TECHNICAL SPECIFICATION FOR MODULAR INTEGRATED PANTRY UNIT FOR LHB TYPE HOT BUFFET COACHES

1. Preamble

1.1. The specification covers the technical and the manufacturing requirements of the modular pantry unit for LHB type Hot Buffet coaches. The requirement shall be covered as detailed.

1.2. The specification covers the design, development, manufacturing, supply, erection and commissioning of required facilities of pantry equipment and integrated unit in coaches at RCF. This shall also cover the operational and functional testing after installation in the coach.

1.3. The quality, aesthetics, design and overall workmanship of individual equipment and integrated modular unit as a whole shall be to International Standards and the quality of OEM LHB equipment shall be considered as a prime basis.

1.4. Firm shall have adequate experience of design, development and manufacturing of similar pantry equipment as per schedule of Technical Requirement to document no RCF/EL/004-2020, Rev-A or latest on CNC machines. The development order shall be awarded only after fulfilling the eligibility conditions in the STR.

1.5. The firm shall maintain data wise in-house quality control system and in-house quality control records etc. for in stage process inspection and testing and the same along with QAP shall be made available to the inspecting official during type testing

1.6. The specification shall be read in conjunction with Schedule of Technical Requirements to document no RCF/EL/004-2020, Rev-A or latest for the manufacture of the pantry equipment.

1.7. The manufacturer shall submit the documentary proof to RCF that they have used the items as per BOM and of Approved make indicated in the respective equipment.

1.8. It will be the responsibility of the supplier to ensure and confirm that equipment/part purchase from other vendor are as per relevant standard and original manufacture last certificate are being obtained by the firm and are tested. Firm shall also keep the record of in-house stage inspection.

1.9. The supplier shall apply through UVAM of IREPS portal for submission of prototype sample for processing of prototype approval

1.10. The QAP and BOM shall be got approved from RCF before manufacturing

1.11. The Tenderer shall submit the clause by clause compliance to the specification in their offer.

2. DESIGN & DRAWING APPROVALS

2.1. The firm shall manufacture the units as per OGA drawings

2.2. Maintenance and repair instructions with information about trouble-shooting

3. SERVICE CONDITIONS

3.1. Environmental conditions

Ambient temperature	: -10 deg. C to 55 deg. C
Max. Relative humidity	: Upto 95 % during rainy season
Altitude	: Maximum 1776 meters
Atmosphere	: Extremely dusty

3.2. 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 10Hz. and upto 50Hz.

4. Governing Specification

4.1. The following UIC regulations shall apply

UIC 563	Fitting provided in coaches in the interests of hygiene and cleanliness
UIC 564-2	Regulation relating to fire protection and fire-fighting measures in passenger-carrying Railway vehicles or assimilated vehicles used on international services.
UIC 565-2	Special comfort and constructional characteristics and rules of hygiene for restaurant cars accepted in international traffic.
UIC 566	Loadings of coach bodies and their components.
DIN 4102	Flame/fire prevention of insulating material.
IEC-60335-2-21	Particular requirements for storage water heaters.
IEC-60571	Electronic equipment used on Railway Vehicles
IEC-61373	Shock and Vibration Tests for Rolling Stock Application
IEC-61000	Electromagnetic Compatibility
IEC-60529	Classification of Degree Of Protection Provided By Enclosures
IS:2082	Stationary Storage type Water Heaters
IS:7872	Freezers
IS:1287	Electric Toaster
IS:4165	General purpose thermostats
IS:10773	Wrought copper tubes for Refrigeration and air conditioning purposes.
IS:3017	Thermostat for use with Electric water heater

IS:8183	Thermal insulation
IS:368	Electric Immersion water heaters
IS:302	General & safety requirements for household and similar Elect. Appliances.
ELRS/SPEC/S1/0015	Specification for Electronics used in Rolling Stock Application
RDSO/PE/SPEC/0138	Specification for Conduit system for Cable Management
ELRS/SPEC/ELC/0019	Thin walled Flexible Elastomeric cables with copper connectors for working voltage i) upto 750 volts, ii) above 750 volts upto 1.8/3kV
EN45545	Fire Protection On Railway Vehicles

