RHT

Temperature + Humidity Tx.

User Manual

WARNING

❖ This manual should be passed on to the end user.

❖ The contents of this manual are subject to change without prior notice.

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❖ ABUS gives no warranty of any kind with regard to this manual, including, but not limited to, fitness for a particular purpose.

❖ If any question arises or errors are found, or if any information is missing from this manual, please inform your supplier or inform at info@abustek.com.

❖ The specifications mentioned in this manual are limited to those for the standard type under the specified model number break-down and do not necessarily apply for customized instruments.

❖ Please note that changes in the specifications, construction, or component parts of the instrument may not immediately be reflected in this manual at the time of change.

❖ If the customer or any third party is harmed by the use of this product, ABUS assumes no responsibility for any such harm owing to any defects in the product which were not predictable, or for any indirect damages.

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it must be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process system performance leading to personal injury or death. Therefore, comply fully with all Warning and Caution notices.

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of Technical Communications Department, ABUS Technologies

HEALTH AND SAFETY

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given. Any deviation from these instructions will transfer the complete liability to the user.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

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CATALOGUE

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1. INTRODUCTION

The Relative Humidity and Temperature Transmitters RHT-WM and RHT-DM are microprocessor-based instruments that incorporate high-accurate and stable sensors whose information is converted to linear 4-20 mA or 0-10 Vdc.

As they are microprocessor equipment, they can be totally configured through the communication interface ATxConfig and ATxConfig software.

The humidity output can be configured to represent the Relative Humidity measured or the temperature value at dew point.

The RHT-WM model is intended for wall mounting. The RHT-DM comes with a probe tip for duct or wall mounting.

2. PRESENTATION

Technical Parameters

HUMIDITY MEASUREMENT
Accuracy: Refer to figure *RHT and Temperature accuracies*;
Repeatability: ±1 % RH;
Hysteresis: ±1 % RH;
Non-linearity: << 1 % RH;
Stability: < 1 %RH / year;
Span: Any value between 0 and 100 % RH or –40 and 100 °C for dew point;
Response time: 4 seconds in slow moving air.

TEMPERATURE CHANNEL
Accuracy: Refer to figure *RHT and Temperature accuracies*;
Repeatability: ±0.1 °C;
Span: Between -40 and 120 °C;
Response time: Up to 30 seconds in slow moving air.

GENERAL SPECIFICATIONS
Power supply: 12 Vdc to 30 Vdc (4-20 mA model) or 18 to 30 Vdc (0-10 V model).
Outputs: 4-20 mA or 20-4 mA current, 2-wire loop power supply, 0-10 Vdc voltage (optional).
OUT1 output resolution: 0.006 mA (4-20 mA) or 0.003 V (0-10 V);
OUT2 output resolution: 0.022 mA (4-20 mA) or 0.015 V (0-10 V);
Channel isolation: The 4-20 mA outputs are isolated from each other. The 0-10 V outputs share a common ground;
Output Load (RL):   4-20 mA output: RL (Ohms max) = (Vdc – 12) / 0.02
                                   Let Vdc = Loop power supply (12 to 30 Vdc)
0-10 Vdc output: RL (min) = 10 kilo ohms
Reverse polarity protection: YES
Protection: Electronic circuit case - IP65; Sensors capsule: IP40
Cable entrance: Compress fitting PG7;
Operating limits: Sensor e probe (RHT-DM): See Figure 01;
Electronic circuit: -10 to +65 °C, 0 to 95 %RH.

IMPORTANT NOTE: The transmitter sensor may be damaged or lose calibration if it is exposed to aggressive atmospheres with high concentrations as Chloride Acid, Nitride Acid, Sulphuric Acid and Ammonia. Acetone, Ethanol and Propylene Glycol may cause reversible measurement errors.   No accuracy improvement results from narrowing the range for the 4-20 mA output. For example, 3 %RH accuracy will be achieved for a transmitter configured to a 20-80 %RH or to a 30-40 %RH range.

