



Uses:

- For measuring all physical parameters necessary to evaluate heat stress and thermal comfort
- For calculating comfort indices PMV, PPD and DR
- For calculating heat stress indices WBGT and required sweat rate
- For calculating ET*
- For long-duration monitoring (weeks) of the time history of thermal parameters and indices
- For evaluation of the thermal environment in vehicles

Features:

- Complies with: ISO 7730/CEN 27730; ISO 7726; ISO 7243/CEN 27243; ASHRAE 55; SAE J2234
- Four modules available: Comfort Module UA 1276, Heat Stress Module UA 1277, Dry Heat Loss Module UA 1278 and Analog Interface Module UA 1346
- Measured data is stored on SQL Server Database and can be accessed from Excel using 7701 Excel Database Manager Software

System Introduction

The Thermal Comfort Data Logger – INNOVA 1221 and the Thermal Comfort Manager Software – INNOVA 7701 build a system modularly of up to four input modules that enables the measuring of all physical parameters necessary to evaluate thermal comfort according to ISO 7730 and ISO 7726, as well as to evaluate heat stress according to ISO 7243 and ISO 7933.

Hardware Introduction

The INNOVA 1221 can operate as a stand-alone data logger or on-line together with a PC, where data can be displayed and processed. The data logger also supplies the necessary power to transducers connected to the modules and it controls the measurement. The power supply comes either from a battery pack or a mains power supply. Depending on the configuration the battery pack enables up to 18 hours of measurement to be made.

Setup the INNOVA 1221

Parameters are set up on the INNOVA 1221 via the RS-232 interface; transducers are connected to the sockets and it is decided what measurement data is stored or retrieved. The following are measured: Instantaneous values (i), Mean values (m), Max. values (h); Min. values (l); Standard deviation (s).

Measurement Interval of as little as one tenth of a second can be specified in the INNOVA 7701 application software depending on the transducers chosen.

Average Time is an option that specifies over how long a period the maximum, minimum, mean values and standard deviation are to be calculated.



Thermal Comfort Data Logger – INNOVA 1221

Automatic Measurements means when start and stop times are entered that the data logger operates as a self contained stand-alone instrument. Before and after measurement the INNOVA 1221 is in a passive state.

Data Format for all selected measurement and index data are stored in the SQL Server 2005 database where they can be accessed e.g. from Excel.

Interface for the data logger is an RS-232 serial interface socket. The interface is used to setup and transfer measurement data from the data logger to the PC. Using the INNOVA JV0901 USB to RS-232 converter the PC USB port also can be used.

Modes of operations

Stand-alone: Once the measurement setup has been defined for the INNOVA 1221 and the transducers, the PC can be disconnected, allowing the data logger to operate as a stand-alone unit. All the measurement data from the transducers is transferred to the data logger and stored in the internal memory, which can, for example, store up to one week's worth of measurement data if a 10 minute measurement interval is selected.

On-line: If real-time measurement data is desired, simply retain the PC/1221 connection. The RC-232 interface enables real-time measurement data to be transferred to the PC and displayed on screen as graphs. The measured data is stored in the SQL2005 Server database and can be imported into Excel using the provided Excel software provided.

Description of Modules

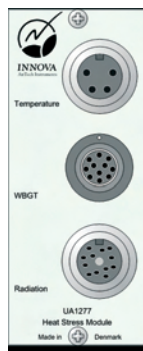
Comfort Module – UA1276



This module enables transducers to be connected that will provide measurement data for the majority of the physical parameters required to evaluate thermal comfort.

The module has three sockets, enabling a Temperature Transducer, a Humidity Transducer and an Air Velocity Transducer to be connected.

Heat Stress Module – UA1277



This module enables connection of the transducers that will provide measurement data to evaluate heat stress.

The module has three sockets, enabling a Temperature Transducer (with a wider measurement range than UA 1276), a WBGT Transducer and a Radiant Asymmetry Temperature Transducer to be connected.

