AIR*CO*N 8

CARBON MONOXIDE DETECTION & VENTILATION PANEL

INSTRUCTION MANUAL

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1. <u>DESCRIPTION OF THE SYSTEM</u>

The AirCOn 8 carbon monoxide detection panel is a single loop analogue addressable system, using the Zeta Addressable protocol.

The loop is divided into 8 zones. Zones 1 to 7 can have 1 to 14 CO detectors. The last two addresses per zone are reserved for Relay Modules (ZIOU) SEE TABLE BELOW. These are the first & second ventilation level relays. Zone 8 can have up to 12 detectors. Any unused addresses can be used for alarm sounders, which will activate if the CO level of any detector goes above the programmed alarm level.

The panel has one programmable ventilation level. The second ventilation level and the alarm level are calculated according to the level of the first ventilation level. These levels are global and apply to all 8 detection zones.

Any zone can be disabled by pressing the relevant on/off button.

ZONE ALLOCATION & DEVICE TYPE CHART

Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8	
Addr	Type	Addr	Type	Addr	Type	Addr	Type	Addr	Type	Addr	Type	Addr	Type	Addr	Type
1	CO	17	CO	33	CO	49	CO	65	CO	81	CO	97	CO	113	CO
2	CO	18	CO	34	CO	50	CO	66	CO	82	CO	98	CO	114	CO
3	CO	19	CO	35	CO	51	CO	67	CO	83	CO	99	CO	115	CO
4	CO	20	CO	36	CO	52	CO	68	CO	84	CO	100	CO	116	CO
5	CO	21	CO	37	CO	53	CO	69	CO	85	CO	101	CO	117	CO
6	CO	22	CO	38	CO	54	CO	70	CO	86	CO	102	CO	118	CO
7	CO	23	CO	39	CO	55	CO	71	CO	87	CO	103	CO	119	CO
8	CO	24	CO	40	CO	56	CO	72	CO	88	CO	104	CO	120	CO
9	CO	25	CO	41	CO	57	CO	73	CO	89	CO	105	CO	121	CO
10	CO	26	CO	42	CO	58	CO	74	CO	90	CO	106	CO	122	CO
11	CO	27	CO	43	CO	59	CO	75	CO	91	CO	107	CO	123	CO
12	CO	28	CO	44	CO	60	CO	76	CO	92	CO	108	CO	124	CO
13	CO	29	CO	45	CO	61	CO	77	CO	93	CO	109	CO	125	I/O 1ST
14	CO	30	CO	46	CO	62	CO	78	CO	94	CO	110	CO	126	I/O 2ND
15	I/O 1ST	31	I/O 1ST	47	I/O 1ST	63	I/O 1ST	79	I/O 1ST	95	I/O 1ST	111	I/O 1ST		
16	I/O 2ND	32	I/O 2ND	48	I/O 2ND	64	I/O 2ND	80	I/O 2ND	96	I/O 2ND	112	I/O 2ND		

NOTE: ANY UNUSED CO ADDRESSES CAN BE USED FOR LOOP SOUNDERS, WHICH WILL ACTIVATE ON AN ALARM CONDITION.

