

i-Digit

Programmable electronic thermostat
with LCD display for 2/4 pipe fan coils



GENERAL FUNCTIONS OF THE PRODUCT:

- Digital electronic thermostat, large LCD display with dimmable blue back lighting
- Product designed for control of fan-coil and hydronic cassettes
- Standard programmer for weekly schedule
- Clock with perennial calendar and standard integrated battery
- Connection to RS485 bus network possible on models 1 - 2 - 3
- Complete management of the device via Modbus communication protocol
- Operates with 2 pipe – 4 pipe – fan only systems
- Control of electrical heater as replacement or addition (P07)
- Control of external air recirculation damper
- Control of humidification/dehumidification/humidity reading only, with internal humidity sensor on models 1 - 3
- Automatic/manual/centralised SUMMER/WINTER season changeover (P09)
- Continual or thermostat-controlled fan operation (P05)
- Automatic/manual changeover of the fan speed
- Air temperature reading by internal or remote sensor (automatic sensor recognition)
- Anti-freeze function even with thermostat turned off
- Standard dirty filter signal
- Separate parameter settings for hot and cold fan start-up temperature thresholds (P18 and P19)
- Separate parameter settings for change of season hot and cold temperature thresholds (P16 and P17)
- Automatic season change with reference to flow temperature (P08 e P09)
- Automatic season change referenced against air temperature (P09)
- Management of centralised comfort/economy operation
- Management of ON-OFF valve, modulating and floating, (2 pipe system only)
- Energy efficient management of 3-speed and brushless fan
- Economy and auxiliary inputs for window contact management
- Control of current absorbed by the fan with malfunction threshold and alarm output management (P35 e P36)
- Setting/restriction of the temperature range regulated by parameters (P23 e P24)
- Keypad lock function
- Diagnostic function to control thermostat and system malfunctions
- Quiet regulation achieved with triac regulation technology

TECHNICAL CHARACTERISTICS

Power supply: 230V~ -15% +10%
 50Hz Power absorbed: 2.0 VA
 Operation temperature: 0°C to 40°C
 Storage temperature: -10°C to +50°C
 Humidity function: 20% to 80% RH non-condensing
 Storage humidity: 20% to 80% RH (N.C.)
 Container: ABS V0 self-extinguishing
 RAL9001 Protection rating: IP 20
 Dimensions: 110 x 110 x 40 mm (L x H x W)
 Weight: approx. 330 g

AMBIENT AIR SENSOR:

Range of adjustment: 5°C - 40°C (configurable)
 Sensor used: NTC 10kΩ @ 25°C +/-1%
 Air sensor precision: +/- 1°C
 Air sensor resolution: 0.1°C
 Display field: 0°C to 50°C
 Hysteresis: adjustment 2% to 100% of the proportional band
 Cabling: max.15 m of shielded cable 0.5 to 1.5 sqmm

WATER SENSOR:

Sensor type: NTC 10kΩ @ 25°C +/-1%
 Precision: +/- 1°C
 Resolution: 0.1°C
 Display field: 0°C to 50°C
 Cabling: max. 15 m shielded cable 0.5 to 1.5 sqmm

HUMIDITY SENSOR:



Sensor type: capacitive
 Display field: 10 to 99% UR
 Precision: +/- 1%
 Hysteresis: 1 %

OUT POWER:


fan: 1A @ 230V~ cosΦ =1 total
 Valves: 0,3A @ 230V~ cosΦ =1 x output
 Inductive load valves: 10VA x output

THERMOSTAT OPERATION:

The commands available for the user are the four buttons present on the side of the display:


BUTTON	MAIN FUNCTION	SECONDARY FUNCTION
+	Increase desired temperature setting	Browse/increase variables and parameters
-	Decrease desired temperature setting	Browse/decrease variables and parameters
	ON/OFF	ESC menu function
	Access/browse menu	Save settings function

-Button (plus)

On pressing this button, the temperature settings are displayed, press again  and the setting will be increased by 0.1 °C with each subsequent press, keep the button pressed down for 5 sec for a faster change to the setting. After 10 sec the device automatically exits the configuration function of the set temperature briefly press the on/off button to exit immediately.

This button is also used for browsing, scrolling and increases within the various programming menus.

-Button (minus)

On pressing this button, the temperatures settings are displayed, press again  and the setting will be decreased by 0.1 °C each subsequent press, keep the button pressed down for 5 sec for a faster change to the setting. After 10 sec the device automatically exits the configuration function of the set temperature briefly press the on/off button to exit immediately.

This button is also used for browsing, scrolling and decreases within the various programming menus.

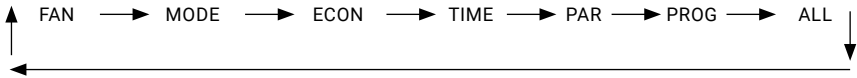
-Button  **(ON/OFF)**

Press for 2 seconds to switch on or turn off the device; switched off, the thermostat shows OFF on the display but the ambient temperature, clock, any alarms and the relative humidity (optional) continue to be displayed.