5. Scope of Supply :-

Sno	Description	Drawing no	Qty
i.	Work table with Hot under storage	LH72254	2
ii.	Work table with cold under storage	LH72255	2
iii.	Induction Hot Plate	LH72256	1
iv.	Induction Hot Plate	LH72257	1
v.	Overhead Shelf	LH72258	4
vi.	Induction WOK with Table	LH72259	1
vii.	Hot Case	LH72260	1
viii.	Wall shelf	LH72261	1
ix.	Brat Pan	LH72262	1
x.	Deep Fridge	LH72263	1
xi.	Sink	LH72264	2
xii.	Wall mounted geyser (vertical - twin)	LH72265	1
xiii.	Sink	LH72266	1
xiv.	Cup Board	LH72267	1
xv.	Deep Fryer	LH72268	2
xvi.	Wall mounted geyser (horizontal)	LH72211	2
xvii.	Microwave Oven	LG/Samsung/IFB	1
xviii.	Combination Oven	Rational SCC101 E	1
xix.	Fridge	LG/Samsung	2
xx.	Flying Insect Killer	Industrial grade	2
xxi.	Enhanced capacity chimney	EDTS-447	1 set

6. General Requirements :

6.1. No positive tolerance over the dimensions shown against individual equipments are permitted, however , negative tolerances shall be governed by MDG0008

6.2. Outer and inner wall of the pantry equipment shall be fabricated from 1.20 & 1.00 mm nominal thickness respectively (unless otherwise specified) satin finished, PVC laminated, high grade, stainless sheet of Grade SS 304L S1 to IS: 6911 (Latest Edition).

6.3. All the outer surface of the pantry unit shall be absolutely free from fabrication defects such as waviness etc. There shall be no wavering/undulation of sheet, housing after fabrication of equipment. The sides and top cover of the outer body shall be so integrated such that it appears to be regular single piece construction of stainless steel sheet. Design of the unit shall be such that minimum welding is contemplated. Structural frames and sheet shall be made in minimum no of pieces, ensuring being through dies on CNC machines, thus eliminating welding. At places where welding is inevitable TIG welding shall be resorted to with proper surface buffing so that welding zones are not visible.

6.4. Continuous welding joints shall be employed to fabricate housing of the pantry units with stitch welded and TIG welding. All weld joints and seams, also those in the invisible areas must be pacified when manufacturing, using acid dipping or glass pearls, to obtain a weld which is free from scales and slag. The visible surfaces must be sanded and polished in such a way as to obtain a uniform surface (grain320) and to correspond with the microloan-brushed quality of the sheet steel.

6.5. Maximum usage of extrusions, readily available finished products and accessories of International Quality (e.g. M/s Southco /Kaff /Hafele /Dirak/Darshana/EBCO) shall be done to enable LHB type quality. As far as possible screws shall not be directly visible to give aesthetically pleasing look. All the fasteners shall be of stainless steel material and conform to the relevant IS specificaiton.

6.6. All the equipment in the pantry shall be so designed so as to enable maintenance from front side for all the power and control switchgear, compressors, blower motors, heating elements etc.

6.7. The switchgear, cables, terminals, clamps and other items inside the pantry unit shall be so designed / located to avoid getting loose or overheated under normal conditions of use. Suitable mechanical and electrical protection shall be provided. Terminations shall be made with the help of crimping sockets of suitable rating/size of M/s Dowells/ Billets/Ascon or WAGO connectors of suitable rating . Heat shrinkable type ferrules shall be used for identification of the cables of M/s TYCO/ Phoenix.