2. PANEL CONTROLS & INDICATIONS
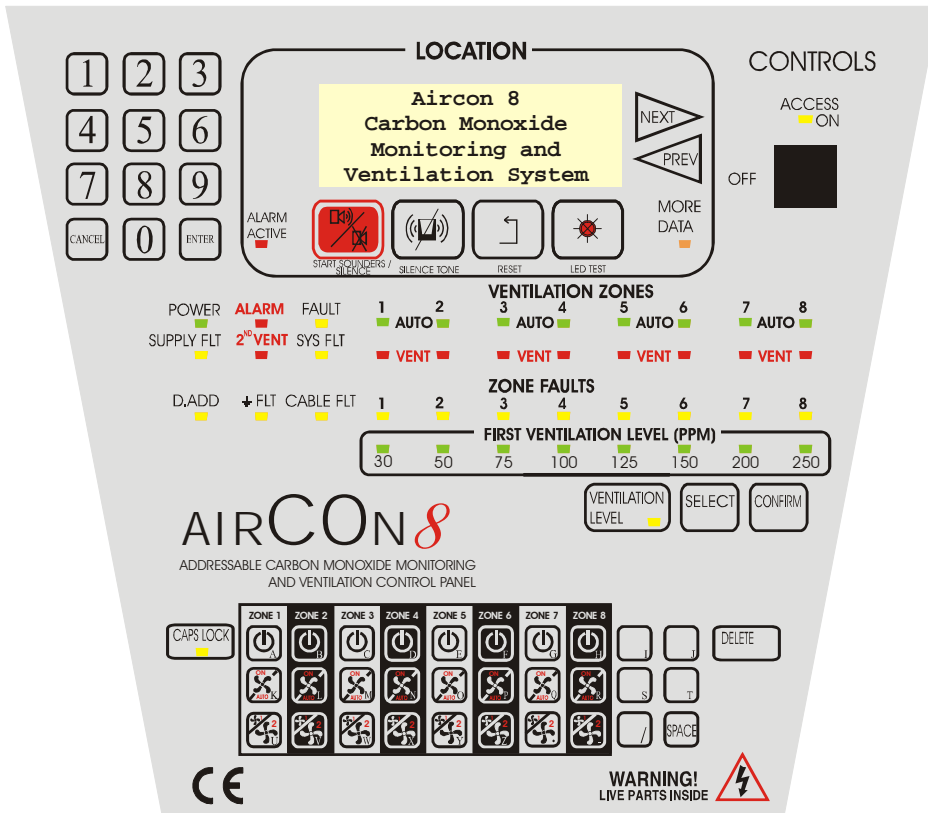
Each zone has the following indications:

AUTO (GREEN LED):
Indicates that the zone is in auto ventilation mode

VENT (RED LED):
STEADY – a detector in this zone is above the programmed ventilation level
FLASHING – A detector in this zone was above the vent level, but is now below it. The ventilation will continue for 5 minutes AFTER the detector drops below the vent threshold.

FAULT (YELLOW LED):
There is a fault on this zone. Check that no heads have been removed.

Each zone has the following controls:

   ZONE ON / OFF

Press to enable or disable the zone.

   MANUAL VENTILATION START

Manual ventilation can only be started for a zone that is on (AUTO LED ON). Once the ventilation has been started manually, the fans will be on for 5 minutes after the level has dropped below the programmed ventilation level.
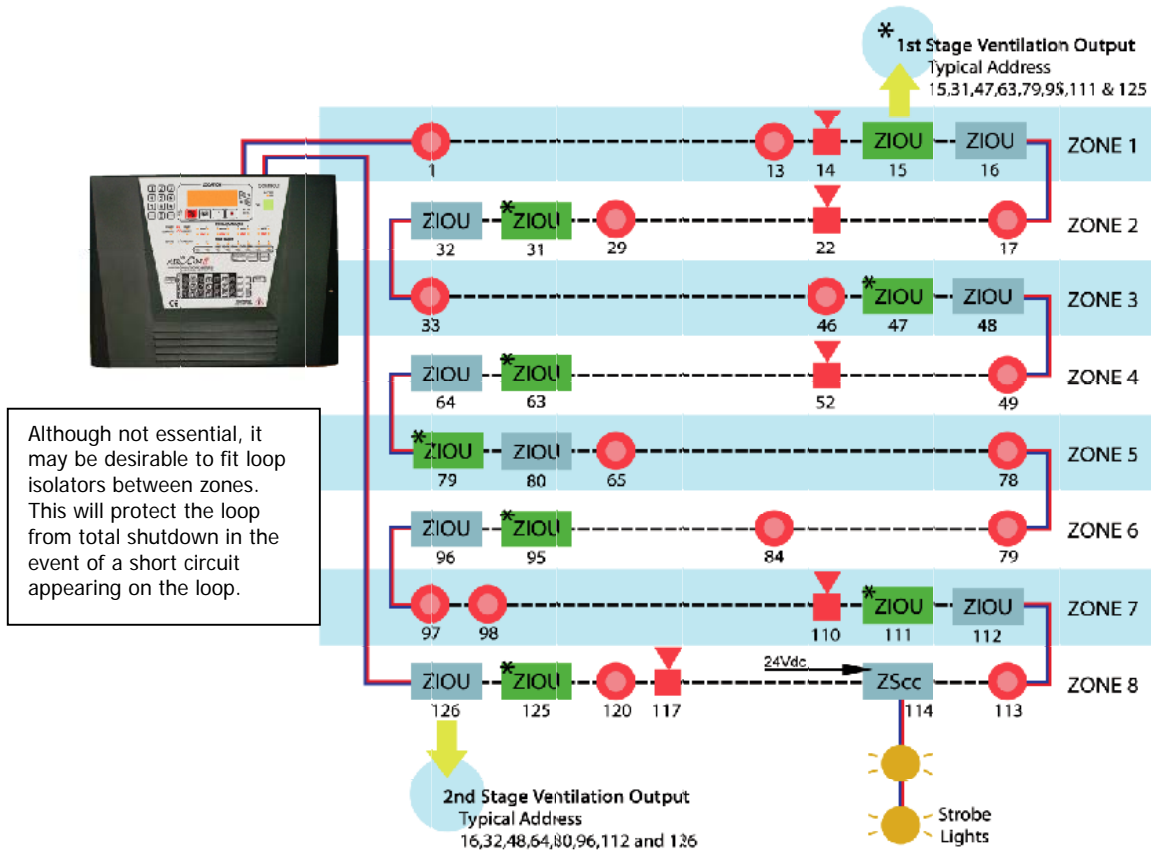
   START SECOND VENTILATION SPEED

