Technical specification for Chimney for High capacity AC Hot-Buffet EOG type Coaches

1.0 Scope

1.1 The specification covers design, manufacture, testing and supply of chimney for the purpose of effectively removing oil vapour, smoke and hot air generated during cooking in the kitchen area of air conditioned pantry cars, used in passenger trains.

2.0 SERVICE CONDITIONS:-

The chimney is required to be operated continuously under varying climatic and atmospheric conditions as detailed below:-

Environmental conditions

Ambient temperature	: -5 deg. C to 55 deg. C
Max. Relative humidity	: Upto 100 %
Max. Temperature inside the pantry car	: 30 deg. C
Altitude	: Maximum 1000 meters
Atmosphere	: Extremely dusty

Working conditions:

a) Train speed (Max.)	160 Kmph
b) Vibration and shocks	
i) Maximum vertical acceleration	3.0 g
ii) Maximum lateral acceleration	3.0 g
iii) Maximum longitudinal acceleration	3.0 g

Sinusoidal form of vibration, the frequency 'f' lies between 1 Hz and 50 Hz and their amplitude 'a' expressed in mm is given as function 'of' by the equation :-

a = 25/f values of 'f' between 1 Hz and 10 Hz.

a = 250/f for values of 'f' between 10 Hz and 50 Hz

3.0 GENERAL INFORMATION

3.1 To remove oil vapor, smoke and hot air generated in the kitchen area of Pantry car, the Chimney will be provided above the individual Cooking range/Hot plate.

3.2 The Chimney will be equipped with a centrifugal blower for drawing in the oil vapor laden hot smoky fumes from the cooking appliance, through the grilled opening in the Chimney and the baffle Filter Media and Exhaust through the Exhauster opening on the roof of the coach. The blower outlet will be interconnected with coach roof by a rigid duct assembly as indicated in the drg.no. LH72269.

3.3 The Chimney design shall be such that, when it operates, uniforms sucking of the fumes from the bottom surface of the Chimney are ensured. The chimney top shall be profiled and designed suitably for this purpose.

3.4 The blowers assembly completes with motor shall be designed to operate continuously during service and able to withstand high temperature fumes

4.0 **CONSTRUCTION**

4.1 The Chimney shall be generally conforming to drg. no. LH72269.This drawing is for general guidance and for the purpose of indicating the limiting dimensions only and suppliers shall submit their overall general arrangement drawing indicating overall dimensions, material specification, thickness, details of fasteners fixing etc. and all essential details for approval to CEDE/RCF before manufacturing of the prototype Chimney.

4.2 The Chimney shall be of light weight construction made of stainless steel Grade SS-304 S2/304L of 1mm thickness to IS:6911, properly folded and indented such that rendering rigidity and structural soundness to the entire assembly suitable for use Rolling stock application.

4.3 The Chimney shall have a structural frame work with mounting as indicated in the drg.no.LH72269, such that the main chimney under surface with the blower centrally on top is well canopied over the cooking appliance, to enable the most efficient exhausting of cooking fumes.

5.0 **Scope of supply**

S.No.	Description	Qty
1	Stainless steel chimney housing min.1.0mm to Gr.-304 S2/304L of IS: 6911 (latest Edition), encasing a structural frame work.	3nos
2	Blower assembly with a suction manifold properly secured to the chimney housing at the top.(chimney top shall have proper profiling to enhance uniform and efficient suction with minimum loss.)	3nos.
3	Baffle filter secured clipped or a clamped on a withdraw able type frame work with handle, to facilitate periodical cleaning	3nos.
4	Interconnecting rigid duct alongwith discharge duct as per drg.no.LH72269	3nos.
5	Control box complete	1nos.

6.0 **Chimney housing**

6.1 The housing shall be made of 1.0mm thick stainless steel to Gr-304 S2/304L to IS:6911(Latest Edition) secured by stainless steel screws, spring and flat washers and nut to the SS structural frame work generally confirming to drg.no. LH72269.

6.2 The housing shall be so shaped and profiled that it enables uniform and optimum suction from the bottom surface of the chimney.

6.3 The housing shall have provision for fixing the blower on top with its suction secured to it through a flanged and gasketed opening or mouth of matching size and shall be easily maintainable.

6.4 The structural frame work shall have provision at its rear on the longitudinal side, for mounting of the chimney to the structural frame as indicated in the drawing. The mounting bracket shall be strong enough to support at least two times the weight of the cantilevered chimney and Blower, without drumming or rattling effect and sagging.

6.5 The structural frame work of the chimney shall incorporate a pocket of adequate depth to house the withdrawable frame work supporting baffle filter with a suitable arrangement to avoid rattling sound.

7.0 **Blower**

7.1 Centrifugal blower shall be provided on top of the chimney housing by means of flanged connections as indicated in the drawing.