6.8. Unit shall be supplied with 4 metres in length for power cables to RDSO specification no ELRS/SPEC/ELC/0019 Rev-4 for Thin Walled Flexible Elastomeric Cables with Copper Conductors. Polyamide conduits used shall be to RDSO specification no RDSO/PE/SPEC/0138-2009 (Rev-1) or latest wherever required. The cable jacket shall be to RCF specification no. EDTS-138 or latest

6.9. All the electrical joints shall be electrically / mechanically properly secured/ protected care should be taken for termination of cables to heating elements in terms of proper crimping/ insulation and protection against any mechanical damage.

6.10. The power cord of all the equipment shall come out at the back of the equipment. The power cord shall be provided with 15 A Plug of approved make. Necessary arrangement shall be made by the firm to conceal these cables by means of cable ducts during installation. After commissioning no cables shall be visible.

6.11. Clearance and creepage distance shall be maintained as per relevant Indian standards

6.12. The design of all parts and components of the pantry shall meet the requirements of UIC sheet 564-2

6.13. All material used are to be resistant to cleaning agents which occur in all purpose cleaners. When selecting the material (insulants seals, etc.), their resistance to vermin (e.g. termites) shall be taken into consideration

6.14. A suitable stainless steel earthing boss shall be provided at the bottom of the units with M8 tapped hole for earthing @ 2 nos. per equipment. Individual earthing of the motor/component shall be done to the equipment frame or looped to the earthing terminal. One no. braided copper cable of size 35sqmm and length 300mm with suitable crimping lug shall be supplied loose for earthing of cabinet with coach for all pantry units

6.15. All metal parts used inside/outside the equipment which are exposed to moisture or ambient conditions shall be corrosion resistant. Sealing materials used shall not loose in service, any of their essential properties such as adhesiveness, plasticity and moisture resistant due to ageing temp. and humidity variation

6.16. The material of all parts of the pantry being in contact with food are to be absolutely safe as far as the physiology of nutrition is concerned

6.17. When selecting the materials, the general aspects of environmental acceptability, the degradability of the materials used without residues and the later recycling are to be taken into consideration.

6.18. The equipment is to be of a light weight design. When choosing other weight-saving materials, cost and mechanical strengths are to be taken into consideration

6.19. Wherever RCF approved make is not available, the item may be got approved before fitment.

6.20. All equipment shall be provided with aluminium name plates suitably riveted in the front side

6.21. All floor mounted equipment shall have suitable anchoring brackets for securing the equipment to the car body

6.22. All accessories required for the installation of the equipment supplied, including cable markers, fire retardant heat shrinkable sleeves, equipment mounting and earthing hardware, table termination hardware, sharp edge protection etc. shall be in the scope of supplier

6.23. All floor mounted equipment mounting leg /provisions shall be ensured in such a way that while opening the equipment door, it shall not infringe with mounting hardware

6.24. Commercial items like fridge, oven etc. cable length shall be minimum 1.5mtrs with 3 pin plug and cable shall be protected with split flexible conduits.

6.25. For special electrical appliances, safety and operating instructions shall be provided, complying to comments as given in 6.20 above.

7. WORK TABLE WITH HOT UNDER-STORAGE :-

7.1. The unit shall be generally conforming to drawing no LH72254 with rating of 500 W at 230 volts, 1-phase, 50 Hz.

7.2. The unit is meant to keep warm and warm up the pre-cooked dishes in casseroles.

7.3. It shall be fabricated from stainless steel sheet 1.20 mm thick for outer wall and 1.0 mm thick for inner wall of grade SS304 S1 to IS:6911(

Latest Edition) with PVC lamination for protection and transportation. In case the specified size is not available next higher size as per IS shall be used. Mechanical strength of all parts shall meet the requirements of UIC-566

7.4. Flap doors shall be provided to prevent heat Loss through gaps. Door shall seal against the framework of Teflon bar as shown in drawing no LH 72260.

