

AMBIENT TEMPERATURE SENSOR AND RELATIVE HUMIDITY



K485

Description

The K485 electronic ambient sensor is a device of the GIACOKLIMA family realized to be used in GIACOMINI radiant floor or ceiling heating and/or cooling systems, combined with the KM20x Controller, the KD200 Display Unit, the KPM20 Adjustment Unit and other communicating devices with compatible protocol.

Principal characteristics

- Wall installation in round 60 mm dia. box
- Bus signal network operation with KPM20 Adjustment Unit (secondary bus)
- Bus signal network operation with KM20x Controller (primary bus)
- Ambient temperature and Relative Humidity measurement with capacitance sensor $\pm 3\%$
- Windowless ambient thermostat function with heating/cooling operation mode; integral relay with exchange contact for direct management of electrothermal actuators or motors for zone valves.

Functioning

The K485 ambient sensor must be connected to the KPM20 Adjustment Unit by secondary bus or to the KM20x network controller by primary bus. Via the bus connection, the ambient sensor receives the electric supply and can communicate the temperature and relative humidity values of the ambient in which it is installed.

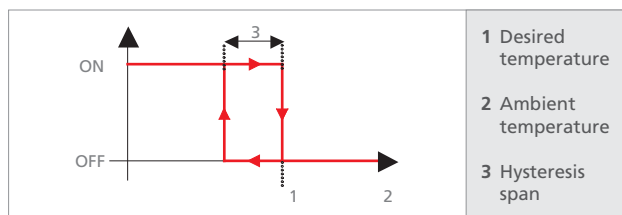
The K485 sensor effects the calculation of the dew temperature of the ambient air, which is important data for the adjustment applications of radiant systems in cooling mode.

In addition the K485 sensor can perform the windowless ambient thermostat function in applications in which no management or visualization element is needed for the user. In the windowless ambient thermostat function, the visualization or setting of the measured and required ambient temperature, as well as the typical attenuation parameters, can be effected on the KD200 display unit associated with the KM20x network controller. Visualization or setting can be effected for a maximum of 16 ambients.

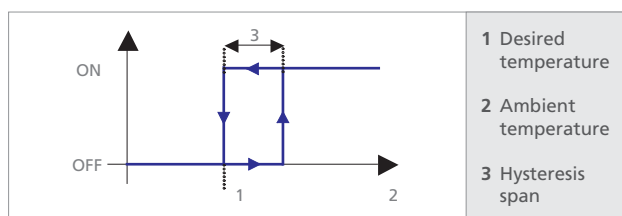
Data from the K485 windowless ambient sensor can also be acquired locally by using supervisor software on a personal computer or via remote control.

The Thermostat function of the K485 sensor is pre-set for an ON/OFF regulation. The Thermostat keeps the ambient temperature T_{amb} within the limits of the temperature T_{set} set by the user. The limit amplitude is determined by the hysteresis span, the pre-set value of which is equal to 1 °C.

When the T_{amb} reaches the limits of the hysteresis span the thermostat effects a switching of the functioning status (from ON to OFF and viceversa).



WINTER mode. When the T_{amb} ambient temperature reaches the lowest limit of the hysteresis span the thermostat switches the functioning status to ON; when it reaches the highest limit it switches to OFF.

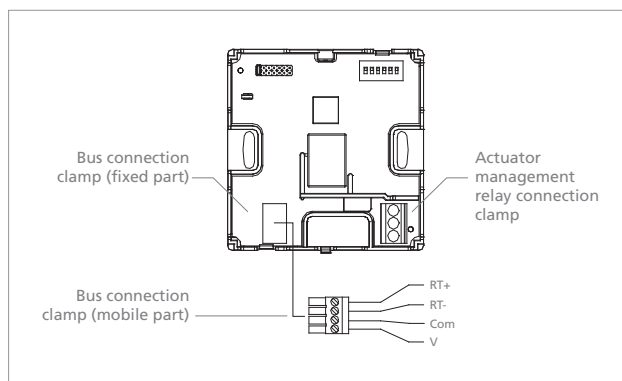


SUMMER mode. When the T_{amb} ambient temperature reaches the lowest limit of the hysteresis span the thermostat switches the functioning status to ON; when it reaches the highest limit it switches to OFF.

