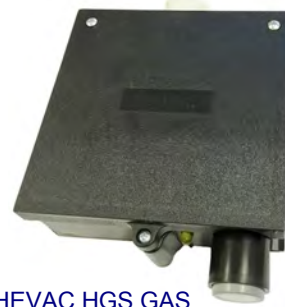


## CarPark VENTILATION CONTROLLER TO SUIT HEVAC HGS GAS SENSORS



HEVAC HGS GAS  
WALL SENSOR



SIREN / STROBE

### Features

- PROGRAMS TO COMPLY WITH BOTH **OCCUPIED & UNOCCUPIED** STANDARDS
- INTERNAL TIME SW. FOR OPTIONAL **PEAK PERIOD FORCED FAN RUN**
- ADJUSTABLE **IDLE MODE TIMER** TO FORCE FAN RUN (GAP & DURATION)
- CLEAR PLAIN ENGLISH L.C.D MESSAGE'S OF INPUT & OUTPUT STATUS
- HANDY **TEST / DEMO ROUTINE** FOR EASY COMMISSIONING & TESTING
- CAN READ ANY COMBINATION OF **CO & NO2** SENSORS
- UPTO 7 SENSORS, **EXPANDABLE** TO 42 WITH EXPANSION MODULES
- **NEW : EVENT LOGGER, N/O or N/C FAN FAULT I/P & IM OK RELAY OUTPUT**
- SETTINGS SITE ADJUSTABLE (**PASSWORD PROTECTED**)
- **RS485 MODBUS** COMMUNICATION
- **TIME WEIGHTED AVERAGE** OR **CURRENT VALUE** SENSOR RESPONSE

### Use

*The HCP7-F has been purpose built to comply with AS1668.2 Car Park CO control requirements in occupied & non occupied non naturally ventilated car parks. The controller can also be set to respond to NO2 sensors. Output operation can be easily set as 2 speed on/off or to modulate a fan via a VSD. Forced fan ON overrides are available & interlocked with internal time switches both for peak times and to start after an adjustable idle period for minimum ventilation requirements. The HCP7-F can read up to 7 Hevac HGS sensors directly or via expansion modules (EXP7) up to 42 sensors. External monitoring is also available via RS485 MODBUS. All output relays are voltage free permitting the use of AC or DC circuitry and are rated at 240v 8A. The HCP7 can be powered from 12-24 v DC or AC.*

## Keypad, displays & settings.

The controllers fascia includes 4 push buttons , a 2x16 character LCD screen and five L.E.D's indicating Low & High fan speeds, Strobe and Siren operation, and a common Fault, Demo & I'm OK led. The controllers 4 push buttons have the following functions:

"**MENU/ENTER**" : To edit the controllers settings, press this button to enter the controllers menu list (some menus are password protected).

"**MUTE / ESC**" : Used to exit a menu or as a Siren Mute, (which can also be muted by an external push button connected between terminals M and D2).

"**TEST / UP**" : pressing the "TEST" button causes normal operation to stop and a 5 minute demo/test program to run that simulates CO levels increasing from 0ppm to 63ppm & returning to 0 to demonstrate the effect on outputs and displays at various CO levels, note normal delay times are bypassed or reduced.

"**STATUS / DOWN**" : pushing the "STATUS" button causes the display to show input and output status .Push the up or down buttons to see all pages of information.

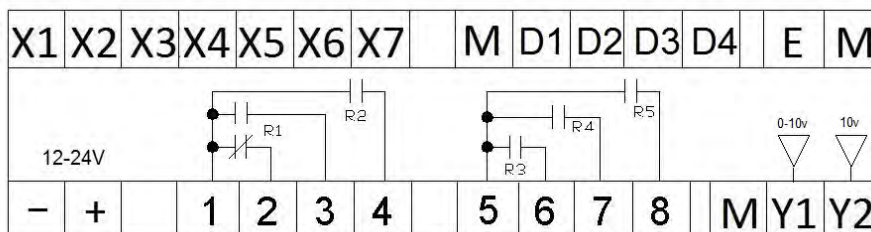
## TECHNICAL DETAILS

POWER CONSUMPTION USING 24vAC	@ 10 VA (MAX)	COLOUR	GREY
"	"	MATERIAL	POLYCARBONATE
	24vDC @ 400mA	UV STABILISED	YES
MAX Y1 (VSD O/P) PERMISSIBLE LOAD	1 mA (>10K ohm)	FIRE RETARDANT	YES
MAX SENSOR INPUT CURRENT	0.07mA (Typically 0.02)	SIZE	L105 X W105 X D60mm
6 MODULE DIN MODULE ENCLOSURE			

