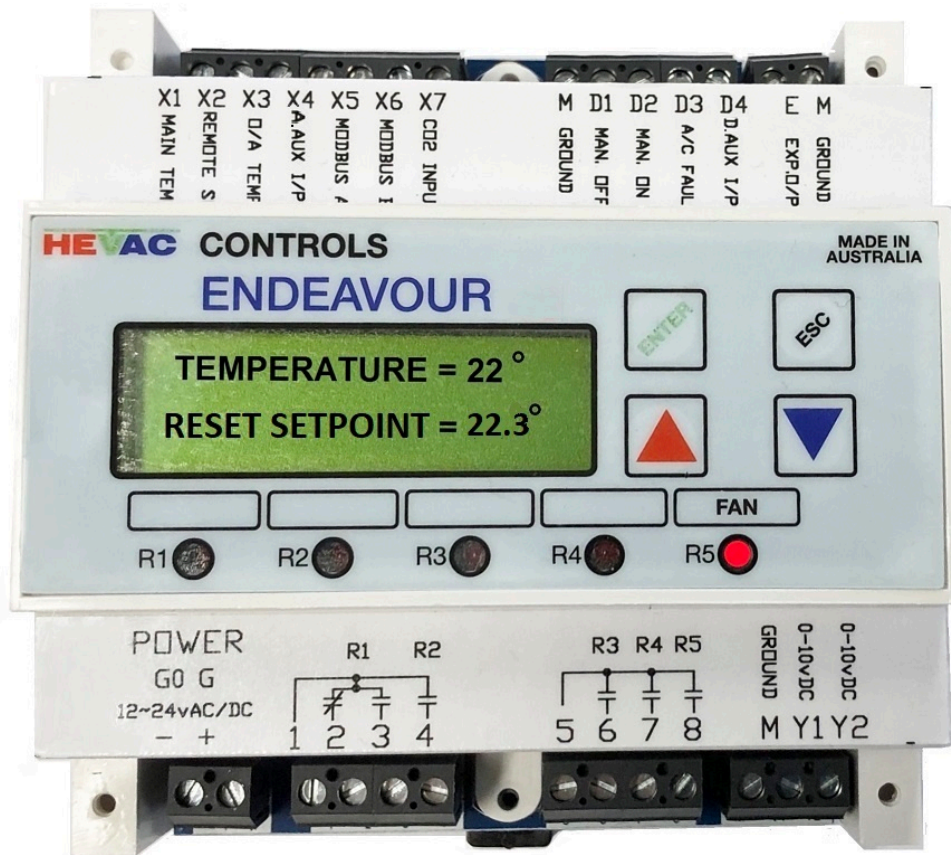


ENDEAVOUR V3.0+ USER MANUAL



New Features this version in blue

- * **INTERNET READY VIA GATEWAY MODULE** OR CONNECT TO LOCAL HMI COLOUR TOUCH SCREEN
- * **SELECTABLE PRE-LOADED PROGRAMS..1H/1C, 2H/2C, COMP./RVH, H+C FCU CONTROL ETC.**
- * **PASSIVE or SCALABLE ACTIVE 0-10vdc or 4-20mA SENSOR inputs**
- * **DEDICATED CO2 CONTROL & ECON.CYCLE OVERRIDE CAPABILITY**
- * **NIGHT PURGE OPERATION FOR LOW COST O/A PRE- COOLING WHEN CONDITIONS SUIT**
- * **EXTERNAL A/C FAULT (D3) INPUT FOR CONTROLLER DISPLAY & HMI or BMS O/P**
- * **AUXILIARY DIGITAL INPUT (D4) FOR BMS STATUS MONITORING (ie fan or pump operation)**
- * **UNIVERSAL ANALOGUE INPUT (X4) FOR EXTRA 2nd or INDEPENDANT CONTROL LOOP**
- * **CONTROLLER SETPOINT RESET by OUTSIDE AIR TEMP. & ROOM HUMIDITY SENSORS**
- * **CAN BE SET TO TIME SWITCH (NO TEMPERATURE CONTROL) or X4 CONTROL ONLY MODE**
- * **LOCKABLE 3 LEVEL MENU & SETPOINT ACCESS**
- * **SERVICE FEATURE TO TEMPORARILY RECLAIM SETPOINT FROM REMOTE SETPOINT DEVICE**
- * **INPUT CAPABILITY FOR MOVEMENT SENSOR TO TRIGGER RUN TIMER**
- * **AUTO / OFF / ON SYSTEM OVERRIDE SWITCH INPUTS**
- * **EVENT DATA LOGGER**
- * **INDEPENDENT AUXILIARY 2nd TIME SWITCH for lights or other amenities.**

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- The Hevac ENDEAVOUR is a fully programmable microprocessor based Universal controller with 5 analogue & 4 digital inputs + 5 relay & 2 analogue (0-10vDC) outputs. Run (start) operation can be triggered via an internal 365 day Time Switch, Run Timer & or external Auto/Off/Manual connected switches. Modbus capability also allows the controller (or controllers) to be connected to a local HMI colour touch screen or (coming soon) to the Internet via a gateway module for remote monitoring & override. A 2nd independent time switch is also included for auxiliary independent time switch requirements. This latest software update also features an additional independent 2nd I/O control loop capability, the expanded power of input X4 allows the Endeavour to now be used as a general purpose **Universal Controller** measuring & controlling some medium other & or temperature, making this version extremely powerful & flexible. The controllers I/O are displayed via a scrolling backlit LCD screen giving plain English status together with 5 dedicated LED's showing the relays on/off state (which can be labeled on the face plate with a marker). Typically used for Air Conditioning control applications where On/Off control of Heating & Cooling stages and /or modulating control of actuators / devices requiring a variable 0-10vdc control signal is required. The Endeavour can also be set to "Time Switch only" mode with all other non timer capabilities disabled allowing this controller to be used as a 2 channel 365 day Time Switch only. The 4 programmable relays & the 2 analogue output "use" (modes) can be set as : Heat, Cool or Both (both means the output operates as both a heating and a cooling output) or can now alternatively be set to respond to an external rising or falling scalable universal input signal (0-10v or 4-20mA) on terminal X4. The relays can also be tied to respond to either analogue output. The 5th relay is dedicated as a System Run (Fan / Main Time Switch) relay which can be set to operate continuously whilst the controller is enabled or to cycle on & off with a heat or cool run call (typical for domestic A/C systems). The 2 analogue outputs can be set to P or P+I mode (proportional+ integral action) and the minimum & maximum signal levels can be range limited, any minimum value setting is automatically overridden to zero when the system is off which is perfect for EC fan time switch control when a minimum speed requirement is needed when triggered to start. Also new to this latest update, the main temperature setpoint can be shifted (reset) due to outside temperature & room humidity levels. O/A temperature particularly influences how we dress & together with room humidity affects our perception of environmental comfort, shifting the operating setpoint (following outside air temperature) also substantially saves energy operating costs.

OPTIONAL REMOTE INTERLOCKS & OVERRIDES

- Remote System AUTO / OFF & AHR operation can be easily added by simply connecting a normally open (N/O) switch anywhere convenient in parallel with the main (passive) thermistor temperature sensor wires X1 & M. Momentarily shorting X1 & M results in triggering a run timer function (typically as an after hours timer function) or / & constant shorting of X1 & M for more then 2 seconds results in a system OFF function. Manual override functions are also available at the controller terminals "D1,D2 & M" for Auto/Off/On & AHR operation. From version v2.26+ input D2 can be connected to a movement sensor to trigger the Endeavours adjustable run timer.
- For auxiliary control interlocks spare relays or analogue outputs can be controlled by an independent passive Hevac temperature sensor (-D type) or by any type of 0-10vDC or 4-20mA input (scalable) on terminal **X4** with a programmable appropriate designator ie **C, %, pa, ppm, CO2, Volt**. Using both inputs X1 & X4 the Endeavour is now effectively 2 independent controllers in one, making the Endeavour a powerful dual loop Universal controller.
- The controller has **Modbus** communications capability for connection of up to 32 controllers to our colour HMI wall (or switchboard door) display panel for zone status, individual setpoint adjustment & system Auto/Off/On override. Alternatively upto 247 controllers can be connected to a 3rd party BMS system for remote control & monitoring. A BMS can also monitor 2 dedicated digital inputs, "D3" is a A/C fault input & "D4" is a general purpose on/off status input that could be used for example to monitor & prove supply air fan running operation via a mechanical pressure switch. In the near future this controller can be monitored / overridden via a gateway module connected to the Internet.
- With an optional **O/A sensor** connected, the Economy cycle damper operation (Y1 output) for temperature control can be interlocked for free heating, cooling or both when the outside air temperature conditions are favorable. The use of outside air for temperature control can also be inhibited if the outside air temperature falls below an adjustable minimum O/A temperature (factory set at 12c for DX or FCU coil protection). This O/A temperature input can now also be used to automatically reset the controllers operating setpoint in relation to the outdoor temperature for energy saving & greater comfort control. Input X4 can also reset the controllers setpoint due to measured room or O/A humidity.
- With an optional **CO2 sensor** connected, economy cycle dampers can also be overridden & proportionally driven to the fresh air mode to reduce high CO2 levels. The maximum damper output signal for CO2 control can be restricted in extreme O/A temperatures so as not to lose temperature control, all settings are user adjustable. The CO2 input can now also control spare relays for on/off CO2 control.
- **Remote Set Point** devices (either passive or active) can be connected to the controller. If a passive adjuster is connected (default setting), the controller will automatically detect and hand over set point adjustment authority to the remote device (then ignoring the controllers UP & DOWN buttons). The remote set point adjustment can be built into a room temperature sensor (SRT-DSP or HSMO-DAT) or as a separate stand alone device giving remote setpoint control only (SPA-D). The range of the **passive** remote setpoint (0-10k) is fixed at 18 to 25 degrees or if an active remote setpoint is used (0 to 10v) the 0-10vDC is adjustable for a range of 0-100c.
As a service aid any remote setpoint device can be temporarily virtually disconnected by holding the UP & DOWN buttons together for 5 seconds which hands conventional setpoint control back to the controller to aid in commissioning & testing & will automatically return to remote control after 10 minutes or can be cancelled anytime by again pushing the UP & DOWN buttons together.

Technical Data

General Specifications	Operating Voltage	12 to 24 Volts AC or DC
	Power Consumption	
	At 24vDC Volts	MAX. 150mA
	At 24vAC Volts	4 VA
	Switching Capacity of Relays	
	Voltage	AC 1....250 Volts
	Current	8.0 (2.5) Amps
	Set point Setting Range	1-99 oC in 0.1 oC Increments
	Relay Switch ON Points (Dead band)	0.1-19.9 oC
	Relay Hysteresis (Switching Differential)	0.1-9.9 oC
	Relay to Energise Time Delay	0.1-42 Minutes
	Y1/Y2 Output Voltage Range	0-10VDC (NOTE MINIMUM & MAXIMUM Y OUTPUT VOLTAGE USER ADJUSTABLE)
	Y1/Y2 Start Point (Dead band)	0-19.9 oC
	Y1/Y2 Range (Proportional Band)	0.5-25 oC
	Y1/Y2 Integral action (P+I triggers >10% P output)	Off-60 minutes

ANALOG INPUTS

- X1 : Main Temperature Sensor Input configurable (with jumper & software) as Active (0-10vdc OR 4-20mA ~0 to 100c (adjustable) or Passive (4.2k@22c).
- X2 : Remote Set point configurable (with jumper & software) as passive using 10K potentiometer (18-25c Range) or 0-10vdc (top end range configurable).
- X3 : Outside temperature sensor configurable (with jumper & software) as Active (0-10vor 4-20mA ~0-100c) or Passive (4.2k@22c). Optional use for O/A S/P reset.
- X4 : Universal input configurable (with jumper & software) for auxiliary control loop to control spare relays or analogue outputs or humidity measurement induced reset of the controllers operating temperature setpoint.
- X7 : Room or R/A Duct CO2 Sensor input to override economy cycle operation or used to control spare internal relays (R1-4) for on/off CO2 control interlocks.

Communication :

Terminal's X5 & X6 configurable for RS485 MODBUS communication.
X7 can be set to ground (via an internal 100 ohm resistor) for use as a comms shield connection if not used as a CO2 sensor connection.

Output Indication:

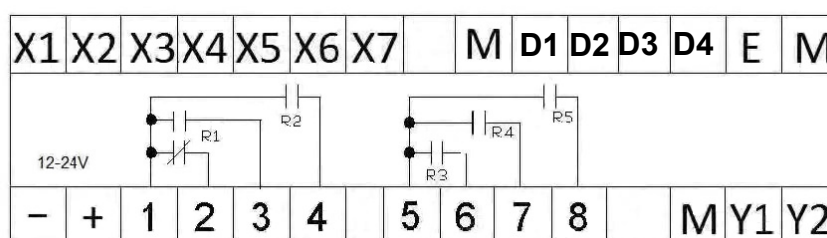
Relay On/Off Status	5 x Red LED
LCD Display	2 x 16 character LCD
Display Resolution	0.1 Increments

Technical Data (Cont.)

Environmental Conditions	Operation	
	Ambient Temperature	0...45oC
	Humidity	< 85 % RH (Non Condensing)
	Storage and Transport	
	Ambient Temperature	-5...65oC
	Humidity	< 90 % RH (Non Condensing)
Product Standards	COMPLIES TO ALL RELEVANT AUSTRALIAN STANDARDS including 6mm segregation between high & low voltage connections	
Weight	Including Packaging	600 grams
Housing	Colour	Grey
	Material	ABS POLYCARB
	UV Stabilised	YES
	Fire Retardant	YES
	Size	L105mm x W105mm x D60mm
	Mounting Method	35mm Din Rail Mountable

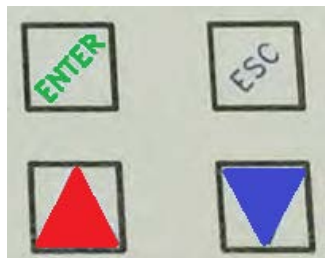
Terminal Designations

X1	Main Temperature Sensor Input (Passive or Active)	M	Common sensor & signal ground
X2	Remote S/P input (Passive or Active)	D1	Manual System OFF
X3	O/A sensor input (Passive or Active)	D2	Manual System ON &/or AHR trigger input
X4	Auxiliary analogue input (Passive or Active)	D3	External FAULT I/P (for indication)
X5	MODBUS RS485 - A Terminal	D4	External On/Off status I/P for BMS monitoring
X6	MODBUS RS485 - B Terminal	E & M	future Expansion module local comms.
X7	CO2 sensor (default) or MODBUS SHIELD (GND)		



- | | |
|--|--------------------------------------|
| - 12-24 Volt Supply Neutral
(internally connected to terminals M) | 5 Relay 3,4 & 5 Common |
| + 12-24 Volt AC or DC Supply Active | 6 Relay 3 Normally Open |
| 1 Relay 1 & 2 Common | 7 Relay 4 Normally Open |
| 2 Relay 1 Normally Closed | 8 Relay 5 Normally Open FAN / T.SW.1 |
| 3 Relay 1 Normally Open | M Signal ground |
| 4 Relay 2 Normally Open | Y1 Analog Modulating Output 0-10 vDC |
| | Y2 Analog Modulating Output 0-10 vDC |

The controllers face plate has four push buttons to access & edit controller settings.



“ENTER” ACTS AS THE SAVE OR MENU OPEN BUTTON

“ESC” ACTS AS THE EXIT OR JUMP BACK TO PREVIOUS MENU BUTTON

“UP” & “DOWN” BUTTONS ADJUST SETPOINT, SCROLL MENUS & TO EDIT VALUES.

The controller has a backlit (16x2) LCD screen & 5 red LED's to give controller input & output status. The LCD screen will automatically cycle through relevant screens displaying applicable information as per the users programmed use of the controller. The screen can alternatively be set to not scroll and manually moved to next display by pressing the escape button.

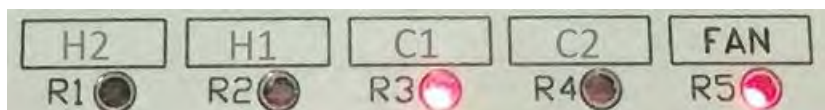
To access the menu list as shown on page 7, press the ENTER button & use the UP & DOWN arrow buttons to scroll through the menus, pressing ENTER to open a particular menu to edit. The relay assignments are user programmable using one of the 11 preset programs or can be manually set, and as such the relay “use identifier” text box above each LED is not factory marked and is for optional labeling by the commissioning technician. A forced controller reset will load test program #0, but ex Hevac (unless otherwise arranged) default settings for these relays are set using preset program # 8 assigned as :

R1 Not Used, R2=COMP2, R3=COMP1, R4=R/V HEAT, R5=FAN,

The keyboard can be set in three **lock levels**, level 0 is unlocked, level 1 allows setpoint adjustment only, level 2 allows no adjustment. To access the lock levels press & hold all four button for 5 seconds & release to display the existing level, adjust using the UP or DOWN arrow buttons and press the ENTER button to set & return to the running screen.



The LCD screens will automatically cycle through each relevant display unless the display is set to not scroll.