7.2 The centrifugal fan shall be capable of giving air delivery of 600 m^3/hr against a static head of 10mm water gauge or better.

8.0 **Motor**

8.1 The motor shall operate at a nominal voltage of 230V, 1ph, 50Hz, 1300 RPM with continuous rating not more than 200W.

8.2 The motor shall be a single phase capacitor start and run induction motor, capable of working from 185V to 270V, generally conforming to IS: 2312 (Latest edition)

8.3 The motor shall be of IP44 construction

8.4 The motor with blower assembly shall be mounted on top of the chimney and secured with chimney casing with suitable Stainless Steel hardware and silicon rubber gasket.

8.5 If the impeller of the blower is of fabricated design, it shall be made of galvanized steel sheet of appropriate thickness or properly cross indented such that during operation it does not get deformed and shall be fully welded to its hub.

8.6 The impeller and hub assembly shall be mechanically designed to withstand 1.25 times the maximum operating speed.

8.7 The impeller shall be dynamically balanced, limiting the unbalance to 2.0 gms-cm/kg.

9.0 **Technical Details**

S.No.	Description	Features
a	Sweep(mm)	180
b	Voltage Range	230±10%
c	Phase	Single
d	Frequency	50Hz
e	Minimum Air volume CMM	600 m^3/hr against a static head of 10mm water gauge
f	Speed (rpm)	1300
g	Power input (Max) watts	200
h	Nominal current (A) amps	1.0
i	Noise level (db)	68
j	Degree of protection	IP44
k	Insulation class	Class-H

10.0 **Electrical Control box**

10.1 Separate control box shall be provided near the chimney (as shown in the drg.) for controlling the operation of the blower and indication lamp using High intensity LED to indicate 'ON' condition of the chimney. This LED shall be RED colour.

10.2 Three speed (Low, Medium, Fast) Electronic regulator of reputed make shall also be provided to control speed.

10.3 Internal wiring of the control box shall be done with help of 1.5 sq.mm of Teflon cables to part no.0085 105 "OLFLON FEP" of M/s LAPP KABLE or M/s RR KABLE or similar equivalent approved make.

10.4 The individual ELCB of 25Amp.30mA of M/s Schneider/L&T/Legrand/ABB/Siemens make for each chimney shall be provided in the electrical control box.

11.0 **Interconnecting Duct**

11.1 A interconnecting duct (1mm thick) of inner dimensions 129X134mm with adapter to connect one end to the Blower outlet shall be supplied.

11.2 The duct shall be rigid stainless steel of clear length 900mm.

12.0 **Fasteners**

12.1 All fasteners, nuts and washers shall be of stainless steel.

12.2 The minimum size of structural fastener shall be M5.

12.3 All fasteners up to size M8 shall be of slotted hexagonal head.

13.0 **Tests & Inspection.**

13.1 **TYPE TEST:**

All the type tests mentioned in Clause 13.4 shall be carried out on a prototype unit. The firm manufacturing for the first time shall get the prototype approved from CEDE/RCF.

13.2 **ROUTINE TEST:**

Routine tests mentioned in clause 13.4 shall be carried out on each unit by the manufacturer at his works to ensure compliance with the specification and the drawings.

13.3 **ACCEPTANCE TEST:**

a) Acceptance test mentioned in clause 13.4 to be witnessed by inspecting agency nominated by the purchaser at the works of the manufacturer, on the samples picked up by the inspecting authority. All the acceptance tests shall be carried out at firm's premises at the manufacturer's cost. Inspecting officer will witness the tests.

d) A copy of the internal tests conducted by the firm shall be supplied to inspecting/purchasing authority shall maintain record of all the tests conducted for future reference Inspecting agency will check the authenticity and the originality of the bill of material for each item by seeing the invoices invariably to avoid spurious material being safety involved.

13.4 Test classified as Type, Acceptance and Routine tests shall be carried out as per IS: 2312(latest edition) as applicable with technical data as per clause 9.0 of this specification.

TEST	Type Test	Acceptance Test	Routine Test	Clause of IS:2312
Starting	Yes	Yes	Yes	CL.10.0
Air delivery	Yes	Yes	No	CL.14.2
Temperature rise	Yes	Yes	No	CL.14.3
High voltage	Yes	No	No	CL.14.8
Insulation resistance	Yes	Yes	Yes	CL.14.9
Electrical input	Yes	Yes	Yes	CL.14.11
Fan speed	Yes	Yes	Yes	CL.14.12