7.5. Each door shall be provided with the following

i)	Door handle with Lock	T-Handle as per part no 92-11-131 and 92-12-131 of M/s Southco & Part no.200-9334 and 200-0418 of M/s Dirak make or Darshana
ii)	Piano type Hinges	Stainless steel continuous piano type of M/s Hafele/Darshana Industries make.
Door handle with Lock and piano hinge shall be got approved from CEDE/RCF before fitment		

7.6. Suitable perforated adjustable shelves (04 nos.) may be provided on both sides as indicated in the drawing

7.7. Notching shall be provided in the sliding angles of the food trays to prevent rattling sound during the train run

7.8. Rock wool plate / bonded mineral wool with material density of 40-50 Kg/ cubic metre to IS:8193 or any other VDE/EN standard shall be sandwiched between walls and secured in such a manner that it does not sag during service conditions over a passage of time

7.9. Air heating elements of M/s Escorts/Eichen/Daspass & Theeta make (finned heaters), 300 mm long shall be provided in front of the blower and secured in such a way to allow maximum air flow through the heaters. Heating elements shall be of 500 watts suitable for 240 V+/-5%, 1 phase, 50 Hz, AC power supply generally confirming to the requirements of the IS:302.

7.10. In order to maintain uniform temperature inside the compartments, thermostatic control of M/s Rieber/Jumo/Danfoss make. The thermostat shall be located inside the control box and shall be factory set at 80 Deg C. The thermostat shall generally conform to IS:4165-67 and withstand the test requirements as laid down in the spec. A safety thermostat at factory preset shall be provided to avoid excessive heating of the cabinet in case of blower motor failure

7.11. A control box shall be provided at the top of the unit as shown in Drg. no. LH72254 which will accommodate all switchgears as per 'Bill of Material'. The control box shall be thermally insulated from all sides.

S.No	Description	Make	Qty.
1	Air heating elements (Finned type)	M/s Escorts/Eichen/Daspass & Theeta make. Firm shall however take prior approval of the same	3

3	16A, 2 pole, 2 way with OFF Rotary Switch	SG16/61079 of M/s Salzer or equivalent of Kaycee / Siemens	3
4	Indicators (LED TYPE) i) Red ii) Green	• 22.5mm LED indicators to Cat no. XB7-EVO4MPN-230V AC of M/s. Scheider Electric, Siemens, Teknic (for blower & heater 'ON') • 22.5mm LED indicators to Cat no. XB7-EVO3MPN-230V AC of M/s. Scheider Electric, Siemens, Teknic (for Power 'ON')	6 1
5	Thermostat	Model no. EWS 110°C of M/s. Rieber or equivalent of M/s. JUMO/DANFOSS make	3
8 a) b)	Power supply cable Power wiring cable	e-beam cable as per RDSO specification no ELRS/SPEC/0019 (latest revision)	Lot
9	Trays	Stainless steel fabricated food trays	4

8. Work Table with cold storage under-storage

8.1. The unit shall conform to drawing no LH72255, 500 W at 230 volts, 1-phase, 50 Hz.

a)	Overall dimensions of the Deep Freezer	
	Height	840 mm
	Depth	600 mm
	Width	1420 mm
b)	Max Power	Firm shall advise the maximum power rating at Tender stage. It shall not exceed 500 W
c)	Operating voltage	230 V ± 10 %, 50 Hz ± 3 %,
d)	Thermostat	Danfoss KP-61/ Alco / Honeywell – 18 Deg. C to -25 Deg. C
e)	Condenser & Evaporator coils	These shall be of suitable size comprising of copper tubes to IS:10773 and Aluminium fins and shall withstand a pressure of 30 Kg/Sq.cm to fulfil the functional requirements
f)	Condenser Fans	Suitable size and capacity of the condenser fan of M/s Fergas or ebm-Nadi make shall be provided to achieve uniform temperature and air circulation
g)	Compressor	R134a charged compressors shall be of standard make of LG, M/s Emerson or equivalent Tecumshah / Maneouroup. The capacity and make

		of the compressor shall be got approved by CEDE/RCF before fitment. Heat Load Calculation in proof of capacity shall also be submitted
h)	Thermal Insulation	Foamed Polysterene (Styrofoam) with close cell structure or polyurethane foam consist of two components conforming to fire prevention class B-1 flame resistance to PA-111 2.1001 in accordance with Din 4102

