

INSTALLATION RULES
 FOR GASEOUS FIRE FIGHTING SYSTEMS:
 ISO 14520:2006 (EU EXCEPT UK)
 PRESSURE EQUIPMENT REGULATIONS (SI 1999/2001)
 PED CAT: I
 PRESSURE EQUIPMENT DIRECTIVE 27/23/EC

NOTE: ALL DIMENSIONS MUST BE CHECKED ON SITE AND NOT SCALED FROM THIS DRAWING.

IMPORTANT: TO MEET SYSTEM REQUIREMENTS THE PIPEWORK INSTALLED MUST BE IDENTICAL TO THE ISOMETRIC LAYOUT ON WHICH THE FLOW CALCULATION HAS BEEN BASED

DESIGN PARAMETERS	
ROOM VOLUME	452.91m³
AGENT QUANTITY	353.5kg
FLOOR VOLUME	89.56m³
AGENT QUANTITY	74.0kg
ROOM HEIGHT	4870mm
FLOOR HEIGHT	1070mm

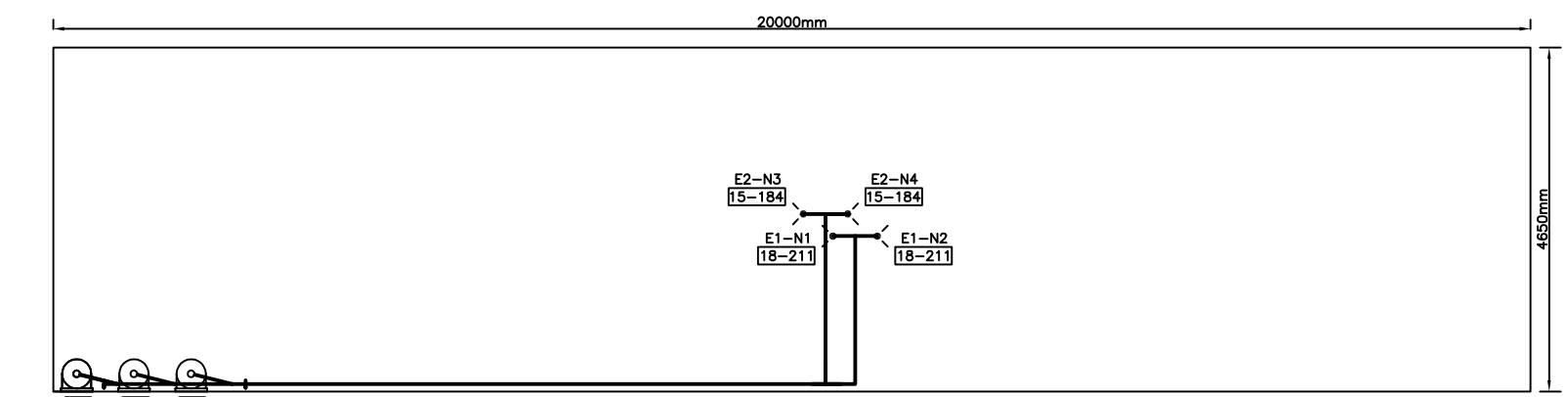
DESIGN CONCENTRATION BASED ON:

ISO 14520
 ROOM & CEILING 5.33% @ 20°C
 FLOOR 5.6% @ 20°C

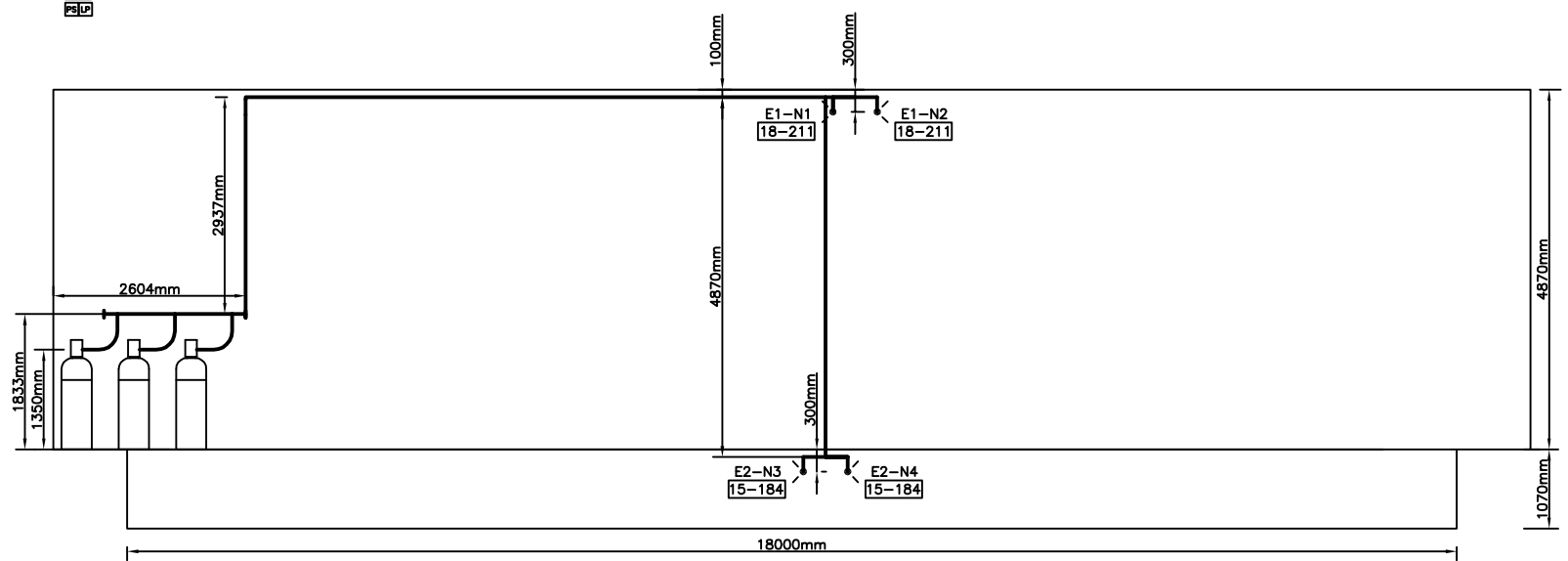
DESIGN CONCENTRATION AFTER DISCHARGE = 5.36 vol %

NOTE: IF THE DESIGN CONCENTRATIONS ARE ABOVE THE 10 vol% L.O.A.E.L. OF THIS AGENT AS STATED BY BS EN 15004-9, ISO 14520-9 OR NFPA 2001: 2012 EDITION, ADDITIONAL SAFETY PRECAUTIONS MAY APPLY

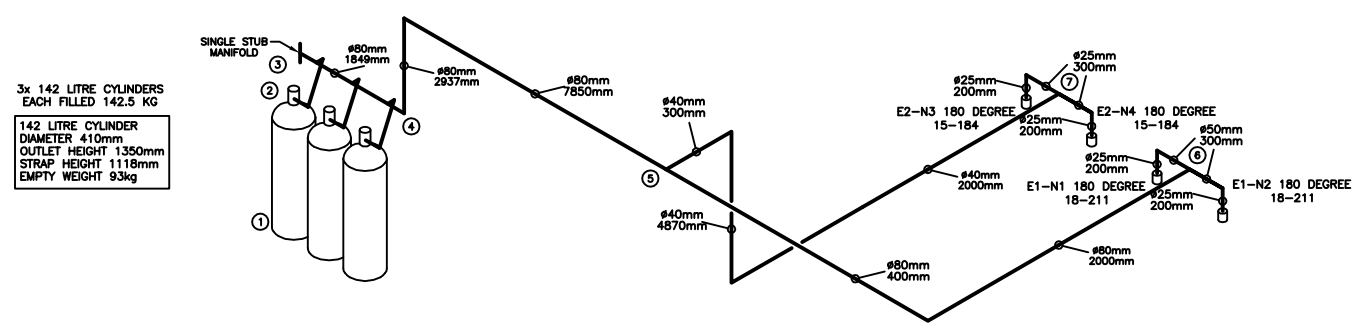
PLAN VIEW SCALE 1:100



ELEVATION VIEW SCALE 1:100



ISOMETRIC VIEW N.T.S.



