HEVAC Control Agencies

AUSTRALIAN MANUFACTURER

ENDEAVOUR

STAND ALONE or BMS ZONE A/C CONTROLLER / TIME SWITCH

COMPATIBLE WITH A WIDE RANGE OF SENSORS

NEW

ROOM

DUCT

O/A WALL

PIPE

CONNECT UP TO 32 ENDEAVOURS TO HMI

Features

- ❖ **Scrolling LCD display showing all relevent information & current I/O status.**
- ❖ **Event Driven Time Switch programming allowing switching Past Midnight.**
- ❖ **5 x Analogue + 4 x Digital inputs / 5 x (8A) Relays + 2 x Analogue outputs.**
- ❖ **Economy Cycle use for Cooling, Heating & CO2 control when Suitable.**
- ❖ **Programmable "Start By" Internal 365 day Time Switch & /or Push Button triggered Run Timer & or Manual On/Off System Switch.**
- ❖ **Optional Remote Set Point inputs configurable as 10K, 0-10vDC or MODBUS.**
- ❖ **Most sensor inputs configurable as Resistance (passive), or (Active)- Voltage or Current.**
- ❖ **Data Logger to aid in service & system performance analysis.**
- ❖ **Automatic Night Purge for building cool down when O/A conditions suitable.**
- ❖ **Ext. Inputs for : Auto / Off / On, AHR & A/C Fault & Aux. digital I/P status.**
- ❖ **LED Indication of Relay Outputs.**
- ❖ **Preset for most Common application but easily Editable with intuitive Menu.**
- ❖ **Optional use CO2, Outside & Supply Air Temperature + Aux.0-10v inputs.**
- ❖ **Modbus for Remote HMI or BMS Override Control & Monitoring.**
- ❖ **Mounts in most M.C.B din rail enclosures.**
- ❖ **Set Point range 1- 99 celcius, analogue outputs set as P or P+ I, O/P deadbands +/- 20c**

The **ENDEAVOUR** Temperature controller is a programmable very flexible microprocessor based module designed to control A/C & Fan Coil units via remote zone sensors with optional use of many internal & external features: 365 day Time Switch, Run Timer, Outside & Supply Air temperature sensors, CO2 sensor input + new an assignable auxiliary universal 0-10v control & monitoring input, making this controller an ideal stand alone or BMS semi autonomous zone A/C controller. The ENDEAVOUR is intended for applications where On/Off control of Heating and Cooling stages and / or modulating control of actuators, compressors or fans is required. The controller is suitable for mounting in a mechanical services switchboard or the A/C units control cubicle, and connected to remote measuring sensors & optional override switches by 2 or 3 wire screened cable. Four of the five relays are programmable for their mode of operation as Compressor, Heating, Cooling stages or new (with this latest update) as a CO2, Auxiliary Time Switch relay, or any 0-10vdc input with individual editable switching characteristics. The 5th relay is dedicated as a System Run (fan / time switch) relay which can now also be set to cycle or continuous operation whilst the system is enabled. The two Analog 0-10vDC output signals can be programmed individually for start, range, P or P + I mode of operation. The controller is now lockable in 3 levels plus includes a basic data event logger. Other notable new features & enhancements include : A/C fault input, on/off relay / modulating CO2 control, can be set to operate as a Time Switch only (other functions inhibited), Min/Max limitation of analogue O/P's & keyboard override of any remote setpoints temporarily returning Setpoint to local control to aid quick A/C testing & service. Another recent enhancement now also allows an input connected to X4 to control spare internal relays , ie a 0-10v output type humidity sensor to control a spare internal relay for a high humidity control interlock.

EXTERNAL OVERRIDES & OPTIONAL CONNECTIONS

Upto 32 ENDEAVOUR controllers can be connected via 2 wire shielded RS485 MODBUS to the Hevac HMI-EZS colour touch screen master control panel (can be wall or panel mounted) for centralised control and monitoring, or up to 247 controllers as a semi autonomous zone controller to a 3rd party BMS system.

HMI-EZS

HSMO-DAQT

NEW DIGITAL DISPLAY TEMP./ HUMIDITY& CO2 SENSORS + SETPOINT & AHR BUTTONS

8 VERSIONS OF HSMO TO SUIT REQUIREMENTS

Remote System **AUTO / OFF & AHR** operation can be easily added by simply connecting a N/O switch & or push button in parallel with the main temperature sensor (X1 & M) wires in the field either in the form of a room sensor c/w switches or as separate switches mounted where convenient. Momentarily shorting the sensor wires results in triggering a run timer function (typically as an after hours run function) or constant shorting of these wires results in a system **OFF** function. These functions & more are also alternatively duplicated at the controller using the D1, D2 & M terminals for **AUTO / OFF / ON & AHR** overrides.