This button is also used to exit the various configuration menus.

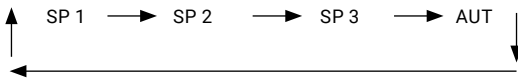
-Button  **(menu)**


Press for 3 seconds the user choice of sub-menus, FAN will flash on the display and if the + or - button is pressed you can select any option from following rotating menus:



● **FAN select fan**

Press the menu button, scroll with the + button select the FAN option with the menu button, on pressing the + button again you can choose the operating speed of the fan with the manual settings SP 1-SP 2- SP 3 or on the AUT automatic setting:



 **SP 1 = Minimum speed setting** (33% for electronic brushless fan)

 **SP 2 = Medium speed setting** (66 % for brushless electronic fan)

 **SP 3 = Maximum speed setting** (100 % for brushless electronic fan)

A **AUT** = The fan operating speed will be automatically selected by the thermostat based on difference between the ambient temperature and the desired temperature.

The maximum speed reached depends on the proportional band setting (P11)

Confirm the desired configuration using menu button.

If the thermostatic operating mode has been selected (P05=0) the fan stops when the desired temperature (set) has been reached.

If the continual operating mode has been chosen (P05=1) the fan continues to operate at the speed set when in manual mode and at the minimum speed when in automatic mode.

If the system flow sensor is connected, the fan follows the following logic:

2 pipe system: it respects minimum fan consent (P18) and maximum fan consent (P19)

4 pipe system. it respects minimum fan consent (P18) and ignores maximum fan consent (P19)

Note. when respecting consent, the fan does not start up until it reaches the temperature set in the respective parameter.

● **MODE Select heating/cooling/ventilation**

Press the menu button, scroll with the + button and confirm MODE with the menu button, after, by pressing the + button, select one of the various operating modes: COOL, HOT, FAN.

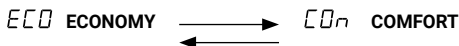


Confirm choice by pressing the menu button.

PLEASE NOTE: if the automatic/centralised season change mode has been selected (P09) the MODE menu does not appear.

ECON Select ECONOMY-COMFORT operating mode

Press the menu button, scroll the settings with the + button, confirm ECON with the menu button, by subsequently pressing the + button, you can select one of the two operating modes: ECONOMY and COMFORT



Confirm choice by pressing the menu button.

ECON = in COMFORT mode the thermostat works according to the temperature setting

ECON = if you activate the **ECONOMY** function you are setting a reduction in energy consumption changing the temperature setpoint of the value set in the P10 parameter, reducing the setpoint for heating and increasing it for cooling.

The same function can be activated, even in centralised mode, by closing the contact of pin 1 of the RJ45 connector, the function is disabled by opening the contact

TIME Time and date clock setting

Press the menu button, scroll the settings with the + and confirm TIME with the menu button:

HRS: the hour numbers flash, set the correct hour with the +/-, confirm with the menu button

MIN: the minutes numbers flash, set the correct minutes with the +/-, confirm with the menu button

DAY: the day numbers flash, set the correct day with the +/-, confirm with the menu button

MON: the month numbers flash, set the correct month with the +/-, confirm with the menu button

YEA: the year numbers flash, set the correct year with the +/-, confirm with the menu button

PROG Weekly programming

Press the menu button, scroll the settings with the + and confirm PROG with the menu button:

Select the weekday to programme by scrolling with the + button:

SUN = Sunday

MON= Monday

TUE= Tuesday

WED= Wednesday

THU= Thursday

FRI= Friday

SAT= Saturday

Select the weekday to programme and confirm it with the menu button to access programme options for the F1 and F2 bands:

Press the menu button and set the hour for activation of the F1 band
 Press the menu button and set the minutes for activation of the F1 band
 Press the menu button and set the operating temperature of the F1 band

Press the menu button and set the hour for activation of the F2 band
 Press the menu button and set the minutes for activation of the F2 band
 Press the menu button and set the operating temperature of the F2 band

Select the next day to programme with the + button or exit by pressing the ESC button.

