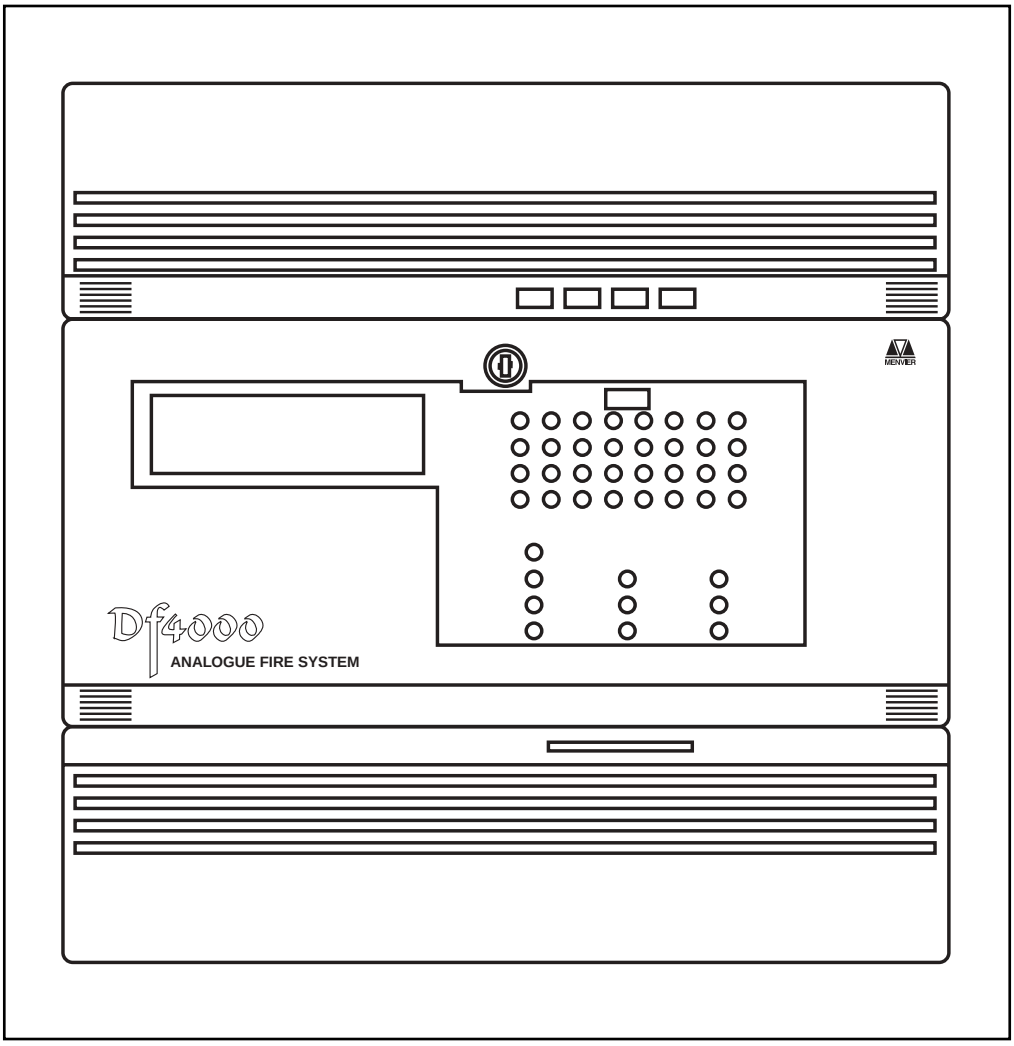
Analogue Addressable DF4000 Fire Detection System



INSTALLATION INSTRUCTIONS AND OPERATING MANUAL

MENVIER

Introduction to the manual

This is the fourth edition (Issue D) of the Menvier DF4000 Manual. It is presented in loose leaf format for quick and easy reference.

There are 7 parts to the complete manual, parts 1 and 7 however, are omitted from this particular manual as they do not relate to the installation and operation of the system.

Each part of this manual is separately numbered and starts with its own detailed contents page. For your convenience a brief outline of each part's content is given below.

Outline of contents

Revision record sheet

This sheet to be up-issued with table of contents

List all up-dated information including up-dates to table of contents and all information contained within this part of manual, i.e. PCB issue up-dates etc.

NOTE: Revision sheet, Contents sheet and up-date pages MUST REPLACE existing pages when an up-date has been made, discarding previous pages.

Rev	Date	Section	Revision details	Comments
D	10/11/95	All	'Defender' (or 'Defender 2') changed to 'Menvier Defender' (or (Menvier Defender 2').	
D	10/11/95	Part 1, Page 1	Alteration to enclosure diagram.	
D	10/11/95	Part 1, Page 25	Remote signal delay changed to 10 minutes max.	
D	10/11/95	Part 3, Contents	Contents page updated to include addition of extra page and text re-arrangement.	
D	10/11/95	Part 3, Pages 1 and 13	Replacement of AXA1 diagrams with new single loop panel enclosure diagrams.	
D	10/11/95	Part 3, Pages 2 and 3	Alterations to enclosure diagrams (buttons removed & logo added).	
D	10/11/95	Part 3, Page 14	'Power Supply Installation' text moved from page 13.	
D	10/11/95	Part 3, Page 15	'Connecting Up the System' text moved from page 14.	
D	10/11/95	Part 3, Page 15	Inclusion of 'Additional Notes for Electromagnetic Compatibility'.	
D	10/11/95	Part 3, Pages 16 to 20	Additional page to allow for new panel diagram & EMC notes has advanced pages 15 -19 by 1 page.	
D	10/11/95	Index	Inclusion of Electromagnetic Compatibility.	
E	04/11/02	All	Alterations to Logo and MIU770 changed to MIU771	
E	04/11/02	All	‘Defender 2’ changed to DF4000	

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PART 2: MENVIER DF4000 SYSTEM DESIGN

Introduction

The following Design Section will help you to design and install the Menvier DF4000 Fire Detection System in accordance with BS5839. Please note, howevever, that these notes are not exhaustive and reference should be made to the appropriate sections of BS5839 with regard to the specific choice/ installation and location of equipment. Menvier has a team of engineers who will be pleased to give advice on the design of specific systems. If in doubt please contact the Menvier Sales Office.

Contents

Choice of Components

General guidance on fire detectors

The Menvier DF4000 system is designed to be operated with analogue detectors. These may be used as conventional addressable detectors but, if they are operated using the Customer Data Non Volatile RAM (CDR) facilities, additional features are available.

By using appropriate interfaces it is possible to use the Menvier DF4000 system with conventional detectors and call points. Although this may be appropriate when expanding an existing system, some of the advanced functions of the Menvier DF4000 system will not be available so it is not recommended for new installations.

Smoke detectors normally give a much faster response to a fire than heat detectors. In general it takes a fire ten times as big to activate a heat detector as a smoke detector. However, in some environments (e.g. high dust areas), smoke detectors may be unsuitable.

Selection of smoke detectors

Smoke detectors should not be used in locations where there is likely to be ambient dust/smoke or fumes because of the increased possibility of false alarms (for example in a kitchen). If conditions at the installation are likely to be fairly clean there are 2 types of smoke detector to consider: the MAI710 lonisation smoke detector (labelled red) and the MAP720 Photoelectric smoke detector (labelled black).

lonisation smoke detectors work by using a small radioactive source inside a special chamber generating low-level radiation which is absorbed by smoke particles and puts the detector into alarm status. They are most sensitive to small smoke particles such as those formed by flaming or fast-burning fires - particularly where the source of the fire is close to the detector. They are also more sensitive to cigarette smoke and should not be used where cigarette smoke is normally present.

lonisation detectors are suitable for use where a fast burning fire might be expected. For example, where there are liquid fuels or other fast burning materials. However, certain fumes can cause false alarms and this needs to be taken into consideration.

Photoelectric smoke detectors are activated by the action of smoke particles scattering light and are more sensitive to larger particles of smoke. This makes them more sensitive to slow burning fires such as smouldering materials or smoke that has travelled a long distance from the root of the fire. Photoelectric detectors are unaffected by draughts so they should be used in conjunction with duct probes for measuring smoke in air ducts,or where there is likely to be a fast moving air flow which might affect the operation of an ionisation detector.

Both the MAI710 and MAP720 detectors are intelligent sensing devices designed to operate specifically with the AXA fire system. As standard, they have an in-built alarm level to the requirements of EN54, but the sensitivity level of the detectors can be varied from the AXA control panel. This allows the detector to be accurately programmed to give maximum sensitivity with minimum likelihood of false alarm.

They are also self monitoring so that the system is notified if the detector background level should rise (a high level fault indicating the need for service), or fall, (indicating a low level fault in the sensing mechanism). Self-monitoring detectors are therefore superior to both conventional and addressable detectors which only report the wiring or presence of the detector.

Selection of heat detectors

A single programmable heat detector, the MAH730, is designed to operate with the Menvier AXA system. This single device gives the same performance as that offered by the three types of heat detectors found in conventional and addressable systems. The standard sensitivity of the MAH730 detector is similar to those set to EN54 grade 1 which means it gives the fastest response. If a slower response or a higher temperature response is required, this can be obtained by programming the customer installation to invoke a fixed temperature response or higher temperature response as required. The MAH730 detector has the same enhanced monitoring as the two smoke detectors (see above) and confirms normal operation if all is well, although it does interpret any change in background level in a different way because it is dependent on temperature.

Selection of call points

Choosing call points is simpler than choosing detectors because there are basically only two types. The call points can be surface or flush mounted and accessories are available to make installation as simple as possible.

The MBG613, MBG607/617 are specifically for use with the AXA addressable system. They contain a socket to take the special AX address modules and are wired directly to the main address loop. The MBG617 is designed for more onerous conditions and is rated at IP65. It should be used where an external call point is required or where high levels of dust or moisture are expected.

Note: The MBG613 will fit a standard flush fixing single gang box.

The MBG104R/MBG114R/MBG914 call point is designed for standard conventional alarm systems but it can be used on the AXA system if connected via a MIU771 address interface unit. This method allows more than one call point to be connected to a single address thereby reducing the addresses required but with the disadvantage of not knowing exactly which device is signalling a fire.

Note: MBG103R/MBG113R/MGB913 are the flush mounting convention call point.

The 470R connection must only be used when mounting the MBG913R/MBG914R call points on an MIU771 or MI0780 units.

System Design Guidelines

Loop lengths

The maximum permitted loop length is 2 km measured from the near to the far terminals on the loop processor PCB. There is no minimum limit to loop length.

Any wiring spurs off the loop must be included within the 2 km limit. Maximum spur length is 100m.

On long loop runs, the lengths of wiring rises and falls (between floors, down to manual call points) must be included. Remember to include these especially when taking loop lengths from plan drawings.

Loop loading - total number of addresses

The total number of addresses per loop is 120. When designing systems, the optimum number of addresses per loop is approximately 90 to 100, this includes detectors, call points and all other addressable items (e.g. MPU, MIO, loop repeaters etc.). This figure insures the system always runs well within its capacity and most importantly allows the end user flexibility to add further detectors, interfaces, repeaters etc., if the building is extended or modified subsequent to the system being installed.

There will of course be many projects where to be commercially competitive loop loadings between 100 and 120 addresses become necessary. Always try, where practicable to even the loop loadings out - a four loop system with 400 addresses is obviously better balanced with all four loops having approximately 100 addresses each; rather than 2 loops at 120 and 2 at 80 each.

Loop loading - MSI 750 short circuit isolator

The maximum number of MSI 750 short circuit isolators per loop is 20.

Two further isolating units are included within the panel at the beginning and end of each loop; dividing the loop into a maximum of 21 sections for short circuit protection.

To comply to the requirements of BS 5839 Pt.1, Section 6.6.2 circuits containing fire detectors; a single fault on a loop shall not remove protection from an area greater than a single zone - in general a floor area of 2000 m^2. It should be noted that the other zonal restrictions outlined in section 7.2 must also be taken into consideration hence possibly reducing the zone size.

A short circuit isolator should always be provided where the loop crosses the zone boundary. Care should be taken to minimise wiring runs which cross zone boundaries (e.g. up and down through several floors of a building or in and out of zones many times). It may be necessary to extend wiring lengths to reduce isolator numbers. The Menvier Defenders loop length of 2 km is the longest in the industry therefore flexibility in wiring runs should not be a problem.

Two simultaneous faults on a loop should not remove protection from an area greater than 10,000 m^2. This requirement limits the total floor area covered by one loop to 10,000 m2/ regardless of the number of detectors.

Loop loading - MFAREP repeater panels

The maximum number of repeater units allowed on a loop is 25. Each repeat unit takes up an address and requires a local mains supply and batteries.

Note: The MFAREP Repeater Panel can be spurred directly from the main panel. When a spur is wired from the buffer hoard within the control panel, a maximum of five repeaters can be connected. If wired in a 'daisy chain' configuration, any number of repeaters can be connected because the signal is boosted at every repeater.

Interface units

The range of interface units comprises:-

MPU244A - 4 way alarm unit.

MPU244R - 4 way relay unit.

MIU771 - Single way input unit (monitored).

MIO780 - Single way input/output unit (input monitored).

The table overleaf gives the basic combination of allowable input and output devices on any single loop. Use this table with the guidelines below to check the loading requirement is allowable.

1) Calculate the maximum values per column.

2) Provided the maximum permissible values are not exceeded in any column, the loading requirement is allowable.

3) MIO780/I/R - for software programme requirements the MIO 780 must be counted either as an input or as an output, (i.e. if a MIO 780 is specified to provide both an input and an output, it takes up both an input address and an output channel, and so must be counted in both columns of the following table).

Maximum loop loading calculation table

Values in brackets should be multiplied by the quantity of units required

		Maximum permissible values				
Qty	**Code**	**Inputs**	**Inputs**	**Relay output**	**Alarm output**	**Address**
		16 per loop	10 per loop	16 per 2 loops	12 per 2 loops	120 per loop
	MIO780/I/R	(1)		(1)		(1)
	MIO780/I*	(1)				(1)
	MIO780/R			(1)		(1)
	MIO780/A				(1)	(1)
	MIU771		(1)			(1)
	MPU244/A				(4)	(1)
	MPU244/R			(4)		(1)
	MAP720					(1)
	MAI710					(1)
	MAH730					(1)
	MBG613					(1)
	MFAREP (max 25)					(1)
	TOTALS					

* Note: The MIO780 should be programmed as an input interface to prevent the Customer Programming Software from assigning an output configuration at that address

Cable & wiring

Only the cable types listed below are allowable:

1. PVC sheathed mineral - insulated copper sheathed PYRO™ M.I.C.C.
2. Fire TEC™
3. Fire TUF™
4. FP 200™
5. RADOX™
6. Armoured cable as specified in BS 5839 Pt.1 section 17.3. This cable type must be screened (the steel armour is not suitable as an electrical screen).

When choosing your preferred cable type, you must take note of the following cable and wiring requirements.

1. The cable must be 2 core with a screen and earth and must be insulated.
2. The conductors should be 1.5mm^2 mimimum.
3. Multicore cable should not be used for detector wiring.
4. Different loops should NEVER be run within the same cable.
5. Loop feeds and returns should never be used within the same cable.
6. Four core loop wiring is allowed where detector and sounder loop wiring are combined. It must be remembered that when detector and sounder wiring are combined, only continuous alarm ringing is possible (i.e. no intermittent alarm).

Cable resistance

Core diameter	**Typical FP200 resistance**
1.0mm^2	18.1 Ohms/km/Core
1.5mm^2	12.1 Ohms/km/Core
2.5mm^2	7.41 Ohms/km/Core
4.0mm^2	4.61 Ohms/km/Core

Cable capacitance

When choosing a cable type, cable capacitance is an important specification. Typical values are as follows:

	Cable type					
	FIRETUF		**FP200**		**PYRO**	
Core Ø	*Core to core*	*Core to screen*	*Core to core*	*Core to screen*	*Core to core*	*Core to screen*
1.0mm^2	10nF	17.5nF	10nF	17nF	15nF	25nF
1.5mm^2	12nf	20.5nF	-	19nF	-	-
2.5mm^2	13nF	24nF	-	21nF	18nF	31nF

(Values are capacitance per 100m)

Note: Values for FIRETUF™ and FP200™ are similar but values for PYRO™ are a little higher. If you use other cables, make sure they have capacitance values less than those in the above table, and within 10%

Cable specifications for ancillary equipment

Ancillary device	Cable specification
MFAREP Repeater panels	When MFAREP repeaters are spurred from the main panel, a 2 core + screen + earth cable must be used. *Note: If a repeater is connected as a spur, no main controls such as sound and silence alarms are possible from that repeater unit.*
MFASC Communications interface	For inter-panel connections via the MFASC communications interface, a 5 core + screen + earth cable should be used. *Note: If an alarm event at one panel affects the operation of another panel on the MFASC network, a fire protected cable must be used (see the list above). It is usual practice to install fire resistant communication network cables throughout the installation so that if the site configuration changes, the control and alarm functions can be modified to suit.*
Zonal mimic panels	Mimic panels are wired either directly from the main panel or from an MFAREP repeater unit. A 3 core cable + earth + screen should be used.

Screen continuity

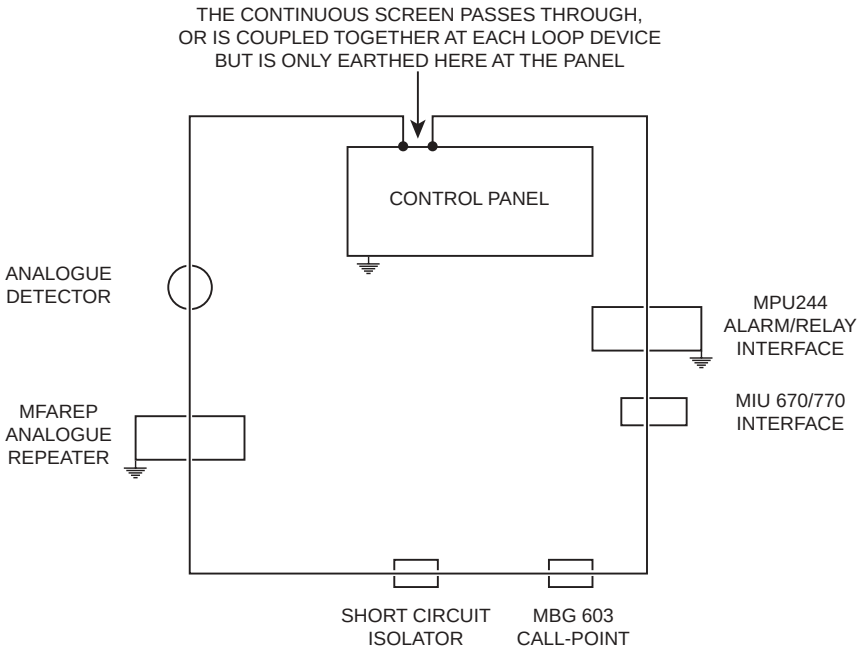
Cable screening is a most important consideration and to avoid system communications problems on site, you should adhere to the following guidelines:

1) The screen on the cable should only be connected at the main control panel.

2) The continuity of the cable screen is most important and screening MUST be continuous along the full loop length, therefore care must be taken to ensure the connection is continued at each loop device. More site problems are experienced as a result of breaks in cable screening than any other reason.

3) When installing MFAREPs and MPU244's always make sure the screen of the cables entering and leaving the units are isolated from the metal enclosures, but remain continuous. The enclosures are earthed via the mains input.

The diagram below is provided to ensure there is no confusion regarding the screen continuity guidelines.



Mains supply

The Mains supply should be installed in accordance with the current edition of the IEE wiring regulations. Connection to the mains supply must be via an isolating protective device (e.g. an isolating fuse) reserved solely for the fire alarm system. The cover should be coloured red and labelled ‘FIRE ALARM - DO NOT SWITCH OFF’. The isolating protective device should be secure from unauthorised operation and ideally installed in a securely closed box with a breakable cover.

An additional warning label should be provided, depending on whether:-

a) The isolating protective device is fed from the live side of the main isolating device in which case the label on the isolating protective device, should read in addition - 'WARNING: THIS SUPPLY REMAINS ALIVE WHEN THE MAIN SWITCH IS TURNED OFF’. A further label should be placed on the main isolating device reading 'WARNING: THE FIRE ALARM SUPPLY REMAINS ALIVE WHEN THIS SWITCH IS TURNED OFF.

or

b) If the isolating protective device is fed from the dead side of the main isolating device, a label should be fixed to the main isolating device reading 'WARNING: THIS SWITCH ALSO CONTROLS THE SUPPLY TO THE FIRE ALARM SYSTEM’.

Mains supply termination

The mains supply must be routed directly to the power supply unit and not via the main control and indicating panel.

Distributed power supplies

Any distributed power supply (i.e. mains connections for MFAREP repeat units MPU244 or relay units MBD100 beam detectors Etc.) should be switched by a switch coloured red and labelled ‘FIRE ALARM : DO NOT SWITCH OFF’.