** example of optional identification of output relays by installation contractor*

PROGRAM MENUS

MENU

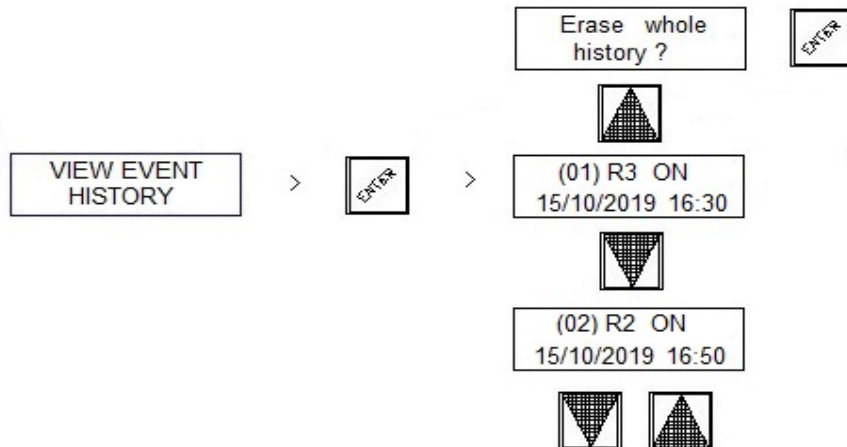
FUNCTION

-
- VIEW EVENT HISTORY :** SEQUENTIAL TIME STAMPED LIST OF RELAY ON/OFF EVENTS (HISTORY)
- Set "START BY METHOD" :** SET SYSTEM ON/OFF OPERATION "BY" the internal **TIMESWITCH** (1), Internal **RUN TIMER** (Triggered by remote push button) or by a remote **MANUAL ON / OFF SYSTEM SWITCH** (by shorting out sensor X1 & M wires or D1 & M terminals).
- Set CLOCK :** TO SET THE CONTROLLERS TIME, DATE AND ENABLE DAY LIGHT SAVING
- SET MAIN TIME SWITCH (1) :** PROGRAM MAIN (SYSTEM) TIME SWITCH (1) DAYS & ON OFF TIMES .
- SET AUX. TIME SWITCH (2) :** PROGRAM AUXILIARY INDEPENDENT 7 DAY TIME SWITCH (2) ON & OFF TIMES.
- SET RUN / AHR TIMER PERIOD :** SET RUN TIMER DURATION FOR USE AS AN AFTER HOURS RUN TIMER OR AS A SYSTEM RUN (FOR) TIMER (with or without use of the main time switch).
- SET HOLIDAYS :** PROGRAM INDIVIDULE OR GROUP HOLIDAYS SYSTEM OFF OVERRIDE DATES.
- NIGHT PURGE :** ENABLE & CONFIGURE TIME AND TEMP. CONDITIONS **FOR** NIGHT VENT MODE
- SCREEN DISPLAY :** SET LCD SCREEN TO AUTO SCROLL OR MANUAL DISPLAY CHANGE
- CONTROLLER FUNCTION :** SET MAIN CONTROLLER FUNCTION AS : TEMPERATURE / T.SW. CONTROLLER, X4 ONLY CONTROL (ie pressure controller) or TIME SWITCH ONLY MODE
- PRESET PROGRAMS :** SELECTABLE PRESET CONFIGURED OUTPUTS TO SUIT DIFFERENT A/C UNITS & FCU's
- R1-4 RELAY PROGRAMMING :** MANUAL EDITING OF MODE & SETTINGS FOR THE 4 PROGRAMMABLE RELAYS (R1-4).
- R5 FAN CONTROL METHOD :** PROGRAM R5 (FAN) TO CYCLE WITH HEAT / COOL CALL OR CONTINUOUS.
- Y1 & Y2 ANALOGUE PROGRAMMING :** MANUAL EDITING OF MODE & SETTINGS FOR THE TWO ANALOGUE OUTPUTS
- X1 SENSOR CONFIGURATION :** SET MAIN CONTROL SENSOR (WHICH RELATES TO THE CONTROLLERS SETPOINT)
- X2 REMOTE S/P CONFIGURATION :** SET TYPE OF OPTIONALLY CONNECTED REMOTE SETPOINT AS PASSIVE 0-10K (FIXED RANGE OF 18-25C) or 0-10VDC (MAX RANGE ADJUSTABLE).
- X3 O/AIR TEMP. SENSOR CONFIG. :** ENABLE & ADJUST SETTINGS FOR O/A TEMPERATURE SENSOR & ITS AFFECTS INCLUDING OUTSIDE TEMP, TO CONTROLLER SETPOINT RESET CONFIG.
- X4 AUXILIARY INPUT CONFIG :** ENABLE MONITORING & / or CONTROL OF AN AUXILIARY ANALOGUE INPUT ie S/A TEMPERATURE or ROOM HUMIDITY. (IF SET TO HUMIDITY CAN BE ALSO BE USED TO RESET CONTROLLERS OPERATING TEMPERATURE SETPOINT).
- X7 CO2 SENSOR CONFIGURATION :** ENABLE & ADJUST SETTINGS FOR A ROOM or (R/A DUCT) CO2 SENSOR
- MODBUS SETUP :** ENABLE MODBUS & SET BAUD RATE & ADDRESS SETTINGS
- RESTORE FACTORY DEFAULTS :** CLEARS & RESETS ALL SETTINGS BACK TO FACTORY DEFAULTS
- EXIT MENU :** EXIT THIS MENU LIST AND RETURN TO OPERATING SCREENS

VIEW EVENT HISTORY (DATA LOGGER)

The ENDEAVOUR incorporates a basic event data logger that records the last 250 "ON" switching events.

example 01 : RELAY 3 ON 15/10/2019 16:30
 02 : RELAY 2 ON 15/10/2019 16:50
 03 : NIGHT PURGE ON 16/10/2019 04:35



The history can be reset & cleared by pressing the **UP** button from the 1st event which prompts an "erase history message" question ..pressing **ENTER** clears the history.

SET *START BY* METHOD (A/C STOP / START OPERATION)

To set the A/C system "START BY" method, press the fascia button labeled "**ENTER**" then press the **DOWN** arrow button until the LCD display displays

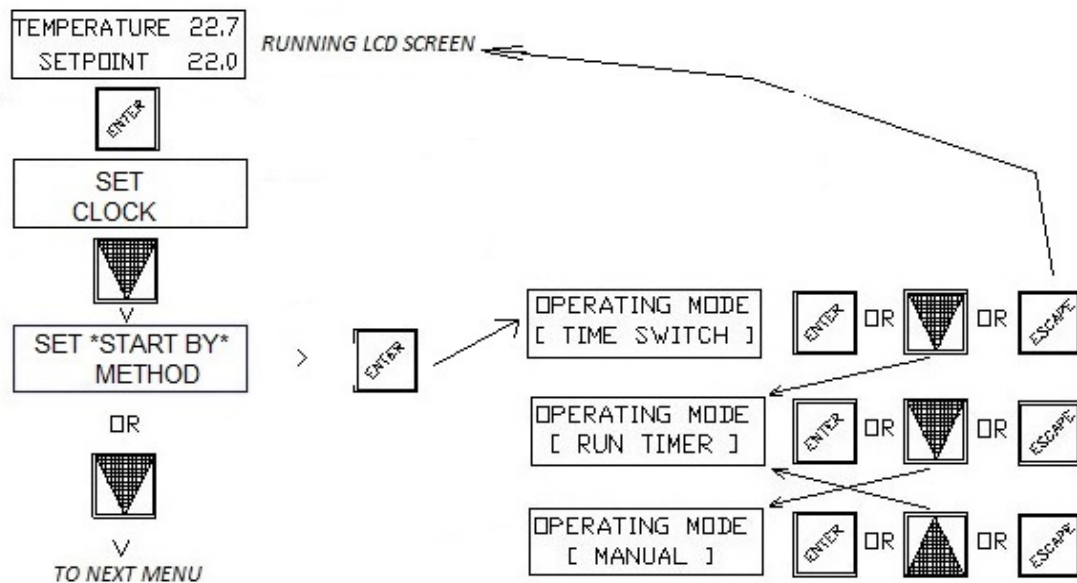
"SET START BY METHOD "

Press the **ENTER** button to open this menu & see the existing setting, use the UP & DOWN buttons to cycle through the 3 choices :

"TIME SWITCH", "RUN TIMER" or "MANUAL".

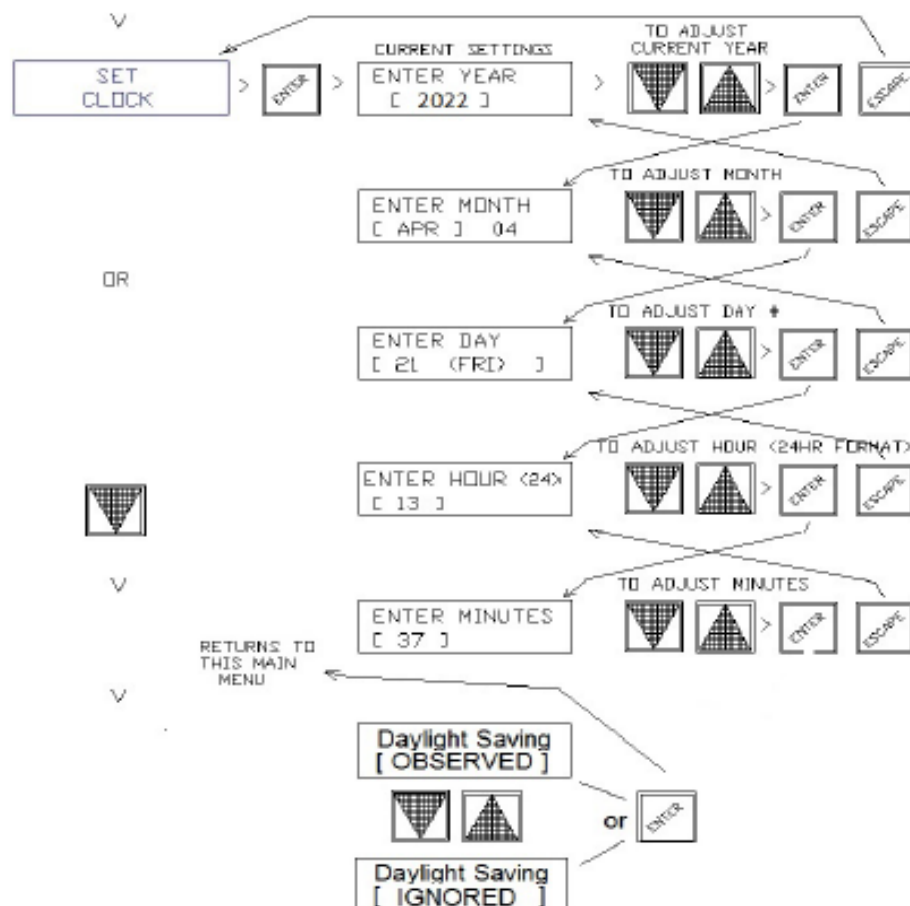
Select your choice by pressing the "**ENTER**" button. The display will then return to this parent menu. Exit to the normal running screens by pressing the "**ESC**" button or scroll to another main menu item to edit or check using the "**UP**" or "**DOWN**" arrow buttons.

- 1.) TIME SWITCH (1) System enabled by the controllers internal main 7 day Time Switch, which can be programmed for a total of 18 possible switching events for individual or groups of days (allowing multiple on/off times per day).
- 2.) RUN (for) TIMER System operation triggered by a momentary on/off pulse from a switch wired in parallel with the 2 (passive) sensor wires or across the controllers D2 & M terminals. Adjust the timer for the required time i.e. 8 hours. This feature can also be triggered from a movement sensor (turn toggle off setting to NO.)
- 3.) MANUAL - System 24/7 ON or ON/OFF state set only by an external "System Switch" or external interlock wired in parallel with the 2 sensor wires connected to our passive temperature sensor or alternatively shorting the controllers D1 & M terminals which has the same affect resulting in a "System Off" mode with all relays and analogue outputs de-energized,



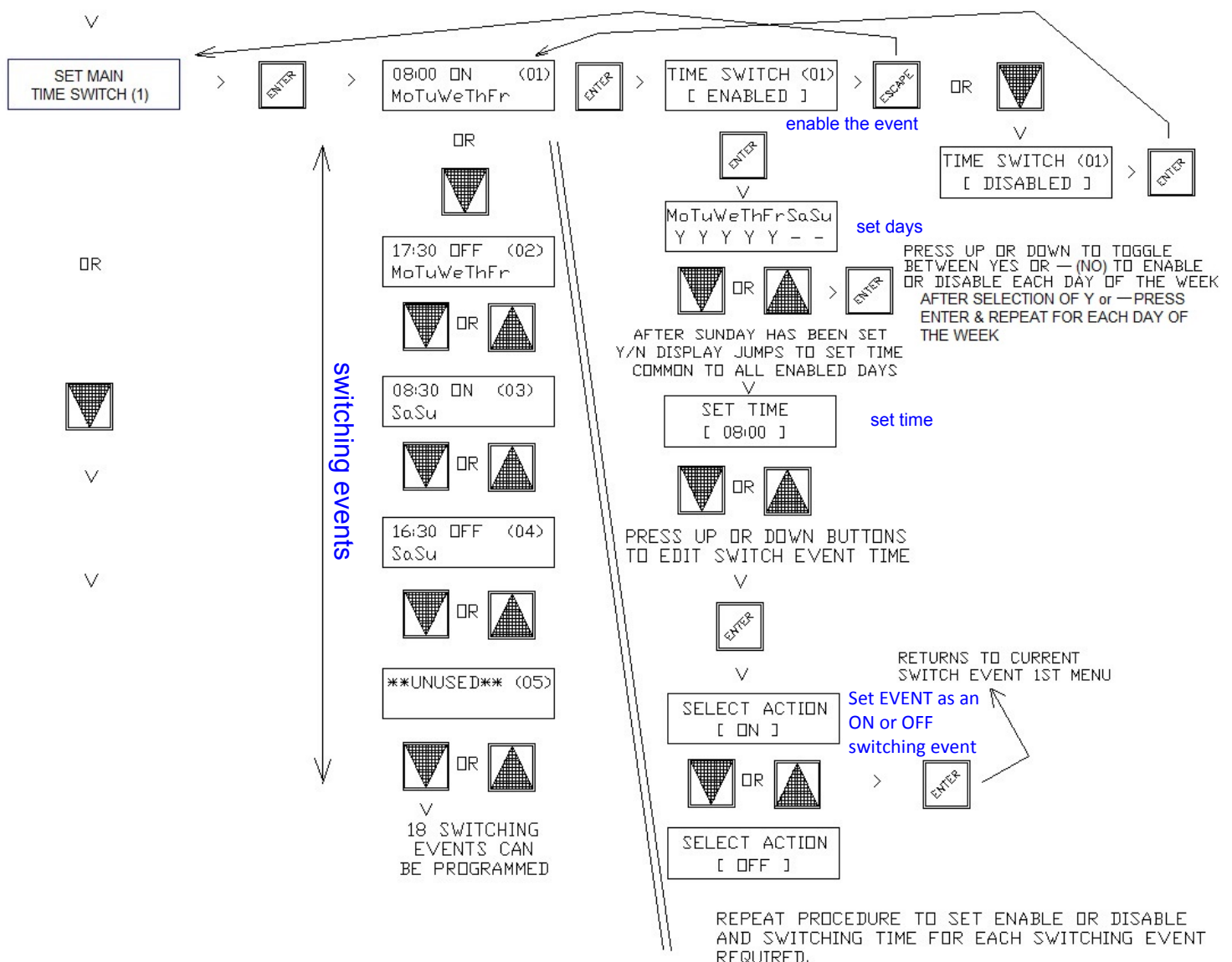
SET CLOCK (TIME & DATE SETTINGS)

To edit the controllers time and date settings, press the fascia button labeled “**ENTER**” and using the **DOWN** button scroll down the menu until.. “**SET CLOCK**” is displayed. Press the **ENTER** button to check and edit the controllers time, date and daylight saving enable (or disable) settings. Daylight saving, if enabled, starts on the 1st Sunday in October (at 2am) and finishes on the 1st Sunday in April (3am)



SET MAIN TIME SWITCH (1)

The controller's internal main time switch (1) (if enabled for use) can be easily programmed for any combination of ON/OFF switching times for any day of the week. The controller comes preset with factory default settings for operating the system: Monday to Friday from 08:00 (event 01) until 17:30 (event 02). To edit settings, press the fascia button labeled **"ENTER"** and scroll down through the menu tree until **"SET MAIN TIME SWITCH (1)"** is displayed. Press the **"ENTER"** button to open this menu. The existing detail for switching event 01 is displayed. Unlike other time switches, this controller has very flexible unassigned switching events (instead of fixed sequential ON then OFF routines). Time switching events can be set to switch (change state) at any time & day/s, and set as a switching ON event or OFF event. Typically the switching events would be programmed in the order of ON events (with common days & time) followed by an OFF event with matching days and common OFF time, but any variation is easily programmed. As an example: switching events could be programmed such that switching event 1 (01) turns the system ON for Monday to Friday at 08:30, followed by event 2 (02) turning the system ON Saturday & Sunday at 09:00, then event 3 turning the system OFF Monday to Sunday at 17:30. With this programming approach, multiple & varied ON / OFF events can be set on individual or groups of days, plus there is no issue switching past midnight which most other time switches cant achieve. 18 switching events are available.



SET AUX. TIME SWITCH (2)

ENTER

08:00 ON (01)
MoTuWeThFr

ENTER

Time Switch 2 (01)
[ENABLED]

ESCAPE OR

TIME SWITCH (01)
[DISABLED]

ENTER

Set each required ON & OFF event to "ENABLED"

OR

17:30 OFF (02)
MoTuWeThFr

OR

08:30 ON (03)
SaSu

OR

16:30 OFF (04)
SaSu

enable the event

set days

PRESS UP OR DOWN TO TOGGLE BETWEEN YES OR NO TO ENABLE OR DISABLE EACH DAY OF THE WEEK

AFTER SUNDAY HAS BEEN SET Y/N DISPLAY JUMPS TO SET TIME

set time

Enter Time
[08:00]

PRESS UP OR DOWN BUTTONS TO EDIT SWITCH EVENT TIME

Holiday Override
[NO]

Holiday Override
[YES]

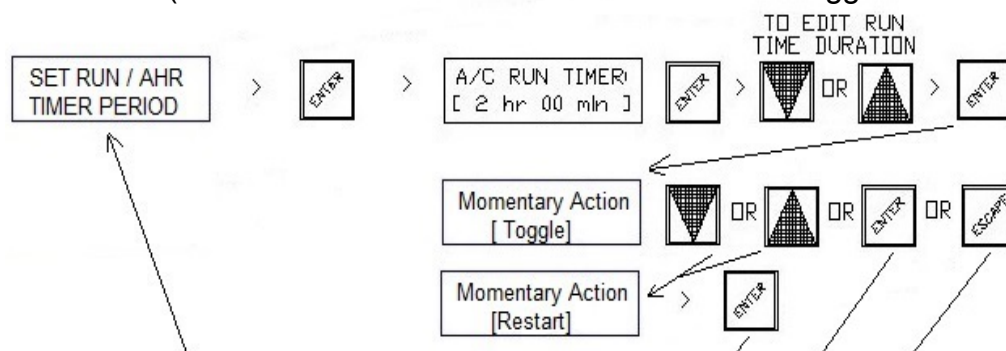
ENTER

REPEAT PROCEDURE FOR EVENT (02) 1st OFF TIME , and events (03) & (04) IF A 2ND ON/OFF TIMES/DAYS NEED TO BE SET.