Table 1: Example of daily programming: 09:00 with F1 setpoint at 20°C -- 20:00 with F2 setpoint 15°C

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
F2=15°C									F1=20°C									F2=15°C						

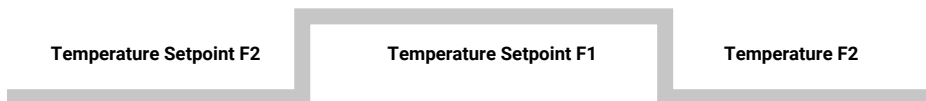


Table 2: example of weekly programming

SUN	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
MON	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
TUE	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
WED	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
THU	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FRI	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
SAT	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Table 3: example programme of weekly schedule set in table 2 if P1=1


Day	Schedule F1	Setpoint F1	Schedule F2	Setpoint F2
SUN	08:00	20°C	23:00	15°C
MON	14:00	20°C	23:00	15°C
TUE	14:00	20°C	23:00	15°C
WED	14:00	15°C	23:00	15°C
THU	14:00	20°C	23:00	15°C
FRI	14:00	20°C	20:00	15°C
SAT	08:00	20°C	14:00	15°C

summer winter


Table 4 : example programme of weekly schedule set in table 2 if P1=2

Day	F1 Time	F1 ON/OFF	F2 Time	F2 ON/OFF
SUN	08:00	ON	23:00	OFF
MON	14:00	ON	23:00	OFF
TUE	14:00	ON	23:00	OFF
WED	14:00	OFF	23:00	OFF
THU	14:00	ON	23:00	OFF
FRI	14:00	ON	20:00	OFF
SAT	08:00	ON	14:00	OFF

 summer  winter

When the  icon is turned on in the display, it shows that the thermostat is following a programmed schedule.

● **ALL Message/alarm display**

This menu can only be consulted when there is at least one alarm status. The presence of the  icon on the display warns that there are one or more alarm messages.

Press the menu button, scroll with the + button, confirm ALL with the menu button and the alarm abbreviation is displayed.

Scroll with the + button to verify all the registered alarms present.

If there are no alarms ALL will not show on the menu.

Table 5 : alarms

Message display	Alarm description	Reset alarm
<i>ALL FIL</i>	Filter exceeded working time limit	Visualise alarm on display and press the menu button for 3 sec
<i>ALL Air</i>	Internal air sensor malfunction	Automatic on elimination of the malfunction
<i>ALL Prb</i>	No sensor connected	Automatic on elimination of the malfunction
<i>Cur PAH</i>	Fan maximum current threshold exceeded P36	Display the alarm and press the menu button for 3 sec
<i>Cur Min</i>	Fan minimum current threshold exceeded P35	Display the alarm and press the menu button for 3 sec

Table 6 : messages

Message display	Description
<i>win</i>	Window contact active

● **PAR** Parameter configuration menu

The menu for configuring parameters is divided in two levels, a first level protected from access and unintended changes and a second level with password protection.

To access the **first level** of the parameters menu press the menu button, scroll with the + button and confirm on **PAR**, pressing the menu button for 5 sec the P01 parameter is displayed and with the +/- buttons it is possible to scroll through all parameters from P01 to P10.

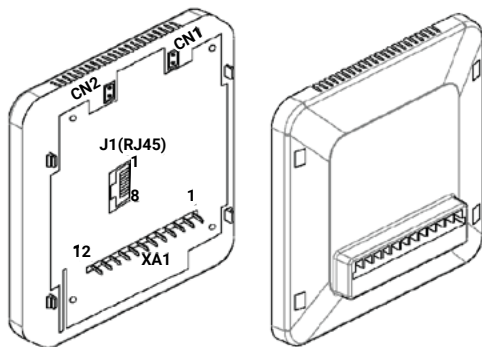
Select the parameter that you want to alter and confirm the choice with the menu button, the parameter will flash, alter the parameter with the +/- buttons and confirm/save the change with the menu button. Press the ESC (ON/OFF) button twice consecutively to return to the home screen of the display.

Access to the **second level** of the parameter menu is exclusively for the authorised technical service and, as such, requires a password for access.

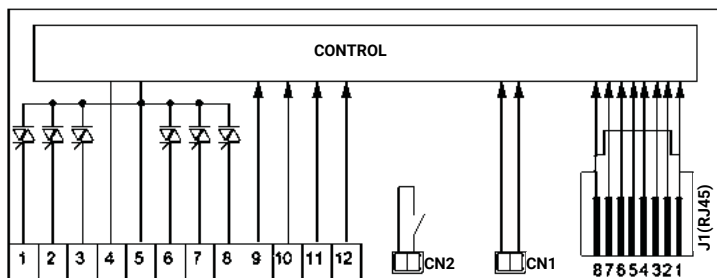
Press the menu button, scroll with the + button and confirm on **PAR**, keeping the menu button pressed down for 5 sec the P01 parameter is displayed, press the - (minus) button and P2LE is shown on the display, confirm the choice with the menu button and insert the password using the +/- buttons, set the password confirming it with the menu button and access the list of parameters P11...P55.

Scroll the parameters with the +/- buttons, select the parameter that you want to alter and confirm the choice with the menu button, at this point the parameter will flash, alter the parameter with the +/- buttons and confirm/save the change with the menu button. Press the ESC (ON/OFF) button twice consecutively to return to the home screen of the display.