Dry Heat Loss Module – UA1278



This module enables two Dry Heat Loss Transducers MM0057 to be connected. The transducer can be operated in the heated mode measuring dry heat loss and equivalent temperature or in an unheated mode measuring operative temperature.

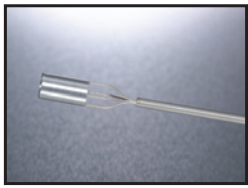
Due to the power consumption, the number of UA1278 modules fitted to the 1221 must be limited to three using the ZG0342 Power Supply.

Analog Interface Module – UA1346



This module enables six analog signals to be sampled from six non-specific measuring instruments. The data is sampled, stored and displayed just like data from the other measurement modules.

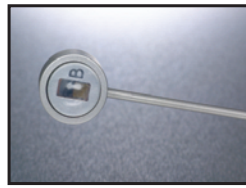
Thermal Comfort Transducers



Air Temperature
MM0034



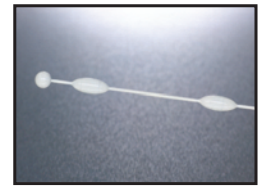
Surface Temperature
MM0035



Radiant Temperature
MM0036



Humidity
MM0037



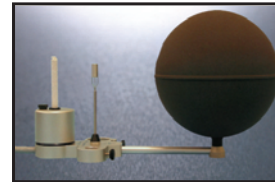
Air Velocity
MM0038



Dry Heat Loss
MM0057



Operative Temp.
MM0060



WBGT
MM0030

Ordering Information:

Includes the following accessories:

7701 Application Software
ZG0146 Battery Box
Instruction Manual on CD

Basic System Requirements:

Requires on or more of these modules:

UA1276 Comfort Module
UA1277 Heat Stress Module
UA1278 Dry Heat Loss Module
UA1346 Analog Interface Module

Requires one or more of these transducers:

MM0030 WBGT Transducer
MM0034 Air Temperature Transducer
MM0035 Surface Temperature Transducer
MM0036 Radiant Temperature Asymmetry Transducer
MM0037 Humidity Transducer
MM0038 Air Velocity Transducer
MM0057 Dry Heat Loss Transducer
MM0060 Operative Temperature Transducer

Cables:

From computer to 1221 (alternatives):

WL0945 RS-232 cable 25/9pin
WL0946 RS-232 cable 25/25 pin
JV0901 RS-232 to USB converter

Optional Accessories

ZG0342 Mains Power Supply
AQ0157 Charging Adaptor
UA0803 Tripod incl. one rod
UA1348 Tripod extension rods, three pcs.
UA0588 Transducer Mounting Adaptor
DH0492 Tripod Mounting adaptor, three arms (excl. 3*UA0588)
UA1347 Tripod Mounting Adaptor, four arms (excl. 4*UA0588)
KE0357 Transducer Carrying Case
KE0401 WBGT Transducer Carrying Case
AO1429 Adaptor Cable for MM0023 to UA1278
JP0500 Analog Connector to UA1346

Configured System Innova 3710

Basic Thermal Comfort System comprises:

1221 + 7701 + UA1276 + MM0034 + MM0037 + MM0038 +
MM0060 + WL0945 + KE0357 + UA0803 + UA1348 +
DH0492 + 4*UA0588

Specifications – INNOVA 1221

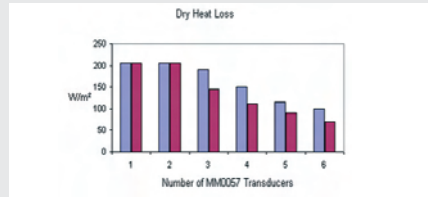
INNOVA 1221, UA1276, UA1277, UA1278 and UA1346

DIMENSIONS: Height: 138mm (5.4"), Width: 285mm (11.2"), Depth: 300 mm (11.8"), Weight: 4.0 kg (8.8 lb.) excl. power supply

Measurement Range: For Dry Heat Loss Module – UA1278 when mains power supply ZG0342 is connected**

