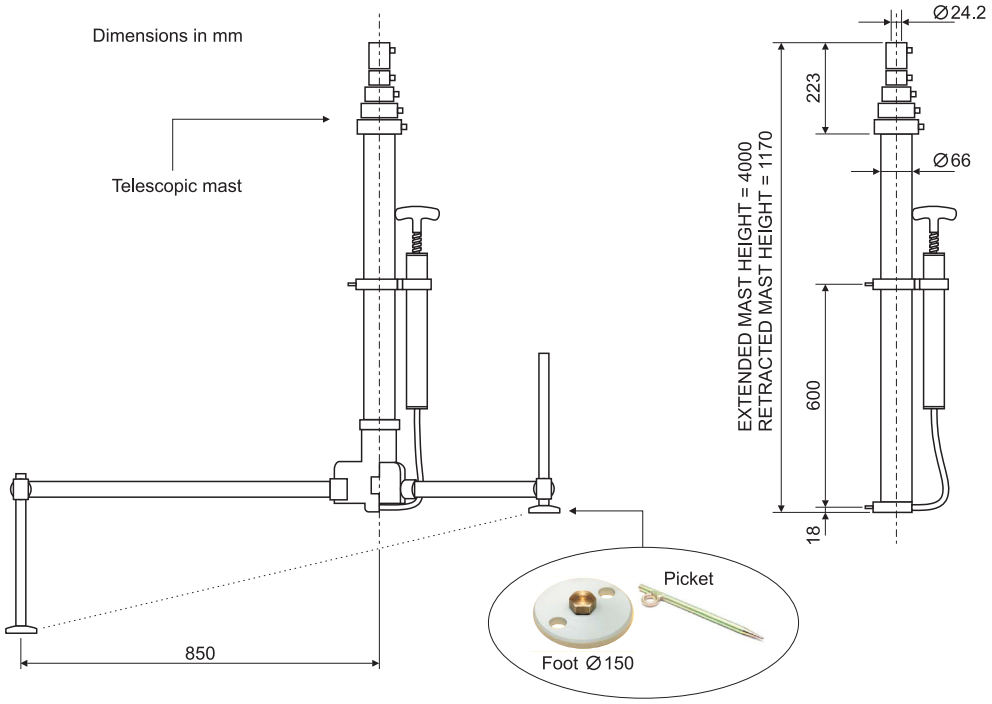
If, after purchase, it becomes necessary to perform noise spectral analyses, there is an upgrade (HD2010UC.U1) that transforms this sound level meter into HD2010UC/A model.

HD2010UC/A class 1 - INTEGRATING SOUND LEVEL METER AND ANALYZER

I.N.RI.M. approved according to IEC 61672:2002

CODE	DESCRIPTION	EURO
HD2010UC/A.Kit1 	**Class 1 integrating sound level meter and analyzer** kit with advanced data logging functions and 4 MB memory. Real-time spectral analysis, class 1 according to IEC61260:1997, **in octave bands from 32 Hz to 8 kHz**. Full **statistical analysis** with **calculation of percentile levels** from L_1 to L_{99}. **Capture and analysis of sound events** with trigger function. **Combined data logging: profiles, reports and events.** Measurement range **30 dB – 140 dB**, linear range **80 dB**. **Pre-polarized condenser ½" microphone**, **detachable**, optimized for free field measurements. **The kit DOES NOT INCLUDE the acoustic calibrator.** *Included:* o HD2010UC/A Class 1 sound level meter, o UC52/1 pre-polarized ½" condenser microphone and HD SAV windscreen, o HD2010PNE2 preamplifier, o HD2110USB cable (alternatively, on request, HD2110RS serial cable for RS232 connection), o **Noise Studio software** (*) and carrying case, o **ACCREDIA calibration certificate**, according to IEC 61672, of the chain consisting of sound level meter, HD2010PNE2 preamplifier and microphone. o **ACCREDIA calibration certificate**, according to IEC 61260, of the octave filters bank.	2200
OPTIONS AVAILABLE FOR HD2010UC/A.Kit1		
HD2010.O0	"**Memory module**": 4 MB expansion memory.	50
HD2010.O1	"**Third octave**": spectral analysis in third octave bands **from 25 Hz to 12.5 kHz**, class 1 according to IEC61260. **ACCREDIA Calibration certificate according to IEC61260 included.**	465
HD2010.O4	"**Reverberation time**": reverberation time measurement by source interruption and integration of pulse response method.	430
HD2010.OR	"**Heated preamplifier**": replacement of the standard preamplifier HD2010PNE2 with the heated version HD2010PNE2W. The heated preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration and 5m integrated extension cable (10m on request).	40
	Version with 10m integrated cable.	75
ACCESSORIES AVAILABLE FOR HD2010UC/A.Kit1		
HD2020	Sound level calibrator class 1 according to IEC 60942:2003 with LCD display. Frequency 1000 Hz, levels 94 dB and 114 dB. **ACCREDIA calibration certificate included.**	600

(*) ***"Noise Studio" software:***
Supplied with all the kits, it allows the instrument setup and to download and display, graphically or in a table form, the measures stored in the instrument. The displayed data can be printed and exported in Excel® and PDF formats. Optional software modules for specific applications are available (see pages 16-17). The modules extend the program basic functions and can be activated with license and hardware key (not included). A demo version of the application modules is included in the software.

CODE	DESCRIPTION	EURO
	ACCESSORIES AVAILABLE FOR HD2010UC/A.Kit1	
HD2010PNE2	Preamplifier for UC52/1 microphones, equipped with CTC device for electrical calibration and driver for cable up to 10 m.	210
HD2010PNE2W	Heated preamplifier for UC52/1 microphones, with 5m integrated extension cable (10m on request). The preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration.	250
	Version with 10m integrated cable.	285
HDWME	Outdoor protection with windscreen, rain shield and bird spike. **Combinable with the HD2010PNE2W preamplifier.** Included: • windscreen HD SAV3 • bird spike HD WME1 • rain shield HD WME2 • stainless steel support HD WME3	550
CPA/5	5 m extension cable.	75
CPA/10	10 m extension cable.	100
VTRAP	Tripod with 1550 mm maximum height.	130
VTRAP.H4	Tripod with 4 m maximum height. Max. load 10 kg	1715
		
HD2110/SA	Support to fix the preamplifier to the tripod.	42
HD40.1	Portable serial thermal printer, SWD10 power supply included.	265
HD2110RS	RS232–M12 serial cable for PC or HD40.1 printer connection.	42
HD2110USB	USB–M12 serial cable for PC connection.	42
SWD10	Stabilized mains power supply 100-240 Vac/12 Vdc 1 A.	44
HD2010MC	Module for data logging and data download to MMC or SD type memory cards, 2 GB SD card included.	165

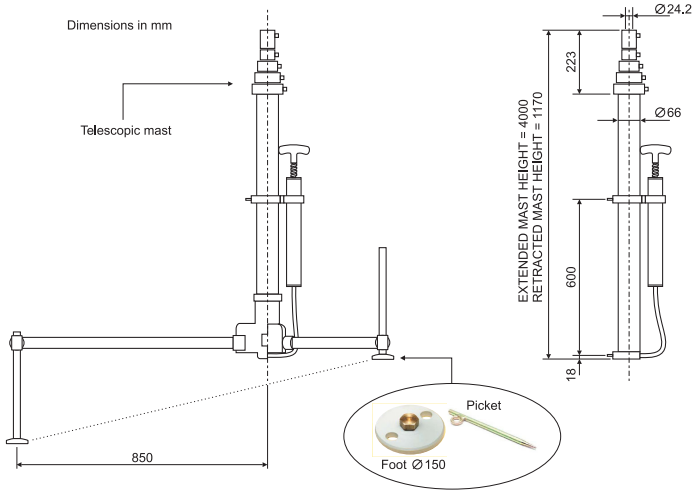
HD2110L class 1 - INTEGRATING SOUND LEVEL METER AND ANALYZER

I.N.RI.M. approved according to IEC 61672:2002

CODE	DESCRIPTION	EURO
HD2110L.Kit1 	**Class 1 integrating sound level meter and spectral analyzer** kit with advanced data logging function and 8 MB memory. Real-time **spectral analysis**, class 0 according to IEC61260:1997, in octave bands **from 16 Hz to 16 kHz**. Full **statistical analysis** with **calculation of percentile levels** from L_1 to L_{99}. **Capture and analysis of sound events** with trigger function. **Combined data logging: profiles, reports and events.** Measurement range **23 dB – 140 dB**, linear range **110 dB**. **50 mV/Pa detachable ½" condenser microphone MC21E**, pre-polarized, optimized for free field measurements WS2F (IEC61094-4). Alternatively, on request, microphone MC21P or MC22P polarized at 200 V. **The kit DOES NOT INCLUDE the acoustic calibrator.** *Included:* o HD2110L sound level meter, o MC21E pre-polarized ½" condenser microphone (alternatively MC21P or MC22P microphone polarized at 200 V) and HD SAV windscreen o HD2110PEL preamplifier (HD2110PL in combination with the microphone polarized at 200 V MC21P), o HD2110USB cable (alternatively, on request, HD2110RS serial cable for RS232 connection), o **Noise Studio software** (*) and carrying case, o **ACCREDIA calibration certificate**, according to IEC 61672, of the chain consisting of sound level meter, preamplifier and microphone. o **ACCREDIA calibration certificate**, according to IEC 61260, of the octave filters bank.	2840
OPTIONS AVAILABLE FOR HD2110L.Kit1		
HD2110.O1	"**Third octave**": spectral analysis with double bank of third octave **from 16 Hz to 20 kHz and from 14 Hz to 18 kHz** according to IEC61260. Evaluation of audibility of the spectral components by real-time comparison with the isophonic curves ISO 226:2003. **ACCREDIA Calibration certificate according to IEC61260 of the bank from 20 Hz to 20 KHz included.**	600
HD2110.O4	"**Reverberation time**": reverberation time measurement by source interruption and integration of pulse response method.	430
HD2110.O6	"**FFT**": 1/32s Short Leq profile and FFT spectral analysis over the entire audio range with variable resolution from 1.5 Hz to 100 Hz.	500
HD2110.OP	"**Polarized microphone**": replacement of the standard MC21E pre-polarized microphone and HD2110PEL preamplifier with the MC21P or MC22P microphone polarized at 200V and HD2110PL preamplifier.	No charge
HD2110.OR	"**Heated preamplifier**": replacement of the standard preamplifier HD2110PEL with the heated version HD2110PEWL. The heated preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration and 5m integrated extension cable (other lengths on request). **This option is available only in conjunction with standard MC21E pre-polarized microphone and is not compatible with the option HD2110.OP.**	40
	Version with 10m integrated cable.	75
	Version with 20m integrated cable.	125
	Version with 50m integrated cable.	275

(*) ***"Noise Studio" software:***

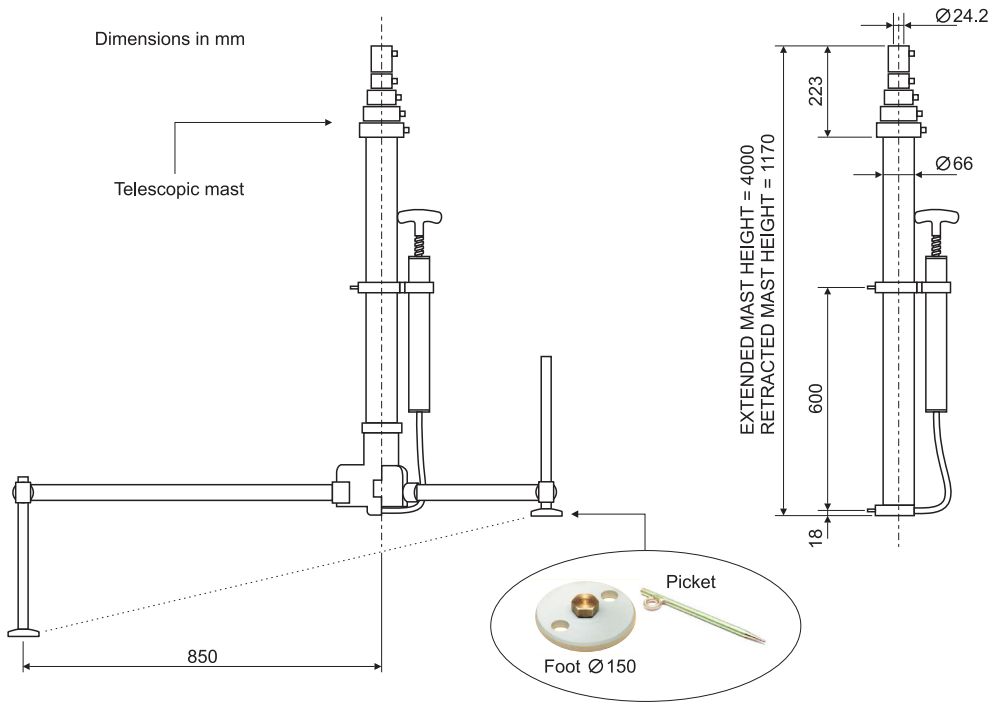
Supplied with all the kits, it allows the instrument setup and to download and display, graphically or in a table form, the measures stored in the instrument. The displayed data can be printed and exported in Excel® and PDF formats. Optional software modules for specific applications are available (see pages 16-17). The modules extend the program basic functions and can be activated with license and hardware key (not included). A demo version of the application modules is included in the software.

CODE	DESCRIPTION	EURO
	ACCESSORIES AVAILABLE FOR HD2110L.Kit1	
HD2020	Sound level calibrator class 1 according to IEC 60942:2003 with LCD display. Frequency 1000 Hz, levels 94 dB and 114 dB. **ACCREDIA calibration certificate included.**	600
HD2110PEL	Microphone preamplifier for MC21E pre-polarized microphones, equipped with CTC device for electrical calibration and driver for cable up to 100 m.	270
HD2110PL	Microphone preamplifier for MC21P and MC22P microphones polarized at 200V, equipped with CTC device for electrical calibration and driver for cable up to 100 m.	270
HD2110PEWL	Heated preamplifier for pre-polarized MC21E microphones, with 5m integrated extension cable (other lengths on request). The preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration and driver for cable up to 100 m.	310
	Version with 10m integrated cable.	345
	Version with 20m integrated cable.	395
	Version with 50m integrated cable.	545
MC21E	½" high stability pre-polarized condenser microphone, suitable for free field measurements. Compliant with IEC61094-4 WS2F type. Combinable with HD2110PEL and HD2110PEWL preamplifiers.	800
MC21P	½" high stability condenser microphone polarized at 200 V, suitable for free field measurements. Compliant with IEC61094-4 WS2F type. Combinable only with HD2110PL preamplifier.	800
MC22E	½" high stability pre-polarized condenser microphone, suitable for diffused field measurements. Compliant with IEC61094-4 WS2D type. Combinable with HD2110PEL preamplifier.	1150
MC22P	½" high stability condenser microphone polarized at 200 V, suitable for diffused field measurements. Compliant with IEC61094-4 WS2D type. Combinable only with HD2110PL preamplifier.	1150
HDWME	Outdoor protection with windscreen, rain shield and bird spike. **Combinable with the HD2010PEWL preamplifier.** Included: • windscreen HD SAV3 • bird spike HD WME1 • rain shield HD WME2 • stainless steel support HD WME3	550
CPA/5	5 m extension cable.	75
CPA/10	10 m extension cable.	100
CPA/20	20 m extension cable.	150
CPA/50	50 m extension cable.	300
VTRAP	Tripod with 1550 mm maximum height.	130
VTRAP.H4	Tripod with 4 m maximum height. Max. load 10 kg 	1715
HD2110/SA	Support to fix the preamplifier to the tripod.	42
HD40.1	Portable serial thermal printer, SWD10 power supply included.	265
HD2110RS	RS232–M12 serial cable for PC or HD40.1 printer connection.	42
HD2110USB	USB–M12 serial cable for PC connection. For sound level meters with M12 connector.	42
SWD10	Stabilized mains power supply 100-240 Vac/12 Vdc 1 A.	44
HD2010MC	Module for data logging and data download to MMC or SD type memory cards, 2 GB SD card included.	165

HD2010UC class 2 - INTEGRATING SOUND LEVEL METER

CODE	DESCRIPTION	EURO
HD2010UC.Kit2 	**Class 2 integrating sound level meter** kit with 4 MB memory. Measurement range **30 dB - 140 dB**, linear range **80 dB**. **Pre-polarized condenser ½" microphone**, **detachable**, optimized for free field measurements. **The kit DOES NOT INCLUDE the acoustic calibrator.** *Included:* o HD2010UC sound level meter, o UC52 pre-polarized ½" condenser microphone and HD SAV windscreen, o HD2010PNE2 preamplifier, o HD2110USB cable (alternatively, on request, HD2110RS serial cable for RS232 connection), o **Noise Studio software** (*) and carrying case, o **ACCREDIA calibration certificate**, according to IEC 61672, of the chain consisting of sound level meter, preamplifier and microphone.	1300
OPTIONS AVAILABLE FOR HD2010UC.Kit2		
HD2010.O0	"**Memory module**": 4 MB expansion memory. **HD2010.O2 "Advanced Data Logger" option is required**.	50
HD2010.O2	"**Advanced Data Logger**": sound level profiles automatic recording, full statistical analysis, capture and analysis of sound events with trigger function, simultaneous data logging of profiles, reports and events. "Navigator" program for reviewing stored data.	460
HD2010.OR	"**Heated preamplifier**": replacement of the standard preamplifier HD2010PNE2 with the heated version HD2010PNE2W. The heated preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration and 5m integrated extension cable (10m on request).	40
	Version with 10m integrated cable.	75
ACCESSORIES AVAILABLE FOR HD2010UC.Kit2		
HD2010PNE2	Preamplifier for UC52/1 microphones, equipped with CTC device for electrical calibration and driver for cable up to 10 m.	210
HD2010PNE2W	Heated preamplifier for UC52/1 microphones, with 5m integrated extension cable (10m on request). The preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration.	250
	Version with 10m integrated cable.	285

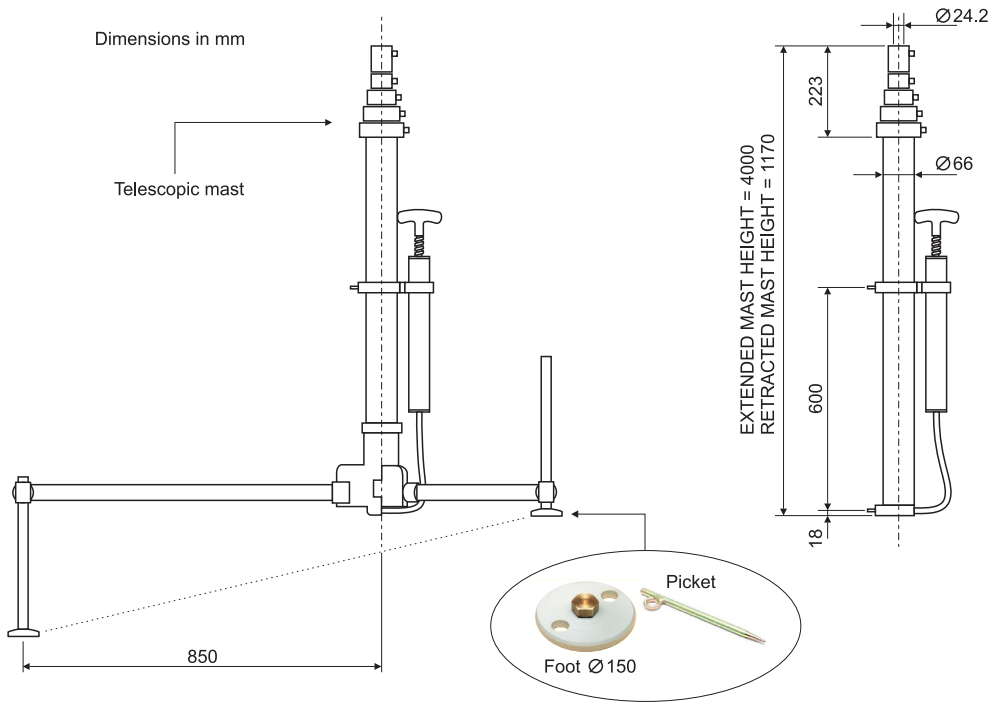
(*) ***"Noise Studio" software:***
Supplied with all the kits, it allows the instrument setup and to download and display, graphically or in a table form, the measures stored in the instrument. The displayed data can be printed and exported in Excel® and PDF formats. Optional software modules for specific applications are available (see pages 16-17). The modules extend the program basic functions and can be activated with license and hardware key (not included). A demo version of the application modules is included in the software.

CODE	DESCRIPTION	EURO
	ACCESSORIES AVAILABLE FOR HD2010UC.Kit2	
HDWME	Outdoor protection with windscreen, rain shield and bird spike. **Combinable with the HD2010PNE2W preamplifier.** Included: • windscreen HD SAV3 • bird spike HD WME1 • rain shield HD WME2 • stainless steel support HD WME3	550
CPA/5	5 m extension cable.	75
CPA/10	10 m extension cable for.	100
VTRAP	Tripod with 1550 mm maximum height.	130
VTRAP.H4	Tripod with 4 m maximum height. Max. load 10 kg	1715
		
HD2110/SA	Support to fix the HD2010PNE2 preamplifier to the tripod.	42
HD40.1	Portable serial thermal printer, SWD10 power supply included.	265
HD2110RS	RS232–M12 serial cable for PC or HD40.1 printer connection. For sound level meters with M12 connector.	42
HD2110USB	USB–M12 serial cable for PC connection. For sound level meters with M12 connector.	42
SWD10	Stabilized mains power supply 100-240 Vac/12 Vdc 1 A.	44
HD2010MC	Module for data logging and data download to MMC or SD type memory cards, 2 GB SD card included.	165

HD2010UC/A class 2 - INTEGRATING SOUND LEVEL METER

CODE	DESCRIPTION	EURO
HD2010UC/A.Kit2 	**Class 2 integrating sound level meter and analyzer** kit with data logging function and 4 MB memory. Real-time **spectral analysis**, class 1 according to IEC61260:1997, **in octave bands from 32 Hz to 8 kHz**. Full **statistical analysis** with **calculation of percentile levels** from L_1 to L_{99}. **Capture and analysis of sound events** with trigger function. **Combined data logging: profiles, reports and events.** Measurement range **30 dB – 140 dB**, linear range **80 dB**. **Pre-polarized condenser ½" microphone**, **detachable**, optimized for free field measurements. **The kit DOES NOT INCLUDE the acoustic calibrator.** *Included:* o HD2010UC/A sound level meter, o UC52 pre-polarized ½" condenser microphone and HD SAV windscreen, o HD2010PNE2 preamplifier, o HD2110USB cable (alternatively, on request, HD2110RS serial cable for RS232 connection), o **Noise Studio software** (*) and carrying case, o **ACCREDIA calibration certificate**, according to IEC 61672, of the chain consisting of sound level meter, preamplifier and microphone. o **ACCREDIA calibration certificate**, according to IEC 61260, of the octave filters bank.	1920
OPTIONS AVAILABLE FOR HD2010UC/A.Kit2		
HD2010.O0	"**Memory module**": 4 MB expansion memory.	50
HD2010.O1	"**Third octave**": spectral analysis in third octave bands **from 25 Hz to 12.5 kHz**, class 1 according to IEC61260. **ACCREDIA Calibration certificate according to IEC61260 included.**	465
HD2010.O4	"**Reverberation time**": reverberation time measurement by source interruption and integration of pulse response method.	430
HD2010.OR	"**Heated preamplifier**": replacement of the standard preamplifier HD2010PNE2 with the heated version HD2010PNE2W. The heated preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration and 5m integrated extension cable (10m on request).	40
	Version with 10m integrated cable.	75
ACCESSORIES AVAILABLE FOR HD2010UC/A.Kit2		
HD2010PNE2	Preamplifier for UC52/1 microphones, equipped with CTC device for electrical calibration and driver for cable up to 10 m.	210
HD2010PNE2W	Heated preamplifier for UC52/1 microphones, with 5m integrated extension cable (10m on request). The preamplifier is combinable with the microphone outdoor protection HDWME and is equipped with CTC device for electrical calibration.	250
	Version with 10m integrated cable.	285

(*) ***"Noise Studio" software:***
Supplied with all the kits, it allows the instrument setup and to download and display, graphically or in a table form, the measures stored in the instrument. The displayed data can be printed and exported in Excel® and PDF formats. Optional software modules for specific applications are available (see pages 16-17). The modules extend the program basic functions and can be activated with license and hardware key (not included). A demo version of the application modules is included in the software.