## TERMINAL DESIGNATIONS

<b>X1</b>	<b>GAS SENSOR INPUT 1</b>	
<b>X2</b>	"	<b>2</b>
<b>X3</b>	"	<b>3</b>
<b>X4</b>	"	<b>4</b>
<b>X5</b>	"	<b>5 or MODBUS "A"</b>
<b>X6</b>	"	<b>6 or " " "B"</b>
<b>X7</b>	"	<b>7 or " " comms shield</b>
<b>M</b>	<b>GROUND TERMINAL</b>	
<b>D1</b>	<b>FAN FAULT INPUT (settable as open or close on fault)</b>	
<b>D2</b>	<b>SIREN MUTE P.B INPUT</b>	
<b>D3</b>	<b>ENABLE T/SW. FORCED FAN RUN &amp;/or Manual run I/P</b>	
<b>D4</b>	<b>2 SPEED NOT VSD FAN OPERATION</b>	
<b>E</b>	<b>LOCAL BUS COMMS (to expansion module)</b>	
<b>M</b>	<b>GROUND TERMINAL</b>	

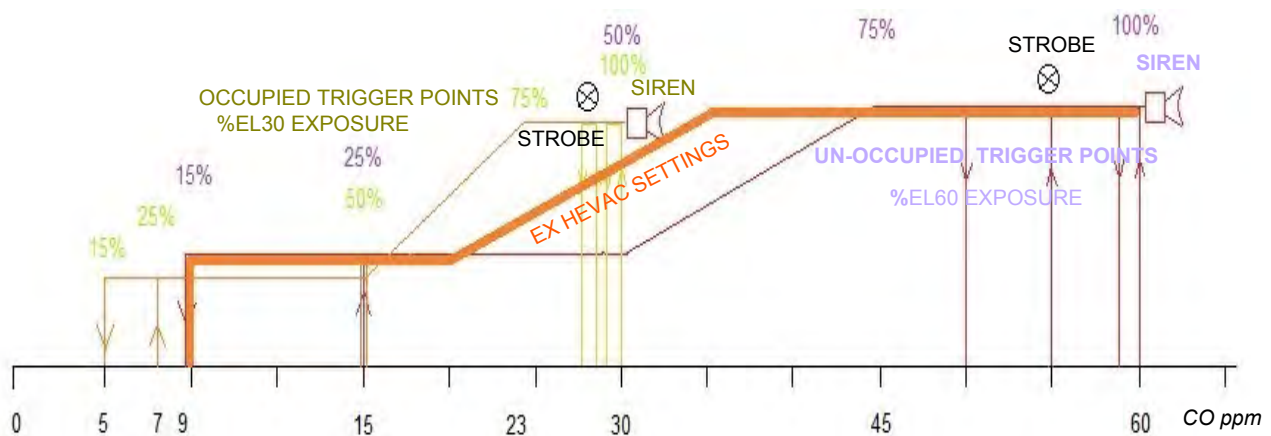
<b>-</b>	<b>12-24v NEUTRAL / GROUND</b>
<b>+</b>	<b>12-24v ACTIVE (AC or DC)</b>
<b>1</b>	<b>COMMON for RELAYS 1 &amp; 2</b>
<b>2</b>	<b>RELAY 1 N/C</b>
<b>3</b>	<b>RELAY 1 N/O- LOW SPEED</b>
<b>4</b>	<b>RELAY 2 N/O- HIGH SPEED</b>
<b>5</b>	<b>COMMON for RELAYS 3, 4 &amp; 5</b>
<b>6</b>	<b>RELAY 3 N/O- STROBE</b>
<b>7</b>	<b>RELAY 4 N/O- SIREN</b>
<b>8</b>	<b>RELAY 5 N/O- I'M OK= CLOSED</b>
<b>M</b>	<b>GROUND TERMINAL</b>
<b>Y1</b>	<b>VSD 0-10vDC OUTPUT</b>
<b>Y2</b>	<b>FIXED 10VDC OR Y1 MIRROR</b>