This can only be started after the first ventilation has been started (either manually or automatically). The fans will be at their 2nd speed for 5 minutes after the level has dropped below the programmed ventilation level.

3. CONNECTING THE DETECTORS & RELAYS

The CO detectors, ventilation relays and alarm sounders are connected to a single addressable loop.

Although not essential, it may be desirable to fit loop isolators between zones. This will protect the loop from total shutdown in the event of a short circuit appearing on the loop.

The devices (detectors, interfaces and sounders) have a unique address set via a dip switch on the device. The address is binary, using switches 1 to 7. Valid addresses are 1 to 126.

*** NOTE: THE SWITCH SETTINGS FOR THE CO DETECTORS ARE DIFERENT TO THE SWITCH SETTINGS FOR THE RELAY MODULES & THE SOUNDERS. SEE BELOW***

FOR CO DETECTORS :
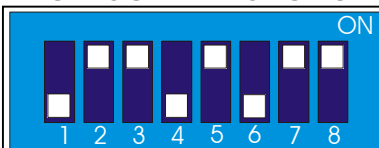
The address setting is binary, with the **OFF** position being binary **0** , and the **ON** position being binary **1**. Switch 8 is not used for setting the address.

If you are not familiar with binary, check the table on page 17, or use the following rule:

Switch 7 on = add 64,
Switch 6 on = add 32,
Switch 5 on = add 16,
Switch 4 on = add 8,
Switch 3 on = add 4,
Switch 2 on = add 2,
Switch 1 on = add 1.

The example shown would be:
switches 7, 5, 3 & 2
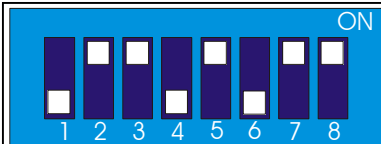=64 + 16 + 4 + 2 = Address 86

FOR SOUNDERS & INTERFACES:

The address setting is binary, with the **ON** position being binary **0** , and the **OFF** position being binary **1.** Switch 8 is not used for setting the address, but sometimes has a device specific function. (check instructions that came with the device)

If you are not familiar with binary, check the table on page 17, or use the following rule:

Switch 7 off = add 64,
Switch 6 off = add 32,
Switch 5 off = add 16,
Switch 4 off = add 8,
Switch 3 off = add 4,
Switch 2 off = add 2,
Switch 1 off = add 1.

The example shown would be:
switches 6, 4 & 1
=32 + 8 + 1 = Address 41

When all devices have been connected and addressed, turn the controls keyswitch to the ACCESS ON position. The access LED will light. Press 3 6 9 to enter the main menu. Select option 3 to configure the loop.

During configuration, any zone that contains a CO detector will light its green "AUTO" LED to show that the zone contains detectors and has entered the "Auto Vent mode" (See ventilation modes later in this manual)

4. LABELLING THE DEVICES (OPTIONAL)

As the Aircon 8 panel is analogue addressable, it has the option of giving each device (detector, interface or sounder) a 20 character label. When an event occurs at the panel (Ventilation, alarm or fault), the panel will display the label entered for the device, thus helping to locate the event. (The panel will still function perfectly without any labels entered).