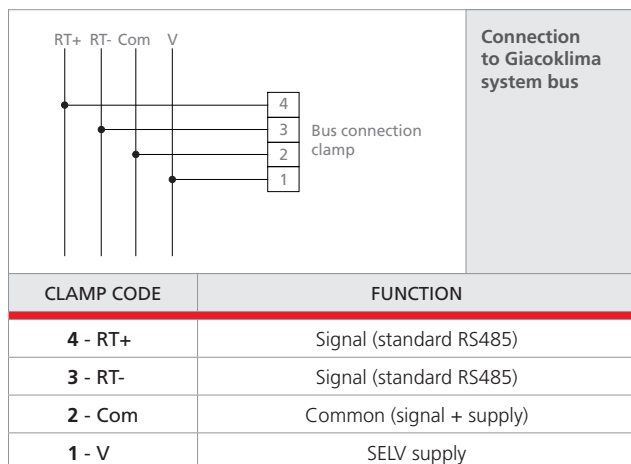
When functioning as ambient thermostat function, the K485 is endowed with an antifreeze protection function to avoid any damages due to excessively low ambient temperature. This function is active only when the system is set on WINTER mode and automatically triggers the heating when the ambient temperature drops below the pre-set antifreeze temperature threshold of +5 °C.

Electrical connections to bus

The K485 ambient sensor is endowed with screw clamp for bus connection. The connection includes a fixed part, soldered to the printed circuit board of the device, and a mobile part, which can be removed; the mechanical coding prevents an erroneous insertion of the mobile part into the fixed part. The electrical connection of the bus cable is effected with the mobile part.



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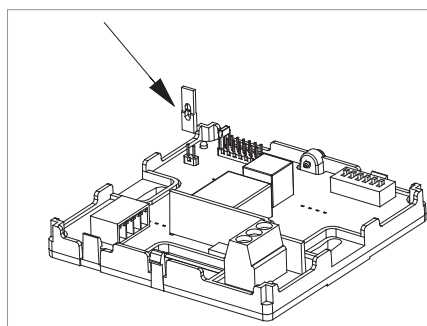


Warning!

In order to avoid any damage to the K485 sensor, before effecting connection to system bus ensure that the KPM20 I/O device or the RK20x network controller are not supplied. In case of connection to the KM20x controller (by primary bus) of more than 4 K485 sensors, it is necessary to arrange for a separate supply of the devices.

With the K485 sensor, the bus cable and the actuators connection cable must not be chased in the same conduit. It is advisable to effect a chain connection of the various devices in enter-exit mode. In order to adapt the cable impedance, it may be necessary to insert the 120 Ohm terminal resistance on the last device of the chain, by means of the special bridge which is placed on the printed circuit of the device.

Installation and start up of the device may be effected only by qualified personnel.

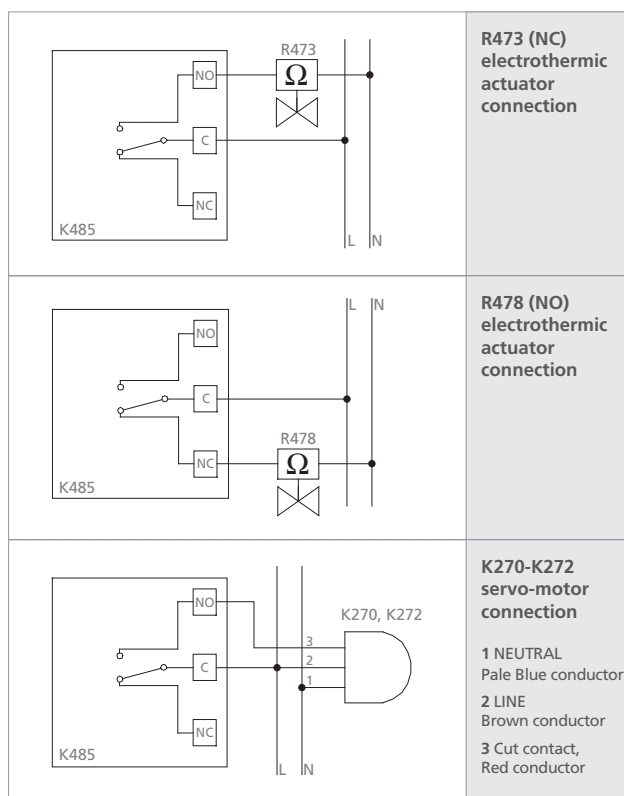


Insertion
of terminal
resistance
bridge

Actuator electrical connections

The ambient sensor is also endowed with a clamp for the connection of an electrothermic actuator or a zone valve motor; in this case the clamp is provided only with the fixed part. The Giacomini electrothermic actuators and zone valve motors listed in the following table may be used.