CODE	DESCRIPTION	EURO
	ACCESSORIES AVAILABLE FOR HD2010UC/A.Kit2	
HDWME	Outdoor protection with windscreen, rain shield and bird spike. **Combinable with the HD2010PNE2W preamplifier.** Included: • windscreen HD SAV3 • bird spike HD WME1 • rain shield HD WME2 • stainless steel support HD WME3	550
CPA/5	5 m extension cable.	75
CPA/10	10 m extension cable.	100
VTRAP	Tripod with 1550 mm maximum height.	130
VTRAP.H4	Tripod with 4 m maximum height. Max. load 10 kg	1715
		
HD2110/SA	Support to fix the HD2010PNE2 preamplifier to the tripod.	42
HD40.1	Portable serial thermal printer, SWD10 power supply included.	265
HD2110RS	RS232–M12 serial cable for PC or HD40.1 printer connection. For sound level meters with M12 connector.	42
HD2110USB	USB–M12 serial cable for PC connection. For sound level meters with M12 connector.	42
SWD10	Stabilized mains power supply 100-240 Vac/12 Vdc 1 A.	44
HD2010MC	Module for data logging and data download to MMC or SD type memory cards, 2 GB SD card included.	165

SOFTWARE

The DeltaLog5 software, for which updates are no longer available, has been replaced by the Noise Studio software downloadable from the web site www.deltaohm.com (Support ⇒ Software ⇒ Noise Studio).

The DeltaLog5 analysis software have been replaced by application modules of the Noise Studio software that can be enabled with license and CH20 hardware key; respectively:

- **DeltaLog 5 Monitor ⇒ NS4 - Module "Monitor"**
- **DeltaLog 5 Building ⇒ NS3 - Module "Acoustic Insulation"**
- **DeltaLog 5 Environment (R&A) ⇒ NS5 - Module "Environmental Noise"**

The application modules are available in demo version in the Noise Studio software supplied with the Delta Ohm sound level meters and vibration analyzers.

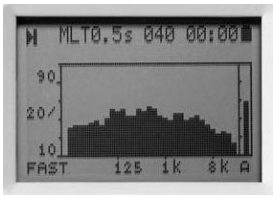
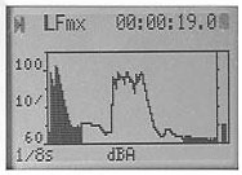
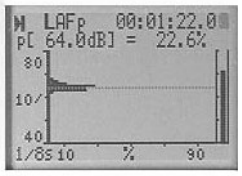
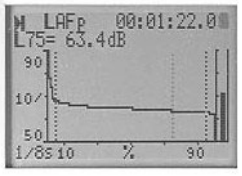
CODE	DESCRIPTION	EURO
Noise Studio	Software for PC with Windows® operating systems: supplied with the instrument, it allows the measurements setup and to download and display the measures graphically or in a table form. The measurements results can be printed and exported in Excel® and PDF formats. Optional software modules for specific applications are available. The modules extend the program basic functions and can be activated with license and hardware key (not included). A demo version of the application modules is included in the basic program.	**Supplied with sound level meters and vibration analyzers**
CH20	**Hardware key** for PC with Windows® operating systems. When connected to a USB port, it enables the use of the Noise Studio software modules. *Note*: **the key can be used with the software versions starting from 6.0. The key is not compatible with software versions older than 6.0**.	50
NS1	**"Workers protection" module** Analysis of the noise and vibrations exposure in the workplace in compliance with directives 2003-10-CE and 2002-44-CE, D.L. 81/2008, UNI 9432 and ISO 9612 normatives. Calculation of the exposure levels and related uncertainties and evaluation of the individual protection devices effectiveness, of the noise sources pulse index and of the presence of the DC-shift phenomenon in the hand-arm transmitted vibrations analysis. It can be used with HD2010UC, HD2010UC/A, HD2010, HD2010RE, HD2110 and HD2110L sound level meters, HD2030 and HD2070 vibration analyzers.	260
NS2A	**"Acoustic pollution" module** [(1)] Acoustic climate analysis on a daily, weekly and annual basis including road, railway and airport noise. The software performs statistical and spectral analyses and automatically identifies noisy events. The analyses are performed in compliance with the national (D.L. 194/2005 and D.M. 16/03/1998) and EU (2002/49/EC directive) legislation regarding the acoustic pollution and the mapping of the territory. It can be used with HD2010UC, HD2010UC/A, HD2010, HD2010RE, HD2110 and HD2110L sound level meters with data logging functions.	250
NS3	**"Acoustic insulation" module** Evaluation of the buildings passive acoustic requirements in compliance with the legislation in force (D.P.C.M. 5/12/1997). Calculation of rooms and auditoria reverberation time according to ISO 3382 and ISO 354 with functions for editing the decay curves. Calculation of partitions, fronts and lofts insulation in the laboratory and in place, in conformity with the ISO 140 normatives. Calculation of the insulation indexes according to ISO 717. Classification of the housing units according to UNI 11367:2010. Management by project and reporting of measurements, calculations and graphs. It can be used with HD2010UC/A, HD2010, HD2010RE, HD2110 and HD2110L sound level meters and spectrum analyzers. **The module is the updated version of the software DeltaLog5 Building**.	400

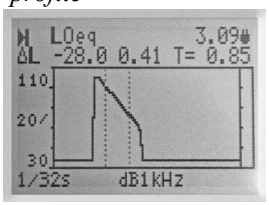
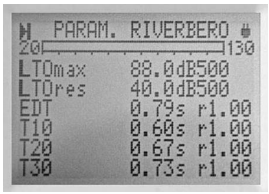
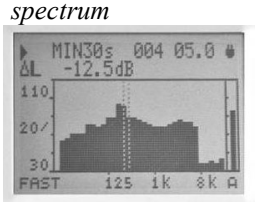
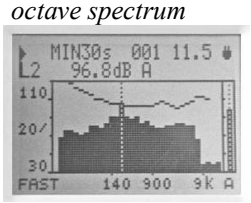
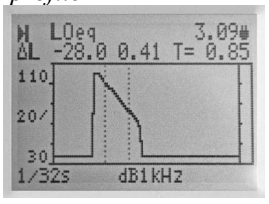
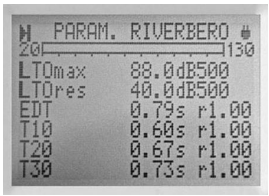
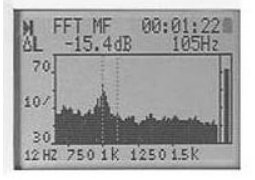
CODE	DESCRIPTION	EURO
NS4	**"Monitor" module** Acoustic monitoring and PC remote control. Programmed data acquisition, events identification and synchronized audio recording. It can be used with HD2010UC, HD2010UC/A, HD2010, HD2010RE, HD2110 and HD2110L sound level meters with data logging functions. **The module is the updated version of the software DeltaLog5 Monitor**.	250
NS5	**"Environmental noise" module** (*) Analysis of acoustic pollution and environmental noise sources. The software performs statistical and spectral analyses, manually and automatically identifies, by means of the trigger function, single and combined sources. Masking and automatic search for pulse and tonal components in compliance with the national (D.M. 16/03/1998) legislation regarding the acoustic pollution. Automatic report and comparison of the limits, both absolute and differential, according to the legislation in force. It can be used with HD2010UC/A, HD2010, HD2010RE, HD2110 and HD2110L sound level meters and spectrum analyzers with data logging functions. **The module is the updated version of the software DeltaLog5 Environment**.	250
	COMBINED SOFTWARE PACKAGES	
NSA	"**Environment**" modules kit, the following application modules are included: o NS2A - "Acoustic pollution" o NS5 - "Environmental noise"	450
NSLA	"**Work & Environment**" modules kit, the following application modules are included: o NS1 - "Workers protection" o NS2A - "Acoustic pollution" o NS5 - "Environmental noise"	600
NSAE	"**Environment & Building**" modules kit, the following application modules are included: o NS2A - "Acoustic pollution" o NS3 - "Acoustic insulation" o NS5 - "Environmental noise"	750
NSS	**Noise Studio** software complete with the following application modules: o NS1 - "Workers protection" o NS2A - "Acoustic pollution" o NS3 - "Acoustic insulation" o NS4 - "Monitor" o NS5 - "Environmental noise"	1200

(*) **The module NS2 "Acoustic pollution" included in the previous versions of the price list has been divided in two modules:**

- **NS2A "Acoustic pollution": acoustic climate analysis on a daily, weekly and annual basis and analysis of road, railway and airport noise, it can be used for long-term monitoring and acoustic mapping.**
- **NS5 "Environmental noise": analysis of environmental noise sources with identification of any pulse and tonal components.**

ACCESSORIES AND SPARE PARTS

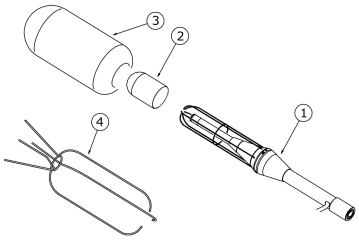
CODE	DESCRIPTION	EURO
	SOUND LEVEL METER KIT OPTIONS	
HD2010.O0	**"Memory module"**, to be installed at a later time after the purchase: • To double the sound level meter non-volatile memory. It can be installed ***only by the manufacturer*** in sound level meters: o HD2010UC o HD2010UC/A	50
HD2010.O1 *Third octave bands spectrum* 	**"Third octave":** • Third octave spectral analysis from 25 Hz to12.5 kHz according to IEC 61260. It can be installed ***only by the manufacturer*** in sound level meters: o HD2010UC/A **ACCREDIA Calibration certificate according to IEC 61260 included**	465
HD2010.O2 *LAFp profile at 1/8s*  *Probability distribution*  *Graph of percentile levels* 	**"Advanced Data Logger":** • Graphic screen with LAFp profile at 1/8s • Full statistical analysis with graphic screens for level distribution and percentiles. • Acquisition of event parameters with programmable trigger. • Continuous and at intervals data storage • Simultaneous data logging of profiles, reports and events. • Navigator program for reviewing stored data. It can be installed in sound level meters: o HD2010UC	460

CODE	DESCRIPTION	EURO
HD2010.O4 *Reverse Integration (Schroeder) of the decay profile*  *Reverberation times*  	**"Reverberation Time":** • Reverberation time measurement by both sound source interruption and integrated pulse response according to ISO 3382-1:2009 and ISO 3382-2:2008. It can be installed in sound level meters and analyzers: o HD2010UC/A	430
HD2110.O1 *Third octave standard spectrum*  *½ band moved third octave spectrum*  	**"Third octave":** • Third octave spectral analysis with double filter bank from 16 Hz to 20 kHz and from 14 Hz to 18 kHz. • Real time calculation of the isophonic curves according to ISO226:2003. It can be installed ***only by the manufacturer*** in sound level meters: o HD2110L **ACCREDIA calibration certificate according to IEC 61260 of the filter bank from 20 Hz to 20 KHz included**	600
HD2110.O4 *Reverse Integration (Schroeder) of the decay profile*  *Reverberation times*  	**"Reverberation Time":** • Reverberation time measurement by both sound source interruption and integrated pulse response according to ISO 3382-1:2009 and ISO 3382-2:2008. It can be installed in sound level meters and analyzers: o HD2110L	430
HD2110.O6 *FFT spectrum with 12Hz resolution*  	**"FFT":** • Narrow band spectral analysis over the entire audio spectral range with variable resolution from 1.5 Hz to 100 Hz. • Short Leq at 1/32 s intervals. It can be installed in sound level meters: o HD2110L	500

CODE	DESCRIPTION	EURO
	UPGRADE OF SOUND LEVEL METER KIT ***(To be performed by the manufacturer)***	
HD2010UC.U1	Upgrade of **HD2010UC with "Data Logger" option** **into** **HD2010UC/A** *Included*: o DSP with octave bands spectral analysis The presence of any other option is not relevant for the upgrade. **ACCREDIA calibration certificate of sound level meter according to IEC 61672 and octave filter bank according to IEC 61260 is included.**	660
HD2010.U1	Upgrade of **HD2010 with "Data Logger" option** **into** **HD2110L** *Included*: o Extension of linear dynamic to 110 dB o Preamplifier HD2110PEL or HD2110PL The presence of any other options is not relevant for the upgrade. **ACCREDIA calibration certificate of sound level meter according to IEC 61672 and octave filter bank according to IEC 61260 is included.**	820
HD2010.U2	Upgrade of **HD2010 with "Data Logger" and "Third octave" options** **into** **HD2110L with "Third octave – Double bank" option** *Included*: o Extension of linear dynamics to 110 dB o Preamplifier HD2110PL The presence of any other options is not relevant for the upgrade. **ACCREDIA calibration certificate of sound level meter according to IEC 61672 and octave and third octave filter bank from 20 Hz to 20 KHz according to IEC 61260 is included.**	1210
Upgrade LCD	Backlit LCD option for sound level meters with standard LCD without backlit.	185
Upgrade Memory Card HD2010MC 	Upgrade of sound level meter with mini-DIN serial connector to allow the connection of the memory card plus cable chosen from HD2110USB and HD2110RS *Included*: • Replacement of mini-DIN serial connector with M12 connector. • HD2110USB cable (alternatively, on request, HD2110RS serial cable for RS232 connection). • HD2010MC: MMC or SD memory cards reader with 2 GB SD type memory card.	300
	ACOUSTIC CALIBRATORS	
HD2020 	Sound level calibrator, class 1 according to IEC 60942:2003, with LCD display, **suitable for ½" standard microphones**. Does not require any correction for static pressure, humidity and temperature. Calibration frequency 1000 Hz, levels 94 dB and 114 dB. For all the sound level meters. **ACCREDIA calibration certificate according to IEC 60942 included.**	600

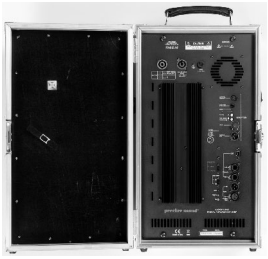
CODE	DESCRIPTION	EURO
	MICROPHONES	
	***PRE-POLARIZED CONDENSER MICROPHONES*** ***STANDARD ½" DIAMETER*** ***FREQUENCY RESPONSE OPTIMIZED FOR FREE FIELD MEASUREMENTS***	
UC52/1	**Pre-polarized** condenser microphone, ½" diameter, sensitivity 22.5 mV/Pa, optimized for **free field** measurements over the frequency range 20 Hz ÷ 16 kHz. Supplied with calibration card. **Compatible with the preamplifiers HD2010PNE2 and HD2010PNE2W.** For HD2010UC and HD2010UC/A **class 1**.	600
UC52	**Pre-polarized** condenser microphone, ½" diameter, sensitivity 22.5 mV/Pa, optimized for **free field** measurements over the frequency range 25 Hz ÷ 10 kHz. Supplied with calibration card. **Compatible with the preamplifiers HD2010PNE2 and HD2010PNE2W.** Supplied with calibration card. For HD2010UC and HD2010UC/A **class 2**.	415
MC21E	**Pre-polarized** condenser microphone, ½" diameter, sensitivity 50 mV/Pa, optimized for **free field** measurements over the frequency range 3.15 Hz ÷ 20 kHz. WS2F type capsule according to IEC61094-4:1995. **Compatible with the preamplifiers HD2110PEL and HD2110PEWL.** Supplied with calibration card. For HD2110L.	800
MC22E	**Pre-polarized** condenser microphone, ½" diameter, sensitivity 50 mV/Pa, optimized for **diffused field** measurements over the frequency range 3.15 Hz ÷ 12.5 kHz. WS2D type capsule according to IEC61094-4:1995. **Compatible with the preamplifier HD2110PEL.** Supplied with calibration card. For HD2110L.	1150
	***CONDENSER MICROPHONES POLARIZED AT 200V*** ***STANDARD ½" DIAMETER*** ***FREQUENCY RESPONSE OPTIMIZED FOR FREE OR DIFFUSED FIELD MEASUREMENTS***	
MC21P	Condenser microphone **polarized at 200V**, ½" diameter, sensitivity 50 mV/Pa, optimized for **free field** measurements over the frequency range 3.5 Hz ÷ 20 kHz. WS2F type capsule according to IEC61094-4:1995. **Insulated grid** for electrostatic calibration. **Compatible with the preamplifier HD2110PL.** Supplied with calibration card. For HD2110L.	800
MC22P	Condenser microphone **polarized at 200V**, ½" diameter, sensitivity 50 mV/Pa, optimized for **diffused field** measurements over the frequency range 3.5 Hz ÷ 12.5 kHz. WS2F type capsule according to IEC61094-4:1995. **Insulated grid** for electrostatic calibration. **Compatible with the preamplifier HD2110PL.** Supplied with calibration card. For HD2110L.	1150

CODE	DESCRIPTION	EURO
	***PREAMPLIFIERS***	
	The standard preamplifiers can be connected to the Delta Ohm sound level meters directly or through extension cables. A special optional accessory allows to fix the preamplifier to a tripod with standard support for cameras.	
PREAMPLIFIER FOR SOUND LEVEL METERS HD2010UC AND HD2010UC/A		
HD2010PNE2	Microphone preamplifier equipped with CTC device for electrical calibration and driver for cable up to 10 m. **For UC52/1 and UC52 pre-polarized microphones.**	210
PREAMPLIFIERS FOR SOUND LEVEL METER HD2110L		
HD2110PL	Microphone preamplifier **for MC21P and MC22P microphones polarized at 200V**, equipped with CTC device for electrical calibration and driver for cable up to 100 m.	270
HD2110PEL	Microphone preamplifier **for MC21E and MC22E pre-polarized microphones**, equipped with CTC device for electrical calibration and driver for cable up to 100 m.	270
	OUTDOOR HEATED PREAMPLIFIER	
	The heated preamplifiers are used for outdoor measurements and are connected to the sound level meter through the built-in cable. The accessory HD2110/SA allows to fix the preamplifier to a tripod with standard support for cameras. ***For the best effectiveness of the heating, the preamplifier should be placed with the weather protection in a vertical position.***	
HEATED PREAMPLIFIER FOR SOUND LEVEL METERS HD2010UC AND HD2010UC/A		
HD2010PNE2W	Heated preamplifier with 5 m (10 m on request) integrated extension cable. The preamplifier is combinable with the outdoor microphone protection HDWME and is equipped with CTC device for electrical calibration. **For UC52/1 and UC52 pre-polarized microphones.**	250
	Version with 10m integrated cable.	285
HEATED PREAMPLIFIER FOR SOUND LEVEL METER HD2110L		
HD2110PEWL	Heated preamplifier with 5 m (other lengths on request) integrated extension cable. The preamplifier is combinable with the outdoor microphone protection HDWME and is equipped with CTC device for electrical calibration. **For pre-polarized microphones (MC21E)**.	310
	Version with 10m integrated cable.	345
	Version with 20m integrated cable.	395
	Version with 50m integrated cable.	545
	***CABLES***	
	Extension cables to connect the microphone preamplifier to the sound level meter. ***The Delta OHM extension cables can only be used with Delta OHM sound level meters with standard and outdoor preamplifiers up to a maximum length of the connection between preamplifier and sound level meter equal to 10 m for the models HD2010UC and HD2010UC/A and equal to 100 m for the model HD2110L.***	
CPA/5	5 m extension cable.	75
CPA/10	10 m extension cable.	100
CPA/20	20 m extension cable. Only for HD2110PL, HD2110PEL and HD2110PEWL preamplifiers.	150

CODE	DESCRIPTION	EURO
CPA/30	30 m extension cable. Only for HD2110PL, HD2110PEL and HD2110PEWL preamplifiers.	200
CPA/50	50 m extension cable. Only for HD2110PL, HD2110PEL and HD2110PEWL preamplifiers.	300
	CABLES FOR CONNECTION TO PC	
HD2110CSNM 	RS232 null-modem serial cable with DB9 standard connector for PC or HD40.1 printer connection. **For sound level meters with 8-pole mini-DIN connector.**	42
C207	RS232 – USB converter **for sound level meters with mini-DIN connector**. The converter is supplied with CD with installation drivers for PC with Windows® operating systems.	70
HD2110USB	USB – M12 type serial cable for PC connection. **For sound level meters with M12 connector.**	42
HD2110RS	RS232 – M12 type serial cable for PC or HD40.1 printer connection. **For sound level meters with M12 connector.**	42
	ACCESSORIES AND SPARE PARTS	
HDSAV 	Windscreen for ½" microphone.	30
HDWME 	**Outdoor microphone protection** The unit consists of the following parts: • HDSAV3: windscreen (3) • HDWME1: bird spike (4) • HDWME2: rain shield (2) • HDWME3: stainless steel support with housing for preamplifier (1) 	550
HDSAV3	Windscreen for HDWME outdoor protection.	50
HDWME1	Bird spike for HDWME outdoor protection.	180
HDWME2	Rain shield for HDWME outdoor protection.	31
HDWME3	Preamplifier stainless steel housing and rain shield support for HDWME outdoor protection.	310
HD40.1 	24-column portable thermal printer. Serial RS232 input; paper width 57 mm, complete with SWD10 power supply. Null-modem RS232 serial cable with DB9 connector is required.	265
BAT-40	Spare battery pack for HD40.1 printer.	27
RCT	4 rolls of thermal paper, 57 mm width and 32 mm diameter.	7
SWD10	Stabilized mains power supply 100-240 Vac/12 Vdc 1 A.	44
HD2110/SA	Support to fix the preamplifier to the tripod.	42
VTRAP	Tripod with 1550mm maximum height.	130
HD2010MC 	Module for data logging and data download to MMC or SD up to 2 GB memory cards. 2 GB SD type memory card included.	165