3x 142 LITRE CYLINDERS
 EACH FILLED 142.5 KG

142 LITRE CYLINDER
 DIAMETER 410mm
 OUTLET HEIGHT 1350mm
 STRAP HEIGHT 1115mm
 EMPTY WEIGHT 93kg

HYDRAULIC INFORMATION

AREA	7455 01 B.KID
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A	31/03/15	FOR APPROVAL	PJW	
REV	DATE	REVISION	DRAWN	CHECKED



CLIENT: ABS SRI

PROJECT: AG ROOM

TITLE: AMBIENT & RAISED FLOOR
 NOVEC 1230
 FIRE SUPPRESSION SYSTEM

DRAWN BY: PJW DATE: 31/03/15

SCALE: SCALE 1:100 @ A3

AGENT: NOVEC 1230

DRAWING No. 7455 01 REV A

ELECTRIC CONTROL HEAD ELECTRICAL DETAILS

VOLTAGE: 24V DC
 CURRENT: 0.5 AMPERS NOM. CONTINUOUS
 INTENDED FOR USE IN HAZARDOUS (CLASSIFIED) AREAS CLASS I DIVISION 1 GROUPS C & D AND CLASS II DIVISION 1 GROUPS E, F & G BETWEEN -40° AND +40°

USE CONDUIT SEAL WITHIN 450mm OF THIS DEVICE

18 AWG-LEADS: 457mm LONG
 RED: + POSITIVE
 BLACK: - NEGATIVE
 GREEN: EARTH
 UNDESIGNED: ENSURE POLARITY

ELECTRICAL CONNECTIONS SCHEMATIC

PRESSURE OPERATED SWITCH ELECTRICAL DETAILS

CONNECT TO COMMON (C) AND NORMALLY OPEN (NO) OR NORMALLY CLOSED (NC) TERMINAL IN THE MAIN COLUMN. THIS WILL LEAVE TWO FREE COLUMNS OF TERMINALS WHICH CAN BE USED TO CONNECT TO TWO EXTRA INDICATORS.

WIRING TERMINALS

18 AWG 120 VAC	15 AMP 230 VAC	3/4 HP 1-2-3 PH 125-480 VAC
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PRESSURE INLET

MAXIMUM DISTANCE BETWEEN PIPEWORK SUPPORTS

Pipe Size (mm)	Maximum Distance Between Supports (metres)
15	1.5
20	1.8
25	2.1
32	2.4
40	2.7
50	3.4
80	4.3
100	4.5
150	5.2
200	5.8

MINIMUM PIPEWORK DISTANCE BETWEEN TEE & FITTING

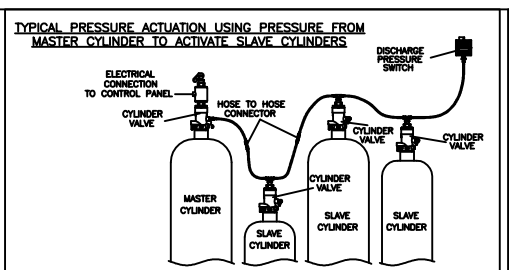
Tee Size (mm)	Minimum Distance Between Fittings (mm)
15	150
20	200
25	250
32	300
40	400
50	500
80	800
100	1000
150	1500
200	2000

TABLE 7. STEEL PIPEWORK

NOMINAL PIPE SIZE	PUBLICATION	TYPE OF PIPE	MINIMUM WALL THICKNESS
25 BAR SYSTEMS			
UP TO AND INCLUDING 50mm	BS EN 10255:2004	BW	-
	BS EN 10216-1:2002	S	430
	BS EN 10216-1:2002	HFS or CFS	360 or 430
	ASTM A108-77	HF or CD	A or B
			HEAVY
			SCHEDULE 40 (SCHEDULE 80 FOR SCREWED JOINTS)

FITTINGS:

a) UP TO AND INCLUDING 20mm IN DIAMETER
 1) SCREWED, COMPLYING WITH BS 1254, BS EN 10241:2000 OR CLASS 150 OF ANSI B16.3.
 b) ABOVE 20mm UP TO AND INCLUDING 80mm IN DIAMETER.
 1) SCREWED, COMPLYING WITH BS EN 10241:2000 OR CLASS 300 OF ANSI B16.3.
 NOTE: ALL PIPEWORK & FITTINGS TO BE GALVANISED.



RECOMMENDED PRESSURE RELIEF (250Pa) 100% FREE VENT AREA

ROOM VOID NEGATIVE SURFACE AREA = 0.482m²
 VENT SIZE = 695mm sq

ROOM VOID POSITIVE SURFACE AREA = 0.093m²
 VENT SIZE = 306mm sq

NOVEC™ 1230 Hydraulic Flow Calculation Program
Data
NOVEC 1230 Version 1.0.4

Project Name: DTA AG ROOM
Location:
Hazard Name: AG Room

Date: 3/31/15
Project Number: 7455
Revision: B

Data File Name: X:\Application Team\ - Job Information Record\Four Digit Numbers\7455 - ABS - AG Room
Data File Units: Metric