CODE	TYPE	SUPPLY	FIGURE	TECHNICAL SHEET
R478	Normally open	24 V~ 50 Hz	R478X102	0102GB february 2005
		230 V~ 50 Hz	R478X101	
R473	Normally closed	24 V~ 50 Hz	R473X102	0102GB february 2005
		230 V~ 50 Hz	R473X101	
K270		24 V~ 50 Hz	K270Y002	
		230 V~ 50 Hz	K270Y001	
K272		24 V~ 50 Hz	K271Y002	
		230 V~ 50 Hz	K271Y001	



Warning!

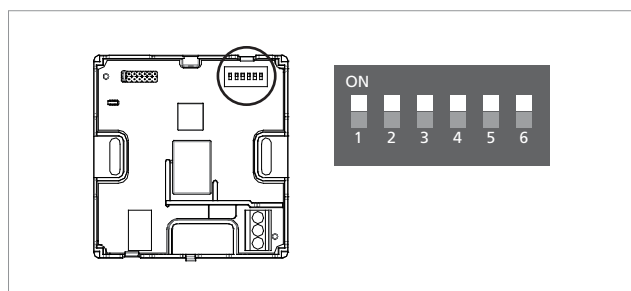
In case of connection of several actuators to the sensor contact, ensure that the exit relay capacity is not exceeded. It is advisable to connect no more than 5 R473, R478 electrothermic actuators in parallel or no more than two K270, K272 motorized actuators in parallel on the same sensor.

CLAMP CODE	FUNCTION
NO	Normally open contact clamp
C	Common clamp
NC	Normally closed contact clamp

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Addressing

The K485 ambient sensor may be combined with the KPM20 Adjustment Unit and the KM20x Controller. To enable correct bus communication the ambient sensor must be assigned an address by means of the 6-way microswitch placed inside the device.



Add.	Position of microswitch way					
	1	2	3	4	5	6
0	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF
17	ON	OFF	OFF	OFF	ON	OFF
18	OFF	ON	OFF	OFF	ON	OFF
19	ON	ON	OFF	OFF	ON	OFF
20	OFF	OFF	ON	OFF	ON	OFF
21	ON	OFF	ON	OFF	ON	OFF
22	OFF	ON	ON	OFF	ON	OFF
23	ON	ON	ON	OFF	ON	OFF
24	OFF	OFF	OFF	ON	ON	OFF
25	ON	OFF	OFF	ON	ON	OFF
26	OFF	ON	OFF	ON	ON	OFF
27	ON	ON	OFF	ON	ON	OFF
28	OFF	OFF	ON	ON	ON	OFF
29	ON	OFF	ON	ON	ON	OFF
30	OFF	ON	ON	ON	ON	OFF
31	ON	ON	ON	ON	ON	OFF

To access the microswitch:

- shut off supply to the device;
- remove the front part of the case by loosening the screw placed on the upper side;
- set the cursors of the microswitch following the table below;
- close the case.

At time of delivery all microswitch cursors are on „OFF% position (numbers 1-6 side). It is possible to assign an address comprised between 0 and 31 to the ambient sensor. Verify which address to assign on the project documentation.

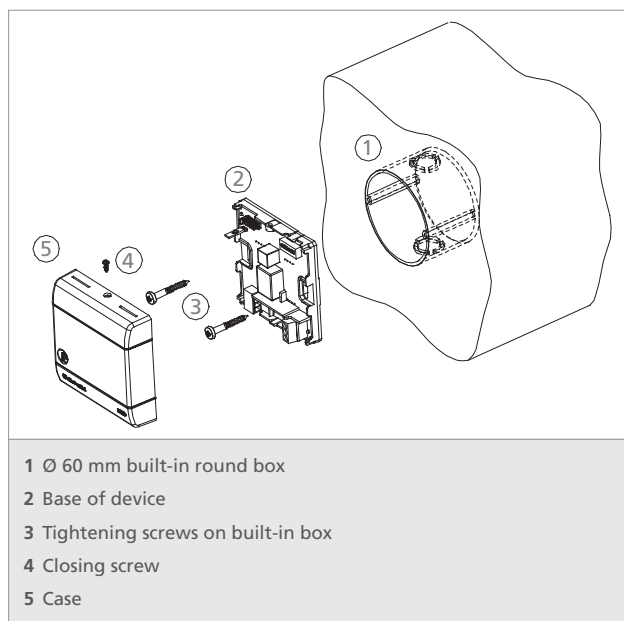


Warning!