SOUND SOURCES FOR BUILDING ACOUSTICS

CODE	DESCRIPTION	EURO
	TAPPING MACHINE	
HD2040 	Normalized impact noise generator in accordance with ISO 140-6, ISO 140-7, ISO 140-8, ASTM E492 and E1007 normatives. Supplied with: • rechargeable lithium-ion battery • built-in battery charger • radio remote control • instruction manual Optional carrying case.	3150
	TAPPING MACHINE ACCESSORIES	
HD2040-R	Additional radio remote control. Frequency 869.525 MHz. Power 6 mW.	300
HD2040-A	Additional radio remote control antenna.	40
HD2040-V	Machine carrying case.	310
HD2040-B	Spare rechargeable lithium-ion battery pack. Nominal voltage 7.2 V. Nominal capacity 2900 mAh.	62
	DODECAHEDRAL SOUND SOURCE	
HD2050 	Dodecahedral sound source in accordance with ISO 140-3 and ISO 3382 normatives. Supplied with: • HD2050.1.5 signal cable • HD2050.1.L cable • instruction manual • carrying case	2400
	DODECAHEDRAL SOUND SOURCE ACCESSORIES	
HD2050.1 	Stand for dodecahedron HD2050, with steering wheels, extensible and foldable. Minimum height 1300 mm, maximum height 2050 mm. Rod damping system. Supplied with protective bag.	245
HD2050.1.5	Signal cable, length 5 m.	132
HD2050.1.L 	L-shaped signal cable.	91
HD2050V	Carrying case for dodecahedron HD2050.	295

CODE	DESCRIPTION	EURO
	DIGITAL AMPLIFIER	
HD2050.20 	Digital amplifier with integrated parametric equaliser. Supplied with: • Podware software • flight-case • HD2050.20R radio remote control kit for controlling the HD2050.20 internal generator. Consisting of receiver (integrated in the amplifier) and transmitter with activation button. Transmission range up to 100 m. • HD2050.2 power supply cable • instruction manual	3100
	DIGITAL AMPLIFIER ACCESSORIES	
HD2050.1.5	Signal cable, length 5 m.	132
HD2050.20R	Radio remote control kit for controlling the HD2050.20 internal generator. Consisting of receiver and transmitter with activation button. Transmission range up to 100 m.	360
	SOUND SOURCE FOR FACADE INSULATION	
HD2050.30 	Directional sound source for facade insulation measurements. Supplied with: • instruction manual HD2050.1.5 signal cable not included.	820
	ACCESSORIES FOR THE SOUND SOURCE FOR FACADE INSULATION	
HD2050.30.1	Protective bag for the directional sound source.	70
HD2050.30.2	45° support for the HD2050.30 directional source. It allows to direct the loudspeaker to 45° and to hoist it on the HD2050.1 stand.	250
HD2050.1	Stand with steering wheels, extensible and foldable. Minimum height 1300 mm, maximum height 2050 mm. Rod damping system. Supplied with bag.	245
HD2050.1.5	Signal cable, length 5 m.	132
HD2050.20	Digital amplifier with integrated parametric equaliser. Supplied with: flight-case, HD2050.2 power supply cable and HD2050.20R radio remote control kit (receiver integrated in the amplifier).	3100
	SUBWOOFER	
HD2050.40 	Passive subwoofer. Supplied with: • steering wheels • instruction manual For the connection to the HD2050 dodecahedron it is necessary the signal cable HD2050.1.2 not included.	985
	SUBWOOFER ACCESSORIES	
HD2050.40.1	Extensible stand to mount the HD2050 dodecahedron on the subwoofer HD2050.40. Minimum height 1370 mm, maximum height 1970 mm (subwoofer + stand + wheels).	87
HD2050.1.5	Signal cable, length 5 m.	132
HD2050.1.2	Signal cable, length 2 m.	88

ISO 9001 CALIBRATION REPORTS

DELTA OHM INTEGRATING SOUND LEVEL METERS AND ACOUSTIC CALIBRATORS

CODE	DESCRIPTION	EURO
	Integrating sound level meter and acoustic Calibrator	
R.F3C	Calibration report for sound level meter (IEC61672 or alternatively IEC60651 and IEC60804), filter bank (IEC61260) and calibrator (IEC60942).	320
R.FC	Calibration report for sound level meter (IEC61672 or alternatively IEC60651 and IEC60804) and calibrator (IEC60942).	220
	Integrating sound level meter	
R.F	Calibration report for sound level meter (IEC61672 or alternatively IEC60651 and IEC60804).	175
R.8	Calibration report for octave filters (IEC61260).	110
R.3	Calibration report for third octave filters (IEC61260).	140
	Acoustic calibrator	
R.C	Calibration report for monofrequency calibrator (IEC60942).	90

MEANING OF CALIBRATION REPORTS AND CERTIFICATES CODES

R = Report
S = ACCREDIA LAT N° 124 certificate
F = Sound level meter
I = Integrating
3 = Third octave
8 = Octave
C = Acoustic calibrator
O = Other brands equipments

ACCREDIA LAT N° 124 CERTIFICATES

CODE	DESCRIPTION	EURO
	DELTA OHM sound level meter and acoustic calibrator kit	
S.FI38C	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804), acoustic calibrator (IEC60942) and octave and third octave filters (IEC61260).	420
S.FI3C	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804), acoustic calibrator (IEC60942) and third octave filters (IEC61260).	390
S.FI8C	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804), acoustic calibrator (IEC60942) and octave filters (IEC61260).	360
S.FIC	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804) and acoustic calibrator (IEC60942).	260
	Other brands sound level meter and acoustic calibrator kit	
S.OFC	Calibration of sound level meter (IEC60651) and acoustic calibrator (IEC60942).	310
S.OFIC	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804) and acoustic calibrator (IEC60942).	350
	DELTA OHM sound level meter	
S.FI38	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804) and octave and third octave filters (IEC61260).	370
S.FI3	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804) and third octave filters (IEC61260).	340
S.FI8	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804) and octave filters (IEC61260).	310
S.FI	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804).	210
	Other brands sound level meter	
S.OF	Calibration of sound level meter (IEC60651).	260
S.OFI	Calibration of integrating sound level meter (IEC61672 or alternatively IEC60651 and IEC60804).	300
	DELTA OHM calibrator	
S.C	Calibration according to IEC60942 of **mono-frequency calibrator** for ½" microphones.	115
	Other brands calibrator	
S.OC	Calibration according to IEC60942 of **mono-frequency calibrator** for ½" microphones or pistonphone.	115
S.OCM	Calibration according to IEC60942 of **multi-frequency calibrator B&K4226**.	350
	Microphone	
S.M	Calibration of **½" microphone**.	115
	DELTA OHM octave or third octave filter banks	
S.38	Calibration according to IEC61260 of octave or third octave **filter banks**.	200
S.3	Calibration according to IEC61260 of third octave **filter banks**.	170
S.8	Calibration according to IEC61260 of octave **filter banks**.	135

ACCREDIA LAT N° 124 CERTIFICATES

CODE	DESCRIPTION	EURO
	Other brands octave or third octave filter banks	
S.O38	Calibration according to IEC61260 of octave or third octave **filter banks**.	On request
S.O3	Calibration according to IEC61260 of third octave **filter banks**.	On request
S.O8	Calibration according to IEC61260 of octave **filter banks**.	On request

VIBRATION ANALYZERS

VIBRATION ANALYZERS

CODE	DESCRIPTION	EURO
HD2070.K1 	**3-channel vibration analyzer kit for IEPE accelerometers** • Measurement of the vibrations transmitted to the hand-arm system and to the whole body with Fa, Fc, and Fz band-pass filters and Wb, Wc, Wd, We, Wj, Wk, Wh, Wj, Wk, Wm filters compliant with ISO 8041, ISO 2631 and ISO 5349 requirements. • Data logging functions with **8 MB memory and 2 GB SD card.** • Octave bands from 0.5 Hz to 2 kHz and third octave bands from 0.3 Hz to 3.2 kHz real time spectral analysis of the acceleration according to IEC 61260 with velocity and displacement calculation (**"Spectral analysis" option**). • Statistical analysis with probability distribution graph, calculation and graphical display of the percentile levels from L_1 to L_{99} (**"Statistical analysis" option**). • Digital recording of the accelerometer signals (**"Digital recording" option**). • Recording of vocal comments associated to the measurements. • Measurement range **110 dB**, linear range 80 dB. • RS232 and USB serial interface. One tri-axial accelerometer or up to three mono-axial accelerometers can be connected to the analyzer. HD2070 is compliant with ISO 8041, ISO 2631, ISO 5349 and IEC 61260 normatives. **The options indicated in the description, the accelerometers, the connection cables and the adapters ARE NOT included in the kit.**	1700

The kit includes:

- **HD2070**: 3-axis vibration analyzer with data logging and storing of vocal comments.
- **HD6188**: Silicone grease.
- **HD6273**: Wax tray for accelerometers gluing.
- **080A90**: Glue for quick fixing.
- **HD2030MC**: 2 GB SD memory card.
- **CP22**: USB serial cable for PC connection. Alternatively it can be supplied on request the **HD2110CSNM** cable for RS232 (COM type) serial ports.
- **"Noise Studio" software** for PC with Windows® operating systems.
- User manual and carrying case.
- ISO 9001 calibration report for HD2070 vibration analyzer according to ISO 8041.

Options available for HD2070 analyzer

HD2070.O1	"**Spectral analysis**": measurement of the acceleration spectrum in octave bands from 0.5 Hz to 2 kHz and third octave bands from 0.5 Hz to 3.15 kHz class 1 according to IEC 61260. ISO9001 calibration report according to IEC 61260 of both banks included.	1000
HD2070.O2	"**Statistical analysis**": acceleration probability distribution graph and calculation of the percentile levels from L_1 to L_{99} in 1 dB classes.	200
HD2070.O3	"**Digital recorder**": digital storing of the accelerometer signals in the memory card for subsequent analyses.	300

CODE	DESCRIPTION	EURO
HD2030.K1 	**4-channel vibration analyzer kit for IEPE accelerometers** • Measurement of the vibrations transmitted to the hand-arm system and to the whole body with Fa, Fc, and Fz band-pass filters and Wb, Wc, Wd, We, Wj, Wk, Wh, Wj, Wk, Wm filters compliant with ISO 8041, ISO 5349 and ISO 2361 requirements. • Data logging functions with **8 MB memory and up to 2 GB SD card.** • Octave bands from 0.5 Hz to 2 kHz and third octave bands from 0.3 Hz to 3.2 kHz real time spectral analysis of the acceleration according to IEC 61260 with velocity and displacement calculation. • Statistical analysis with probability distribution graph, calculation and graphical display of the percentile levels from L_1 to L_{99}. • Digital recording of the accelerometer signals. • Recording of vocal comments associated to the measurements. • Measurement range **110 dB**, linear range 80 dB. • RS232 and USB serial interface. One tri-axial and one mono-axial accelerometer or up to four mono-axial accelerometers can be connected to the analyzer. HD2030 is compliant with ISO 8041, ISO 2631, ISO 5349 and IEC 61260 normatives. **The accelerometers, the connection cables and the adapters ARE NOT included in the kit.**	3100

The kit includes:

- **HD2030**: 4-axis vibration analyzer complete with octave and third octave bands spectral analysis and statistical analysis. Digital recording of the accelerometer signals in the memory card and storing of vocal comments.
- **HD6188**: Silicone grease.
- **HD6273**: Wax tray for accelerometers gluing.
- **080A90**: Glue for quick fixing.
- **HD2030MC**: 2 GB SD memory card.
- **CP22**: USB serial cable for PC connection. Alternatively it can be supplied on request the **HD2110CSNM** cable for RS232 (COM type) serial ports.
- **"Noise Studio" software** for PC with Windows® operating systems.
- User manual and carrying case.
- ISO 9001 calibration reports for HD2030 vibration analyzer:
  - Calibration as vibration meter according to ISO 8041
  - Calibration of the octave filters from 0.5Hz to 2kHz according to IEC 61260
  - Calibration of the third octave filters from 0.3Hz to 3.15kHz according to IEC 61260

VIBRATION ANALYZERS

KIT WITH ACCELEROMETERS FOR MEASUREMENTS IN THE WORKPLACE

CODE	DESCRIPTION	EURO
HD2070.HA-WB 	**Kit for 3-axis measurement of the vibrations transmitted to the hand-arm system and to the whole body with rubber pad for the measurement of the vibrations transmitted through seats and backs.** The kit includes the 3-channel vibration analyzer HD2070 and two tri-axial accelerometers with seat pad. **The kit INCLUDES the adapters for the mounting of the accelerometer for hand-arm measurements.**	5700

The kit includes:

- **HD2070**: 3-axis vibration analyzer with data logging and storing of vocal comments. Includes:
  - Silicone grease **(HD6188)**, wax (**HD6273)** and glue (**080A90)** for accelerometers.
  - 2 GB SD memory card (**HD2030MC)** and USB serial cable (**CP22**) for the connection to PC. Alternatively, the HD2110CSNM cable for RS232 (COM type) serial ports can be supplied on request.
  - "**Noise Studio**" software for PC with Windows® operating systems, user manual and carrying case.
  - Calibration reports as vibration analyzer according to ISO 8041.

- **HDP356B41 IEPE tri-axial accelerometer with 100 mV/g sensitivity** for the measurement of the vibrations transmitted to the whole body (range ±10 g, weight 13 g approx.) integrated in a rubber pad for the measurement of the acceleration transmitted through the seat and back. Includes:
  - 270 g rubber pad for the measurement of the acceleration transmitted through the seat and back with 3 m **HD2030.CAB3-3M** cable (other lengths on request) for the connection to the input of the HD2070 analyzer.
  - Manufacturer **calibration document** and **ISO 9001 calibration report** of the vibration analyzer – accelerometer chain with filters Wd, Wd, Wk respectively for the axes x, y and z.

- **HDP356A02 IEPE tri-axial accelerometer with 10 mV/g sensitivity** for the measurement of the vibrations transmitted to the hand-arm system (range ±500 g, weight 10 g approx.). Includes:
  - The 10-32 UNF and M6 mounting screws made of copper-beryllium alloy (**081B05** and **M081B05**).
  - **HD2030.CAB3-3M**: 3m cable (other lengths on request) for the connection to the right input (tri-axial) **of the HD2070 analyzer**.
  - Manufacturer **calibration document** and **ISO 9001 calibration report** of the three axes of the vibration analyzer – accelerometer chain with filter Wh.

- **Accelerometer mounting adapters (HD2030.124)** for hand-arm measurements. Includes:
  - **HD2030.AC1**: cube-shaped adapter for anatomical handles and small size tools. To be fastened with plastic cable-tie or metallic clamp (included) to the handle.
  - **HD2030.AC2**: adapter for cylindrical handles. The accelerometer is placed laterally with respect to the hand.
  - **HD2030.AC4**: general use adapter. The accelerometer is placed between the forefinger and the middle-finger or between the middle-finger and the ring-finger of the hand.

Options available for HD2070 analyzer

HD2070.O1	"**Spectral analysis**": measurement of the acceleration spectrum in octave bands from 0.5 Hz to 2 kHz and third octave bands from 0.5 Hz to 3.15 kHz class 1 according to IEC 61260. ISO9001 calibration report according to IEC 61260 of both banks included.	1000
HD2070.O2	"**Statistical analysis**": acceleration probability distribution graph and calculation of the percentile levels from L_1 to L_{99} in 1 dB classes.	200
HD2070.O3	"**Digital recorder**": digital storing of the accelerometer signals in the memory card for subsequent analyses.	300

KIT WITH ACCELEROMETERS FOR MEASUREMENTS IN THE WORKPLACE

CODE	DESCRIPTION	EURO
HD2030.HA-WB 	**Kit for 4-axis measurement of the vibrations transmitted to the hand-arm system and to the whole body with rubber pad for the measurement of the vibrations transmitted through seats and backs.** The kit includes the 4-channel vibration analyzer HD2030 complete with spectral and statistical analysis with two tri-axial accelerometers with seat pad. **The kit INCLUDES the adapters for the mounting of the accelerometer for hand-arm measurements.**	6800

The kit includes:

- **HD2030**: 4-axis vibration analyzer complete with spectral and statistical analysis. Digital recording of the accelerometer signals in the memory card and storing of vocal comments. Includes:
  - Silicone grease **(HD6188)**, wax (**HD6273)** and glue (**080A90)** for accelerometers.
  - 2 GB SD memory card (**HD2030MC)** and USB serial cable (**CP22**) for the connection to PC. Alternatively, the HD2110CSNM cable for RS232 (COM type) serial ports can be supplied on request.
  - "**Noise Studio**" software for PC with Windows® operating systems, user manual and carrying case.
  - Calibration reports for vibration analyzer and octave and third octave filters according to ISO 8041 and IEC 61260.

- **HDP356B41 IEPE tri-axial accelerometer with 100 mV/g sensitivity** for the measurement of the vibrations transmitted to the whole body (range ±10 g, weight 13 g approx.) integrated in a rubber pad for the measurement of the acceleration transmitted through the seat and back. Includes:
  - 270 g rubber pad for the measurement of the acceleration transmitted through the seat and back with 3 m **HD2030.CAB3-3M** cable (other lengths on request) for the connection to the right input (tri-axial) of the HD2030 analyzer.
  - Accelerometer calibration document and calibration report of the chain with filters Wd, Wd, Wk (axes x, y and z).

- **HDP356A02 IEPE tri-axial accelerometer with 10 mV/g sensitivity** for the measurement of the vibrations transmitted to the hand-arm system (range ±500 g, weight 10 g approx.). Includes:
  - The 10-32 UNF and M6 mounting screws made of copper-beryllium alloy (081B05 and M081B05).
  - **HD2030.CAB3-3M**: 3m cable (other lengths on request) for the connection to the right input (tri-axial) of the HD2030 analyzer.
  - Accelerometer calibration document and calibration report of the chain with filter Wh.

- **Accelerometer mounting adapters (HD2030.124)** for hand-arm measurements. Includes:
  - **HD2030.AC1**: cube-shaped adapter for anatomical handles and small size tools. To be fastened with plastic cable-tie or metallic clamp (included) to the handle.
  - **HD2030.AC2**: adapter for cylindrical handles. The accelerometer is placed laterally with respect to the hand.
  - **HD2030.AC4**: general use adapter. The accelerometer is placed between the forefinger and the middle-finger or between the middle-finger and the ring-finger of the hand.

SOFTWARE

"Noise Studio" software:
Supplied with the instrument, it allows the instrument setup and to download and display, graphically or in a table form, the measures stored in the instrument. The measurement results can be printed and exported in Excel® and PDF formats. Optional software modules for specific applications are available. The modules extend the program basic functions and can be activated with license and hardware key (not included). A demo version of the application modules is included in the software

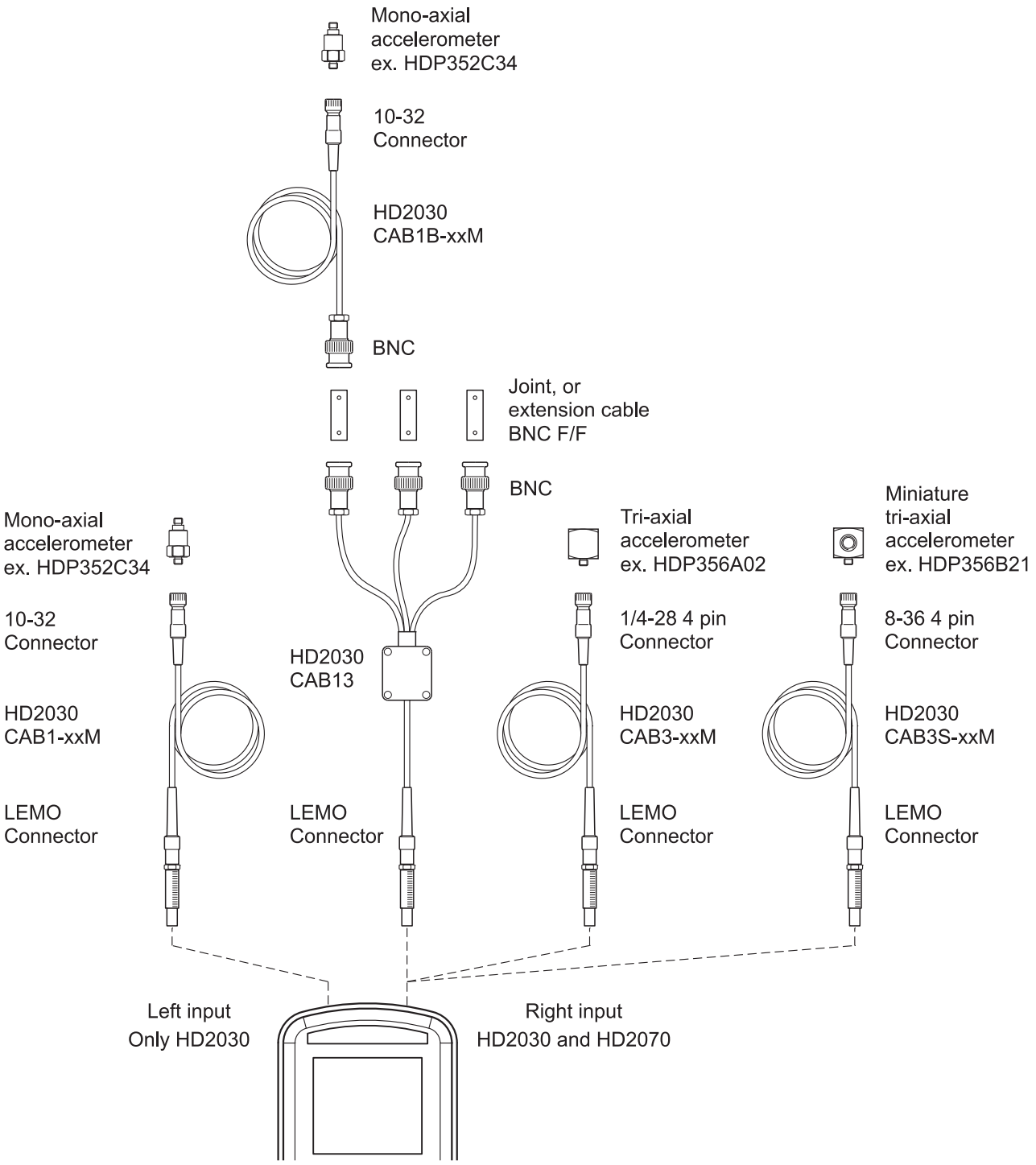
"Noise Studio" software: application modules

The use of the application modules requires the hardware key (code CH20)

FOR FURTHER INFORMATION ON APPLICATION MODULES AVAILABILITY SEE PAGES 16-17.