Shall any error occur in the measures taken by the sensor, they can be corrected with the ATxConfig software? The ATxConfig interface can be connected to the transmitter even connected to the process and under operation. See figure and Zero Correction field in the main screen of the ATxConfig software. Measures accuracy and sensor operating limits:
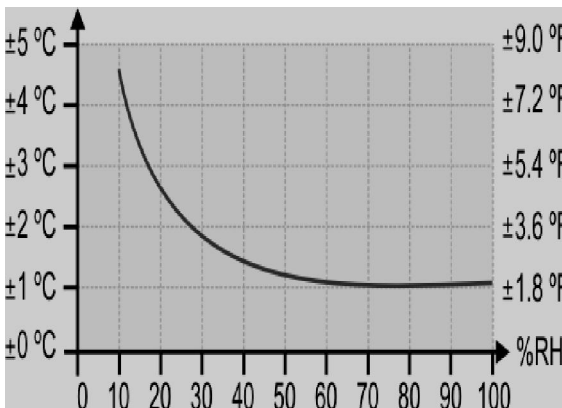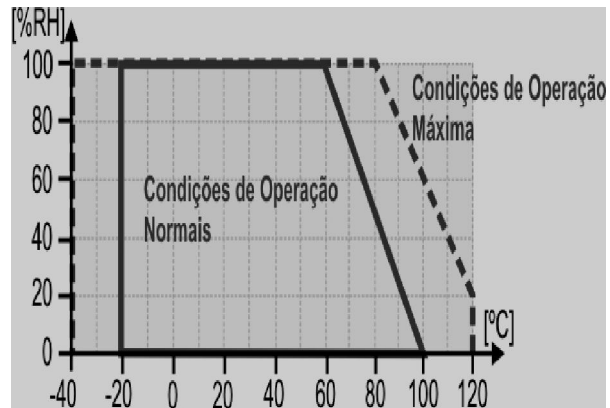
Relative Humidity Accuracy at 25°C
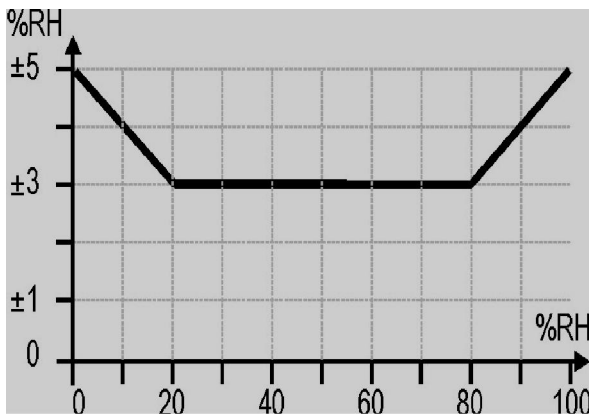
Temperature Accuracy
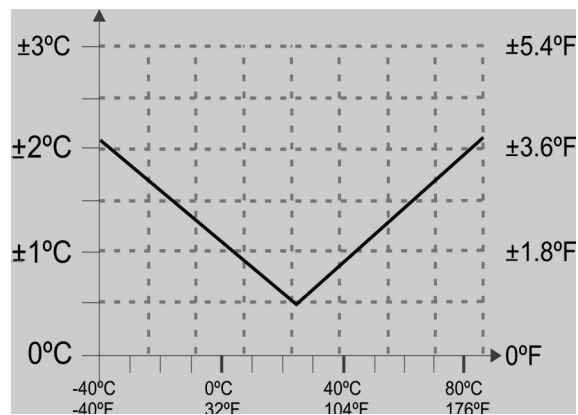
Dew point accuracy at 25°C

Sensor Operating Conditions

RHT and Temperature accuracies

3. DIMENSIONS

The **RHT-DM** (**D**uct **M**ount) model transmitter should be installed with a flange. This flange is first screwed onto the duct wall and the transmitter probe is then inserted into the flange central hole and locked. Figure *Mounting Flange for RHT,* below shows flange dimensions and holes. It is also available in stainless steel or polyamide 6.6.
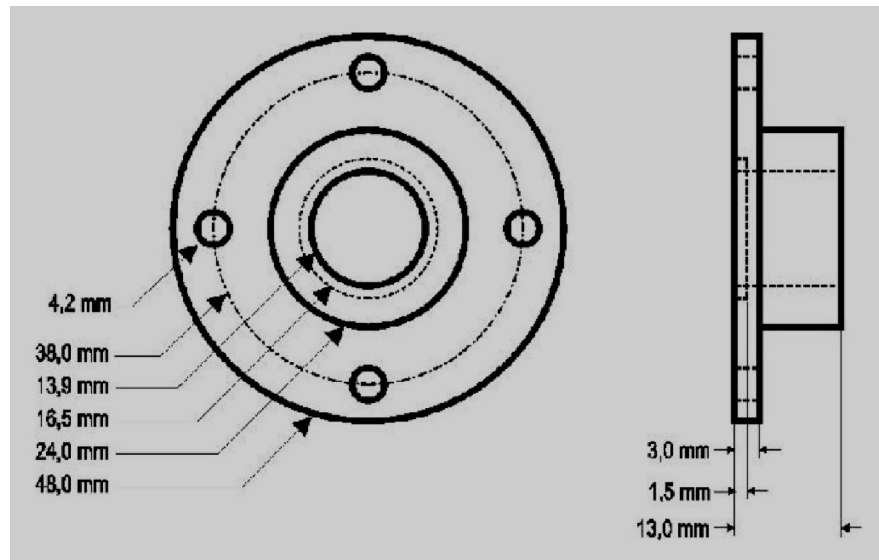