VIEW OF REGULATOR AND SUB-BASE'

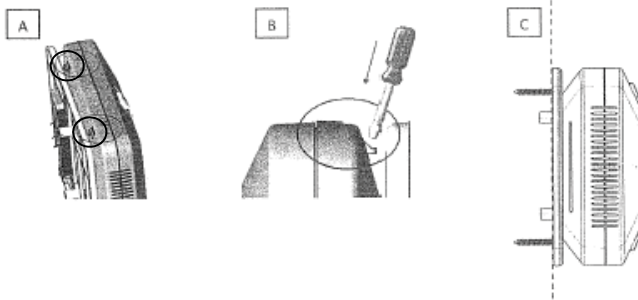


SIMPLIFIED INTERNAL DIAGRAM



WALL INSTALLATION

1) The regulator consists of two parts: sub-base with terminal blocks and base with electronics. For ease of installation the two parts are supplied already separated (unattached). Once the electrical connections have been completed on the terminal block of the sub-base, the two parts must be joined by the 4 clips found on the four corners: insertion of the 4 tines into the 4 slots. A little pressure from your hand should be enough to click it into place, we recommend attaching the terminal block side first. Figure B shows the tine inserted into the slot. 2) The standard sub-base is designed to be fixed onto the model 503 flush mounting box. In the absence of a 503 box, a wall mounting base can be used in place of the standard sub-base and flush mounting block. This accessory can be bought separately and has a wider profile than the standard base due to the terminal block being housed in the sub-base (figure C)



SPECIAL FUNCTIONS i-Digit2 AND i-Digit3

CN1

The input can be used to display an external information. For activation of the function it is necessary to set P33=1.

The input can be managed with a pure contact:

If set at P32=1, when open the display lights up with ☒

If set at P32=0, when closed the display lights up with ☒

CN 2

FAN CURRENT CONTROL

Output on CN2 connector

Pure contact output for motor alarm.

For activation of the function P35 and P36 must not be set at 0.

If the current absorbed by the motor exceeds set min/max levels (see P35 and P36 parameters) the contact closes.

If the current falls below the minimum threshold P35 ☒ lights up on the display with "CURR MIN" in the alarm notification menu.

If the current exceeds the maximum threshold P35 ☒ lights up on the display with "CURR MAX" in the alarm notification menu.

KEYPAD LOCK

Use of the buttons may be blocked by pressing the ON-OFF button followed immediately by the + button and keeping them pressed down together for 3 seconds.

To unblock the use of the buttons, repeat the same operation used for blocking.

VISUALISE WATER TEMPERATURE

If connected to a water temperature sensor, the temperature can be viewed on the display in real time.

Keep the MENU button held down for 5 seconds and the display will show "TH20" and the relative temperature.

The system automatically exits the temperature visualisation after 5 sec.

HUMIDITY CONTROL (only available on models iDIGIT1 and 3)

If P12=1 and P15=1

The auxiliary output (Pin3-XA1) is on (230Vac) when the ambient humidity is less than that programmed.

If P12=2 and P15=1

The auxiliary output (Pin3-XA1) is on (230Vac) when the ambient humidity is greater than that programmed.

If P12=3

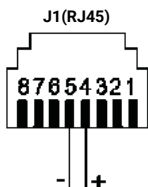
When the ambient temperature = programmed temperature, the cold output goes on (230Vac) if the ambient humidity is greater than that programmed

Variation of the humidity set point: press the ON/OFF and MENU buttons together

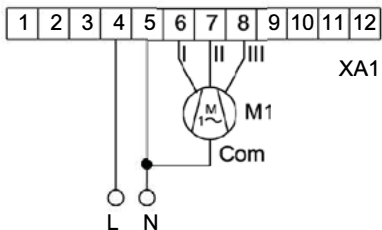
PROTOCOL 485 COMMUNICATION PORT (only available on models iDIGIT1-2-3)

Specifications on request

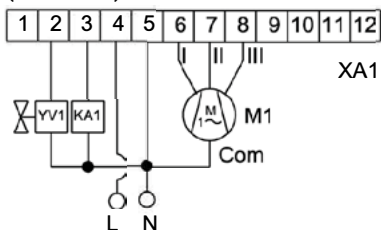
See P42 for addressing



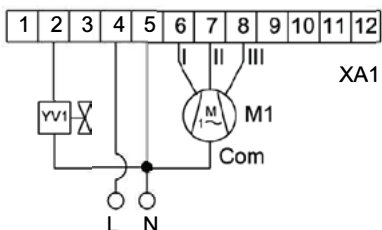
ONLY FAN (three speeds)



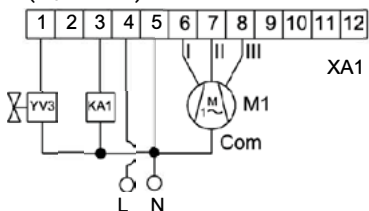
SYSTEM WITH RESISTOR AS ADDITIONAL (on/off valve)