1. turn keyswitch to the on position and enter the access code (3 6 9)

2. Select option 4 for message editing. The panel will now ask for its write enable switch to be set to the on position . (This is the dip switch on the CPU board, switch 1).

```
Please Set The
Write Enable Switch
To the On Position
```

3. The panel will now ask for the loop number, and loop address of device being named to be entered. Press enter to confirm loop 1, and enter again to confirm address 001. Enter the device label using the built in keyboard. The label can be 20 characters long, so try to be as descriptive as possible.

```
  Message Editing
Loop:1   Address:001
Floor 1. Row 20
Can: Exit   Ent: Next
```

Use the caps lock for capital letters. The delete button is used to correct mistakes. When the label has been entered, record the device type & label in the system setup chart in the user manual. Press enter 3 times to move to the next device (or enter the loop number and address to move forward several places.

12 When all devices have been entered, press Cancel to exit the message editing screen. The panel will askfor the write enable switch to be set back to the off position .

```
Please Set The
Write Enable Switch
To the Off Position
```

NOTE: IF THE PANEL IS POWERED DOWN WITH THE WRITE ENABLE SWITCH ON, IT WILL ERASE THE DEVICE LABELS WHEN IT IS RE-POWERED.

5. <u>VENTILATION LEVELS</u>

On the AirCOn 8 Analogue Addressable CO panel, there are 3 levels of ventilation. They are First Ventilation Level, Second Ventilation Level (for use with equipment with 2 speed fans), and alarm. For ease of use, only the 1st ventilation level can be programmed by the user. The other 2 levels will be set automatically depending on the level programmed for the first ventilation, according to the table below:-

1ST VENTILATION LEVEL	2nd VENTILATION LEVEL	ALARM LEVEL
30 ppm	50 ppm	75 ppm
50 ppm	75 ppm	100 ppm
75 ppm	100 ppm	150 ppm
100 ppm	125 ppm	200 ppm
125 ppm	150 ppm	250 ppm
150 ppm	175 ppm	300 ppm
200 ppm	225 ppm	300 ppm
250 ppm	275 ppm	300 ppm

The ventilation level programmed will apply to all 8 zones

The default value is:-
    first ventilation level = 50ppm,
    second ventilation level = 75ppm,
    alarm level = 100ppm,

CHANGING THE VENTILATION (AND ALARM) LEVELS

Remember that you can only select the ventilation level, as the alarm level is set automatically, according to the table above.

If you want to change the ventilation level, press the ventilation level button. The yellow led will light to confirm that you are changing the ventilation level. Press select button, and the Green Vent Level LED will change position

30 ppm – 50 ppm – 75 ppm – 100 ppm – 125 ppm – 150 ppm – 200 ppm – 250 ppm – 30 ppm etc

When the LED is at the desired ventilation level, press confirm to select it. The new ventilation level has now been set for all 8 zones.

6. <u>VENTILATION MODES</u>

The Aircon 8 Panel has the following operation modes for ventilation:-

- <u>Automatic ventilation mode:</u> This is the mode selected during configuration. The AUTO led will light up to confirm this status.

- <u>Manual ventilation mode-first speed:</u> By pressing (manual start) the panel will activate the first ventilation level relay for that zone. The Zone Vent LED will flash (to show that all detectors are below the vent level). A Manual start can only be performed for a zone that is on (auto LED on), and the relay will stay energised for 5 minutes

- <u>Manual ventilation mode-second speed:</u> By pressing (Start Second Speed Ventilation) the panel will activate the second ventilation level relay for that zone. The 2nd VENT LED will be on. The second ventilation speed can only be activated if the First ventilation is active (either from a manual or automatic start).

- <u>Disconnection mode:</u> By pressing (Zone On / Off) the zone will be turned off, and will not react to any signals from detectors. Its green Auto LED will be off.

7 <u>SILENCING ACOUSTIC SIGNALS</u>

The Aircon 8 panel will not give an audible signal for ventilation events. This is part of its normal operation, so it does not need to give an audible signal. It will make an audible signal for a fault condition, or for an alarm condition.

To silence a fault signal, turn the keyswitch to on and press the silence tone button.

To silence an alarm condition, turn the keyswitch to on and press stop/start sounders. This will turn off any sounders which are connected to the system. Then Press the Silence tone to turn off the panel's buzzer. Press the reset button after the CO has cleared.

8. <u>FAULT INDICATORS AND MESSAGES DISPLAYED</u>

The AirCOn 8 panel can detect the following faults:

Double Address:
This means that 2 detectors or modules have been given the same binary address. If both the devices are detectors, the Aircon panel will light the detectors LED to indicate the fault.