RETURNS TO CURRENT SWITCHING EVENT. SCROLL UP OR DOWN TO OTHER SWITCHING EVENTS AS REQUIRED

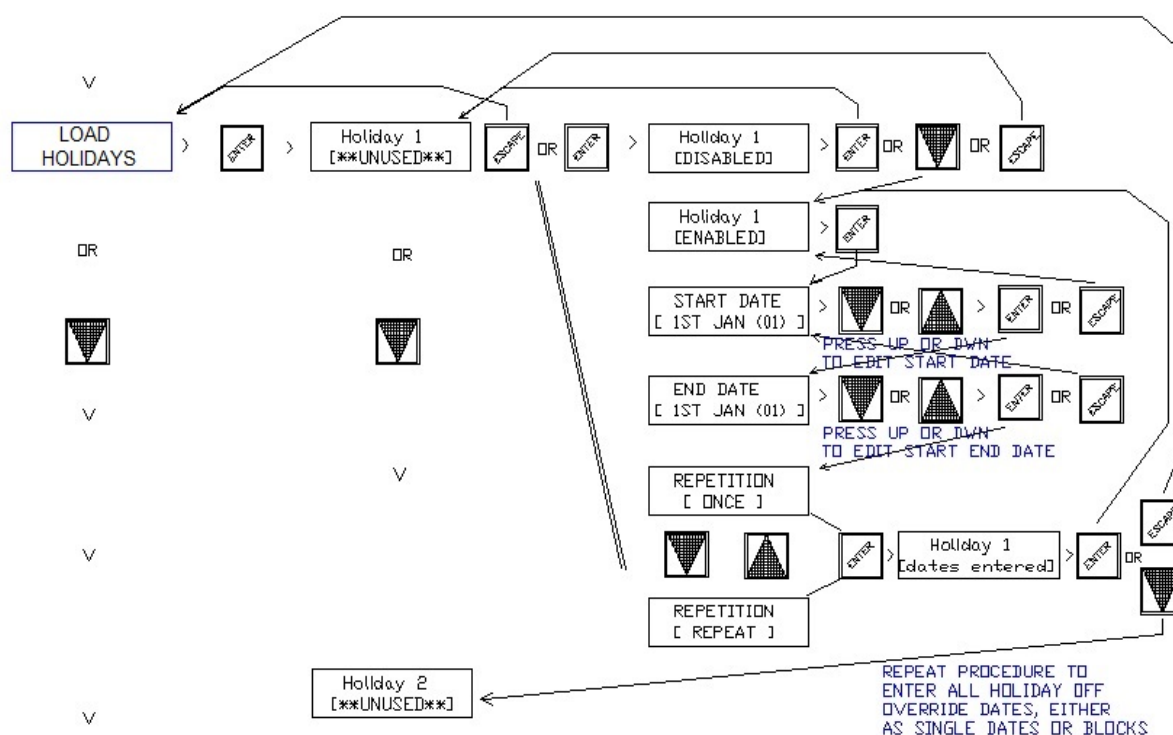
RUN / AHR TIMER

Whether the Run Timer is used as a short duration type “After Hours”(AHR) Run timer (if the system normally operates by the controllers internal time switch), or set for a longer period, typically as a “Run (For) Timer”, the procedure to set up the timer is the same. The timer trigger inputs “D2” or “X1” can be set such that new input pulses causes a toggle on/off or to restart the timer (which suits the use of movement sensors to trigger timer function).



LOAD HOLIDAYS (OFF OVERRIDE) SETUP

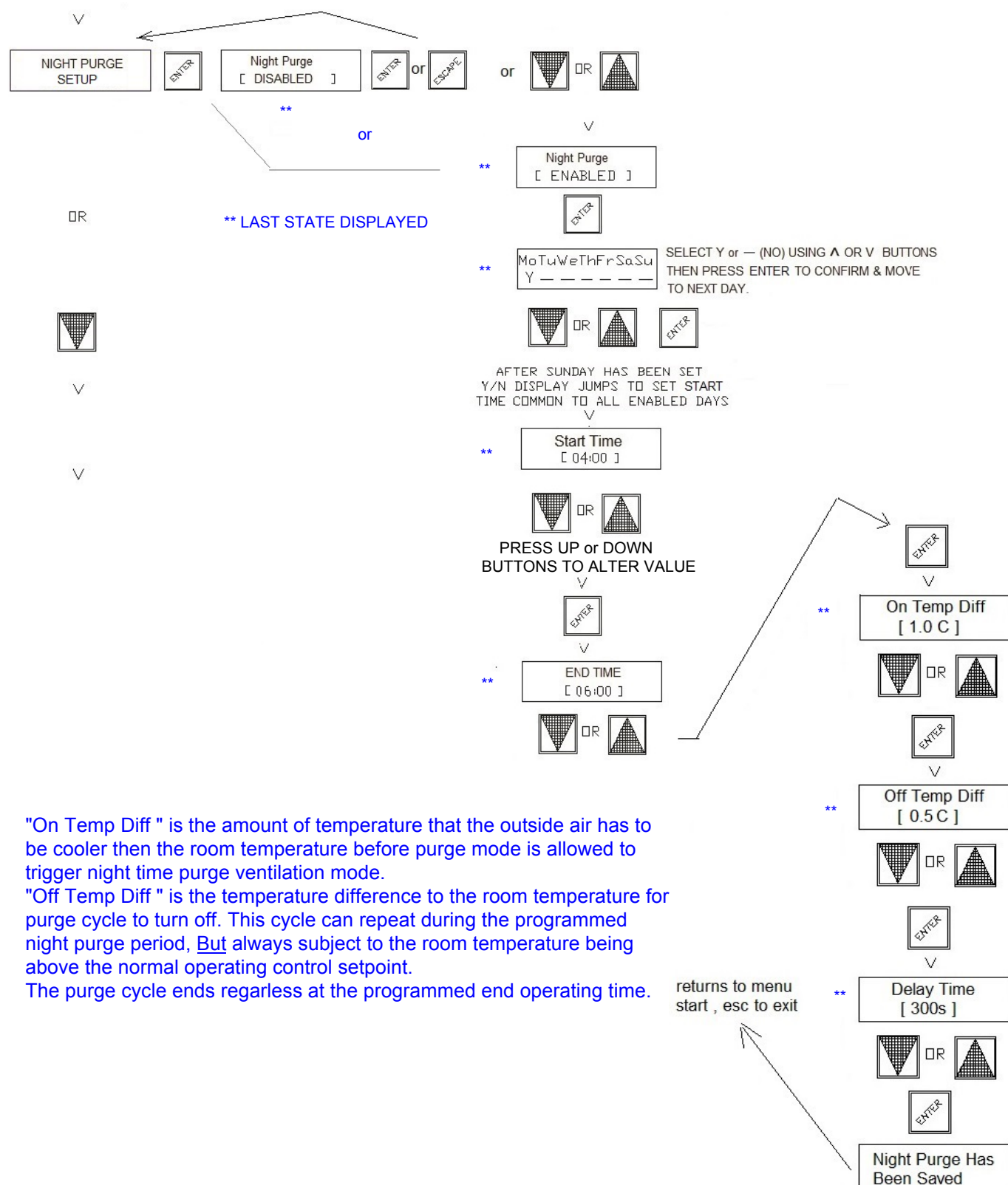
Individual or group of dates can be programmed as holiday time switch “OFF” overrides. To edit or set Holiday dates, Press the fascia button labeled “ENTER” to have the LCD display jump to the 1st menu item in the menu tree - “SET CLOCK” scroll down through the menu tree with the “DOWN” arrow button until “LOAD HOLIDAYS” is displayed. Pressing the “ENTER” button will then display either the 1st existing Holiday date or HOLIDAY DISABLED. If disabled, press the “DOWN” button to change to ENABLED. Once enabled, the 1st holiday default start date of 1st JAN (01) will be displayed, (01) means the 1st holiday. Using the “UP” or “DOWN” buttons scroll through calendar dates until the required 1st HOLIDAY START date is displayed, press “ENTER” to then also program the 1st HOLIDAY END date which can either be the same as the start date (if a single day holiday) or a future inclusive date for a group of days (i.e.: Easter or a school holiday term break). The controller asks after each holiday is set whether this holiday OFF override event should only execute once or repeat each year on the same date(s), set as either ONCE or REPEAT using the “UP” or “DOWN” buttons, press “ENTER” to accept settings then the “DOWN” button to jump to the next holiday start date to program. Repeat this procedure until all holiday dates are set.



NIGHT PURGE SETUP

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With this feature enabled it is possible to setup a low running cost building night time ventilation purge cycle, to vent built up heat from within the building with cooler outside air in order to reduce the cost of mechanical cooling during occupancy hours at startup. During the user programmable **enable times**, if the **room temperature is above the main set point** and the measured **outdoor temperature is cooler** by an adjustable amount to the room temperature, this software will cause the supply fan (connected to relay 5) to energise & the modulating motorised economy cycle dampers (connected to analog output Y1) to reposition to the full fresh air mode. These output states are maintained until the room temperature drops to a settable temperature difference in relation to the outside air temperature or / & the O/A temperature rises above the room temperature setpoint, or the enable time ends.



"On Temp Diff " is the amount of temperature that the outside air has to be cooler then the room temperature before purge mode is allowed to trigger night time purge ventilation mode.

"Off Temp Diff " is the temperature difference to the room temperature for purge cycle to turn off. This cycle can repeat during the programmed night purge period, But always subject to the room temperature being above the normal operating control setpoint.

The purge cycle ends regardless at the programmed end operating time.

SCREEN DISPLAY



The Endeavours information LCD screens will by default Auto Scroll displaying one information screen (page) after another relative to the I/O that has been programmed. Alternatively if auto scroll is not preferred the screen can be set to remain on any page and other screens than displayed by pressing the "ESC" button. To change the default auto scroll setting , press the "ENTER" button and scroll down the menu until "SCREEN DISPLAY" is shown, press "ENTER" and toggle the choice "[Y]" (YES) or "[N]" (NO) using the UP or down buttons.

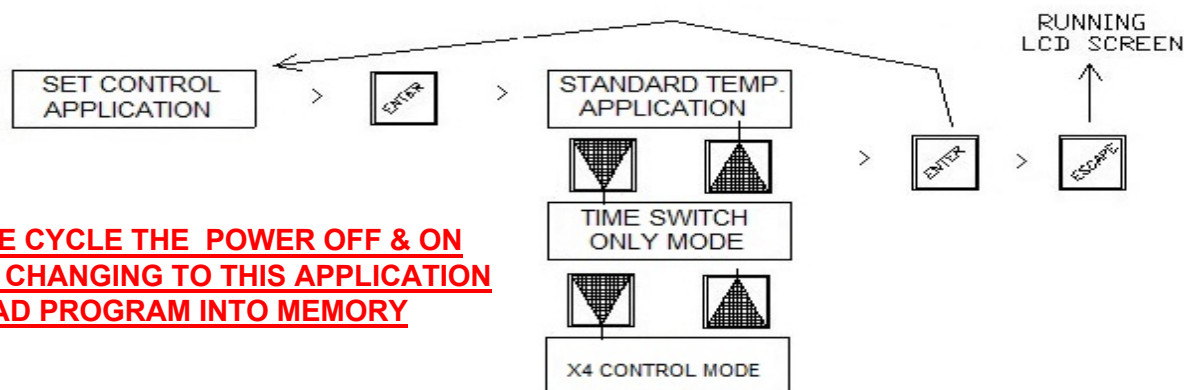
CONTROLLER FUNCTION *MAIN USE OF CONTROLLER*

The Endeavour controller can be set to operate as a standard temperature controller for control of A/C & Fan Coil Units etc (default use) or set in a reduced control mode as Time Switch **or** X4 I/O **only** mode which if selected inhibits most other functions not relative to the reduced mode.

In **Time Switch only** mode functions enabled are Time Switch 1, Time Switch 2 , Run Timer & AUTO /OFF / ON system overrides modes, this mode responds to time settings under "Time Switch 1" & outputs on relay 5 (terminals 5 & 8).

NOTE : Y1 & Y2 can also be used in this mode & set to a minimum value to use as a time switch controlled fixed analogue output control ..ie to time switch control an EC fan but at a fixed speed.

In **X4 only mode**, only the secondary control loop using X4 as the sensor input is used driving programmed relays or analogue outputs as required as for example to control a modulating pressure controlled bypass valve using a differential pressure sensor connected to the X4 input.



**PLEASE CYCLE THE POWER OFF & ON
AFTER CHANGING TO THIS APPLICATION
TO LOAD PROGRAM INTO MEMORY**

The Endeavour is pre-loaded with eleven preset programs to suit most typical control interlock requirements for reverse cycle air conditioners, fan coil units & AHU's. To select a preset program press the "ENTER" button to enter the menu system and scroll down the list until "**PRESET PROGRAMS**" is displayed, press ENTER to see the current selected program, using the UP or DOWN buttons scroll to the desired suitable program and press ENTER to load this new preset into the controllers memory, its a good idea after this action to cycle the controllers power to ensure the new program is loaded into the microprocessors operating system. The controller will also load these nominal defaults :

X1,2,3 & 4 SET TO PASSIVE IN SOFTWARE (ALSO SET TO PASSIVE BY DEFAULT IN HARDWARE BY JUMPERS ON BOTTOM PCB - see page 23)

NOTE PRE-SETS USING X3 & Y1 FOR ECONOMY CYCLE WILL AUTOMATICALLY ENABLE THE X3 INPUT & THE Y1 OUTPUT

X5 & X6 MODBUS DISABLED IN SOFTWARE BUT ENABLED IN HARDWARE.

X7 (CO2) DISABLED IN SOFTWARE BUT SET (READY TO VOLTAGE INPUT) IN HARWARE
RESETS BY OUTSIDE AIR TEMPERATURE & ROOM HUMIDITY=DISABLED

"SYSTEM ON BY " = TIME SWITCH,

R5 (FAN RELAY) ON/OFF WITH SYSTEM (NOT CYCLE)

DAY LIGHT SAVING = ENABLED,

RUN TIMER = 2 Hour.

NIGHT PURGE=OFF

LCD SCREEN SCROLL=ON

SETPOINT SET TO 22

NOTE RELAY 5 IS NOT ADJUSTABLE & PRESET AS THE SYSTEM (TIME SWITCH) ENABLE RELAY, TYPICALLY USED TO ENABLE THE A/C FAN, ALTHOUGH IT CAN BE SET TO CYCLE ON HEAT / COOL DEMAND FOR TYPICAL DOMESTIC APPLICATIONS WHERE THE FAN TURNS OFF AT SETPOINT.

PRESET PROGRAM SUMMARY LIST.

PROGRAM # 0	FACTORY RESET PROGRAM	TRIPLE COMP.+0-10vDC ECON.+MOD COMP. O/P's USED FOR TESTING
PROGRAM # 1	1H / 1C	1 HEAT / 1 COOL
PROGRAM # 2	1H / 1C +ECON.	1 HEAT / 1 COOL +0-10vDC Y1 ECON.CYCLE OUTPUT
PROGRAM # 3	2H / 2C	2 HEAT / 2 COOL
PROGRAM # 4	2H / 2C +ECON.	2 HEAT / 2 COOL +0-10vDC Y1 ECON.CYCLE OUTPUT
PROGRAM # 5	1 CMP. / RVH	SINGLE COMPRESSOR & REVERSING VALVE CALL
PROGRAM # 6	1CP / RVH+EC	SINGLE COMP. & RVH +0-10vDC ECON.CYCLE O/P
PROGRAM # 7	1H / 1C +STG2	HEAT 1, COOL 1 + COMMON STAGE 2 COMPRESSOR
PROGRAM # 8	2 CMP / RVH	TWIN COMP. & REV/VALVE (**EX HEVAC DEFAULT**)
PROGRAM # 9	2 CP / RVH+EC	TWIN COMP./RVH + 0-10vDC ECON. & MOD. COMP. O/P's
PROGRAM # 10	3 CP / RVH+EC	TRIPLE COMP./RVH+0-10vDC ECON.& MOD.COMP. O/P's
PROGRAM # 11	HV+CV+PUMP	HEAT & COOL 0-10vDC MOD. VALVE O/P's +HWP+CWP

If the Endeavour is forced to a factory reset (2nd last menu item) it will automatically clear the existing program & load **PROGRAM # 0** which is mainly intended as a test program for quick testing of all outputs etc using minimum time delays, similar to preset program 10 but without the compressor start delays.