Mounting flange for RHT-DM.

The probe is made in stainless steel, with standard lengths of 150 mm and 250 mm.
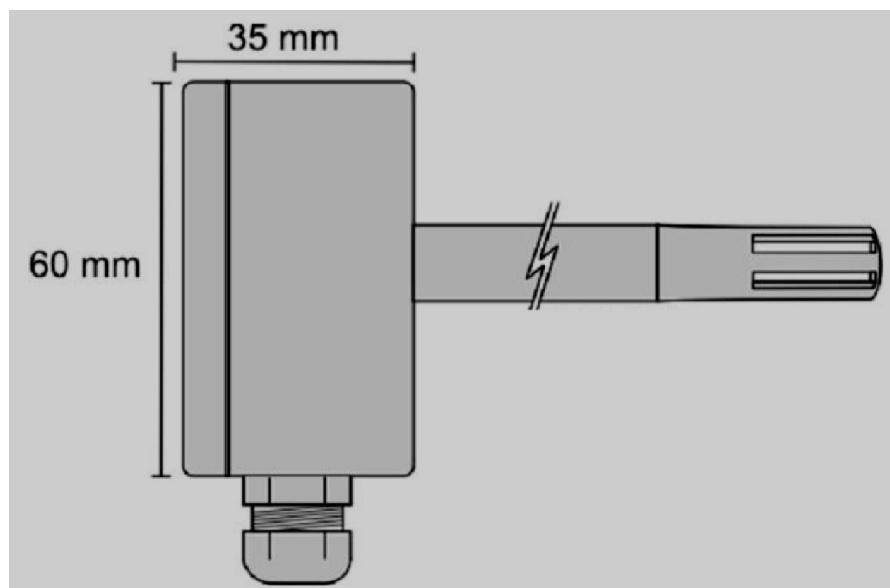
Model RHT/DM dimensions.

The model **RHT/WM** (**W**all **M**ount) was designed to be mounted directly onto a wall. With the cover off, the user can access the 2 fixing points and the signal connector, as shown in figure *RHT/WM fixing holes and housing dimensions*, below. The transmitter sensor capsule must be placed faced down in order to assure the specified accuracy and protection level.
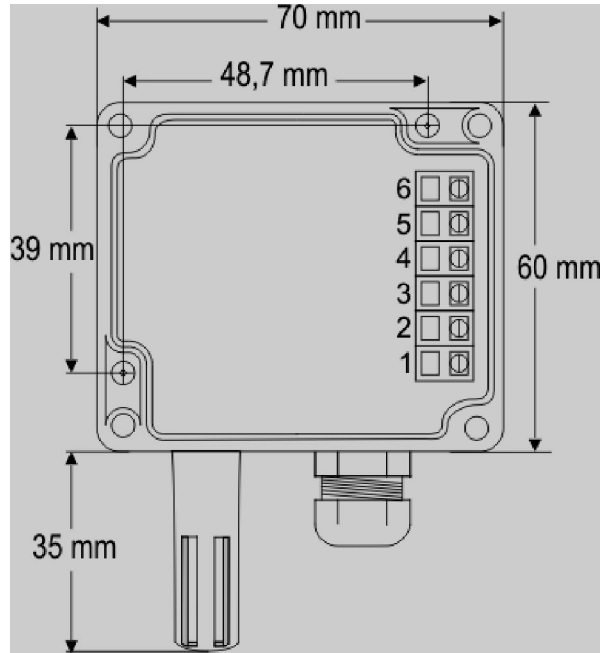
RHT/WM fixing holes and housing dimensions.