Blue shading: $t_{amb} \geq 45^{\circ}\text{C}$

Purple shading: $t_{amb} < 45^{\circ}\text{C}$



POWER SUPPLY:

Internal Power Supply: plug-in battery pack (ZG0146) for six 1.5 Volt IEC R20 alkaline batteries or six NiCd rechargeable cells (not included)

External Power Supply (optional): plug-in power supply ZG0342. This is powered from 90 to 264 V AC mains supply at 47 to 65 Hz or 360 to 444 Hz

Power Consumption:

INNOVA 1221 alone 1.8W, UA1276 alone (without transducers) 0.4W, UA1277 alone (without transducers) 0.2W, UA1278 alone (without transducers) 0.4W

Battery Lifetime (typical): 18 hours with alkaline batteries, nine hours with rechargeable NiCd batteries installed (with one UA1276 and one 1277 installed) 10 hours with alkaline batteries, five hours with rechargeable NiCd batteries installed (with one UA1276 and one 1278 installed)

Data Transfer:

Built-in RS-232 interface using following communication parameters:
 Baud Rate: 9600 Data Bits: 8
 Stop Bits: 1 Parity: none
 Handshake: hardware/switched line

Data Storage:

INNOVA 1221 can store at least 10240 measured values. These values can be instantaneous, minimum, maximum, mean and standard deviation


** If an extended operating range is necessary contact LumaSense Technologies.

Modules

Comfort Module – UA1276			
Socket	Transducers	Measurement *** Range (UA1276)	Resolution
Temperature	MM0034, MM0035, MM0060	-20° to 100° C	0.1° C
Humidity	MM0037	-20° to 100° C	0.1° C
Air Velocity	MM0038	See transducer Product Data Sheet	
Heat Stress Module – UA1277			
Socket	Transducers	Measurement *** Range (UA1277)	Resolution
Temperature	MM0034, MM0035, MM0060	-40° to 150° C	0.1° C
WBGT	MM0030	-40° to 150° C	0.1° C
Radiation	MM0036	See transducer Product Data Sheet	
Dry Heat Loss Module – UA1278			
Socket (2)	Transducers	Measurement *** Range (UA1278)	Resolution
Dry Heat Loss	MM0057 Dry Heat Loss	0 to 205 W/M²	0.1° W/M²
	MM0057 Operative	-20° to 50° C	0.1° C
Analog Input Module – UA1346			
Socket (6)	Measurement Range (UA1346)		Resolution
Analog Input	Voltage 0-10V (Current 0-20 mA)		0 to 4 V: 1 mV 4 to 10V: 2.5 mV

* At 0.5 CLO. Only one UA1278 installed.

*** Indicates the measurement range on the module and not the range for the individual transducers. For additional specifications, see the individual Product Data Sheets for the transducers.

COMPLIANCE WITH STANDARDS	
	CE-mark indicates compliance with EMC Directive and Low Voltage Directive.
Safety	EN 61010-1 (1993) & IEC 1010-1 (1990): Safety requirements for electrical equipment for measurement, control and laboratory use.
EMC Emission	EN 5008 1-1 (1992) : Generic emission standard. Part 1: Residential, commercial and light industry.
EMC Immunity	EN 50082-2 (1995): Generic immunity standard. Part 2: Industrial environment. Note: The above is guaranteed using accessories listed in this Product Data sheet.
Temperature	IEC 68-2-1 & IEC 68-2-2: Environmental Testing. Cold and Dry Heat.
Humidity	IEC 68-2-3: Operating 90% RH (non-condensing at 30°C).
Enclosure	IEC 529: IP20.
Mechanical	IEC 68-2-6: Vibration: 0.3 mm, 20m/s², 10-500 Hz. IEC 68-2-27: Shock: 750 m/s². IEC 68-2-29: Bump: 2 x 1000 at 400m/s².

LumaSense Technologies reserves the right to change specifications and accessories without notice.

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