CODE	DESCRIPTION	EURO
	ACCESSORIES	
HD2060 	**Portable calibrator for vibrating chains** with frequency 15.915 Hz and levels 1 m/s^2 and 0.1 g, and frequency 159.155 Hz and levels 10 m/s^2 and 1 g. With LCD display. Includes: • HD2060.20: support with UNF 10-32 screw for mounting tri-axial accelerometers • HD6245.1: insulated base with integrated UNF 10-32 screw for mounting the accelerometers with adhesive • BAT-40: 1.2 V x 4 NiMH rechargeable battery pack • SWD10: stabilized mains power supply 100-240 Vac / 12 Vdc – 1A • Carrying case • Calibration report	1800
HD6245.1	Insulated adhesive base with integrated 10-32 UNF screw	42
HD2060.20	Support for the lateral mounting of tri-axial accelerometers with 10-32 UNF mounting screw	32
HD2030MC	2 GB SD type memory card.	25
HD2030AM	Earphone with microphone. The device is equipped with volume control.	30
SWD10	Stabilized mains power supply 100-240 Vac/12 Vdc 1 A.	44
VTRAP	Tripod with 1550 mm maximum height.	130
HD40.1 	24-column portable thermal printer with RS232 serial interface. Paper width 57 mm. Powered by four 1.2 V NiMH rechargeable batteries. Connected to the analyzer through the cable HD2110CSNM (not supplied). *Includes:* • SWD10: stabilized mains power supply 100-240 Vac/12 Vdc 1 A • 5 rolls of thermal paper • user manual.	265
BAT-40	Spare battery pack for HD40.1 printer with integrated temperature sensor.	27
RCT	Kit including four rolls of thermal paper for HD40.1 printer. Width 57 mm, diameter 32 mm.	7
HD2110CSNM 	8-pole MiniDin – 9-pole sub D female connection cable for PC with RS232C input (COM type port) and for the connection of the HD40.1 printer.	42
CP22 	Serial connection cable for PC with USB interface. USB type A connector on the PC side and USB type B connector on the instrument side.	42

CONNECTION CABLES OF THE ACCELEROMETERS TO THE HD2030 AND HD2070 ANALYZERS



CODE	DESCRIPTION	EURO
	CABLES FOR MONO-AXIAL ACCELEROMETERS	
HD2030.CAB1-3M	Low noise coaxial cable for the connection of **mono-axial accelerometers** to the left input of the analyzer. **Length 3 m** and connectors: • Accelerometer side: SMA 10-32 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDD3056B2, HDD3200B5T and HDP352C34.	200
HD2030.CAB1-5M	Low noise coaxial cable for the connection of **mono-axial accelerometers** to the left input of the HD2030 analyzer. **Length 5 m** and connectors: • Accelerometer side: SMA 10-32 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDD3056B2, HDD3200B5T and HDP352C34.	220
HD2030.CAB1-10M	Low noise coaxial cable for the connection of **mono-axial accelerometers** to the left input of the HD2030 analyzer. **Length 10 m** and connectors: • Accelerometer side: SMA 10-32 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDD3056B2, HDD3200B5T and HDP352C34.	260
HD2030.CAB13	Cable for the connection of three mono-axial accelerometers to the right input (tri-axial) of the HD2030 analyzer. Length 40 cm and connectors: • Accelerometers side: 3 BNC male with BNC F/F adapter • Instrument side: circular push-pull 4-pin connector The accelerometers are connected to the HD2030CAB13 cable through HD2030CAB1B-3M cables.	100
HD2030.CAB1B-3M	Coaxial cable for the connection of **mono-axial accelerometers** to the HD2030CAB13 cable. **Length 3 m** and connectors: • Accelerometer side: SMA 10-32 • Instrument side: BNC male It can be used with the accelerometers: HDD3056B2, HDD3200B5T and HDP352C34.	90
HD2030.CAB.BNC-xxM	Coaxial cable extension for the connection of **mono-axial accelerometers** to the HD2030CAB13 cable. The **maximum cable length is 200 m** and both ends are terminated with BNC female connectors.	On request
	CABLES FOR TRI-AXIAL ACCELEROMETERS	
HD2030.CAB3-3M	Cable for the connection of **tri-axial accelerometers** to the right input of the HD2030 analyzer. **Length 3 m** and connectors: • Accelerometer side: 4-pin ¼-28 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDD3023A2, HD3263M8 and HDP356A02.	240
HD2030.CAB3-5M	Cable for the connection of **tri-axial accelerometers** to the right input of the HD2030 analyzer. **Length 5 m** and connectors: • Accelerometer side: 4-pin ¼-28 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDD3023A2, HD3263M8 and HDP356A02.	260
HD2030.CAB3-10M	Cable for the connection of **tri-axial accelerometers** to the right input of the HD2030 analyzer. **Length 10 m** and connectors: • Accelerometer side: 4-pin ¼-28 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDD3023A2, HD3263M8 and HDP356A02.	300

CODE	DESCRIPTION	EURO
	CABLES FOR MINIATURE TRI-AXIAL ACCELEROMETERS	
HD2030.CAB3S-3M	Cable for the connection of **miniature tri-axial accelerometers** to the right input of the HD2030 analyzer. **Length 3 m** and connectors: • Accelerometer side: miniature 4-pin 8-36 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDP356B20, HDP356B21 and HDP356A22.	265
HD2030.CAB3S-5M	Cable for the connection of **miniature tri-axial accelerometers** to the right input of the HD2030 analyzer. **Length 5 m** and connectors: • Accelerometer side: miniature 4-pin 8-36 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDP356B20, HDP356B21 and HDP356A22.	290
HD2030.CAB3S-10M	Cable for the connection of **miniature tri-axial accelerometers** to the right input of the HD2030 analyzer. **Length 10 m** and connectors: • Accelerometer side: miniature 4-pin 8-36 • Instrument side: circular push-pull 4-pin connector It can be used with the accelerometers: HDP356B20, HDP356B21 and HDP356A22.	340

ACCELEROMETERS

CODE	DESCRIPTION	EURO
	MONO-AXIAL **SENSITIVITY 100 mV/g**	
HDP352C34 	General purpose ICP mono-axial accelerometer. Sensitivity 100 mV/g — Range ±50 g pk — Weight 5.8 g 10-32 UNF threaded hole — 10-32 connector Includes: • 10-32 UNF copper-beryllium alloy mounting screw (081B05) • M6 copper-beryllium alloy mounting screw (M081B05) • Calibration certificate (ACS-1) The accelerometer is connected to the left input (mono-axial) of the analyzer through the HD2030CAB1-xxM cable (not included).	360
	TRI-AXIAL **SENSITIVITY 1 mV/g**	
HDP356B20 	Miniature ICP tri-axial accelerometer for the measurement of the vibrations transmitted to the hand-arm system at high shock levels. Sensitivity 1 mV/g — Range ±5000 g pk — Weight 4 g 5-40 UNC threaded hole — 8-36 4-pin connector Includes: • 5-40 UNC copper-beryllium alloy mounting screw (081A27) • 10-32 UNF copper-beryllium alloy mounting screw (081A90) • M3 copper-beryllium alloy mounting screw (M081A27) • Calibration certificate (ACS-1T) The accelerometer is connected to the right input (tri-axial) of the analyzer through the HD2030CAB3S-xxM cable (not included).	1560
	TRI-AXIAL **SENSITIVITY 10 mV/g**	
HDP356A02 	ICP tri-axial accelerometer for the measurement of the vibrations transmitted to the hand-arm system. Sensitivity 10 mV/g — Range ±500 g pk — Weight 10.5 g 10-32 UNF threaded hole — ¼-28 4-pin connector Includes: • 10-32 UNF copper-beryllium alloy mounting screw (081B05) • M6 copper-beryllium alloy mounting screw (M081B05) • Calibration certificate (ACS-1T) The accelerometer is connected to the right input (tri-axial) of the analyzer through the HD2030CAB3-xxM cable (not included).	1310
HDP356B21 	Miniature ICP tri-axial accelerometer for the measurement of the vibrations transmitted to the hand-arm system. Sensitivity 10 mV/g — Range ±500 g pk — Weight 4 g 5-40 UNC threaded hole — 8-36 4-pin connector Includes: • 5-40 UNC copper-beryllium alloy mounting screw (081A27) • 10-32 UNF copper-beryllium alloy mounting screw (081A90) • M3 copper-beryllium alloy mounting screw (M081A27) • Calibration certificate (ACS-1T) The accelerometer is connected to the right input (tri-axial) of the analyzer through the HD2030CAB3S-xxM cable (not included).	1560

NOTE: For the availability and delivery time of the accelerometers please ask the warehouse.

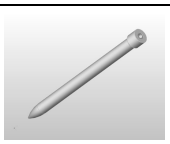
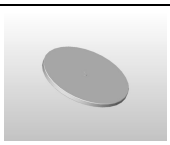
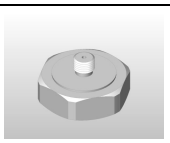
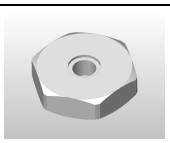
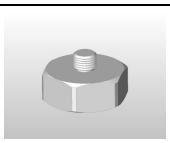
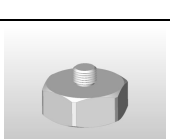
ACCELEROMETERS

CODE	DESCRIPTION	EURO
	TRI-AXIAL **SENSITIVITY 100 mV/g**	
HDP356A22 	General purpose miniature ICP tri-axial accelerometer. Sensitivity 100 mV/g — Range ±50 g pk — Weight 5.4 g 5-40 UNC threaded hole — 8-36 4-pin connector Includes: • 5-40 UNC copper-beryllium alloy mounting screw (081A27) • 10-32 UNF copper-beryllium alloy mounting screw (081A90) • M3 copper-beryllium alloy mounting screw (M081A27) • Calibration certificate (ACS-1T) The accelerometer is connected to the right input (tri-axial) of the analyzer through the HD2030CAB3S-xxM cable (not included).	1860
HDD3143D1 	General purpose tri-axial accelerometer. Sensitivity 100 mV/g — Range ±50 g pk — Weight 14 g Thru-hole for 6-32 UNC or M3 screw — ¼-28 4-pin connector Includes: • 6-32 UNC mounting screw • Mounting adapter with M3 screw for fixing to the floor support HD2030AC5 The accelerometer is connected to the right input (tri-axial) of the analyzer through the HD2030CAB3-xxM cable (not included).	On request
HDP356B41 	General purpose ICP tri-axial accelerometer inserted in a rubber pad for the measurement of the vibrations transmitted to the whole body also through seats and backs. Sensitivity 100 mV/g — Range ±10 g pk — Weight 272 g The accelerometer is provided with fixing 10-32 UNF threaded thru-hole. Includes: • HD2030CAB3-3xxM, 3 m connection cable to the right input (tri-axial) of the analyzer. • Calibration certificate (ACS-1T).	2060
	TRI-AXIAL **SENSITIVITY 1 V/g**	
HDP356B18 	High sensitivity ICP tri-axial accelerometer for the measurement of vibrations in buildings. Sensitivity 1 V/g — Range ±5 g pk — Weight 25 g 10-32 UNF threaded hole — ¼-28 4-pin connector Includes: • 10-32 UNF copper-beryllium alloy mounting screw (081B05) • M6 copper-beryllium alloy mounting screw (M081B05) • Calibration certificate (ACS-1T) The accelerometer is connected to the right input (tri-axial) of the analyzer through the HD2030CAB3-xxM cable (not included).	1260

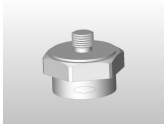
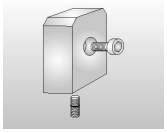
NOTE: For the availability and delivery time of the accelerometers please ask the warehouse.

The accelerometers are supplied with the specified accessories and the manufacturer calibration document. On request, it is possible to supply the ISO 9001 calibration report, referenced to national prototypes, of the chain formed by accelerometer and HD2030 or HD2070 analyzer (see the "ISO 9001 CALIBRATION REPORTS" table).

ACCELEROMETERS MOUNTING ACCESSORIES

CODE	DESCRIPTION	EURO
HD6188	Hydro repellent and electrically insulating silicone grease.	12
HD6273	Wax tray for gluing.	38
080A90	Glue for quick fixing.	20
081B05	 Screw with dual 10-32 UNF threading. Included in the HDP356A02 and HDP352C34 accelerometers.	23
081A90	 Screw with dual 5-40 UNC and 10-32 UNF threading. Included in the HDP356B21, HDP356A22 and HDP356B20 accelerometers.	30
M081B05	 Screw with dual 10-32 UNF and M6x0.75 threading. Included in the HDP356A02 and HDP352C34 accelerometers.	23
M081A27	 Screw with dual 5-40 UNC and M3x0.5" threading. Included in the HDP356B21, HDP356A22 and HDP356B20 accelerometers.	30
081A27	 Screw with dual 5-40 UNC threading. Included in the HDP356B21, HDP356A22 and HDP356B20 accelerometers.	30
HD6239	 Accelerometer push-rod. It can be used with all the accelerometers.	180
HD6286	 Adhesive metallic disk. It is used to magnetically couple the accelerometer on non-metallic surfaces. It can be used with the magnetic bases HD6284 and HD6196.	10
HD6284	 Magnetic base with 10-32 UNF threaded hole. It can be used with all the accelerometers.	160
HD6196	 Magnetic base with integrated 10-32 UNF screw. It can be used with the HDP356A02, HDP356C34 and HDP356B41 (removing the rubber pad) accelerometers.	185
HD6226	 Adhesive mounting base with 10-32 UNF threaded thru-hole. It can be used with all the accelerometers.	30
HD6245	 Insulated base with integrated 10-32 UNF screw and 10-32 UNF threaded hole. It can be used with the HDP356A02, HDP356C34 and HDP356B41 (removing the rubber pad) accelerometers.	42
HD6245.1	 Insulated adhesive base with integrated 10-32 UNF screw. It can be used with the accelerometers that do not have the fixing screw.	42

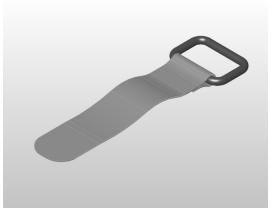
ACCELEROMETERS MOUNTING ACCESSORIES

CODE	DESCRIPTION		EURO
HD6220		Insulated base with integrated 10-32 UNF mounting screw and 10-32 UNF threaded hole for the accelerometer mounting. It can be used with all the accelerometers.	170
HD2060.20		Support for the lateral mounting of tri-axial accelerometers with 10-32 UNF mounting screw.	32

MOUNTING ADAPTERS FOR HAND-ARM MEASUREMENTS

CODE	DESCRIPTION	EURO
HD2030AC1 	Cube-shaped adapter for the mounting of the accelerometers with 10-32 UNF or 5-40 UNC threaded hole on the tools handle. The adapter has to be fastened with plastic cable-tie or metallic clamp close to the handle holding hand. Suitable for anatomical handles and small size tools, where the weight and dimensions of the measurement chain must be minimized. Material: **light alloy**. *Includes:* • 10-32 UNF cylindrical head with hex socket screw with 4 mm hex key • 5-40 UNC cylindrical head with hex socket screw with 4 mm hex key • 10 cable-ties, width 4.5 mm, length 200 mm • 1 metallic clamp, width 9 mm	60
HD2030AC2 	Adapter for the mounting of the accelerometers with 10-32 UNF or 5-40 UNC threaded hole on cylindrical handles. The adapter, inserted between the hand and the handle, is pushed against the handle by the hand itself. Because the accelerometer is placed in a lateral position, the measurement must be repeated placing the accelerometer both on the right and left side of the hand. Suitable for large cylindrical handles. Material: **light alloy.** *Includes:* • 10-32 UNF cylindrical head with hex socket screw with 4 mm hex key • 5-40 UNC cylindrical head with hex socket screw with 4 mm hex key • 10 cable-ties, width 4.5 mm, length 200 mm • 2 velcro straps, width 25 mm, length 300 mm (HD2030FV)	100
HD2030AC3 	Adapter for the mounting of the accelerometers with integrated 10-32 UNF mounting screw on cylindrical handles. The adapter, inserted between the hand and the handle, is pushed against the handle by the hand itself. Because the accelerometer is placed in a lateral position, the measurement must be repeated placing the accelerometer both on the right and left side of the hand. Suitable for large cylindrical handles. Provided with 10-32 UNF fixing hole for the mounting of the accelerometer. Material: **inox**. *Includes:* • 10 cable-ties, width 4.5 mm, length 200 mm • 2 velcro straps, width 25 mm, length 300 mm (HD2030FV)	110
HD2030AC4 	Adapter for the mounting of the accelerometers with 10-32 UNF or 5-40 UNC threaded hole on tool handles. The adapter, inserted between the hand and the handle, is pushed against the handle by the hand itself. The accelerometer is placed in central position between the middle-finger and the ring-finger or between the forefinger and the middle-finger. Suitable for anatomical handles even if not cylindrical or with small dimensions. Material: **light alloy**. *Includes*: • 10-32 UNF cylindrical head with hex socket screw with 4 mm hex key • 5-40 UNC cylindrical head with hex socket screw with 4 mm hex key • 10 cable-ties, width 4.5 mm, length 200 mm • 2 velcro straps, width 25 mm, length 300 mm (HD2030FV)	110

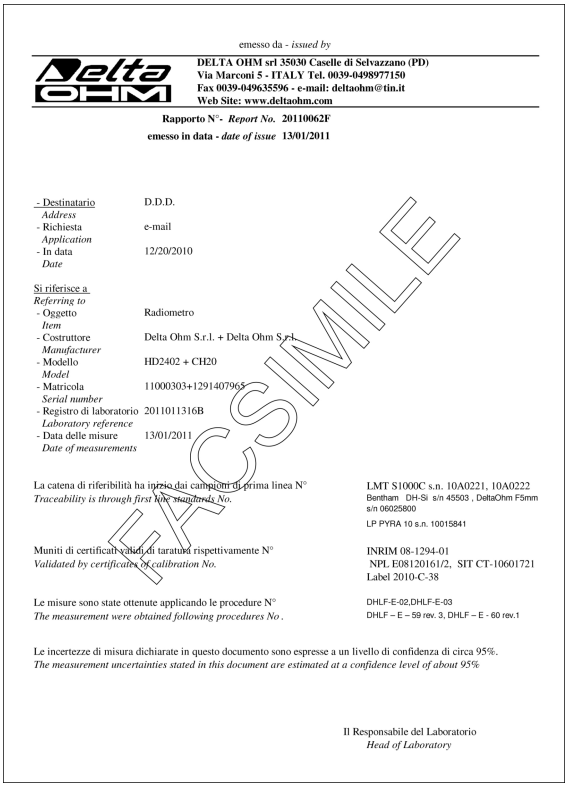
MOUNTING ADAPTERS FOR HAND-ARM MEASUREMENTS

CODE	DESCRIPTION	EURO
HD2030AC5 	Support for tri-axial and mono-axial accelerometers suitable for the measurement of the vibrations transmitted by floors and vibrating surfaces in general. It is provided with levelling device and three feet, the height of two of the feet is adjustable. The support has a cavity on the bottom side with a M4 threaded hole. On the top side there is a 10-32 UNF threaded hole for the accelerometer mounting. A cubic adapter, to be fixed on the top side of the support, allows to mount three mono-axial accelerometers orientated along orthogonal axes. Material: **nickel-plated steel**, weight 1.9 kg. The adapter can be used with all the accelerometers. *Includes:* • Steel support with three feet and levelling device. The support has a 10-32 UNF threaded hole on the top side and a cavity on the bottom side with a M4 threaded hole. • Cubic adapter to be mounted on the support top side with two M4 screws (included). The cube is provided with 10-32 UNF threaded holes on three orthogonal faces. • 3 mm hex key.	240
HD2030.124	Adapters kit for the measurement of the vibrations transmitted to the hand-arm system. *Includes:* • HD2030AC1: cube-shaped adapter for anatomical handles and small size tools. The adapter has to be fastened to the handle with plastic cable-tie or metallic clamp (included). • HD2030AC2: adapter for cylindrical handles. The adapter is placed laterally with respect to the hand. HD2030AC4: general purpose adapter. The accelerometer is placed between the forefinger and the middle-finger or between the middle-finger and the ring-finger.	265
HD2030.1234	Adapters kit for the measurement of the vibrations transmitted to the hand-arm system. *Includes:* • HD2030AC1: cube-shaped adapter for anatomical handles and small size tools. The adapter has to be fastened to the handle with plastic cable-tie or metallic clamp (included). • HD2030AC2: adapter for cylindrical handles. The adapter is placed laterally with respect to the hand. • HD2030AC3: adapter for cylindrical handles provided with threaded hole for accelerometers with 10-32 UNF screw. The adapter is placed laterally with respect to the hand. • HD2030AC4: general purpose adapter. The accelerometer is placed between the forefinger and the middle-finger or between the middle-finger and the ring-finger.	370
HD2030FV 	Velcro strap, width 25 mm, length 300 mm	15

ISO 9001 CALIBRATION REPORTS	EURO
Periodical check of the HD2030 and HD2070 vibration analyzers according to ISO 8041 and IEC 61260. Calibration of the vibration meter and spectral analyzer in octave and third octave bands.	900
Periodical check of the HD2030 and HD2070 vibration analyzers according to ISO 8041. Calibration of the vibration meter.	320
Periodical check of the HD2030 and HD2070 vibration analyzers according to IEC 61260. Calibration of the spectral analyzer in octave bands.	220
Periodical check of the HD2030 and HD2070 vibration analyzers according to IEC 61260. Calibration of the spectral analyzer in third octave bands.	460
Periodical check according to ISO 8041 of an accelerometric chain formed by an accelerometer (choice of one axis for the tri-axial input) and one of the filters of the HD2030 and HD2070 vibration analyzers. Accelerometric chain single axis calibration for hand-arm or whole body measurements.	190
Periodical check according to ISO 8041 of an accelerometric chain formed by a tri-axial accelerometer and one of the filters of the HD2030 and HD2070 vibration analyzers. Accelerometric chain three axes calibration for hand-arm or whole body measurements.	410
Periodical check of the portable calibrator for vibrating chains HD2060.	140

MULTISENSOR PHOTO RADIOMETER (AOR)