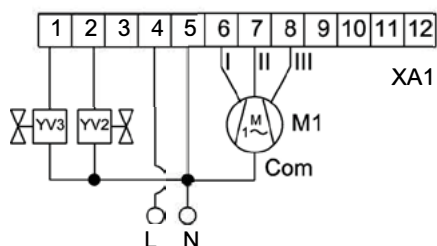
2 PIPE SYSTEM (on/off valve)



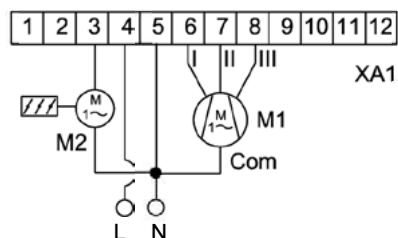
SYSTEM WITH RESISTOR AS REPLACEMENT (on/off valve)



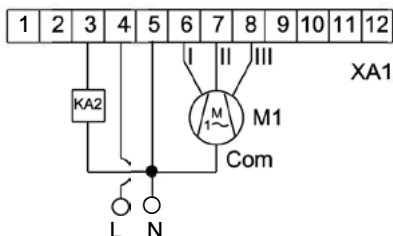
4 PIPE SYSTEM (on/off valve)



SYSTEM WITH MOTORISED DAMPERS



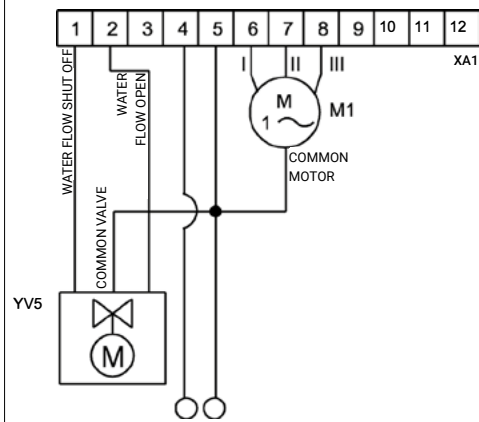
SYSTEM WITH HUMIDIFIER/DEHUMIDIFIER



- L = Phase 230Vac
- N= Neutral - 230Vac
- M1= Fan Motor - 230Vac
- M2= Damper Motor - 230Vac
- I= Minimum Speed
- II= Medium Speed
- III= Maximum Speed
- Com= Common Motor
- KA1= Resistor activation relay
- KA2= Humidifier/dehumidifier relay activation
- XA1= i-Digit terminal board
- YV1= Hot/cold valve 230Vac - ON/OFF
- YV2= Hot valve 230Vac - ON/OFF
- YV3= Cold valve 230Vac - ON/OFF

LIST

2 PIPE SYSTEM (three-point floating valve)



LIST

L = Phase 230Vac
N = Neutral - 230Vac
M1 = Fan Motor - 230Vac
I = Minimum speed
II = Medium speed
III = Maximum speed
XA1 = i-Digit terminal board
YV5 = Hot/cold valve 230Vac - floating (3 point)

INPUT WATER TEMPERATURE SENSOR

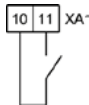
Operation in heating and cooling



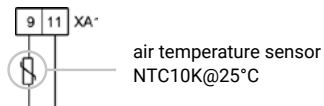
- 1) For a 2 pipe system with a three way valve set to automatic season change the sensor is positioned upstream of the valve
- 2) For a 4 pipe system the sensor is positioned in the heating battery

