



Read this document carefully before using this device. The guarantee will be expired by device damages if you don't attend to the directions in the user manual. Also we don't accept any compensations for personal injury, material damage or capital disadvantages.

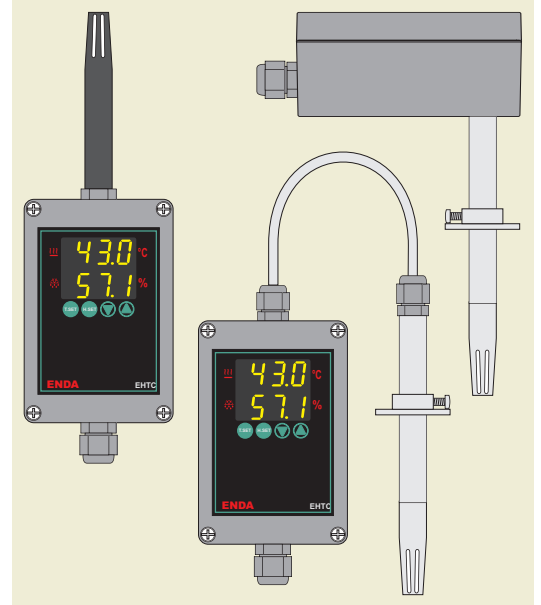
ENDA EHTC HUMIDITY AND TEMPERATURE CONTROLLER

Thank you for choosing ENDA EHTC Relative Humidity and Temperature Controller devices.

- * 4-Digits, Primary and Secondary display
- * 0 ... 100% RH Humidity measurement
- * -40 ... +125°C Temperature measurement
- * Relay outputs for Temperature and Humidity control
- * Selectable heating or cooling control
- * Selectable moistening or drying control
- * 0-20mA, 4-20mA, 0-10V or 1-5V output
- * PID or ON-OFF temperature control
- * PID (SELF TUNE) Feature
- * ON-OFF Humidity control
- * Temperature units °C or °F
- * Buzzer alarm for temperature value
- * Cabled, Wall-mounted or duct type installations
- * Screw-terminal Connection
- * RS485 ModBus communication (Optional)
- * CE Marked according to European Norms

ORDER CODE : EHTC - XX - XX - XXX - XX - XX

Product Basic Cone		Modbus Selection	
Humidity and Temperature Control Device		BLANK	N/A
Installation Type		RS	RS485 ModBus (Specify at Order)
Wall-mounted	W	Relay Output	
Cable connection	CB	BLANK	N/A
Duct mounted	DC	2R	2 Relay Outputs
Supply Voltage (Specify at Order)		Immersion Length (Specify at Order)	
90-250V AC	UV	100	100mm (Wall-mounted)
9-30V DC / 7-24V AC	LV	150	150mm
		250	250mm
		350	350mm



R^oHS
Compliant



SPECIFICATIONS	EHTC-W-xV-100-xx-xx	EHTC-CB-xV-x50-xx-xx	EHTC-DC-xV-x50-xx-xx
Montage Type	Wall-mounted	1,5m. Cable Connection	Duct Mounted
Immersion Length	100mm	150/250/350mm (Specify at order)	
Weight	425gr	150mm 615gr 250mm 665gr 350mm 730gr	150mm 500gr 250mm 550gr 350mm 615gr
Humidity Range	0 ... 100 % RH (Shouldn't be icing and condensation in the ambient)		
Temperature Range	-40.0 ... +125.0°C or -40.0 ... +257.0°F (Shouldn't be icing and condensation)		
Device Operating Temp.	-40 ... +50°C (Shouldn't be icing and condensation)		
Accuracy	±2 % RH (20 ~ 80 % for RH range) ±4 % RH (0 ~ 100 % for RH range) ±0,5°C (for 20 ~ 40°C range) ±1°C (for 0 ~ 70°C range) ±2°C (for -40 ~ 125°C range)		
Response Time	63% Humidity variation for 7 seconds (with 1m/sec airflow at 25°C) 63% Temperature variation for 20 seconds (with 1m/sec airflow at 25°C)		
Control Outputs	Temperature Relay ; 250V AC, 5A (resistive load), NO :: Humidity Relay ; 250V AC, 5A (resistive load), NO		
Life Expectancy for Relay	Mechanical 5.000.000; Electrical 100.000 operation. 250V AC, 5A (resistive load)		
Analog Outputs	For Humidity and Temperature : 0-20mA DC, 4-20mA DC, 0-10V DC or 1-5V DC can be programmed. (Load resistance Max 500Ω for current outputs)		
Supply	90-250V AC, 50/60Hz or 9-30V DC / 7-24V AC, 50/60Hz (Specify at order)		
Power Consumption	Max. 2VA		
Wiring	2,5mm ² and 1,75mm ² screw-terminal connections		
EMC	EN 61326-1: 2013		
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)		