PROGRAM # 0 Outputs will be set as follows for 3 COMP./ REV.VALVE +ECON.CYCLE + MOD. COMPRESSOR

<u>RELAY</u>	<u>I</u>	<u>MODE</u>	<u>I</u>	<u>DEADBAND</u>	<u>I</u>	<u>SWITCH DIFF.</u>	<u>I</u>	<u>TIME DELAY</u>	<u>I</u>	<u>COMMENTS</u>
1		HEAT+COOL		3		1.0		10 secs		COMP.3 RELAY
2		HEAT+COOL		2		0.7		10 secs.		COMP.2 RELAY
3		HEAT+COOL		1		0.3		10 secs.		COMP.1 RELAY
4		HEAT		0.4		0.3		10 secs		R/V HEAT
<u>ANALOGUE</u>	<u>I</u>	<u>MODE</u>	<u>I</u>	<u>DEADBAND</u>	<u>I</u>	<u>P.BAND</u>	<u>I</u>	<u>P/P+I</u>	<u>I</u>	<u>COMMENT</u>
Y1		COOL		0		1.0		P		ECON.CYCLE O/P
Y2		HEAT+COOL		1		1.0		P		MOD. COMP. O/P

PRESET PROGRAM # 1 **1H/1C** (1STAGE HEAT /1 STAGE COOL) HEAT / COOL TYPE A/C UNIT
 SEE PAGE 31 FIG.9 *TYPICAL OF OLD APAC & DAIKIN UNITS*

RELAY I	MODE	I DEADBAND	I SWITCH DIFF.	I TIME DELAY	I COMMENTS
1	-	-	-	-	
2	-	-	-	-	
3	HEAT	1.0	0.3	1 Min.	HEAT CALL
4	COOL	1.0	0.3	1 Min.	COOL CALL

ANALOGUE I	MODE I	DEADBAND I	P.BAND I	P/P+I I	COMMENT
Y1	-	-	-	-	
Y2	-	-	-	-	

PRESET PROGRAM # 2 **1H/1C+ECON** (1 HEAT /1 COOL + ECON.CYCLE) ..HEAT/COOL TYPE A/C
 SEE PAGE 31 FIG.9

RELAY I	MODE	I DEADBAND	I SWITCH DIFF.	I TIME DELAY	I COMMENTS
1	-	-	-	-	
2	-	-	-	-	
3	HEAT	1.0	0.3	1 Min.	HEAT CALL
4	COOL	1.0	0.3	1 Min.	COOL CALL

ANALOGUE I	MODE I	DEADBAND I	P.BAND I	P/P+I I	COMMENT
Y1	COOL	0.0	1.0	P	ECON.CYCLE 0-10vDC
Y2	-	-	-	-	

PRESET PROGRAM # 3 **2H/2C** (2 STAGE HEAT / 2 STAGE COOL) ..HEAT/ COOL TYPE A/C UNIT
 SEE PAGE 31 FIG.10 *TYPICAL OF DAIKIN UNITS*

RELAY I	MODE	I DEADBAND	I SWITCH DIFF.	I TIME DELAY	I COMMENTS
1	HEAT	2.0	0.7	2 Min.	HEAT STG 2 CALL
2	HEAT	1.0	0.3	1 Min.	HEAT STG 1 CALL
3	COOL	1.0	0.3	1 Min.	COOL STG 1 CALL
4	COOL	2.0	0.7	2 Min.	COOL STG 2 CALL

ANALOGUE I	MODE I	DEADBAND I	P.BAND I	P/P+I I	COMMENT
Y1	-	-	-	-	
Y2	-	-	-	-	

PRESET PROGRAM # 4 **2H/2C+ECON** (2 HEAT/2 COOL+ECON.CYCLE)..HEAT/ COOL TYPE A/C UNIT
 SEE PAGE 31 FIG.10

RELAY I	MODE	I DEADBAND	I SWITCH DIFF.	I TIME DELAY	I COMMENTS
1	HEAT	2.0	0.7	2 Min.	HEAT STG 2 CALL
2	HEAT	1.0	0.3	1 Min.	HEAT STG 1 CALL
3	COOL	1.0	0.3	1 Min.	COOL STG 1 CALL
4	COOL	2.0	0.7	2 Min.	COOL STG 2 CALL

ANALOGUE I	MODE I	DEADBAND I	P.BAND I	P/P+I I	COMMENT
Y1	COOL	0.0	1.0	P only	0-10vDC ECON. CYCLE
Y2	-	-	-	-	

PRESET PROGRAM # 5 **1COMP/RVH** (1 STAGE COMP. / RVH) .. COMP / R/V TYPE A/C UNIT

SEE PAGE 31 FIG.11 *TYPICAL OF MOST SINGLE COMPRESSOR REVERSE CYCLE UNITS INCLUDING TEMPERZONE, ARMCOR & ACTRON*

RELAY I MODE I DEADBAND I SWITCH DIFF. I TIME DELAY I COMMENTS

1	-	-	-	-	
2	-	-	-	-	
3	HEAT +COOL	1.0	0.3	1 Min.	COMP. CALL
4	HEAT	0.4	0.3	10 sec.	RVH CALL

ANALOGUE I MODE I DEADBAND I P.BAND I P/P+I I COMMENT

Y1	-	-	-	-	
Y2	-	-	-	-	

PRESET PROGRAM # 6 **1CP/RVH+EC** (1 STAGE COMP./ RVH+ECON. CYCLE) COMP./RV TYPE UNIT

SEE PAGE 31 FIG.11

RELAY I MODE I DEADBAND I SWITCH DIFF. I TIME DELAY I COMMENTS

1	-	-	-	-	
2	-	-	-	-	
3	HEAT +COOL	1.0	0.3	1 Min.	COMP. CALL
4	HEAT	0.4	0.3	10 sec.	RVH CALL

ANALOGUE I MODE I DEADBAND I P.BAND I P/P+I I COMMENT

Y1	COOL	0.0	1.0	P only	0-10vDC ECON.CYCLE
Y2	-	-	-	-	

PRESET PROGRAM # 7 **1H/1C+STG2** HEAT 1 / COOL 1 + STAGE 2 COMPRESSOR

SEE PAGE 31 FIG.12 *TYPICAL OF OLD APAC & YORK MILLENNIUM A/C UNITS*

RELAY I MODE I DEADBAND I SWITCH DIFF. I TIME DELAY I COMMENTS

1	-	-	-	-	
2	HEAT+COOL	2.0	0.7	2 Min	STAGE 2 CALL
3	HEAT	1.0	0.3	1 Min.	HEAT CALL
4	COOL	1.0	0.3	1 Min.	COOL CALL

ANALOGUE I MODE I DEADBAND I P.BAND I P/P+I I COMMENT

Y1	-	-	-	-	
Y2	-	-	-	-	

PRESET PROGRAM # 8 **2COMP/RVH** (2 STAGE COMP. / RVH) .. COMP/ RVH TYPE A/C UNIT

SEE PAGE 31 FIG.13

*****EX HEVAC DEFAULT*****

RELAY I MODE I DEADBAND I SWITCH DIFF. I TIME DELAY I COMMENTS

1	-	-	-	-	
2	HEAT +COOL	2.0	0.7	2 Min.	COMP.2 CALL
3	HEAT +COOL	1.0	0.3	1 Min.	COMP.1 CALL
4	HEAT	0.4	0.3	10 sec.	RVH CALL

ANALOGUE I MODE I DEADBAND I P.BAND I P/P+I I COMMENT

Y1	-	-	-	-	
Y2	-	-	-	-	

PRESET PROGRAM # 9 **2CP/RVH+EC** (2 STAGE COMP./ RVH+0-10v ECON + MOD.COMP. O/P's)

SEE PAGE 31 FIG.13

COMPRESSOR / REVERSING VALVE TYPE UNIT

RELAY I MODE I DEADBAND I SWITCH DIFF. I TIME DELAY I COMMENTS

1	-	-	-	-	
2	HEAT +COOL	2.0	0.7	2 Min.	COMP.2 CALL
3	HEAT +COOL	1.0	0.3	1 Min.	COMP.1 CALL
4	HEAT	0.4	0.3	10 sec.	RVH CALL

ANALOGUE I MODE I DEADBAND I P.BAND I P/P+I I COMMENT

Y1	COOL	0.0	1.0	P only	0-10vDC ECON.CYCLE
Y2	HEAT+COOL	1.0	1.0	P only	0-10vDC MOD.COMP. O/P

PRESET PROGRAM # 10 **3CP/RVH+EC** (3 STAGE COMP./ RVH+0-10v ECON +MOD.COMP. O/P's)

SEE PAGE 31 FIG.14

COMPRESSOR / REVERSING VALVE TYPE UNIT

RELAY I MODE I DEADBAND I SWITCH DIFF. I TIME DELAY I COMMENTS

1	HEAT +COOL	3.0	1.0	3 Min.	COMP.3 CALL
2	HEAT +COOL	2.0	0.7	2 Min.	COMP.2 CALL
3	HEAT +COOL	1.0	0.3	1 Min.	COMP.1 CALL
4	HEAT	0.4	0.3	10 sec.	RVH CALL

ANALOGUE I MODE I DEADBAND I P.BAND I P/P+I I COMMENT

Y1	COOL	0.0	1.0	P only	0-10vDC ECON.CYCLE
Y2	HEAT+COOL	1.0	1.0	P only	0-10vDC MOD.COMP. O/P

THIS PROGRAM IS SAME AS OLDER VERSION 2 DEFAULT SETTINGS

PRESET PROGRAM # 11 **HV+CV+PUMP** (HEAT & COOL 0-10vdc O/P's +HWP & CWP)

TYPICAL OUTPUTS FOR FAN COIL UNIT

RELAY I MODE I DEADBAND I SWITCH DIFF. I TIME DELAY I COMMENTS

1	-	-	-	-	
2	-	-	-	-	
3	HEAT	0.5	0.3	1 Min.	HEAT CALL
4	COOL	1.0	0.3	1 Min.	COOL CALL

ANALOGUE I MODE I DEADBAND I P.BAND I P/P+I I COMMENT

Y1	HEAT	0.4	2.0	60 Mins	0-10vDC TO HEAT VALVE
Y2	COOL	0.9	2.0	60 Mins	0-10vDC TO COOL VALVE

R1-4 RELAY EDITING (MANUAL EDITING / ASSIGNMENT)

To set or edit the Relay modes of operation and switching parameters etc, Press the fascia button labeled "**ENTER**" & using the "**DOWN**" button scroll down through the menu until "**RELAY PROGRAMMING**" is displayed. Press the "**ENTER**" button to open this menu. A "**summary screen**" (not editing screen) is then be displayed for Relay 1, the other 3 relay summary screens can be seen by simply scrolling up or down this sub menu using the "**UP**" or "**DOWN**" arrow buttons. To edit the parameters for a particular relay, whilst at its summary

screen press the "**ENTER**" button to display its 1st item to edit which is "**MODE**" of operation -: the relays can be set as "**UNUSED**", "**COOL ONLY**" (**C**), "**HEAT ONLY**" (**H**), "**HEAT & COOL**" (**B**) (which means the relay operates as BOTH a heating & a cooling mirrored stage), "**CO2**" (**0**) control or as an (auxiliary) **TIME SWITCH (2)** relay, (**X**) **X4 RISING** or **X4 FALLING**, (**Y**) **Y1 RISING** or **Y1 FALLING** or **Y2 RISING** or **Y2 FALLING**. If a relay is not required, to save confusion, set it to "**UNUSED**" (it's associated led will also be disabled).

A HEATING STAGE SUMMARY SCREEN

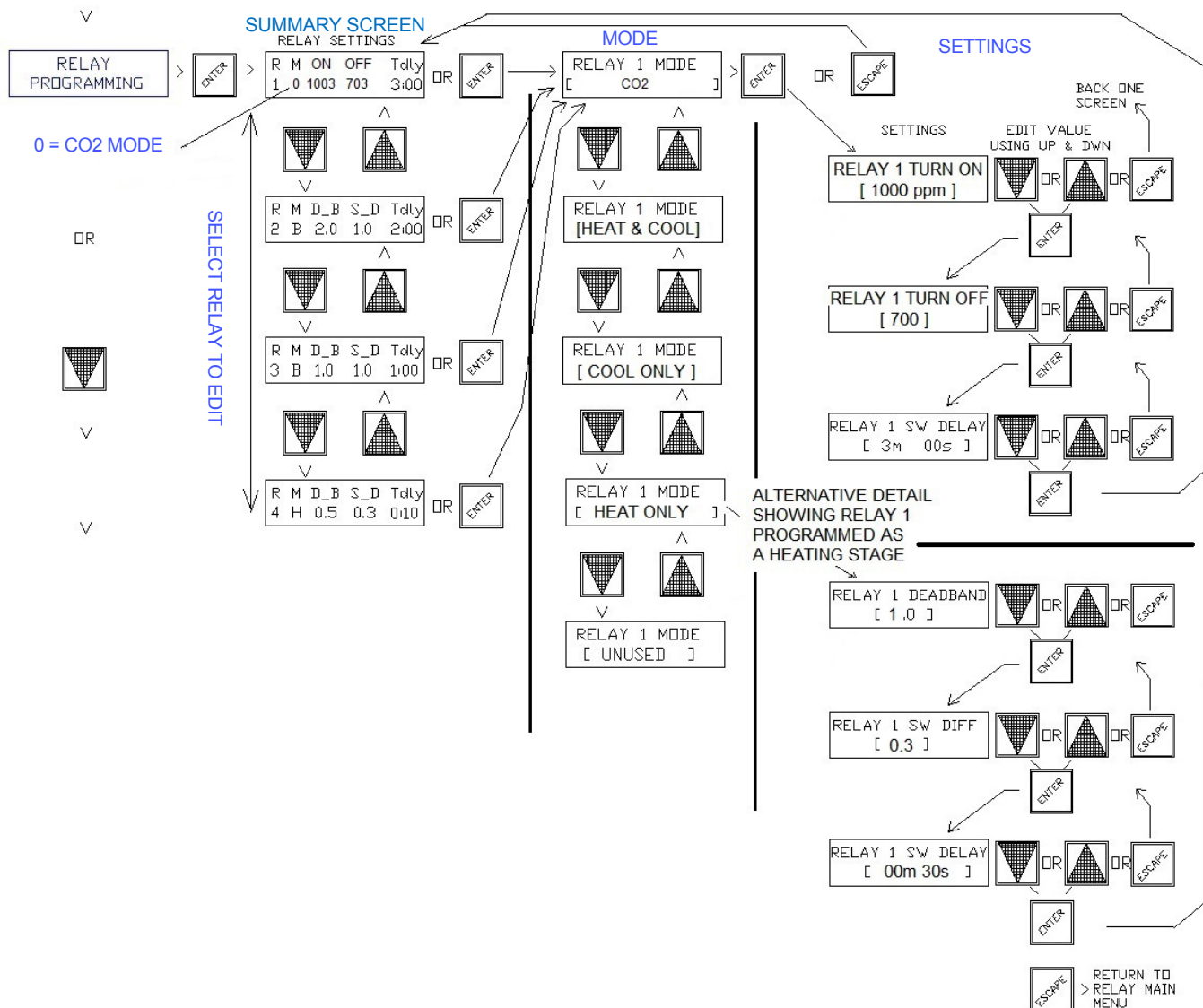
R	M	D_B	S_D	Tdly
4	H	0.5	0.3	0:10

CO2 SUMMARY SCREEN

R	M	ON	OFF	Tdly
1	0	1000	700	0:10

SCREEN LABEL DESCRIPTIONS

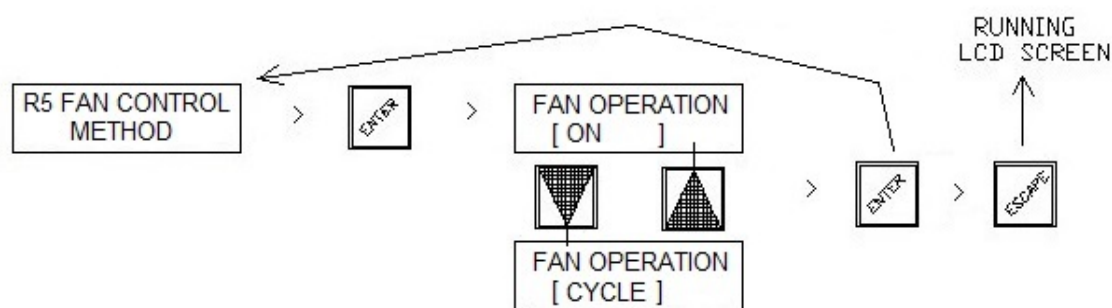
- (M) **MODE**: Sets what control function the relay serves : HEAT, COOL, BOTH, CO2, Auxiliary Time Switch or responds from ext I/P on X4 or Y1/Y2.
- (DB) **DEADBAND**: The temperature gap in degrees C, from the controllers setpoint to turn on a relay stage.
- (S_D) **SWITCH DIFFERENTIAL** : The amount of temperature change in degrees C back towards the setpoint to turn the stage off again.
- (Tdly) **SWITCH DELAY** : Delay in Minutes & Seconds until the relay stage turns on after exceeding the deadband setting.

RELAY PARAMETERS EDITING... continuedRELAYS 1 - 4 CAN BE ASSIGNED FOR USE AS

- : UNUSED
- : COOL ONLY (C)
- : HEAT ONLY (H)
- : HEAT & COOL (B)
- : CO2 (0)
- : TIME SW. 2 (Auxiliary independent Time Switch)
- : Respond to an external input on **X4 (X) rising**
- : Respond to an external input on **X4 (X) falling**
- : Internally respond to **Y1 (Y) rising** : Internally respond to **Y1 (Y) falling**
- : Internally respond to **Y2 (Y) rising** : Internally respond to **Y2 (Y) falling**

R5 FAN CONTROL METHOD

The ENDEAVOUR has the ability to cycle the fan relay (R5) with heat / cool demand whilst the air conditioning system is enabled to run (whether that be "ON BY" : Time Switch, Run Timer or set to operate by Manual on/off switch) . R5 can be set to remain ON continuously (default) during the ON running period of the system or be set to cycle on & off when a relay programmed as a heating or cooling temperature control stage starts & stops. To set the fan control method of R5, press the fascia button labeled "ENTER" and scroll down through the menu tree until " R5 FAN CONTROL METHOD " is displayed. Press the "ENTER" button to open this menu. The existing method is displayed. The fan cycle method is a typical mode of fan operation in a domestic installation to save on power & noise but in commercial buildings typically regulations call for the fan to remain on continuously whilst the building is occupied to meet minimum building ventilation requirements, if however minimum ventilation is achieved by some other means, it may be preferable to have the fan cycle with the heating or cooling as required to reduce drafts & noise when the temperature is comfortable.



Y1 & Y2 ANALOGUE (OUTPUTS) EDITING

To set or edit the two analogue outputs (Y1 & Y2) for mode of operation and output characteristics, Press the fascia button labeled "ENTER" to have the LCD display jump to the 1st menu item in the menu tree - "SET CLOCK". Scroll down through the menu tree with the "DOWN" button until "Y1 & Y2 ANALOGUE PROGRAMMING" is displayed. Press the "ENTER" button to open this menu. A summary screen is then displayed for Analogue output Y1, The other analogue output Y2 summary screen can be seen by simply scrolling down this sub menu using the "DOWN" arrow button. To edit the parameters for a particular

analogue output, whilst at its summary screen press the "ENTER" button to display its 1st item to edit which is "MODE" of operation -: the analogue outputs can be set as a **DISABLED, COOL ONLY, HEAT ONLY, "HEAT & COOL" , X4 RISING, X4 FALLING**. "HEAT & COOL" (BOTH) means the analogue output will function as both a heating and a cooling output with its parameters mirrored to operate on either side of the controller's setpoint: if for example the deadband is set to 1 degree, then the analogue output will start to produce a DC output voltage from 1 degree above and 1 degree below setpoint. If an analogue output is not needed it can be set to "DISABLED". If both Y1 & Y2 are both disabled they will not appear in the scrolling running display screens. It is also possible to set each Y outputs min & max O/P values, but note the minimum value is overridden and set to 0v when the controller is in the OFF mode. The two Y analogue outputs can be interlocked to control a spare internal relay on either a rising or falling signal typically used to interlock a relay function with the modulating travel of an actuator to act as an axillary switch.