## AS1668.2 - 2012 COMPLIANCE

**\*\*\*NOTE \*\*\*:** AS1668.2-2012 Calls for CO ppm sensor response to be based on a Time Weighted Average (TWA) set over an 8 hour period (exposure limit time frame), and with different O/P trigger values depending on the space being used as an occupied or unoccupied CarPark. The standard sets occupied carparks to comply to a maximum exposure limit (%EL over 8 hours) of 30ppm & 60ppm for unoccupied carparks. Hevac has found that although the specified settings for unoccupied carparks satisfy the health & safety standards and conserve energy, they give poor comfort response to sudden build up of annoying fumes from an idling car or forklift etc, So as a reasonable compromise, Hevac has preset the HCP7 controller to exceed the AS1668.2 requirements, using the controllers "CUSTOM" programming menu to set outputs to use current value (CV) not TWA. The site commissioning technician can change most settings (with the custom menu) or select one of the inbuilt preset occupied or un-occupied programs that fully comply to the standards, but compliance to meet minimum standards then shifts from HEVAC to the programmer. **Note :** AS1668.2-2012 no longer calls up the use of NO2 sensors, although HEVAC still recommends their system inclusion particularly when many diesel trucks or cars use the parking facilities. The "CONFIGURE" menu for editing is password protected, please contact our office on 0395627888 or refer to the supplied programming manual. The controller incorporates a simple event data logger, or a 3rd party Modbus connected monitoring / data logging module c/w web interface is also available if required. Please refer to the standards for other criteria that affect system compliance.

*IT SHOULD BE NOTED THAT THE CODE DOESNT ACTUALLY CALL UP THE REQUIREMENT OF A STROBE LIGHT , THIS HAS BEEN A TRADITION THAT CONTROL SUPPLIERS HAVE ALSO SUPPLIED AND SET TO TRIGGER AS AN EARLY WARNING BEFORE THE REQUIRED SIREN TRIGGER POINT IS REACHED.*



*THE CODE ALSO CALLS UP FORCED RUNNING OF THE FAN SYSTEM TO MEET MINIMUM VENTILATION REQUIREMENTS IN A 24HR PERIOD. AS SUCH THE HCP7 INCLUDES AN IDLE TIMER THAT TRIGGERS FAN OPERATION FOR 10 MINUTES (ADJUSTABLE) IF THE FAN SYSTEM HASNT STARTED IN THE PREVIOUS 24HRS (ADJUSTABLE).*



**\* NOTE : THE CONTROLLER IS DELIVERED PRESET USING SETTINGS FROM THE "CUSTOM" MENU AS PER HEVAC RECOMMENDATIONS & EXCEED AS1668.2 REQUIREMENTS NO2 SETTINGS ARE BASED ON HEVAC RECOMMENDATIONS.**

**UNOCCUPIED MODE FACTORY FIXED SETTINGS (using 8Hr TWA) (as per AS1668.2)**

**FIXED PRESET SETTINGS FOR 2 SPEED FAN OUTPUT (LOW / HIGH)**

RELAY 1 TWA LOW SPEED ON > 15 ppm OFF < 9ppm CO / ON > 2ppm OFF <1.5ppm NO2 / 1 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 2 TWA HIGH SPEED ON > 45 ppm OFF < 30ppm CO / ON > 3ppm OFF < 2.5ppm NO2 / 2 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 3 TWA STROBE ON > 55 ppm OFF < 50ppm CO / ON > 3.5ppm OFF <3ppm NO2 / 1 Min. ON DELAY  
 RELAY 4 TWA SIREN ON > 60 ppm OFF < 55ppm CO / ON > 4ppm OFF < 3ppm NO2 / 4 Min. ON DELAY

**FIXED PRESET SETTINGS FOR VSD CONTROLLED FANS**

RELAY 1 TWA VSD ENABLE ON > 15 ppm OFF < 9ppm CO / ON > 2ppm OFF < 1.5ppm NO2 / 1 Min. ON DELAY/ 5 Min OFF DELAY  
 Y1 0-10v TWA VSD RAMP 100% > 45 ppm - Min < 30 ppm CO / 100% >3ppm - Min < 2ppm NO2 / + Integral time = 60 Minutes  
 RELAY 2 TWA ON > 60 ppm OFF < 55ppm CO / ON > 3ppm OFF < 2.5ppm NO2 / 2 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 3 TWA STROBE ON > 55 ppm OFF < 50ppm CO / ON > 3.5ppm OFF < 3ppm NO2 / 1 Min. ON DELAY  
 RELAY 4 TWA SIREN ON > 60 ppm OFF < 55ppm CO / ON > 4ppm OFF < 3ppm NO2 / 4 Min. ON DELAY