8.2. The unit shall be fabricated from 1.20 mm thick for outer and 1.00 mm for inner walls of grade SS-304 S1 to IS: 6911 (Latest Edition) with PVC lamination for protection and transportation. In case the specified size is not available next higher size as per IS shall be used.

8.3. Suitable perforated adjustable shelves (04 nos.) may be provided as indicated in the drawing

8.4. D-type neoprene airframe profile of silicon grey gasket to part ref no 41 of M/s FERMOD & Darshana make for sealing purpose shall be provided. Doors shall be provided with chrome plated edge hinges and edge locks as shown in the drawing. Edge hinges and edge locks shall be of M/s STUV / Southco / Hafele & Darshana make only and get approved before fitment from CEDE/RCF

8.5. Necessary anti vibration pads as recommended by the OEM of compressor shall be provided. It shall be possible to attend to the components of the equipment module and to remove the module from the front of the refrigerating unit by removing the screws of front panel. The shut off valves (if provided) for charging/maintenance shall be accessible from the front and shall be possible to charge the gas without dismantling the pantry from the coach

8.6. The unit shall have individual power and control box of identical shape and size and provided symmetrically. This control box shall house indicator green colour LED type 22.5 mm dia of M/s Schneider/Siemens/Teknic make.ELCB 25A.30Ma of M/s Siemens/L&T/MDS make,Rotary switch 16 Amp,2 Pole,2way with OFF of M/s Siemens/Salzer/Kaycee.The switchgear provided on the front panel shall have adequate length of cables to ensure easy maintenance .

8.7. Individual thermostatic control in each cooling area shall be provided to maintain preset temperature within the specified temp ranges

9. **INDUCTION HOT PLATE AND WOK** :-

9.1. Technical Requirements

Sno	Description	Parameters
1	Construction	The general construction shall be as per i) Hot Plate to drg no LH72256 & LH72257 ii) WOK to drg no LH72259 Industrial induction table top for general purpose heating & other application with heat resistance glass ceramic

2	Input power supply	The induction heating system shall be supplied with temperature and power control arrangement
3	Input Wattage & line frequency	3.5 KW , 415 V, 3-phase, 50 Hz for Induction Hot Plate 3.5 KW , 230 V, 1-phase, 50 Hz for Induction Wok
4	Control and Indications for each cook top module	Control ON-OFF, variable power knob (with visual LED bar-graph) Indications Indication ON, temperature in DegC, Trip, System Overheat
5	Induction Operation Frequency	15-20 kHz PWM (PWM shall be controlled by microprocessor and not by Oscillator)
6	Working Load	100 Kgs (However firm shall define the load for individual equipment)
7	Noise Level	Less than 50 dB
8	Efficiency	> 90% overall > 95 % electrical system
9	Power factor	0.9 (preferably)
10	Protection	Over voltage Over current Over heating (There shall be redundancy of sensors so that in case of failure of one of the sensors other sensor shall still work to make protection fool proof)
11	Switching	Zero voltage
12	Temperature control	Thermostat with tripping
13	Saving in Energy	At least 35 % saving w.r.t. conventional resistive heating system. This is to be measured by boiling equivalent quantity of water
14	Cooling of IGBT	Forced air cooling

9.2. Constructional Requirements

9.2.1. The cooking system shall comprise of Industrial grade Cooking tables suitable for all types of cooking and frying activities and capable of heavy duty application. The system shall be designed for continuous rating. The overall general arrangement shall be as per drawing no LH72256 &LH72257.

