Honeywell

T6580

FAN COIL CONTROLLER

PRODUCT SPECIFICATION SHEET

DESCRIPTION

A pleasing and modern appearance makes the T6580 ideal for living quarter applications, in particular offices and hotels.

In all versions, the control is Proportional + Integral (P+I). This ensures accurate temperature control in all operating conditions.

The controller is suitable for mounting on a fan-coil chassis or for wall mounting.

In 2-pipe plants the summer/winter switching can be activated by a central contact, controlled automatically through a connected thermostat or by a sensor installed on the pipe near the fan coil.

There are two pre-set room regulating levels: Comfort and Economy, to which two temperature levels are linked; the selection of which can be made through the room unit or by digital inputs.

The sensor for the temperature regulation is located inside the room unit and is overridden if the optional remote sensor is fitted.

Commands available: set-point configuration knob, fan speed knob, push button for operating mode setting; push button for summer/winter switching (Economy mode and summer/winter switch buttons are not included on the Lite model).

FEATURES

- 2-pipe or 4-pipe fan coil applications
- **Installer setup mode allows 11 parameters to be changed easily on-site**
- **Proportional + integral digital control regulator**
- **Heating / cooling sequence and supplementary-heating with electrical resistance heater**
- **Electrical resistance / cooling sequence**
- **Cooling / cooling sequence**
- **Ventilation only**
- **Manual or automatic summer / winter switching**
- **Automatic 3-speed fan control or manual override**
- **Selectable valve actuators: ON-OFF, PWM**
- **Actuator voltage: 230 Vac**
- **Digital inputs: water thermostat, change of season, economy, window contact**
- **Analogue inputs: room temperature, inlet water temperature**
- **Regulator voltage: 230 Vac, 50/60 Hz**
- **Destratification cycle**
- **Filter clean timer**
- **CE certification**

GENERAL INFORMATION

The T6580 microprocessor controls were designed to regulate heating and/or cooling within a room air-conditioning systems. The T6580 regulates the water valves, the fan speed, and the electrical resistance heater (where installed), in 2-pipe and 4-pipe fan coil systems.

Table 1. Ordering codes for the T6580 FCU Controller:

Model	Description
T6580A1008	FCU Controller 2/4 Pipe with S/W switch & Economy function
T6580A1016	LITE FCU Controller 2/4 Pipe

DESCRIPTION

INPUTS AND OUTPUTS

Digital Inputs

PRESENCE or TIMED PROGRAM:

The open contact indicates a presence in the room (room occupied) and the set point changes from economy to comfort. This contact can also be linked to an external timer system.

WINDOW:

The closed contact indicates that the window is open. This causes the valve(s) to close and the fan to stop (energy saving function). The anti-freeze protection function is automatically activated, with 4 °C as default.

SUMMER / WINTER SWITCHING:

A closed contact indicates that warm water is flowing through the pipes. This automatically changes the control from summer to winter mode. NB that the water temperature sensor can also be connected as an alternative for this feature to operate.

WATER TEMPERATURE THERMOSTAT:

A thermostat can be installed at the water outlet of the heat exchanger. This thermostat will automatically detect the presence of warm water in the system during the winter heating mode. The fan cannot start until warm water is detected. The temperature of the water must be set on the thermostat itself.

Analogue Inputs

RETURN AIR TEMPERATURE SENSOR:

When installed, this sensor has priority over the room unit internal sensor. The sensor is positioned at the air intake of the fan coil and is used as alternative to the room sensor.

WATER TEMPERATUR SENSOR:

This sensor can be set to either switch the summer / winter mode, or to enable fan operation, or both

A) Summer / winter switching: The sensor measures water supply temperature. When this drops below the limit value set in Parameter 14, the summer function mode is activated. When the water supply temperature is above the limit set in Parameter 15, the winter function mode is activated. Supply water between the upper and lower limits means that the thermostat stays OFF.

B) Enabling fan function: In 2 and 4-pipe fan coils the sensor is installed on the return pipe after the heating coil. This enables the fan function. Parameters 14 and 15 set the temperature that enables the fan to start.

