

# SERIES 60 DETECTORS FOR USE IN HAZARDOUS AREAS

The Series 60 range of smoke and heat detectors includes intrinsically safe versions, specifically developed for use in hazardous areas.

## AVAILABILITY

An ionisation smoke detector, integrating ionisation smoke detector and five grades of heat detector are available.

## FUNCTION

The Series 60 IS detectors are functionally equivalent to their standard Series 60 counterparts. They differ in design only in that their circuits and construction have been modified to conform to the requirements of EN 50014: 1997 and amendments 1 & 2, EN 50020: 2002 and EN 50284: 1999.

All types are certified EEx ia IIC T5 at ambient temperatures up to 40°C or T4 at ambient temperatures up to 60°C.

The EC-Type Examination certificate number, applicable to all types, is BAS02ATEX1288.

## MECHANICAL CONSTRUCTION

Series 60 IS detectors use the same outer casings as the standard Series 60 detectors, and therefore share the same dimensions. The detectors are identified as intrinsically safe by a printed legend around the lid (see photo above).

The detectors must be used with the certified Series 60 IS base which is considered for certification purposes to be part of the detector.



## Part nos:

55000-212	<i>Ionisation smoke detector</i>
55000-213	<i>Integrating ionisation smoke detector</i>
55000-110	<i>Grade 1 heat detector (60°C)</i>
55000-111	<i>Grade 2 heat detector (65°C)</i>
55000-112	<i>Grade 3 heat detector (75°C)</i>
55000-113	<i>Range 1 heat detector (80°C)</i>
55000-114	<i>Range 2 heat detector (100°C)</i>
45681-207	<i>Base</i>

The base is marked with the legend 'PART OF BASEEFA CERTIFIED DETECTOR - CERT NO BAS02ATEX1288'. *Use of any other base will invalidate the approval.*

## SYSTEM REQUIREMENTS

The detectors must be used in a system which includes suitable safety barriers and which is certified by BASEEFA or other competent body.



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INVESTOR IN PEOPLE



Quality Systems Certificate No 010  
Assessed to ISO 9001



Apollo Fire Detectors has verified the performance and obtained system certification for a system incorporating any of the following safety barriers:

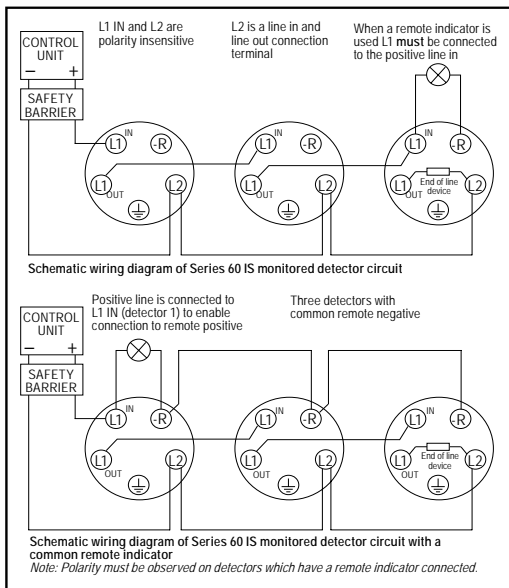
Any certified 28V/300Ω shunt safety barrier  
 MTL4061  
 Pepperl + Fuchs KFDO-ICS-Ex1.51 or Ex2.51

Other barriers have been approved and are included in the system certification but system compatibility must be checked due to dc loading characteristics.

The BASEEFA system certificate number is Ex97D2054.

The system certification allows up to 20 Series 60 IS detectors to be connected to a single barrier circuit with an end-of-line resistor of not less than 1.8kΩ. However, it must be ensured that the voltage available at each detector is above the minimum specified in the quiescent condition. It is also important to ensure that the alarm load is suitable for the control and indicating equipment.