9.2.2. Cook top for heavy work shall be 3phase, 415 volts except Induction Wok which shall be on Single phase 230 volts 50 Hz

9.2.3. Glass Ceramic : Schott Ceran or equivalent glass ceramic suitable to be used in Induction cooking for catering requirements. Glass Ceramic panels must pass the International Impact tests like impact resistance

test(according to EN60335-1) as well as Pan Drop Test (Impact Resistance test according to EN60335-2-36). No cracking due to thermal stress at 700 DegC (Max). Resistance to the cook top panel to thermal shock when the hot cook top panel is quenched with cold water (room temperature) (requirements according to EN60335-2-36 should be complied) Glass ceramic should be restricted on Hazardous substances (RoHS) compliant

9.2.4. Suitable adjustable stopper should be provided to hold the utensils to prevent any accident in case of any jerk or disturbance. The cooking system should have the special feature for withholding of vigorous vibration of running train

9.2.5. Induction compatible containers of stainless steel withholding body of pure solid furnished stainless steel with glass ceramic working top of suitable size and number shall be provided

9.2.6. Temperature control :- glass ceramic temperature monitoring shall be provided ensuring that when the glass attains the temperature beyond 180 Deg C supply shall be cut-off

9.2.7. Operating Panel :- The operating switch board/ MCCB should be provided in the front side of the Induction range and it should be covered properly to avoid ingress of water / Oil. Proper operating switch should be fitted in front of specified induction type cook top. The operating panel should be lockable to avoid un-authorised access.

9.2.8. Power Box

9.2.8.1. The electronic power inverter shall be provided in a separate stainless steel (grade SS304 S1 to IS-6911 minimum 1mm thickness) enclosure called Power Box and shall be accessible for any kind of maintenance purpose of the electronic system.

9.2.8.2. The Inter-connection between the power box and the induction cook top shall be done with adequately rated Teflon cables and Industrial grade connectors. All the wiring shall be secured with fire retardant sleeves.

9.2.8.3. The protection of the cable harness shall be ensured employing flexible polyamide conduits with metallic fittings, lock nuts and tube clamps as per RDSO specification no RDSO /PE/SPEC/0138(Latest Edition)

9.2.8.4. IGBT shall be employed as switching devices which shall be temperature protected with sensor enabled. Zero voltage switching technique should be employed.

9.2.8.5. The control circuit shall be EMI/EMC compliant.

9.2.8.6. For any kind of malfunctioning due to what so ever reason , the system shall trip automatically and shall not allow the heating to go on and also prevent any kind of further damage

9.2.8.7. In case the utensil is lifted while cooking then immediately current fold back circuit shall be activated and system shall go in safe mode of operation. In this mode the load on the coil will be negligible and there shall be no damage to the system or to the coil or to the cook.

9.2.8.8. The power supply system shall be surge protected which enables Switching OFF of the IGBT output. The electronic circuit used for induction cooking will have all Industrial Grade electronic components. All material to be used shall be fire retardant as per HL-2 to EN45545.

9.2.8.9. Firm must provide standard drawing and troubleshooting directory of power inverters & related wiring of the induction type cooking range.

9.2.8.10. Proper metal stickers should be riveted on meters, switches, indications etc

9.2.8.11. All equipment shall be so designed that there shall be no water ingress during washing of the pantry floor, washing of the table top etc. the housing shall be IP44 Protected.

10. OVERHEAD SHELF

10.1. The overhead shelf shall be made of stainless steel sheet as per OGA drawing no LH72258

10.2. The shelf shall be perforated type with holes at a suitable distance as indicated in the drawing

11. DEEP FAT FRYER :-

11.1. The deep fat fryer shall be of M/s Sammic , Kiran or equivalent approved make The unit shall be single tank stainless steel SS304 grade construction complete with stainless steel Lid cover, stainless steel residue plate and detachable stainless steel basket. The capacity of the oil tank shall be min 8 litres. Overall wattage of the Fat fryer shall be 3.6KW at 230 volts, 1-phase, 50 Hz.