ENVIRONMENTAL CONDITIONS

Ambient/storage temperature	-40 ... +60°C (Shouldn't be icing and condensation in the ambient)
Rated pollution degree	According to EN 60529 : IP65
Height	Max. 2000m



Do not use the device in locations subject to corrosive and flammable gases.

HOUSING

Enclosure material	Self extinguishing plastics
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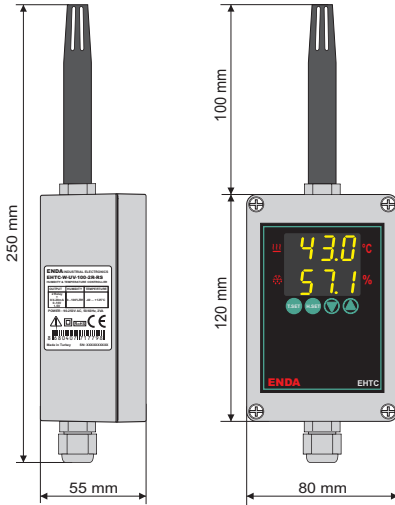
While cleaning the device, solvents (thinner, gasoline, acid etc.) or corrosive materials must not be used.



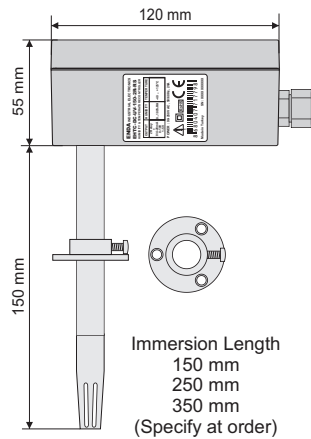
SISEL MÜHENDİSLİK ELEKTRONİK SAN. VE TİC. A.Ş.
Şerifali Mah. Barbaros Cad. No:18 Y.Dudullu 34775
ÜMRANIYE/İSTANBUL-TURKEY
Tel : +90 216 499 46 64 Pbx. Fax : +90 216 365 74 01
url : www.enda.com.tr