Customer Information

Customer Name: ABS Sri
Customer Address:
Customer Contact: Matteo Benzoni
Contact's Phone Number: +39 039 8396355

Cylinder Information

Amount of NOVEC per Cylinder (kg): 142.50 Type of Cylinder: 142 litre Cylinder EU
Quantity of Cylinders: 3 Cylinder Maximum Capacity (kg): 158.76
Cylinder Initial Temperature(C): 21.1 Altitude Relative to Sea (m): 0
Type of Hardware: EU

Hazard Information

Hazard: AMBIENT
Concentration Required: 5.33

Hazard Type: Class A Fire
Hazard Temp. (C): 21.1

Nozzle(s): E1-N1 180° Nozzle
E1-N2 180° Nozzle

Dimensions (m): 20.0 X 4.65 X 4.87

Total Agent Required: 353.26Kgs

Hazard: RAISED FLOOR
Concentration Required: 5.60

Hazard Type: Class A Fire
Hazard Temp. (C): 21.1

Nozzle(s): E2-N3 180° Nozzle
E2-N4 180° Nozzle

Dimensions (m): 18.0 X 4.65 X 1.07

Total Agent Required: 73.60Kgs

Piping Model

Section		Pipe		Cplng/		90's	Tee's	Union	Note 1	EQL
Start	End	Lgth	Elev	Sch	Size					
1	2	0.00	1.30	40T	50	0	None	0	801	6.91
2	3	0.50	0.00	40T	80	0	None	0	801	0

NOVEC™ 1230 Hydraulic Flow Calculation Program
Data
NOVEC 1230 Version 1.0.4

Project Name: DTA AG ROOM
Location:
Hazard Name: AG Room

Date: 3/31/15
Project Number: 7455
Revision: B

Piping Model (Continued)

Section		Lgth	Elev	Pipe		90's	Tee's	Cplng/ Union	Note 1	EQL
Start	End			Sch	Size					
3	4	1.85	0.00	40T	80	0	None	0	803	0
4	5	10.79	2.94	40T	80	2	None	0	0.000	0
5	6	2.40	0.00	40T	80	1	Thru	0	0.000	0
6	E1-N1	0.50	-0.20	40T	50	1	Side	0	13.5485	0
6	E1-N2	0.50	-0.20	40T	50	1	Side	0	13.5485	0
5	7	7.17	-4.87	40T	40	2	Side	0	0.000	0.0
7	E2-N3	0.50	-0.20	40T	25	1	Side	0	4.2291	0.0
7	E2-N4	0.50	-0.20	40T	25	1	Side	0	4.2291	0.0

Note 1: This column is used to indicate either a manifold, fixed agent amount or fixed nozzle orifice diameter. The 800 Series numbers indicate either a single cylinder (801) or multiple cylinders (802 = 2 cylinders, 803 = 3 cylinders, etc...).
This data file has fixed nozzle diameters.

Note 2: The data input file shown here may not agree with the data used for the flow calculation.
The data input file may have been changed since the calculation was performed.

NOVEC™ 1230 Hydraulic Flow Calculation Program
Results
NOVEC 1230 Version 1.0.4

Project Name: DTA AG ROOM
Location:
Hazard Name: AG Room

Date: 3/31/15
Project Number: 7455
Revision: B

Customer Information

Customer Name: ABS Sri
Customer Address:
Customer Contact: Matteo Benzoni
Contact's Phone Number: +39 039 8396355

System Information

Storage Pressure (bar):	25.80	Average Cyl Pressure (BAR):	10.9
Ave Initial Pipe Temp (C):	21.11	Fill Density (kg/cu.m.):	1006.59
Percent Agent in Pipe:	32.7	Average Discharge Time (sec):	8.1
Quantity of Cylinders:	3	Type of Cylinder:	142 litre Cylinder EU
Amount per Cylinder (kg):	142.5	Total Amount of Agent (kg):	427.5
Type of Hardware:	EU	Altitude Relative to Sea (m):	0