The system certification also allows the use of remote LED indicators. These may be connected to individual detectors or may use a connection common to two or more detectors as shown below:




For information on the operating principles of the Series 60 range, please refer to the Series 60 Engineering Product Guide, PP1050. For an introduction to Intrinsic Safety and classification of Hazardous Areas, please refer to the XP95 IS Engineering Product Guide, PP1095.

*Information given in this document is given in good faith, but Apollo Fire Detectors Limited cannot be held responsible for any omissions or errors. The company reserves the right to change specifications of products at any time without prior notice.*

## ELECTRICAL CHARACTERISTICS

The following characteristics apply at 24V DC and 25°C unless otherwise stated:

<b>Supply voltage</b>	14 to 28V DC (non-polarised)
<b>Quiescent current</b>	
Ionisation detectors	45µA
Heat detectors	50µA
<b>Alarm load</b>	310Ω (typical) in series with 2 volt drop
<b>Alarm current</b>	
(minimum)	10mA
(maximum)	60mA
<b>Minimum alarm voltage</b>	5V (at least 10V for good LED illumination)

All detectors are  marked  
0600

## INSTALLATION GUIDELINES

The detectors must be installed in accordance with the appropriate local code of practice eg BS5435 in the UK. The following points should be noted in addition:

It is important that detectors are installed in such a way that all terminals and connections are protected to at least IP20 when the detector is in the base. If the base is mounted on a conduit box with a diameter of less than 85mm then the base should be fitted with the Series 60/XP95 Backplate, part number 45681-233.

The base contains an earth terminal which is provided simply as a convenient termination point for cable screens. It is not essential for the correct operation of the detector and is not intended to be used for a safety (IS) earth.