DIMENSIONS

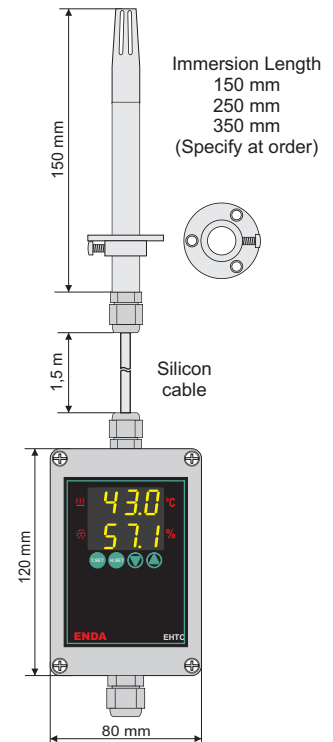
EHTC-W-xV-100-xx-xx
WALL-MOUNTED



EHTC-DC-xV-x50-xx-xx
DUCT TYPE



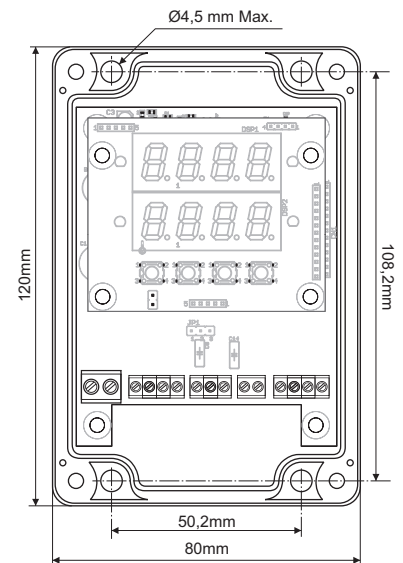
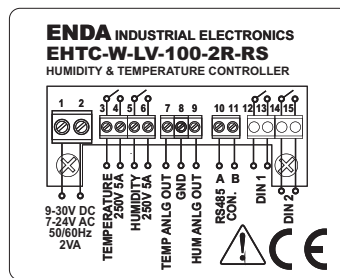
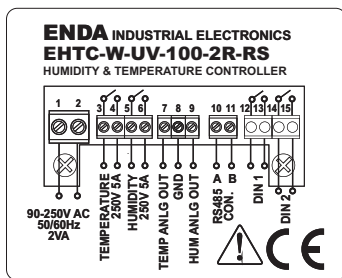
EHTC-CB-xV-x50-xx-xx
CABLED TYPE



CONNECTION DIAGRAM / INSTALLATION

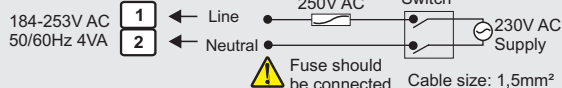


ENDA EHTC Series humidity and temperature controller devices are intended for wall-mounted or duct type installations. Make sure that the device is used only for intended purpose. The electrical connections must be carried out by a qualified staff and must be according to the relevant locally applicable regulations. During an installation, all of the cables that are connected to the device must be free of electrical power. The device must be protected against inadmissible humidity, vibrations, severe soiling. Make sure that the operation temperature is not exceeded. The cables should not be close to the power cables or components.



NOTE:

SUPPLY:



Note:

- Mains supply cords shall meet the requirements of IEC 60227 or IEC 60245.
- In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.

Equipment is protected throughout by **DOUBLE INSULATION**.

Holding screw 0.4-0.5Nm

ENDA INDUSTRIAL ELECTRONICS

EHTC-W-UV-100-2R-RS

HUMIDITY & TEMPERATURE CONTROLLER

OUTPUT	HUMIDITY	TEMPERATURE
2 Relay 0/4-20mA 0-10V 1-5V	0...100%RH	-40 ... +125°C

POWER : 90-250V AC, 50/60Hz, 2VA



8 680407 717798

Made in Turkey SN: XXXXXXXXXX



For the best measurement, device must be mounted to where the air flow exist and measurement part must turned to down.

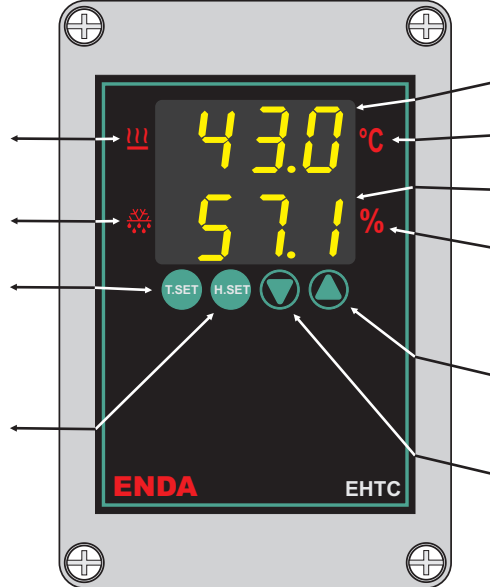
FRONT PANEL OPERATING INSTRUCTIONS

Illuminates while the temperature control relay output is activated.

Illuminates while the humidity control relay output is activated.