In accordance with EU directive 2006/25/CE and D.Lgs. 81/2008

CODE	MULTISENSOR PHOTO – RADIOMETER	EURO
HD2402	 Multisensor instrument, datalogger for measuring non-coherent optical radiations in accordance with the European directive 2006/25/EC and legislative decree n. 81/2008. Sensors: photometric for measuring illuminance (380÷780 nm), radiometric for the UV range (220÷400 nm) with spectral weighting factor S(λ), radiometric for the UVA range (315÷400 nm), radiometric for the range 400÷700 nm (blue) with spectral weighting factor B(λ), radiometric for the IR range (700÷1300 nm) with spectral weighting factor R(λ), thermopile for measuring IR irradiance (400÷2800 nm). Powered directly by the PC or by an external power supply. Supplied with: DeltaLog 13 software **from version 1.0.1.0** for data download, real time monitor and data management on a Personal Computer, **CH20–ROA** hardware key to enable the software, CP24 connecting cable, SWD05 power supply, VTRAP20 tripod, instruction manual, carrying case.	3480
	CERTIFICATION	
VCERT-L2402	SINGLE CALIBRATION REPORT FOR ALL THE SENSORS. ONE POINT ONLY FOR EACH SENSOR. 	740
VACCREDIAL9	ACCREDIA CERTIFICATE FOR THE ACCREDITED MEASUREMENTS (LUXMETER AND UVA) AND SINGLE CALIBRATION REPORT FOR THE REMAINING SENSORS. LUXMETER SIT (ACCREDIA) CERTIFICATE: RANGE 50÷4000 LUX. UVA RADIOMETER ACCREDIA CERTIFICATE: RANGE 10÷50 W/m^2	1060
	ACCESSORIES	
CH20–ROA	Hardware key for PC with Windows® operating systems. When connected to a USB port, it enables the use of the DeltaLog 13 software with the HD2402 instrument. (To replace the one supplied with the kit, in case of loss or failure).	50
DELTALOG 13	Further copy of the CD-ROM with the DeltaLog 13 software for the connection to the PC for instrument configuration and data download. For Windows® operating systems. Supplied with CH20-ROA hardware key. (To replace the one supplied with the kit, in case of loss or failure).	550
CP24	PC or power supply connecting cable, with M12 connector on instrument side and male A type USB connector on PC/power supply side.	85
SWD05	**100-240 Vac / 5 Vdc-1 A** stabilized mains power supply. Output with A type USB connector.	45
VTRAP20	Tripod to be fixed to the instrument, max height 270 mm.	52

emesso da - *issued by*

DELTA OHM srl 35030 Caselle di Selvazzano (PD)
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Rapporto N°- *Report No.* 20110062F
emesso in data - *date of issue* 13/01/2011

- Destinatario *Address*	D.D.D.
- Richiesta *Application*	e-mail
- In data *Date*	12/20/2010
Si riferisce a *Referring to*	
- Oggetto *Item*	Radiometro
- Costruttore *Manufacturer*	Delta Ohm S.r.l. + Delta Ohm S.r.l.
- Modello *Model*	HD2402 + CH20
- Matricola *Serial number*	11000303+1291407965
- Registro di laboratorio *Laboratory reference*	2011011316B
- Data delle misure *Date of measurements*	13/01/2011

La catena di riferibilità ha inizio dai campioni di prima linea N° *Traceability is through first line standards No.*: LMT S1000C s.n. 10A0221, 10A0222 Bentham DH-Si s/n 45503 , DeltaOhm F5mm s/n 06025800 LP PYRA 10 s.n. 10015841

Muniti di certificati validi di taratura rispettivamente N° *Validated by certificates of calibration No.*: INRIM 08-1294-01 NPL E08120161/2, SIT CT-10601721 Label 2010-C-38

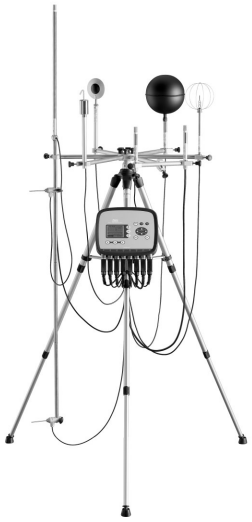
Le misure sono state ottenute applicando le procedure N° *The measurement were obtained following procedures No .*: DHLF-E-02,DHLF-E-03 DHLF – E – 59 rev. 3, DHLF – E - 60 rev.1

Le incertezze di misura dichiarate in questo documento sono espresse a un livello di confidenza di circa 95%.
The measurement uncertainties stated in this document are estimated at a confidence level of about 95%

Il Responsabile del Laboratorio
Head of Laboratory

FACSIMILE

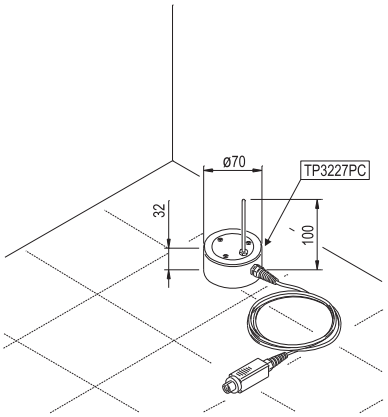
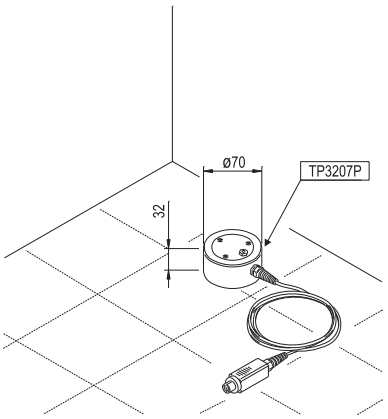
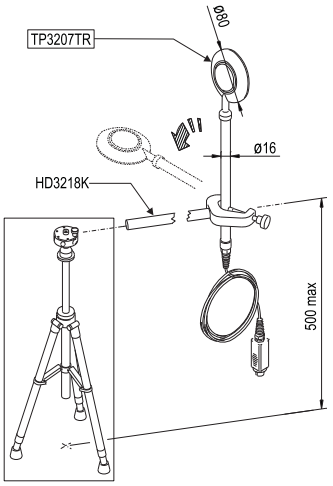
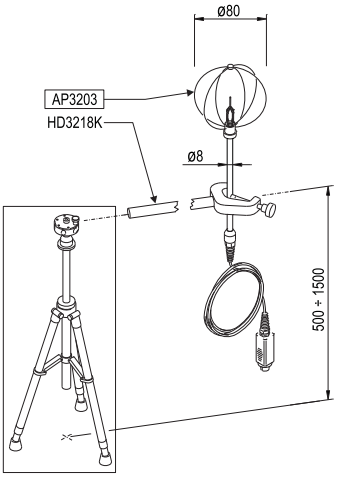
MULTIFUNCTION INSTRUMENTS FOR MICROCLIMATE ANALYSIS WBGT – PMV – PPD

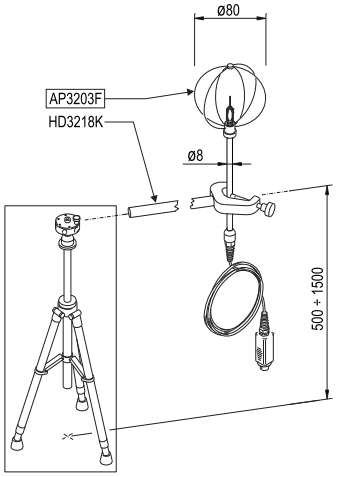
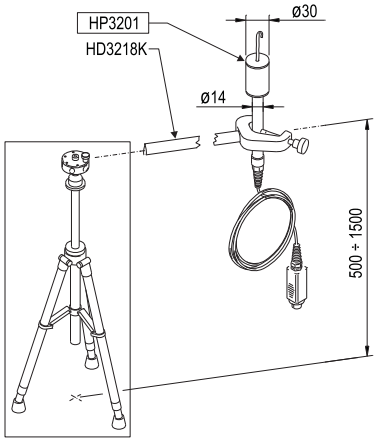
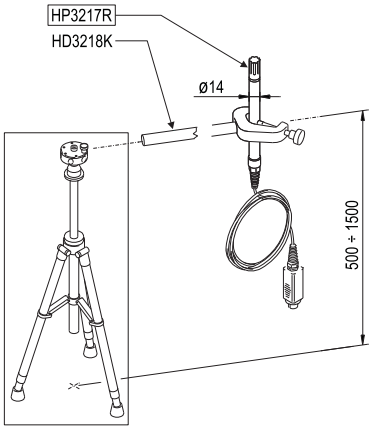
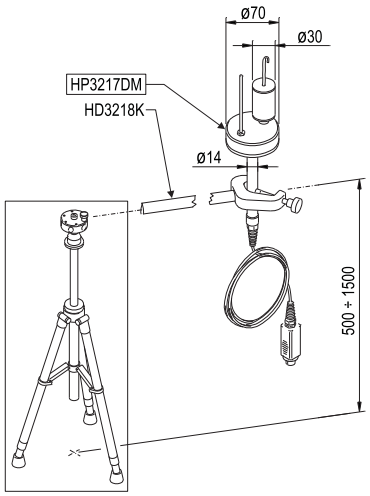
CODE	DATALOGGER MULTIFUNCTION INSTRUMENT FOR MICROCLIMATE ANALYSIS	EURO
HD32.1	 **Thermal microclimate, datalogger multifunction instrument** to measure the microclimate in moderate, hot, severe hot, cold environments and the measure of physical quantities. It is provided with 8 inputs for probes equipped with SICRAM module and a back-lighted graphic display. The instrument is able to manage three operative programs (**progr. A – Microclimate Analysis, progr. B – Discomfort Analysis, progr. C – Physical Quantities**). Memory capacity from 15 seconds to 1 hour up to 650,000 single parameters. Functions: CLOCK, HOLD, RELATIVE, MINIMUM, MAXIMUM, MEAN MEASUREMENT. Simultaneous display of the measurements on eight inputs. Output for PC RS232C or USB. Power supply: 4 alkaline batteries type C, autonomy of about 200 hours (it depends on the kind and number of connected probes), 12 Vdc socket for mains voltage. **The KIT includes the instrument HD32.1 with operative program A: Microclimatic Analysis for moderate environments, 4 alkaline C-type batteries, DeltaLog 10 Basic software, instruction manual. The carrying case, the probes, the cables, different programs and software have to be ordered separately.**	1800

ACCESSORIES		
9CPRS232	Sub D 9-pole Female/Female RS232 null-modem cable.	42
CP22	USB 2.0 connection cable, connector type A - type B.	42
DELTALOG 10	Further copy of CD-ROM with software DeltaLog 10 for PC data download and management. For Windows® operating systems.	85
BAG32	Carrying case made of strong aluminium for instrument HD32.1 and its accessories.	275
SWD10	100-240 Vac/12 Vdc-1 A stabilized mains power supply.	44
VTRAP32	Tripod equipped with 6 input head and 5 probe holders code HD3218K.	335
HD3218K	Clamp shaft for a further probe.	42
AM32	Two clamps shaft for two further probes.	54
AQC	200 cc distilled water.	10

SOFTWARE AND PROGRAMS FOR HD32.1		
SOFTWARE DELTALOG 10 Hot and Severe Hot Environments Code MC1	The use of this software requires the complete **HD32.1 Kit basic.**	500
SOFTWARE DELTALOG 10 Cold Environments Code MC2	The use of this software requires the complete **HD32.1 Kit basic.**	450
SOFTWARE DELTALOG 10 Discomfort Analysis Code MC3	The use of this software requires the B operative program – Discomfort Analysis and the complete **HD32.1 Kit basic.**	400
HD32.1 Program B Discomfort Analysis Code MC4	The B program requires the HD32.1 Moderate Environments and the software DeltaLog10 Discomfort Analysis.	400
HD32.1 Program C Physical Quantities Code MC5	The C program physical quantities requires the program HD32.1 Moderate Environments. Program A is included.	400

CODE	PROBES FOR OPERATIVE PROGRAMS A: MICROCLIMATIC ANALYSIS B: DISCOMFORT ANALYSIS	EURO
TP3207	Pt100 sensor temperature probe. Probe stem Ø 14 mm, length 140 mm. Cable length 2 metres. Equipped with SICRAM module. Measuring range -40 °C…+100 °C. Uncertainty +/- 0.15 °C in the range -30 °C …+100 °C. Response time 10" at constant temperature. **Used for calculating the following indices: IREQ,WCI, DLE, RT, PMV, PPD, WBGT, SR. Used for calculating Mean radiant temperature.** (On request 4 fixed points temperature ACCREDIA certificate)	121
TP3275	Globe temperature probe, Pt100 sensor, globe Ø 150 mm. Stem Ø 14 mm, length 110 mm. Cable length 2 metres. Equipped with SICRAM module. Measuring range -10 °C…+100 °C. **Used for measuring Mean radiant temperature, WBGT.** (On request 4 fixed points temperature ACCREDIA certificate)	365
TP3276	Globe temperature probe, Pt100 sensor, globe Ø 50 mm. Stem Ø 8 mm, length 110 mm. Cable length 2 metres. Equipped with SICRAM module. Measuring range -10 °C…+100 °C. **Used for measuring Mean radiant temperature, WBGT.** (On request 4 fixed points temperature ACCREDIA certificate)	335
TP876S	Only globe Ø 50 mm (net price)	90
TP3227K	Temperature probe composed of **2 independent probes**, Pt100 sensor. Stem diameter Ø 14 mm, length 500 mm. Cable length 2 metres. Equipped with double SICRAM module and extension shaft Ø 14 mm, length 450 mm TP3227.2. Measuring range -10 °C…+100 °C. **Used for measuring local discomfort due to vertical thermal gradient. It can be used for studying subjects standing or sitting. The height of one probe can be regulated.** (On request 2 temperature ACCREDIA certificates at 4 fixed points, one for each probe)	202

CODE	PROBES FOR OPERATIVE PROGRAMS A: MICROCLIMATIC ANALYSIS B: DISCOMFORT ANALYSIS	EURO
TP3227PC	Temperature probe composed of 2 **independent probes**, Pt100 sensor, one for measuring floor temperature (diameter Ø 70 mm, height 30 mm), the other for measuring temperature at the height of the ankles (diameter Ø 3 mm, height 100 mm). Cable length 2 metres. Equipped with double SICRAM module. Measuring range -10 °C…+100 °C. **Used for measuring local discomfort due to vertical thermal gradient.** (On request 2 temperature ACCREDIA certificates at 4 fixed points, one for each probe) 	215
TP3207P	Temperature probe, Pt100 sensor, for measuring floor temperature (diameter Ø 70 mm, height 30 mm). Cable length 2 metres. Equipped with SICRAM module. Measuring range -10 °C…+100 °C. **Used for the evaluation of dissatisfied people due to radiant asymmetry**. (On request 4 fixed points temperature ACCREDIA certificate) 	140
TP3207TR	Probe for measuring radiant temperature. Probe stem Ø 16 mm, length 250 mm. Cable length 2 metres. Equipped with SICRAM module. Measuring range 0 °C…+60 °C. **Used for the evaluation of dissatisfied people due to radiant asymmetry.** (On request LP NET 07 calibration report) 	495
AP3203	Omnidirectional hotwire probe. Measuring range: air speed 0.05 ÷ 5 m/s, temperature 0 ÷ +80 °C. Probe stem Ø 14 mm, length 110 mm. Cable length 2 metres. Equipped with SICRAM module. **Used for calculating the following indices: IREQ, WCI, DLE, RT, PMV, PPD, SR. Used for calculating Mean radiant temperature.** (On request air speed ACCREDIA certificate 0.15 – 5 m/s) 	410

CODE	PROBES FOR OPERATIVE PROGRAMS A: MICROCLIMATIC ANALYSIS B: DISCOMFORT ANALYSIS	EURO
AP3203F	Omnidirectional hotwire probe for cold environments. Measuring range: air speed 0.05 ÷ 5 m/s, temperature -30…+30 °C. Probe stem Ø 14 mm, length 110 mm. Cable length 2 metres. Equipped with SICRAM module. **Used for calculating the following indices: IREQ, WCI, DLE, RT, PMV, PPD, SR. Used for calculating Mean radiant temperature.** (On request air speed ACCREDIA certificate 0.15 – 5 m/s) 	410
HP3201	Natural ventilation wet bulb probe. Pt100 sensor. Probe stem Ø 14 mm, length 110 mm. Cable length 2 metres. Equipped with SICRAM module, two spare braids and 50 cc distilled water. Measuring range +4 °C…+80 °C. **Used for measuring WBGT.** (On request 4 fixed points temperature ACCREDIA certificate) 	245
HP3217R	Combined temperature and relative humidity probe. Capacitive RH sensor, Pt100 temperature sensor. Probe stem Ø 14 mm, length 110 mm. Cable length 2 metres. Equipped with SICRAM module. Measuring range: temperature -20…+80 °C, relative humidity 0…100 %. **Used for calculating the following indices: IREQ, WCI, DLE, RT, PMV, PPD, SR.** (On request humidity ACCREDIA certificate Isotherm **A** and 4 temperature fixed points) 	190
HP3217DM	**Double** natural ventilation wet bulb probe and temperature probe (dry bulb). Probe stem Ø 14 mm, length 110 mm. Cable length 2 metres. Equipped with double SICRAM module, spare braid and 50 cc distilled water. Measuring range +4 °C…+80 °C. (On request 2 temperature ACCREDIA certificates at 4 fixed points, one for each probe) 	385

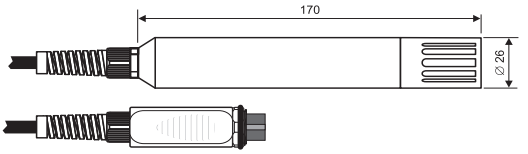
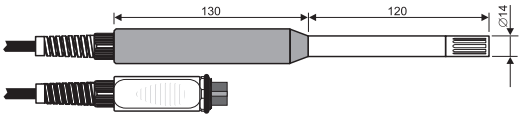
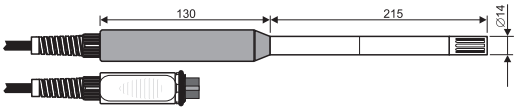
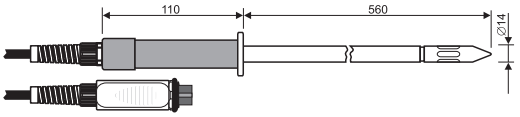
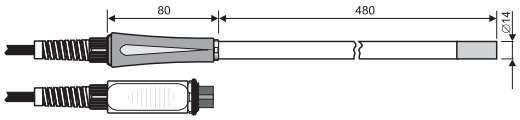
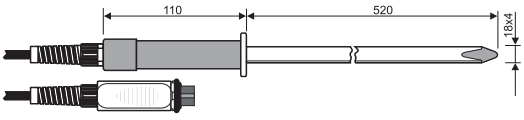
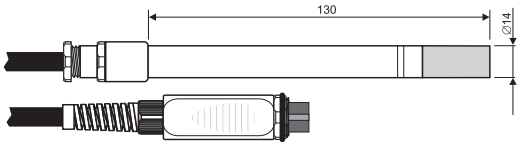
CODE	PROBES FOR CO – CO_2 AIR QUALITY	EURO
HD320A2	Probe for carbon monoxide CO measurement equipped with SICRAM module, with 2-electrode electrochemical sensor. Measuring range 0 ÷ 500 ppm. Cable length 2m equipped with SICRAM module.	200
HD320B2	Probe for carbon dioxide CO_2 measurement equipped with SICRAM module, with double source infrared sensor. Measuring range 0 ÷ 5000 ppm. Cable length 2m equipped with SICRAM module.	350
HD320AS2	Magnetic support for fixing the probe HD320A2 to the housing of probe HD320B2.	78

PROBES FOR C OPERATIVE PROGRAM: PHYSICAL QUANTITIES

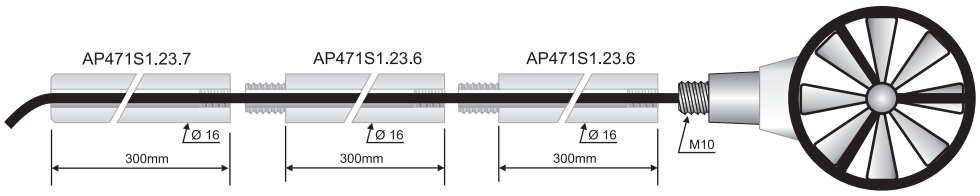
TEMPERATURE PROBES COMPLETE WITH SICRAM MODULE

TP472I	Immersion probe, Pt100 sensor, α 385. Probe stem ∅ 3 mm, length 300 mm. Four wires connecting cable, length 2 m.	130
TP472I.0	Immersion probe, Pt100 sensor Pt100. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.	83
TP473P.0	Pointed probe, Pt100 sensor. Stem Ø 4 mm, length 150 mm. Cable length 2 metres.	95
TP474C.0	Contact probe, Pt100 sensor. Stem Ø 4 mm, length 230 mm, contact surface Ø 5 mm. Cable length 2 metres.	96
TP475A.0	Air probe, Pt100 sensor. Stem Ø 4 mm, length 230 mm. Cable length 2 metres.	94
TP472I.5	Penetration probe, Pt100 sensor. Stem Ø 6 mm, length 500 mm. Cable length 2 metres.	181
TP472I.10	Penetration probe, Pt100 sensor. Stem Ø 6 mm, length 1000 mm. Cable length 2 metres.	198

RELATIVE HUMIDITY AND TEMPERATURE PROBES COMPLETE WITH SICRAM MODULE

	(*) For temperatures up to 150 °C, we recommend the use of probes with stainless steel stem and filter P7. Extra charge €		32
HP472ACR	%RH and Pt100 temperature combined probe. 2 m connecting cable. Working range: -20…+80 °C , 0…100 %RH.		160
HP473ACR (*)	%RH and Pt100 temperature combined probe 2 m connecting cable. Working range: -20…+80 °C, 0…100 %RH.		166
HP474ACR (*)	%RH and Pt100 temperature combined probe 2 m connecting cable. Working range: -40…+150 °C, 0…100 %RH.		170
HP475ACR	%RH and Pt100 temperature combined probe. 2 m connecting cable. Stainless steel probe stem. Tip dimensions ∅ 14 x 75 mm. Working range: -40…+150 °C, 0…100 %RH. **(Measurement of water activity in grains)**		310
HP475AC1R	%RH and Pt100 temperature combined probe. Stainless steel probe stem, stainless steel 20µ sintered filter. 2 m connecting cable. Working range: -40…+180 °C, 0…100 %RH.		315
HP477DCR	%RH and Pt100 temperature combined sword probe. 2 m connecting cable. Working range: -40…+150 °C, 0…100 %RH. **(Measurement of water activity on paper)**		290
HP478ACR	%RH and Pt100 temperature combined probe. 5 m connecting cable. Working range: -40…+150 °C, 0…100 %RH.		190

The combined humidity and temperature probes with last letter of the code R are compatible with the HD32.1 instruments having firmware version from A1.13.