C) Sensor set to enable both functions: In 2-pipe systems the sensor detects the supply water temperature and determines the summer or winter function mode. The fan function consent during the winter operating mode is given with a configurable delay time set in Parameter 24.

Analogue and digital outputs

FAN:

Fan speed control, from one to three speeds. A 230 Vac output, 50 Hz .Max 1.25 (3 peak)A.

HEATING VALVE:

Choice of a 230 Vac, 0.8 A command module for maximum four on-off or thermal actuators.

COOLING VALVE:

Choice of a 230 Vac, 0.8 A command module for maximum four on-off or thermal actuators.

TECHNICAL FEATURES

			BASIC
Regulation range	10…30 °C		✔
Voltage	230 Vac, 50/60 Hz		✔
Outputs (warm and cold water)	PWM		✔
	On-Off		✔
			✔
Selector or Keys			
Temperature levels	Comfort / Economy	Pushbutton	✔
Seasons	Summer/Winter	Pushbutton	✔
Fan	Auto-0-1-2-3	5-position selector dial	✔
Set point	Temperature: 10,…30 °C	Dial	✔
Analogue Inputs			✔
Room Temperature	Air intake probe (remote)	NTC10K	✔
Water Temperature	Contact or immersion probe	NTC10K	✔
Digital Inputs			
	Consent thermostat/summer-winter switching/anti-condensation pump		✔
	Window opening		✔
	Presence/timed program		✔
Proportional band	Selectable from 1 to 5 °C		✔
Dead Zone	From 0 to 4 °C		✔
Applications	Fan only		✔
	2-pipe system with/without electrical resistance		✔
	4-pipe system with/without electrical resistance		✔
Housing	Single housing		✔
Automatic valve commands			✔
Local Communication			No
Centralized Communication			No

Table 2. Technical Features

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FAN FUNCTION

The fan can function provided the consent thermostat is satisfied or the water temperature probe detects a temperature above the fixed value, where these inputs are present.

The fan is controlled through the 5 position-speed selector dial.

0 = fan OFF. In this position the valve is also closed.

  Only the anti-freeze function is activated.

1 = always 1st fan speed

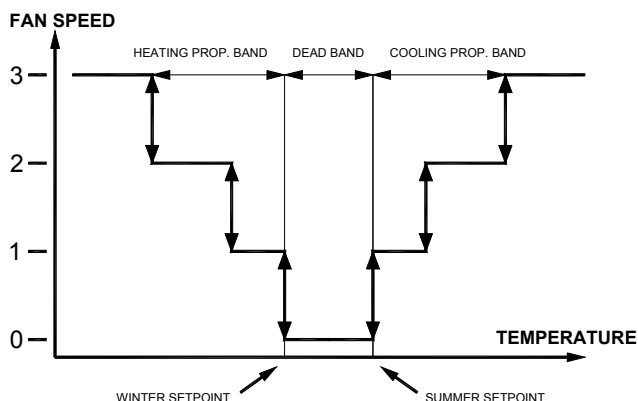2 = always 2nd fan speed

3 = always 3rd fan speed

Fig. 1 Fan speed sequence

In the AUTO function, the fan and the valves are automatically activated. The fan output varies as a function of the difference between the room temperature and the set point.

Auto Position: the fan operates with the speed determined by the regulator.

In the **heating** mode, the fan will have speed 0 when Tamb > (set point).

1st speed when (set point -30% of the BP) <Tamb < (set point).The minimum time at this speed is 2 minutes in normal conditions.

2nd speed when (set point -90% of the BP) <Tamb < (set point –30% of the BP).The minimum time at this speed is 2 minutes in normal conditions.

3rd speed when Tamb < (set point –90%).The minimum time at this speed is 2 minutes in normal conditions.

If a variation of more than the BP value occurs between the set point and the actual temperature, the minimum length of time in any one state is reduced to 5 seconds.

If the action is **cooling**, fan control will be opposite to that used during the **heating** action.

During the cooling cycle function, and if the set point is satisfied, the fan will continue to operate at speed 1 for 3 minutes, and will then stop.