4. ORDERING DETAILS

| TYPE						DESCRIPTION
Product	RHT					Humidity and temperature transmitter
Mounting		D	* Please Specify Immersion Length			Duct Mounting
		W	Standard Length			Wall Mounting
Configuration		M				Range (Temp. & HY), Burnout, Programmable
		N				All parameters Factory Setting
Output			0			0~10V dc
			4			4~20mA dc
Immersion Length	* If Mounting is opted as "D", please mention the immersion length.			6		150mm
				10		250mm
				?		Customized
Accessories					N	None
					L	With LCD Display
					Y	With RS485 Communication

Example: RHT > D > M > 4 > 6 > Y

5. CONNECTIONS

The transmitter can be ordered as 4-20 mA current output or 0 to 10 Vdc voltage output. The output signal is defined on purchase and cannot be later changed. Variables can be monitored together or separately. Combinations of mobile jumpers **J4** and **J5** within the transmitter case define how variables will be used. The jumpers also define the transmitter terminals with available output signals.
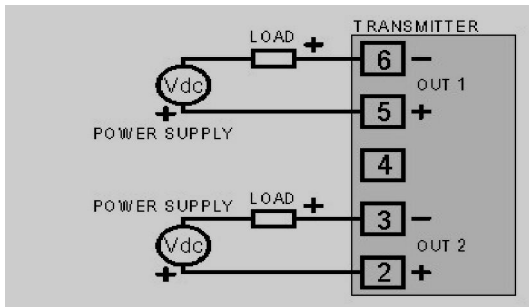
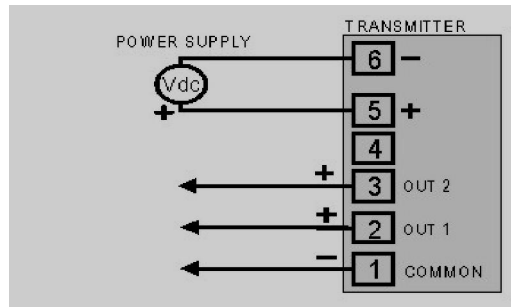| Jumper J5	Jumper J4	OUT1	OUT2
Position A	Position A	Temperature	Humidity
Position A	Position B	Temperature	Off
Position B	Position A	Humidity	Off
Position B	Position B	Humidity	Temperature

Configuration of OUT1 and OUT2 outputs
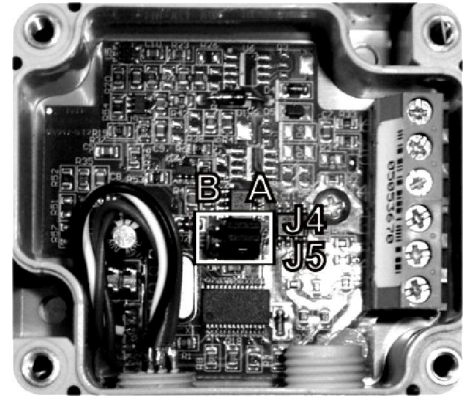
J4 and J5 position within the transmitter

Figures below shows the required electrical connections:
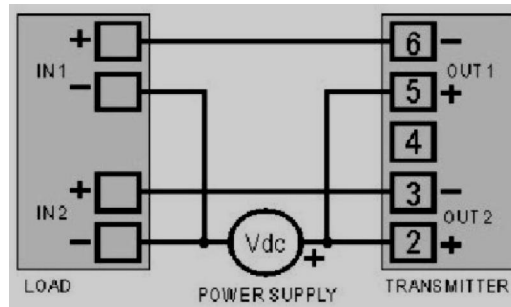

4-20 mA connections

0-10 VDC connections
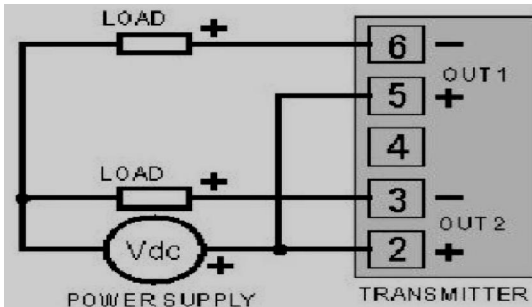
4-20 mA connections with single source

04-20 mA model with single source and load with two input channels

LOAD represents the output signal measurement equipment (controller, register, etc). The connection wires go inside the transmitter through to the cable gland mounted in the transmitter case.