CODE	HOTWIRE PROBES FOR AIR SPEED MEASUREMENT COMPLETE WITH SICRAM MODULE	EURO
AP471S1	Directional hotwire probe to measure air speed in the range 0.1…40 m/s and air temperature in the range -25 °C…+80 °C. Temperature compensation from 0 to +80 °C. Probe diameter (measurement area) 8 mm. Probe complete with handle and telescopic shaft: minimum length 360 mm, maximum length 1060 mm. Cable length with fully closed telescopic shaft 1800 mm.	380
AP471S2	Omni-directional hotwire probe to measure air speed in the range 0.1…5 m/s and air temperature in the range -25 °C…+80 °C. Temperature compensation from 0 to +80 °C. Probe diameter (measurement area) 8mm. Probe complete with handle and telescopic shaft: minimum length 360 mm, maximum length 1060 mm. Cable length with fully closed telescopic shaft 1800 mm.	410
AP471S3	Directional hotwire probe, 180 °C articulated tip for easy positioning, to measure air speed in the range 0.1…40 m/s and air temperature in the range -25 °C…+80 °C. Temperature compensation from 0 to +80 °C. Probe diameter (measurement area) 8 mm. Probe complete with handle and telescopic shaft, minimum length 450 mm, maximum length 1140 mm. Cable length with fully closed telescopic shaft 1660 mm.	430
AP471S4	Omni-directional hotwire probe with telescopic shaft and table base. Maximum height 760 mm, minimum height 380 mm. Measurement of air speed in the range 0.1…5m/s and of air temperature in the range 0 °C…+80 °C. Wire protection spherical cage diam. 100 mm. 2 m cable.	470
	VANE PROBES FOR AIR SPEED MEASUREMENT COMPLETE WITH SICRAM MODULE	
AP472S1	Vane probe with K type thermocouple ∅ 100 mm to measure air speed in the range 0.6…25 m/s and air temperature in the range –25 °C … +80 °C. Probe complete with handle, **telescopic shaft available on request**. Minimum length of shaft with handle 360 mm, maximum length with handle 1025 mm. 2 m cable.	370
AP472S2	Vane probe diam. 60 mm with handle to measure air speed in the range 0.5…20 m/s. **Telescopic shaft available on request**. Minimum length of shaft with handle 360 mm, maximum length with handle 1025 mm. 2 m cable.	340
AST.1	Telescopic shaft (minimum length 210 mm, maximum length 870 mm) for vane probes AP472S1 and AP472S2.	86
AP471S1.23.6	Fixed extension shaft ∅ 16 x 300 mm, M10 male thread on a side, female on the other. For vane probes AP472S1, AP472S2.	34
AP471S1.23.7	Fixed extension shaft ∅ 16 x 300 mm, M10 female thread on a side only. For vane probes AP472S1, AP472S2.	30
		
	PHOTOMETRIC – RADIOMETRIC PROBES FOR LIGHT MEASUREMENT COMPLETE WITH SICRAM MODULE	
LP471PHOT	Photometric probe for measuring the **ILLUMINANCE**, spectral response according to the photopic curve, **class B according to CIE N° 69**, cosine correction diffuser. Measuring range: 0.1 lux … $200 \cdot 10^3$ lux.	160
LP471RAD	Radiometric probe for measuring the **IRRADIANCE** in the spectral range 400 nm … 1050 nm, cosine correction diffuser. Measuring range: 0.1 mW/m^2 … 2000 W/m^2.	180
LP471PAR	Quantum-radiometric probe for measuring the **PHOTONS FLOW** in the chlorophyll field **PAR** (photosynthetically Active Radiation 400 nm … 700 nm), µmol/m^2s measure, cosine correction diffuser. Measuring range 0.01 µmol $m^{-2}s^{-1}$ … $10 \cdot 10^3$ µmol $m^{-2}s^{-1}$	210
LP471UVA	Radiometric probe for measuring the **IRRADIANCE** in the **UVA** spectral range 315 nm…400 nm, peak at 360 nm, quartz diffuser for cosine correction. For non-destructive testing ISO 3059:2001, EN 571-1, ASTM E1417. Measuring range: 0.1 mW/m^2 … 2000 W/m^2.	252
LP471UVB	Radiometric probe for measuring the **IRRADIANCE** in the **UVB** spectral range 280 nm …315 nm, peak at 305 nm, quartz diffuser for cosine correction. Measuring range: 0.1 mW/m^2 … 2000 W/m^2.	259
LP471UVC	Radiometric probe for measuring the **IRRADIANCE** in the **UVC** spectral range 220 nm…280 nm, peak at 260 nm, quartz diffuser for cosine correction. Measuring range: 0.1 mW/m^2 … 2000 W/m^2.	318
LP471LUM 2	Photometric probe for measuring the **LUMINANCE**, spectral response according to the photopic curve, angular field 2°. Measuring range: 0.1 cd/m^2 … $2000 \cdot 10^3$ cd/m^2.	303
LP32F/R	Holding bracket for photo- radiometric probes.	46
LP471BLUE	Radiometric probe for **EFFECTIVE IRRADIANCE** measurement in the spectral range of **Blue** light. Spectral range 380nm…550nm, diffuser for cosine correction. Measurement range: 0.0001 W/m^2 …2000 W/m^2.	260

CODE	PHOTOMETRIC – RADIOMETRIC PROBES FOR LIGHT MEASUREMENT COMPLETE WITH SICRAM MODULE	EURO
LP471P-A	Combined probe for measuring the **ILLUMINANCE** (lux), with standard photopic spectral response, and for measuring the **IRRADIANCE** (W/m^2) in the **UVA** spectral range (315-400 nm, with peak at 365 nm). Both sensors are equipped with diffuser for the correction according to the cosine law. Illuminance measuring range: 0.3 lux … $200 \cdot 10^3$ lux. Irradiance measuring range: 0.1 mW/m^2…2000 W/m^2. The probe provides the ratio of the UVA irradiance and the illuminance in µW/lumen (quantity of interest in the museums field). CIE 157. 2 m cable.	390
LP471A-UVeff	Combined probe for measuring the **TOTAL EFFECTIVE IRRADIANCE** according to the weighting curve UV. The two sensors are used to correctly measure the total effective irradiance in the range 250-400 nm. Both sensors are equipped with diffuser for the correction according to the cosine law. The probe provides the total effective irradiance (E_{eff}), the effective irradiance in the range UV-CB and the UVA irradiance. Total effective irradiance measuring range: 0.001 W/m^2…20 W/m^2. B_C effective irradiance measuring range: 0.001 W/m^2…20 W/m^2. UVA irradiance measuring range: 0.1 W/m^2…2000 W/m^2. 2 m cable.	628
LPBL	Base with levelling device. **On request for assembly with the probes when placing the order (not suitable for LP471 LUM2 probe)**. Working temperature -40 °C…+ 80 °C.	84
LPBL3	 Adjustable wall support for Ø 30 mm photometric and radiometric probes.	95

CODE	HD32.2 DATALOGGER FOR MICROCLIMATE ANALYSIS WBGT Index	EURO
HD32.2	 Thermal microclimate to measure the WBGT Index in Hot Environments. 3 inputs for probes with SICRAM module, graphic display. The kit is composed of instrument, four 1.5V AA batteries, instruction manual, software DeltaLog 10 Hot Environment with WBGT index analysis. Cables and probes have to be ordered separately. **These probes are requested** for the **WBGT** measurement: • Dry bulb temperature probe **TP3207.2**. • Globe temperature probe **TP3276.2**. • Natural ventilated wet bulb temperature probe **HP3201.2**.	760
HD32.2A	 Thermal microclimate to measure the WBGT Index in Hot Environments. 3 inputs for probes with SICRAM module, graphic display. The kit is composed of instrument, four 1.5V AA batteries, instruction manual, software DeltaLog 10 Hot Environment with WBGT index analysis. Cables and probes have to be ordered separately. **These probes are requested** for the **A version WBGT** measurement: • Dry bulb temperature probe **TP3207**. • Globe temperature probe **TP3275**. • Natural ventilated wet bulb temperature probe **HP3201**.	760
	PROBES FOR HD32.2	
TP3207.2	Temperature probe with Pt100 sensor. Probe stem Ø 14 mm, length 150 mm. Complete with module SICRAM.	105
TP3276.2	Globe temperature probe with Pt100 sensor, globe Ø 50 mm. Stem Ø 8 mm, length 170 mm. Complete with module SICRAM.	292
HP3201.2	Natural ventilation wet bulb. Pt100 sensor. Probe stem Ø 14 mm, length 170 mm. Complete with module SICRAM, spare braid and 50 cc distilled water.	210
	PROBES FOR HD32.2A	
TP3207	Temperature probe with Pt100 sensor. Probe stem Ø 14 mm, length 140 mm. Complete with module SICRAM.	121
TP3275	Globe temperature probe with Pt100 sensor, globe Ø 150 mm. Stem Ø 14 mm, length 110 mm. Complete with module SICRAM.	365
HP3201	Natural ventilation wet bulb. Pt100 sensor. Probe stem Ø 14 mm, length 110 mm. Complete with module SICRAM, two spare braids and 50 cc distilled water.	245
	ACCESSORIES FOR HD32.2 AND HD32.2A	
VTRAP30	Tripod to be fixed to the instrument, max height 280 mm.	80
VTRAP32.2A.3A	Tripod with instrument holder for HD32.2A.	145
HD32.2.7	Holder for 4 probes, to be fixed on the standard tripod for version HD32.2A.	96
HD2110RS	Connecting cable with M12 connector on instrument side and with 9 poles SubD female connector for RS232C on PC side.	42
HD2110USB	Connecting cable with M12 connector on instrument side and USB 2.0 connector on PC side.	42
DELTALOG 10	Further copy of CD-ROM with software DeltaLog 10 for PC data download and management. For Windows® operating systems.	85
SWD10	100-240 Vac/12 Vdc-1 A stabilized mains power supply.	44
AQC	200 cc distilled water.	10
HD40.1	Printer (**HD2110/RS** cable is requested).	265
BAT-40	Spare battery pack for HD40.1 printer with built-in temperature sensor.	27
RCT	Kit including 4 thermal paper rolls, width 57 mm, diameter 32 mm.	7

CODE	HD32.3 DATALOGGER FOR MICROCLIMATE ANALYSIS WBGT Index – PMV – PPD	EURO
HD32.3	 Thermal microclimate to measure the WBGT Index, PMV Index (Predicted Mean Vote) and PPD (Predicted Percentage of Dissatisfied). 3 inputs for probes with SICRAM module, graphic display. The kit is composed of instrument, four AA 1.5 V batteries, instruction manual, software DeltaLog 10 for WBGT, PMV and PPD index analysis. The probes and cables have to be ordered separately. The **probes necessary** for **WBGT** measurement are the following: • Dry bulb temperature probes **TP3207.2**. • Globe temperature probe **TP3276.2**. • Natural ventilation wet bulb temperature probe **HP3201.2**. The **probes necessary** for **PMV** and **PPD** measurement are the following: • Relative humidity and temperature combined probe **HP3217.2**. • Omnidirectional hotwire probe **AP3203.2**. • Globe temperature probe **TP3276.2**.	950
HD32.3A	 Thermal microclimate to measure the WBGT Index, PMV Index (Predicted Mean Vote) and PPD (Predicted Percentage of Dissatisfied). 3 inputs for probes with SICRAM module, graphic display. The kit is composed of instrument, four AA 1.5 V batteries, instruction manual, software DeltaLog 10 for WBGT, PMV and PPD index analysis. The probes and cables have to be ordered separately. The **probes necessary** for **WBGT** measurement are the following: • Dry bulb temperature probes **TP3207**. • Globe temperature probe **TP3275**. • Natural ventilation wet bulb temperature probe **HP3201**. The **probes necessary** for **PMV** and **PPD** measurement are the following: • Relative humidity and temperature combined probe **HP3217R**. • Omnidirectional hotwire probe **AP3203**. • Globe temperature probe **TP3275**.	950
PROBES FOR HD32.3		
TP3207.2	Temperature probe with Pt100 sensor. Probe stem Ø 14 mm, length 150 mm. Complete with SICRAM module. **Used for WBGT measurement.**	105
TP3276.2	Globe temperature probe with Pt100 sensor, globe Ø 50 mm. Stem Ø 8 mm, length 170 mm. Complete with SICRAM module. **Used for WBGT and PMV measurement.**	292
HP3201.2	Natural ventilation wet bulb probe. Pt100 sensor. Probe stem Ø 14 mm, length 170 mm. Complete with SICRAM module, spare braid and 50 cc distilled water.	210
HP3217.2	Relative humidity and temperature combined probe. Capacitive RH sensor, Pt100 temperature sensor. Probe stem Ø 14 mm, length 150 mm. Complete with SICRAM module. **Used for PMV measurement.**	210
AP3203.2	Omnidirectional hotwire probe. Measuring range: air speed 0.05 ÷ 5 m/s, temperature 0 ÷ +80 °C. Probe stem Ø 8 mm, length 230 mm. Complete with SICRAM module. **Used for PMV measurement.**	395
PROBES FOR HD32.3A		
TP3207	Temperature probe with Pt100 sensor. Probe stem Ø 14 mm, length 140 mm. Complete with SICRAM module. **Used for WBGT measurement.**	121
TP3275	Globe temperature probe with Pt100 sensor, globe Ø 150 mm. Stem Ø 14 mm, length 110 mm. Complete with SICRAM module. **Used for WBGT and PMV measurement.**	365
HP3201	Natural ventilation wet bulb probe. Pt100 sensor. Probe stem Ø 14 mm, length 110 mm. Complete with SICRAM module, two spare braids and 50 cc distilled water.	245
HP3217R	Relative humidity and temperature combined probe. Capacitive RH sensor, Pt100 temperature sensor. Probe stem Ø 14 mm, length 110 mm. Complete with SICRAM module. **Used for PMV measurement.**	190
AP3203	Omnidirectional hotwire probe. Measuring range: air speed 0.05 ÷ 5 m/s, temperature 0 ÷ +80 °C. Probe stem Ø 14 mm, length 110 mm. Complete with SICRAM module. **Used for PMV measurement.**	410
ACCESSORIES FOR HD32.3 AND HD32.3A		
VTRAP30	Tripod to be fixed to the instrument, max height 280 mm.	80
VTRAP32.2A.3A	Tripod with instrument holder for HD32.2A.	145
HD32.2.7	Holder for 4 probes, to be fixed on the standard tripod for version HD32.3A.	96
HD2110RS	Connecting cable, M12 connector on instrument side and with 9 poles SubD female connector for RS232C on PC side.	42
HD2110USB	Connecting cable with M12 connector on instrument side and USB 2.0 connector on PC side.	42
DELTALOG 10	Further copy of CD-ROM with software DeltaLog 10 for PC data download and management. For Windows® O.S.	85
SWD10	100-240 Vac/12 Vdc-1 A stabilized mains power supply.	44
AQC	200 cc distilled water.	10
HD40.1	Printer (**HD2110/RS** cable is requested).	265
BAT-40	Spare battery pack for HD40.1 printer with built-in temperature sensor.	27
RCT	Kit including 4 thermal paper rolls, width 57 mm, diameter 32 mm.	7

INDOOR AIR QUALITY (IAQ)

Temperature, Humidity, Pressure, CO, CO_2

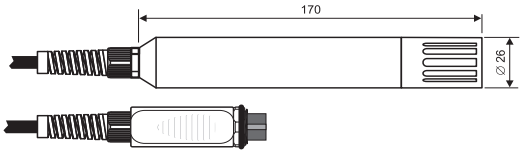
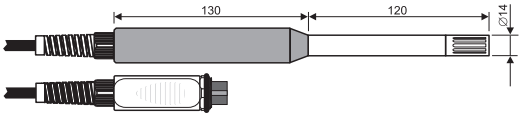
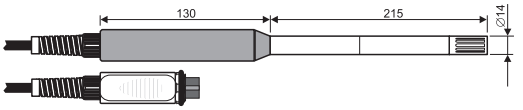
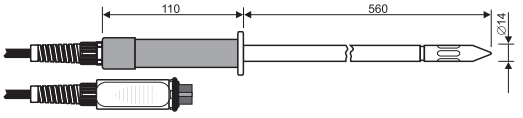
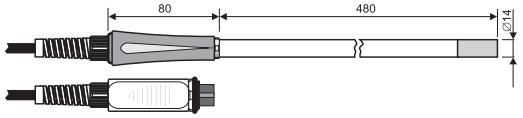
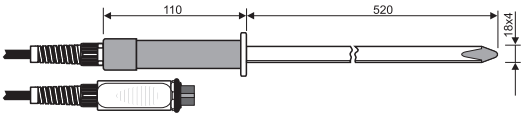
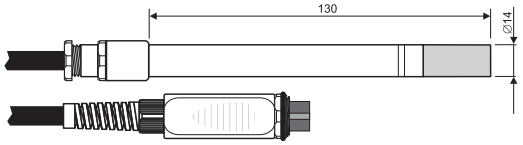
CODE	INSTRUMENTS FOR AIR QUALITY – CO – CO_2 MEASUREMENTS FOR INDOOR	EURO
HD37AB1347	 Datalogger for indoor air quality analysis (IAQ). The instrument measures the quantities: temperature, relative humidity, atmospheric pressure, CO_2 (Carbon Dioxide) and CO (Carbon Monoxide, only with P37AB147 probe). The SICRAM hotwire air speed probes, vane air speed probes, temperature probes, relative humidity and temperature combined probes can also be connected to the instrument. Memory capacity of 67,600 records for each of the two inputs. Logging interval from 15 seconds to 1 hour. Power supply: 4 x 1.2 V NiMH rechargeable batteries AA type. **The power supply/battery charger SWD10 is optional**. The kit includes: HD37AB1347 instrument, 4 x 1.2 V NiMH rechargeable batteries AA type, DeltaLog 10 software from **0.1.5.0 version**, instruction manual and carrying case. **The probes and the cables have to be ordered separately.**	790

PROBES FOR HD37AB1347

AIR QUALITY PROBES WITH SICRAM MODULE

P37AB147	 Temperature, relative humidity, atmospheric pressure, CO_2 (Carbon Dioxide) and CO (Carbon Monoxide) combined probe. Complete with SICRAM module. Probe Dimensions 275 mm x 45 mm x 40 mm. Connection cable length 2 m.	510
P37B147	Temperature, relative humidity, atmospheric pressure and CO_2 (Carbon Dioxide) combined probe. Complete with SICRAM module. Probe Dimensions 275 mm x 45 mm x 40 mm. Connection cable length 2m.	475

RELATIVE HUMIDITY AND TEMPERATURE COMBINED PROBES WITH SICRAM MODULE

	(*) For temperatures up to 150 °C, we recommend the use of probes with stainless steel stem and filter P7. Extra charge €	32
HP472ACR	%RH and Pt100 temperature combined probe, complete with SICRAM module. 2 m connecting cable. Working range: -20…+80 °C , 0…100 %RH. 	160
HP572ACR	%RH and K thermocouple temperature combined probe, complete with SICRAM module. 2 m connecting cable. Working range: -20…+80 °C, 0…100 %RH.	166
HP473ACR (*)	%RH and Pt100 temperature combined probe, complete with SICRAM module. 2 m connecting cable. Working range: -20…+80 °C , 0…100 %RH. 	166
HP474ACR (*)	%RH and Pt100 temperature combined probe, complete with SICRAM module. 2 m connecting cable. Working range: -40…+150 °C, 0…100 %RH. 	170
HP475ACR	%RH and Pt100 temperature combined probe, complete with SICRAM module. 2 m connecting cable. Stainless steel probe stem. Tip dimensions ∅ 14 x 75 mm. Working range: -40…+150 °C, 0…100 %RH. **(Measurement of water activity in grains)** 	310
HP475AC1R	%RH and Pt100 temperature combined probe, complete with SICRAM module. Stainless steel probe stem, stainless steel 20µ sintered filter. 2m connecting cable. Working range: -40…+180 °C, 0…100 %RH. 	315
HP477 DCR	%RH and Pt100 temperature combined sword probe complete with SICRAM module. 2 m connecting cable. Working range: -40…+150 °C, 0…100 %RH. **(Measurement of water activity on paper)** 	290
HP478ACR	%RH and Pt100 temperature combined probe complete with SICRAM module. 5 m connecting cable. Working range: -40…+150 °C, 0…100 %RH. 	190
HD75	Saturated solution for verifying Relative Humidity probes at 75% RH, complete with fixing adapter for probes diameter 14 thread M12×1.	78
HD33	Saturated solution for verifying Relative Humidity probes at 33% RH, complete with fixing adapter for probes diameter 14 thread M12×1.	78
P6	10µm sintered stainless steel protection for probes diameter 14, thread M12×1.	28
P7	20µm PTFE protection for probes diameter 14, thread M12×1.	28
P8	20µm stainless steel grid and Pocan protection for probes diameter 14, thread M12×1.	16

Pt100 SENSOR PROBES α=0,00385 °C^{-1} , R_0 = 100 Ω

Depending on the manufacturing technology of the Platinum sensing element, there are two categories of Pt100 sensor probes:

- **WIRE WOUND** probes : identified by the letter **I** in the ordering code;
- **THIN FILM** probes : identified by the number **0** in the ordering code.