DESTRATIFICATION CYCLE

When the room probe is positioned at the air intake, and the setpoint is reached, the fan cycles according to the time settings made in Parameters 20 and 21 to enable correct reading of the room temperature.

FAN START DELAY DURING THE WINTER SEASON

During the heating action, the fan switches from OFF to the first speed, after the delay programmed in Parameter 22.

ELECTRICAL RESISTANCE

When using electrical resistance heater, (i.e., instead of the water heating system), the fan is started after the delay set in Parameter 23, starting as soon as the resistance heater was turned on. When the resistance heater turns off the fan continues to operate for the time set in Parameter 24.

HEATING & COOLING OUTPUT FUNCTION
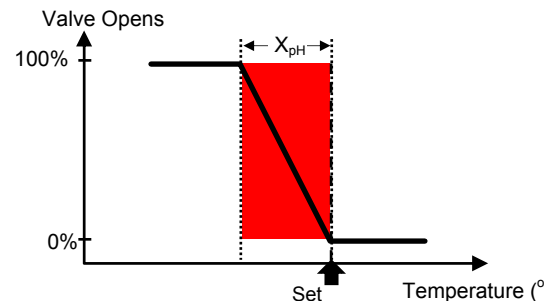
2-PIPE FAN COIL WITH AN ON-OFF and PWM ACTUATOR:

 Fig. 2 :
 2-PIPE FAN COIL WITH AN ON-OFF & PWM ACTUATOR

The set point is set to the upper point (to the lower point for cooling) of the proportional band, so the valve is closed when the temperature exceeds the set point.

The valve opening percentage is regulated by the P+I algorithm.

4-PIPE FAN COIL WITH ON-OFF & PWM OUTPUT:
Fig. 3 4-PIPE FAN COIL WITH ON-OFF & PWM
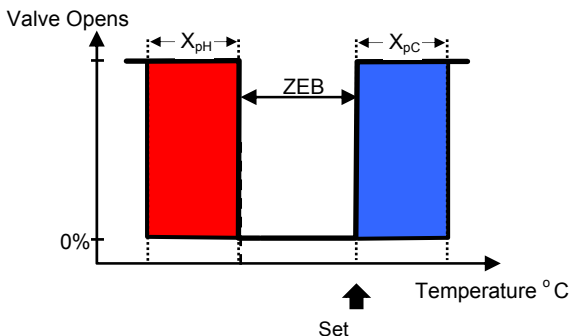
OUTPUT

The heating set point is set to the upper point, while the cooling setpoint is set to the heating setpoint plus the dead band.

The valve opening percentage is regulated by the P+I algorithm.
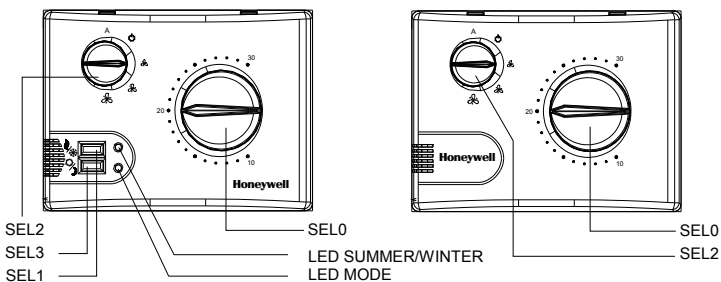
SIGNALS AND COMMANDS

Fig. 4 Room Unit

The room unit has two signal LEDs that give different indications during the various operating and configuration phases.

SUMMER/WINTER LED (BASIC MODEL ONLY):

RED ON when the RFC is in the WINTER function mode.

GREEN ON when the RFC is in the SUMMER function mode.

RED or GREEN LED BLINKING (1 second ON, 1 second OFF) when the set point is satisfied, but the fan is still running, or when the valve is opening and the fan hasn't been started yet.

ORANGE LED BLINKING (1 second ON, 5 seconds OFF) when the room temperature is in the dead band or the set point is satisfied, since the controller is in the COMFORT mode.