6. INSTALLATION

Recommendation

- Conductors of small electrical signals must be distant from activation or high-tension/current conductors, preferably passing through grounded conduits.
- A specific electrical power supply network should be provided for instruments use only.
- In controlling and monitoring applications, possible consequences of any system failure must be considered in advance.
- RC filters (47 R and 100 nF, serial) in inductor charges (contactors, solenoids, etc.) are recommended.
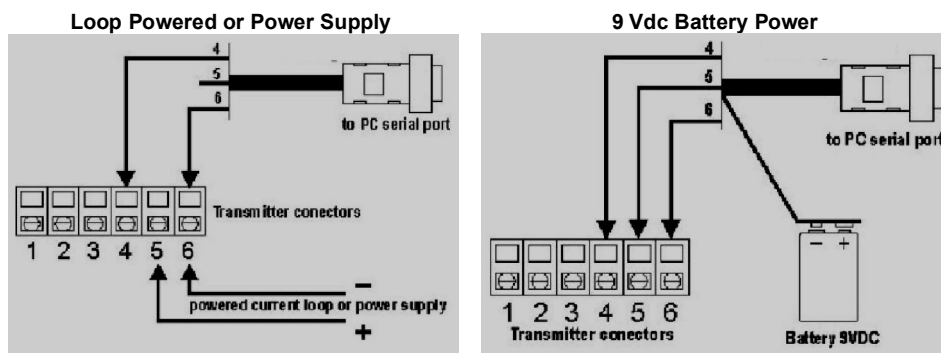
7. CONFIGURATION

If the default configuration or the ordered configuration satisfies the application, then no further configuration is necessary and the transmitter is ready to be used. If a new setting is desired, this can be accomplished by the **ATxConfig** and sent to the transmitter through the ATxConfig interface.

The ATxConfig Interface and Software compose the Transmitter Configuration Kit, which can be purchased separately from ABUS or one of its distributors. The latest release of this software can be downloaded from our web site. To install, run the **ATx_setup.exe** and follow the instructions.

Serial port configuration errors may occur when other software are sharing the same serial port. Close all serial port applications prior to using the ATxConfig software.

The ATxConfig interface cable is 1.5m long. One extremity is connected to the transmitter. The other extremity has a female connector DB9, which must be connected to the serial port available in the PC.

Connections of the ATxConfig Interface

The transmitter requires to be powered during configuration. The ATxConfig provides powering; however this depends on the PC used. To assure proper communication, it is recommended to apply external power to the transmitter. A 9V battery connected to the battery socket in the ATxConfig interface extremity can be used to power the transmitter during the configuration. Another option is to run the transmitter configuration when it is already connected to the process, using the same power that powers the process. Refer to figure *Connections of the ATxConfig Interface*.

After making such connections, users must run the **ATxConfig** software and, if necessary, use the Help to configure the transmitter. Figure *ATxConfig software Main Window*, shows the ATxConfig Main Windows.
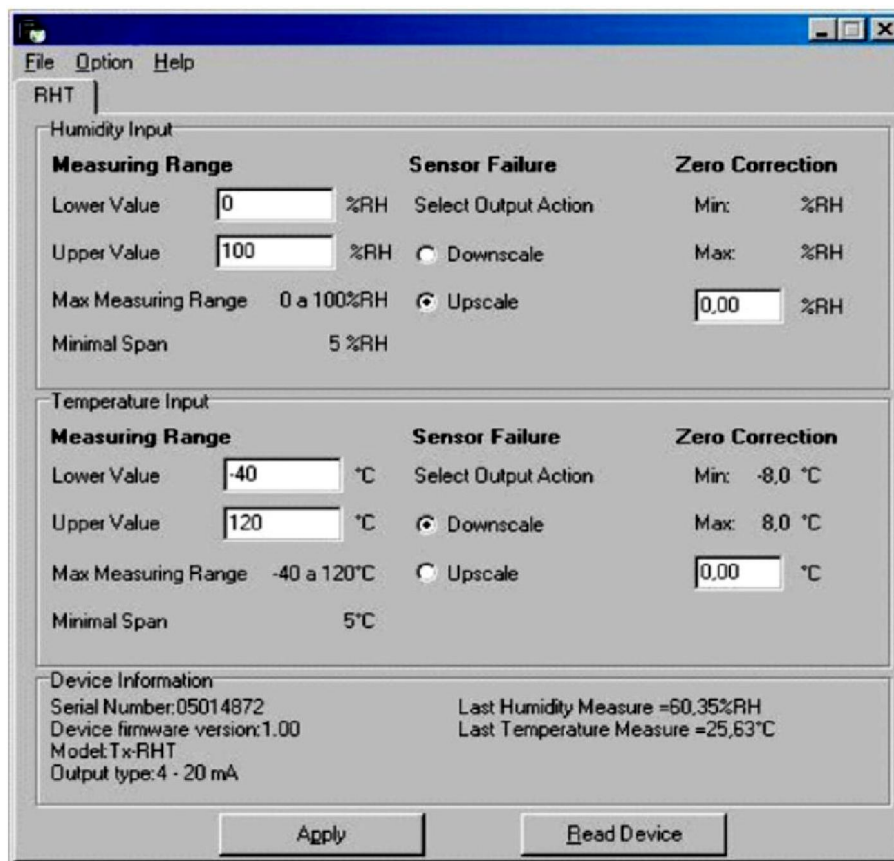
ATxConfig Main Window