The best performances are obtained by using the wire wound probes, characterized by a very low long-term drift compared to the thin film probes. **The measuring uncertainty of the probes with SICRAM module can be improved with a calibration Report or an ACCREDIA calibration certificate.**

TOLERANCE CLASSES

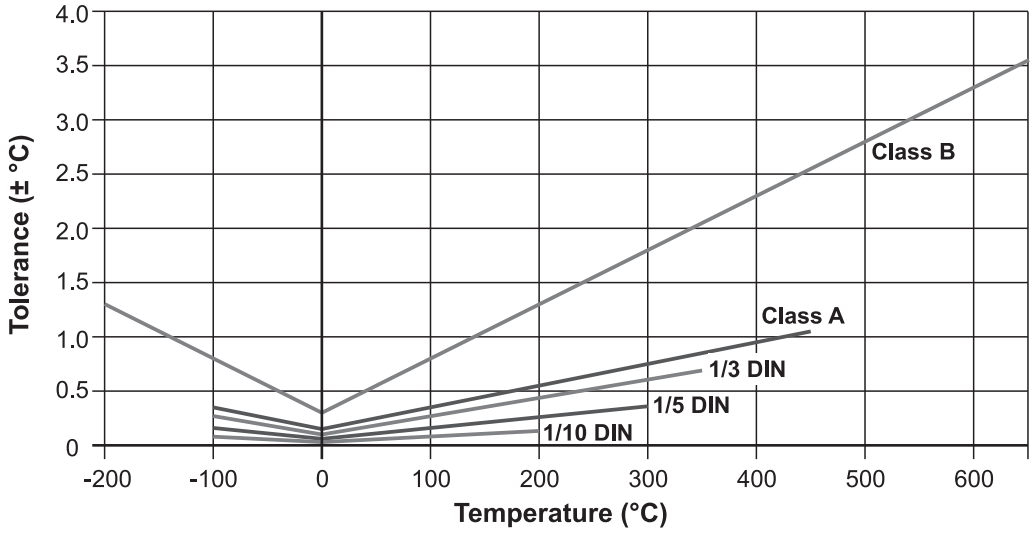
Reference standards:
- **DIN 43760 : 1980**
- **IEC 60751 : 2008**
- **BS EN 60751 : 2008**

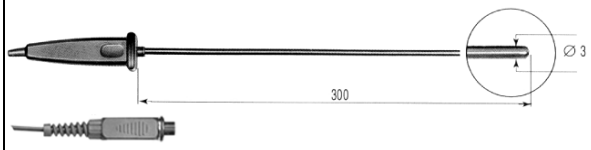
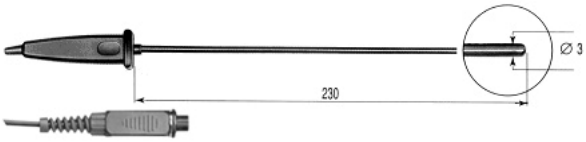
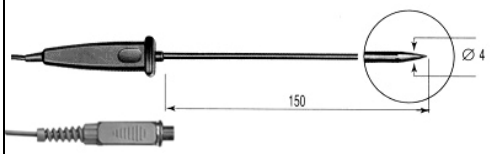
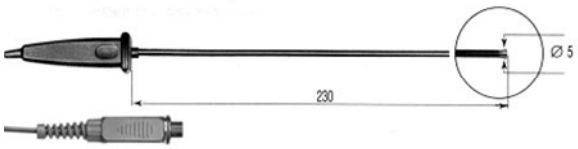
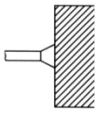
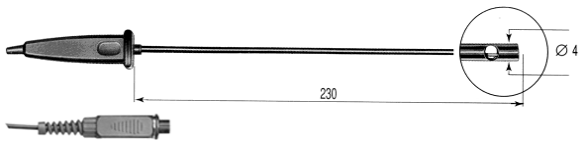
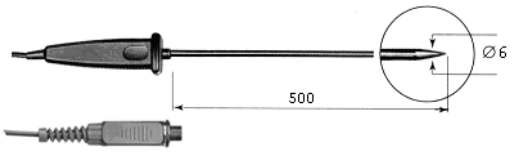
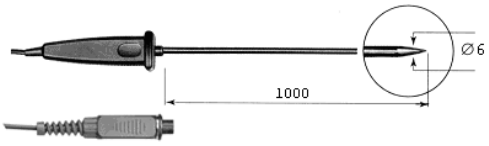
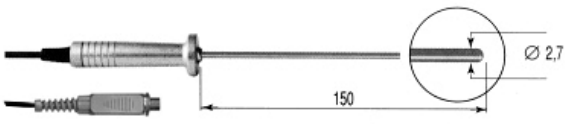
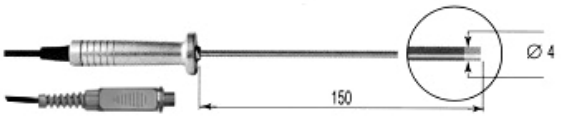
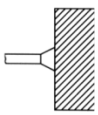
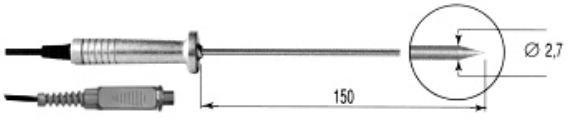
IEC nomenclature	DIN nomenclature	Temperature range of validity of the tolerance class		Tolerance at 0 °C
		WIRE WOUND sensor	THIN FILM sensor	
W0.03 (*)	1/10 DIN	Not defined by the standard	Not defined by the standard	± 0.03 °C
W0.06 (*)	1/5 DIN	Not defined by the standard	Not defined by the standard	± 0.06 °C
W0.1	1/3 DIN	-100…+350 °C	0…+150 °C	± 0.1 °C
W0.15	Class A (1/2 DIN)	-100…+450 °C	-30…+300 °C	± 0.15 °C
W0.3	Class B (DIN)	-196…+660 °C	-50…+600 °C	± 0.3 °C

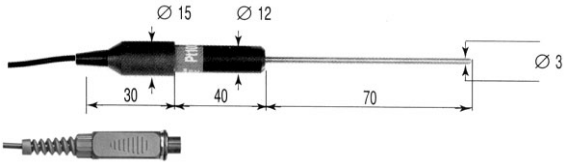
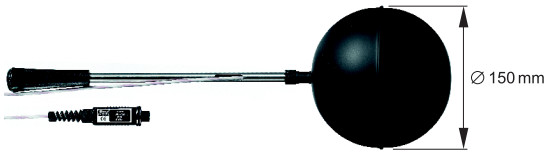
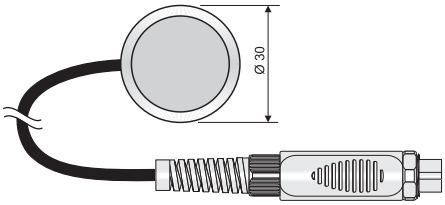
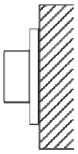
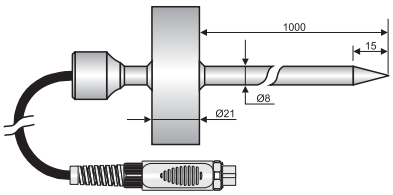
(*) Note: the tolerance classes W0.03 and W0.06 are not included in the IEC 60751 standard.

TOLERANCE AS A FUNCTION OF TEMPERATURE (the temperature range refers to the platinum wire wound probes)

Temperature (°C)	Tolerance (°C)				
	W0.3 Class B (DIN)	W0.15 Class A (1/2 DIN)	W0.1 1/3 DIN	W0.06 1/5 DIN	W0.03 1/10 DIN
-200	± 1.3	---	---	---	---
-100	± 0.8	± 0.35	± 0.27	± 0.16	± 0.08
0	± 0.3	± 0.15	± 0.10	± 0.06	± 0.03
100	± 0.8	± 0.35	± 0.27	± 0.16	± 0.08
200	± 1.3	± 0.55	± 0.44	± 0.26	± 0.13
300	± 1.8	± 0.75	± 0.60	± 0.36	---
350	± 2.1	± 0.85	± 0.69	---	---
400	± 2.3	± 0.95	---	---	---
450	± 2.6	± 1.05	---	---	---
500	± 2.8	---	---	---	---
600	± 3.3	---	---	---	---
650	± 3.6	---	---	---	---



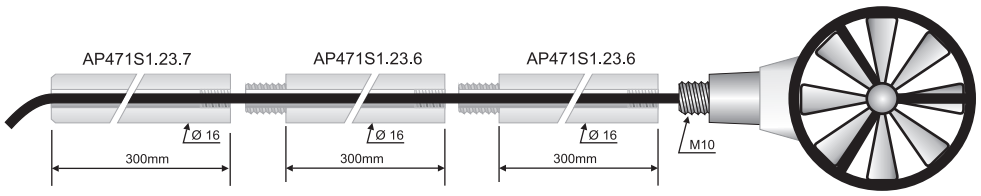
CODE	Pt100 SENSOR TEMPERATURE PROBES WITH SICRAM MODULE					EURO
	°C max	τ s	Description	Dimensions	Use	
TP472I	-196 +500	3 s	Immersion probe Stem Ø 3 mm Length 300 mm Cable length 2 m			130
TP472I.0 **1/3 DIN** **Thin Film**	-50 +300	3 s	Immersion probe Stem Ø 3 mm Length 230 mm Cable length 2 m			83
TP473P.I	-50 +400	5 s	Penetration probe Stem Ø 4 mm Length 150 mm Cable length 2 m			136
TP473P.0 **1/3 DIN** **Thin Film**	-50 +300					95
TP474C.I	-50 +400	5 s	Contact probe Stem Ø 4 mm Length 230 mm Contact surface Ø 5 mm Cable length 2 m			131
TP474C.0 **1/3 DIN** **Thin Film**	-50 +300					96
TP475A.0 **1/3 DIN** **Thin Film**	-50 +250	12 s	Air probe Stem Ø 4 mm Length 230 mm Cable length 2 m			94
TP472I.5	-50 +400	3 s	Penetration probe Stem Ø 6 mm Length 500 mm Cable length 2 m			181
TP472I.10	-50 +400	3 s	Penetration probe Stem Ø 6 mm Length 1000 mm Cable length 2 m			198
TP49A.0 **Class A** **Thin Film**	-70 +250	3.5s	Immersion probe Stem Ø 2.7 mm Length 150 mm Cable length 2 m Aluminium handle			86
TP49AC.0 **Class A** **Thin Film**	-70 +250	5.5s	Contact probe Stem Ø 4 mm Length 150 mm Cable length 2 m Aluminium handle			90
TP49AP.0 **Class A** **Thin Film**	-70 +250	4s	Penetration probe Stem Ø 2.7 mm Length 150 mm Cable length 2 m Aluminium handle			89

CODE	Pt100 SENSOR TEMPERATURE PROBES WITH SICRAM MODULE					EURO
	°C max	τ s	Description	Dimensions	Use	
TP87.0 **1/3 DIN Thin Film**	-50 +200	3s	Immersion probe Stem Ø 3 mm Length 70 mm Cable length 1 m With handle	 Cable L = 1 m		75
TP875.I	-30 +120	15'	Globe-thermometer Ø 150 mm Cable length 2 m With handle			370
TP876.I	-30 +120	15'	Globe-thermometer Ø 50 mm Cable length 2 m With handle			342
TP878.0 **1/3 DIN Thin Film**	0 +85	60s	Contact probe for solar panels Cable length 2 m			88
TP878.1.0 **1/3 DIN Thin Film**	0 +85	60s	Contact probe for solar panels Cable length 5 m			96
TP879.0 **1/3 DIN Thin Film**	-20 +120	60s	Penetration probe for compost Stem Ø 8 mm Length 1 m Cable length 2 m			260

HOTWIRE AIR SPEED PROBES WITH SICRAM MODULE		
AP471S1	Directional hotwire probe to measure air speed in the range 0.1…40 m/s and air temperature in the range -25 °C…+80 °C. Temperature compensation from 0 to +80 °C. Probe diameter (measurement area) 8 mm. Probe complete with handle and telescopic shaft: minimum length 360 mm, maximum length 1060 mm. Cable length with fully closed telescopic shaft 1800 mm. Probe complete with SICRAM module.	380
AP471S2	Omni-directional hotwire probe to measure air speed in the range 0.1…5 m/s and air temperature in the range -25 °C…+80 °C. Temperature compensation from 0 to +80 °C. Probe diameter (measurement area) 8 mm. Probe complete with handle and telescopic shaft: minimum length 360 mm, maximum length 1060 mm. Cable length with fully closed telescopic shaft 1800 mm. Probe complete with SICRAM module.	410
AP471S3	Directional hotwire probe, 180°C articulated tip for easy positioning, to measure air speed in the range 0.1…40 m/s and air temperature in the range -25 °C…+80 °C. Temperature compensation from 0 to +80 °C. Probe diameter (measurement area) 8 mm. Probe complete with handle and telescopic shaft, minimum length 450 mm, maximum length 1140 mm. Cable length with fully closed telescopic shaft 1660 mm. Probe complete with SICRAM module.	430
AP471S4	Omni-directional hotwire probe with telescopic shaft and table base. Maximum height 760 mm, minimum height 380 mm. Measurement of air speed in the range 0.1…5 m/s and of air temperature in the range 0 °C…+80 °C. Wire protection spherical cage diam. 100 mm. 2 m cable. Probe complete with SICRAM module.	470

VANE AIR SPEED PROBES WITH SICRAM MODULE		
AP472S1	Vane probe with K type thermocouple ∅ 100 mm to measure air speed in the range 0.6…25 m/s and air temperature in the range –25 °C … +80 °C. Probe complete with handle, **telescopic shaft available on request**. Minimum length of shaft with handle 360 mm, maximum length with handle 1025 mm. 2 m cable. Probe complete with SICRAM module.	370
AP472S2	Vane probe diam. 60 mm with handle to measure air speed in the range 0.5…20 m/s. **Telescopic shaft available on request**. Minimum length of shaft with handle 360 mm, maximum length with handle 1025 mm. 2 m cable. Probe complete with SICRAM module.	340

CODE	ACCESSORIES	EURO
SWD10	100-240 Vac/12 Vdc-1 A stabilized mains power supply.	44
VTRAP20	Tripod to be fixed to the instrument, max height 270 mm.	52
HD2110RS	Connecting cable with M12 connector on instrument side and with 9 poles SubD female connector for RS232C on PC side.	42
HD2110USB	Connecting cable with M12 connector on instrument side and USB 2.0 connector on PC side.	42
DELTALOG 10	Further copy of CD-ROM with software DeltaLog 10 for PC data download and management. For Windows® operating systems.	85
HD40.1	Printer (**HD2110/RS** cable is requested).	265
BAT-40	Spare battery pack for HD40.1 printer with built-in temperature sensor.	27
RCT	Kit including 4 thermal paper rolls, width 57mm, diameter 32mm.	7
ACCESSORIES FOR P37AB147 AND P37B147 PROBES		
MINICAN.12A	Nitrogen can for CO and CO_2 calibration at 0ppm. 20 litres volume. **With regulating valve.** **Note: the cylinder cannot be shipped by air.**	180
MINICAN.12A1	Nitrogen can for CO and CO_2 calibration at 0ppm. 20 litres volume. **Without regulating valve**. **Note: the cylinder cannot be shipped by air.**	90
ECO-SURE-2E CO	CO spare sensor (P37AB147 only).	48
HD37.36	Connection tube kit between instrument and MINICAN.12A for CO calibration (P37AB147 only).	20
HD37.37	Connection tube kit between instrument and MINICAN.12A for CO_2 calibration.	25
ACCESSORIES FOR AIR SPEED PROBES		
AST.1	Telescopic shaft (minimum length 210 mm, maximum length 870 mm) for AP472S1 and AP472S2 vane probes.	86
AP471S1.23.6	Fixed extension shaft ∅ 16 x 300 mm, M10 male thread on a side, female on the other. For vane probes AP472S1, AP472S2.	34
AP471S1.23.7	Fixed extension shaft ∅ 16 x 300 mm, M10 female thread on a side only. For vane probes AP472S1, AP472S2.	30



CODE	INSTRUMENTS FOR AIR QUALITY – CO – CO_2 MEASUREMENTS FOR INDOOR	EURO
HD21AB17	 Datalogger for indoor air quality analysis (IAQ). The instrument measures the quantities: CO_2 (Carbon Dioxide), CO (Carbon Monoxide), temperature, relative humidity and atmospheric pressure. Memory capacity of 67,600 records. Logging interval from 15 seconds to 1 hour. Power supply: 4 x 1.2 V NiMH rechargeable batteries. **The power supply/battery charger SWD10 is optional**. The kit includes: HD21AB17 instrument, 4 x 1.2 V NiMH rechargeable batteries, DeltaLog 10 software from **0.1.5.3 version**, instruction manual and carrying case. **The cables have to be ordered separately.**	650
HD21AB	 Datalogger for indoor air quality analysis (IAQ). The instrument measures the quantities: CO_2 (Carbon Dioxide), CO (Carbon Monoxide) and atmospheric pressure. Memory capacity of 67,600 records. Logging interval from 15 seconds to 1 hour. Power supply: 4 x 1.2 V NiMH rechargeable batteries. **The power supply/battery charger SWD10 is optional**. The kit includes: HD21AB instrument, 4 x 1.2 V NiMH rechargeable batteries, DeltaLog 10 software from **0.1.5.3 version**, instruction manual and carrying case. **The cables have to be ordered separately.**	480
ACCESSORIES		
SWD10	100-240 Vac/12 Vdc-1 A stabilized mains power supply.	44
CP23	PC connecting cable with male mini-USB connector on instrument side and male A type USB connector on PC side.	21
DELTALOG 10	Further copy of CD-ROM with software DeltaLog 10 for PC data download and management. For Windows® operating systems.	85
BAT-40	Spare battery pack with built-in temperature sensor.	27
ACCESSORIES FOR THE CO AND CO_2 SENSORS		
MINICAN.12A	Nitrogen can for CO and CO_2 calibration at 0ppm. 20 litres volume. **With regulating valve**. **Note: the cylinder cannot be shipped by air.**	180
MINICAN.12A1	Nitrogen can for CO and CO_2 calibration at 0ppm. 20 litres volume. **Without regulating valve**. **Note: the cylinder cannot be shipped by air.**	90
ECO-SURE-2E CO	CO spare sensor.	48
HD37.36	Connection tube kit between instrument and MINICAN.12A for CO calibration.	20
HD37.37	Connection tube kit between instrument and MINICAN.12A for CO_2 calibration.	25
ACCESSORIES FOR THE HUMIDITY SENSOR		
HD75	Saturated solution for verifying Relative Humidity probes at 75% RH, complete with fixing adapter for probes diameter 14 thread M12×1.	78
HD33	Saturated solution for verifying Relative Humidity probes at 33% RH, complete with fixing adapter for probes diameter 14 thread M12×1.	78
P6	10µm sintered stainless steel protection for probes diameter 14, thread M12×1.	28
P7	20µm PTFE protection for probes diameter 14, thread M12×1.	28
P8	20µm stainless steel grid and Pocan protection for probes diameter 14, thread M12×1.	16

CODE	AIR QUALITY – CO – CO_2 DATALOGGERS FOR INDOOR	EURO
HD37AB17D	 Datalogger for measuring: temperature, relative humidity, CO (Carbon Monoxide) and CO_2 (Carbon Dioxide). Memory capacity of 20,000 records. Sampling interval from 3 seconds up to 5 minutes. The kit includes: instrument HD37AB17D, USB cable CP22 for PC connection, 6 Vdc power supply SWD06, BAT-20 battery pack, software DeltaLog 13, instruction manual and carrying case.	880
HD37B17D	 Datalogger for measuring: temperature, relative humidity, CO_2 (Carbon Dioxide). Memory capacity of 20,000 records. Sampling interval from 3 seconds up to 5 minutes. The kit includes: instrument HD37B17D, USB cable CP22 for PC connection, 6 Vdc power supply SWD06, BAT-20 battery pack, software DeltaLog 13, instruction manual and carrying case.	780
ACCESSORIES FOR HD37AB17D AND HD37B17D		
VTRAP20	Tripod to be fixed to the instrument, max height 270 mm.	52
DELTALOG 13	Further copy of CD-ROM with software DeltaLog 13 for PC data download and management. For Windows® operating systems.	85
SWD06	**100-240 Vac / 6 Vdc – 1 A** stabilized mains power supply.	45
BAT-20	Spare battery packet for the instruments HD37AB17D and HD37B17D with built-in temperature sensor.	32
CP22	USB cable for PC connection. A type USB connector on the PC side and B type USB connector on the instrument side.	42
P6	10µm sintered stainless steel protection for probes diameter 14, thread M12×1.	28
P7	20µm PTFE protection for probes diameter 14, thread M12×1.	28
P8	20µm stainless steel grid and Pocan protection for probes diameter 14, thread M12×1.	16
HD75	Saturated solution for verifying Relative Humidity probes at 75% RH, complete with fixing adapter for probes diameter 14 thread M12×1.	78
HD33	Saturated solution for verifying Relative Humidity probes at 33% RH, complete with fixing adapter for probes diameter 14 thread M12×1.	78
MINICAN.12A	Nitrogen can for CO and CO_2 calibration at 0ppm. 20 litres volume. **With regulating valve**. **Note: the cylinder can not be shipped by air.**	180
MINICAN.12A1	Nitrogen can for CO and CO_2 calibration at 0ppm. 20 litres volume. **Without regulating valve**. **Note: the cylinder can not be shipped by air.**	90
ECO-SURE-2E CO	CO spare sensor.	48
HD37.36	Connection tube kit between instrument and MINICAN.12A for CO calibration.	20
HD37.37	Connection tube kit between instrument and MINICAN.12A for CO_2 calibration.	25

CALIBRATION REPORTS AND CERTIFICATES

ISO 9001 CALIBRATION REPORTS	EURO
Instrument in line with the probe	
TEMPERATURE:	
If not expressly requested, the calibration points will be at the lab operator discretion.	
• Zero point (always carried out for immersion, contact, wire, air probes)	30
• A point between –40 °C and +350 °C	41
• A point between +350 °C and +600 °C	48
• A point below –41 °C up to –75 °C	58
• A point above 601 °C (max 1200 °C)	60
• 4 points between -10 °C and +100 °C	128
• 4 points between 0 °C and +200 °C	134
The calibration reports may be carried out compatibly with the size and shape of the probe. If necessary, the calibration of immersion, contact, wire and air probes is performed by immersion in temperature baths.	
Examples of calibration reports can be viewed in the **Laboratory** section of the web site **www.deltaohm.com**.	
RELATIVE HUMIDITY AND TEMPERATURE:	
If not expressly requested, the calibration points will be at the lab operator discretion.	
Combined relative humidity and temperature probe	
• **VCERT-UR**: Temperature: 4 fixed points between 4 °C and 60 °C Isotherm **A** at a temperature of 23 °C at the fixed points 25 – 45 – 65 – 85 – 45 %R.H.	408
• **VCERT-UR1**: Isotherm **B** at a temperature of 10 °C at the fixed points 25 – 45 – 65 – 85 – 45 %R.H.	336
• **VCERT-UR2**: Isotherm **C** at a temperature of 45 °C at the fixed points 25 – 45 – 65 – 85 – 45 %R.H.	398
• **VCERT-UR3**: Different Isotherms on request	420
Examples of calibration reports can be viewed in the **Laboratory** section of the web site **www.deltaohm.com**.	
AIR SPEED:	
If not expressly requested, the calibration points will be at the lab operator discretion.	
Fan, vane up to 60 mm diameter, hotwire probes:	
• **VCERT-V1**: Low speed (0.2…2 m/s): 1 cycle at the points 0.2 – 0.35 – 0.5 – 0.75 – 1 – 2 m/s	290
• **VCERT-V2**: Medium speed (1…25 m/s): 1 cycle at the points 1 – 2.5 – 5 – 10 – 25 m/s	280
• **VCERT-V3**: High speed (30…60 m/s): 1 cycle at the points 30 – 35 – 40 – 50 – 60 m/s	320
• **VCERT-V4**: An additional point between 0.5 and 25 m/s	40
• **VCERT-V5**: An additional point between 25 and 60 m/s	55
Ultrasonic, Pitot or Darcy tube, cup, vane (with ∅ > 60 mm) anemometers:	
• **VCERT-V6**: Medium speed (1…25 m/s): 1 cycle at the points 1 – 2.5 – 5 – 10 – 25 m/s	280
• **VCERT-V7**: High speed (30…60 m/s): 1 cycle at the points 30 – 35 – 40 – 50 – 60 m/s	320
• **VCERT-V8**: Complete calibration 0.2…60 m/s: 1 cycle	610
• **VCERT-V9**: An additional point between 1 and 25 m/s	50
• **VCERT-V10**: An additional point between 25 and 60 m/s	60
Examples of calibration reports can be viewed in the **Laboratory** section of the web site **www.deltaohm.com**.	

