PRODUCT DESCRIPTION

Programmable regulators with RS232 serial interface are designed to measure temperature, relative humidity and barometric pressure of air in non-aggressive environment, to alarm indication and to control of external devices. Three galvanic no isolated binary inputs are intended for detection of binary signals. Regulators are available in wall-mount version or with probe on a cable. For measuring temperature and relative humidity of compressed air is used type HxxxxP.

Two output relays functions can be set from regulator keyboard or from computer. Each relay can be assigned to one of measured, detected or computed value (dewpoint temperature, absolute humidity, specific humidity mixing ratio and specific enthalpy). Setting of delay, hysteresis, audible alarm is enabled for each relay. It is possible to control output relay status via RS232 link too. Devices are equipped with four button keyboard and two-line LCD display.

Regulators support Modbus RTU protocol and protocol compatible with standard Advantech-ADAM. For set of all parameters you can use *TSensor* software (see *www.cometsystem.cz/software.*htm).

type *	measured values	construction	mounting
H4331	T	external probe Pt1000/3850 ppm	wall
H3331	T + RH + CV	ambient air	wall
H3331P	T + RH + CV	probe on a cable – pressure up to 25 bars	wall
H7331	T + RH + P + CV	ambient air	wall

* models marked Hxxxx**Z** are custom - specified devices   T…temperature, RH…relative humidity, P…barometric pressure, CV…computed values

INSTALLATION AND OPERATION

The mounting holes and connection terminals are accessible after unscrewing the four screws in the corners of case and removing the lid. Devices have to be mounted on a flat surface to prevent its deformation. Pass cables for binary sensors and external probe connection (length up to 10m) through released gland and connect wires according to diagram. Use the same procedure if you require a different connection of RS232 link than with supplied cable. Choose shielded cables (external diameter 4 to 6.5mm) with wire cross-section 0.14 to 1.5mm^2. The binary sensor and external probe cable shielding is connected to proper terminal device only, do not connect it to other circuitry and do not ground it. Tighten glands and screw the lid. Insert attached plug into unused cable glands too. The all cables should be located as far as possible from potential interference sources. Pay attention to device mounting, because incorrect choice of working position or place of measuring could adversely affect accuracy and long-term stability of measured values.

Actual parameters settings of each relay can be displayed by pressing of „ ▲ " key. To change any parameter, press the „**Set**" key, enter password (default 0000) and set required value. Then click on „**Set**" and pressing „**Esc**" key exit setup mode. To change the password and to set all other parameters (acoustic alarm, response to the error status, choice of communication protocol, choice of units, select the computed value etc.) is used *Extended setting mode* (see manual for devices at *www.cometsystem.cz/manuals.htm*).

Devices don´t require special maintenance. We recommend you periodic calibration for measurement accuracy validation.

COMMUNICATION PROTOCOLS AND ERROR STATES

Description of communication protocols you can download from *www.cometsystem.cz/manuals.htm*. Device setting from the manufacturer is **ModBus RTU**, address **1**, communication speed **9600 Bd** (no parity, 2 stop bits).

Device continuously checks its state during operation and if an error appears, it is displayed relevant code: **Err 1** – measured or calculated value is over the upper limit, **Err 2 –** measured or calculated value is below the lower limit or pressure measurement error occurred, **Err 0, Err 3** a **Err 4** – it is a serious error, please contact distributor of the device, **Err5, Err6** - there is problem with assigned value to output relay, **Err9** – inserted password is not valid.

SAFETY INSTRUCTIONS

- Humidity and temperature sensors of the regulator can not be operate and store without a filter cap.
- Temperature and humidity sensors have not to be exposed to direct contact with water and other liquids.
- It is not recommended to use the humidity regulators for long time under condensation conditions.
- Take care when unscrewing the filter cap as the sensor element could be damaged.
- Don't connect or disconnect devices while power supply voltage is on.
- If the sensing probe of H3331P regulator is installed, make sure that measured area is without pressure.
- Installation, electrical connection and commissioning should be performed by qualified personnel only.
- Devices contain electronic components, it needs to liquidate them according to currently valid conditions.
- For more information, please use detailed manuals and other documentation which are available at
  www.cometsystem.cz/manuals.htm or *www.cometsystem.cz/software.htm*

Technical specifications

Device type	H4331	H3331	H7331	H3331P
Common parameters	*Supply voltage:* 9 to 30Vdc *Power consumption:* ~ 1W + binary sensors *Relay outputs:* max. switching voltage ... 50V, max. switching current ... 2A, max. switching power ...60VA *Binary inputs:* low level input voltage ... 0 to 0.5V, high level input voltage ... 3 to 30V, auxiliary power supply +U ... 9 to 30 Vdc / overall current max. 100 mA			
Temperature measuring range	-200 to 600°C	-30 to 105 °C	-30 to 105 °C	-30 to 105 °C
Accuracy of temperature measurement	±0.2°C (without probe)	± 0.4°C	± 0.4°C	± 0.4°C
Relative humidity (RH) measuring range	—	0 to 100 %RH	0 to 100 %RH	0 to 100 %RH
Accuracy of humidity measurement from 5 to 95 %RH at 23°C	—	± 2.5 %RH	± 2.5 %RH	± 2.5 %RH
Barometric pressure measuring range	—	—	600 to 1100 hPa	—
Accuracy of barometric pressure measurement at 23°C	—	—	±1.3hPa	—
Other calculated humidity variables	—	yes	yes	yes
Recomended calibration interval	2 years	1 year	1 year	1 year
Protection class of the case with elektronics	IP65	IP65	IP54	IP65
Protection class of the sensors cover	—	IP40	IP40	IP40
Temperature operating range of the case with electronics *	-30 to +80°C	-30 to +80°C	-30 to +80°C	-30 to +80°C
Temperature operating range of the sensing element (sensors)	—	-30 to +105°C	-30 to +105°C	-30 to +105°C
Humidity operating range	0 to 100%RH	0 to 100%RH	0 to 100%RH	0 to 100%RH
Mounting position	any position	any position **	any position **	any position **
Storage temperature range (humidity 0 to 100%RH, no condensation)	-30 to +80°C	-30 to +80°C	-30 to +80°C	-30 to +80°C
Electromagnetic compatibility according to	EN 61326-1	EN 61326-1	EN 61326-1	EN 61326-1
Weight (including RS232 communication cable)	350 g	420 (460, 540) g	420 (460, 540) g	470 (510, 590) g
Dimensions [mm]				

Electrical wiring

* It is recomended to switch off the LCD display at ambient temperature above 70°C.

** if it can lead to long term condensation of water, it is necessary to use the probe at position with sensor cover downwards