If "T.SET" Key is pressed ;
- In "Running Mode", indicates the temperature set value,
- In "Programming Mode", provides to adjusting the selected parameter value.

If "H.SET" Key is pressed ;
- In "Running Mode", indicates the adjusted humidity set value.



Measured temperature value (Primary Display)

If illuminated, temperature unit is °C.
If not illuminated, temperature unit is °F.

Measured humidity value (Secondary Display)

- If illuminates in "Running Mode", indicates the humidity value,
- If illuminates in "Programming Mode", indicates the corresponding parameter is also available in user menu.

If "Upward" Key is pressed ;
- In "Running Mode", turns off the buzzer alarm,
- In "Programming Mode", provides to increasing the selected parameter value.

If "Downward" Key is pressed ;
- In "Running Mode", turns off the control outputs,
- In "Programming Mode", provides to decreasing the selected parameter value.

Displaying and Changing Temperature Set Value

Measurement Value



During "Running Mode", if **T.SET** key is preset, temperature setpoint value flashes for 3 seconds. While flashing, by pressing **Up** and **Down** keys, temperature set value can be changed. If no key is pressed for 3 seconds or if one of the set keys is pressed again, adjusted set value is saved and the "Running Mode" is entered.

Displaying and Changing Humidity Set Value

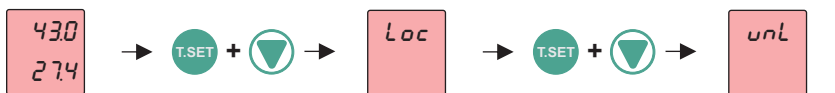
Measurement Value



During "Running Mode", if **H.SET** key is preset, humidity setpoint value flashes for 3 seconds. While flashing, by pressing **Up** and **Down** keys, humidity set value can be changed. If no key is pressed for 3 seconds or if one of the set keys is pressed again, adjusted set value is saved and the "Running Mode" is entered.

Locking & Unlocking Keypad

Measurement Value



During "Running Mode", if **T.SET** and **Down** keys are pressed together for 2 seconds, **Loc** message is displayed and the keypad locked. While keypad is locked, if **T.SET** and **Down** keys are pressed together for 2 seconds, **unL** message is displayed and the keypad unlocked and "Running Mode" is entered.

While keypad is locked, if one of the key is pressed, **Loc** message is displayed. During keypad locked, temperature and humidity set values can be displayed but can not be changed.

Activating / Deactivating Control Outputs

During "Running Mode", if **Down** key is pressed for 2 seconds, **cds** message displayed and the control outputs become deactivated and device works as an indicator.

While control outputs deactivated, by pressing **Down** key for 2 seconds, **CEnb** message displayed and device continues to control functions.

Stopping Buzzer Alarm

When an alarm condition occurs, an audible alarm is triggered. By pressing **Up** key, buzzer alarm can be turned off.

Default Settings

Powered on device by pressing **Up** key, **dPRr** message appears on display and device reset to default settings.

Displaying Revision Number

If **T.SET**, **Down**, **Up** keys are pressed together in "Running Mode", revision number **r.001** appears on display.

Error - Warning - Alarm Definitions

	Sensor Failure. Check the sensor connection. The audible warning is activated. Temperature and humidification outputs are disabled. Analog outputs are zero.
	Temperature Alarm. Audible warning is activated. Temperature output is disabled.
	Humidification Alarm. Audible warning is activated. Humidification output is disabled.
	Self tune menu has been entered.
	During self tune menu, indicates that the measured temperature value is greater than 60% of the set value. In this case, self tune process can not be started.
	Self tune process is running.
	Self tune process has been successfully completed.