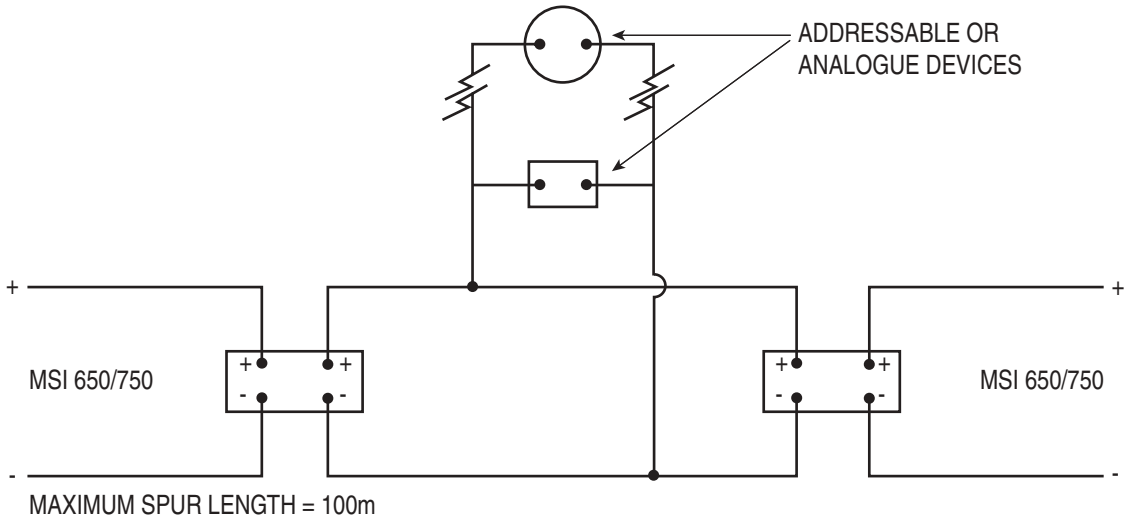
Cable segregation

All cables for the fire alarm system should be segregated from any other cables/wiring/services as defined in BS 5839 Part 1 section 17.10 and the IEE wiring regulations.

Wiring configurations

Spurs can be taken off the loop in several ways:

1) MIU771 Addressable Interface - Allows up to 5 conventional smoke detectors and unlimited MBG113/4 call points. The maximum allowable spur length is 100m
2) Direct Loop Spur Wiring - Allows a zone or up to 20 analogue detectors and call points to be directly spurred off the loop.



If this configuration is employed, then the following rules must be obeyed:-

a) The junction box terminating the spur wiring must be directly preceded and superseded by MSI750 short circuit isolators.

b) Only a single zone can be covered by the spur.

c) A maximum of 20 detectors is allowable.

d) The maximum spur length is 100 m and this length must be included in the total length of the loop.

All the above rules must be adhered to in order for the wiring spur to comply to BS 5839 Part 1 (where a single fault on a loop (or spur) cannot remove protection from an area greater than a single zone).

Battery capacity

All Menvier DF4000 panels are supplied with secondary batteries capable of providing a fully loaded system (i.e. maximum loop loadings and maximum alarm loading) with the stated standby period.

The advantages of this are:-

1) In most systems of average or moderate loading, the standby period will be longer than stated.

2) No battery calculations are required during system design.

3) It is difficult for the installer, or end user, to overload the system either initially, or later, as extra equipment is added over a time period.

It is however often advantageous to know precisely the capacity requirement of a system. Often a lightly loaded system may well have an actual standby capability far greater than that stated as standard (i.e. standard 24 hrs, actual, due to light loading 72 hrs).

The battery capacity can be calculated for any system using this calculation sheet overleaf and the information given below.

K1 = Standby period in hours: 72.5 for 72 hours, 48.5 for 48 hrs and 24.5 for 24 hrs.

A = Standby period in amps

B = Alarm load in amps

1.12 = Life factor @ 25° for 4 years

Alarm Period = 30 minutes after standby period
Batteries supplied as standard: MFAXA2/4 = 15/17.5 AH, MFAXA6/8 = 30/34.4 AH

Menvier battery & standby calculation table

Product code	Qty	Standby current (Amps)	Total standby	Alarm load (Amps)	Total alarm
MFAXASL1		0.108		0.420	
MFAXA2		0.108		0.71	
MFAXA4		0.145		0.775	
MFAXA6		0.253		1.055	
MFAXA8		0.290		1.12	
C/W Printer		0.050		0.050	
MAP720		0.00032		0.00032	
MAI710		0.00032		0.00032	
MAH730		0.00032		0.00032	
MBG613		0.0001		0.0001	
MIU771		0.0012		0.0012	
MIO780		0.00035		0.00035	
MS1750		0.0001		0.0001	
MFAREP on Spur (powered from panel) MFAREP On Loop*		0.050 0.00028		0.100 0.00028	
MPU244 On Loop*		0.00028		0.00028	
MAR724				0.01	
Electronic sounder				0.02	
Motorised bell 4/6” Motorised bell 8”				0.025 0.03	
MDS724 MXB124 2.1W Beacon				0.02 0.09	
MXB224 3.6W Beacon				0.155	
		TOTAL (A)		TOTAL (B)	

** Note: MPU244 and MFAREP supplied as standard with a 72 hour internal battery back-up.*

BATTERY CAPACITY - 1.12 (K1 x A + 1.15 x (B - A)) = TOTAL Ah

Equipment Compatibility

Detectors

When you specify Menvier equipment, you can be sure of full compatibility. However, if detectors supplied by other manufacturers are used, they can still be connected to the AXA system by using the address interface, MIU771.

If you do use detectors supplied by other manufacturers the following requirements must be met:

1) The detectors must be suitable for operation between 15V DC and 30V DC. The MIU771 interface is designed to power up to five detectors, each with a quiescent current of less than 35μA. If you use detectors drawing more current than this, make sure that the total quiescent load on the address interface is no more than 200μA.

2. The impedance of the detectors in the fire condition must be between 350Ω and 600Ω at a voltage of less then 10 volts and must remain latched in the alarm 'ON' condition in this state.

3. The detectors should have an equivalent parallel capacitance of less than 500 pica farads.

Call points

Loop wired call points are the addressable type, MBG603/613.

For wiring via an MIU only, call points shall be of the normally open circuit type and shall operate to an impedance of between 350Ω and 600Ω, preferably 470Ω.

Sounders

Any sounders or visual indicators can be used with the AXA system so long as they meet the following conditions:

1) They are suitable for operation between 18V and 28V.

2) They are polarised and suppressed.

3) The total alarm load is less than the rating of the panel/Alarm Power Interface.

Note: It is possible to use devices outside these requirements if they are supplied with power from a separate source and switched via a MAR024/MAR724 heavy duty relay which can be connected directly to the alarm lines with no additional interface components.

Relay circuits

Additional relays can be added to the AXA system by using relay power interfaces (MPU244R), connected to the detection loop via an address.

Relays/Auto-diallers and auxiliary equipment

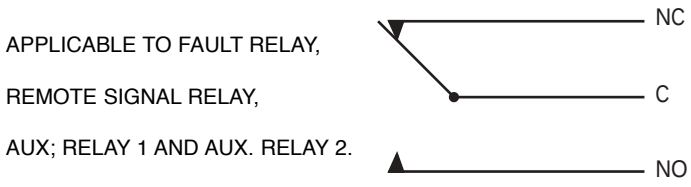
A wide variety of relays and other equipment can be connected to the AXA system, but you should note the following constraints:

1) Volt free contacts, both normally open and normally closed, must be supplied for the remote fire and fault signals and for the auxiliary fire signal. The voltage on these terminals should be limited to 24V ±20% at 1A and the equipment should be suppressed. If a non-suppressed relay is used then a diode can be connected as shown in the wiring diagram overleaf, to suppress any reverse emf on the release of the relay which might cause the panel to malfunction.

2) A 24V DC output is provided at the panel to make it easy to connect ancillary equipment. Although the panel can supply a continuous quiescent load of up to 100mA, BS5839 precludes this practice and any ancillary equipment you connect should only consume power in the alarm or fault mode to meet the requirements of BS5839.

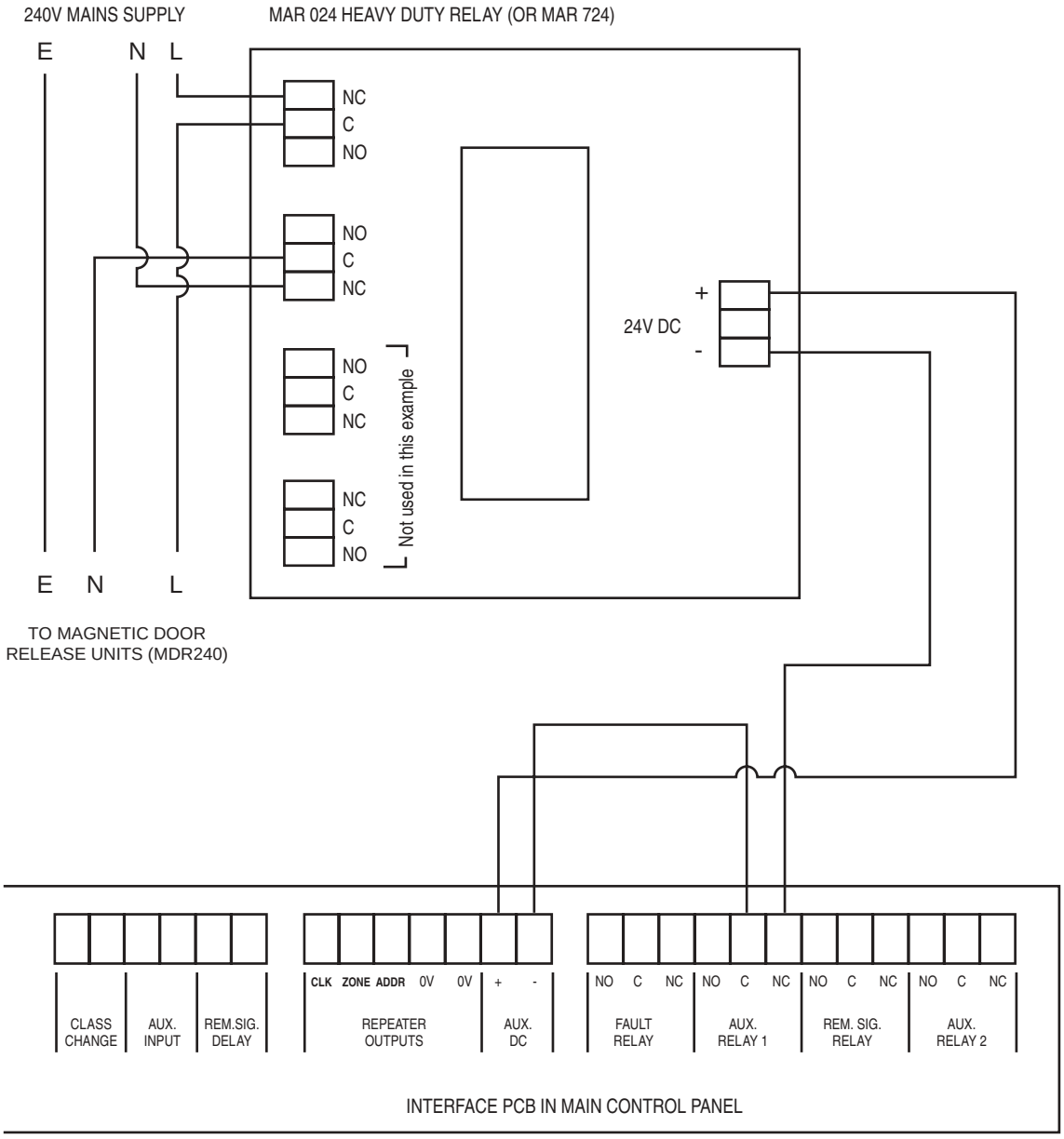
3) The panel is capable of supplying an alarm load of up to 5A, however if this is not to be used/ the current drain from the auxiliary DC output in alarm conditions can be increased to a maximum of 3A. As an example, an alarm load of 3.6A and an auxiliary DC output load (in alarm conditions) of 1.4A is permissible. The AUX DC output is fused but unmonitored.

Note: For the AXA1 single loop panel the total alarm load is 2A.



Internal AXA Relay Connections

AXA Auxiliary relay - typical applications



List of accessories

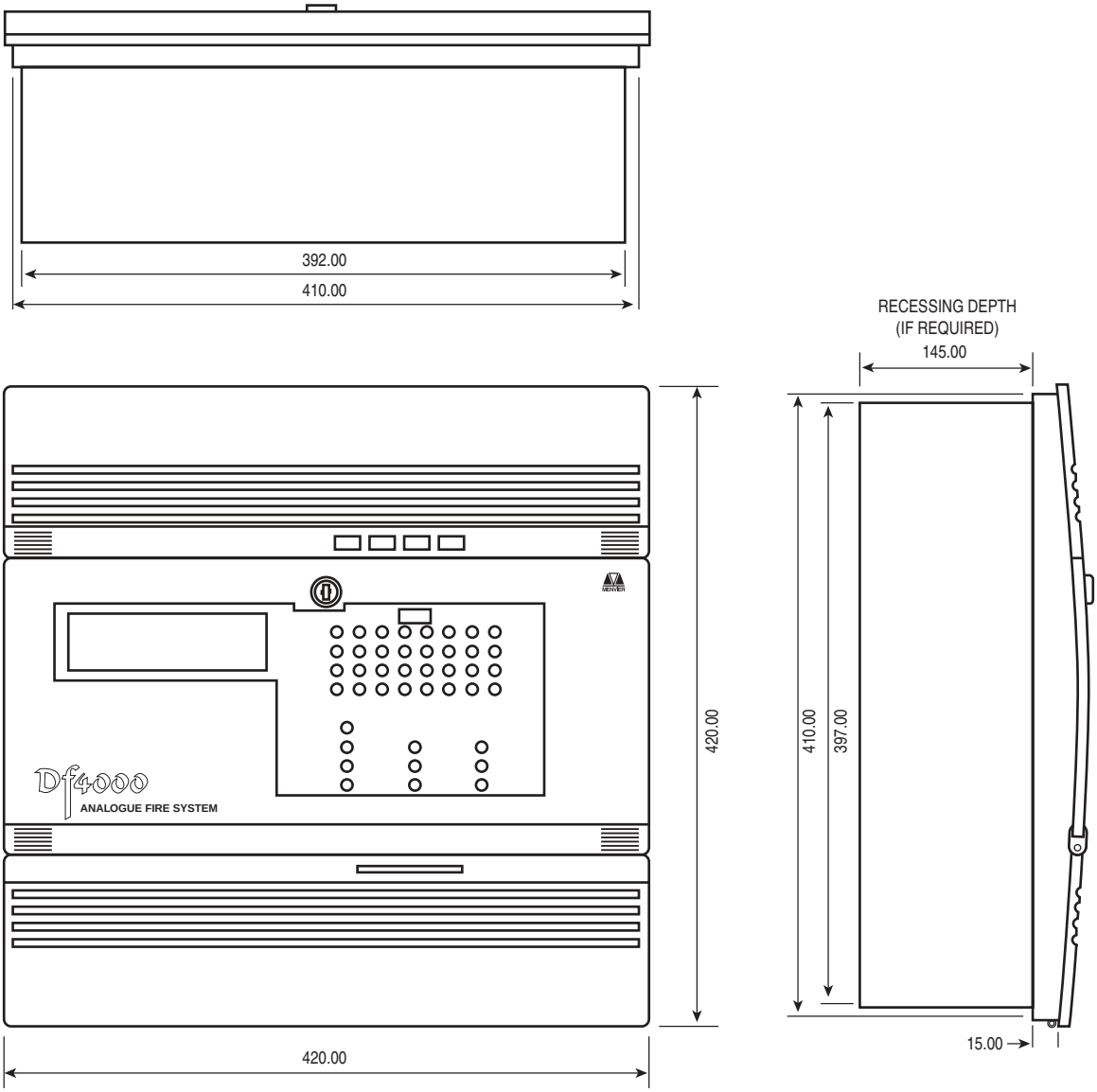
Note: All Menvier sounders and strobes are supplied polarised and suppressed.

General accessories	**Model number**
Replacement battery pack	MB1524
Address module addresses 61-E0 (61-120)	MAM60+
Spare address module 1-60	MAM1-60
Analogue accessories	
Detector base	MDB700
Ionisation smoke detector	MAI710
Photoelectric smoke detector	MAP720
Heat detector (programmable for various responses)	MAH730
Addressable call point	MBG603/613
Flush mounting bezel for MBG603	MBG605
Weatherproof addressable call point	MBG607/617
Address interface	MIU771
Short circuit isolator	MSI750
Non addressable accessories	
Non addressable detector base (required when connecting detectors to a MIU771)	MDB700
Flush mounting call point	MBG113R/MBG913
Bezel for MBG113R	MBG105
Metal box for use with flush call point	MBG106
Surface mounting call point	MBG114R/MBG914
Weatherproof call point	MBG117R/MBG917
Sounders etc.	
Bell (internal)	MBM246
Bell (external)	MWB824
Electronic sounder (weatherproof)	MWS424
Strobe light	MXB124
Heavy duty relay	MAR24 or MAR724
Magnetic door release (240V)	MDR240
Magnetic door release (24V)	MDR24L

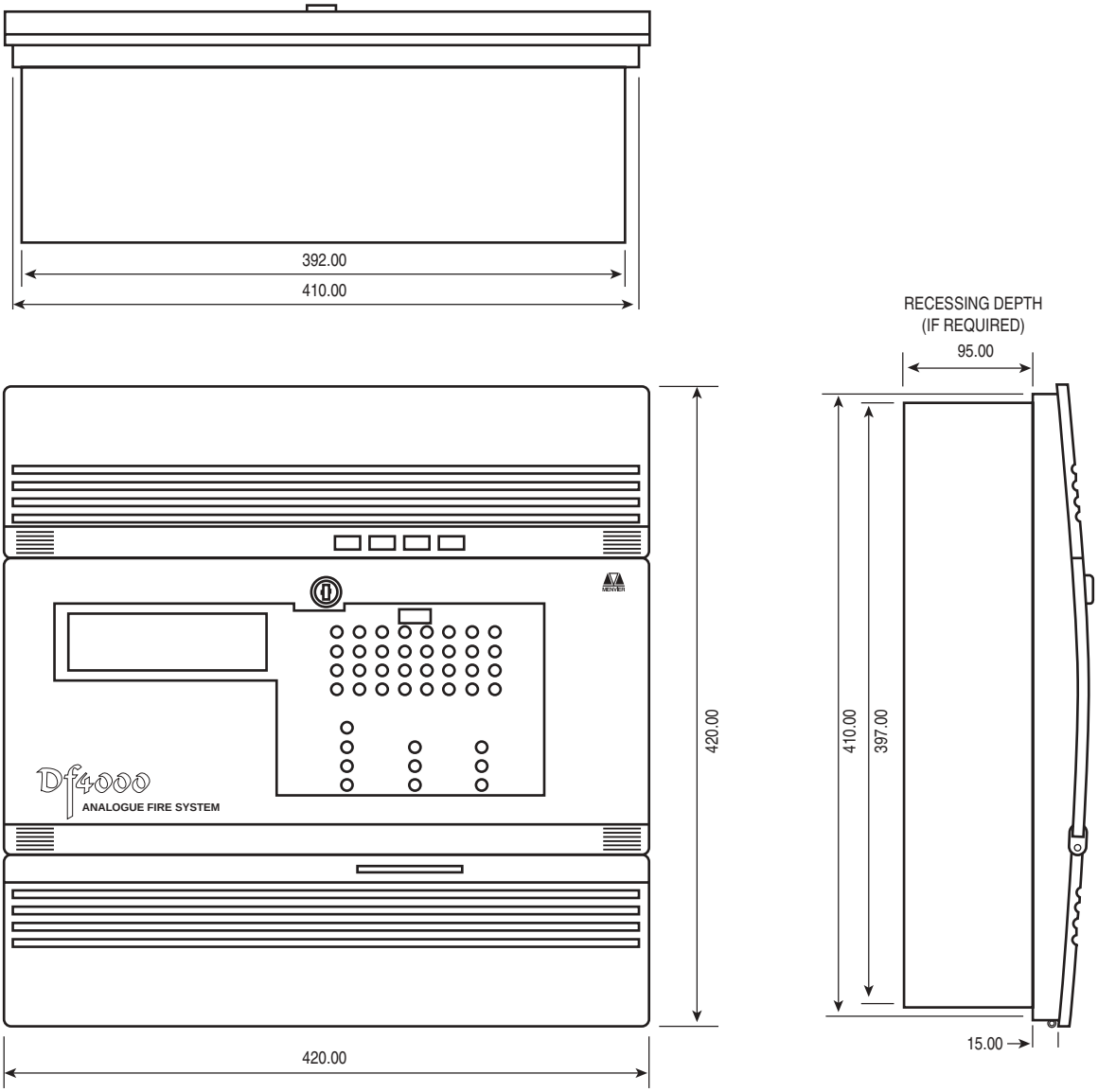
PART 3: INSTALLATION AND COMMISSIONING

Contents

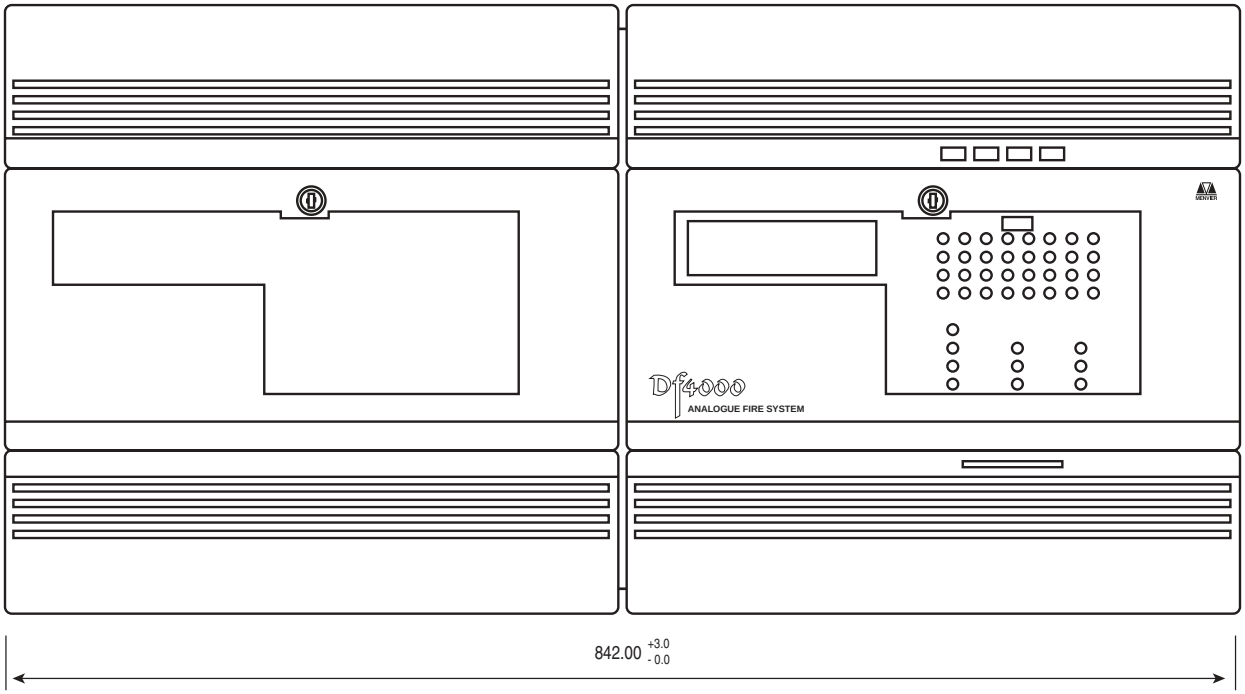
MFAXASL1 (1P) Main enclosure dimensions (mm)