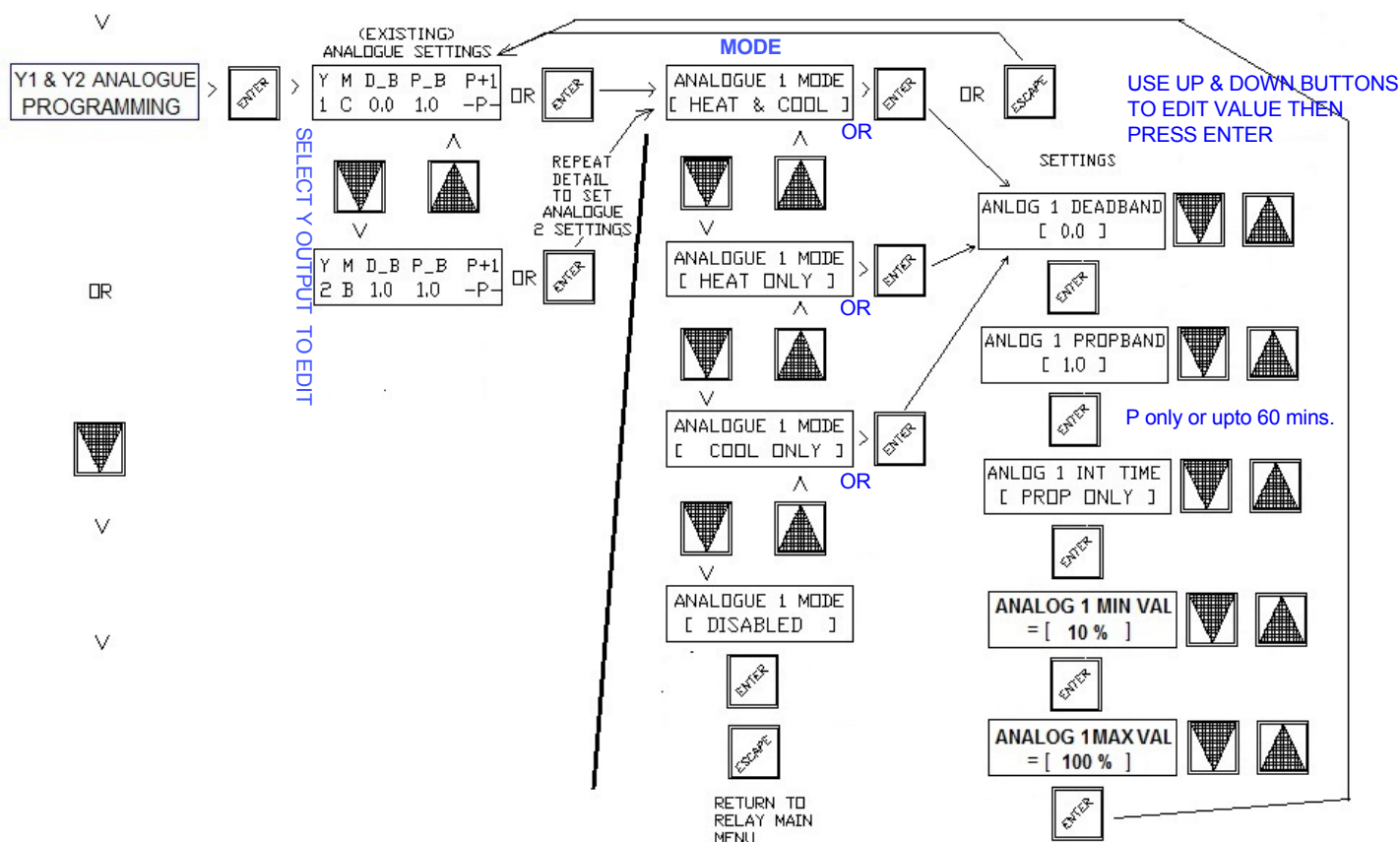
Y1 & Y2 can now also be directly controlled from X4 to function as an independent analogue control loop.

Y1 & Y2 ANALOGUE (OUTPUTS) EDITING...CONTINUED**EXAMPLE OF ANALOGUE SUMMARY SCREEN**

Y = ANALOGUE O/P # (Y1 or Y2)
M = MODE OF OPERATION (H,C or B)
D_B = DEADBAND (0-25c)
P_B = PROPORTIONAL BAND (1-25c)
P+I = INTEGRAL TIME (1-60min or -P- only)

Y	M	D_B	P_B	P+I
1	C	0.0	1.0	-P-

- MODE** : Y output used as a Heating O/P, Cooling O/P or set to act as BOTH (mirrored Heating & Cooling O/P), or to directly respond to the X4 analogue input.
- DEADBAND** : The temperature gap from the controller's setpoint till the Y produces an O/P
- PROB(ortional) BAND** : The change of temperature over which the Y O/P would increase to 10volts
- INT(egral) TIME** : Time in minutes that the integral action adds the P only output to itself over the integral time setting. Note P+I action starts as the output produced by proportional only O/P exceeds 10%.

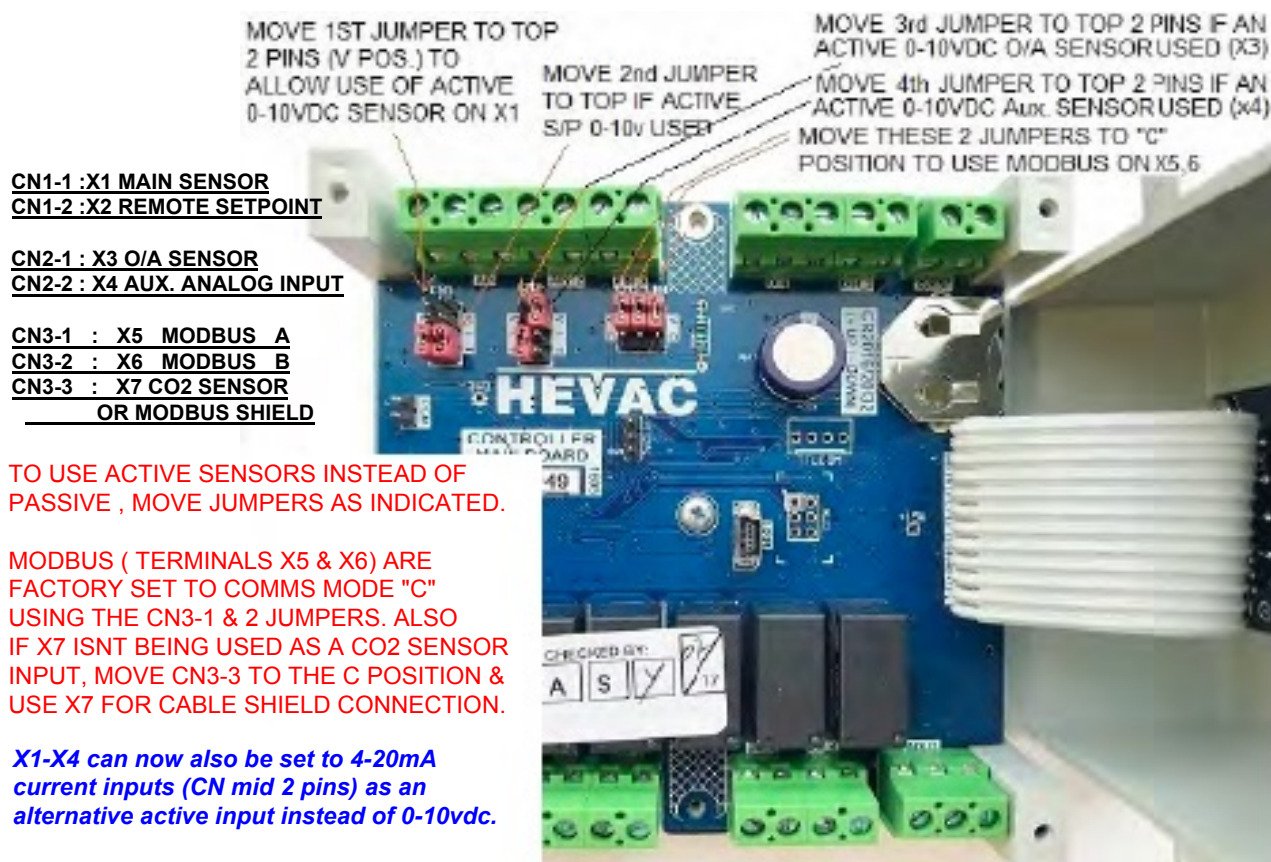


NOTE AS OF V2.45: Y1 & Y2 USE CAN NOW BESIDES HEAT/ COOL APPLICATIONS CAN BE SET TO DIRECTLY REACT TO AN INPUT ON X4 (RISING OR FALLING) AS AN INDEPENDANT EXTRA I/O CONTROL LOOP. see page 20.

Another possible alternative use for the Y1 & Y2 analogue outputs could be for use as an EC FAN time switch controlled run & speed setting module, the controller could be set to time switch only mode but with Y1 (as an example) set to a minimum output of 50% (which is still accessible even in time switch only mode). When the time switch 1 is ON, Y1 would produce 5v (EC fan ~ 50%) and when the time switch turns off the Y1 output would return to 0v output.

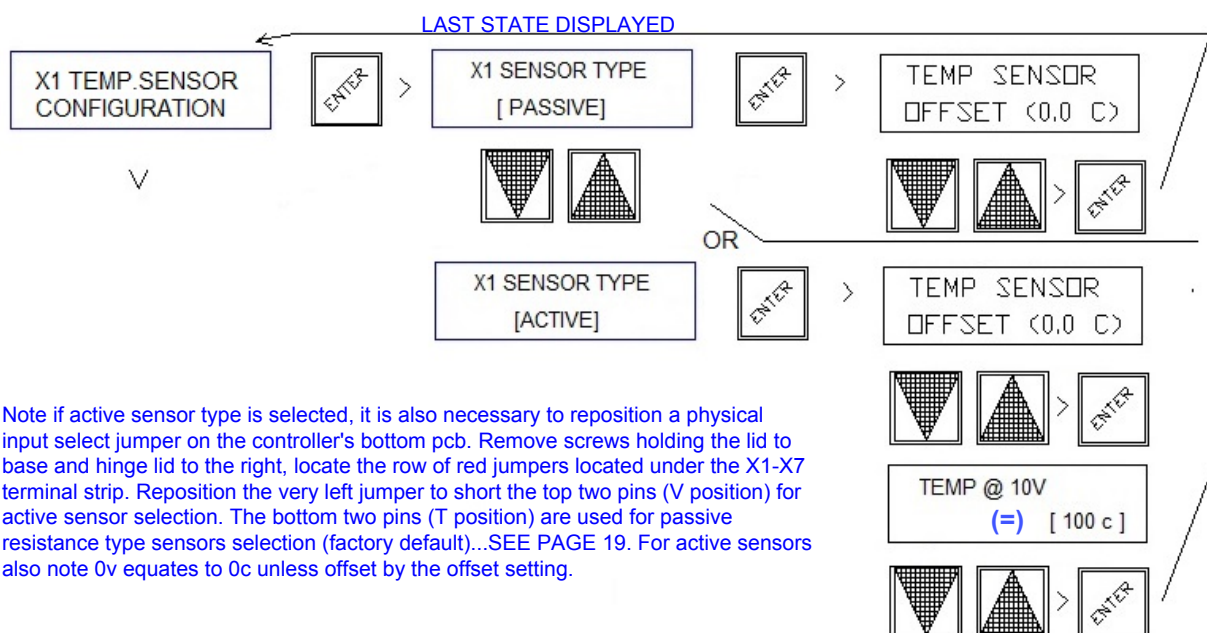
CONTROLLER BOTTOM PCB SHOWING SENSOR PASSIVE / ACTIVE SELECTION PINS

SETTING JUMPER PINS TO SUIT SENSOR TYPE



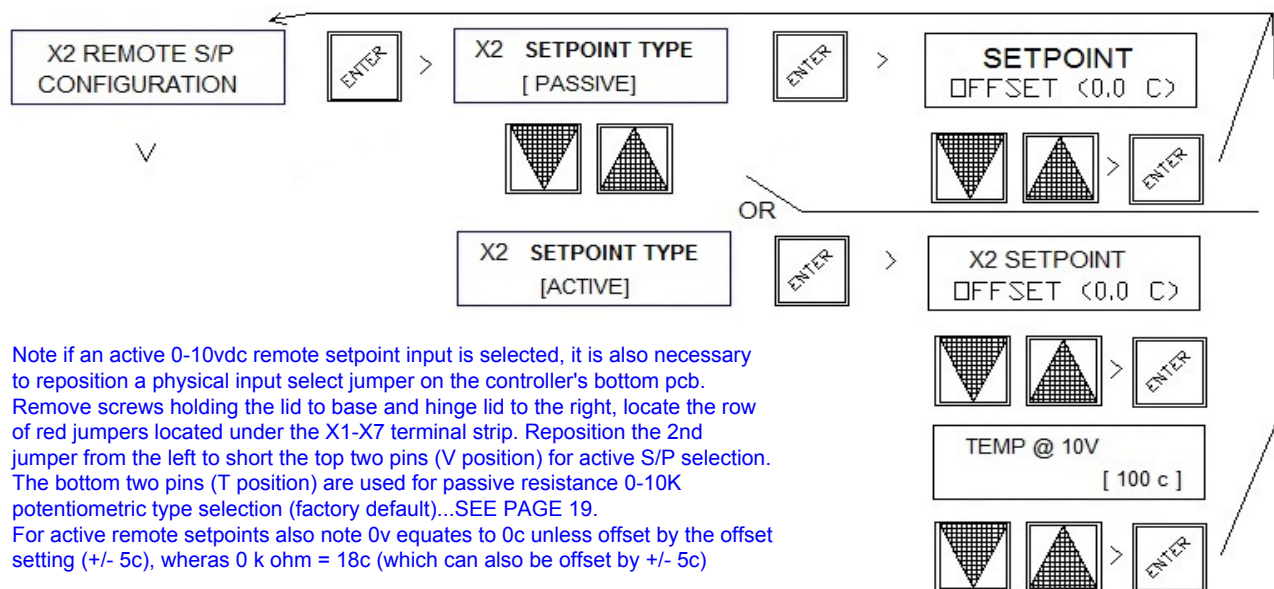
X1 TEMP. SENSOR CONFIGURATION (sensor type & span settings)

X1 is the main temperature sensor input that the operating setpoint relates to. The input can be set either as a Passive (Hevac type -D sensors) (default) or as an Active type (0-10vdc) in software but must also be selected as a passive or active type in hardware with a small jumper (CN1) on the bottom circuit board to match the software setting. Offset (cal) adjustment is settable for both passive & active types & for active sensors the maximum range is also adjustable ie: 10v = 20 ~ 100c



X2 REMOTE SET POINT CONFIGURATION

A Remote Set Point device (either passive or active) can be connected to the controller. If a passive adjuster is connected (default setting), the controller will automatically detect and hand over set point adjustment authority to the remote device (then ignoring the controllers UP & DOWN buttons for set point adjustment). A (passive) remote set point potentiometer can be built into a room temperature sensor - Hevac room sensor model SRT-DSP or supplied as a separate stand alone device model SPA-D. The range of the passive remote set point is fixed at 18 to 25 degrees over 0 to 10K. If an active remote set point is used the 0-10vDC signal is configurable from -5 to +5c for 0v & adjustable upto 100c for 10v. Note when in active mode, input voltages below 0.5 disable remote setpoint.



Note : as a service aid, any remote setpoint can be virtually temporarily disconnected and return setpoint control back to the Endeavour UP & DOWN buttons. Press & hold the UP & DOWN buttons for 5 seconds to trigger this mode. Setpoint control will automatically return to remote control after 10 minutes or can be reset by again pressing & holding the UP & DOWN buttons.

X3 O/AIR TEMPerature SENSOR CONFIG. (+ O/A INDUCED S/P SHIFT)

Economy cycle operation using analogue output Y1 can be interlocked with an outside air temperature sensor (either passive or active) connected to terminal X3, such that the use of a modulating motorised economy cycle damper set is inhibited for temperature control unless the outside air temperature is more favorable for temperature control then using recycled air from the controlled space. A low limit outside air temperature can also be set to inhibit Y1 economy cycle output if the O/A temperature is below an adjustable setting.

X3 Can now also be used for outdoor compensation (reset) of the controllers temperature setpoint so as to match temperature comfort perceptions relative to the outdoor temperature. Winter & summer start, range & authority settings are all adjustable in the menu.

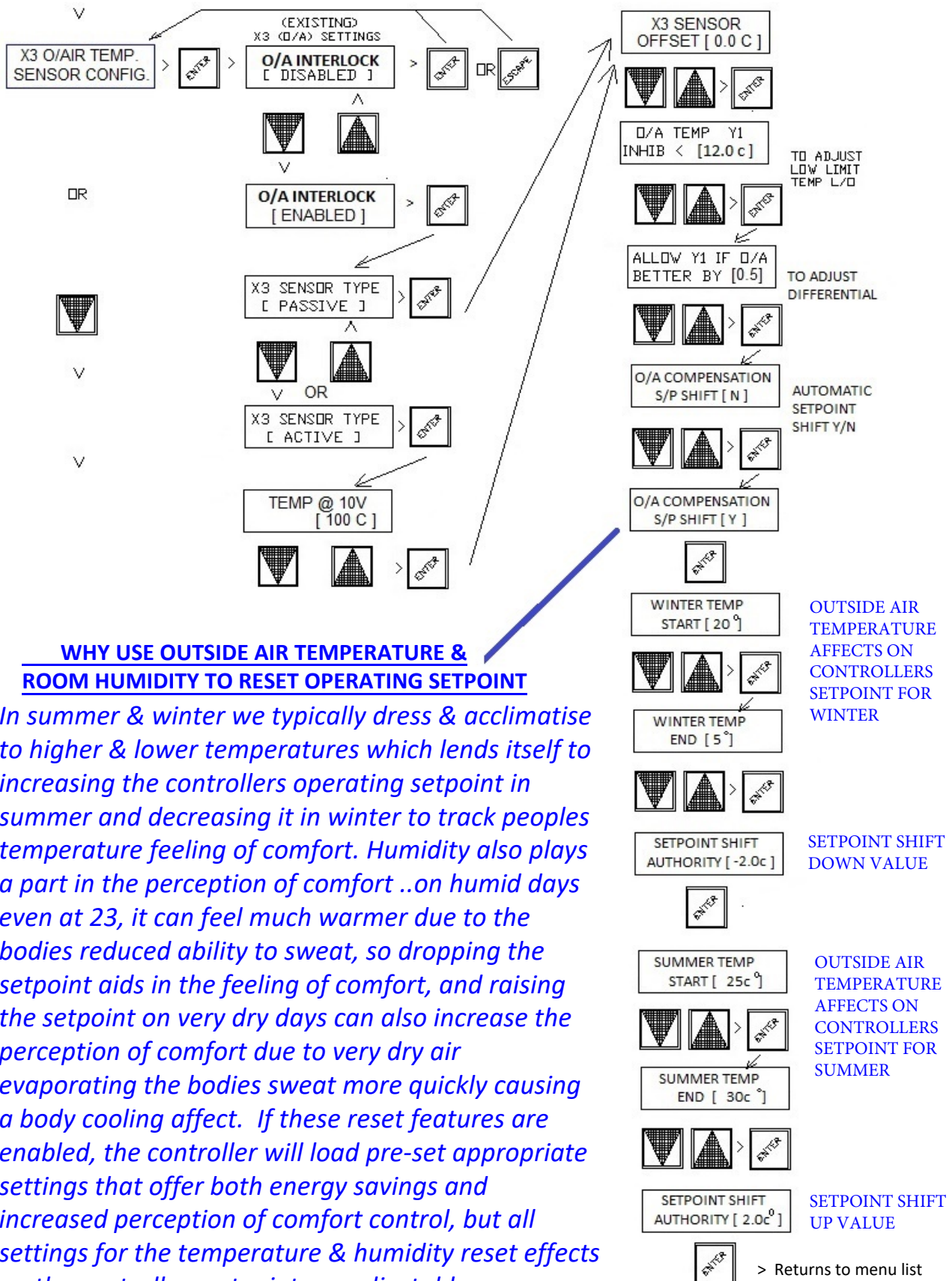
To enable the outside air temperature input, Press the fascia button labeled "ENTER" to have the LCD display jump to the 1st item in the menu tree "SET CLOCK", then scroll down the menu tree list with the "DOWN" arrow button until "X3 O/AIR TEMP.CONFIGURATION" is displayed. Press the "ENTER" button to open this menu and the existing status is displayed. If "DISABLED" is displayed press the "DOWN" arrow button to change the setting to 'ENABLED' then press "ENTER".