MINIMUM WATER TEMPERATURE THERMOSTAT

operation in heating

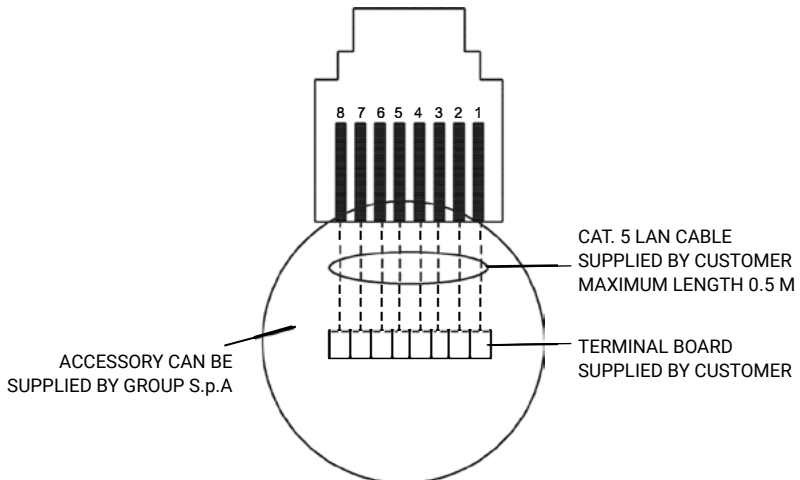
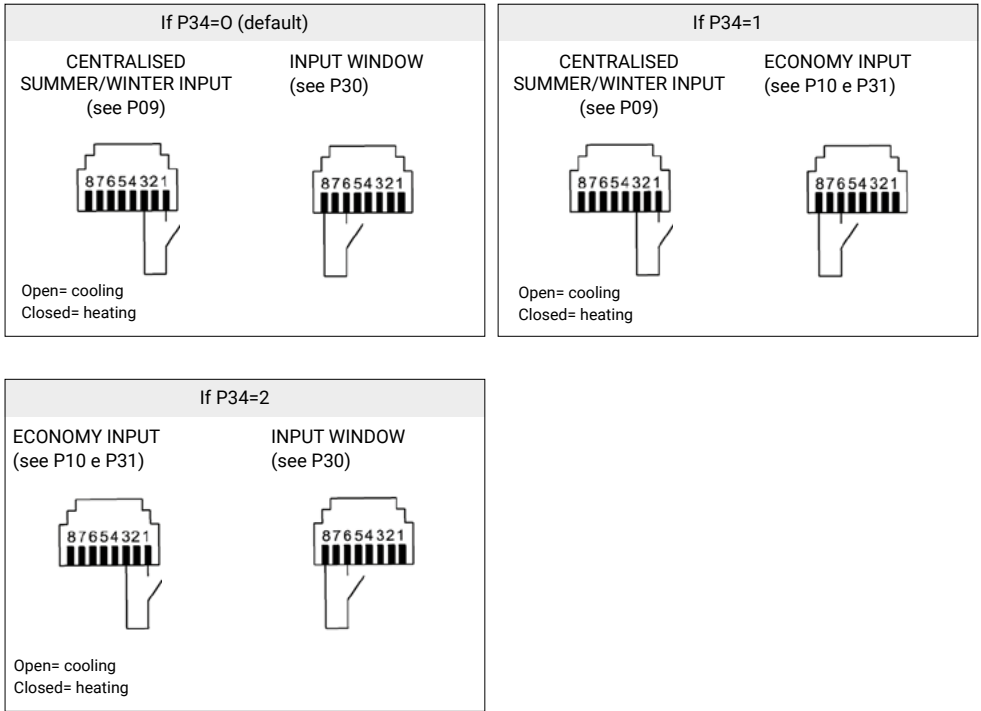


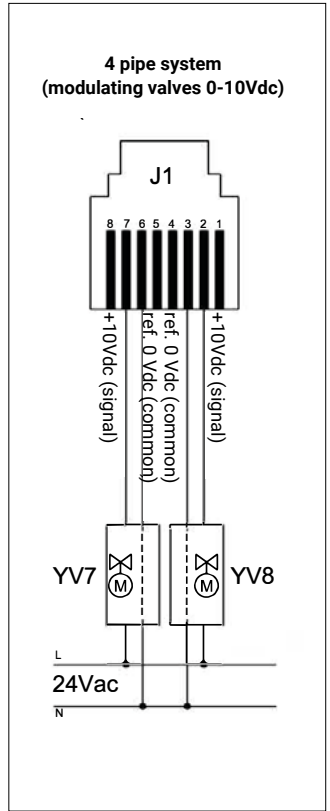
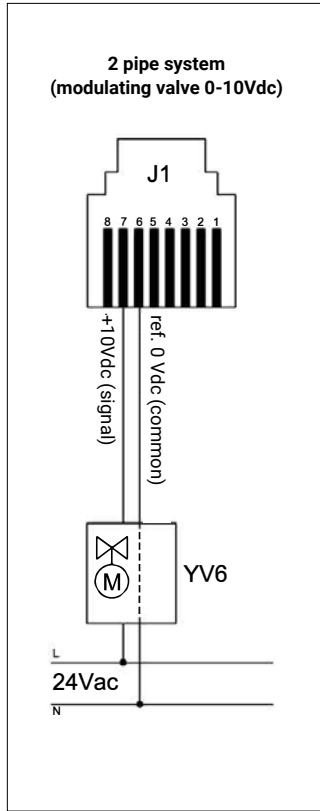
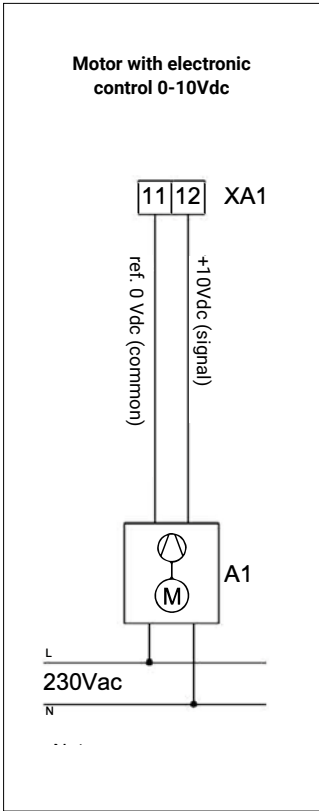
INPUT FOR REMOTE AIR TEMPERATURE SENSOR