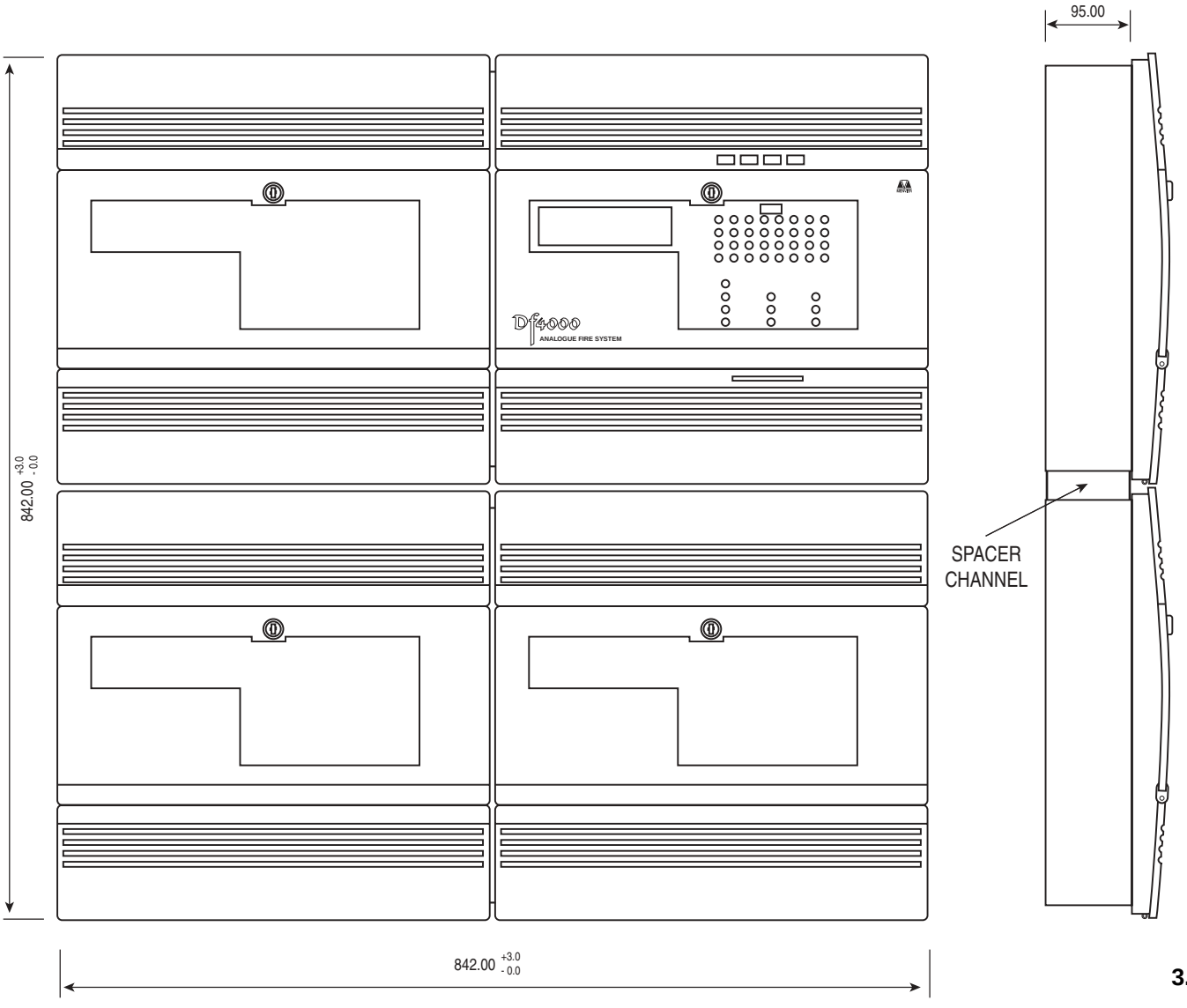
AXA2/4 Main enclosure dimensions (mm)



AXA2/4 Loop main control panel with power supply unit

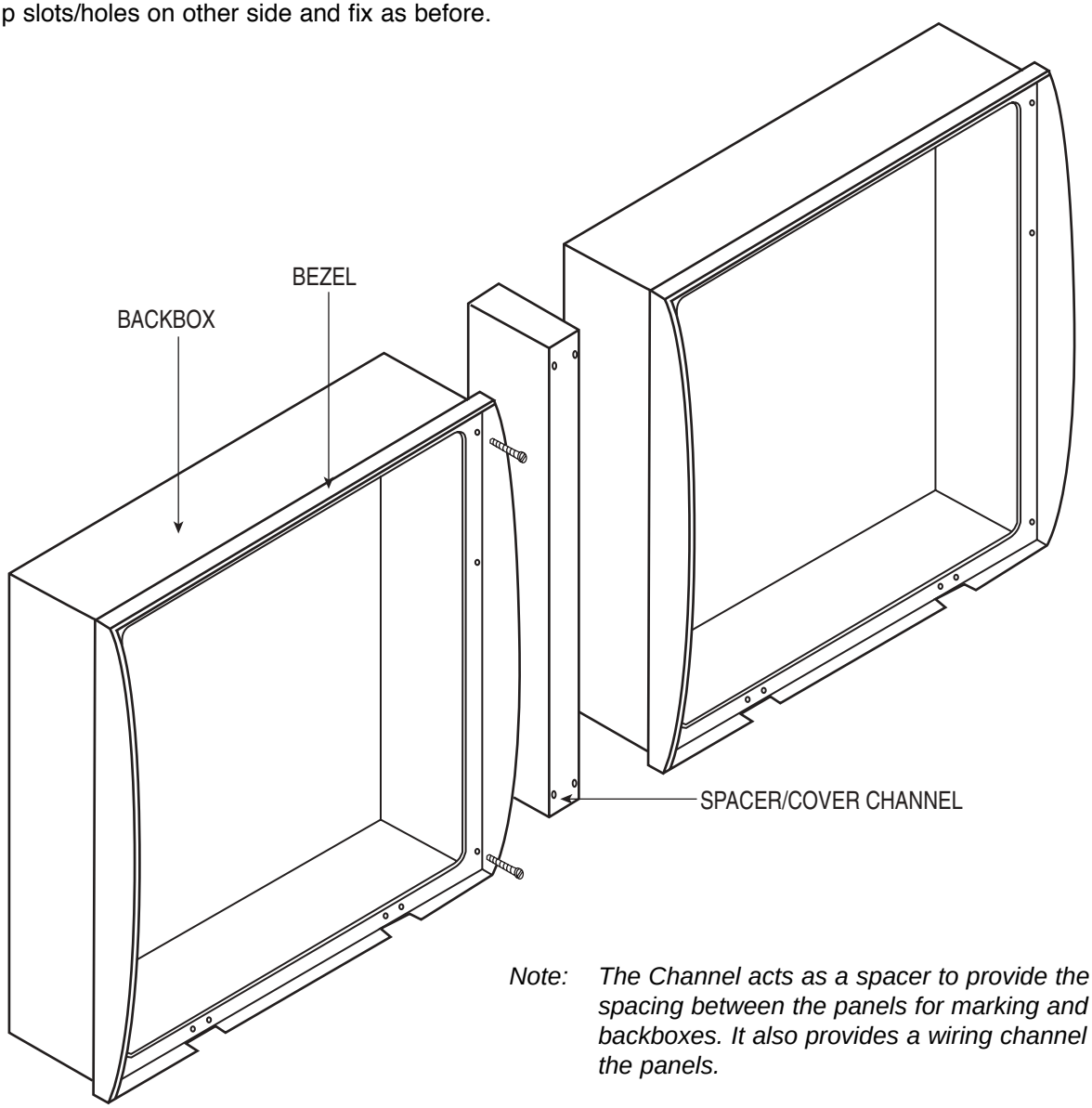


AXA6/8 Loop main control panel with power supply unit



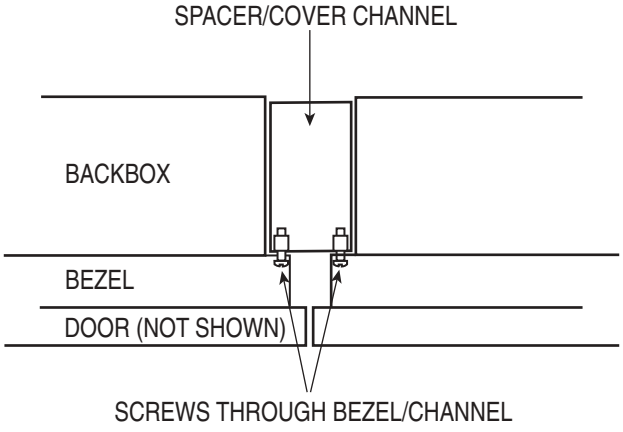
Fixing details for two or more panels

1. Place Channel just under bezel to butt up to side of backbox.
2. Locate and position holes in the channel to line up with slots in the bezel.
3. Attach to one of the panels.
4. Line up slots/holes on other side and fix as before.

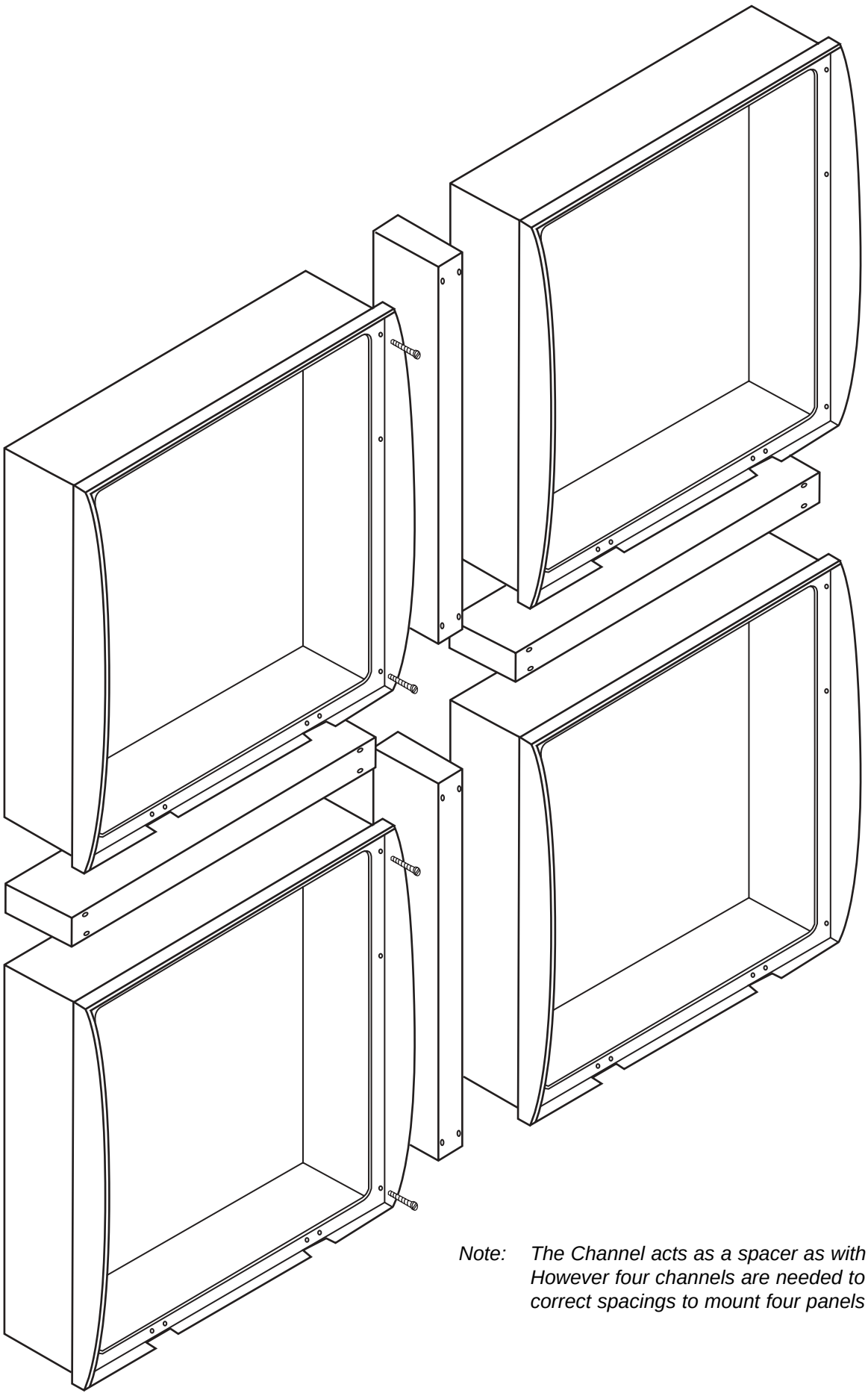


Note: The Channel acts as a spacer to provide the correct spacing between the panels for marking and fixing backboxes. It also provides a wiring channel between the panels.

View looking down on spacer channel and panels side by side

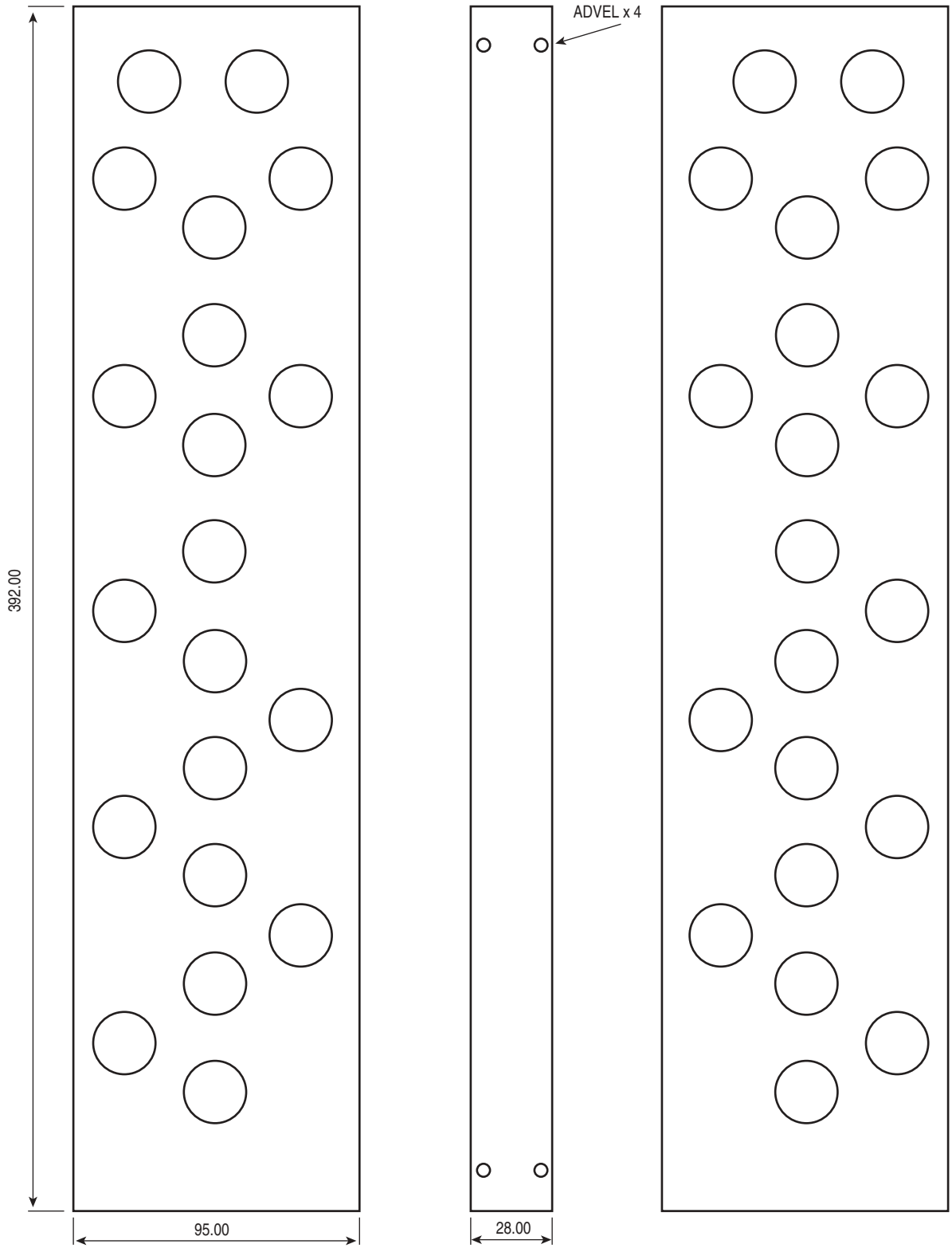


To mount panels Above and Below each other use the same method as described for mounting side by side.



Note: The Channel acts as a spacer as with two panels. However four channels are needed to provide the correct spacings to mount four panels as shown.

Dividing/Spacer channel



Channel is used as a spacer between two panels and/or as a cover to hide cables running from one panel to another.