Use the screen legend on page 19 to enter & edit settings.

SENSOR TYPE: **PASSIVE**: 4K@25C 2 wire Sensor (SOT-D) or
ACTIVE: 0-10V~0-100C 3 wire Sensor (OSAO)

O/A TEMP Y1 low limit O/P lock out : < 0-20C (factory default =12c)

ALLOW Y1 IF O/A BETTER (then room) BY : 0.3-10C (factory default=0.5)



X4 AUXILIARY INPUT CONFIG → **ENTER** → **X4 INPUT [DISABLED]** → **X4 SUPPLY AIR [ENABLED]**

LAST SET STATE DISPLAYED

X4 INPUT TYPE [PASSIVE] → **ENTER** → **X4 INPUT UNITS [C]** → **ENTER** → **X4 SENSOR OFFSET <0.0 C>** → **ENTER** → **X4 INPUT TYPE [ACTIVE]**

OR

X4 INPUT UNITS [%] → **ENTER** → **X4 INPUT OFFSET <0.0%>** → **ENTER** → **VALUE @ 10V = [500 %]** → **ENTER** → **VALUE @ 10V = [100 %]** → **ENTER** → **HUMID.COMPENSATE S/P SHIFT [N]** → **ENTER**

IF HUMIDITY TO CAUSE RESET OF CONTROLLERS SETPOINT SET TO "Y"

HUMID.COMPENSATE S/P SHIFT [Y] → **ENTER** → **LOW HUMIDITY START [40 %]** → **ENTER** → **LOW HUMIDITY END [10 %]** → **ENTER** → **TEMP. S/P SHIFT AUTHORITY [0.5]** → **ENTER** → **HIGH HUMIDITY START [60 %]** → **ENTER** → **HIGH HUMIDITY END [90 %]** → **ENTER** → **TEMP. S/P SHIFT AUTHORITY [-1.0]** → **ENTER**

LOW HUMIDITY RESET START POINT

LOW HUMIDITY RESET END POINT

RESULTING CONTROLLER SETPOINT RESET

HIGH HUMIDITY RESET START POINT

HIGH HUMIDITY RESET END POINT

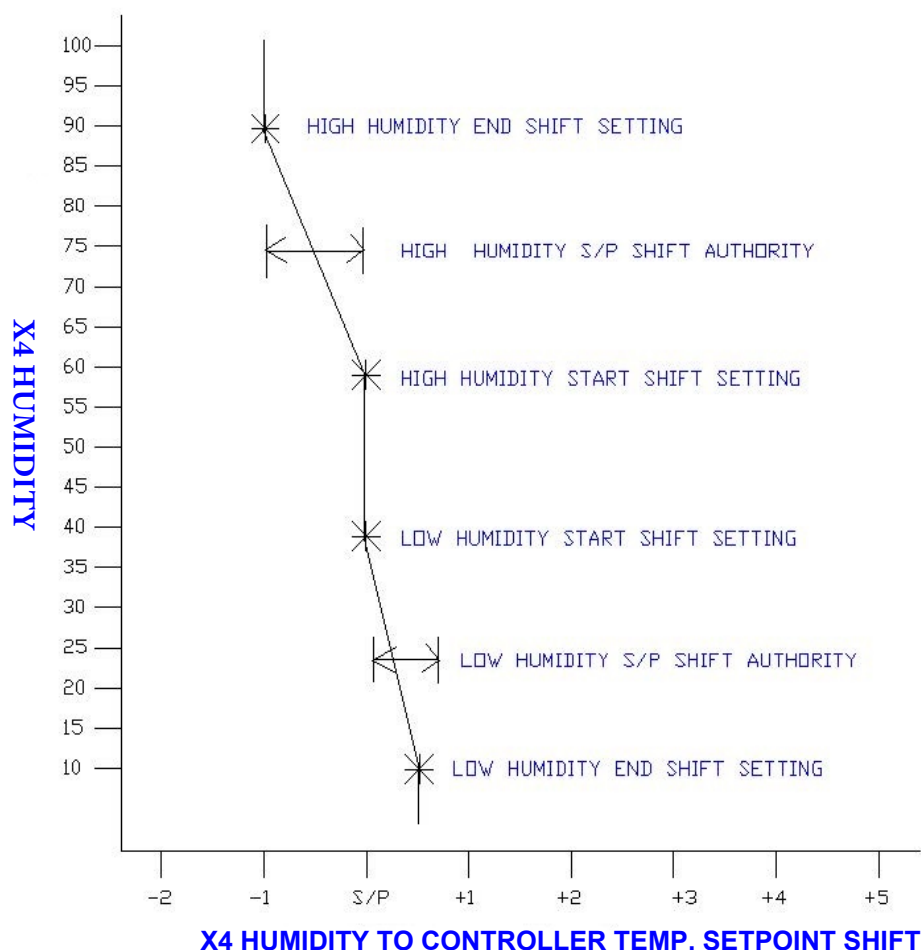
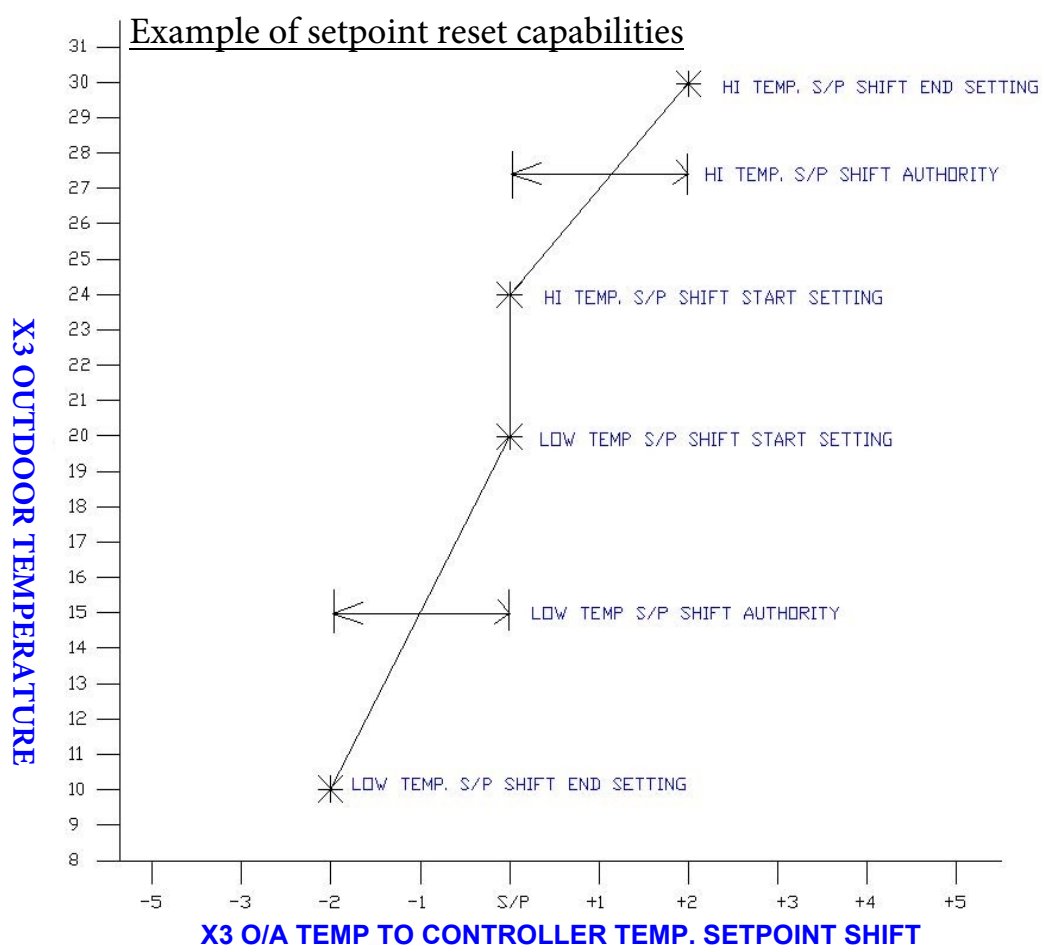
RESULTING CONTROLLER SETPOINT RESET

SELECT UNIT AS APPROPRIATE : C, %, ppm, V, Pa or blank

FOR HUMIDITY CHOOSE % SYMBOL

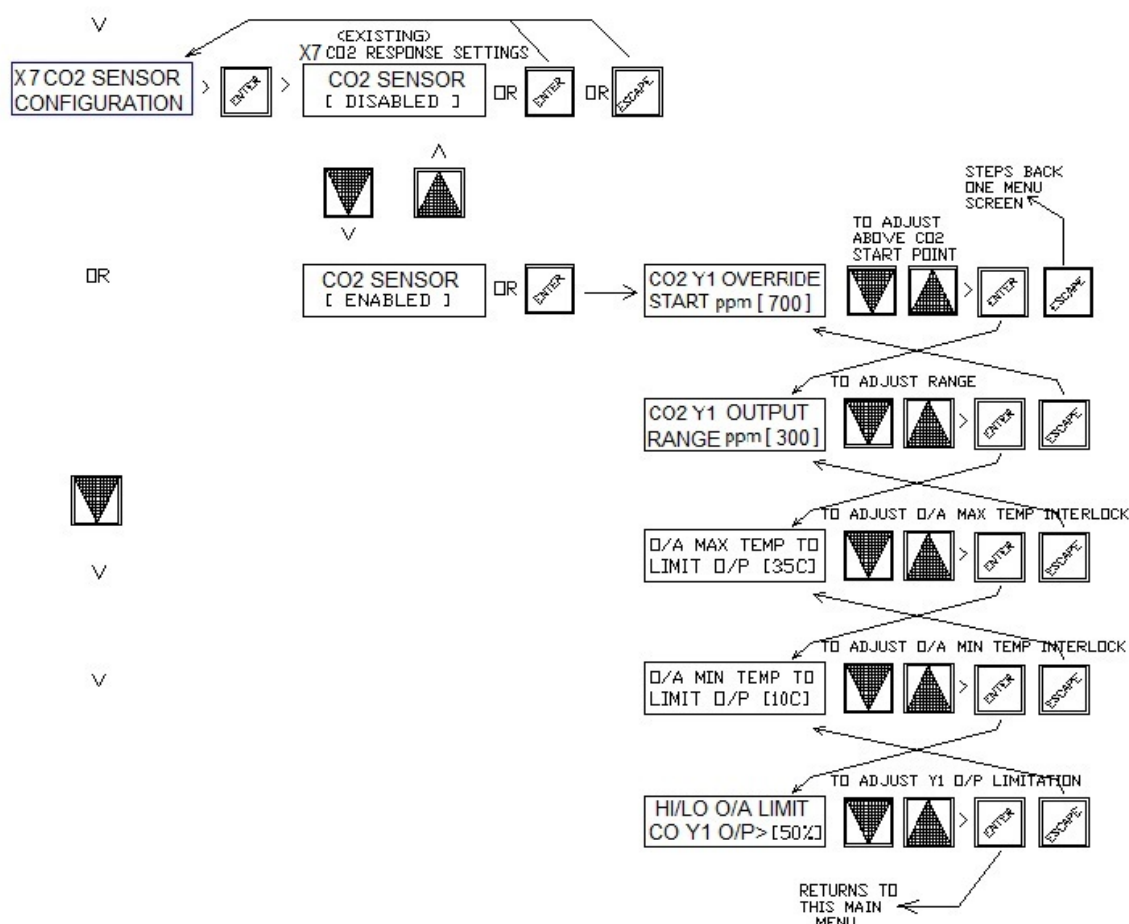
CHANGE 10V TO = 100%

OUTDOOR TEMPERATURE & ROOM or O/A HUMIDITY AUTOMATIC CONTROLLER TEMPERATURE SETPOINT SHIFT.



Enable this Input if a CO2 sensor is connected to the controller for air quantity control to reduce CO2 build up, by either overriding the economy cycle damper operation connected to analogue output terminal Y1 (to increase fresh air intake) or / & to control an internal relay set for on/off CO2 control. Typical settings (factory default if enabled) are to proportionally modulate open the economy cycle damper set to the fresh air mode as CO2 levels exceeds 700 ppm and cause full fresh air mode if levels reach 1000 ppm, or with this latest update can now alternatively just operate a relay for on/off CO2 control ..ie for energising a fresh air fan.

To edit settings, press the fascia button labeled “**ENTER**” to have the LCD display jump to the 1st menu item in the menu tree “**SET CLOCK**”, using the DOWN arrow button scroll down the menu until “**X7 CO2 SENSOR CONFIGURATION**” is displayed. To then enable this feature, Press the “**ENTER**” button followed by the “**DOWN**” arrow button to change the “DISABLED” setting to ‘ENABLED’. Either except the default settings of (Y1 damper output) start at 700 and range over 300 ppm or edit the values with the “**UP**” or “**DOWN**” buttons, press “**ENTER**” to confirm settings. Note so as not to lose temperature control in extreme outside air temperatures, O/A temperature limits can be set to inhibit full fresh mode due to high CO2 levels when the outside air temperature is either too hot or too cold (adjustable). In this menu set the high and low outside air temperatures where fresh air mode output signal (due to CO2 control) should be restricted (factory settings are: below 10c and above 35c), the now restricted CO2 generated Y1 output signal is adjustable from 0 to 100% (factory setting is 50%). This CO2 input can also control spare internal relay/s for on/off CO2 interlocks (ie Hi/Low fan speed)..see relay programming.