ORANGE LED BLINKING (1 second ON and 1 second OFF) in the ECONOMY mode, when the set point is satisfied.

ORANGE LED BLINKING (1 second ON and 15 seconds OFF) in the OFF state.

MODE LED:
Function mode display

The flashing of the Mode LED shows the current state of the regulator (COMFORT or ECONOMY).

When pressing the SEL 3 key, the changes to the flashing of the Mode LED indicates the state of the device. In particular:

With the controller in COMFORT mode: when pressing the SEL 3 key the Mode LED turns on.

With the controller in the ECONOMY mode: when pressing the SEL 3 key the Mode LED flashes regularly 3 times a second.

Dirty Filter Signal and Alarm

With the controller in normal operating mode the Mode LED turns on when the filter maintenance hours have been reached.

This signal indicates that the filter must be cleaned.

After cleaning the filter, proceed as described below to reset the operating hours count down:

1. Press the SEL3 knob until the Mode LED briefly blinks 8 times. The filter operating hours are then reset to zero.

Daily valve drive

To prevent a possible valve blockage due to a prolonged standstill period, the valve is driven automatically at least once every 24 hours for 150 seconds. This function is enabled by parameter 19.

CHANGE OF THE ROOM UNIT FUNCTION MODES

FOR ROOM UNITS WITHOUT A DISPLAY

CHANGE OF SEASON – SUMMER / WINTER (BASIC MODEL ONLY)

If Parameter #9 (summer / winter switching) is in the MANUAL mode, changing the season is possible by using the SEL1 KEY on the front panel. Press this key for 5 seconds until the colour of the selected season appears on the S/W LED for 5 seconds. After this, the LED will assume the appropriate operating mode. The default value of Parameter #9 is Manual.

CHANGE OF FUNCTION MODE (COMFORT / ECONOMY)

During normal functioning, while the unit is turned ON, it is possible to change the operating mode mode, from COMFORT to ECONOMY, in succession by using SEL3. Proceed as follows:

In the COMFORT mode: when pressing the SEL3 key, the Mode LED turns on and stays on (comfort). By continuing

to press the key, the controller switches to the ECONOMY mode after 5 seconds and the Mode LED blinks for 0,3 seconds ON - 0,3 seconds OFF until the key is released.

From the ECONOMY mode: if the SEL3 key is pressed again, the Mode LED blinks for 0,3 seconds ON - 0,3 seconds OFF. By continuing to press the key for another 5 seconds the controller switches to the COMFORT mode, and the Mode LED will turn to on and stay on.

INSTALLATION

POSITION

The RFC series room unit is the room temperature control element in a fan coil plant, or small split system units. The room probe of the unit must be positioned 1.5 m from the floor (according to local legislation, this may be 1.2m), in a position exposed to good room air circulation. It should not be affected by:

a. Air currents or dead zones behind doors or in corners
b. Warm or cold air coming from air ducts
c. Solar radiation or radiation from household appliances
d. Non heated or cooled areas such as external walls behind the room unit
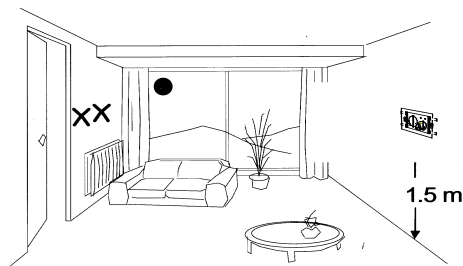e. Pipes or chimneys embedded in the wall

Fig. 5 Positioning the room unit

INSTALLATION

IMPORTANT: this product must be installed according to the local safety norms in force and only by qualified personnel. Isolate the electrical power supply before starting to **install or dismantle** the device.