Piping Model Results

Section Start	Section End	Pipe Size (mm)	Length (m)	Elev (m)	EQL (m)	Tee	Start (BAR)	Term (BAR)	Flow (kg/sec)
1	2	50 - SCH 40	0.0	1.3	7.0		10.89	9.78	19.48
2	3	80 - SCH 40	0.5	0.0	0.5		9.78	9.92	19.48
3	4	80 - SCH 40	1.9	0.0	1.9		9.92	9.37	58.44
4	5	80 - SCH 40	10.8	2.9	15.5		9.37	7.23	58.44
5	6	80 - SCH 40	2.4	0.0	6.3	THRU	7.23	6.96	48.60
6	E1-N1	50 - SCH 40	0.5	-0.2	6.0	BULL	6.96	6.13	24.30
6	E1-N2	50 - SCH 40	0.5	-0.2	6.0	BULL	6.96	6.13	24.30
5	7	40 - SCH 40	7.2	-4.9	12.9	SIDE	7.23	6.20	9.84
7	E2-N3	25 - SCH 40	0.5	-0.2	3.3	BULL	6.20	5.24	4.92
7	E2-N4	25 - SCH 40	0.5	-0.2	3.3	BULL	6.20	5.24	4.92

Concentration Results

Enclosure Area	Enclosure Volume (cu.m)	Agent Required (kg)	Agent Discharged (kg)	Concentration Requested / Achieved
AMBIENT	452.91	353.3	353.5	5.33 / 5.33

7455 01



**NOVEC™ 1230 Hydraulic Flow Calculation Program
Results
NOVEC 1230 Version 1.0.4**

Project Name: DTA AG ROOM
Location:
Hazard Name: AG Room

Date: 3/31/15
Project Number: 7455
Revision: B

Concentration Results (Continued)

Enclosure Area	Enclosure Volume (cu.m)	Agent Required (kg)	Agent Discharged (kg)	Concentration Requested / Achieved
RAISED FLOOR	89.56	73.6	74.0	5.60 5.63

Nozzle Information

Nozzle ID	Size mm (in)	Nozzle Part Number	Style	Nozzle Material	Total Orifice Area (sq.cm.)	Discharged (kg)
E1-N1	50 mm (2)	45-294718- 211	180°	Brass	13.5485	176.76
E1-N2	50 mm (2)	45-294718- 211	180°	Brass	13.5485	176.76
E2-N3	25 mm (1)	45-294715- 184	180°	Brass	4.2291	37.02
E2-N4	25 mm (1)	45-294715- 184	180°	Brass	4.2291	37.02

Error Messages

NOVEC Flow Calculation Module Version 1.1.0
Orifice diameters and pipe sizes are fixed in input data.
No Errors
Time and date of calculation 14:29:13 03-31-2015

PIPING NOTICE: This flow calculation is only listed and approved for Schedule 40 and Schedule 80 pipe meeting the specifications of American National Standards Institute (ANSI) B36.10 for steel pipe.

Millimeter pipe diameter equivalents are given for reference only.

Calculation performed with Version 1.0.4

Calculation by Kidde Products
Thame Park Road
Thame
Telephone: 1844265109

TIME AND DATE OF PRINTOUT 14:29:21 3/31/15

NOVEC™ 1230 Hydraulic Flow Calculation Program
Bill of Material
NOVEC 1230 Version 1.0.4

Project Name: DTA AG ROOM
Location:
Hazard Name: AG Room

Date: 3/31/15
Project Number: 7455
Revision: B

Nozzle Bill of Material

Item No	Qty	Nozzle Size	Nozzle Description	Orifice Area	Nozzle Part Number
1	2	25 mm (1)	180°Nozzle, Brass	4.2291	45-294715- 184
2	2	50 mm (2)	180°Nozzle, Brass	13.5485	45-294718- 211

Pipe and Fitting Summary

Item	Type	Size (in)	Qty
Pipe	40 T	25mm	1.0 (M)
Pipe	40 T	40mm	7.2 (M)
Pipe	40 T	50mm	1.0 (M)
Pipe	40 T	80mm	15.5 (M)
Elbow (90)	CL 300 (B16.3)	25mm	2 (Ea)
Elbow (90)	CL 300 (B16.3)	40mm	2 (Ea)
Elbow (90)	CL 300 (B16.3)	50mm	2 (Ea)
Elbow (90)	CL 300 (B16.3)	80mm	3 (Ea)
Tee, Straight	CL 300 (B16.3)	40mm	1 (Ea)
Tee, Straight	CL 300 (B16.3)	80mm	2 (Ea)
Concen. Reducer	CL 300 (B16.3)	40mm x 25mm	2 (Ea)
Concen. Reducer	CL 300 (B16.3)	80mm x 50mm	2 (Ea)
Concen. Reducer	CL 300 (B16.3)	80mm x 40mm	1 (Ea)

The above list of pipe and fittings are based on the calculation input data. Any additional equivalent length, inputted as elbows, will appear as elbows in this list. This list is approximate for field conditions and is not intended necessarily for a buy list.