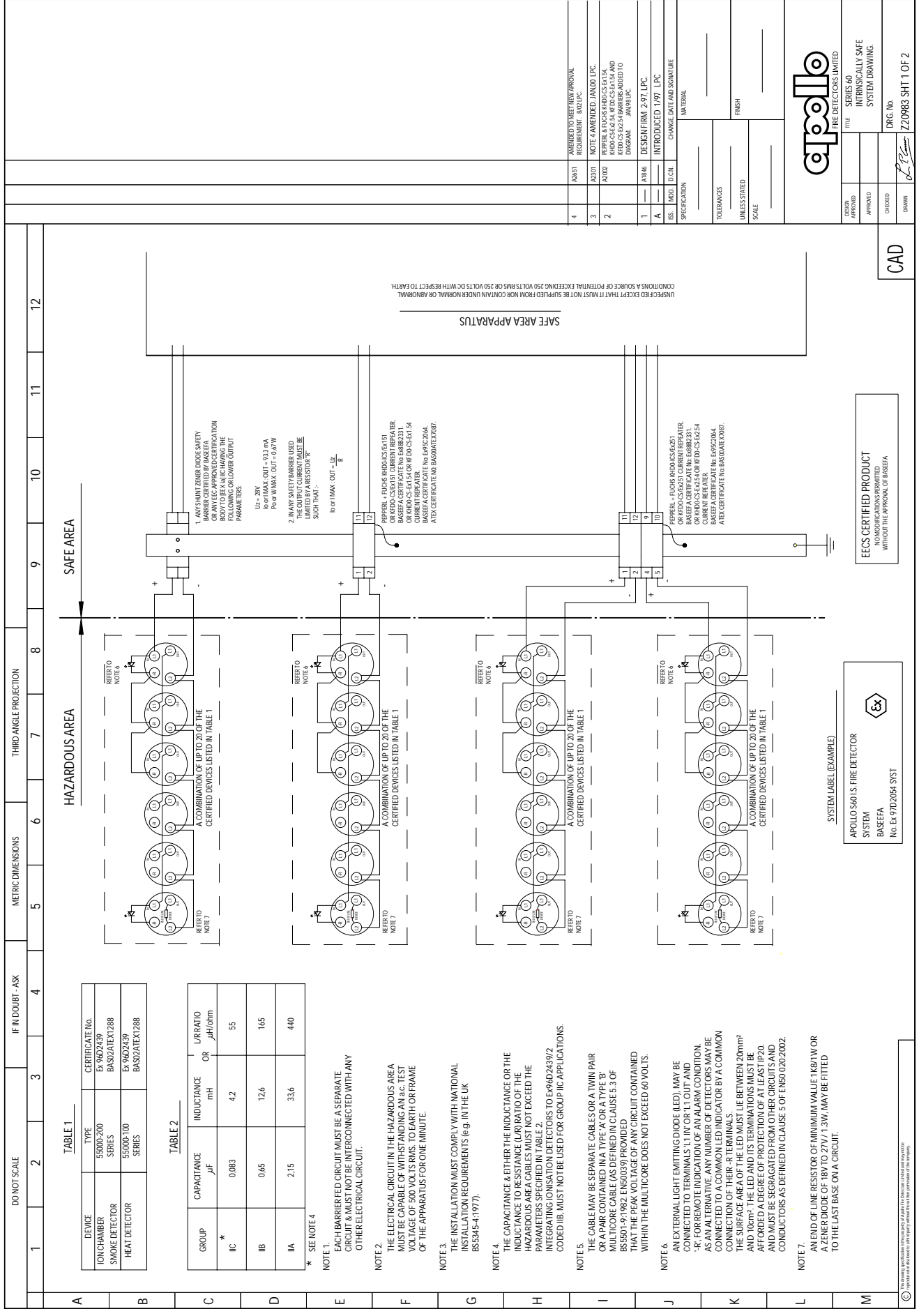
## APPROVALS

The Product Certification Technical Files for the Series 60 IS range are held by BASEEFA (2001) in accordance with the requirements of the ATEX Directive, 94/9/EC.

Series 60 IS detectors have been approved by LPCB, VdS, DBI, IFA and PAVUS to EN54. They have also been approved for marine use by the following bodies:

American Bureau of Shipping  
 Bureau Veritas  
 Det Norske Veritas  
 Germanischer Lloyd  
 Lloyds Register of Shipping  
 Maritime and Coastguard Agency

Details of approvals held are available on request.



**TABLE 1**

DEVICE	CERTIFICATE No.
ION-CHAMBER SMOKE DETECTOR	Ex 94D2439 BASO2ATEX1288 SERIES
HEAT DETECTOR	Ex 94D2439 BASO2ATEX1288 SERIES

**TABLE 2**

GROUP	CAPACITANCE $\mu$ F	INDUCTANCE mH	OR $\mu$ H/ohm
* IIC	0.83	4.2	55
IIB	0.45	12.6	165
IIA	2.15	33.6	440

\* SEE NOTE 4  
 NOTE 1. EACH BARRIER FED CIRCUIT MUST BE A SEPARATE CIRCUIT & MUST NOT BE INTERCONNECTED WITH ANY OTHER ELECTRICAL CIRCUIT.

NOTE 2. THE ELECTRICAL CIRCUIT IN THE HAZARDOUS AREA MUST BE CAPABLE OF WITHSTANDING AN a.c. TEST VOLTAGE OF 500 VOLTS RMS, TO EARTH OR FRAME OF THE APPARATUS FOR ONE MINUTE.