INSTALLING THE ROOM UNIT

1. Using a screwdriver, loosen the retaining screw in the bottom side of the housing, until the cover can be removed.

2. Pass the wires to rear holes of housing and then fix to the wall with screws.

3. Fix the wires to the connector, taking care to follow the electrical diagram.

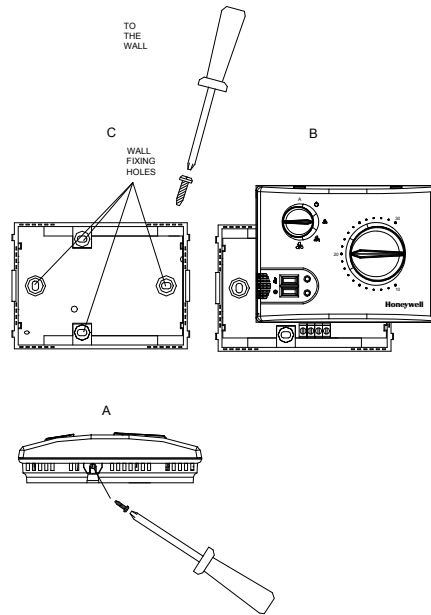4. Replace the cover and secure it by tightening the screw in the bottom part of the housing.

Fig. 6 Installing the wall-mount room unit

INSTALLING THE SENSORS:

1. **Water Temperature sensor for automatic Summer/Winter switching:** position the sensor upstream from the valve as shown in Fig. 7.

2. **Water Temperature sensor for automatic Summer/Winter switching and fan start consent thermostat:** position the sensor as shown in Fig. 7.

3. **Temperature sensor with fan start consent thermostat function***:* position the sensor on the exchanger fins as shown in Fig. 8.
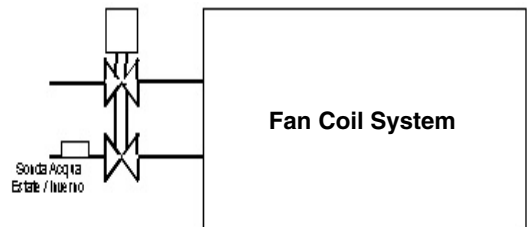

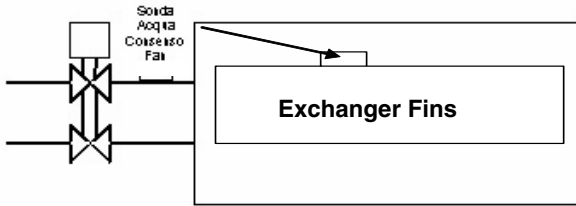**Fig. 7 Locating the Summer / Winter water sensor**

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Fig. 8 Locating the Fan Coil consent water sensor

WIRING THE REGULATOR

The terminals are suitable for 1.5 mm² cables.

WIRING THE ACTUATORS FOR 4-PIPE SYSTEMS

The actuators must be wired to terminals 4-3 (heating water valve) and 4-2 (cooling water valve).

WIRING THE ACTUATORS FOR 2-PIPE SYSTEMS

In 2-pipe fan coil systems, the actuator must be connected to the heating water outlet, terminals 4, 3.

STARTUP

MANUAL PARAMETER SETUP PROCEDURE

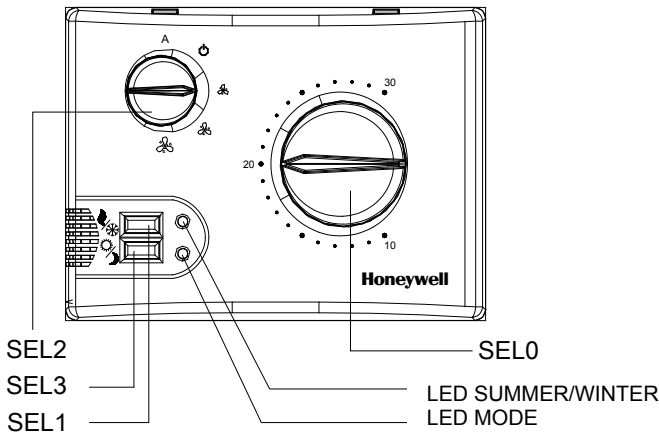The RFC regulator allows manual access to the parameters without the need of a PC.

Fig. 9 Setting the parameters

The SEL0 selector knob allows parameters (from 1 to 10) to be selected, (see parameter table below).

The fan speed selector SEL2 allows the value of the chosen parameter to be set.