Cable (Loop) Fault:
This means that the panel has detected a fault (either open circuit or short circuit) in the cable loop. Check the cable systematically to locate the problem.

Supply fault:
Either mains power or battery backup power has been lost. Check the supply is present, and the relevant fuses are intact.

Earth fault:
This means that there is a short circuit between a part of the system wiring and earth. This usually means there is a short between the one of the cables in the detection loop and the cable screen.

Zone Fault:
This means that one of the devices in that zone has stopped communicating with the panel, or has detected an internal fault and is reporting this to the panel. Check that the device has not been removed, and that the device is communicating with the panel (check the detector in the device status menu- see next section)

9. <u>VIEWING INDIVIDUAL DETECTORS</u>

To view the CO level at a particular detector,
1. Turn on the access keyswitch
2. enter the menu access code (3 6 9)
3. select "Device status" (option 5)
4. press next to scroll to the desired device (or press 1 (enter) 047 (enter) to skip to address 47 for example)
5. The screen will display:

```
Device Type: CO  *
Value: <4  No Devs:1
====================
Loop:1   Address:001
```

The Value is the detector reading in <u>ppm</u>

The detector itself actually communicates a binary analogue value to the Aircon panel. The analogue value responds to a ppm reading, as shown in the table below.

An.Value	ppm Value	An.Value	ppm Value	An.Value	ppm Value
8 or less	Fault value	29	100	50	205
9	<4	30	105	51	210
10	5	31	110	52	215
11	10	32	115	53	220
12	15	33	120	54	225
13	20	34	125	55	230
14	25	35	130	56	235
15	30	36	135	57	240
16	35	37	140	58	245
17	40	38	145	59	250
18	45	39	150	60	255
19	50	40	155	61	260
20	55	41	160	62	265
21	60	42	165	63	270
22	65	43	170	64	275
23	70	44	175	65	280
24	75	45	180	66	285
25	80	46	185	67	290
26	85	47	190	68	295
27	90	48	195	69	300
28	95	49	200	70	305

10 <u>DETECTOR LED CODES</u>

- **1 green pulse every 3 secs:** correct operation
- **Permanently lit up(red)-no alarm on panel**: the detector has been set to the same address as another device on the loop. Check the system setup chart to locate the double address.
- **Permanently lit up(red)- panel in alarm**: the CO concentration measured by the detector is equal or greater than the alarm level (see table for alarm level for each ventilation setting)

11. <u>TESTING THE DETECTOR WITH GAS</u>

The Zeta Addressable CO detector can be tested with a standard smoke detector test pole fitted with a canister of Carbon Monoxide gas. The detector is an electrolytic cell type, so the chamber is constantly monitored.

<u>Remember that diesel vehicles do not generate CO, so can not be used to "test" the detectors.</u>
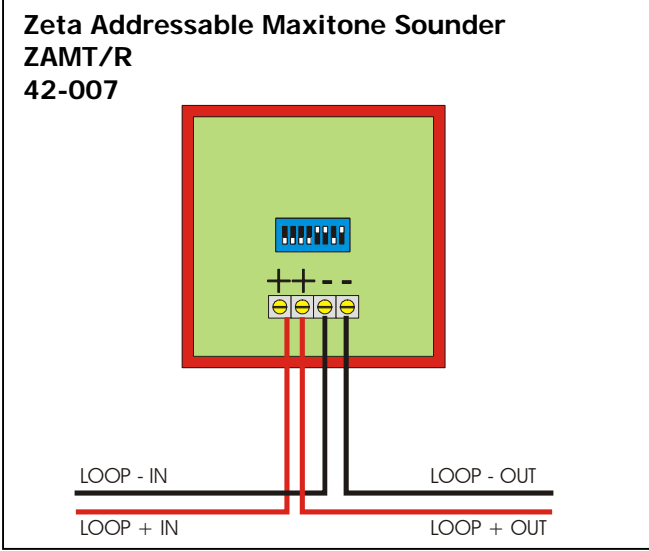
12. <u>TECHNICAL CHARACTERISTICS OF THE PANEL</u>

TECHNOLOGY   Dual 8 bit microprocessor

POWER SUPPLY   230V ac: Giving 1.1A @ 29V dc

MAXIMUM CAPACITY   8 Zones,
14 x CO zone 1-7, 12 x CO zone 8 : 110 detectors

MAX CABLE LENGTH   Depends on max. current & cable size. See table.