Verify correctness of assigned address: there cannot be two devices with the same address in the same plant.

Installation

The K485 ambient sensor is a device for wall-mounting. The base is provided with buttonhole slots for hanging the dia. 60 mm. round recessed box endowed with holes for screw tightening.



It is advisable to mount the K485 environment sensor on an internal wall at a height of approx. 1.5 m from the ground in a position indicative of the average ambient temperature to be monitored and/or controlled. Do not mount the sensor on external walls, in proximity of doors or windows or in positions where the sun irradiation is considerable. Position the ambient sensor away from steam, water main, areas with no air flow or sources of electrical interference. To attach the sensor to the wall:

1. loosen and extract the screw placed on the upper side and remove the case from the base. Be careful not to damage the electronic devices within;
2. position the base on the built-in box and screw into the holes of the box the tightening screws included in the supply;
3. adjust the horizontal alignment by means of the buttonhole slots;
4. select the address of the device by means of the multiple-way microswitch;
5. run the bus cable terminal through the opening on the base;
6. prepare the bus cable for connection (unsheathing: approx. 10 mm, stripping: approx. 4 mm) and connect it to the loose end of the 4-pole clamp;
7. in windowless thermostat use, effect wiring of connection cable to electrothermic actuator or zone valve motor; pay attention to the type of actuator (normally closed or normally open).
8. position the case on the base and tighten the screw placed on the upper side.

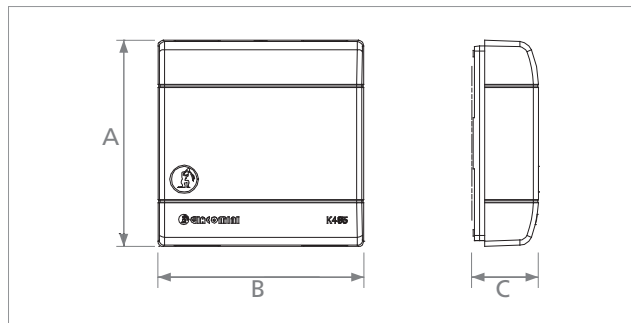


Warning!

In windowless thermostat function, ensure that the 230V~ supply tension of the actuators is switched off during the realization of connections. Installation of the device must be effected only by qualified personnel.

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Dimensions



Technical data

K485AY002	
Supply tension	from bus (when connected to primary or secondary bus) 8-12 V~, or 6-8 V~, 50 ÷ 60 Hz
Current	I nominal 30 mA = I max 50 mA =
Bus	Bidirectional, RS485, 9600 baud
Measure field	12 ÷ 28 °C ± 1% of scale bottom
Relative humidity sensor	Capacitive type Measure field: 10÷95% precision at 20°C: ± 3% of scale bottom
Connections	- RS485 serial bus: 4-wire telephone cable (for distances < 200 m) (1) - relay: 17 AWG cable
Relay number	1 S.P.D.T. (with exchange contact)
Relay resistive load	8 A, 230 V~
Relay inductive load	4 A, 230 V~
CE Conformance	Residential/Industrial directive CE89/336/EEC, EN50081/1, EN50082/2
Operative environmental conditions	0 ÷ 55 °C up to 90% U.R. (R.H)
Storage environmental conditions	-34 ÷ 55 °C
Dimensions	80 x 80 x 20 mm (AxBxC)

(1) For bus connection it is advisable to use cables with flexible conductor

Technical specification texts

K485A ^ Temperature and Relative Humidity Ambient Sensor

Electronic temperature and relative humidity ambient sensor, wall-mounting installation in dia. 60 mm. round box. Acquisition of temperature and relative humidity by means of GIACOKLIMA system bus: local dew temperature calculation and dew protection by means of comparison with supply temperature data. Integrated windowless thermostat function, with exchange contact control relay for direct management of electrothermic actuators or zone valve motors.

ITEM	DESCRIPTION	TECHNICAL SHEET
KD200	Display unit	0268EN july 2007
KPM20	Regulation module	0271EN june 2007

Additional information

For additional information please check the Giacomini website at the following address: www.giacomini.com

☎ +39 0322 923372

☎ +39 0322 923255

✉ consulenza.prodotti@giacomini.com

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Giacomini S.p.A. Via per Alzo, 39 I-28017 San Maurizio d'Opaglio (NO) Italy