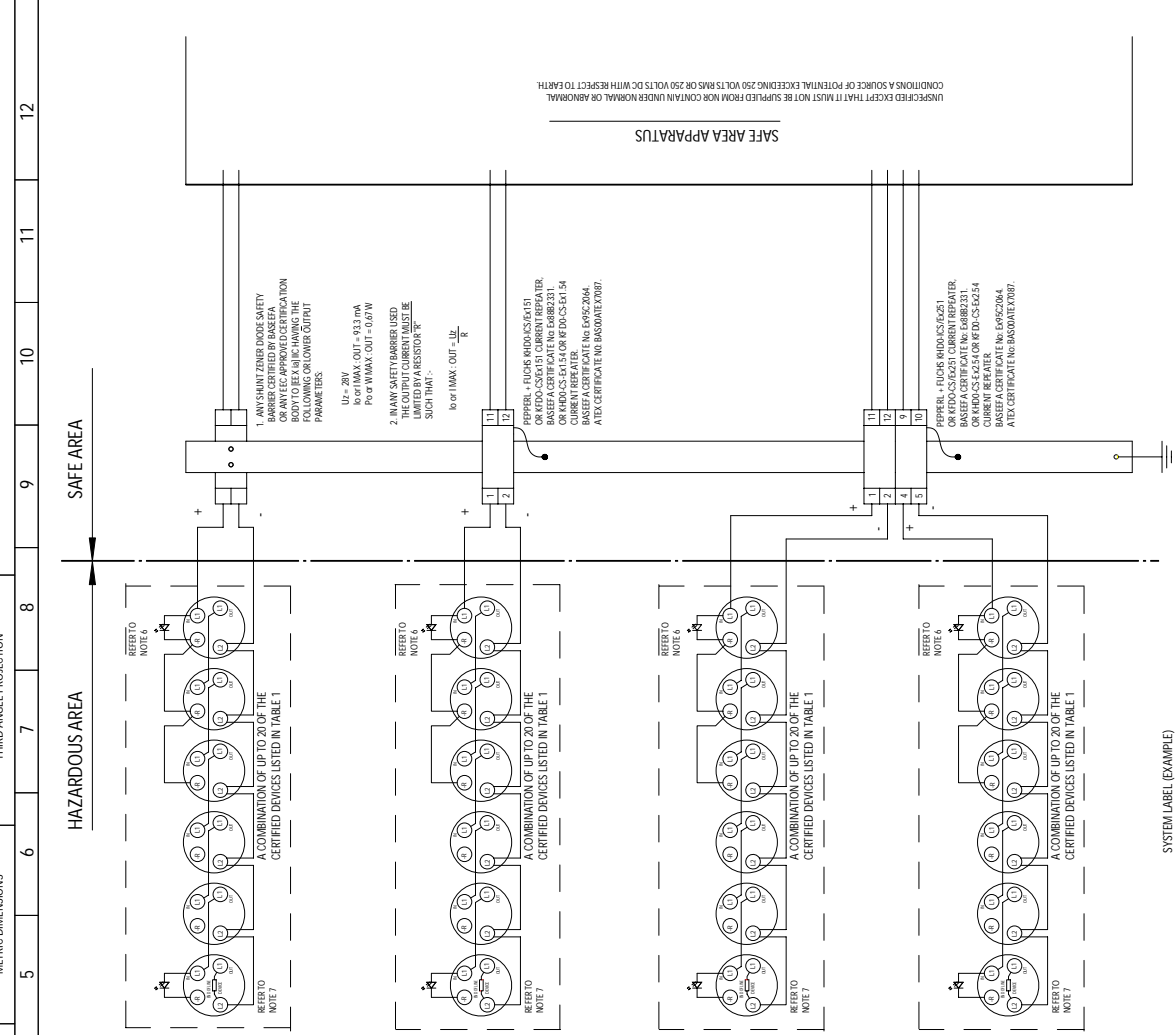
NOTE 3. THE INSTALLATION MUST COMPLY WITH NATIONAL INSTALLATION REQUIREMENTS (e.g. IN THE UK BS5345-4:1977).

NOTE 4. THE CAPACITANCE & EITHER THE INDUCTANCE OR THE INDUCTANCE TO RESISTANCE (L/R) RATIO OF THE HAZARDOUS AREA CABLES MUST NOT EXCEED THE PARAMETERS SPECIFIED IN TABLE 2.