Maximum Loop Current (in Alarm)	500 mA	400 mA	300 mA	200 mA
1mm CSA cable	500 m	625 m	830 m	1250 m
1.5mm CSA cable	750 m	930 m	1250 m	1870 m
2.5mm CSA cable	1000 m	1250 m	1660 m	2500 m

STATUS MEMORY   Non-volatile E² PROM with 10 year data memory

VENTILATION LEVELS   8 programmable levels, 2 speed output optional

ALARM LEVELS   8 levels linked to ventilation level

VENTILATION OUTPUT   Loop Powered relay module 1A, SELV

ALARM OUTPUT   29V 50mA output (to drive relay)
Addressable sounders (on any spare address)

DIMENTIONS   355 mm x 275 mm x 100 mm

12 **CONNECTION DIAGRAMS**

Zeta Addressable CO Detector
CO800
47-015

LOOP + IN   LOOP + OUT

Zeta Input Output Unit
ZIOU
48-105

N/C
CM
N/O

47K EOL 0.5W

LOOP - IN   LOOP - OUT
LOOP + IN   LOOP + OUT

Fyreye Loop Isolator
FEA-ISO
80-091

LOOP - IN   LOOP - OUT
LOOP + IN   LOOP + OUT

Zeta Addressable Maxitone Sounder
ZAMT/R
42-007

LOOP - IN   LOOP - OUT
LOOP + IN   LOOP + OUT
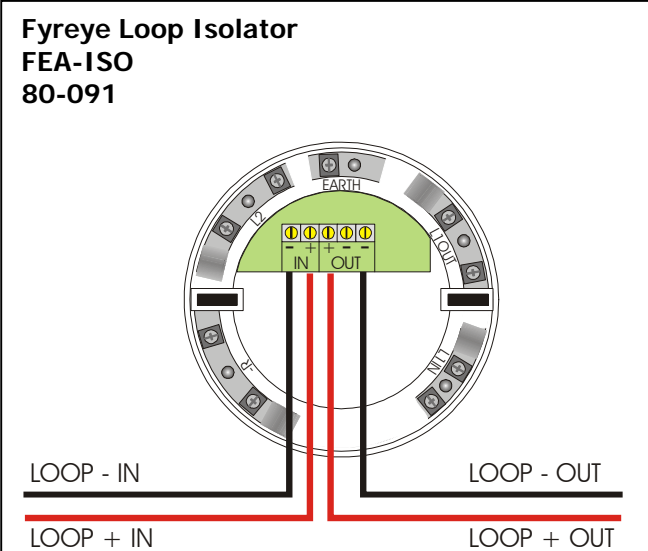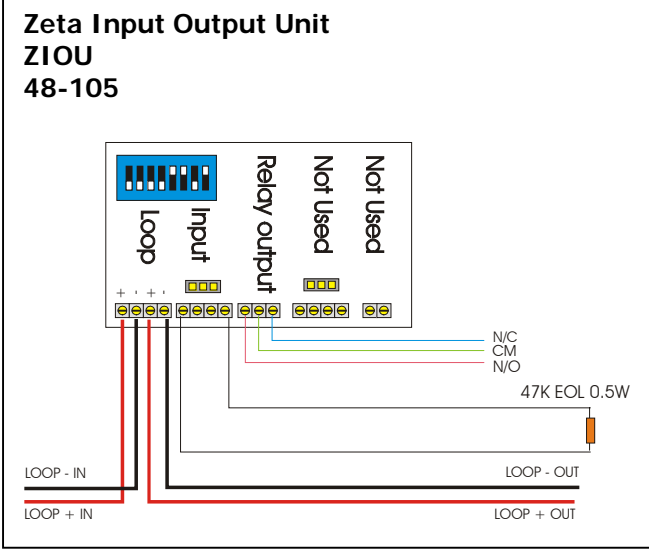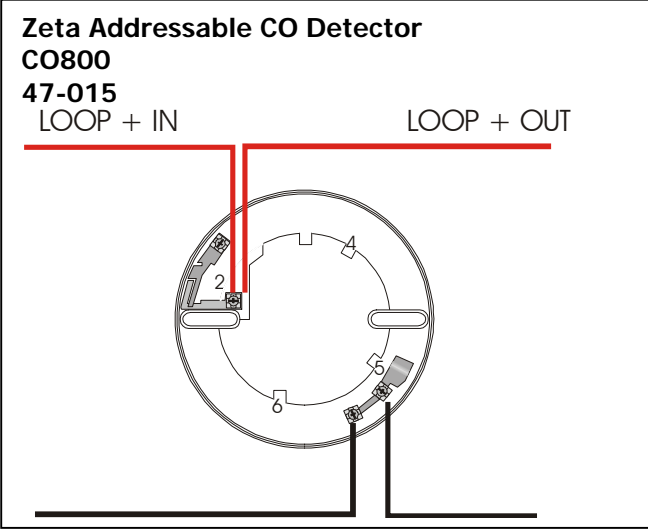
14. GENERAL RECOMMENDATIONS