The SEL1 and SEL3 keys, if pressed simultaneously for 5 seconds, allow access to the "parameter settings mode".

SEL1 is used as the "Enter" button when pressed during the programming phase and confirms the newly set value.

If pressed for 5 seconds during programming, SEL1 saves the parameter settings (the green S/W LED blinks 3 times to indicate that the data has been saved).

The green or red LED indicates which value was set in the parameter selected by the "selector SEL 0" knob.

SETTING OR CHANGING THE PARAMETER VALUES

To access the "parameter setting" mode, proceed as follows:

1) Rotate and set the SEL0 knob to position 10 degrees.

2) Set the SEL2 knob to the AUTO position.

3) Press keys SEL1 and SEL3 for >= 5 sec.

After pressing the keys for 5 seconds, the S/W LED will start to blink alternating red-green-red-green for 3 seconds to indicate that the "parameter setting" mode Has been accessed.

Three seconds after accessing the 'parameter selection menu', the LED turns to green if the current parameter corresponds to the value selected with the SEL0 knob. The LED turns red if the current parameter is not the selected one.

To change a parameter value, position the SEL2 knob to the selected value (the LED will turn red), then press the SEL1 programming key and wait until the LED turns to green.

To save a new setting in the permanent memory of the controller, press the SEL1 key for >= 5 seconds; the green LED will blink 3 times to confirm the new parameter settings.

After saving the value, the controller immediately exits the parameter configuration mode.

The above sequence is valid for the configuration of all parameters that are selectable with the SEL0 knob, therefore:

Select a parameter by rotating the SEL0 knob, and set its value with the selector knob SEL2.

CHECKING THE PARAMETER SETTINGS

By simply moving selector knob SEL2 one can also check which value was set in any specific parameter (green LED = the same chosen parameter, red LED = a different parameter). If no controls are touched for two minutes, the controller will revert to normal operating mode.