Diagram showing component layout of main control panel

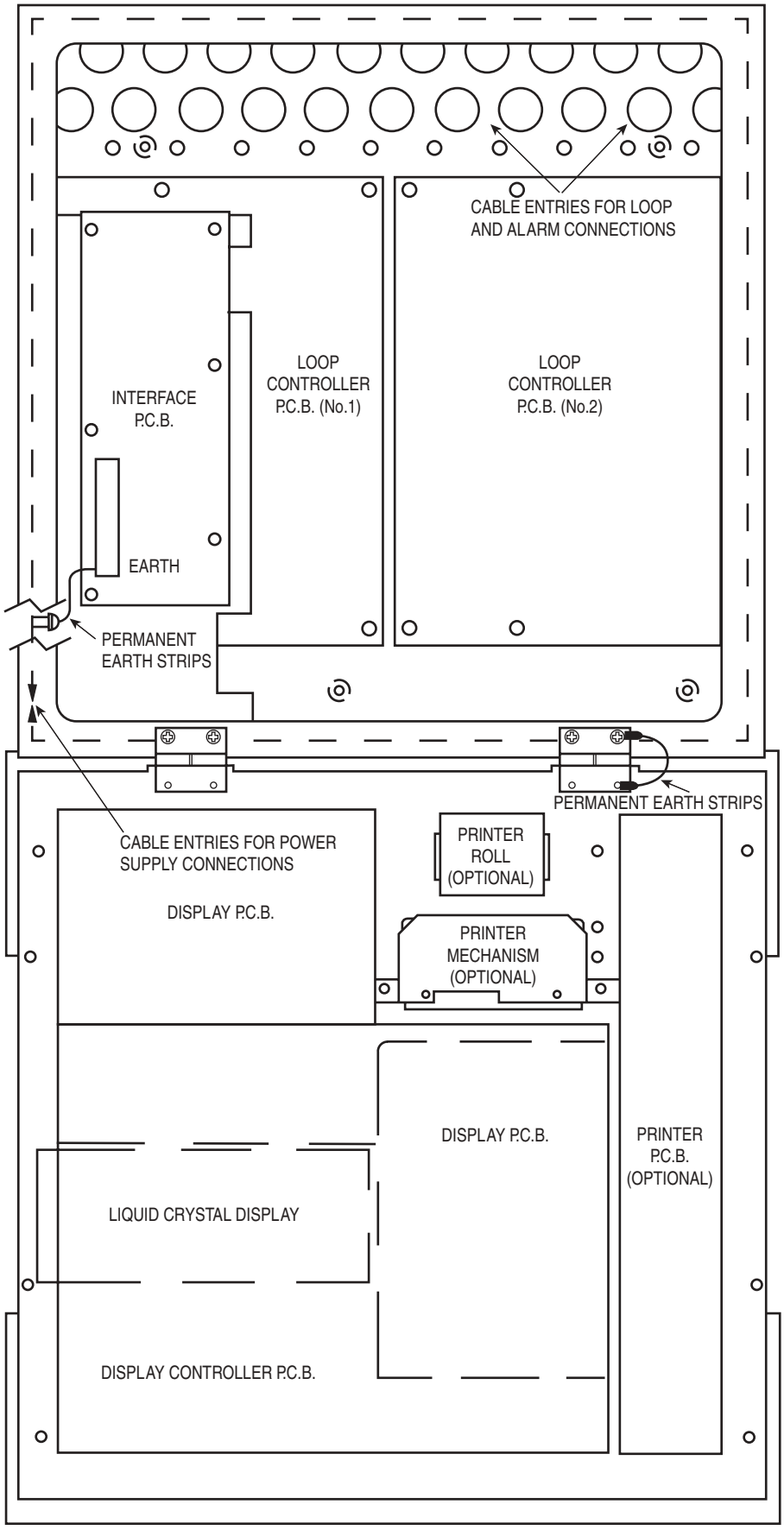


Diagram showing component layout of power supply unit

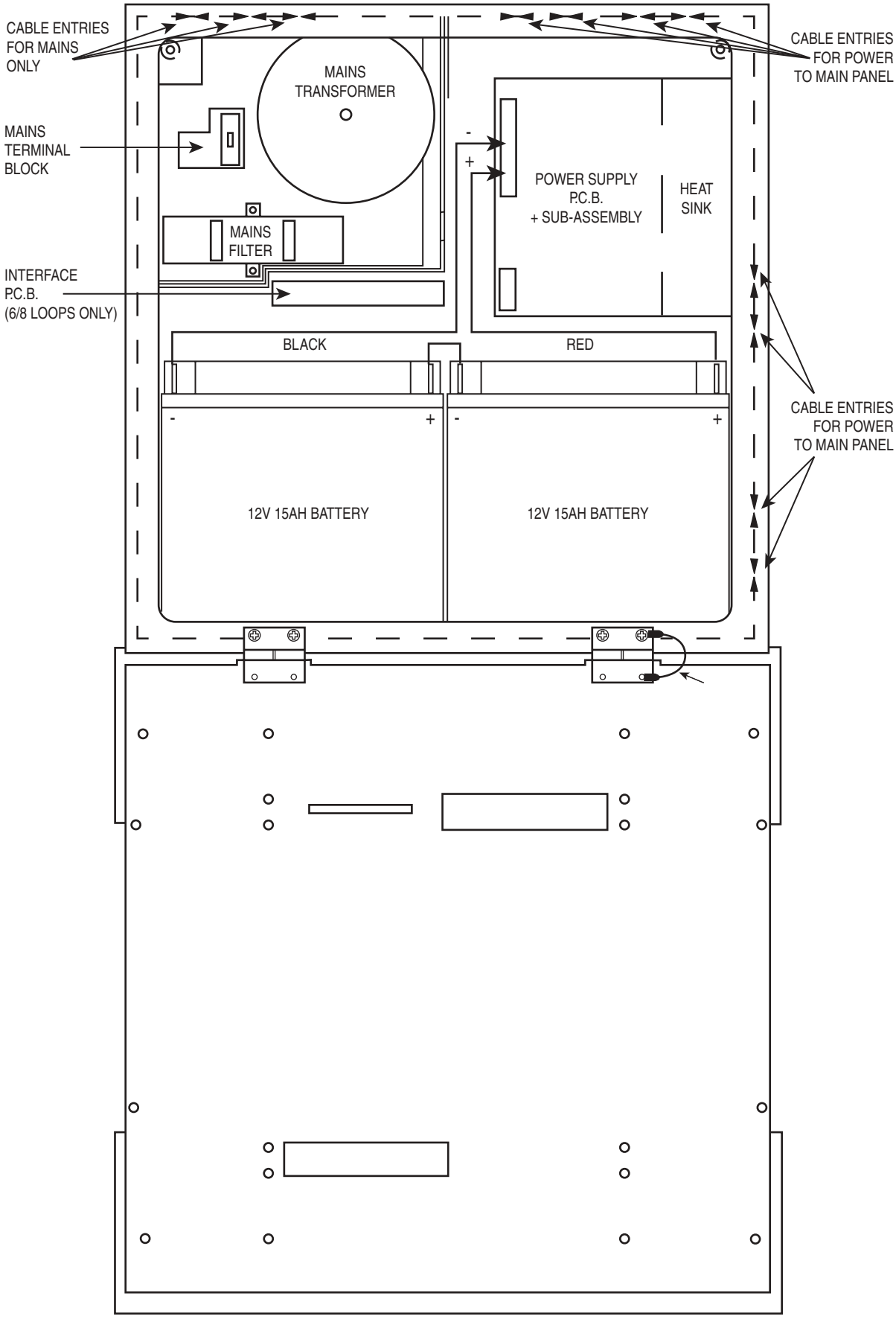


Diagram showing component layout of main control panel and power supply unit - AXA2(P) and AXA4(P)

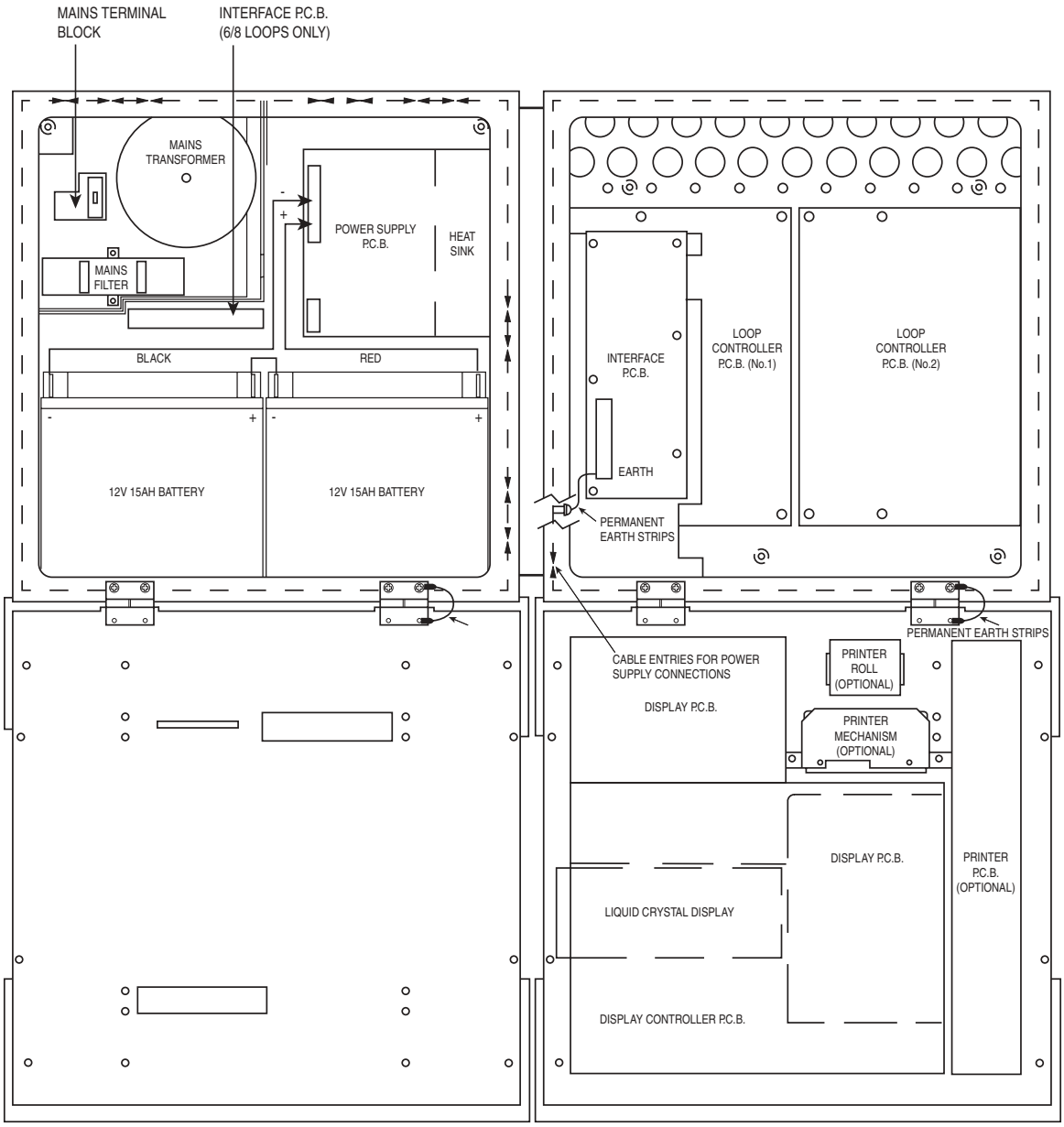
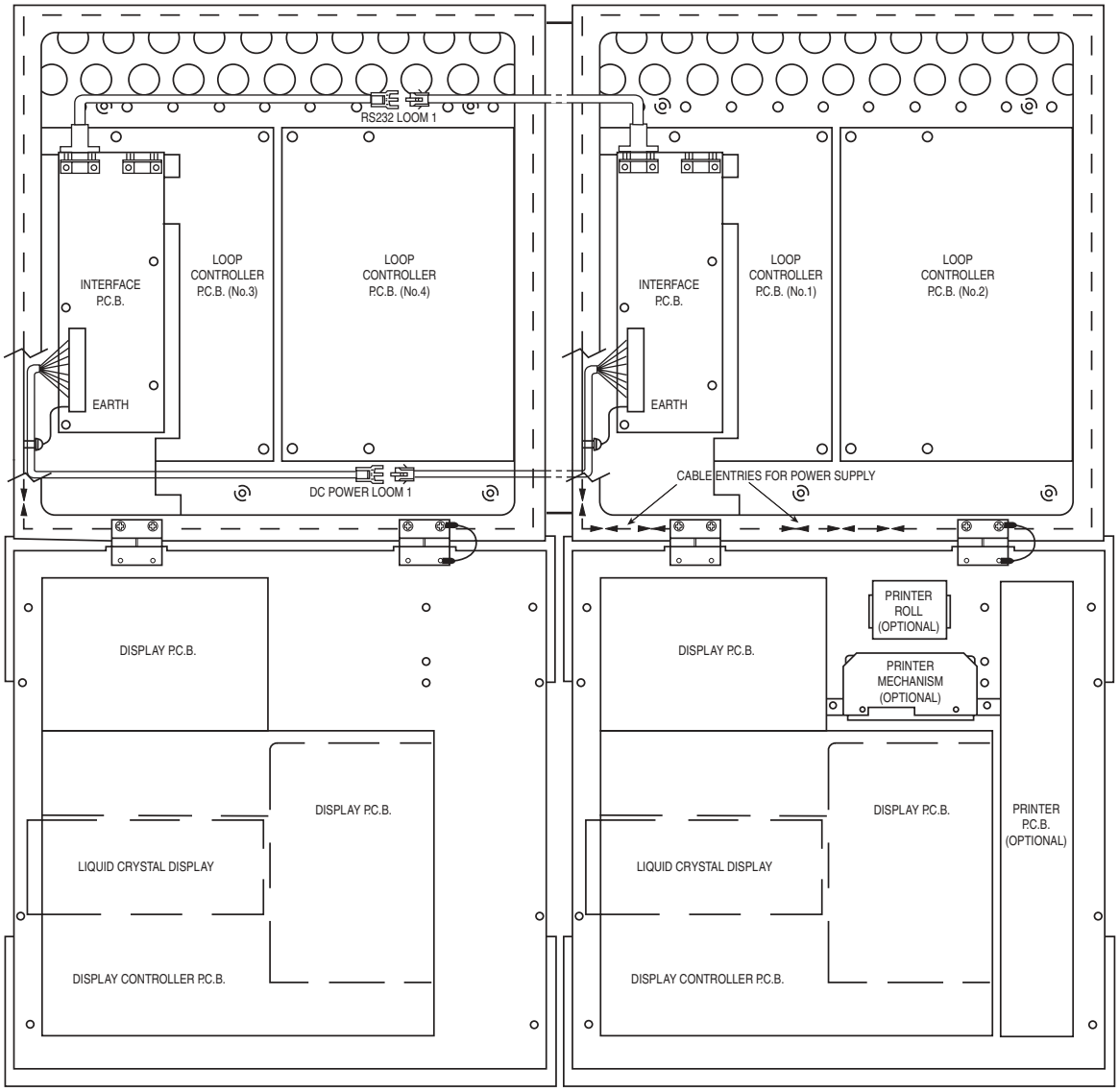


Diagram showing wiring details between main control panels for AXA6/8 loop configurations



Sub panel interconnection between interface PCBs for 6/8 loop analogue control panel

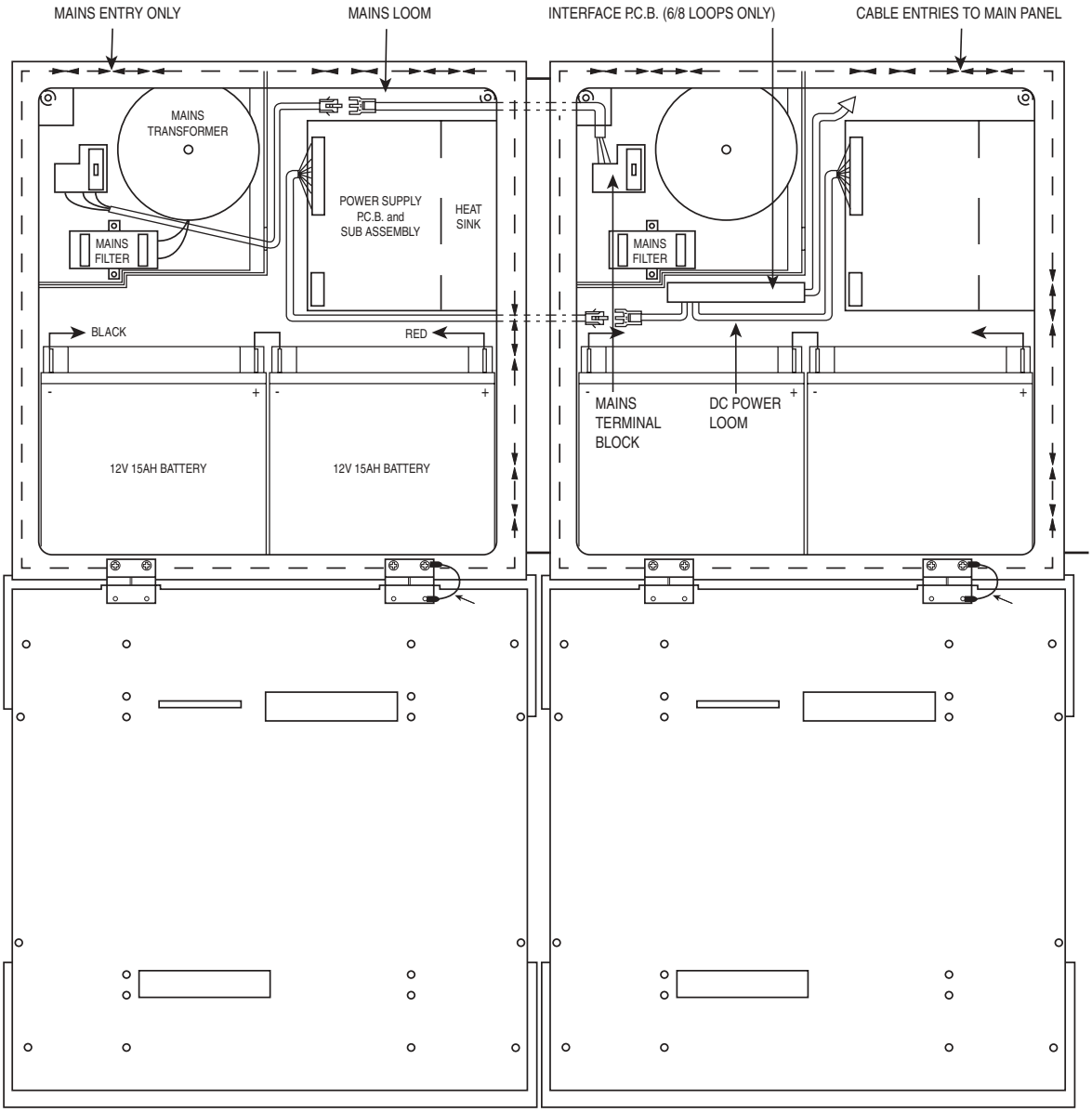
DC Power Loom 1

Top Section Interface PCB	Bottom Section Interface PCB
OVH	OVH
EARTH	EARTH
+24V DC	+24V DC
Batt. O/C Monitor	Batt. O/C Monitor
Batt. Low Monitor	Batt. Low Monitor
Mains Monitor	Mains Monitor

RS232 Loom 2

Top Section Interface PCB RS232 Port A	Bottom Section Interface PCB RS232 Port A
TX Pin 3	RX Pin 2
RX Pin 2	TX Pin 3
CTS Pin 8	DTR Pin 4
DTR Pin 4	CTS Pin 8
SG Pin 5	SG Pin 5
System Reset	System Reset

Diagram showing wiring details between power supply units for AXA6/8 loop configurations



Panel installation: General

The AXA1 is a single box construction with an integral power supply. The Menvier AXA 2/4 panels each consist of 2 units. The main enclosure contains all the monitoring and control circuit boards and the second unit contains the power supply. This allows flexibility in system layout - you have a choice of mounting the power supply either directly beneath the main unit or alongside (on the left) using the spacer channel as a mounting aid and wiring channel.

The units are supplied complete and fully assembled in a single carton with the batteries contained in a separate compartment.

Panel disassembly prior to installation

When unpacking the main enclosure, you should remove the fascia moulding and the door prior to installation. Unlock the hinged perspex cover (using the keys contained in the bag attached to the front) and undo the screw located on each side of the display/ legend panel. This allows the fascia moulding to hinge open and you can then access all the circuit boards including the loop controllers.

The front door assembly has lift-off hinges. To remove this door simply slide to the right and lift off. Carefully detach the ribbon cable assembly from the interface board, remove the printer supply and attach the earth connection. Put the door and the fascia moulding to one side until the main enclosure has been installed. The fascia moulding has the display board, the control board and the optional printer port attached to it so take care not to damage any of these components or assemblies.

Main Panel Re-assembly

First carry out an earth leakage test on the cables prior to connection of the equipment.

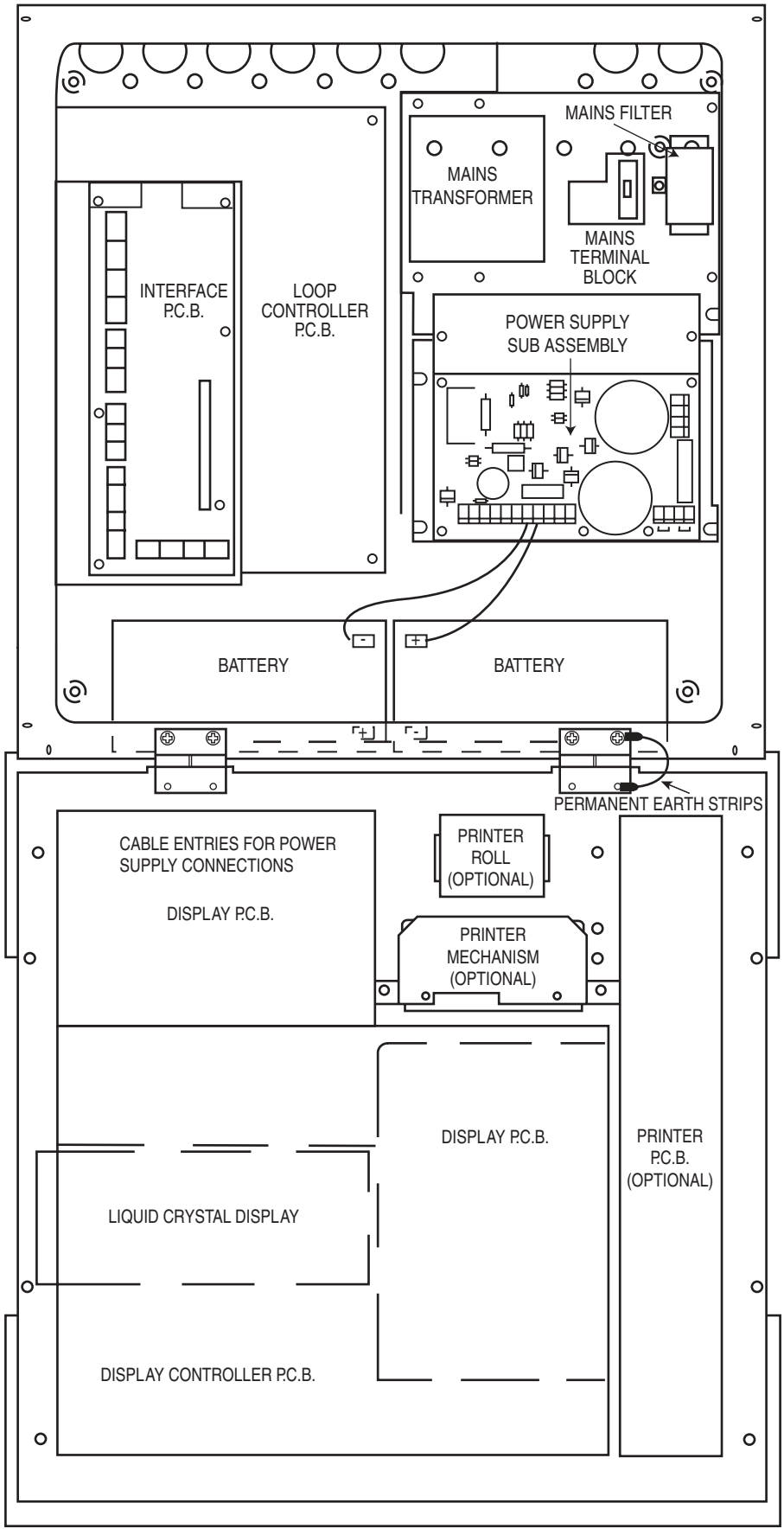
Note: You should also do this before terminating cables to bases and interface units.