Must always be used if the regulator is installed on board the unit. The sensor is automatically recognised by the thermostat. With the sensor connected the destratification cycle is active which activates the fan at minimum speed for 90 seconds every 15 minutes

CONFIGURATION INPUT J1 (RJ45) PLACED ON THE BACK OF THE REGULATOR



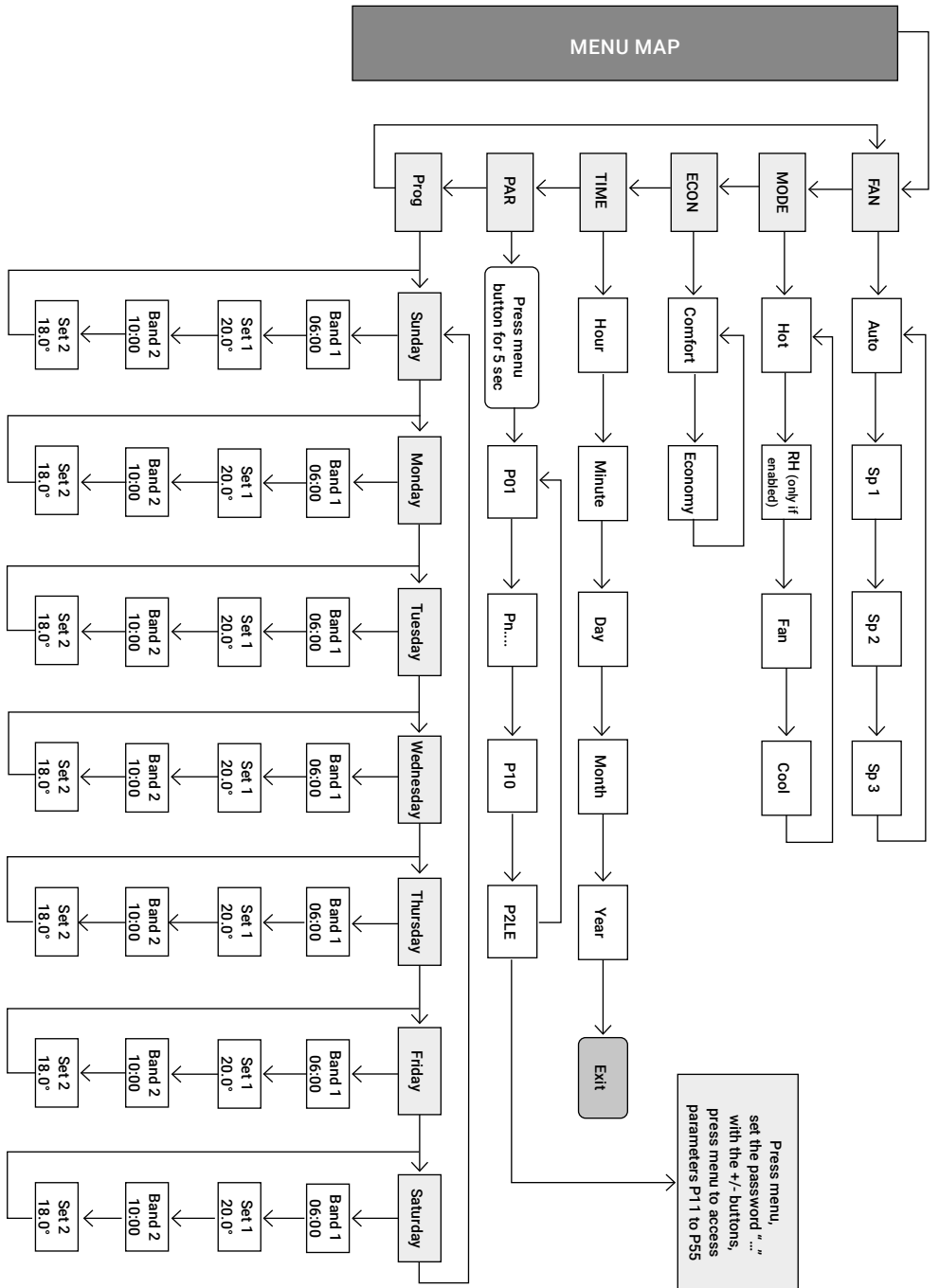


LEGEND

A1 = Motor with electronic control
 YV6 = Hot/cold modulating valve 0-10Vdc
 YV7 = Hot modulating valve 0-10Vdc
 YV8 = Cold modulating valve 0-10Vdc

Note:

- 1) Never short circuit the unused J1 PIN
- 2) Regulation of the motor with electronic control:
 - Speed selector in position I = constant output at 3Vdc
 - Speed selector in position II = constant output at 6Vdc
 - Speed selector in position III = constant output at 9Vdc
 - Speed selector in position A: The output is variable depending on the ambient temperature, setpoint and parameters configured



DEFAULT VALUE	LEVEL 1 PARAMETERS					
0	P01	weekly programme	0 not enabled	1 enabled with set point	2 enabled with ON/OFF	
15	PtaB	factory customisation tables	0 .. 20			
4	P03	range of neutral zone (°C)	0 .. 10			
0	P04	type of system	0 2 pipe system	1 4 pipe system	2 fan only	
0	P05	fan regulation	0 thermostated	1 continuous		
0	P06	type of output valve	0 on/off	1 thermal (impulse control)	2 floating, 3-point	
0	P07	type of electrical resistor	0 absent	1 replacement	2 additional	3 In addition with water temp. control
0	P08	water temperature sensor	0 absent	1 cooling/heating changeover	2 fan activation	3 cooling/heating changeover and fan activation
1	P09	cooling/heating changeover	0 centralised/ water temperature	1 manual	2 air temperature	3 air temperature + water temperature
2	P10	economy reduction (°C)	1.0 .. 6.0			
0	P2LE	access level 2 parameters	PASS = 123			
LEVEL 2 PARAMETERS						
2	P11	ambient temperature of the proportional band (°C)	1.0 .. 5.0			
0	P12	humidity regulation	0 display only	1 humidification	2 dehumidification	3 cooling + dehumidification
5	P13	ambient temperature of the proportional band (°C)	5.0 .. 20			
6	P14	full reset regulation time (sec)	0 .. 200			
0	P15	auxiliary output function (pin3-xa1)	0 resistor as addition	1 humidifier dehumidifier	2 external air damper	3 grill
35	P16	changeover upper threshold	20.0 .. 50.0			
15	P17	changeover lower threshold	5.0 .. 25.0			
35	P18	heating fan switch on threshold	20.0 .. 50.0			
15	P19	cooling fan switch on threshold	5.0 .. 25.0			
4.0	P20	antifreeze temperature	0 .. 10.0			
150	P21	3-point floating servo control time (sec)	0 .. 400			
6	P22	filter warning time (300hrs x K)	0 .. 20			
5	P23	temperature set point, lower limit (°C)	5.0 .. 40.0			
40	P24	temperature set point, upper limit (°C)	5.0 .. 40.0			
0	P25	ambient temperature correction (°C)	-5.0 .. 5.0			
0	P26	ambient humidity correction (%)	-20.0 .. 20.0			
0	P27	heating fan switch-on delay (sec)	0 .. 250			
60	P28	fan switch-on delay with resistor ON (sec)	10 .. 600			

120	P29	fan switch-off delay with resistor OFF (sec)	10 .. 600		
0	P30	input window (RJ45 type connector)	0 contact open, function active	1 contact open, function not active	
DEFAULT VALUE					
LEVEL 2 PARAMETERS					
0	P31	economy input (on J1-type RJ45)	0 contact open, function not active	1 contact open, function active	
0	P32	input AUX (CN1)	0 contact open, envelope icon not present	1 contact open, envelope icon present	
0	P33	input AUX (CN1)	0 not active	1 active	2 active
0	P34	input configuration (on J1-type RJ45)	0 centralised summer/winter changeover + window	1 centralised summer/winter changeover + economy	2 window + economy
0	P35	fan current minimum threshold (mAxP54)	0 .. 50		
0	P36	fan current maximum threshold (mAxP54)	0 .. 200		
0	P37	Type of NTC sensor	0 10K0HM@25°	1 20K0HM@25°	
20.0	P38	default set point temperature	5 .. 40		
0	P39	temperature scale	0 °C	1 °F	
0	P40	display lighting level	0 .. 5		
0	P41	external lighting level (LED)	0 .. 5		
1	P42	MODBUS network address	0 .. 255		
100	P43	hysteresis valves on/off (%)	2 .. 100		
15	P44	used for customisations through Ptab			
90	P45	used for customisations through Ptab			
18	P46	used for customisations through Ptab			
27	P47	used for customisations through Ptab			
50	P48	settings for default humidity set point (%)	0 .. 100		
0	P49	modulating valve signal, lower limit (%)	0 .. 50		
100	P50	modulating valve signal, upper limit (%)	50 .. 100		
20	P51	modulating fan signal, lower limit (%)	0 .. 50		
100	P52	modulating fan signal, upper limit (%)	50 .. 100		
1	P53	fan consents with manual speed	0 not active	1 active	
100	P54	motor current multiplication constant	50 .. 130		
241	P55	Selection of network addresses for management of groups	241 .. 254		