**OCCUPIED MODE FACTORY FIXED SETTINGS (using 8Hr TWA) (as per AS1668.2)**

RELAY 1 TWA LOW SPEED ON > 9 ppm OFF < 7ppm CO / ON > 2ppm OFF <1.5ppm NO2 / 1 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 2 TWA HIGH SPEED ON > 23 ppm OFF < 15ppm CO / ON > 3ppm OFF < 2ppm NO2 / 2 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 3 TWA STROBE ON > 28 ppm OFF < 26ppm CO / ON > 3.5ppm OFF < 3ppm NO2 / 1 Min. ON DELAY  
 RELAY 4 TWA SIREN ON > 30 ppm OFF < 28ppm CO / ON > 4ppm OFF < 3ppm NO2 / 4 Min. ON DELAY

**FIXED PRESET SETTINGS FOR VSD CONTROLLED FANS**

RELAY 1 TWA VSD ENABLE ON > 9 ppm OFF < 7ppm CO / ON > 2ppm OFF < 1.5ppm NO2 / 1 Min. ON DELAY/ 5 Min OFF DELAY  
 Y1 0-10v TWA VSD RAMP 100% > 23 ppm - Min < 15 ppm CO / 100% >3ppm - Min < 2ppm NO2 / + Integral time = 60 Minutes  
 RELAY 2 TWA ON > 30 ppm OFF < 28ppm CO / ON > 3ppm OFF < 2.5ppm NO2 / 2 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 3 TWA STROBE ON > 28 ppm OFF < 26ppm CO / ON > 3.5ppm OFF < 3ppm NO2 / 1 Min. ON DELAY  
 RELAY 4 TWA SIREN ON > 30 ppm OFF < 28ppm CO / ON > 4ppm OFF < 3ppm NO2 / 4 Min. ON DELAY

**\* CUSTOM MODE REVISED EX HEVAC DEFAULT SETTINGS (exceeds AS1668.2)**

**NOTE : ALL OUTPUT RESPONSES SET TO CV NOT TWA**

**FIXED PRESET SETTINGS FOR 2 SPEED FAN OUTPUT (LOW / HIGH)**

RELAY 1 CV LOW SPEED ON > 15 ppm OFF < 9ppm CO / ON > 2ppm OFF < 1.5ppm NO2 / 1 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 2 CV HIGH SPEED ON > 35 ppm OFF < 20ppm CO / ON > 3ppm OFF < 2.5ppm NO2 / 2 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 3 CV STROBE ON > 55 ppm OFF < 50ppm CO / ON > 3.5ppm OFF < 3ppm NO2 / 1 Min. ON DELAY  
 RELAY 4 CV SIREN ON > 60 ppm OFF < 55ppm CO / ON > 4ppm OFF < 3ppm NO2 / 4 Min. ON DELAY

**FIXED PRESET SETTINGS FOR VSD CONTROLLED FANS**

RELAY 1 CV VSD ENABLE ON > 15 ppm OFF < 9ppm CO / ON > 2ppm OFF < 1.5ppm NO2 / 1 Min. ON DELAY/ 5 Min OFF DELAY  
 Y1 0-10v CV VSD RAMP 100% >35 ppm - Min < 20ppm CO / 100% >3ppm - Min < 2ppm NO2 / + Integral time = 60 Mins.  
 RELAY 2 CV ON > 60 ppm OFF < 55ppm CO / ON > 3ppm OFF < 2.5ppm NO2 / 2 Min. ON DELAY/ 5 Min OFF DELAY  
 RELAY 3 CV STROBE ON > 55 ppm OFF < 50ppm CO / ON > 3.5ppm OFF < 3ppm NO2 / 1 Min ON DELAY  
 RELAY 4 CV SIREN ON > 60 ppm OFF < 55ppm CO / ON > 4ppm OFF < 3ppm NO2 / 4 Min. ON DELAY