RESETTING TO THE DEFAULT VALUES

1. Set the SEL0 knob to + 10 °C.

2. Set the SEL2 knob to position 2.

3. The red LED blinks quickly to indicate that the default parameter table has been chosen.

4. Press the programming key SEL1.

5. The GREEN LED on the device blinks 3 times to indicate that the device is saving the DEFAULT parameter table.

1st LEVEL PARAMETER TABLE

The parameters below are the ones that can be directly modified from the controller key pad.
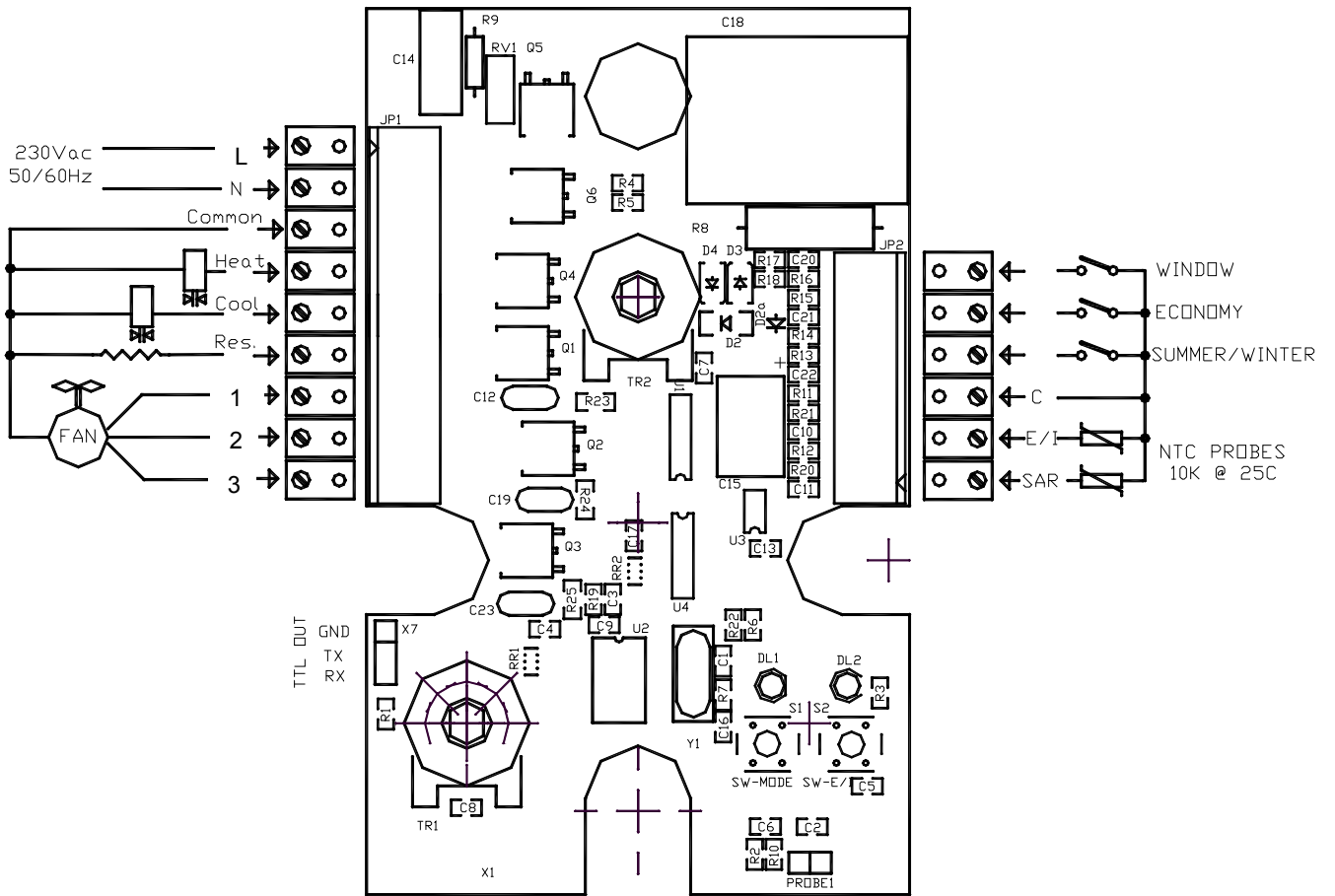
SEL0 KNOB POSITION	PARAMETER No.	PARAMETER TO BE SET	PARAMETER DESCRIPTION	Selector Position SEL 1 AUTO DEFAULT VALUE	Selector Position SEL 1 OFF	Selector Position SEL 1 1	Selector Position SEL 1 2	Selector Position SEL 1 3
10	1	COMFORT SET POINT RANGE	Configuring the COMFORT set point range	10-30	12-28	13-27	14-26	15-25
11	2	DEAD BAND	Defines the Dead Band by 4-pipe plants	4	3	2	1	0
12	3	TYPE OF PLANT	Type of plant	2-PIPE	4-PIPE	FAN ONLY		
13	4	FAN	Defines the fan operating mode in the dead band	CYCLED	CONTINUOUS	CYCLED IN WINTER / CONTINUOUS IN SUMMER	CYCLED IN SUMMER / CONTINUOUS IN WINTER	
14	5	TYPE OF OUTPUT	Defines the type of regulation at output 1	PWM	ON-OFF			
15	6	WINDOW CONTACT	Defines if the window contact is n. o. or n. c.	ACTIVE = CONTINUOUSLY CLOSED	ACTIVE = CONTINUOUSLYOPEN			
16	7	DESTRATIFICATION	Activate or deactivate the destratification function	ENABLED	DISABLED			
17	8	WATER TEMPERATURE SENSOR FUNCTION	Selecting the NTC probe function for the water temperature	FAN FUNCTION CONSENT	SUMMER / WINTER SWITCHING	WITHOUT PROBE	SUMMER / WINTER SWITCHING + FAN FUNCTION CONSENT	
18	9	SUMMER / WINTER SWITCHING	Selecting summer to winter switching	Manual	Centralized or by NTC probe	From the room unit		
19	10	SENSOR READING OFFSET	Modifies the room temperature sensor reading	0	+ 1°C	- 1°C	+ 2°C	- 2°C
20	11	RESET	Resetting the DEFAULT values or the Filter hours		Setting the filter hours to zero		Resetting the default parameters	