Other **Optional use Inputs** include : (X3) Outside air temperature, (X4) Auxiliary input (passive or active) for auxiliary temperature monitoring (ie S/A) , (X7) CO2 sensor, Scalable auxiliary universal 0-10vdc input (alternative X4 use) to control spare relays, (D3) on/off A/C fault status & (D4) a general use external on/off status monitoring BMS input (ie: S/A fan proving via on/off pressure switch).

With an optional **O/A temperature sensor** connected (X3), the Economy cycle damper operation for temperature control can be interlocked for free heating, cooling or both when the outside air temperature conditions are favorable. The fresh air sensor is compared to the room (or return air) temperature sensor and if outside air temperature is measured to be more suitable than using recycled air for free temperature control the motorized damper output signal will modulate per room temperature demand.
The use of outside air for temperature control can also be inhibited if the outside air temperature falls below an adjustable minimum temperature (factory set at 12C).

With an optional **CO2 sensor** connected (X7) , the economy cycle dampers will be also be 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 **Auxiliary input (X4)** can be used for monitoring a temperature sensor ie supply air **or** set as a 0-10vDC input for control of any spare relays in the controller not used for main (X1) temperature control. Can be set to display input as degrees C, volts, %, ppm, pa or no unit.

A **Remote Set Point** device (passive or active) can be connected to X2 on the controller. **If** a passive (default setting) adjuster is connected , 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). The passive remote set point potentiometer can be built into a room temperature sensor (SRT-DSP) or as a separate stand alone device (SPA-D). The range of the passive remote setpoint is fixed at 18 to 25 degrees over 0 to 10K or if an active 0-10V remote setpoint is used, 0v can be set to = -/+ 5c & full scale (10v) is adjustable up to 100c.

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 RELEVENT 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)

X2 Remote S/P input (Passive or Active) (Optional connection)

X3 O/A sensor input (Passive or Active) (Optional connection)

X4 Auxiliary input for monitoring or relay control (Optional connection)

X5 MODBUS RS485 - A Terminal

X6 MODBUS RS485 - B Terminal

X7 CO2 (default) or MODBUS SHIELD (GND)

M Common sensor & signal ground

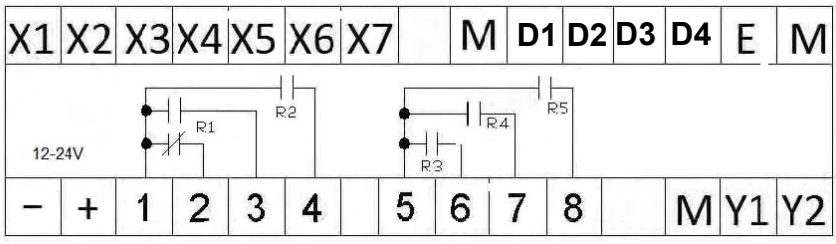
D1 Manual System OFF

D2 Manual System ON Override &/or AHR trigger input

D3 External FAULT I/P (for indication)

D4 External On/Off status I/P for BMS monitoring

E & M future Expansion module comms.



- 12-24 Volt Supply Neutral (internally connected to terminals M)