Hvac Temperature Controller												
n	s	Access	Description	Units	Type	Explanation	MODBUS MEMORY MAP	Default	Error	InternalUse	InternalUse	
Read Coils										Semaphore/Op Address	Byte Address	
00161	160	ReadOnly	Running	-	boolean	TRUE if the unit is running, FALSE if not		-	-	00160	20.0	
00162	161	ReadOnly	Outdoor Temp Sensor Present	-	boolean	TRUE if the outdoor temperature sensor is fitted, FALSE if not		-	-	00161	20.1	
00163	162	ReadOnly	CO2 Sensor Present	-	boolean	TRUE if the CO2 sensor is fitted, FALSE if not		-	-	00162	20.2	
00164	163	ReadOnly	Night Purge Active	-	boolean	TRUE if Night Purge is active		-	-	00163	20.3	
00165	164	ReadOnly	Off by external switch	-	boolean	TRUE if external switch is active		-	-	00164	20.4	
00166	165	ReadOnly	X4 USED	-	boolean	TRUE if the X4 is in use		-	-	00165	20.5	
00167	166	ReadOnly	Holiday Mode	-	boolean	TRUE if the unit's time switch has a holiday active (whether it is on or not)		-	-	00166	20.6	
00168	167	ReadOnly	Sensor Error	-	boolean	TRUE if a sensor error is affecting the outputs		-	-	00167	20.7	
Inputs												
10001	0	ReadOnly	REMOTE OFF or Timer Trigger 0 (D1)	-	boolean	TRUE if input is on, FALSE otherwise		-	-			
10002	1	ReadOnly	REMOTE ON 1 (D2)	-	boolean	TRUE if input is on, FALSE otherwise		-	-			
10003	2	ReadOnly	A/C FAULT INPUT STATUS 2 (D3)	-	boolean	TRUE if input is on, FALSE otherwise		-	-			
10004	3	ReadOnly	AUX. DIGITAL INPUT STATUS 3 (D4)	-	boolean	TRUE if input is on, FALSE otherwise		-	-			
Write Coils										Semaphore Address	Byte Address	
00169	168	ReadWrite	MODBUS Master Write Request	-	boolean	TRUE if a master is connected, only required if MB Master is writing. Sampled every 60 seconds. MODBUS Write Regs will be cleared if not set and the controller will return to local values.		-	-	00168	21.0	
01001	1000	ReadWrite	Relay 1	-	boolean	TRUE if relay is active		-	-	00000	n/a	
01002	1001	ReadWrite	Relay 2	-	boolean	TRUE if relay is active		-	-	00001	n/a	
01003	1002	ReadWrite	Relay 3	-	boolean	TRUE if relay is active		-	-	00002	n/a	
01004	1003	ReadWrite	Relay 4	-	boolean	TRUE if relay is active		-	-	00003	n/a	
01005	1004	ReadWrite	Relay 5 (Fan)	-	boolean	TRUE if relay is active		-	-	00004	n/a	
01006	1005	ReadWrite	LED 1	-	boolean	TRUE if LED is active		-	-	00005	n/a	
01007	1006	ReadWrite	LED 2	-	boolean	TRUE if LED is active		-	-	00006	n/a	
01008	1007	ReadWrite	LED 3	-	boolean	TRUE if LED is active		-	-	00007	n/a	
01009	1008	ReadWrite	LED 4	-	boolean	TRUE if LED is active		-	-	00008	n/a	
01010	1009	ReadWrite	LED 5	-	boolean	TRUE if LED is active		-	-	00009	n/a	
Read Registers												
45001	5000	ReadOnly	Controller model	-	unsigned 16bit	Controller model number		9	-			
45002	5001	ReadOnly	MODBUS mapping version	-	unsigned 16bit	MODBUS memory/coil map		8	-			
41172	01171	ReadOnly	Relay 1 Mode	Byte	unsigned 8bit	1=Cool, 2=Heat, 3=Heat&Cool, 4 (132)=CO2, 5 (133)=Time Switch 2, 6 (134) = X4 Rising, 7 (135) = X4 Falling, 8 (136) = Y1 Rising, 9 (137) = Y1 Falling, 10 (138) = Y2 Rising, 11 (139) = Y2 Falling, Bit 7 (80 hex or 128 decimal) will be set TRUE if the mode is above 3, so add 128 to each value over 3.		0			171	
41173	01172	ReadOnly	Relay 2 Mode	Byte	unsigned 8bit			0				172
41174	01173	ReadOnly	Relay 3 Mode	Byte	unsigned 8bit			0				173
41175	01174	ReadOnly	Relay 4 Mode	Byte	unsigned 8bit			0				174
41218	1217	ReadOnly	Run Mode	Byte	unsigned 8bit	Configured run mode: 0=Manual, 1=Timer (AHR), 2=TimeSwitch, 3=Timeswitch ONLY, 4=X4 Only		0				217
41219	01218	ReadOnly	Run Timer	Byte	unsigned 8bit	Run timer, in 10min steps, max 24hr = 24 * 6 = 144 (10min)		0				218
41220	01219	ReadOnly	X1 Thermistor Offset	Byte	unsigned 8bit	user adjustable offset for thermistor, Therm = Thermistor + (PmbThermOffset - 128) * 0.1 (so it's +/- 12.7° max)		0				219
41221	01220	ReadOnly	CO2 OUTPUT RESPONSE START	Byte	unsigned 8bit	range 1 thru 200, representing 10 - 2000ppm, PPM = PmbCO2Start * 10.0		0				220
41222	01221	ReadOnly	CO2 OUTPUT RESPONSE RANGE	Byte	unsigned 8bit	range 50 - 150, representing 500 - 1500ppm, PPM = PmbCO2Range * 10.0		0				221
41223	01222	ReadOnly	CO2 Max TEMP INTERLOCK	Byte	unsigned 8bit	range 0 - 50 (°C)		0				222
41224	01223	ReadOnly	CO2 Min TEMP. INTERLOCK	Byte	unsigned 8bit	range 0 - 50 (°C)		0				223
41225	01224	ReadOnly	CO2 Y1 MAXIMUM OUTPUT	Byte	unsigned 8bit	range 0 - 100 (%)		0				224
41226	01225	ReadOnly	O/A Low temp. Y1 lockout	Byte	unsigned 8bit	range 50 - 200, representing 5.0 to 20.0°C		0				225
41227	01226	ReadOnly	O/A (X3) better for use then X1	Byte	unsigned 8bit	range 3 - 50, representing 0.3 to 5.0°C		0				226
41228	01227	ReadOnly	Modbus Slave Address	Byte	unsigned 8bit	modbus slave address, 1-247, 0=disabled		0				227
41229	01228	ReadOnly	Modbus Baud	Byte	unsigned 8bit	baud rate ref MBpBaud, 0=1200, 1=2400, 2=9600, 3=19200, 4=38400, 5=57600, 6=115200		0				228
41230	01229	ReadOnly	10V Input	Byte	unsigned 8bit	TRUE if an analogue input is 0-10V		0				229
41231	01230	ReadOnly	X1TEMPERATURE INPUT @ 10V	Byte	unsigned 8bit	X1 active sensor temperature at 10V (full scale)		0				230
41232	01231	ReadOnly	X2 ACTIVE REMOTE SETPOINT @ 10V	Byte	unsigned 8bit	X2 active remote setpoint at 10V (full scale)		0				231
41233	01232	ReadOnly	X2 Thermistor Offset	Byte	unsigned 8bit	user adjustable offset for thermistor, Therm = Thermistor + (PmbThermOffset - 128) * 0.1 (so it's +/- 12.7° max)		0				232
41234	01233	ReadOnly	keyboard Lock Level	Byte	unsigned 8bit	UI Lock level		0				233
41235	01234	ReadOnly	X4 Input @ 10V	Byte	unsigned 8bit	Coded as /5 up to 100, then /10 from there up. 1=5, 100=500, 101=510		0				234
41236	01235	ReadOnly	X4 Input Offset	Byte	unsigned 8bit	user adjustable offset for input, Value = Input + (PmbThermOffset - 128) * 0.1 (so it's +/- 12.7° max) in temp mode		0				235
41237	01236	ReadOnly	X3 O/A SENSOR @ 10V	Byte	unsigned 8bit	X3 active sensor temperature at 10V (full scale)		0				236
41238	01237	ReadOnly	X3 Thermistor Offset	Byte	unsigned 8bit	user adjustable offset for thermistor, Therm = Thermistor + (PmbThermOffset - 128) * 0.1 (so it's +/- 12.7° max)		0				237
41239	01238	ReadOnly	Y1 Min	Byte	unsigned 8bit	Minimum value for Y1 (1% steps)		0				238
41240	01239	ReadOnly	Y2 Min	Byte	unsigned 8bit	Minimum value for Y2 (1% steps)		0				239
41241	01240	ReadOnly	Y1 Max	Byte	unsigned 8bit	Maximum value for Y1 (1% steps)		0				240
41242	01241	ReadOnly	Y2 Max	Byte	unsigned 8bit	Maximum value for Y2 (1% steps)		0				241
41243	01242	ReadOnly	X4 Units	Byte	unsigned 8bit	Units used for X4 display: 0=°C, 1=°F, 2=ppm, 3=V, 4=Pa, 5=None		0				242
41024	01023	ReadOnly	Target temperature source	Byte	unsigned 8bit	Source of current target temperature		0				23
43014	3013	ReadOnly	Endeavour Setpoint	celcius * 10	signed 16bit	Setpoint temperature. To display in celsius, divide by 10 and display with one decimal place.		-	-			26 - 27
43015	3014	ReadOnly	X1 Indoor temperature	celcius * 10	signed 16bit	Indoor temperature. To display in celsius, divide by 10 and display with one decimal place.		-	9999			28 - 29
43016	3015	ReadOnly	X3 Outdoor temperature	celcius * 10	signed 16bit	Outdoor temperature. To display in celsius, divide by 10 and display with one decimal place.		-	9999			30 - 31
43017	3016	ReadOnly	X7 CO2 LEVEL	ppm	signed 16bit	CO2 level in ppm.		-	-			32 - 33
43018	3017	ReadOnly	Output Y1	percent * 10	signed 16bit	Percent drive level, eg 513 = 51.3%		-	-			34 - 35
43019	3018	ReadOnly	Output Y2	percent * 10	signed 16bit	Percent drive level, eg 513 = 51.3%		-	-			36 - 37
43020	3019	ReadOnly	X4 INPUT	value * 10	signed 16bit	AUXILIARY X4 INPUT VALUE		-	9999			38 - 39
Actual operating state of the device:												
1: Manual Off												22
2: Idle (Auto Off)												24 -
3: Cooling												
4: Heating												
5: Fault												
6: Fan (Recycle)												
7: Econ (Fresh Air)												
8: Vent (Night Purge)												
9: On												
10: CO2												
11: Timeswitch 2												
12: X4												
13: Off due to Sensor Fault												
14: Off due to External Fault Input												
41041	01040	ReadOnly	Current running state	Byte	unsigned 8bit			0				40
Write Registers											Byte Address	
41023	1022	ReadWrite	Operating mode	-	unsigned 8bit	Operating mode: 0 = auto, 1 = force on, 2 = force off		0	-			22
43013	3012	ReadWrite	MODBUS setpoint	celcius * 10	unsigned 16bit	MODBUS controller setpoint, temperature = MODBUSSetpoint/10. 0 means use local setpoint		0	-			24 -

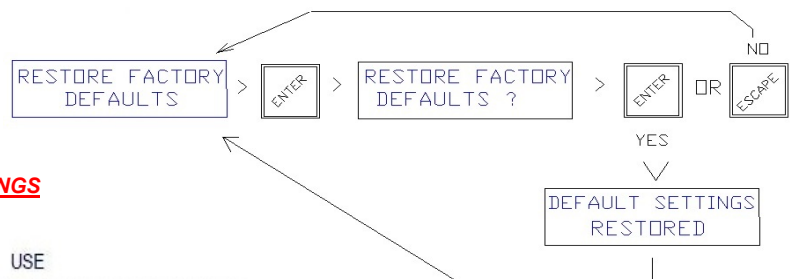
TIPS & TRICKS

- 1.) Sometimes its desirable to have an electrically independent system **RUNNING** output same as the endeavours relay 5 (time switch /fan output) to drive a **System Run Lamp** or energise some auxiliary device when the A/C system is on (ie fan coil unit run interlock to open/close fresh air damper). A trick to achieve this is to program relay 1 for "BOTH" (heat & cool mode), set the deadband setting to zero, the switching differential to 5.0 & the time delay to zero. This will have the affect of overloading the temperature On logic for this relay > locking this relay on when the system is in running operation (ie time switch on). Use relay 1's terminals 1,2 & 3 as required for this electrically independent output.
- 2.) A dedicated **AHR (only) ON Lamp** output (after hours or run timer on) can be achieved by also using the 2nd independent time switch. Set relay 1 as Auxiliary Time Switch 2 mode and set its on /off times to the opposite of the main time switch on/off time settings. Then connecting relays 1 & 5 as a series circuit (active in on 5, than 8 looped to 1, output to lamp from 3). The AHR lamp will illuminate only when the run timer is triggered as affectively both time switch circuits (wired in series) are now on.
- 3.) A fixed **DC output voltage as an on/off output** can be set using a spare Y output (as an example a fixed speed setting to an EC fan). In programming set both the Y's output min & max settings to the desired fixed value to produce a fixed output however this output will still drop to zero when the system is off. This Y output can also be interlocked with a spare relay reacting to an analogue inputs X1 or X4 as an on/off fixed dc output due to the analogue input valve.
- 4.) For applications requiring **two different setpoints** a remote switch or using the controllers 2nd time switch could be used to switch in a fixed dc voltage from a spare Y output into terminal X2. When the feed into X2 is disconnected the controller will use its setpoint as set using the controllers up/down buttons, when the feed to X2 is made the controller will use this input as the setpoint value i.e 0-10v = 0-50c.
- 5.) **Virtual Actuator Auxiliary switch** relative to one of the controllers Y outputs can be set using a spare relay (typically R1) that can be set to react to the output voltage of a Y output or alternatively for motors with a feedback output this output could be connected to X4 to control a spare relay ie to switch a fan on when a damper is 90% open.

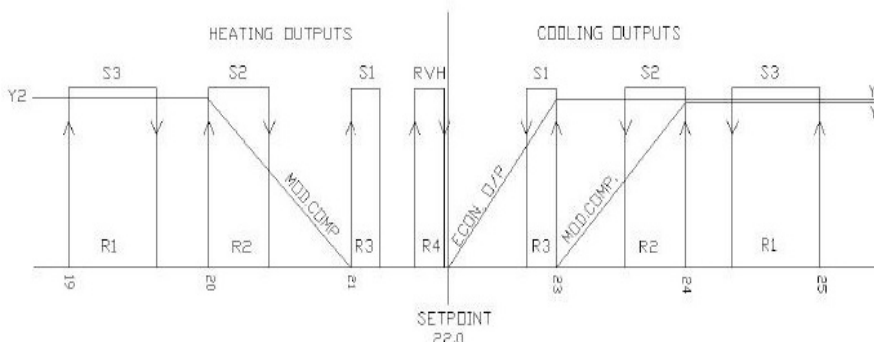
FORCED RESET TO EX FACTORY DEFAULTS

PRESET PROGRAM # 0

SEE PAGE 34 FOR EX HEVAC PROGRAMMED SETTINGS



RELAY	MODE	DB	SD	PB	I	TD	USE
R1	B	3.0	1.0			0.1	HEAT & COOL STAGE 3 (COMP.3)
R2	B	2.0	0.7			0.1	HEAT & COOL STAGE 2 (COMP.2)
R3	B	1.0	0.3			0.1	HEAT & COOL STAGE 1 (COMP.1)
R4	H	0.5	0.4			0.1	REVERSING VALVE HEAT MODE
R5							FIXED AS SYSTEM ON RELAY (FAN)
Y1	C	0.1		1.0	P Only		ECONOMY CYCLE DAMPER O/P
Y2	B	1.0		1.0	P Only		MODULATING COMPRESSOR O/P



CONTROLLER SET AS STANDARD (TEMP.) MODE CONTROLLER
 " START BY " SET TO TIME SWITCH (1)
 RELAYS SET FOR TRIPLE COMPRESOR/REVERSE CYCLE.
 AHR TIMER SET FOR 2 HOURS
 Y1 SET FOR COOL ONLY (ECONOMY CYCLE)
 Y2 SET FOR HEAT+COOL (MODULATING COMPRESSOR)
 X3 (O/A), X4 (AUX.) & X7 (CO2) DISABLED
 X1, 2, 3 & 4 SET AS PASSIVE RESISTANCE INPUTS
 X5 & 6 (MODBUS) SOFTWARE DISABLED
 TIME SWITCH 2 DISABLED
 HOLIDAY DATES EMPTY
 DAY LIGHT SAVINGS AUTO TIME CORRECTION ENABLED.
 NIGHT PURGE MODE DISABLED
 Y1 SET AS COOL & Y2 AS BOTH, & SET FOR FULL 0-10v

HEVAC SENSORS (OTHER VARIANTS ALSO AVAILABLE ie AVERAGING)

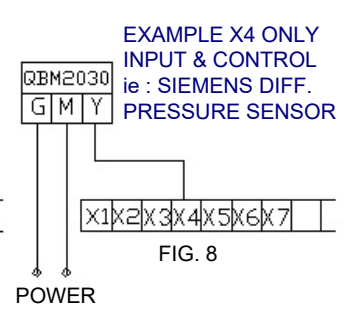
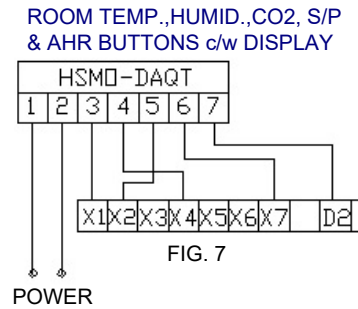
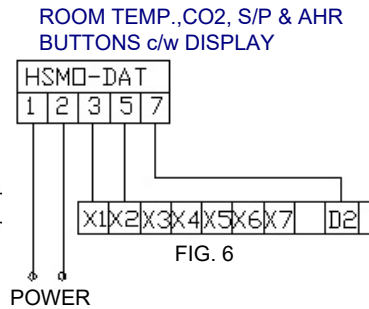
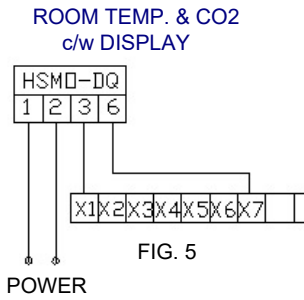
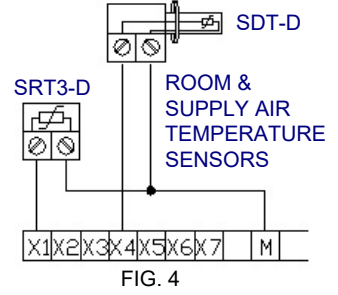
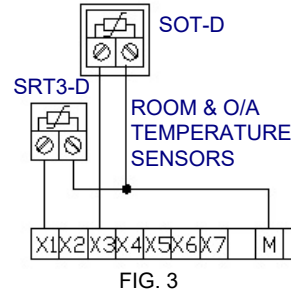
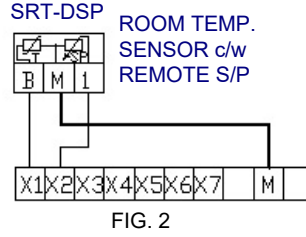
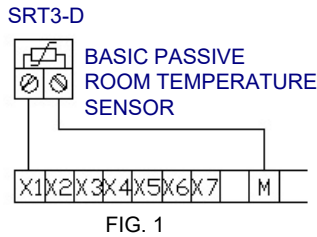
PASSIVE RESISTANCE SENSORS

SRT3-D	(MODERN) ROOM TEMPERATURE SENSOR	2 WIRE
SRT-DSW	ROOM TEMP. SENSOR c/w ON/OFF/AHR SWITCH	2 WIRE
SRT-DSP	ROOM TEMP. SENSOR c/w SETPOINT	3 WIRE
SRT-DSPSW	ROOM TEMP. SENSOR c/w SWITCH & SETPOINT	3 WIRE
SDT-D	DUCT TEMPERATURE SENSOR	2 WIRE
SOT-D	OUTSIDE TEMPERATURE SENSOR	2 WIRE

ACTIVE 0-10VDC SENSORS

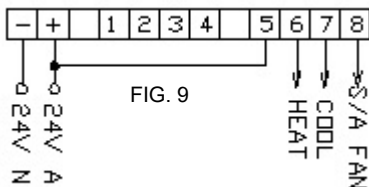
OSAO	ACTIVE OUTSIDE TEMP. SENSOR	3 WIRE
HSMO	ROOM TEMP.& HUMIDITY	4 WIRE
HSMO-Q	ROOM TEMP.,HUMIDITY & CO2	4 WIRE
HSMO-DAT	ROOM TEMP.,S/P & AHR SW.c/w DISPLAY	4 WIRE
HSMO-DQ	ROOM TEMP.,HUMIDITY, CO2 c/w DISPLAY	4 WIRE
HSMO-DAQT	ROOM TEMP.,HUMID., CO2, S/P,AHR & S/P	7 WIRE