Next replace the door and fascia moulding. Replace the earth connection, the ribbon cable connection to the interface board (and the printer supply if fitted).

You can now connect the various cables to the loop control board(s) and interface board(s) (see the appropriate wiring diagrams for specific connections).

Power supply installation

The power supply unit for the AXA1 is contained within the panel enclosure, see below.



The power supply unit for the AXA2,AXA4 and AXA8 panels can be mounted either beneath the main enclosure if both units are to be surface mounted or to the side. If you mount the power supply unit beneath the main enclosure ensure that the minimum gap is left between the bottom of the main enclosure and the top of the power supply unit. This will be determined by the spacer channel provided. Failure to do so may cause a malfunctioning of the power supply under certain conditions.

If you want to locate the power supply unit in a remote position, make sure that cable runs from it are kept to a minimum length. For cables with a core diameter of 2.5mm^2 or less the maximum cable run is four metres. For cables with a core diameter of 4mm^2 or less the maximum cable run is six metres.

It is essential that the power supply unit is located in such a way that the grille on the top of the unit is clear of obstructions to allow proper heat dissipation.

Open the power supply unit enclosure in a similar manner as the main panel. Before installation, remove the power supply sub-assembly from the enclosure to make mounting it easier, and also to enable easier termination of incoming cables prior to connection. To do this you have to disconnect the wires to the transformer and unscrew all the screws which hold the assembly down.

Power supply unit re-assembly

Bring the wires from the main panel into the power supply unit. Remove the two sealed lead acid batteries from the packaging and connect them up in series (see following wiring diagrams). Carefully place the batteries into the compartment of the power supply enclosure and then bring the two connecting wires across and up, ready to be put into the power supply PCB.

The power supply sub-assembly can now be replaced into the right-hand compartment. For added protection against noise interference, ensure the battery wires run directly to the PCB as shown in the diagram. Don't connect them until the remaining wiring has been completed, the mains power has been applied and preliminary checks carried out.

The remaining connections can now be made (see wiring diagrams). You should remove the plug-in fuse to isolate the mains and check all the wiring before powering-up.

Connecting up the system

Each panel is supplied with either two or four sets of address modules (MAM 1-60) depending on the number of loops on the system. The address modules are for addresses 01 to 60 on each loop. Take care to place these to one side because you will use them when installing bases with detectors, call points and interfaces. The actual address of the modules is marked on each device and they should be used sequentially. Starting at address 01, each address should be used up to the maximum address number on each loop. Address numbers can be allotted to devices on the address loop in any order i.e. 01, 09, 04, 33, 02 etc., but all the address numbers, starting at number 1 up to the highest required, must be used or the control panel will display a 'missing address' message.

You can now surface mount or semi-recess the main panel into its required position.

The following wiring diagrams show how to connect each piece of equipment. For optimum reliability please note the following:

1. Earth leakage tests must be carried out with all electronic equipment disconnected.
   Disconnect not only the panel but all addressable call points, addressable interfaces, short circuit isolators and detectors.

2. Use fire resistant cabling for all alarm and address loop cabling.

3. Separate fire alarm low voltage cables from mains and other service cables.

4. Ensure earth screen is continuous all the way around the loop and is only earthed at the main control panel.

Additional instructions for electromagnetic compatibility

When used as intended this product complies with EMC Directive (89/336/EEC) and the UK EMC regulations 1992 (SI 2372/1992) by meeting the limits set by the standards BS 5406 (Pts 2&3) 1988, EN50082-1 1991 and EN50081-1 1992. The following installation guidlines must be followed.

1. External cables must be connected using the cable entries or knockouts provided.

2. When routing external cables inside the product they must be

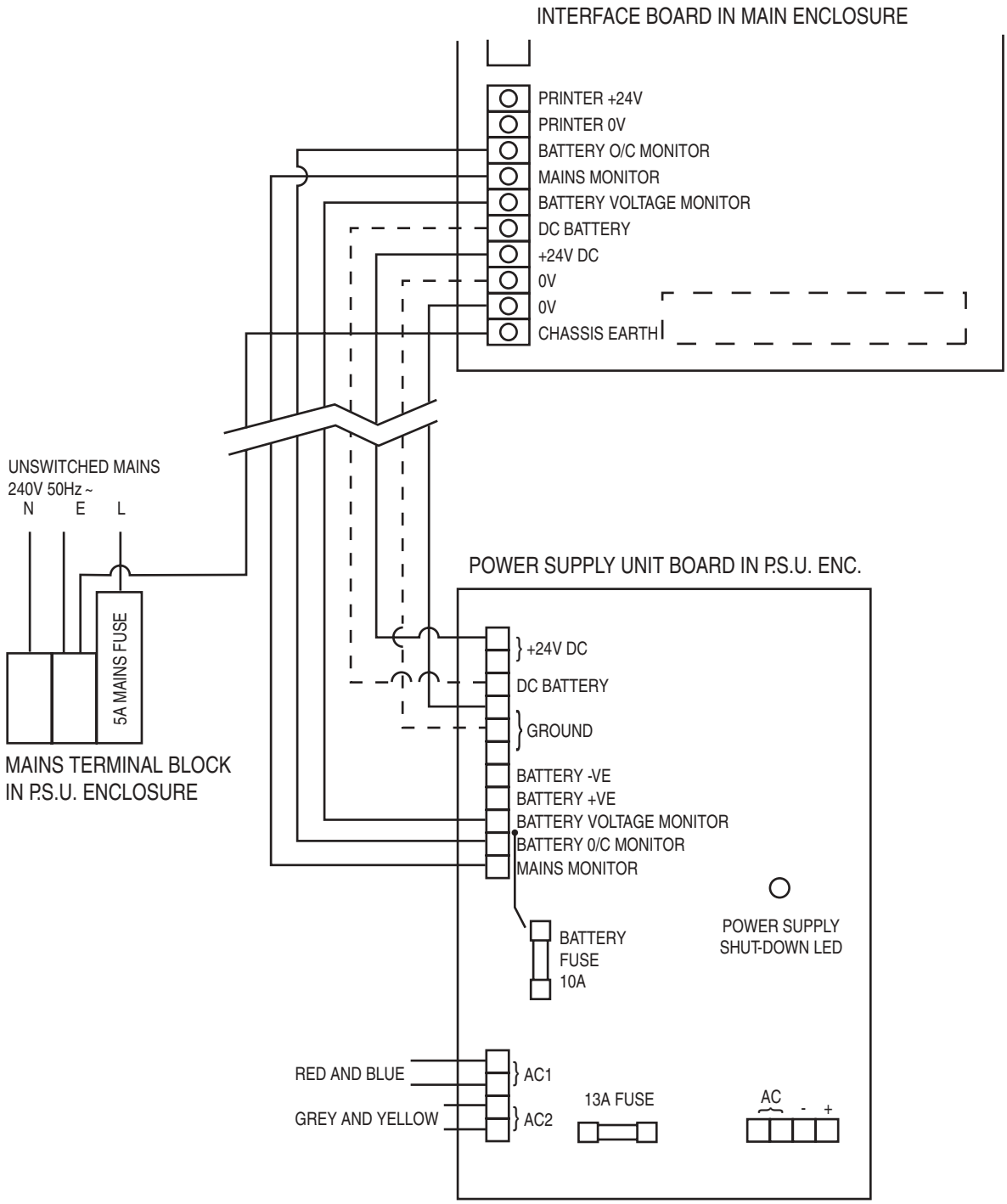
    a) Kept as short as possible

    b) Routed close to the housing

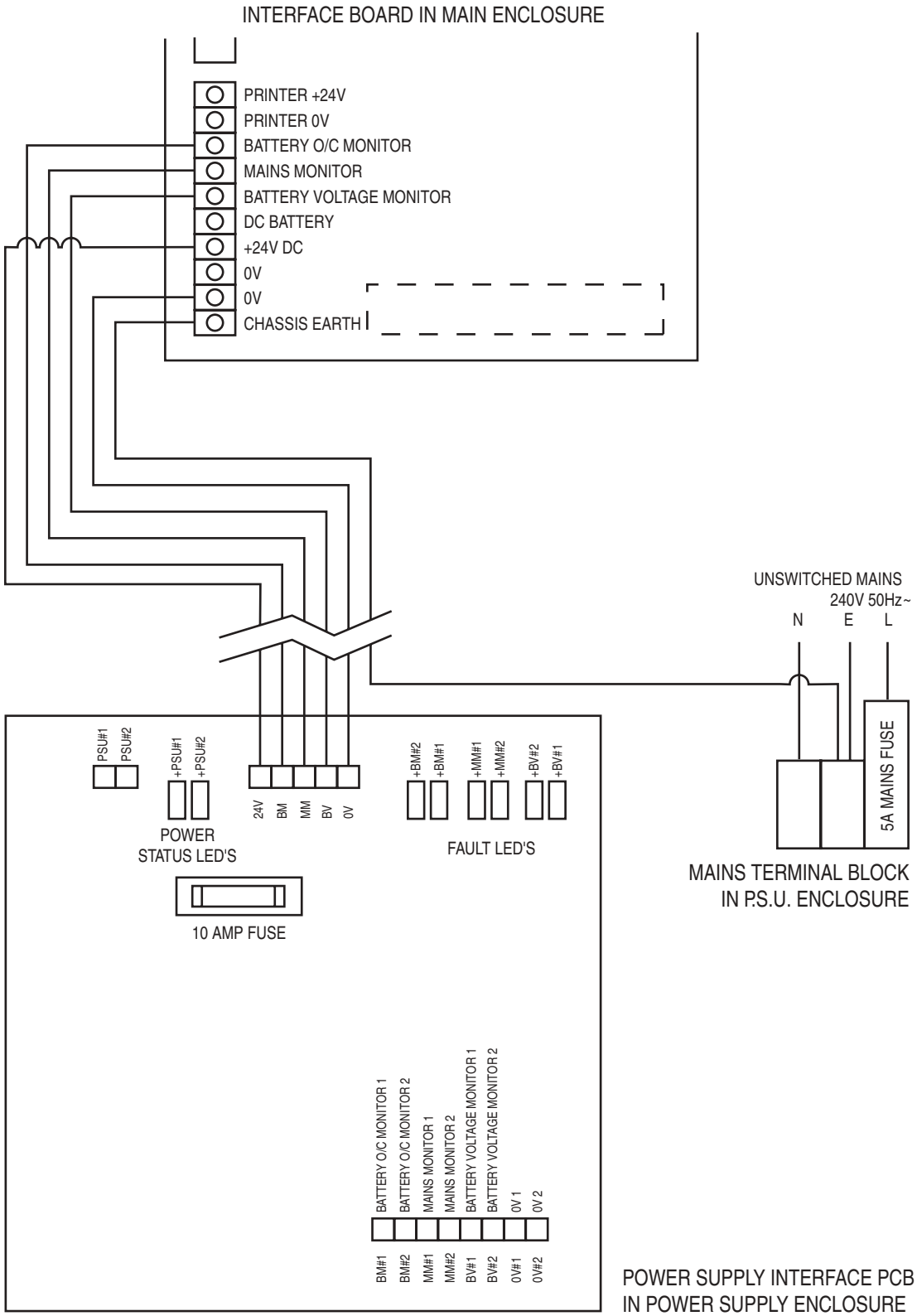
    c) Kept as far as possible from the electronics

Any modifications other than those stated in this manual, or any other use of this product may cause interference and it is the responsibility of the user to comply with the EMC and Low Voltage Directives.

AXA2/4 Connections between main panel and power supply unit

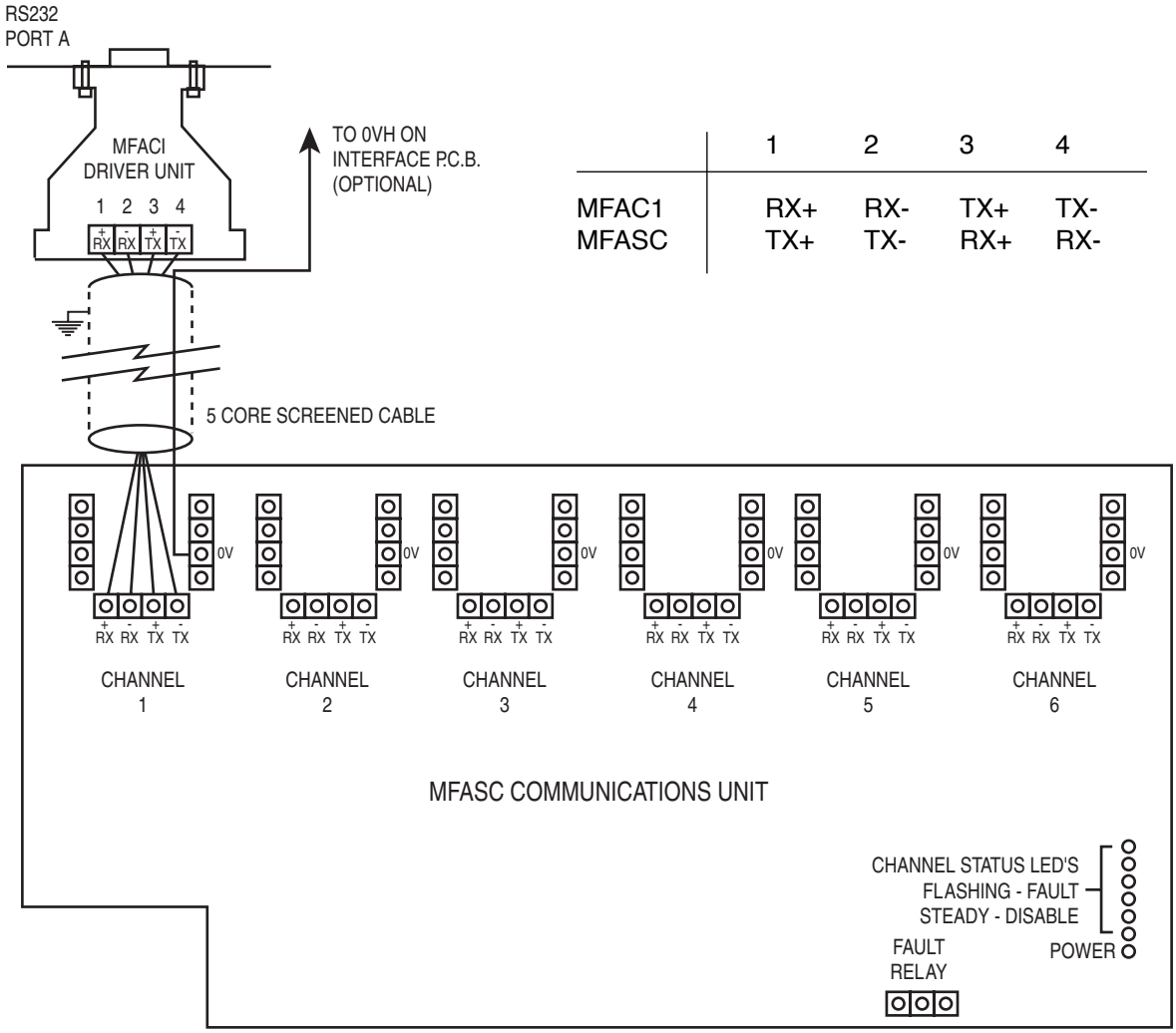


AXA6/8 Connections between Main Panel & Power Supply Unit



Network installation details

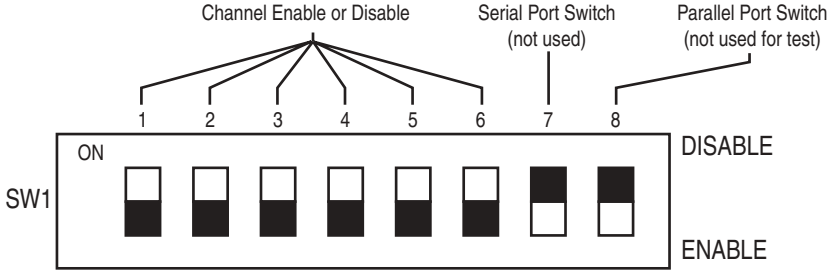
MFASC Communications unit connections



	1	2	3	4
MFAC1	RX+	RX-	TX+	TX-
MFASC	TX+	TX-	RX+	RX-

Connect all MFAXA2/4 Panels on the network to the appropriate channel on the MFASC Communications Unit (as shown above). The MFACI Driver Unit should be connected to the RS232 Port 'A' on each MFAXA 2/4 Panel.

Description of switches and links on MFASC



Normal positions for SW1 (if all channels are being used) are shown above. However, if a channel is not being used, move the appropriate switch into the disable (ON) position.

Note: Any disabled channels will have the appropriate channel status LED on steady.

Links LK1-LK6 should be in the RS422 position when in normal use, with the MFACI connected in the main control panel and using the TX+, TX-, RX+ and RX- terminals.

Note: If connecting a channel to RS232 compatible equipment, e.g. a PC, then the appropriate link must be made in the RS232 position. Contact Menvier Technical Service Department for further details.

If a channel status LED is flashing, then there is a fault on that particular channel. Check all connections are correct to the MFASC unit and at the AXA panel. The channel and type of fault will be indicated on the system.

First time power up

When the Menvier AXA system is first powered up, the panel checks how many addresses are installed on the system unless a site configuration or customer data non volatile RAM has been pre-loaded. The display will show the highest address number on the first loop. If the highest address is correct press the ENTER button to accept the loop.
Next, the highest address on the next loop will be displayed. Press the ENTER button again to accept the loop and so on until the whole system has been accepted.

If any of the highest addresses is not correct you will have to identify the problem. Once the problem has been identified and corrected the system should be powered down. Switch off both mains and battery supplies for at least one minute and then power up the system again by applying first mains power and then connecting the battery. Check again that the highest addresses are now correct.

If the ENTER button is not operated within 3 minutes of powering up, the panel will assume that there are 120 addresses on the particular loop. If the addresses have not been accepted as described above, all the loops will bring up fault messages for any addresses that are not giving a correct response or which are not present. If W is indicated on the display then either the address loop is not connected, detectors have not been fitted to the bases or there is a cable fault interfering with signal transmission. Pressing ENTER when ‘00’ is on the display will cause the system to assume there are 120 addresses on that particular loop.

Once the system has been correctly configured for a particular site it will power up straight away and display any fires or faults as appropriate. Alternatively it will show the site text with the time and date.

Commissioning the Menvier DF4000 system

Commissioning mode

COMMISSIONING MODE allows a single engineer to test the various detectors and call points on a system without always having to return to the panel either to reset the system or silence the alarms.

When in COMMISSIONING MODE, the system operates as normal except that when a detector or call point goes into alarm, the alarms only operate for a few seconds and then will silence. The panel then tries to reset the device automatically and, if successful, the alarms are operated again for a few seconds and the installation engineer can move on to the next detector. After a full test has been carried out the engineer can check the order in which the detectors/call points were operated using the DISPLAY LOG mode. This information can also be printed on the optional printer.

Entering commissioning mode

To enter COMMISSIONING MODE, press the MODE button until the cursor is flashing on COMMISSIONING MODE and then press the ENTER/TEST button. Password protection is incorporated into the system to prevent accidental setting of COMMISSIONING MODE. See Part 5 for more information on password protection. COMMISSIONING MODE can only be cancelled by pressing the RESET button. See Part 5 (page 13) for Commissioning Mode Flowchart.

Note: The complete panel will enter the Commissioning Mode to check that once all the tests are completed the panel is reset and returns to the quiescent state

Log displays

When the panel is in COMMISSIONING MODE the control panel inserts a different code into the log and also onto the print-out. This is to distinguish between when a device has been tested in COMMISSIONING MODE and when a device has been triggered while in normal operation.

The following differences will occur:

a) When in the LOG mode, "Address Test Fire" will appear on the display to indicate a commissioning fire.

b) On the printout a 'Com Fire’ message will appear on the first line of the printout to indicate a commissioning fire.

PART 4: MAINTENANCE

Contents

CONTENTS MUST BE UPDATED IN CONJUNCTION WITH REVISION RECORD SHEET IN INTRODUCTION.
(Section letters represent latest issue of that section only).

Expected Voltage/Current Ratings

TXAX 300VA Rating Toroidal
250V AC 25V: 25V Secondary Voltage (No output mode)

Operating Restrictions

N/A

Fault Finding

PRIMARY: Brown connected to White on primary side
Orange connected to Live
Black connected to Neutral

SECONDARY: Red and Blue connected to TX1 on PCB
Yellow and Grey connected to TX2 on PCB

Maintenance

Ensure that transformer is mounted correctly and that there are no obstructions or damage.