14.0 **Chimney Housing**

14.1 Visual check (on complete chimney assembly)

14.2 Dimensional check (on complete chimney assembly)

14.3 Weight of complete chimney assembly

15.0 **Maintenance**

15.1 The chimney alongwith structural shall be easily maintainable.

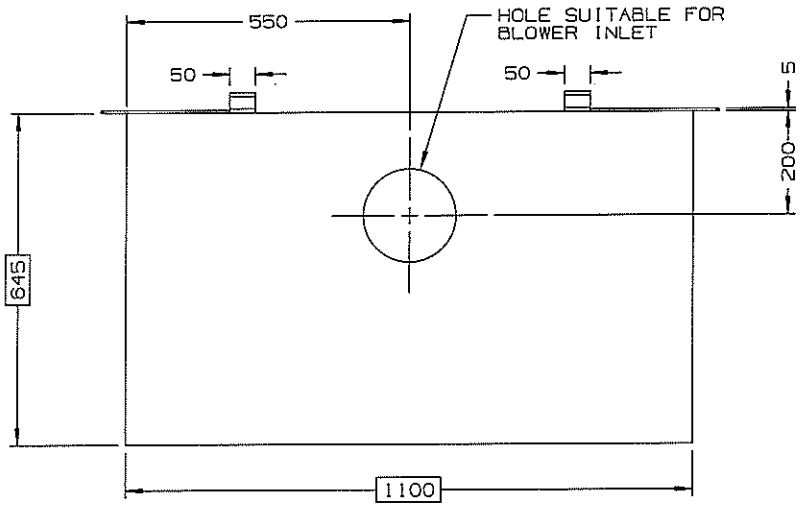
15.2 Baffle Filters for chimney shall be cleaned after every trip to wash away the excess oil caused by fumes.

15.3 The motor assembly shall be easily replaceable without affecting any structural changes.

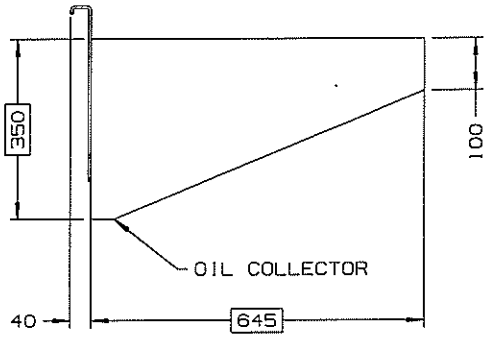
16.0 **Enclosures: -**

1. Drg.no.LH72269.Alt-Nil

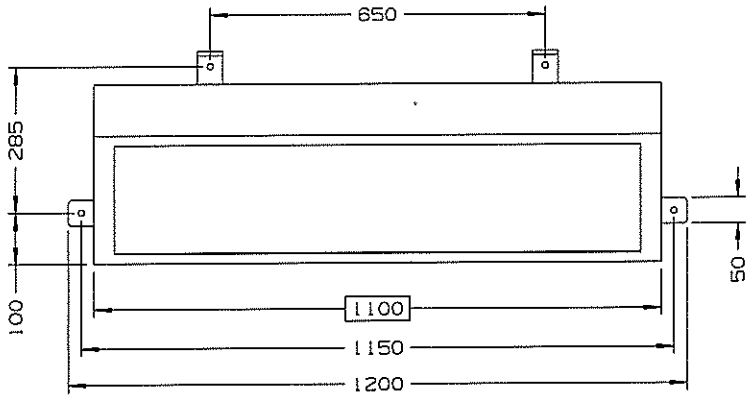
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL



TOP VIEW



SIDE VIEW



CHIMNEY

ALL DIMENSION IN MM.

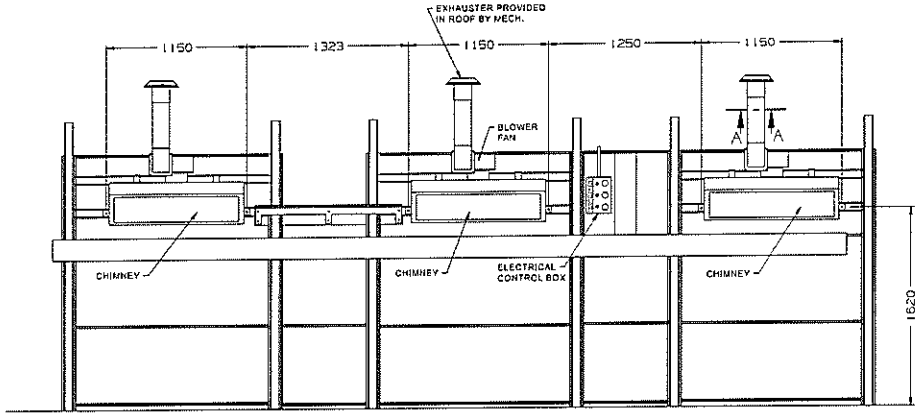
NOTE:-

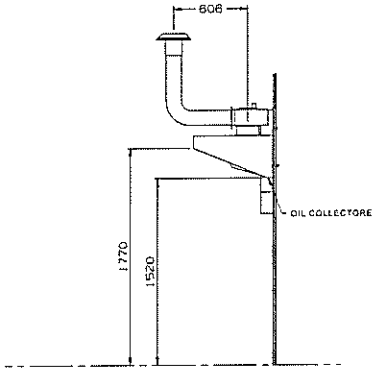
DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