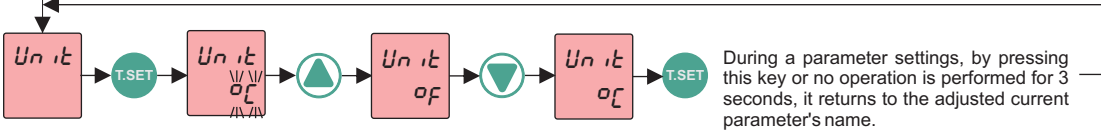
PROGRAMMING THE DEVICE

Running Mode

Device has two menus as user and hidden menu. User menu is the frequently used parameters and the hidden menu is where all parameters are found. Menus can be transferred between parameters. If and keys are pressed together for 2 seconds in the hidden menu, the parameter is transferred to the user menu. Up to 10 parameters can be transferred to the user menu in this way. If and keys are pressed together for 2 seconds in the user menu, parameter is removed from user menu. While navigating on the parameters in hidden menu, if the % (%) symbol is illuminates on parameter, It indicates that the parameter is also available on the user menu.

If and keys are pressed together for 2 seconds, user menu is entered and first parameter in the user menu is displayed. If no operation is performed for 7 seconds or when keys are pressed together, "Running Mode" is entered.

User Menu

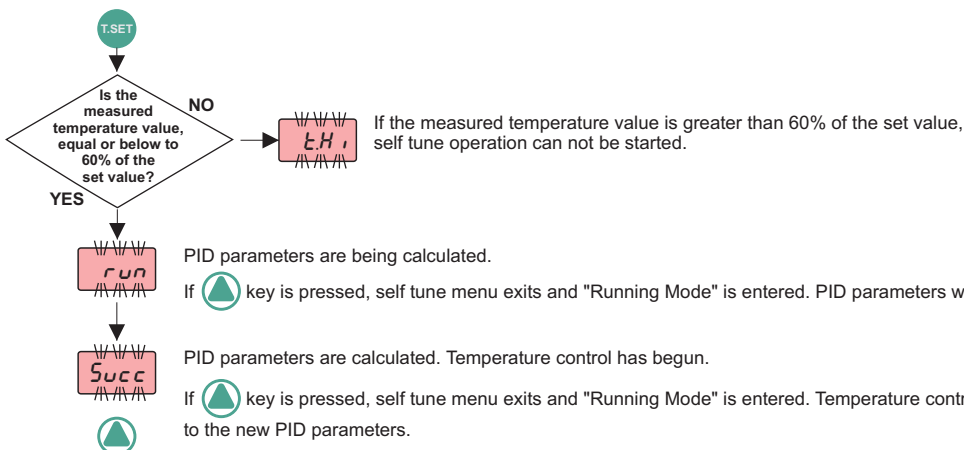


Hidden Menu

If key is pressed for 7 seconds while in user menu, hidden menu is entered and then the first parameter in the hidden menu is displayed. All parameters in the PARAMETER LIST on page 5 can be accessed from this menu. The parameter access and save functions are as in the user menu. If no operation is performed for 7 seconds, or if the keys are pressed together, "Running Mode" is entered.

Self Tune Menu

If the key is pressed for 7 seconds while in user menu, self tune menu is entered. Then key is pressed, if the conditions are suitable, self tune process starts. This menu can be exited by pressing any key.