**\*\*\*CHANGING EX HEVAC SETTINGS SHIFTS RESPONSABILITY FOR COMPLIANCE TO AUSTRALIAN STANDARDS FROM HEVAC TO THE COMMISSIONING PERSONAL\*\*\*. Using "CUSTOM" mode most settings are user adjustable.**

*(NOTE : UNDER VSD CONTROL, RELAY 2 INTERNALLY TAKES ON RELAY 4 TRIGGER SETTINGS AS AN OPTIONAL ALARM OUTPUT i.e. as an override fixed speed input into the VSD)*

## Operational notes

"TIME WEIGHTED AVERAGE" (TWA) is a method used to average out sensor readings to produce an average output value calculated over a set period, whereas "CURRENT VALUE" (CV) produces the actual current real time sensor value. To save energy & meet minimum safety requirements AS1668.2 calls up the use of TWA measured over an 8 hour period, Most CO control systems on the market tend to ignore this and can only respond to current value (which exceeds requirements but uses more energy). This controller can be set to use any combination of TWA or CV for the various outputs. The controller can also be set to force ON fan operation between several configurable blocks of time, intended for use when high periods of traffic are expected and to save cycling and fume build up. The controllers internal time switch is factory preset to force fan operation Monday to Friday in the morning between 7am till 9am and in the evening between 5pm till 7pm (adjustable). **To enable this feature an external link or switch must also be connected between terminals "M" & "D3". This input can alternatively be used as a forced fan run input, for example from a switch, a movement sensor (with built in run on timer) or & a thermostat, The forced fan run speed is also settable with a default of full speed.**

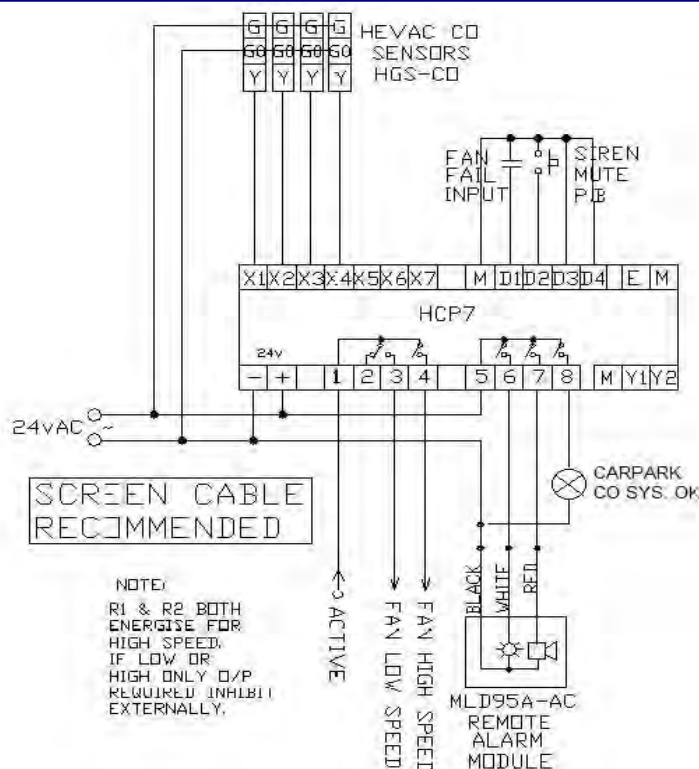
The controller also makes use of an "Idle Run Timer" routine that keeps track of the last fan operation time and automatically starts the fan to satisfy minimum ventilation requirements. The preset factory settings force fan ON operation after 24 hours of idle time and then to run for 10 minutes, both gap & duration settings are user adjustable. HEVAC have also included a feature to Inhibit this forced ON operation by use of an internal time switch, which blocks the Idle Timer triggering fan operation between certain hours so as not to cause unnecessary noise (for example) during night hours in an apartment building. The factory settings for this inhibit timer is to block operation between the hours of 10pm till 9am, Note: This inhibit routine does not stop a genuine fan start call due to a build up of CO or NO2 which is enabled to operate 24/7 as per the code. The number of connected sensors and the sensor measurement maximum value (allowing other brand of sensors to be used) are user adjustable in the menu system under the password protected "CONFIGURE CONTROLLER" sub menu. Please contact HEVAC on 039562788 for the password to edit values.