1.- Do not connect the detectors to their bases until the whole building work has been carried out and remember that once installed, power should be provided as soon as possible.

2.- To carry out the installation, use an individual duct and avoid installing the detector close to sources that generate electromagnetic disturbances (fluorescent lights, engines, counters, etc.) It you cannot avoid installing them close to these disturbances, we recommend you use shielded cable (hose)

3.- Do not use the detector base as a junction box to make connections to more than one detector, use the terminals supplied for the cabling of the detector base.

4.- If extra holes must be drilled in the control unit cabinet, take care to clean the cabinet of all swarf, as the conductive coating could irreversibly damage the electronics.

5.- In compliance with the STANDARD EN 6.1010-1, 1.5mm2 monopole cable should be used for the 220 AC connection to the control unit, protecting the input with a 5A contactor or circuit breaker and installing it as close as possible to the control unit.

6.- The minimum voltage needed for a detector to be able to function is 17V. If long cable runs are used, check the voltage of the first, middle and last detector on the loop.

7.- When the installation is 5 years old the detectors should be replaced and system recommissioned.

8.- REMEMBER that the detectors should not be left in the installation when:
- The control unit is disconnected
- There is no voltage or when there is only temporary power supply for the building work
- The building work has not been completely finished
- When maintenance work is being carried out, such as painting, changes to structure, when floors are being degreased, etc.

When any of the above circumstances cannot be avoided, remove the detectors, store them in their boxes and keep them in a clean and dry place.

15. SYSTEM DESCRIPTION CHART

<u>This must be fully recorded by an authorised Engineer before system handover</u>.

INSTALLATION LOCATION:_____LOOP 1

ADDR	ZONE	TYPE	LABEL	ADDR	ZONE	TYPE	LABEL	ADDR	ZONE	TYPE	LABEL
1	1			43	3			85	6		
2	1			44	3			86	6		
3	1			45	3			87	6		
4	1			46	3			88	6		
5	1			47	3			89	6		
6	1			48	3			90	6		
7	1			49	4			91	6		
8	1			50	4			92	6		
9	1			51	4			93	6		
10	1			52	4			94	6		
11	1			53	4			95	6		
12	1			54	4			96	6		
13	1			55	4			97	7		
14	1			56	4			98	7		
15	1			57	4			99	7		
16	1			58	4			100	7		
17	2			59	4			101	7		
18	2			60	4			102	7		
19	2			61	4			103	7		
20	2			62	4			104	7		
21	2			63	4			105	7		
22	2			64	4			106	7		
23	2			65	5			107	7		
24	2			66	5			108	7		
25	2			67	5			109	7		
26	2			68	5			110	7		
27	2			69	5			111	7		
28	2			70	5			112	7		
29	2			71	5			113	8		
30	2			72	5			114	8		
31	2			73	5			115	8		
32	2			74	5			116	8		
33	3			75	5			117	8		
34	3			76	5			118	8		
35	3			77	5			119	8		
36	3			78	5			120	8		
37	3			79	5			121	8		
38	3			80	5			122	8		
39	3			81	6			123	8		
40	3			82	6			124	8		
41	3			83	6			125	8		
42	3			84	6			126	8		

<u>Pre-Commissioning Cable Checks</u>
+ve in to +ve out less than 24 ohms_____ -ve in to -ve out less than 24 ohms_____
+ve to –ve greater than 500k ohm_____ +ve to Earth greater than 1M ohm._____
-ve to Earth greater than 1M ohm._____ +ve to –ve less than 50 mV pickup (AC & DC)_____

14