Other parameters that are listed in the following table can be modified with factory software, though the TTL port.
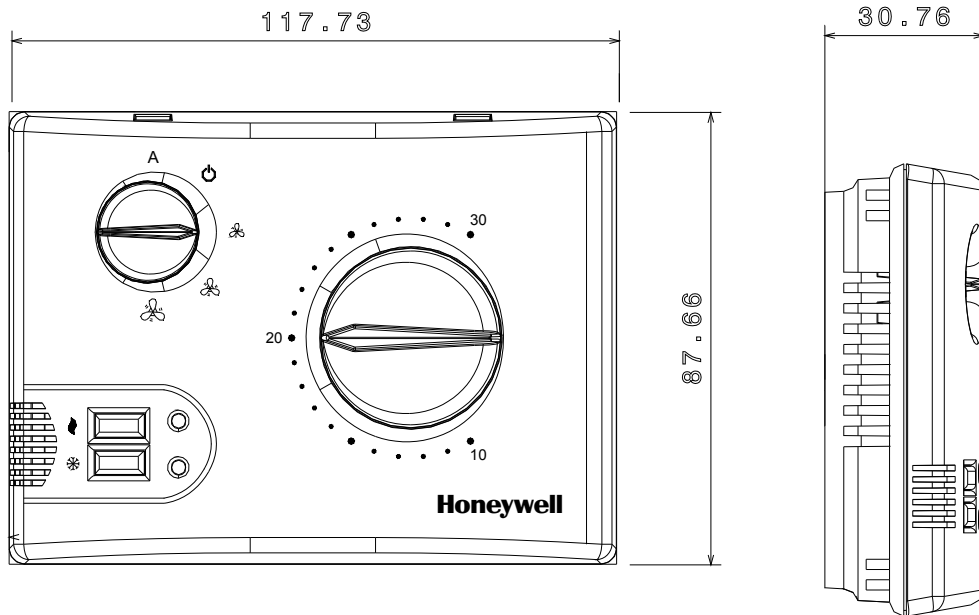
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2nd LEVEL PARAMETER TABLE

PARAMETER No	PARAMETER TO BE CONFIGURED	PARAMETER DESCRIPTION	DEFAULT VALUE	RANGE	NOTES
12	Proportional band °C	Defines the temperature range in which the P+I regulation is carried out	**2**	**1-5**	
13	Economy set point variation	Defines the value to be added to the summer set point and subtracted from the winter set point when the room is not occupied	**2**	**5-10**	
14	Winter temperature function consent	This parameter defines the water temperature above which the system switches to the winter mode or enables the fan	**38**	**20-60**	
15	Summer temperature function consent	This parameter defines the water temperature below which the system switches to the summer mode or enables the fan	**14**	**5 - 25**	
16	Anti-freeze protection °C	Room temperature value, below which the anti-freeze function is activated	**4**	**0 - 10 °C**	
17	Dirty filter signal	Parameter K value	**0**	**0 (disabled) 1 – 20 K**	x300 HH
18		NOT AVAILABLE			
19	Valve exercise	Enables or disables a periodic valve activation to avoid valve blockage	Disabled	• Disabled • Enabled	
20	De-stratification, maximum fan OFF time (minutes)	Defines the fan disabling time during the de-stratification process	**15**	**1 – 60**	
21	De-stratification, minimum fan ON time (minutes)	Defines the fan enabling time during the de-stratification process	**1**	**1-10**	
22	Fan start delay (seconds)	The fan start delay with respect to the heating output activation time	**120**	**0 – 250**	
23	Fan start through electrical resistance (seconds)	Defines the time delay between the electrical heater switching on and the fan starting	**30**	**0-250**	
24	Fan stop through electrical resistance (seconds)	Defines the time that the fan overruns after the electrical heater is switched off	**60**	**0-250**	

ELECTRICAL CONNECTIONS

DIMENSIONS

117.73

30.76

87.66

A

20

30

10

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C €