Expected voltage/current ratings

Nominal Voltage = +24V DC (range 18V - 30V DC)

COMMAND PULSES

Command (Transmission) pulses are positive on top of the loop standing voltage (6.0V - 7.5V tolerance)

Loop Controller to Detector:- Nominal

1.9mS Voltage Pulse: Address reset

244μS Voltage Pulse: Address increment

976μS Voltage Pulse: Toggle pulse

465μS Voltage Pulse: Logic 'O'

685μS Voltage Pulse: Logic '1'

1.5mS Voltage Pulse: Global repeater message

REPLY PULSES
Reception (Reply) pulses are current pulses of approximately 10-20mA

Detector to Loop Controller:- Nominal

244μS Current Pulse:	Status NORMAL	{ Analogue detector followed by ID
9.2mS Current Pulse:	Status FIRE	{ See Reference Section
500μS Current Pulse:		Logic 1 (Logic '0' = no pulse)
976μS Current Pulse:	Low Level Fault	{ Analogue device followed by ID
5mS Current Pulse:	FIRE or PRE-ALARM	{ See Reference Section

Operating restrictions

CABLING:

2km max. loop length of fully screened fire protected cable (e.g. FP200, MICC, FIRETUF).

DIAMETER:

Minimum cable diameter: 1.5mm^2 solid.

EARTHING:

Screen earth at the AXA panel on the outward and return. Screen MUST be continuous.

Fault finding

Use a loop tester to check the current consumption of the total loop.

Use an oscilloscope to check the wave-forms from the transmission and reply pulses described below.

TRANSMISSION PULSES:

Place the oscilloscope probe on the +ve NEAR loop terminal A or B. Voltage pulses are on top of the 24V DC residual voltage and therefore use the AC coupling setting on the oscilloscope to view the pulses. The earth on the oscilloscope probe should be connected to OVH on the Loop Controller PCB.

REPLY PULSES:

Place the other probe onto the cathode of D14 for loop A and D16 for loop B. On the D issue PCB use the marked probe terminals. Set the probe channel to AC coupled. The pulses are approximately 50 mV to 100m V.

REPLY PULSES AFTER SELECTION AND FILTERING CIRCUIT:

Connect the oscilloscope probe to the R81 position (the end nearest IC 11). The pulses are now between 0V and 5V and the channel setting should therefore be on DC.

Note: The triggering of the oscilloscope should be set to the transmission pulse channel probe to ensure that the reply pulses are captured at the correct time. Always use storage mode to ensure that the wave forms are easily viewed.

If you suspect there may be a loop short circuit fault, check that the loop short circuit current is between 0.275A and 0.342A by using appropriate loadings across the +ve and -ve of the faulty loop. Make sure the cables are neatly wired with as much space as possible between them and any other cables to avoid 'cross-talk'.

Maintenance

Check all loop wiring is correct and securely connected to the terminal blocks. Make sure the earth wires on the loop near and far cables are connected to appropriate earthing points. Check that the status of all loop controller LEDs is correct. Only the Mains LED should normally be lit, but if a loop has been disabled by the CDR, the loop Fault/Fire LED will be flashing on and off every 0.5 sec.

Expected voltage/current ratings

During Operation: +24V nominal (18V to 30V DC)

During Monitoring: Reverse voltage of approx. 20V DC for 0-5 sec.

Each line fused at 3.15A

Operating restrictions

Fully screened fire protected cable FF200™, PYRIO™ MICC FIRETUF™

Minimum cable diameter 1.5mm^2 solid.

Avoid risk of loading or voltage drops.

Fault finding

Short Circuit and Open Circuit Resistances.

Short Circuit between +ve terminal and screen (0V) ≤56kΩ.

Maintenance

Check all alarm wiring is correct and securely connected to the terminal blocks. Make sure earth wires on the alarm cables are securely connected to the appropriate earthing points.

Repeater output/auxiliary DC output — Main Panel

Expected voltage/current ratings

Repeater Outputs:	CLK 0-5V	Pulse Train
	ZONE 0-5V	Pulse Train
	ADDR 0-5V	Pulse Train
	Auxiliary D.C:	Nominal +24V DC (18-30V DC) Fused at 5A unmonitored Maximum 100mA (up to 5A when in alarm condition)

Operating restrictions

Unmonitored output
Only draws > 100mA during an alarm condition.

Fault finding

Use an oscilloscope to check wave forms.

CLK & ZONE OUTPUTS

1) Clock pulses should appear every 10 seconds. A square wave with 2ms period and 1:1 mark/space ratio.

2) Zone low pulses when zones in alarm.

ADDRESS OUTPUT

Pulse train appears approximately every 20 seconds or when an event occurs.

Maintenance

N/A

Relay Ratings — Main Panel

Expected voltage/current ratings

Fault Relay:	0.4A @ 30V AC (2A @ 30V DC)
Remote Signal Relay:	0.4A @ 30V AC (2A @ 30V DC)
2 x Auxiliary Relays:	0.4A @ 30V AC (2A @ 30V DC)

Operating restrictions

Avoid direct switching of mains in the enclosure.

Fault finding

N/A

Maintenance

N/A

AUX DC Ratings — Main Panel

Expected voltage/current ratings

Nominal: +24V DC 100mA (up to 5A at expense of alarm load).
18-30V DC Fused at 5A (unmonitored).

Operating restrictions

100mA maximum (up to 5A at expense of alarm load during alarm condition).

Fault finding

Ensure the fuse is intact as this is unmonitored (especially AUX DC fuse).

Maintenance

Check condition of the AUX DC fuse.

Charge Ratings — Main Panel

Expected voltage/current ratings

Charger voltage = 27.5V ± 0.1V DC with a load of 5.6kΩ across the battery leads.

Charger:

Current limit = 1.5A for 15 AH batteries
Main PSU Rating = 7A @ +24V DC
Main PSU limit = Approximately 9A

Operating restrictions

N/A

Fault finding

The main PSU limit is approximately 9A, after which the power shut down LED operates. To clear this condition, correct the short circuit fault and disconnect both the mains and battery power. Re-energise after one minute.

Battery Voltage: 24.0V - 27.6V DC
+24V DC Voltage (wrt ov): 24.5V - 28.0V DC
Battery o/c Monitor (wrt ov): 0.5V - 0.75V DC
Mains Monitor (wrt ov): 29V - 36V DC

Maintenance

N/A

Class Change & Remote Signal Delay — Main Panel

Pull down to 0V connection to operate the Class Change Input and the Remote Signal Relay

You must do this via the volt free contacts located close to the main panel enclosure to reduce any noise pick up on long lengths of cable

Expected voltage/current ratings — Repeater Panel

Transformer

MO86 Primary Voltage: 240V AC

Secondary Voltage: 27.0 - 29.0V AC

Relay Ratings

Fault Relay: O4A at 12.5V AC (2A at 20V DC)
Remote Signal Relay: 0.4A at 12.5V AC (2A at 20V DC)
2 x Auxiliary Relays: 0.4A at 12.5V AC (2A at 20V DC)

AUX DC Ratings

+24V DC at 1A maximum (fused at 1A - unmonitored).

Charge Ratings

Charge Voltage: 27.5V ± 0.1V DC with a load of 5.6kΩ across the battery leads.

Charger Current Limit: 1A

Main PSU Rating: 1.5A at +24V DC

Fault Finding — Repeater Panel

Transformer

Orange wires connected to 24V AC terminal on PCB.

Transformer

MPU244 - MO87: Primary Voltage = 240V AC

Secondary Voltage = 26.5 - 28.0 V AC

Alarm Lines

When the links are set to 2A, 1B (Monitored Alarm Operation) the voltages are as follows:

Normal Operation: +24V DC nominal (18V-30V DC)
Monitoring: Reverse voltage of approx. 20V DC for 0.5 seconds.

Note: Each line Fused at 3.15A

Relay Ratings

Output Relays 5A at 250V AC - 5A at 30V DC.

AUX DC Ratings

+24V DC at 3A maximum at the expense of the alarm load, fused at 5A.

Charge Ratings

Charge Voltage: 27.5V ± 0.1V DC with a load of 5.6kΩ across the battery leads.

Charger Current Limit: 1A

Main PSU Rating: 1.5A at +24V DC

Transformer

Orange wires connected to 24V AC terminal on PCB.

Address Loop

View the wave-forms with an oscilloscope (See circuit diagrams for probe positions and settings).

Alarm Lines

Short circuit between +ve terminal and screen (OV) ≤5.6kΩ.

Repeater Output/AUX DC Output

Zone output for repeater pulses when zones in alarm.

Transformer

M069: Primary Voltage = 240V AC Secondary Voltage = 17.5 -18.8 V AC
Check AC voltage limit on TBI terminals (TX to TX) 16-19 V AC

Channels 1 to 6

On RS232 link setting: +12V DC to -12V DC pulses
TX and RX: Transmission Rate = 9600 Bits per second

Voltage differences on RS422 link setting:

MAIN PANEL: between TX+ and TX- = +4.5V ± 0.5V / -0.1V ± 0.1V
MFASC INTERFACE UNIT: between RX+ and RX- = +4.5V ± 0.5V / -0.1V ± 0.1V

120R terminating resistor at each end of the RX+ and RX- lines

Relay Ratings

Fault: 0.4A at 125V AC (2A at 30V DC)

Charge Ratings

Charge Voltage= 13.7V ± 0.1V DC with a load of 5.6kΩ across the battery leads.

Fault Finding and Operating Restrictions

Channels 1 to 6

Use an oscilloscope across TX+ and TX- or RX+ and RX- terminals. Check all jumpers and switches are correctly set for the channels used. The channel status LEDs flash if there is a communications fault and are steady if disabled using SW1.

1Km max cable length. Min diameter 1mm^2. Fully screened and fire protected.

Expected Voltage/Current Ratings

MAP720 } Operating voltage = 24V DC nominal (18-30V DC)
MAI710 } Quiescent current = 300μA ± 20μA consumption (continuous)
MAH730 }

Operating Restrictions

Ambient Temperature for MAP720 & MAI710 = -20°C to +60°C

Ambient Temperature for MAH730 : Set for grade 1 or 2 = -20°C to +45°C

: Set for range 2 (high temp.) = -20°C to +85°C

Maximum humidity = 95%

Fault Finding

If the LED is flashing every 1.5 seconds there is a fire or pre-alarm condition.
If the LED is flashing every 12 seconds there is a low-level fault condition.

LOW LEVEL FAULT CONDITION:

The analogue level is too low. The detector may be faulty and should be replaced. Note that ionisation detectors situated in fast air flows may report low analogue levels.

HIGH LEVEL FAULT CONDITION:

A high level fault is due to the analogue level being too high. It is normally caused by dirt or dust. Clean or replace the detectors.

RECOMMENDED ANALOGUE SETTINGS:

MAP720/MAI710: Normal analogue level = 100

Alarm level = 140

MA730: Normal analogue level = ambient temperature +20°C
Alarm level = 78 (Grade 1 setting)
86 (Grade 2 setting)
122 (Range 2 high temperature setting)

In the analogue view mode on the panel there are 3 readings indicating the minimum, current and maximum values respectively since the panel was last powered up.

Expected voltage/current ratings — Ancillary Devices

MBG603/613 - Addressable Break Glass

Voltage: +24V DC nominal (18-30V DC)
Maximum Current Consumption: 70μA

MSI750 - Short Circuit Isolator

Voltage: +24V DC nominal (18-30V DC)
Maximum Current Consumption: 100μA

Note: To test the MSI750 Short Circuit Isolator, apply an input voltage of 10V and output resistance of 22kΩ @ 5W. The LED should be lit. Increase the voltage to 24V and the LED should go off. The contact rating on the latching relay is 125V AC at 0.4A and 30V DC at 2A.

MIU771 - Standard Interface Unit

Voltage: +24V DC nominal (18-30V DC)
Maximum Current Consumption: 1.5mA

Note: To test the MIU771 Standard Interface Unit check that the Normal end of Line = 22K, Fire Resistance = 470R, SIC Fault Resistance <200R and O/C Fault resistance > 50K

Spur Loading

Total Current Consumption = 200μA (equivalent to 5 conventional detectors)
Maximum length of spur =100 metres

Equipment Required — Equipment Required

1) DVM
2) Digital Storage Oscilloscope
3) Loop tester for Analogue/Addressable System

References and Related Manuals — References

1) ‘AXA System Alarm Line Interface (MPU244)’ Installation, Commissioning and Operating Manual - PINSTMPU244 Issue E

2) ‘AXA System Repeater - MFAREP & MFAREP/LP’ Installation Instructions and Operating Manual - PINSTMFAREP Issue E

Test	Conditions	Correct Voltage
Mains Monitor Voltage	Mains Connected	35 - 38V DC
Battery Voltage Battery Open Circuit Monitor	Fully Charged Batteries Connected or 5.6kΩ Battery Load	27.5 - 27.7V DC 0.75 - 0.5V
Battery Charger Output Address Loop + to -	Open Circuit with 5.6kΩ Load Mains On Mains Off	28 - 28.2V DC 27.6V DC nom. 26 - 27V DC Battery V less 0.6 - 1V
Alarm Line Voltage when alarms are operated AUX. DC	Mains On Mains Off Mains On Mains Off	26.5 - 28V DC Battery V less 1V approx. 26.5 - 28V DC Battery V less 0.7V approx.
Class Change Input	Open Circuit	5V DC
Repeater Clock and Zone Outputs		OV DC with bursts of 5V pulses at approx. 1k Hz every 10 seconds
Repeater ‘Address’ Output		OV DC with bursts of 5V pulses at approx. 1k Hz every 10 seconds

Fault Reported	Cause	Corrective Action
Power Fault	Either a mains or battery power fault.	Check battery polarity and the battery fuse F2 (The fuse will now blow if the battery polarity is reversed).
	If the green power indicator is lit, the fault is due to a battery fault - normally an open circuit.	If the green indicator is not lit, check the mains voltage at the input terminal block. Check the mains input fuse, the output voltage from the transformer and the AC input fuse F1.
	Possibly due to an incorrect charge voltage, a faulty battery or faulty charge circuit.	The power fault LED will flash if there is a mains fault in which case check the mains supply.
Alarm Fault/Disable	One or more alarm line faults as indicated on the LCD. This could be either an open or short circuit fault.	Check the voltage at the alarm line terminals. Higher than normal voltages indicate open circuit faults (check that the end of line resistor is 22k). Lower than normal voltages indicate short circuit faults. Check for short-circuits, non-polarised or reversed sounders or indicators. Check that the appropriate fuse is fitted and intact. If the LED is flashing, it indicates a fault. If it is steady, the alarms have been disabled.

Fault Reported	Cause	Corrective Action
Main Fault	This LED will be lit if there is a fault on the panel or system.	Check for specific faults
System Fault	This LED is lit if a memory or data check sum or similar system fault has been found, more detailed information will be displayed on the LCD.	Contact the Menvier service department as a PCB or memory circuit will need to be replaced

Other System Indications

Message	Meaning	Comments
Remote Signal Disable	The Remote Signal Isolate switch has ben operated. The LED will be steady.	This switch will inhibit a signal from being transmitted to a remote manned centre and should only be operated during maintenance or system testing.
Commissioning/Test	Commissioning Mode.	This is a special test mode that should only be used during the commissioning of the system or during regular testing.
Remote Signal Activated	This illuminates if the Remote Signal Fire Relay has operated.	
Disable	If one or more devices have been isolated or disabled, this LED will be lit.	

PART 5: SYSTEM OPERATION

Contents

System Indicators

The Fire Indicator (Red Condition)

The red fire indicator lights up when a fire is detected by the system. A detector, an addressable call point or an address interface activates the fire indicator. The indicator flashes until the SILENCE ALARMS or SILENCE BUZZER buttons are pressed to silence the sounders or internal buzzer. After that the indicator light will remain steady. If a further fire signal is received the fire indicator will resume flashing. The red fire indicator can only be switched off by removing the fire condition (waiting for smoke and heat to disperse or replacing broken glass etc.) and then operating the RESET button.

Note: The panel's internal sounder operates at approximately ten second intervals as a warning buzzer during the 'silence alarms' condition.

The Pre-Alarm Indicator (Yellow Condition)

This yellow indicator lights up when a pre-alarm signal is received from a pre¬programmed pre-alarm analogue detector. The indicator will flash until the SILENCE BUZZER button is operated, after which it remains steady. If a further pre-alarm signal is received the pre-alarm indicator resumes flashing. When the pre-alarm event clears the yellow indicator turns off.

The Fault Indicator (Yellow Condition)

This yellow indicator will light if a fault is detected on the system. Further details of the fault will be shown by other indicators. If no other indicators are alight and the green power LED is lit, the fault is due to a major problem with the microprocessor and the 'watchdog' circuit has operated the indicator. If a mains power fault has occurred the SILENCE BUZZER button should be operated to turn on the main LCD backlighting. The fault indicator can also operate while in the DISPLAY LOG mode.

The Power Indicator (Green Condition)

This green indicator is lit when the mains supply to the panel is present. If the mains supply is removed, the fault light operates to indicate that system power is not present and the green power light will flash.

Fault Indicators

The following faults are indicated on the LCD. If there is more than one fault the LCD gives an indication of all areas that are faulty.

Fault Indication	**Function/Meaning**
Alarm Fault/Disable	This indicates that either an alarm line fuse has blown or there is an open or short circuit fault on an alarm line (If the relevant LED is steady, an alarm has been isolated). *Note: The Menvier DF4000 system will indicate an Alarm Fault if non-polarised sounders or indicators are used. Sounders can be polarised by a diode, but take care to ensure that they are suppressed.*
Alarm Silenced	This indicator will light in the fire condition if the 'Silence Alarms' button has been pressed. The internal buzzer also operates in a fire condition. When the 'Silence Alarms' button is pressed it will sound every 10 seconds approx. The 'Alarm Sound' button extinguishes the 'Alarm Silenced' indicator. Press the 'Silence Buzzer' button to turn off the internal buzzer.
Alarm Sound	This indicator will light if the alarms have been sounded. The 'Silence Alarm' button will extinguish the 'Alarm Sound' indicator.
Remote Signal Disable	This indicator will light if the 'Remote Signal Isolate' control has been operated so that a signal to a Remote manned centre is prevented from operating in the event of a fire being detected. *Note: When in a fire condition, there is a reduced menu facility to allow the operator to view the display log and view all the events on the control panel and to isolate or re-enable the Remote Signal Relay. These functions use the bottom lines of the LCD only, so that 'FIRST' and 'LAST' fire information can be left on the LCD.*
Remote Signal Activated	This indicator will light on a fire condition if the remote signal relay has operated ie. the remote signal has not been delayed or isolated.
Delay Enabled	This indicator will light if the Remote Signal Delay is active. When the time elapses (10 minutes max.) the LED will turn off.
System Fault	This indicates that there is a fault with the system, eg. a fault on one or more of the memory circuits on the panel.
Test/Commissioning	This LED will be illuminated when the panel is in the commissioning mode (see Part 3 of this manual)

Loop Controller PCB Indicators

LED	Function/Meaning
Power LED	When on it indicates that there is power to the relevant loop controller PCB
Comms Fault LED	When this LED flashes it indicates that there is a communications fault between the relevant loop controller and the main display controller via the interface PCB.
Reset LED	When on it indicates that the reset line between the display controller and loop controller is low and that therefore the loop controller will be held in a reset state.
Alarm LED	When this LED flashes it indicates that there is an alarm line fault on any of the 4 alarm lines on that loop controller PCB.
Loop A. LED	i) when on continuously there is an address on Loop A in a fire condition ii) when the LED is flashing once every second there is an address on Loop A in a fault condition iii) when the LED is flashing once every half second, there is a Loop A fault condition. For example either a Loop A short circuit fault, a Loop A circuit fault or it indicates that a particular loop has either been disabled or is not utilised.
Loop B. LED	Indicates the same as Loop A LED but that the fault or fire is on Loop B.

Display Controller PCB Indicators

These indicators are located on the inside of the panel door.

LED	Function/Meaning
Power LED	When on it indicates that there is power to the display controller PCB
Reset LED	When on it indicates that the reset line voltage on the display controller is low or the RESET button is held down and that therefore the display controller is held in a reset state.

Power Supply PCB Indicator

LED	Function/Meaning
Power Supply Shut Down Indicator LED	The LED indicator on the power supply PCB in the power supply box operates if the power supply has shut down due to a short circuit or overload fault. You must disconnect both sets of batteries and turn off the mains power. The LEDs will slowly go out. Identify and remove the fault between +24V and OV H/L and then turn the mains back on and re-connect the batteries, checking that the LED is completely off.

The Liquid Crystal Display (LCD)

Description

The LCD is a multi-function display consisting of 8 lines by 40 characters and features high intensity backlighting. In normal operation, the display indicates the site text, customer version number and the time/date with the backlighting off.

During an event on the system the first 3 lines display FIRST EVENT and the next 3 lines display LAST EVENT. The last 2 lines are normally used to display the total number of events, but they are also used for scrolling fire conditions, faults, pre alarms or disabled devices independently or for displaying a reduced menu when in fire condition.

When an event occurs the LCD backlighting comes on unless there is a mains power supply fault.