11.2. Control temperature / thermostat knob shall be provided on the front with LED indications as per drawing no LH72268 (for ref. only). Firm may take prior approval before supplying any other make.

12. HOT CASE

12.1. The hot case is meant to keep warm and warm-up pre-cooked dishes in casseroles. Vegetarian and Non-Vegetarian dishes shall be kept warm separately. In order to fulfil this requirement, the hot case is divided into 3-parts. The temperature of these divisions should amount to an appropriate range of values and shall be separately controlled by thermostat switches

12.2. Technical requirements

12.3. The unit shall generally conform to the OGA drawing for the Hot case to drawing no LH72260

a)	Overall dimensions	
	Height	= 840 mm
	Depth	= 600 mm
	Width	= 1200 mm
(No positive tolerance over these dimensions shall be permitted , however negative tolerance shall be governed by MDG0008)		
b)	Input Power	1500 watts
c)	Power supply	230 V ± 10 %, 50 Hz ± 3 %,
d)	Thermostat	Range 30-110 Deg. C
e)	Trays	18 nos. stainless steel fabricated food trays shall be provided.

12.4. Construction

12.4.1. The unit shall be as per RCF OGA drawing no LH72260. Hot case shall be fabricated from stainless steel sheet 1.20 mm thick for outer wall and 1.0 mm thick for inner wall of grade SS304 S1 to IS:6911(Latest Edition) with PVC lamination for protection and transportation. In case the specified size is not available next higher size as per IS shall be used. Mechanical strength of all parts shall meet the requirements of UIC-566

12.4.2. Flap doors shall be provided to prevent heat Loss through gaps. Door shall seal against the framework of Teflon bar as shown in drawing no LH72260.

12.4.3. Each door shall be provided with the following

i)	Door handle with Lock	T-Handle as per part no 92-11-131 and 92-12-131 of M/s Southco & Part no.200-9334 and 200-0418 of M/s Dirak & Darshana make.
ii)	Piano type Hinges	Stainless steel continuous piano type of M/s Hafele/Darshana Industries makes.
Door handle with Lock and piano hinge shall be got approved from CEDE/RCF before fitment		

12.4.4. Stainless steel fabricated food trays (18 nos.) of size 280x495 mm as shown in the drawing no LH72260 shall be provided in the hot case. These trays shall have CNC punched holes for air circulation and shall be injury free design with no sharp edges / burrs. The sheet of the side tray shall be folded to avoid presence of cutting edges. Trays shall be provided with handles of heat resistant and heat proof Teflon material for easy operation by the catering staff.

12.4.5. Notching shall be provided in the sliding angles of the food trays to prevent rattling sound during the train run

12.4.6. Rock wool plate / bonded mineral wool with material density of 40-50 Kg/ cubic metre to IS:8193 or any other VDE/EN standard shall be sandwiched between walls and secured in such a manner that it does not sag during service conditions over a passage of time.

12.4.7. Air heating elements of M/s Escorts/Eichen/Daspass & Theeta make (finned heaters), 300 mm long shall be provided in front of the blower and secured in such a way to allow maximum air flow through the heaters. Heating elements shall be of 500 watts each suitable for 240 V+/-5%, 1 phase, 50 Hz, AC power supply generally confirming to the requirements of the IS:302.

12.4.8. The heating elements shall be supported on insulators to avoid accidental contact of power supply with the body in case of damage/failure of heaters. Fire retardant FRP sheet/ porcelain of at least 8.0 mm thickness shall be provided to fix the heating element with the duct.