The fields, in the above ATxConfig main window, are described as under:

1. **Measuring range:** Defines the beginning and the end of the transmitter humidity and temperature range.

   a. Lower Value: sets the value of the input signal (RH or temperature) associated to the 4 mA output.

   b. Upper Value: sets the value of the input signal that will correspond to the 20 mA output.

When the lower limit is defined with a value higher than the higher limit the output current operates from 20 to 4 mA. The values configured in these fields can not be beyond the sensor measuring range. The minimum span value has to be observed as well.

2. **Sensor Failure Detection:** Establishes the transmitter output behavior (upscale or down-scale) in the presence of a sensor fail. When Minimum is selected, the output current is < 4 mA (down-scale), typically used for refrigeration. When Maximum is selected, the output current is > mA (up-scale), typically used in heating systems.

3. **Zero Correction:** Allows for small sensor corrections.

4. **Device Information:** Transmitter identification data. These information must be informed when the user contact us.

5. **Read Device:** Brings to the screen the current transmitter parameters configuration.

6. **Send configuration:** Sends a new configuration to the transmitter.

Note: The factory default configuration is (unless otherwise specified or ordered):

- *Sensor RHT, temperature span 0 to 100 °C and humidity span 0 to 100 %RH;*
- *0 °C of zero correction*
- *Upscale when sensor fails.*

8. MAINTENANCE

The calibration of the humidity sensor may change in case it is exposed to contaminating vapors or to high humidity and temperature conditions for extended periods. In order to speed up the calibration restoration, proceed as described below:

- Remove the sensor from the capsule.
- Wash it with water in case there are solid particles on it.
- Place it within a 80 °C (+-10 °C) oven for 24 hours
- Place it for 48 hours in a place with a temperature between 20 and 30 °C and humidity over 75 % RH.
- Place the sensor back in the capsule.

9. SAFETY PRECAUTIONS

1. The unit should be powered for 15 minutes before use.
2. Use in ambient temperature of 0-60°C.
3. Avoid vibrations, shock, excessive dust, corrosive chemical materials or gaseous environment.
4. Input wire should not be too long. If measured signal have to be far away from the unit, please use 2-core shielded cable.
5. Use this instrument in the scope of its specifications, otherwise fire or malfunctions may result.
6. Contact of the instrument, with organic solvents or oils should be avoided.
7. Do not turn on the power supply until all of the wiring is completed. Otherwise electrical shock, fire or malfunction may result.
8. Do not disassemble, repair or modify the instrument.
9. All connections should be tightened properly.
10. Power supply should be constant, should not be fluctuating.

10. WARRANTY

ABUS provides the original purchaser of this instrument a one (1) year warranty against defects in material and workmanship under the following terms:

- The one year warranty begins on the day of shipment as stated on the sales bill.
- During the warranty period all costs of material and labor will be free of charge provided that the instrument does not show any evidence of misuse.
- For maintenance, return the instrument with a copy of the sales bill to our factory.
- All transportation and insurance costs should be covered by the owner of the equipment.
- Should any sign of electrical or mechanical shock, abuse, bad handling or misuse be evident the warranty voids and maintenance costs will be charged.