PARAMETER LIST

CONFIGURATION PARAMETERS		EN AZ	EN ÇOK	BİRİM	BAŞLANGIÇ
<i>Ün it</i>	Temperature unit	°C	°F		°C
<i>dPn t</i>	Decimal point display	no	YES		no
<i>Snd</i>	Buzzer (no: Buzzer not active. YES: Buzzer active)	no	YES		no
<i>o t YP</i>	Temperature, Humidity output type (0-20: 0~20mA, 4-20: 4~20mA, 0-10: 0~10V, 1-5: 1~5V)	0-20	1-5	mA / V	0-20
TEMPERATURE CONTROL PARAMETERS					
<i> t. u P L</i>	Temperature set value Upper Limit	t. L o L	125	°C / °F	125
<i> t. L o L</i>	Temperature set value Lower Limit	-40	t. u P L	°C / °F	-40
<i> t. H Y S</i>	Temperature hysteresis	1	20	°C / °F	2
<i> t. o F F</i>	Temperature offset value	-20	20	°C / °F	0
<i> t. c n t</i>	Temperature control. L o : Output is active when the temperature is below set value (cooling control), H i : The output is active when the temperature is above the set value (heating control).	L o	H i		H i
<i> t. P o n</i>	Temperature output delay time after power-up	00:00	99:00	min:sec	1:00
<i> t. P id</i>	PID temperature control selection (no: On-Off control YES: PID control)	no	YES		no
<i> t. P b</i>	Proportional band for PID control	0	100	%	14
<i> t. t i</i>	Integral time for PID control	00:00	99:00	min:sec	1:56
<i> t. t d</i>	Derivation time for PID control	00:00	99:00	min:sec	0:35
HUMIDIFICATION CONTROL PARAMETERS					
<i> h. u P L</i>	Humidity set value Upper Limit	h. L o L	100	%RH	100
<i> h. L o L</i>	Humidity set value Lower Limit	0	h. u P L	%RH	0
<i> h. H Y S</i>	Humidity hysteresis	1	20	%RH	2
<i> h. o F F</i>	Humidity offset value	-20	20	%RH	0
<i> h. c n t</i>	Humidification control. L o : Output is active when the humidity is below set value (cooling control), H i : The output is active when the humidification is above the set value (heating control).	L o	H i		H i
<i> h. P o n</i>	Humidification output delay time after power-up	00:00	99:00	min:sec	1:00
ALARM PARAMETERS					
<i> R. P o n</i>	Alarm message display delay time after power up	00:00	99:00	min:sec	1:00
<i> R. t. t. P</i>	Temperature alarm configuration (AbS : Absolute alarm, rEF : Relative alarm) AbS: Alarm values are R t. L o and R t. H i rEF: Alarm values are R t. L o = t. S E t - R t. L o and R t. H i = t. S E t + R t. H i	AbS	rEF		AbS
<i> R. t. H i</i>	Temperature upper level alarm (If R t. P is changed, this parameter must be re-programmed)	R t. L o	125	°C / °F	125
<i> R. t. L o</i>	Temperature lower level alarm (If R t. P is changed, this parameter must be re-programmed)	-40	R t. H i	°C / °F	-40
<i> R. t. H S</i>	Temperature alarm hysteresis	1	20	°C / °F	2
<i> R. h. t. P</i>	Humidity alarm configuration (AbS : Absolute alarm, rEF : Relative alarm) AbS: Alarm values are R h. L o and R h. H i rEF: Alarm values are R h. L o = t. S E t - R h. L o and R h. H i = t. S E t + R h. H i	AbS	rEF		AbS
<i> R. h. H i</i>	Humidity upper level alarm. (If R h. t. P is changed, this parameter must be re-programmed)	R h. L o	100	%RH	100
<i> R. h. L o</i>	Humidity lower level alarm. (If R h. t. P is changed, this parameter must be re-programmed)	0	R h. H i	%RH	0
<i> R. h. H S</i>	Humidity alarm hysteresis.	1	20	%RH	2
MODBUS COMMUNICATION PARAMETERS					
<i> R. d. r. S</i>	Slave device address selection	1	247		1
<i> b. R. u. d</i>	Communication speed (baud rate) selection	oFF	1920	Bps	9600