Analog output "Y2" is factory preset as a 10vDC output signal source for use (as example) as a EC fan full speed signal source via a "Auto/Manual" selector switch or for use as a sensor I/P test = full scale.

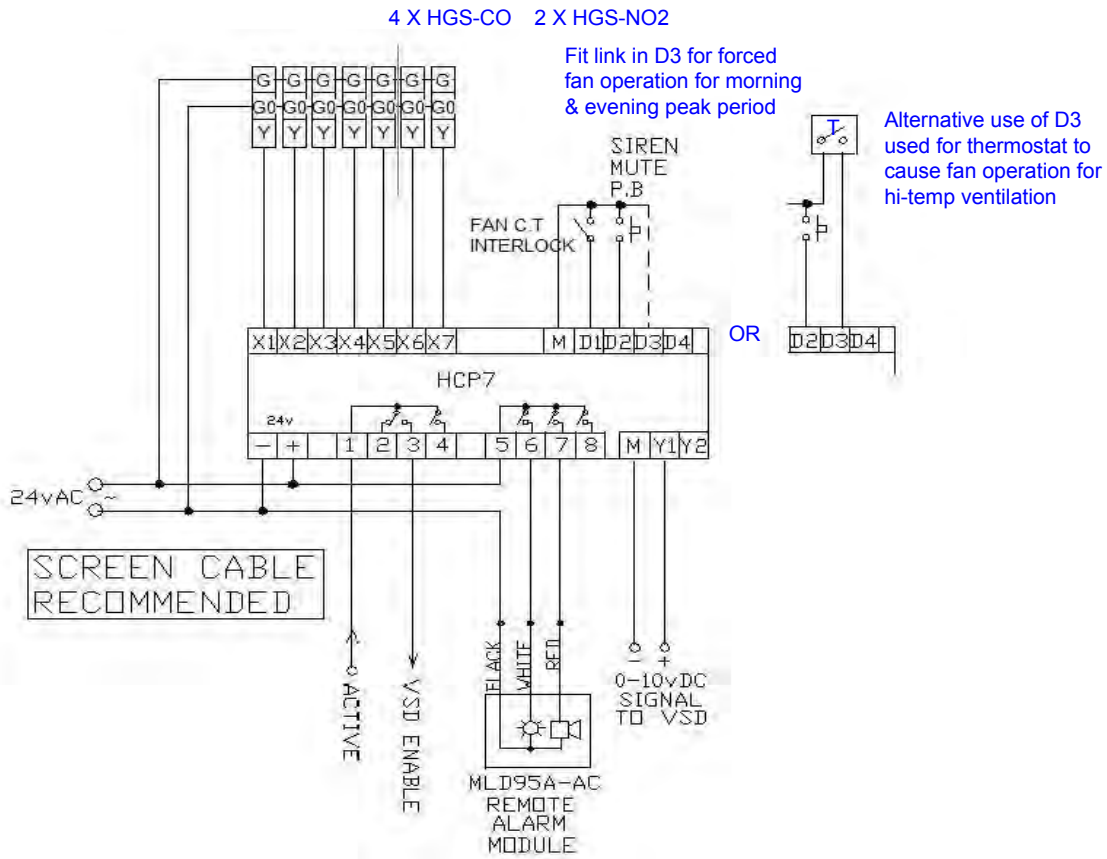
**New features** recently added now gives this controller simple data logging for event triggers to help diagnose faults and system behavior, Relay 5 now acts as an "I'm OK" output which holds relay 5's contacts closed when the controller has power and is operating correctly, and the user choice to set the fan fault input "D1" to react to close on fault (factory default) or open on fault, which better suits the use of C.T's for fan proving. Note fan fault response is only triggered when there is a fan run call.

This is a basic guide only, For complete editing & setup instructions please refer to the programming manual.

### Application Example (1) 4 HEVAC HGS-CO SENSORS CONNECTED using 2 SPEED LO-HI FAN CONTROL



## Application Example (2) 4 X HEVAC CO SENSORS & 2 X HEVAC NO2 SENSORS c/w MODULATING VSD OUTPUT



## Application Example (3) 14 HEVAC HGS CO SENSORS , c/w MODULATING VSD OUTPUT