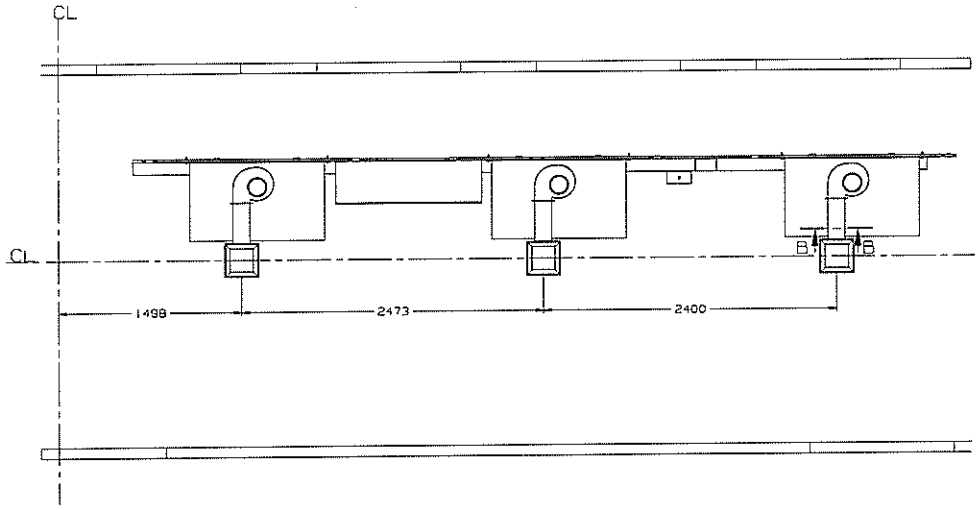
THIS IS A COMPUTER GENERATED DRAWING. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER IT INVALID.

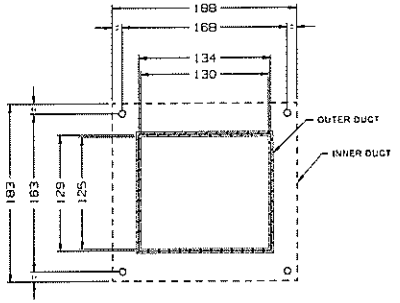
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE 28/11/2023

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M			NIL	NIL	NIL	NIL
WEIGHT	GROUP	ELECTRICAL	SUPERSEDES: NIL			
NIL KG	FILE	D:\PANTRY\LH\LH72269.prt				
S.AREA		CHIMNEY FOR			SCALE	SSE/ED
NIL M²		HIGH CAPACITY HOT-BUFFET LHB TYPE COACH				CHD
~~LENGTH / DIA~~						DRN
NIL M		RAIL COACH FACTORY, KAPURTHALA			REF.DRG.NO.	NIL
~~WIDTH / THICK~~		रेलकोच फैक्टरी कपूरथला		IRS	PL NO.	NIL
NIL M					DRG.NO.	LH72269
HEIGHT		SEE/D&D		DY.CEE/D&D	ALT. NIL	SIZE A3 SHEET 2/2
NIL M						

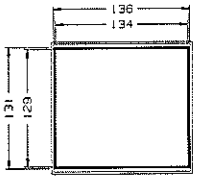








SECTION B-B



SECTION A-A

NOTE:-
1. ALL DIMENSION IN MM.
2. SUITABLE LOCKING/HOLDING PLATES SHALL BE PROVIDED TO HOLD THE STRUCTURE.
3. ALL THE JOINTS SHALL BE OVERLAPPING TYPE SUITABLY WELDED TO AVOID LEAKAGE OF HOT AIR.
4. FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERE TO.

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY

NIL		NIL	NIL	NIL	NIL
WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	SPARES	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL N	GROUP	ELECTRICAL	SUPERSEDES:		NIL	
WEIGHT	FILE	D:\PANTRY\LH\LH72269.prt				
NIL KG		CHIMNEY FOR			SCALE	SSE/ED
S.AREA						DAD
NIL M2		HIGH CAPACITY HOT-BUFFET LHB TYPE COACH				DRN
LENGTH/DIA.					REVISION	NIL
NIL M		RAIL COACH FACTORY, KAPURTHALA				
WIDTH/THICK.		रेलकोच फैक्टरी कपूरथला	IRS		PL NO.	NIL
NIL M					DRG.NO.	LH72269
HEIGHT					ALT.	NIL SIZE A1 SHEET 1/2
NIL M						

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