ENDA EHTC HUMIDITY AND TEMPERATURE CONTROLLER MODBUS ADDRESS MAP

1.1 HOLDING REGISTERS

Holding Register Addresses		Data Type	Data Content	Parameter Name	Read / Write Permission
Decimal	Hex				
0000d	0x0000	word	Temperature set value	<i>tSET</i>	R / W
0001d	0x0001	word	Temperature set value Upper Limit	<i>tUPL</i>	R / W
0002d	0x0002	word	Temperature set value Lower Limit	<i>tLoL</i>	R / W
0003d	0x0003	word	Temperature upper level alarm	<i>RtH ,</i>	R / W
0004d	0x0004	word	Temperature lower level alarm	<i>RtLo</i>	R / W
0005d	0x0005	word	Temperature hysteresis	<i>tHYS</i>	R / W
0006d	0x0006	word	Temperature offfset value	<i>tOFF</i>	R / W
0007d	0x0007	word	Temperature alarm hysteresis	<i>RtHS</i>	R / W
0008d	0x0008	word	Humidity set value	<i>hSET</i>	R / W
0009d	0x0009	word	Humidity set value Upper Limit	<i>hUPL</i>	R / W
0010d	0x000A	word	Humidity set value Lower Limit	<i>hLoL</i>	R / W
0011d	0x000B	word	Humidity hysteresis	<i>hHYS</i>	R / W
0012d	0x000C	word	Humidity offfset value	<i>hOFF</i>	R / W
0013d	0x000D	word	Humidity upper level alarm	<i>RhH ,</i>	R / W
0014d	0x000E	word	Humidity lower level alarm	<i>RhLo</i>	R / W
0015d	0x000F	word	Humidity alarm hysteresis	<i>RhHS</i>	R / W
0016d	0x0010	word	Temperature output delay time after power-up	<i>tPon</i>	R / W
0017d	0x0011	word	Humidity output delay time after power-up	<i>hPon</i>	R / W
0018d	0x0012	word	Alarm message display delay time after power-up	<i>RPon</i>	R / W
0019d	0x0013	word	Integral time for temperature PID control	<i>tI ,</i>	R / W
0020d	0x0014	word	Derivation time for temperature PID control	<i>tId</i>	R / W
0021d	0x0015	word	Proportional band for temperature PID control	<i>tPb</i>	R / W
0022d	0x0016	word	Temperature, Humidity output type (0:0-20, 1:4-20, 2:0-10, 3:1-5)	<i>oLYP</i>	R / W

1.2 INPUT REGISTERS

Input Register Addresses		Data Type	Data Content	Parameter Name	Read / Write Permission
Decimal	Hex				
0000d	0x0000	word	Measured temperature value (°C / °F)	--	R
0001d	0x0001	word	Measured humidity value (%RH)	--	R

* Holding and Input Register parameters of type integer, those "signed integer" is defined as the decimal port of and associated with these parameters. (So, "14.0" is a parameter value of "140" will be read in). Relevant parameters for a period of "mm:ss" type ones in seconds, "hh:mm" while those species defined in minutes.

1.3 COILS

Coil Addresses		Data Type	Data Content	Parameter Name	Read / Write Permission
Decimal	Hex				
00d	0x00	Bit	Temperature unit OFF=°C, ON=°F	<i>Unit</i>	R / W
01d	0x01	Bit	Decimal indication OFF=no, ON=YES	<i>dPnt</i>	R / W
02d	0x02	Bit	Buzzer OFF=no, ON=YES	<i>Sound</i>	R / W
03d	0x03	Bit	Temperature control OFF = Lo, ON = Relative alarm H ,	<i>tCnt</i>	R / W
04d	0x04	Bit	Humidity control OFF = Lo, ON = Relative alarm H ,	<i>hCnt</i>	R / W
05d	0x05	Bit	Temperature alarm configuration OFF = <i>RbS</i> , ON = Relative alarm <i>rEF</i>	<i>RtEP</i>	R / W
06d	0x06	Bit	Humidity alarm configuration OFF = <i>RbS</i> , ON = Relative alarm <i>rEF</i>	<i>RhEP</i>	R / W
07d	0x07	Bit	PID temperature control selection OFF = YES, ON = no	<i>tPid</i>	R / W

1.4 DISCRATE INPUTS

Discrete Inputs Addresses		Data Type	Data Content	Parameter Name	Read / Write Permission
Decimal	Hex				
0000d	0x0000	Bit	Temperature relay output status (0=OFF; 1=ON)	--	R
0001d	0x0001	Bit	Humidification relay output status (0=OFF; 1=ON)	--	R
0002d	0x0002	Bit	Digital input 1, input status (0=OFF; 1=ON)	--	R
0003d	0x0003	Bit	Digital input 2, input status (0=OFF; 1=ON)	--	R