You can use the LCD to scroll through all active events on the system by using the SCROLL UP and SCROLL DOWN buttons (available at access level 1). You can display the contents of the log and interactively allow parts of the system to be disabled. When displaying the system menu on the LCD, the last 5 lines of the display are shown in reverse text.

Zones/Sectors in Fire

Thirty-two LEDs are provided on the panel. You can configure these to operate when specific addresses go into an alarm state. You can therefore use them to display the zones in alarm state. If more than thirty-two zones need to be displayed in an LED format, a zonal repeater mimic can be mounted separate from the fire system control panel. In this case the thirty-two LEDs can either be left inactive or used as sectors in fire by allocating specific zones to specific sectors especially on larger systems.

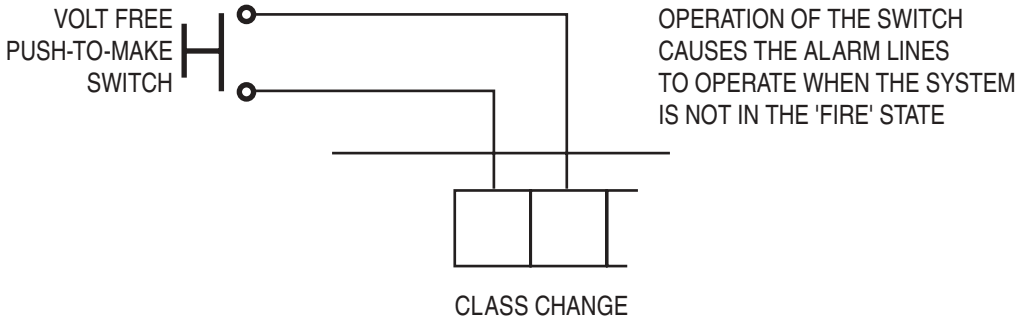
Control Buttons

Control Button	Function
Silence Alarms	This button has two functions: i) In the fire state it silences the alarms and causes the internal sounder to operate only every 10 seconds. The ALARM SILENCED LED will also light. ii) In the fault state it silences the internal sounder. In both the fault and fire states pressing the SILENCE ALARMS button will update the LCD.
Silence Buzzer	This button will silence the panel's internal sounder when in a fire/pre-alarm or fault condition. It will also update the LCD.
Sound Alarms	This button causes all the alarm lines to operate, thus operating any sounders or indicators on the system. In the fire state it will also cause the internal sounder to reactivate every second and extinguish the ALARM SILENCED LED if the SILENCE button has previously been operated.
Enter/Test	The primary use of this button is to test the panel indicators and internal sounder. Pressing the button will illuminate all the indicators/ including the LCD/ and also operate the internal sounder as long as the button is depressed. It is also used in conjunction with the NEXT, LAST and MODE switches to perform some of the special functions described in this manual. Operating the panel TEST will also cause the LAST EVENT of the display to be updated without silencing the alarms. The ENTER button is also used to accept the total number of addresses on the system during first-time power up. If the optional printer has been turned off, pressing the ENTER/TEST button will cause the printer to print out any events which have not yet been printed.
Scroll Function: Scroll Up/Scroll Down	These two buttons, at access level 1, are used to scroll through fire conditions, pre-alarms, faults or disabled devices independantly. Press the SCROLL DOWN button to display the scroll menu, then use the SCROLL UP button to move the cursor to the required event type and select it by pressing SCROLL DOWN. The first event will be displayed (with the zone text if applicable) on the bottom line of the LCD, the event number will be displayed on the line above. Further operation of the SCROLL UP/SCROLL DOWN buttons will scroll through the events in order of occurance. The display will revert back to normal within 20-30 seconds of the last button being pressed.
Last (-)/Next (+)	These buttons are used in conjunction with the MODE button to select various special functions i.e. to move up and down the display log mode and to select the required loop/address number in the disable/re-enable menu.
Mode	This button is used to select the special modes described in Special Functions overleaf, for example DISPLAY LOG, COMMISSIONING MODE, DISABLE DEVICES, CLOCK SET and VIEW SYSTEM information. Pressing the MODE button will display the main menu. Repeated operation of the MODE button moves the cursor through the menu and pressing ENTER selects the desired option.
Exit	This button is used to exit any of the special modes, back to the quiescent display. It is also used to re-enable selected devices when in the DISABLE SYSTEM menu.

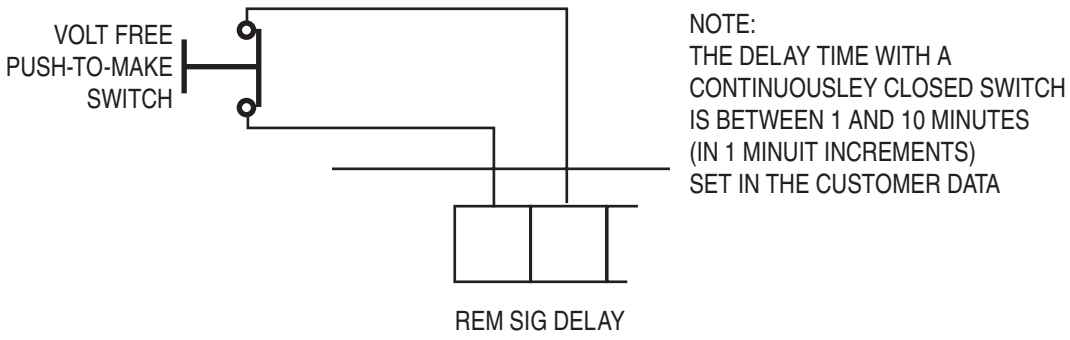
The following two controls are operated via a separate switch or relay contact connected to the CLASS CHANGE or the REMOTE SIGNAL DELAY terminals mounted on the interface PCB. See special functions (section 5.8).

Control Button	**Function**
Class Change	To operate the CLASS CHANGE function, fit a normally open biased switch across the class change terminals. When the switch is operated, the alarm lines will operate and will remain operated until the switch is released. The class change function is inhibited in the fire state. *Note: Any MPU244's configured as alarm outputs will also operate with the panel alarms.*
Remote Signal Delay	To operate the REMOTE SIGNAL DELAY connect a normally closed switch across the Remote signal delay terminals. When a fire is detected by the system, the alarm lines and displays will operate immediately but the remote signal will not operate for up to 10 minutes, programmable in 1 minute increments, unless the switch is opened - in which case the remote signal will operate immediately. The programmed delay is intended to allow building users to investigate whether a fire has occurred and, if not, to stop the fire brigade being called by operating the REMOTE SIGNAL ISOLATE before the delay has elapsed. If a fire has occurred the delay can be immediately halted by opening the switch. While the delay is active the delay enable LED will be lit. *Note: A call point/interface will override this delay as specified in EN54 part 2 standards*
Programmable AUX Input	In addition to the above there is a programmable input which can be used to operate a number of special functions configured for specific site applications, via special non standard programming.

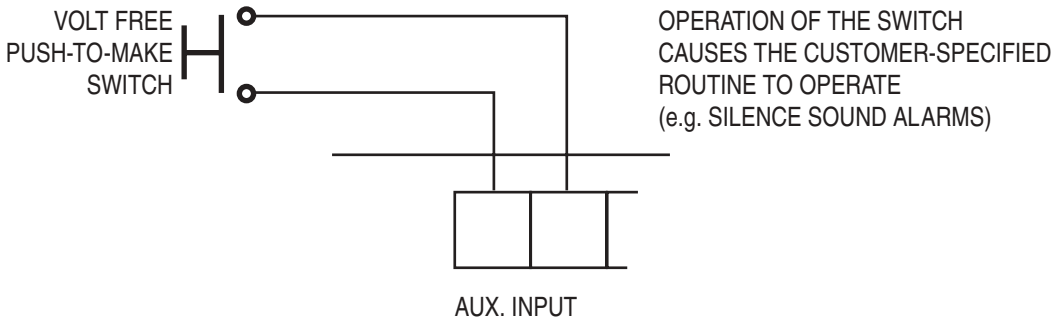
AXA Class Change Connection



AXA Remote Signal Delay Connection



AXA Programmable AUX Input



Special Functions

Using the Mode Functions

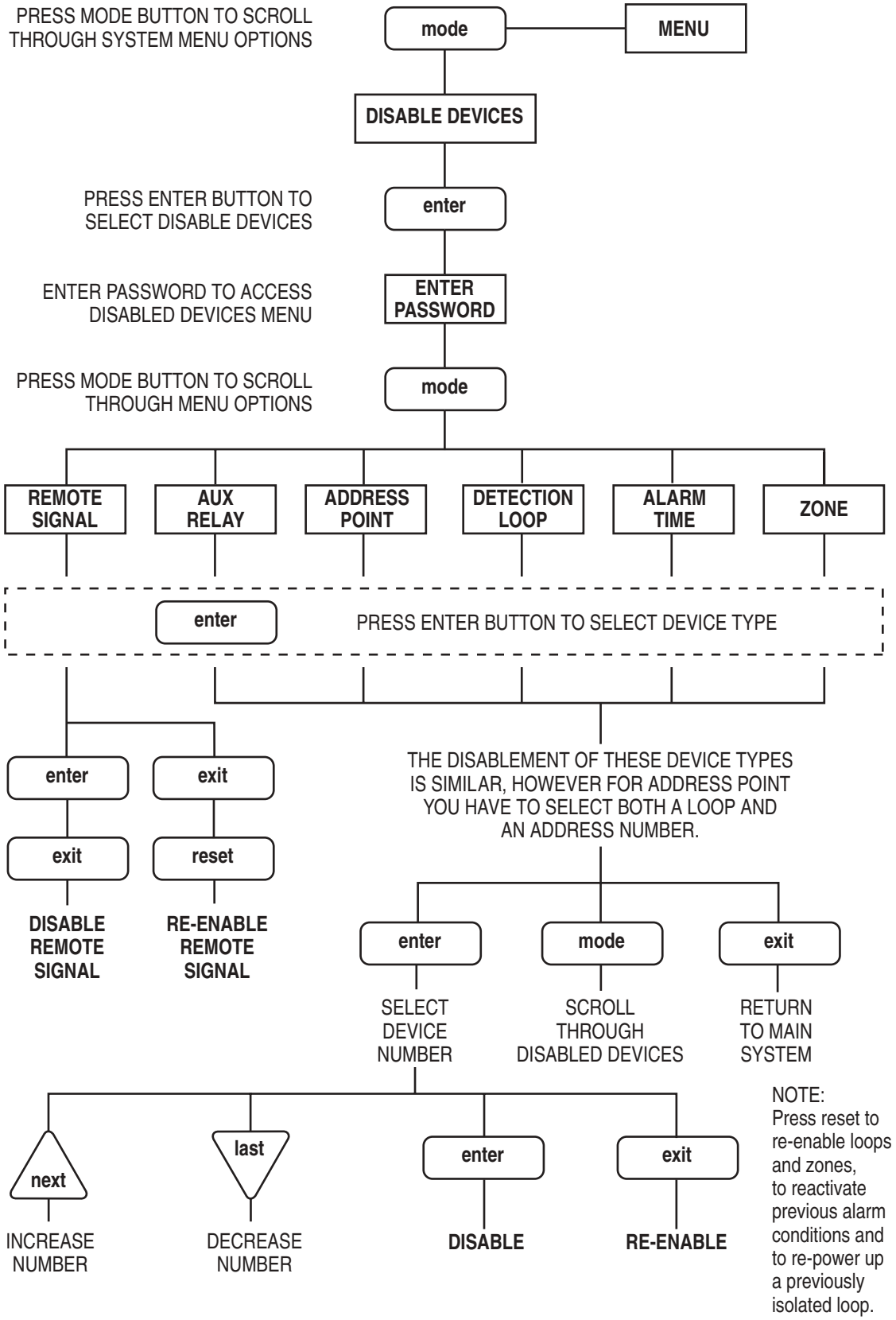
The following special functions are selected by operating the MODE switch until the cursor is next to the appropriate menu item. Then proceed as described below. Successively pressing the MODE switch will move the cursor and pressing the EXIT button will put the panel back into the NORMAL mode. If no functions are selected, the panel will automatically revert to the NORMAL mode within 20-30 seconds of the last button being pressed. However, if you are using COMMISSIONING MODE you have to press the RESET button to cancel this mode (see below).

For the details on how the special function menu operates refer to the menu flowchart.

Mode	**Function**
Address Disable Mode	The ADDRESS DISABLE MODE is used to disable certain addresses. The normal use of this would be in the case of building work or system maintenance that would cause either a fire or fault response on the panel. If the addresses are isolated prior to the work being carried out the panel will not respond to that particular address. Address isolation cannot be cancelled by resetting the system. Re-enable the selected device using the EXIT button when in the DISABLE menu. To enter the ADDRESS DISABLE MODE follow the menu flowchart, for this section.
Loop Disable Mode	This mode is used to disable a complete loop and is useful when some work is needed on a loop. However, care must be taken because all the addresses on that loop are powered down. *Note: After the loop has been re-enabled, a reset will re-power up the previously isolated loop.*
Alarm Disable Mode	This mode is used to inhibit certain alarm lines from operating in the event of fire and is useful during testing of the system. Use it also when changing small parts of the system, and it is essential for the rest of the system to remain powered up, without disrupting the normal conditions within a building.
Relay Disable Mode	This mode is similar to the ALARM DISABLE MODE, in that certain relays can be inhibited from operating in the event of a fire or pre-alarm condition.
Zone Disable Mode	You can isolate zones from the main DISABLE menu. Complete zones can be isolated and then re-enabled. For example, if there are a number of detectors in a theatre and these need to be isolated during a performance then a simple zonal isolation can be carried out and the system re-enabled after the show has finished. To disable zones,use the main DISABLE DEVICES Menu. The operation works in a similar manner to other isolations and the user only has to select the zone to be isolated or re-enabled. *Note: After the zone has been re-enabled, a reset will clear any active address alarm conditions.*

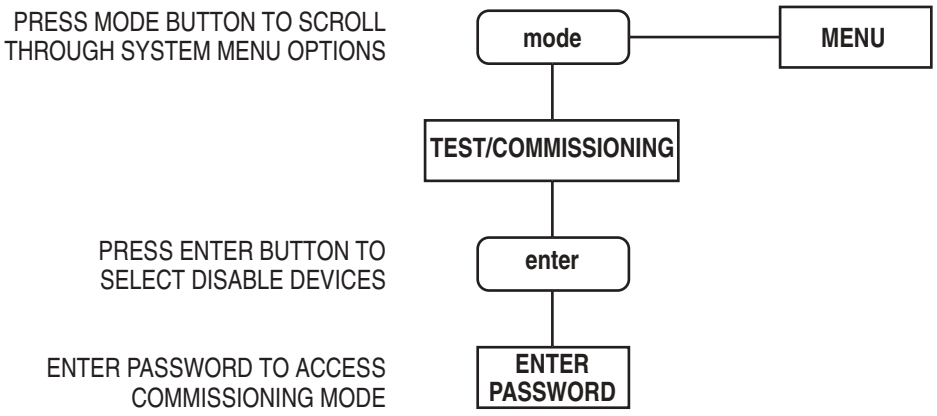
GENERAL DISABLE MENU NOTE: Disabling and re-enabling can be carried out on 2 to 8 loop control panels. A network system can only disable or re-enable devices on individual panels.

Disable Devices Flow Chart



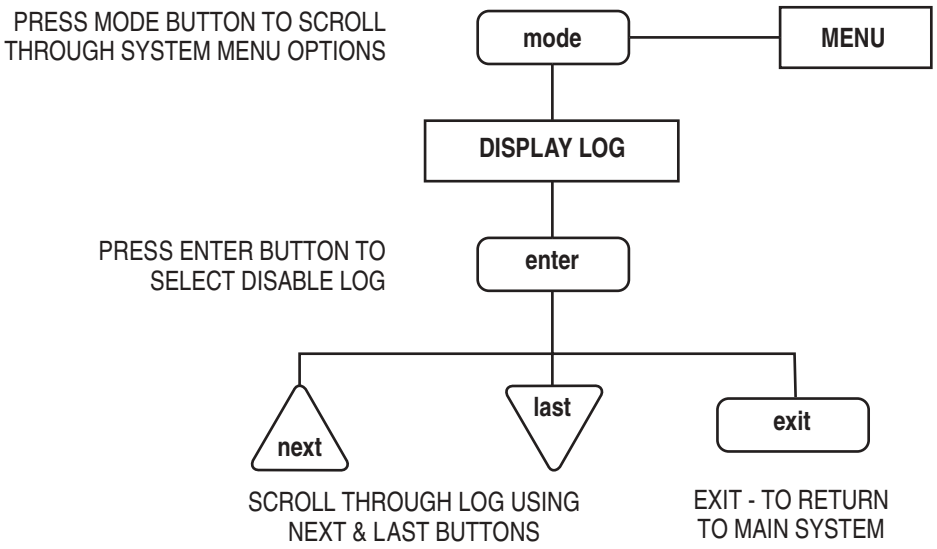
Mode	Function
Commissioning Mode	COMMISSIONING MODE allows a single engineer to test the various detectors and call points on a system without always having to return to the panel either to reset the system or silence the alarms. When in COMMISSIONING MODE, the system operates as normal except that when a detector or call point goes into alarm, the alarms only operate for a few seconds and then will silence. The panel then tries to reset the device automatically and, if successful, the alarms are operated again for a few seconds and the installation engineer can move on to the next detector. After a full test has been carried out the engineer can check the order in which the detectors/call points were operated using the DISPLAY LOG MODE. Also this information can be printed on the optional printer. To enter COMMISSIONING MODE, press the MODE button until the cursor is flashing on COMMISSIONING MODE and then press the ENTER/TEST button. Type in the correct password (see password section) and then the test LED will illuminate.
Note: When in commissioning mode the whole panel is in this mode so steps must be taken so that a fire event detected in an area that is not being tested is not ignored and is investigated. The control panel will attempt to reset that address but if unsuccessful will continue to log that event	

Commissioning Mode Flowchart



Mode	Function
Display Log Mode	The system log displays events that have happened on the system in the order in which they occurred. To display the contents of the log press the MODE switch until the cursor is next to DISPLAY LOG then press the ENTER switch. During a fire condition the display log can be used but events are only displayed on the bottom two lines of the display with reduced information. Events are scrolled up and down using the NEXT and LAST buttons and the DISPLAY LOG MODE is cancelled using the EXIT switch or by the system time-out if no buttons are operated after 20-30 seconds. If you have the optional printer attached you can print the whole contents of the log by entering LOG MODE, and pressing the ENTER and LAST switches together. To print only a section of the log, scroll through the log until the first event to be printed is displayed and then press the ENTER and NEXT switches together, (i.e. if a printout of the last 3 events of a total of 10 events is required, use the LAST and NEXT buttons to position at event No.7 and press the ENTER and NEXT switches together). To stop printing press the EXIT switch.

Display Log Flowchart



Other Features

Clock Setting Mode

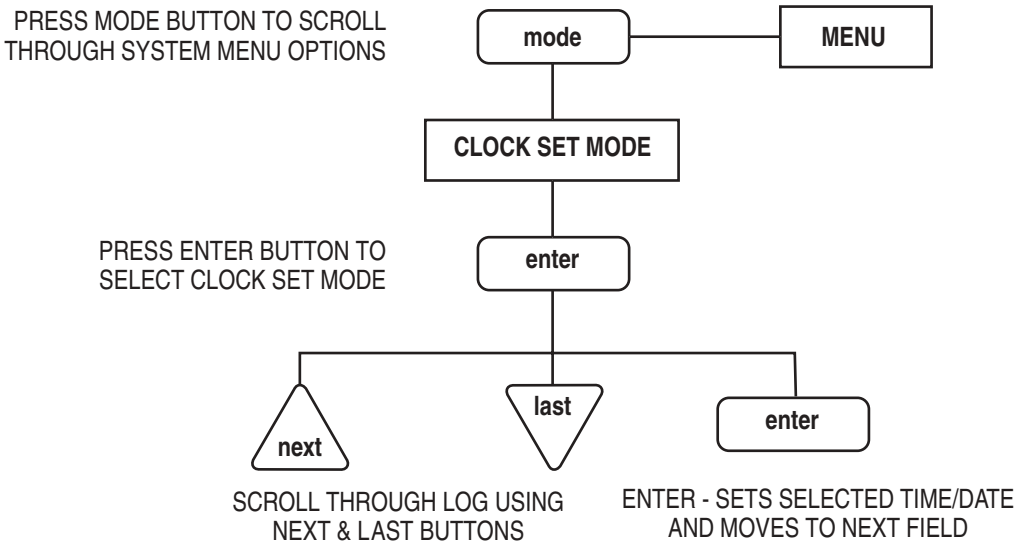
The Menvier DF4000 system has an in-built clock and calendar. On the AXA 6 and 8 loop control panels, the clock in the top section is synchronised with the clock in the bottom section of the control panel, You should not need to change the time and date even in the event of a power loss. However, if it is necessary to alter the time or date, proceed as follows:

1) Open the perspex door of the control panel, release the hinged door assembly and move SW2 on the display controller away from the programming position (i.e. left to the 'CLK' position). Close the door.

2) Press the MODE and ENTER button to select the CLOCK SET mode. Use the NEXT and LAST controls to alter the setting and the ENTER control to scroll through the options and exit CLOCK SET mode.