CONTROLLER SENSOR INPUTS

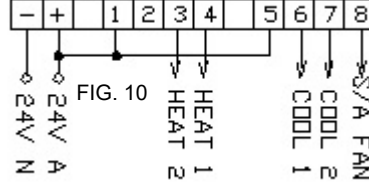


CONTROLLER RELAY OUTPUTS

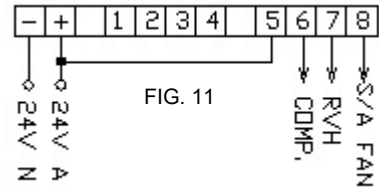
1 HEAT / 1 COOL TYPICAL OUTPUT CONNECTIONS TO SUIT PRESET PROGRAMS 1 & 2



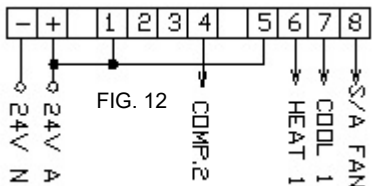
2 HEAT / 2 COOL TYPICAL OUTPUT CONNECTIONS TO SUIT PRESET PROGRAMS 3 & 4



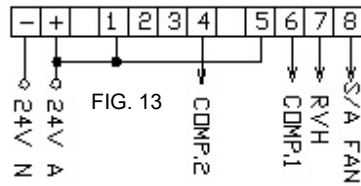
COMPRESSOR / REV.VALVE TYPICAL OUTPUT CONNECTIONS TO SUIT PRESET PROGRAMS 5 & 6



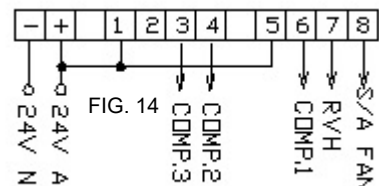
HEAT1/ COOL1 / COMP.2 TYPICAL OUTPUT CONNECTIONS TO SUIT PRESET PROGRAM 7



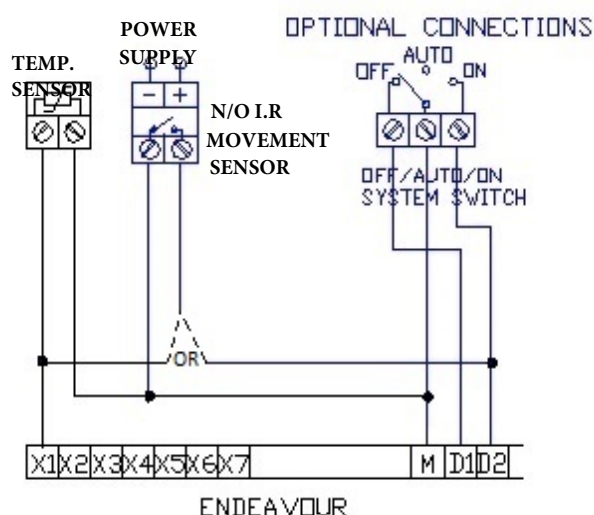
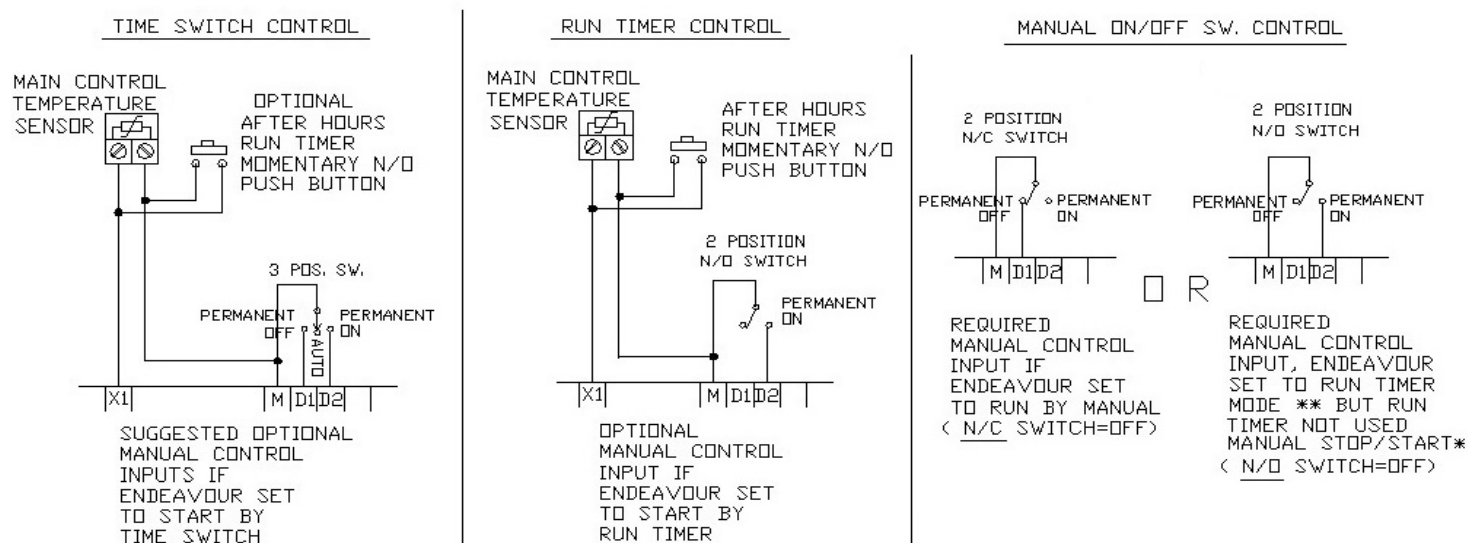
2 COMP / REV.VALVE TYPICAL OUTPUT CONNECTIONS TO SUIT PRESET PROGRAM 8 & 9



3 COMP / REV.VALVE TYPICAL OUTPUT CONNECTIONS TO SUIT PRESET PROGRAMS 0 & 10



GUIDE & SUGGESTED OPTIONAL INPUT USE FOR MANUAL STOP / START EXTERNAL OVERRIDE

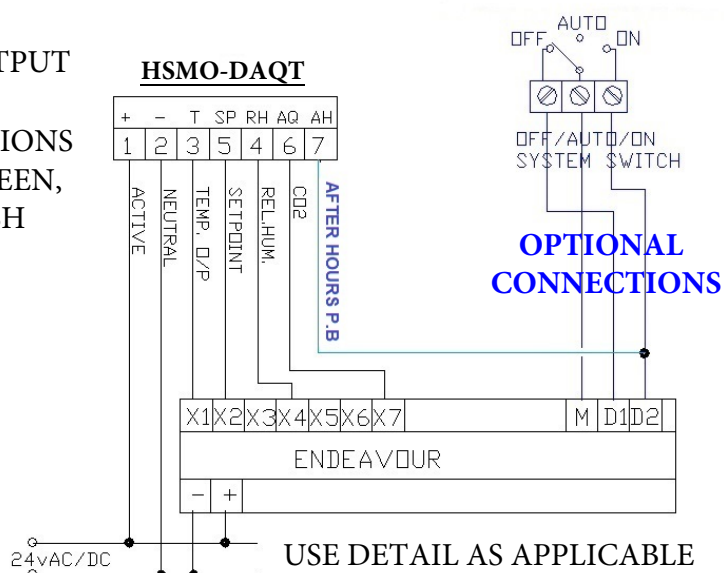


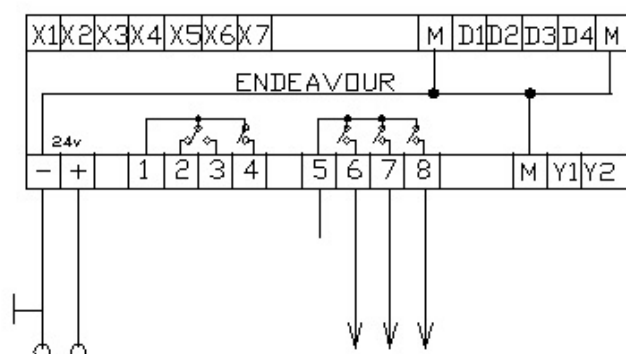
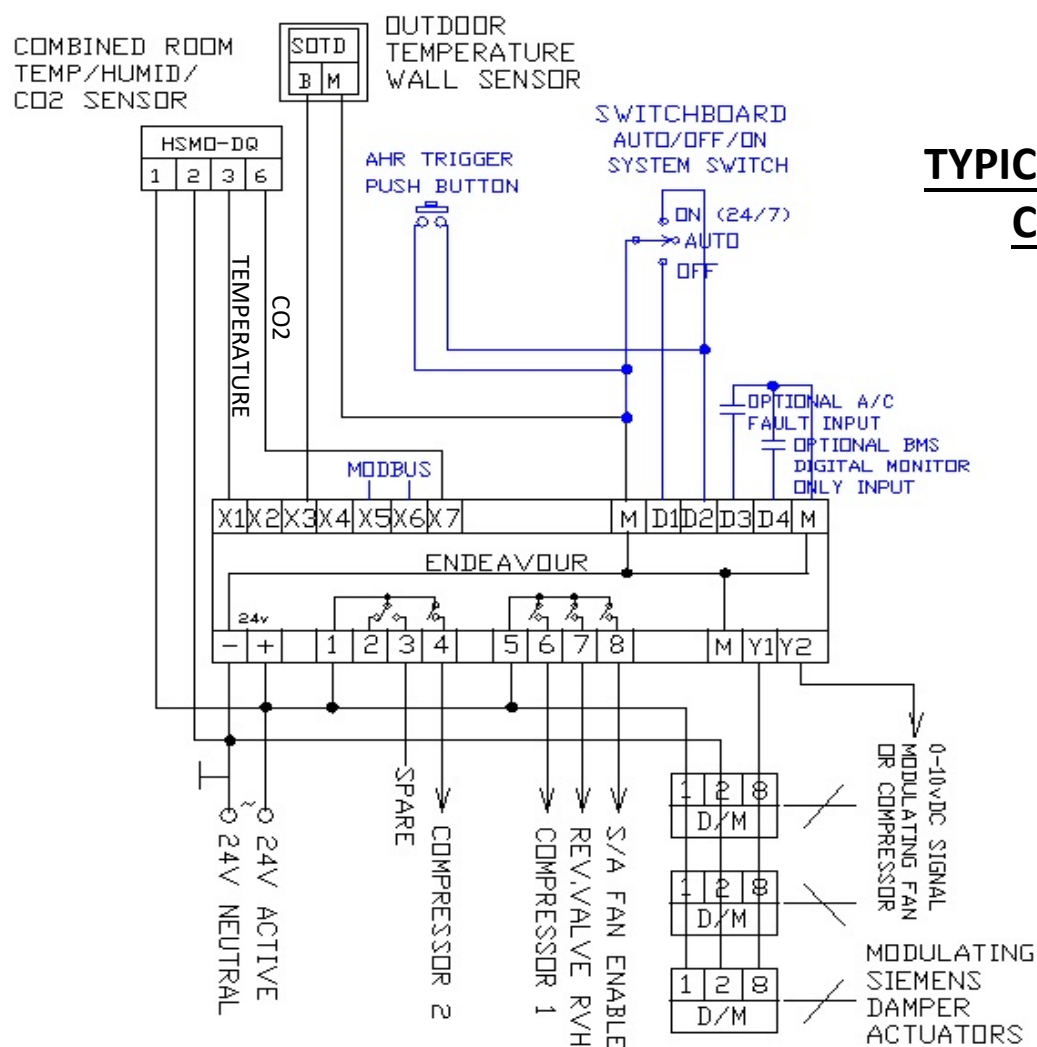
RUN OPERATION TRIGGERED BY MOVEMENT SENSOR

SET ENDEAVOUR TO "START BY" RUN TIMER & SET TIMER TO "RESTART" NOT "TOGGLE" MODE.
CONNECT MOVEMENT SENSOR OUTPUT TO X1 FOR PASSIVE OR D2 FOR ACTIVE SENSORS

CONTROL OPTIONS USING AN ACTIVE MAIN SENSOR

HSMO SERIES MULTI-OUTPUT ROOM TEMPERATURE / HUMIDITY SENSORS. VERSIONS WITH OPTIONAL LCD SCREEN, CO2, SETPOINT & AHR PUSH BUTTONS





SCRATCH PAD FOR CONTROLLER WIRING PER PROJECT

EX HEVAC (Preset #8) ENDEAVOUR SITE PROGRAM INFORMATION

34 / 36

CONTROLLER SET TO "RUN BY" : TIME SWITCHDAYLIGHT SAVING = ENABLED or DISABLEDRUN TIMER SETTING = 2 HOURSSETPOINT = 22c

			M	T	W	T	F	S	S	YES(Y) or NO(-)
<u>TIME SWITCH 1</u>	EVENT 01,	DAYS :	Y	Y	Y	Y	Y	-	-	TIME: <u>8:00</u> , ACTION: <u>ON</u>
"	EVENT 02	" :	Y	Y	Y	Y	Y	-	-	TIME: <u>17:30</u> , ACTION: <u>OFF</u>
"	EVENT 03	" :								TIME: _____, ACTION: <u>ON OFF</u>
"	EVENT 04	" :								TIME: _____, ACTION: <u>ON OFF</u>
"	EVENT 05	" :								TIME: _____, ACTION: <u>ON OFF</u>
"	EVENT 06	" :								TIME: _____, ACTION: <u>ON OFF</u>
"	EVENT 07	" :								TIME: _____, ACTION: <u>ON OFF</u>
"	EVENT 08	" :								TIME: _____, ACTION: <u>ON OFF</u>

TIME SWITCH 2 TIME SWITCH 2 NOT USED HOLIDAYS NO HOLIDAYS LOADED

RELAY 1 – 4 RELAY ASSIGNMENTS

RELAY I	MODE	DEADBAND(DB)	SWITCH. DIFF.(SD)	TIME DELAY (Tdly)	NOTES
1	<u>BOTH</u>				NOT USED
2	<u>BOTH</u>	<u>2.0</u>	<u>0.5</u>	<u>2:00</u>	<u>COMPRESSOR 2</u>
3	<u>BOTH</u>	<u>1.0</u>	<u>0.3</u>	<u>1:00</u>	<u>COMPRESSOR 1</u>
4	<u>HEAT</u>	<u>0.5</u>	<u>0.4</u>	<u>0:10s</u>	<u>rev. valve HEAT</u>
5	= FAN CONTROL METHOD: <u>ON</u> or <u>CYCLE</u> (runs continuously during time switch on period).				

Y1 & Y2 ANALOGUE OUTPUT ASSIGNMENTS

ANALOG O/P	MODE	DEADBAND(DB)	PROP.BAND (PB)	INTEGRAL TIME	MIN O/P	MAX O/P	NOTES
Y1							<u>NOT USED</u>
Y2							<u>NOT USED</u>

"X" ANALOGUE INPUT CONFIGURATIONS

X I/P	PURPOSE	Active/Passive	OFFSET	10v=	PCB JUMPER POS.	NOTES
X1	MAIN TEMP. SENSOR	<u>PASSIVE</u>	<u>0</u>	<u>n/a</u>	<u>T</u>	<u>Main Temp Sensor</u>
X2	REMOTE SETPOINT	<u>PASSIVE</u>	<u>0</u>	<u>n/a</u>	<u>T</u>	<u>Optional remote S/P</u>
X3	OUTSIDE AIR TEMP.SENSOR	<u>PASSIVE</u>	<u>DISABLED</u>		<u>T</u>	<u>Otional O/A sensor</u>
X4	AUXILIARY INPUT	<u>PASSIVE</u>	<u>DISABLED</u>		<u>T</u>	<u>Optional analog input</u>
X5	MODBUS "A" COMMUNICATION TERMINAL	<u>DISABLED</u>			<u>C</u>	
X6	MODBUS "B" COMMUNICATION TERMINAL				<u>C</u>	
X7	CO2 SENSOR	<u>DISABLED</u>			<u>V</u>	<u>Optional CO2 sensor</u>

OTHER SETTINGS

MODBUS = software DISABLED NIGHT PURGE = DISABLED
MAIN CONTROLLER FUNCTION = STANDARD TEMP. APP S/P RESET = DISABLED

ENDEAVOUR SITE PROGRAM INFORMATION

(PLEASE RECORD SETTINGS IF CONTROLLER CHANGED FROM FACTORY DEFAULTS & LEAVE ONSITE.)

CONTROLLER SET TO "START BY" : _____

DAYLIGHT SAVING = ENABLED or DISABLED

RUN TIMER SETTING _____

SETPOINT = _____

			M	T	W	T	F	S	S	YES(Y) or NO(-)
TIME SWITCH 1	EVENT 01, DAYS :									TIME:____:____, ACTION: <u>ON</u> <u>OFF</u>
"	EVENT 02 "	:								TIME:____:____, ACTION: <u>ON</u> <u>OFF</u>
"	EVENT 03 "	:								TIME:____:____, ACTION: <u>ON</u> <u>OFF</u>
"	EVENT 04 "	:								TIME:____:____, ACTION: <u>ON</u> <u>OFF</u>
"	EVENT 05 "	:								TIME:____:____, ACTION: <u>ON</u> <u>OFF</u>
"	EVENT 06 "	:								TIME:____:____, ACTION: <u>ON</u> <u>OFF</u>
"	EVENT 07 "	:								TIME:____:____, ACTION: <u>ON</u> <u>OFF</u>
"	EVENT 08 "	:								TIME:____:____, ACTION: <u>ON</u> <u>OFF</u>

			M	T	W	T	F	S	S	NOTE ACTION FIXED
TIME SWITCH 2	EVENT 01, DAYS :									TIME:____:____, ACTION: <u>ON</u>
"	EVENT 02 "	:								TIME:____:____, ACTION: <u>OFF</u>
"	EVENT 03 "	:								TIME:____:____, ACTION: <u>ON</u>
"	EVENT 04 "	:								TIME:____:____, ACTION: <u>OFF</u>

			DELETE AFTER EXECUTION Y/N											
HOLIDAY 1,	"	START DATE: / / ,FINISH DATE: / / ,D.A.E : Y / N												
" 2 "	"	: / : / :												
" 3 "	"	: / : / :												
" 4 "	"	: / : / :												
" 5 "	"	: / : / :												
" 6 "	"	: / : / :												
" 7 "	"	: / : / :												
" 8 "	"	: / : / :												
" 9 "	"	: / : / :												
" 10 "	"	: / : / :												
" 11 "	"	: / : / :												
" 12 "	"	: / : / :												
" 13 "	"	: / : / :												
" 14 "	"	: / : / :												

RELAY 1 – 4 RELAY ASSIGNMENTS

RELAY	MODE	DEADBAND(DB)	SWITCH. DIFF.(SD)	TIME DELAY (Tdly)	NOTES
1					
2					
3					
4					

RELAY 5 FAN CONTROL METHOD: ON or CYCLE

Y1 & Y2 ANALOGUE OUTPUT ASSIGNMENTS

ANALOG O/P	MODE	DEADBAND(DB)	PROP.BAND (PB)	INTEGRAL TIME	MIN O/P	MAX O/P	NOTES
Y1							
Y2							

“X” ANALOGUE INPUT CONFIGURATIONS

X I/P	PURPOSE	V / I/Passive	OFFSET	10v=	PCB JUMPER POS.	NOTES
X1	MAIN TEMP. SENSOR					
X2	REMOTE SETPOINT					
X3	O/A TEMP.SENSOR					
	O/A INDUCED S/P RESET :					
X4	AUXILIARY INPUT					
	HUMIDITY INDUCED S/P RESET :					
X5	MODBUS “A” COMMUNICATION TERMINAL		C			
X6	MODBUS “B” COMMUNICATION TERMINAL		C			
X7	CO2 SENSOR				V	

OTHER SETTINGS

M, T, W, T, F, S, S

NIGHT PURGE= ENABLED/DISABLED, DAYS: | | | | | | | |, START TIME= : , END TIME= :
ON DIFF = , OFF DIFF = , ON DELAY =

MODBUS = DISABLED / ADDRESS= , BAUDRATE =

MAIN CONTROLLER FUNCTION = STANDARD TEMP. / TIME SWITCH ONLY / X4 ONLY