ISO 9001 CALIBRATION REPORTS	EURO
LIGHT:	
If not expressly requested, the calibration points will be at the lab operator discretion.	
• Calibration of luxmeters in one of the following ranges:	
VCERT-L1: 2.5 lux ÷ 200 lux (7 points)	300
VCERT-L2: 50 lux ÷ 4000 lux (7 points)	260
VCERT-L3: 2.5 lux ÷ 4000 lux (11 points)	420
• **VCERT-L4**: **Subsequent** linearity verification of luxmeters in the range 4000 lux...130000 lux (**ACCREDIA calibration up to the range 4000 lux is requested**).	230
• Calibration of luminance meters in one of the following ranges:	
VCERT-L5: 0.1cdm^{-2}...100 cdm^{-2} (10 points)	260
VCERT-L6: 10 cdm^{-2}...10000 cdm^{-2} (10 points)	260
VCERT-L7: 10000 cdm^{-2} ...30000 cdm^{-2} (5 points)	260
• **VCERT-L8**: Measurement of the Relative Spectral Sensitivity of: luminance meters, radiometers UVA, radiometers UVB and radiometers UVC. (Spectral Response Curve).	355
• Calibration of radiometers UVA in one of the following ranges:	
VCERT-L9: 1 Wm^{-2} ÷ 10 Wm^{-2}	285
VCERT-L10: 10 Wm^{-2} ÷ 50 Wm^{-2}	285
VCERT-L11: 1 Wm^{-2} ÷ 50 Wm^{-2}	380
• **VCERT-L12**: **Subsequent** linearity verification of radiometers UVA in the range 50 Wm^{-2}…1500 Wm^{-2}, carried out by monochromatic light at 365 nm.	230
• **VCERT-L13**: Calibration of radiometers UVB – UVC - ERY	290
• **VCERT-L14**: Calibration of sources in Spectral Irradiance (Wm^{-2}nm^{-2})	660
• **VCERT-L15**: Calibration of radiometers and probes PAR and RAD suitable in the field of VIS-NIR. Calibration is carried out at 580 nm. 3 calibration points.	285
• **VCERT-L16**: Pyranometers calibration. 1 calibration point.	200
• **VCERT-L17**: Albedometers calibration.	400
• **VCERT-L18**: Radiometers calibration.	320
• **VCERT-L26**: Net irradiance meters calibration. 1 calibration point.	220
Examples of calibration reports can be viewed in the **Laboratory** section of the web site **www.deltaohm.com**.	
CO – CO_2:	
• **VCERT-C**: Zero CO calibration report, ACCREDIA traceability	100
• **VCERT-C1**: 3 points CO_2 (0 – 980 – 2400 ppm) calibration report, ACCREDIA traceability	280

ilac-MRA ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
LAT N° 124
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

ACCREDIA CALIBRATION CENTRE LAT N°124
TEMPERATURE

ACCREDITED CENTRE UNCERTAINTIES FOR TEMPERATURE MEASUREMENTS IN THE LABORATORY			
INSTRUMENTS TO BE CALIBRATED	**MEASURING RANGE**	**UNCERTAINTY (*)**	**NOTE**
Noble metal thermocouples	-50 °C...250 °C 250 °C…540 °C 540 °C...1100 °C 1100 °C...1250 °C	0.3 °C 0.4 °C 1.1 °C 2.0 °C	
Common metal thermocouples	Point at **–196 °C**, **liquid nitrogen** -80 °C...250 °C 250 °C...540 °C 540 °C...1100 °C 1100 °C...1250 °C	0.40 °C 0.40 °C 0.53 °C 1.5 °C 2.2 °C	
Thermoresistances	Point at **–196 °C**, **liquid nitrogen** -80 °C...0 °C 0 °C...100 °C 100 °C...250 °C 250 °C...600 °C	0.20 °C 0.15 °C 0.05 °C 0.10 °C 0.20 °C	
Thermometric chains Temperature indicators and transmitters Noble metal thermocouples	-50 °C...250 °C 250 °C…540 °C 540 °C...1100 °C 1100 °C...1250 °C	$2\sqrt{0.15^2 + u_{ris}^2}$ °C $2\sqrt{0.20^2 + u_{ris}^2}$ °C $2\sqrt{0.55^2 + u_{ris}^2}$ °C $2\sqrt{1.0^2 + u_{ris}^2}$ °C	1
Thermometric chains Temperature indicators and transmitters Common metal thermocouples	Point at **–196 °C**, **liquid nitrogen** -80 °C...250 °C 250 °C...540 °C 540 °C...1100 °C 1100 °C...1250 °C	$2\sqrt{0.20^2 + u_{ris}^2}$ °C $2\sqrt{0.20^2 + u_{ris}^2}$ °C $2\sqrt{0.26^2 + u_{ris}^2}$ °C $2\sqrt{0.75^2 + u_{ris}^2}$ °C $2\sqrt{1.1^2 + u_{ris}^2}$ °C	1
Thermometric chains Temperature indicators and transmitters Thermoresistances	Point at **–196 °C**, **liquid nitrogen** -80 °C...0 °C 0 °C...100 °C 100 °C...250 °C 250 °C...600 °C	$2\sqrt{0.10^2 + u_{ris}^2}$ °C $2\sqrt{0.075^2 + u_{ris}^2}$ °C $2\sqrt{0.025^2 + u_{ris}^2}$ °C $2\sqrt{0.050^2 + u_{ris}^2}$ °C $2\sqrt{0.10^2 + u_{ris}^2}$ °C	1
Calibrators-Simulators and Meters For thermoresistances	National and international standards for temperature sensors	$2\sqrt{0.025^2 + u_{ris}^2}$ °C	1
Calibrators-Simulators and Meters For thermocouples	National and international standards for temperature sensors	$2\sqrt{0.10^2 + u_{ris}^2}$ °C	1
Air temperature	0 °C...60 °C	0.1 °C	

(*) The measuring uncertainties are expressed as twice the standard deviation, corresponding, in the case of normal distribution, to a confidence level of about 95%.

1) u_{ris} is the uncertainty contribution due to the resolution of the instrument expressed in °C.

ACCREDITED CENTRE UNCERTAINTIES FOR TEMPERATURE IN OUTDOOR CALIBRATIONS			
INSTRUMENTS TO CALIBRATE	**MEASURING RANGE**	**UNCERTAINTY (*)**	**NOTE**
Temperature Indicators - for thermoresistances - for noble metal thermocouples - for common metal thermocouples	National and international standards for temperature sensors	$2\sqrt{0,5^2 + u_{ris}{}^2}$ °C $2\sqrt{0,75^2 + u_{ris}{}^2}$ °C $2\sqrt{1,0^2 + u_{ris}{}^2}$ °C	1

(*) The measuring uncertainties are expressed as twice the standard deviation, corresponding, in the case of normal distribution, to a confidence level of about 95%.

1) u_{ris} is the uncertainty contribution due to the resolution of the instrument expressed in °C.

TABLE A : CERTIFICATION OF INDICATORS IN LINE WITH THE PROBE

If not expressly requested, the calibration points will be at the lab operator discretion.

THERMOMETRIC CHAINS	MEASURING RANGE Temperature		MINIMUM POINTS NUMBER (0°C point included)	PRICE Including certificate
	Minimum	Maximum		EURO
Indicator in line with a Thermocouple probe	0 °C	250 °C	4	145
	-40 °C*	200 °C	4	160
	-40 °C*	560 °C	5	215
	0 °C	1063 °C	6	255
	0 °C	1200 °C	7	360
	-40 °C*	1200 °C	8	400
Indicator in line with a platinum resistance probe (Pt25, Pt100)	0 °C	250 °C	4	145
	-40 °C*	200 °C	4	160
	-40 °C*	560 °C	5	215
A) An additional point between –73 °C and –41 °C				65
B) An additional point between –40 °C and 0 °C				41
C) An additional point between 0 °C and 200 °C				38
D) An additional point between 200 °C and 560 °C				50
E) An additional point between 560 °C and 1200 °C (only thermocouples)				68
F) The LIQUID NITROGEN point –196 °C				145
G) **Adjustment** (reduction of the systematical error, when possible) only for Pt100				55

Note: The calibrating points have to be equidistant between the minimum and the maximum value of the requested calibration range.

*** In order to extend the calibration to negative range till –73 °C and –196 °C, two calibration points between –73 °C and -40 °C are necessary.**

NOTES:

- The instrumentation setup can be performed only on Delta Ohm instruments.
- The setup has to be authorized by the customer.
- The possibility of setting up instruments produced by other manufacturers has to be examined every time and depends on the conditions of the instrument and availability of relevant technical literature.

TABLE B : CERTIFICATION OF RTD AND TC PROBES ALONE

TC / TRP	MEASURING RANGE Temperature		MINIMUM POINTS NUMBER (0°C point included)	PRICE Including certificate
	Minimum	Maximum		EURO
TC (Thermocouple)	-40 °C	560 °C	5	215
	-40 °C	1063 °C	6	260
	-73 °C*	1063 °C	8	400
	-40 °C	1200 °C	9	465
	-73 °C*	1200 °C	10	530
PRT (Platinum Resistance Thermometers)	0 °C	250 °C	5	200
	-40 °C	200 °C	5	220
	-40 °C	560 °C	6	275
	-73 °C*	250 °C	7	340
	-73 °C*	560 °C	8	420
A) Data tabulation in steps of 1°C (0 °C and 100 °C points are compulsory only for platinum resistance thermometers)				45
B) An additional point between 560 °C and 1200 °C (only thermocouples)				68
C) An additional point between -40 °C and 560 °C				55
D) An additional point between -73 °C and -41 °C				65
E) The LIQUID NITROGEN point –196 °C				145

Note: the calibrating points have to be equidistant between the minimum and the maximum value of the requested calibration range.

*** In order to extend the calibration to negative range till –73 °C, two calibration points between –73 °C and –40 °C are necessary. For extensions till 1200 °C it is necessary to calibrate 4 points between 1065 °C and 1200 °C.**

MAXIMUM OPERATIVE TEMPERATURE FOR ACCREDIA CALIBRATIONS DEPENDING ON THE LENGTH OF THE PROBE STEM

STEM LENGTH	TEMPERATURE RANGE
Longer than 150 mm	-80 °C …200 °C
Longer than 230 mm	-80 °C …250 °C
Longer than 250 mm	-196 °C …560 °C
Longer than 300 mm	-196 °C …1200 °C

NOTE: testing of probes for air, contact, pointed and wire probes is always carried out as though they were immersion probes.

TABLE C: CERTIFICATION OF CALIBRATORS, METERS/SIMULATORS

CALIBRATORS: METERS/SIMULATORS	MEASURING OR TESTING RANGE	PRICE Including certificate
		EURO
Calibrators simulators for thermocouples and resistance thermometers	N° 8 equidistant points in the measuring range **for each probe requested** (J,E,T,K,R,S,B,Pt100,etc.)	200
Calibrators meters for thermocouples and resistance thermometers	N° 8 equidistant points in the measuring range **for each probe requested** (J,E,T,K,R,S,B,Pt100,etc.)	225

TABLE D: ON-SITE ACCREDIA CALIBRATION SERVICE ACCORDING TO ACCREDITATION TABLE

The cost will be agreed from time to time, depending on to the entity of the task and employment of personnel and equipment.

Examples of calibration reports can be viewed in the **Laboratory** section of the web site **www.deltaohm.com**.

ACCREDIA CALIBRATION CENTRE LAT N°124
HUMIDITY

ACCREDITED CENTRE UNCERTAINTIES FOR HUMIDITY			
MEASURE	**INSTRUMENTS TO BE CALIBRATED**	**MEASURING RANGE**	**UNCERTAINTY (*)**
Relative Humidity	Electric and mechanical hygrometers and thermo hygrometers	from 10 %R.H. to 92 %R.H (with air temperature from 0 °C to 60 °C)	from 0.5 %R.H. to 1.8 %R.H.
	Electric psychrometers	from 10 %R.H. to 92 %R.H (with air temperature from 0 °C to 60 °C)	from 0.5 %R.H. to 1.8 %R.H.
Relative Humidity	Saturated salt solutions	from 10 %R.H. to 90 %R.H (with air temperature from 20 °C to 25 °C)	1.4 %R.H.
Dew Point	Condensing mirror hygrometers	from -20 °C to 60 °C	0.16 °C

(*) The measuring uncertainties are expressed as twice the standard deviation, corresponding, in the case of normal distribution, to a confidence level of about 95%.

If not expressly requested, the calibration points will be at the lab operator discretion.

ACCREDIA CERTIFICATES HUMIDITY	**CALIBRATION OF HYGROMETERS, THERMOHYGROMETERS AND ELECTRIC PSYCHROMETERS PORTABLE INSTRUMENTS, INSTRUMENTS FOR FIXED INSTALLATION (panel mount, wall mount, etc.)**	**EURO**
Isotherm **A** at temperature 23 °C at fixed points 25 – 45 – 65 – 85 – 45 %R.H.		360
Isotherm **B** at temperature 10 °C at fixed points of 25 – 45 – 65 – 85 – 45 % R.H.		390
Isotherm **C** at temperature 45 °C at fixed points of 25 – 45 – 65 – 85 – 45 %R.H.		430
An additional point of relative humidity at the temperature of 55 °C		200
Isotherm on 4 points selected by the customer between 10 and 90 % R.H. at the temperature of 23 °C		500
Mechanical hygrometers and termohygrographs **(isotherm A)**		420
Dry bulb / wet bulb psychrometers		430
Temperature calibration of combined probes and minidatalogger in 4 points: 4 °C, 23 °C, 40 °C, 58 °C		142
Temperature calibration of minidataloggers and transmitters with internal sensor in 4 fixed points: 4 °C, 23 °C, 35 °C, 48 °C		142
An additional temperature point in the range 4 °C…58 °C for sensors without electronics		40
Adjustment of instruments with condensing mirror hygrometer (reduction of systematical error)		370

NOTES:

- **Isotherm is a relative humidity calibration with constant air temperature.**
- The instrumentation setup can be performed only on Delta Ohm instruments. **Net price 125 EURO, the calibration report is not included.**
- The setup has to be authorized by the customer.
- The possibility of setting up instruments produced by other manufacturers has to be examined every time and depends on the conditions of the instrument and availability of relevant technical literature.

ACCREDIA CERTIFICATES HUMIDITY	CALIBRATION OF CONDENSING MIRROR HYGROMETERS	EURO
Dew point temperature: 4 equidistant points between -20 °C and 20 °C		500
Dew point temperature: 4 equidistant points between 0 °C and 60 °C		560
Dew point temperature: 5 equidistant points between–20 °C and 60 °C		640
1 additional point between –20 °C and 0 °C		75
1 additional point between 0 °C and 20 °C		65
1 additional point between 20 °C and 60 °C		75
Second additional point		60

Note: in case of dew point temperature over 20 °C the sensor of the condensing mirror hygrometer has to satisfy at least one of the following two requirements:

1) The air collecting line and the measuring end part have to be equipped with a heating system.
2) The end measuring part has to be suitable to enter in the measuring chamber (to clarify before placing the order).

ACCREDIA CERTIFICATES HUMIDITY	CALIBRATION OF SATURATED SALT SOLUTIONS	EURO
Calibration of saturated salt solution at 23 °C as relative humidity generator.		95

Examples of calibration reports can be viewed in the **Laboratory** section of the web site **www.deltaohm.com**.

ACCREDIA CALIBRATION CENTRE LAT N°124
PHOTOMETRY – RADIOMETRY

ACCREDITED CENTRE UNCERTAINTIES FOR PHOTOMETRY – RADIOMETRY				
MEASURE	**INSTRUMENTS TO BE CALIBRATED**	**MEASURING RANGE**	**MEASURING CONDITION**	**UNCERTAINTY (*)**
Illuminance **Lux**	Luxmeters	2.5 lux ÷ 4000 lux		**2.0 %**
Luminance **cd m^{-2}**	Luminance meters	1 cd m^{-2} ÷ 10000 cd m^{-2}		**3.2 %**
Luminous intensity **cd**	Incandescence lamps	1 cd ÷ 3000 cd		**2.7 %**
Correlated colour temperature **K**	Incandescence lamps	2200 K ÷ 3300 K		**50 K**
Irradiance **UVA W/m^2**	Radiometers UVA	1 W/m^2 ÷ 50 W/m^2	365 nm	**5.0 %**
Irradiance **UVB W/m^2**	Radiometers UVB	1.2 W/m^2	311 nm	**6.6 %**
Irradiance **UVC W/m^2**	Radiometers UVC	1.5 W/m^2	254 nm	**7.2 %**
Spectral Sensitivity **A/W**	Photodiodes	$(1\cdot10^{-2} \div 1\cdot10^{1})$ A W^{-1} $(1\cdot10^{-3} \div 1\cdot10^{1})$ A W^{-1} $(1\cdot10^{-4} \div 1\cdot10^{1})$ A W^{-1} $(1\cdot10^{-4} \div 1\cdot10^{1})$ A W^{-1} $(1\cdot10^{-4} \div 1\cdot10^{1})$ A W^{-1} $(1\cdot10^{-4} \div 1\cdot10^{1})$ A W^{-1} $(1\cdot10^{-4} \div 1\cdot10^{1})$ A W^{-1}	200 nm ÷ 240 nm 240 nm ÷ 375 nm 375 nm ÷ 920 nm 920 nm ÷ 1000 nm 1000 nm ÷ 1100 nm 1100 nm ÷ 1550 nm 1550 nm ÷ 1650 nm	**6.6 %** **3.7 %** **1.9 %** **2.0 %** **2.2 %** **2.0 %** **2.6 %**
Spectral Irradiance **W m^{-2} nm^{-1}**	Sources: Deuterium Lamps, Incandescence lamps	$(1\cdot10^{-5} \div 1\cdot10^{0})$ W m^{-2} nm^{-1}	200 nm ÷ 250 nm 250 nm ÷ 300 nm. 300 nm ÷ 350 nm 350 nm ÷ 400 nm 400 nm ÷ 700 nm 700 nm ÷ 800 nm	**10 %** **7.0 %** **4.4 %** **3.8 %** **3.2 %** **3.6 %**
Spectral Radiance **W m^{-2} nm^{-1} sr^{-1}**	Integrating spheres, Strip lamps	$(4\cdot10^{-5} \div 3\cdot10^{0})$ W m^{-2} nm^{-1} sr^{-1}	300 nm ÷ 400 nm 400 nm ÷ 800 nm	**5 %** **4.4 %**
Solar Irradiance Sensitivity **µV/(W/m^2)**	Pyranometers, Albedometers		Average Irradiance: 450 to 550 W/m^2 Tilt: 0,0 degree (**)	**2,6%**

(*) The measuring uncertainties are expressed as twice the standard deviation, corresponding, in the case of normal distribution, to a confidence level of about 95%.

(**) Calibration performed in accordance with ISO 9847:1992 (method IIc)

ACCREDIA LAT N°124 CERTIFICATES
PHOTOMETRY – RADIOMETRY

If not expressly requested, the calibration points will be at the lab operator discretion.

MEASURE	RANGE		EURO
ILLUMINANCE **Lux** (Linearity test of luxmeter. Up to 150000 lux see calibration reports).	2.5 lux ÷ 200 lux (7 points)		335
	50 lux ÷ 4000 lux (7 points)		285
	2.5 lux ÷ 4000 lux (11 points)		495
LUMINANCE **cd m^{-2}**	1 cd m^{-2} ÷ 500 cd m^{-2} (7 points)		285
	100 cd m^{-2} ÷ 10000 cd m^{-2} (7 points)		285
	1 cd m^{-2} ÷ 10000 cd m^{-2} (13 points)		495
LUMINOUS INTENSITY cd	1 cd ÷ 3000 cd		235
CORRELATED COLOUR TEMPERATURE K	2200 K ÷3300K		240
UVA IRRADIANCE Calibration with Xenon-Mercury lamp Filter at 365 nm	1 W m^{-2} ÷ 10 W m^{-2} (3 points)		350
	10 W m^{-2} ÷ 50 W m^{-2} (3 points)		350
	1 W m^{-2} ÷ 50 W m^{-2} (5 points)		490
UVB IRRADIANCE Calibration with Xenon-Mercury lamp Filter at 311 nm	1 W m^{-2}		340
UVC IRRADIANCE Calibration with Xenon-Mercury lamp Filter at 254 nm	1 W m^{-2}		340
SPECTRAL SENSITIVITY	200 nm … 1100 nm 850 nm … 1650 nm		500 Each spectral range
SPECTRAL IRRADIANCE **W m^{-2} nm^{-1}**	200 nm … 400 nm 300 nm … 800 nm		For 10 nm steps 500 For 2 nm steps 750 Each spectral range
SPECTRAL RADIANCE **W m^{-2} nm^{-1} sr^{-1}**	300 nm … 800 nm		For 10 nm steps 500 For 2 nm steps 750
New **SOLAR IRRADIANCE SENSITIVITY** **µV/(W/m^2)**	450 W/m^2…550 W/m^2	Pyranometers	250
		Albedometers	500
ADJUSTMENT			60

NOTES:

- The instrumentation setup can be performed only on Delta Ohm instruments.
- The setup has to be authorized by the customer.
- The possibility of setting up instruments produced by other manufacturers has to be examined every time and depends on the conditions of the instrument and availability of relevant technical literature.

Examples of calibration reports can be viewed in the **Laboratory** section of the web site **www.deltaohm.com**.

ACCREDIA CALIBRATION CENTRE LAT N°124
AIR SPEED

ACCREDITED CENTRE UNCERTAINTY FOR AIR SPEED					
MEASURE	**INSTRUMENTS TO BE CALIBRATED**	**MEASURING RANGE**	**UNCERTAINTY (*)**		**NOTE**
			❶	❷	
Air speed	Hotwire, Vane, Cup, Ultrasonic, Pitot tube, Darcy tube, anemometers.	0.1 m/s	13 %		---
		0.15 m/s	9 %		
		0.2 m/s	6 %		
		0.3 m/s	4 %		
		0.5 m/s	2.8 %		
		0.7 m/s	2.8 %		
		1 m/s	2.4 %	4.2 %	
		2.5 m/s	2.4 %	2.7 %	
		5 m/s	2.0 %	2.6 %	
		7.5 m/s	2.0 %	1.5 %	
		10 m/s	2.0 %	1.5 %	
		15 m/s	2.0 %	1.5 %	
		20 m/s	2.0 %	1.5 %	
		25 m/s	2.0 %	2.4 %	
		30 m/s	2.0 %	2.4 %	
		35 m/s	2.0 %	2.4 %	
		40 m/s		2.4 %	
		50 m/s		2.4 %	
		60 m/s		2.4 %	

(*) The measuring uncertainty is expressed with relation to the measure value and it is stated as extended uncertainty corresponding to the 95% confidence level.

❶ Kind of instrument: hotwire, vane (60 mm max diameter)

❷ Kind of instrument : cup, ultrasonic, Pitot tube, vane (diameter larger than 60 mm)

If not expressly requested, the calibration points will be at the lab operator discretion.

AIR SPEED ACCREDIA LAT N°124 CERTIFICATES	EURO
Fan or vane probes with 60 mm max diameter, hotwire probes	
5 rising points in the range 0.15 m/s...2 m/s	330
5 rising points in the range 0.15 m/s...5 m/s	330
5 rising points in the range 0.15 m/s...10 m/s	330
5 rising points in the range 0.15 m/s...20 m/s	330
5 rising points in the range 0.5 m/s...25 m/s	280
10 rising points in the range 0.5 m/s...40 m/s	440
5 rising and falling points in the range 0.5 m/s...25 m/s	400
5 rising points in the range 25 m/s...60 m/s	375
5 rising and falling points in the range 25 m/s...60 m/s	590
1 additional point	55
Fan or vane probes with diameter larger than 60 mm, cup anemometers, ultrasonic anemometers, Pitot or Darcy tubes	
5 rising points in the range 1m/s...25m/s	330
5 rising and falling points in the range 1m/s...25m/s	600
Additional point in the above mentioned ranges	65
5 rising points in the range 25m/s...60m/s	375
5 rising and falling points in the range 25m/s...60m/s	650
Additional point in the above mentioned ranges	65

NOTES:

- The instrumentation setup can be performed only on Delta Ohm instruments.
- The setup has to be authorized by the customer.
- The possibility of setting up instruments produced by other manufacturers has to be examined every time and depends on the conditions of the instrument and availability of relevant technical literature.

Examples of calibration reports can be viewed in the **Laboratory** section of the web site **www.deltaohm.com**.

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