NOTE 5. INTEGRATING IONISATION DETECTORS TO EX-94D2439/2 CODED IIB, MUST NOT BE USED FOR GROUP IIC APPLICATIONS.  
 NOTE 5. THE CABLE MAY BE SEPARATE CABLES OR A TWIN PAIR OR A PAIR CONTAINED IN A TYPE 'A' OR TYPE 'B' MULTICORE CABLE (AS DEFINED IN CLAUSE 5.3 OF BS5501-9:1982 EN50039) PROVIDED THAT THE PEAK VOLTAGE OF ANY CIRCUIT CONTAINED WITHIN THE MULTICORE DOES NOT EXCEED 60 VOLTS.

NOTE 6. AN EXTERNAL LIGHT EMITTING DIODE (LED), MAY BE CONNECTED TO TERMINALS 'L1' IN OR 'L1' OUT AND '-R' FOR REMOTE INDICATION OF AN ALARM CONDITION. AS AN ALTERNATIVE, ANY NUMBER OF DETECTORS MAY BE CONNECTED TO A COMMON LED INDICATOR BY A COMMON CONNECTION OF THEIR -R TERMINALS.  
 NOTE 6. THE SURFACE AREA OF THE LED MUST LIE BETWEEN 20mm<sup>2</sup> AND 10cm<sup>2</sup>. THE LED AND ITS TERMINATIONS MUST BE AFFORDED A DEGREE OF PROTECTION OF AT LEAST IP20. AND MUST BE SEGREGATED FROM OTHER CIRCUITS AND CONDUCTORS AS DEFINED IN CLAUSE 5 OF EN50020:2002.

NOTE 7. AN END OF LINE RESISTOR OF MINIMUM VALUE 1K671W OR A ZENER DIODE OF 18V TO 27V/1.13W, MAY BE FITTED TO THE LAST BASE ON A CIRCUIT.



ECS CERTIFIED PRODUCT  
 NO MODIFICATIONS PERMITTED  
 WITHOUT THE APPROVAL OF BASEFA

SYSTEM LABEL (EXAMPLE)  
 APOLLO S601S FIRE DETECTOR SYSTEM  
 BASEFA  
 No. EX 97D2054 SYST

UNSPECIFIED EXCEPT THAT IT MUST NOT BE SUPPLIED FROM NOR CONTAIN UNDER NORMAL OR ABNORMAL CONDITIONS A SOURCE OF POTENTIAL EXCEEDING 250 VOLTS RMS OR 250 VOLTS DC WITH RESPECT TO EARTH.