+ 12-24 Volt AC or DC Supply Active

1 Relay 1 & 2 Common

2 Relay 1 Normally Closed

3 Relay 1 Normally Open

4 Relay 2 Normally Open

5 Relay 3,4 & 5 Common

6 Relay 3 Normally Open

7 Relay 4 Normally Open

8 Relay 5 Normally Open (FAN)

M Signal ground

Y1 Analog Modulating Output 0-10 vDC

Y2 Analog Modulating Output 0-10 vDC

HEVAC

Typical Wiring Connections

HEVAC AVAILABLE SENSORS

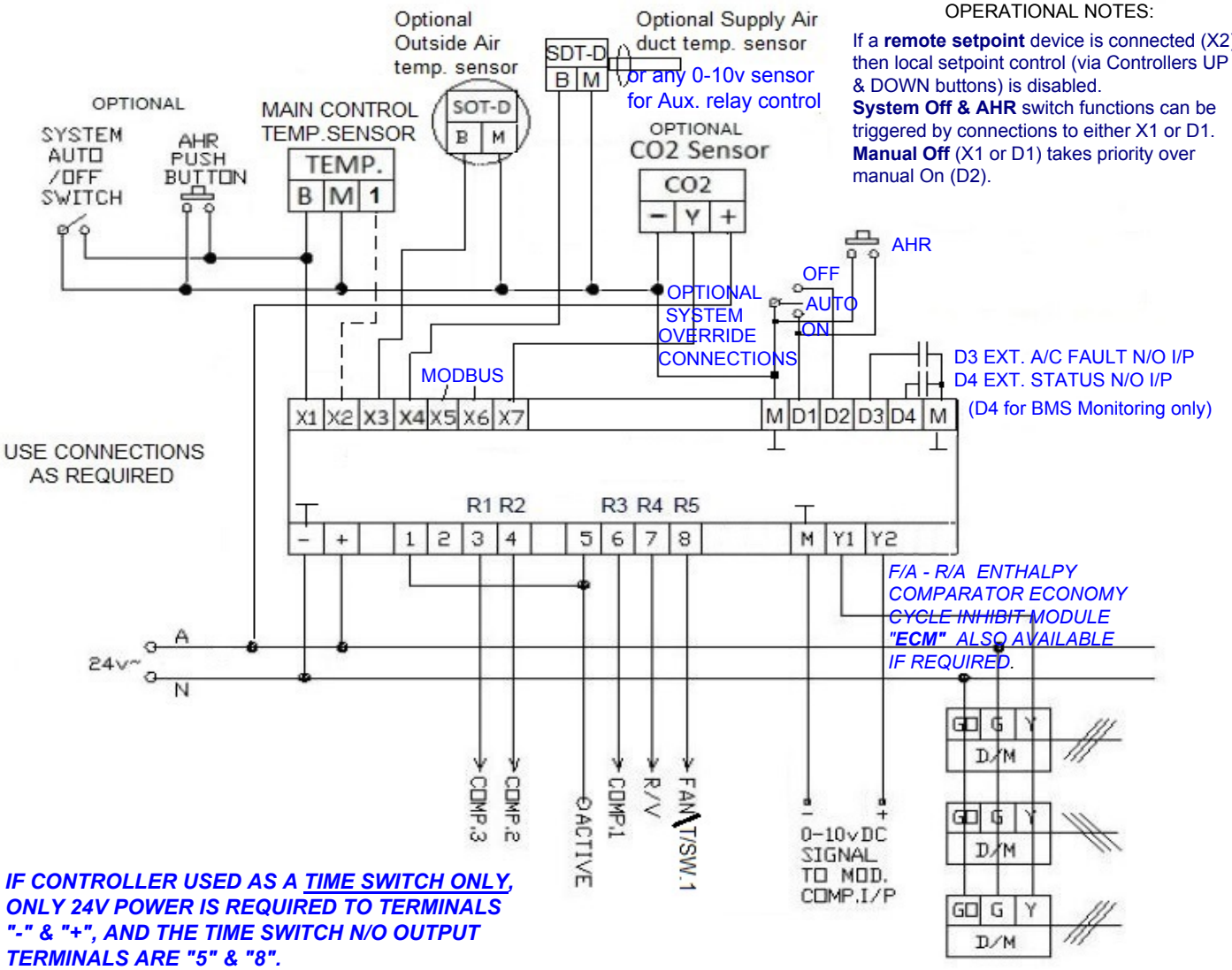
	SRT-D	ROOM TEMPERATURE SENSOR	2 WIRE
	SRT-DSW	" + ON/OFF SWITCH	2 WIRE
	SRT-DSP	" C/W SETPOINT POT.	3 WIRE
	SRT-DSPSW	" C/W S/P + ON/OFF SW.	3 WIRE
NEW	HSMO-DA	C/W DIGITAL DISPAY & S/P BUTTONS	4 WIRE
NEW	HSMO-DAQT	C/W TEMP/HUMID/CO2 + S/P & AHR BUTTONS	
	SDT-D	DUCT TEMPERATURE SENSOR	2 WIRE
	SOT-D	OUTSIDE AIR SENSOR (PASSIVE)	2 WIRE
	OSAO	OUTSIDE AIR SENSOR (ACTIVE)	3 WIRE
	HCRW5	as ROOM CO2 SENSOR only	3 WIRE
	HCRW5	ROOM TEMP. & CO2 SENSOR	4 WIRE

ALSO NOTE: 3rd party 4-20mA TYPE SENSORS CAN NOW ALSO ALTERNATIVELY BE USED FOR INPUTS X1-X4. PHYSICAL RELOCATION OF INPUT JUMPER REQUIRED.

COMING SOON : COMBINED TEMP./ HUMIDITY / CO2 / AHR BUTTON & ADJ. SETPOINT ROOM SENSOR C/W DISPLAY

OPERATIONAL NOTES:

If a **remote setpoint** device is connected (X2) then local setpoint control (via Controllers UP & DOWN buttons) is disabled.
System Off & AHR switch functions can be triggered by connections to either X1 or D1.
Manual Off (X1 or D1) takes priority over manual On (D2).



IF CONTROLLER USED AS A TIME SWITCH ONLY, ONLY 24V POWER IS REQUIRED TO TERMINALS "-" & "+", AND THE TIME SWITCH N/O OUTPUT TERMINALS ARE "5" & "8".

Wiring Considerations

Supply Voltage	The Controller requires a 12-24Volt AC or DC Supply. This diagram assumes a 24 Volt AC connection. Note terminals "M" & "-" are **internally** connected so as to allow a common ground reference.
Cabling Requirements	Its is recommended to connect remote input devices using twisted pair screened cable. Screened cable shield should be grounded to a good Earth at the controller end only.