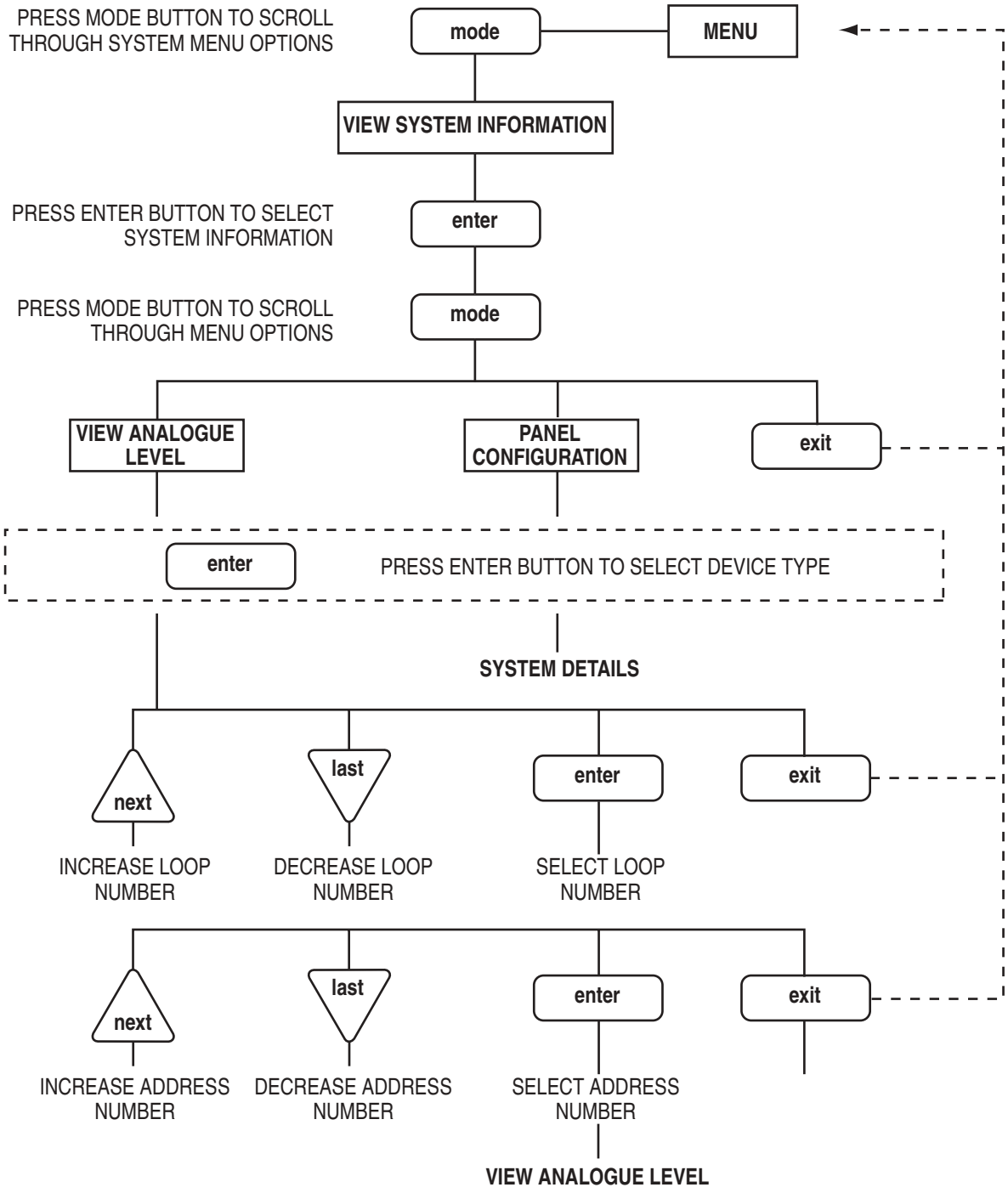
3) Hinge the front door assembly down again and move SW2 back to the normal position (i.e. to the centre) and reassemble the control panel having checked that the time and date are correct.

Note: It is very important that the RESET button is not pressed during this procedure because the customer data could become corrupted and a customer data fault will appear on the display. Should this happen, contact the Menvier Service department to restore the customer data and recheck the system.



View System Configuration

This menu function gives basic information on the system set-up such as number of zones, loops, alarms, addresses etc



Analogue View

You can enter ANALOGUE VIEW via the VIEW SYSTEM information menu. By selecting a loop and address number you can view the minimum, current and maximum background levels for that particular address in a basic bar-chart format on the LCD or in actual values.

The codes used are as follows:

PHO	Analogue Photoelectric Detector
ION	Analogue Ionisation Detector
HRR	Analogue Rate of Rise Detector grade 1
HFX	Analogue Fixed Heat Detector grade 2 or range 2
C / P	Addressable Call Point
ABS	Addressable Base plus Conventional 700 Detector
INT	Addressable Interface MIU771
REP	Analogue Repeater
ALM	Analogue Alarm Line Interface MPU244 / A
RLY	Analogue Relay Interface MPU244 / R
AIO	MIO780 Alarm I / O unit
RIO	MIO780 Relay I / O unit
SPA	Spare Analogue Device (Not Used).

ANALOGUE VIEW mode can be used on the AXA 2 to 8 loop control panels but on a network system you can only view analogue levels for devices on individual panels.

Note: Use the LAST and NEXT buttons to select devices to disable or to view their analogue levels. If you have disabled a device or viewed its analogue level, select the next or previous device number you want, by pressing the NEXT or LAST buttons, respectively. Then press ENTER to activate the isolation or view. To re-enable, press EXIT. This will speed up disabling and viewing devices. If you want to reset the device number then just press the MODE button. In ANALOGUE VIEW mode press the ENTER button to maintain the display, otherwise the system time-out of approximately 20-30 seconds will cancel the display and return it to the quiescent condition.

Password Protection

The Menvier DF4000 system has password protection which restricts access to the DISABLE Menu and to TEST/COMMISSIONING MODE. The password is a four digit code and the default number is 2214. Four keys are used to enter the number which is displayed on the LCD as asterisks. From the MAIN Menu enter the password number by pressing the appropriate digit displayed. If the wrong password is entered three times further access to the system is denied. A dedicated site or panel password can be defined in the Customer Data Non Volatile RAM. However, if no password is required then the Customer Data NV RAM area for the code will be programmed with ‘00’s

Analogue Threshold Levels and Setting

Low Level Fault

The low level fault condition is initiated by an analogue device. The level is pre-set in the detector so that if it falls below a particular threshold, the detector goes into a low level condition. This condition indicates that the sensitivity of the detector has fallen to a sufficiently low level at which the overall response would be below to the lower limit specified by the EN54 standard. In the case of a photoelectric detector the fault could be a failed IR LED. An ionisation detector might give a low level fault condition if it is subjected to rapid air movements.

The low level fault message is also used by alarm, relay and repeater units to indicate local faults at a particular unit. In this case the repeater sends instructions back to the main panel with a message such as SOUND and SILENCE ALARMS.

For analogue photoelectric detectors the Low Level Threshold is 91.

For analogue ionisation detectors the Low Level Threshold is 77.

For analogue heat detectors the Low Level Threshold is 0 which is equivalent to -20°C.

Normal Analogue Level Range

The normal analogue level for photoelectric and ionisation analogue detectors is approximately 100. The full range is as follows:

Analogue photoelectric detectors: 91 to 120

Analogue ionisation detectors: 77 to 120

The normal analogue level for heat detectors is the ambient temperature of the surroundings. The level displayed is ambient temperature +20°C. This is because the lowest limit for the temperature range is -20°C.

High Level Fault

The high level fault message indicates that the analogue level at a particular device has risen to a sufficiently high level that the overall sensitivity has increased. This is a long term monitoring process carried out by the panel which interrogates each individual analogue detector and examines the analogue level and checks with a time element to see if the level has risen sufficiently to give a high level fault. The level is approximately 120.

A high level fault on a smoke detector normally indicates a dirty detector (which requires cleaning). On a heat detector it might indicate that the ambient temperature is too high.

Pre-Alarm Condition/Threshold Level

The pre-alarm threshold is nominally set between 70% and 80% of the full alarm level which is equivalent to an analogue level of 130 for smoke detectors. In the case of heat detectors, the pre-alarm level is qpproximately 10°C below the normal threshold. The pre-alarm condition gives an early warning of an alarm condition. If levels of smoke or heat continue to rise then a full alarm condition will occur.

Note: The pre-alarm condition is automatically reset if level falls below the pre-alarm threshold.

Fire Condition/Levels

Normal Threshold - Levels set to EN54 standards.

Analogue Detector Type	Threshold	Equivalent Definition
Photoelectric	140	Smoke level, m = 0.09dB / m Obscuration = 2.0% / m
Ionisation	140	Smoke level, y = 0.9
Rate of Heat Rise (Grade 1)	078	Static Temperature = 58°C
Fixed Heat (Grade 2)	085	Static Temperature = 65°C
High Temperature (Range 2)	122	Static Temperature = 102°C

Medium Threshold - Levels for photoelectric and ionisation detectors are set so that the response of the detectors is on the upper limit of the smoke response as defined in the EN54 standard. In the case of heat detectors, the temperature setting is at the next grade or range up.

Analogue Detector Type	Threshold	Equivalent Definition
Photoelectric	170	Smoke level, m = 0.11dB / m Obscuration = 2.7% / m
Ionisation	170	Smoke level, y = 1.1
Rate of Heat Rise (Grade 2)	088	Static Temperature = 68°C
Fixed Heat (Grade 3)	095	Static Temperature = 75°C
High Temperature (Range 2/3)	132	Static Temperature = 112°C

High Threshold - These levels are chosen above the levels permitted by the EN54 standard and consequently SHOULD ONLY BE USED IN EXTREME CIRCUMSTANCES where a particular environment is causing unwanted alarms.

Analogue Detector Type	Threshold	Equivalent Definition
Photoelectric	190	
Ionisation	190	
Rate of Heat Rise	098	Static Temperature = 78°C
Fixed Heat	105	Static Temperature = 85°C
High Temperature	142	Static Temperature = 122°C

Site Configuration and System Features

The Menvier DF4000 system has been designed to allow a high degree of operational flexibility by using software options, covering areas such as alarm line operation, phased evacuation and extract and damper control. Other system features include custom display configurations, alarm device displays and automatic address isolation. New features are continually being added to the system, but some of the more specialised configuration options are listed below:

- Each address can be allocated to one of 128 zones.
- Each zone can be configured into one of 32 sectors.
- Each zone can have a specific alarm line ringing configuration.
- Each alarm can be configured either to cadence, time cadence or alarm. Or it may operate after a specific time from any of the allocated zones.
- Each address can be configured to have a specific detector type (to print log records).
- Each address, zone, alarm line and detector type can have a 24 character label associated with it (for print out purposes).
- The two auxiliary relays can operate on specific zones, addresses or multiple addresses.
- The auxiliary input can be configured either as remote or silence/sound alarm. There are a number of other customised features.
- The repeater outputs can be configured for addresses or zones.
- The system can be configured to operate various peripheral devices such as relays or to respond to specific sequences of events.
- The panel can be programmed and customer data altered on site via the RS232 port using a portable computer and special Menvier AXA configuration software.
- A ‘Two-Stage Alarm' operation is a standard feature. If enabled, a first fire state activates the alarm and relays as pre-programmed in the CDR. A second alarm state (in any zone) will activate ALL alarms and relays.

Note: An analogue programming sheet to generate the Customer Data NVRAM is provided.
Pre-alarm detection devices can be enabled as standard when the CDR is generated.
Please state on programming form if pre-alarm at any particular device is not required.

AXA Customer Programming

Form 1: Menvier AXA System Details

This form should be completed in full including the ‘Special Requirements’ section. It MUST be signed and approved by the customer.

Form 2: Zone to Sector Information

This form should include:

1) Zone number (1-128).

2) Sector text or sector number (maximum 24 characters or numbers).

3) Zone description text (maximum 24 characters).

Form 3: Address Information Chart

This form should include:

1) Loop number.

2) Address number (maximum 120 per loop).

3) Zone number (1-128).

4) Device type (selected from the device type codes).

5) Address description text (maximum 24 characters).

6) The threshold level for analogue smoke or heat detectors. If different levels for daytime and night-time are required, give the daytime level. Options should be selected from the Day/Night Threshold key.

7) Day/Night threshold levels. Give the night time level if required.

8) Pre-alarm (If required fill in YES).

Example of Form 1

REF No.									PAGE 1 OF		

MENVIER AXA SYSTEM DETAILS

CLIENT:	PROJECT:
ADDRESS:	ADDRESS: QUOTATION NUMBER:
TEL No:	DELIVERY DATE:

SPECIAL REQUIREMENTS (PLEASE COMPLETE - MARK N/A IF NOT REQUIRED)

A) DAY/NIGHT TIME REQUIRED? = DAY TIME = NIGHT TIME

B) CADENCE TIME (STANDARD IS - 1 SECOND ON/OFF)? =

C) FAULT RELAY DELAY TIMER? =

D) LOOPS NOT USED? =

E) SITE TEXT: 40 CHARACTERS? =

F) MULTI PANEL CONFIGURATION? =

DESCRIBE PANEL NETWORKING/CONFIGURATION

G) ANY OTHER SPECIAL REQUIREMENTS? =

APPROVAL TO SYSTEM BY CUSTOMER

SIGNED:.....

FOR:..... DATE:.....

COOPER LIGHTING AND SECURITY LTD.

WHEATLEY HALL ROAD, DONCASTER, SOUTH YORKSHIRE. DN2 4NB

TEL: 01302 321541 FAX: 01302 303220

Example of Form 2

ZONE TO SECTOR INFORMATION CHART

SITE:		PAGE_____OF_____
ZONE	SECTOR TEXT OR SECTOR NUMBER	ZONE DESCRIPTION TEXT

ADDRESS INFORMATION CHART

LOOP No.

PAGE_____OF_____

SITE:

ADD No.	ZONE No.	DEVICE TYPE	ADDRESS DESCRIPTION TEXT	THRESHOLD LEVEL DAY/ NORM	NIGHT	PRE ALARM

Device Type Key

MAP720 - Photoelectric
MAI710 - Ionisation
HEATRR - Heat Rate of Rise
HEAT60 - Heat Fixed 60°
HEAT90 - Heat Fixed 90°
MPU244R - Relay Interface
MPU244A - Alarm Interface
MBG603 - Call Point
MIU771 - Interface
MFAREP - Repeater
MIO780A - Alarm Input/Output
MIO780R - Relay Input/Output

Thres and Day/Night Level Key

For analogue smoke
STD - Standard threshold
MED - Medium Threshold
HIG - High Threshold

For analogue heat
60S/90S/RRS - Stand. thres
60M/90M/RRM - Med. thres
60H/90H/RRH - High. thres

For other devices
STD - Standard threshold

IF PRE-ALARM REQUIRED PLEASE FILL IN BOX WITH 'YES'

IF DAY/NIGHT NOT REQUIRED FILL IN DAY/NORM THRESHOLD AND LEAVE NIGHT BLANK

Form 4: Zone to Alarm/Relay Information Chart

This form should include:

1) Zone number (1-128).

2) Alarms (select operation from the Alarm Key).

3) Relays (select operation from the Relay Key). (All on a zonal basis)

Form 5: Alarm Text

This form should include:

1) Alarm number.

2) Alarm text (maximum 24 characters).

Example of Form 4

ZONE TO ALARM/RELAY INFORMATION CHART

PAGE________OF________

	ALARMS																																	RELAYS																																		
	Internal								Loop Controller 1												Loop Controller 2												ALARM TIME	RELAY 1	RELAY 1	Loop Controller 1																Loop Controller 2																RELAY TIME
ZONE No.	LC 1 1	2	3	4	LC 1 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4				MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	MPU 1	2	3	4	

Example of Form 5

PAGE________OF________

ALARM TEXT

SITE:

			ALARM No.	ALARM DESCRIPTION TEXT
Internal	LC 1	1		
		2		
		3		
		4		
	LC 2	1		
		2		
		3		
		4		
Loop Controller 1	MPU	1		
		2		
		3		
		4		
	MPU	1		
		2		
		3		
		4		
	MPU	1		
		2		
		3		
		4		
Loop Controller 2	MPU	1		
		2		
		3		
		4		
	MPU	1		
		2		
		3		
		4		
	MPU	1		
		2		
		3		
		4		

Printer Operation

If a printer is fitted to the system it can operate in one of three modes by altering the site specific configuration memory.

1. The printer can print out all events as they occur. Thus an event on the system is shown by paper coming from the panel as well as lights on the fascia. The slide switch on the main display controller PCB should be in the ‘ON’ (centre) position.

2. You can disable the printer by setting the slide switch to the 'OFF' position on the main display controller PCB. If an event occurs nothing will be then printed out until ENTER/TEST is pressed and then the event(s) will be printed out.

3. The printer can be set to print out the contents of the log as described in DISPLAY LOG MODE previously.

Printer Output

The printer produces zone, loop and address numbers along with zone, address and device descriptions.

Example of Printer Output (‘Basement Car Park’):

MISSING ADD
Event number 0010
Time 13:32 Date 30/09/93
Zone 0001

Loop 01 Address 22
Basement Car park - Maximum of 24 characters for zone
Car Park Bay 2 - Maximum of 24 characters for address
Analogue R of R Heat - Maximum of 24 characters for device type

Note: On the AXA6 and AXA8 control panels and on a networked system the printout has reduced text output on loops 5 to 8. However, it does include the zone and address description.

Other programme considerations:-

a) Zones, not addresses, can control alarm lines or relays. If only one address is required for a control circuit, allot it its own zone.

b) Addresses, zones and loops can be mixed but you should comply with the zone layout and cable routing requirements of BS 5839 Part 1.

Paper Switch Feed

At access level 1, the switch labelled ⏎ is a paper feed switch. So if the printer option is fitted, pressing this switch will advance the paper by one line. When an event is printed out, the paper is automatically fed so that the printed event can be torn off easily.

Changing Printer Rolls

Red lines on the paper roll indicate that it is running out. To change it, open the perspex door, remove the retaining screws for the main front panel and hinge it down. Remove the old paper roll and insert the new one into the holder. Fold over the end of the new paper roll and feed it into the slot at the bottom of the printer mechanism. Press the paper feed button several times while gently guiding the paper through the mechanism until the new paper comes out of the slot in the front panel moulding.

Note: Alternatively sellotape the new paper roll to the end of the old one, and feed it through the mechanism by repeatedly pressing the paper feed button.

Changing Printer Ribbon Cassettes

In normal operation a printer ribbon is sufficient for two full rolls of paper. To change the ribbon, open the perspex door, remove the retaining screws for the main front panel and hinge it down. The printer mechanism housing the ribbon is behind the cover plate. See Part 3 - 'Diagram showing layout of Main Control Panel'. Unfasten the plastic cover plate from the printer mechanism by removing the nuts on either side of the cover plate and unscrewing the two small retaining screws. Replace the ribbon cassette, re-assemble the mechanism and re-fit the coverplate.

PART 6: EVENT RECORDS

CONTENTS

What to do in the Event of Fire

1. Carry out the predetermined fire alarm procedure for your site.

2. To find the source of the fire read the description designated 'FIRST EVENT', or consult the location list or mimic diagram to find the location of the fire and investigate further.

3. To silence the alarm sounders unlock and open the front door of the panel and operate the 'SILENCE ALARMS' switch. This will turn off the sounders and turn on the 'ALARMS SILENCE' indicator. Pressing 'SILENCE BUZZER will stop the internal buzzer. The 'NUMBER OF EVENTS' display will show the extent of the fire, and you can review the other detectors in alarm by scrolling through the addresses using the 'NEXT' and 'LAST' switches.

4. Before resetting the system ensure that all smoke and heat has dispersed and all broken call point break-glasses have been replaced. When this has been done operate the 'RESET' switch. Resetting takes a few seconds, if the panel returns to the fire state investigate further to ensure that all smoke and heat has dispersed, that all call point break glasses have been replaced and that there are no cable faults.

5. If more than one fire event has occurred, the number of fires will be displayed. The other fires can be displayed by scrolling through the log, using the 'SCROLL UP' and 'SCROLL DOWN' buttons, as described in the special function section.

Note: The bottom two lines only of the display are used in this case and reduced information with the zone text only is given.

What to do in the Event of a Fault

1. Silence the internal sounder by pressing the 'SILENCE BUZZER' button. If a further fault occurs then the internal sounder will re-activate. If the same fault clears and then re-appears the sounder will also re-activate.

Note: Intermittent address faults will become permanently displayed on the LCD after 10 occurrences. You can only clear them by removing the fault and carrying out a 'RESET' to clear the fault count

2. The type of fault can be ascertained by looking at either the individual panel fault lights (power, alarm fault etc.) or by looking at the display which should give a clear description and location of the fault.

3. Contact your service engineer to rectify the fault. His number should be marked on the front of your manual.

4. If more than one fault is present on the system, the number of faults will be displayed. The other faults can be displayed by scrolling through the faults using the 'SCROLL UP' and 'SCROLL DOWN' buttons as described in the special functions section.

Fire Alarm System Log

It is recommended that this log book is maintained by a responsible executive and that every event affecting the installation be recorded. An event should include fire alarms, failures, tests, temporary disconnections, the dates of the installing engineer's visits and a note of any outstanding work required.

Date	Loop/Address	Event	Action Required	Signed

Date	Loop/Address	Event	Action Required	Signed

Date	Loop/Address	Event	Action Required	Signed

Date	Loop/Address	Event	Action Required	Signed

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PINST MFAXA2/V1

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