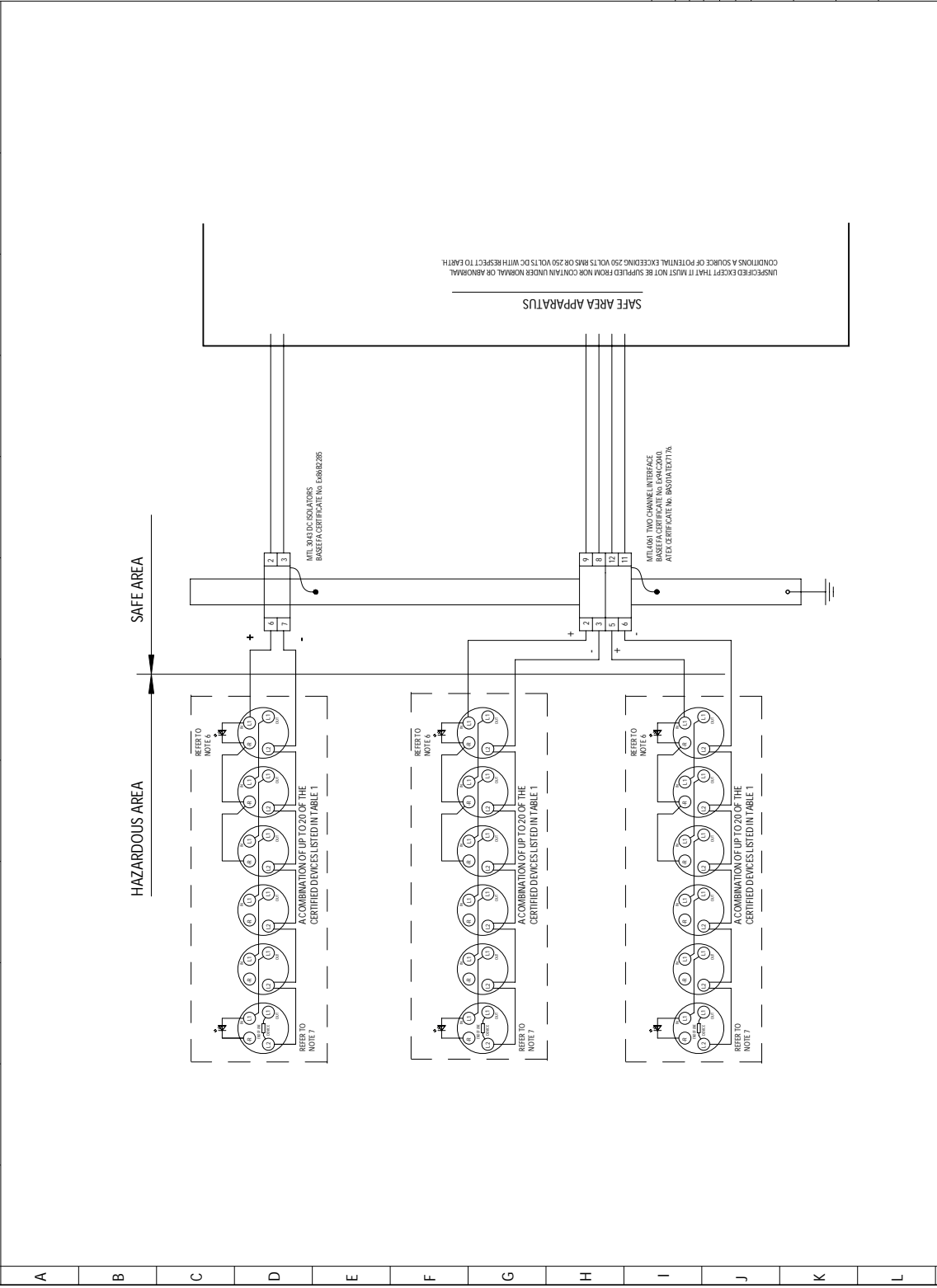
APOLLO FIRE DETECTORS LIMITED  
 THE SERIES 60 INTRINSICALLY SAFE SYSTEM DRAWING.  
 DRG. No. Z20983 SHT 1 OF 2

CAD

APOLLO

APOLLO FIRE DETECTORS LIMITED

1	2	3	4	5	6	7	8	9	10	11	12
DO NOT SCALE		IF IN DOUBT - ASK		METRIC DIMENSIONS				THIRD ANGLE PROJECTION			



4	AZ051	AMENDED TO MEET NEW APPROVAL REQUIREMENT - 8/02/LPC.
3	AZ301	REFER TO SHEET T.JAN/00/LPC.
2	AZ002	REFER TO SHEET T.JAN/98/LPC.
1	A1886	DESIGN FROM 2/97/LPC.
A	---	INTRODUCED JAN/97/LPC.
ISS.	IMOD.	D.C.N.
SPECIFICATION		
MATERIAL		
TOLERANCES		
UNLESS STATED		
SCALE		
FINISH		

DESIGN APPROVED	TITLE
APPROVED	FIRE DETECTORS LIMITED
CHECKED	SERIES 60
DRAWN	INTRINSICALLY SAFE SYSTEM DRAWING
	DRG. NO.
	ZZ0983 SHT 2 OF 2

EECS CERTIFIED PRODUCT  
NO MODIFICATIONS PERMITTED  
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