12.4.9. The hot case is to be provided with a circulating air system to maintain evenly warm up. Tangential blower/Hot air fan to cat. No. QLZ 06/0030 and QLZ06/3000 of M/s ebm NADI / ebmpapst / Reiber or equivalent of M/s Fergas with insulation class-H shall be provided for hot air circulation. The motor and blower assembly shall be suitable to operate continuously in heated environment of110 Deg.C. The blower and duct assembly shall be suitably mounted on a stainless steel frame. The frame shall be draw out type and fabricated from 1.20mm thick stainless steel. The blower, heating elements and switchgear in the control panel shall be easily accessible for maintenance. Insulation shall also be provided between the blower compartment and food compartment to avoid heat flow towards blower motor area.

12.4.10. In order to maintain uniform temperature inside the compartments, thermostatic control of M/s Rieber/Jumo/Danfoss make. The thermostat shall be located inside the control box and shall be factory set at 80 Deg C. The thermostat shall generally conform to IS:4165-67 and withstand the test requirements as laid down in the spec. A safety thermostat at factory preset shall be provided to avoid excessive heating of the cabinet in case of blower motor failure

12.4.11. A control box shall be provided at the top of the unit as shown in Drg. no. LH72260 which will accommodate all switchgears as per 'Bill of Material'. The control box shall be thermally insulated from all sides.

12.4.12. Fire retardant EPDM sponge of dia 30mm suitable for use in heated environment of 100°C continuously shall be provided to secure trays to avoid rattling noise of trays during train run.

S.No	Description	Make	Qty.
1	Hot air fan/Blower	• Cat No. QLZ06/3000(LH) of M/s. ebm-Nadi or equiv. of M/s. ebmpapst/Reiver/Fergas, insulation class H. • Cat No. QLZ06/0030(RH) of M/s. ebm-Nadi or equiv. of M/s. ebmpapst/Reiver/Fergas, insulation class H.	2 1
2	Air heating elements (Finned type)	M/s Escorts/Eichen/Daspass & Theeta make 300 mm (max.) long . Firm shall however take prior approval of the same	3
3	16A, 2 pole, 2 way with OFF Rotary Switch	SG16/61079 of M/s Salzer or equivalent of Kaycee / Siemens	3
4	Indicators (LED TYPE) i) Red ii) Green	• 22.5mm LED indicators to Cat no. XB7-EVO4MPN-230V AC of M/s. Scheider Electric, Siemens, Teknic (for blower & heater 'ON') • 22.5mm LED indicators to Cat no. XB7-EVO3MPN-230V AC of M/s. Scheider Electric, Siemens, Teknic (for Power 'ON')	6 1

5	Thermostat	Model no. EWS 110°C of M/s. Rieber or equivalent of M/s. JUMO/DANFOSS make	3
6	Safety thermostat	Temperature setting shall be 95°C of Utility control/ Elcon/Al make	3
7	Stainless steel sheet (Satin finished)	High grade 304 S1 to IS:6911	Lot
8 a) b)	Power supply cable Power wiring cable	e-beam cable as per RDSO specification no ELRS/SPEC/0019 (latest revision)	Lot
9	Trays	Stainless steel fabricated food trays of size 316x495 mm as shown in the drawing no LE72260	18

13. MICROWAVE OVEN :-

13.1. The microwave Oven shall be 30 L capacity of M/s LG/Samsung/IFB make. Firm offering different model shall get the approval from CEDE office before supply.

13.2. Suitable locking mechanism to be provided at the bottom of the equipment to avoid movement during train running.

14. WALL SHELF :

14.1. The item shall be fabricated from stainless steel 1mm thick to grade SS304 S1 to IS 6911 (Latest Edition)

14.2. The shelf shall be perforated as indicated in the drawing

15. BRAT PAN :-

15.1. The unit shall be generally conforming to BP8080E of M/s Waldorf make or equivalent, however, in case firm offers alternative make , same may be got approved before supply from office of the CEDE/RCF

15.2. Heavy duty commercial type appliance shall be provided for braising, boiling, steaming, poaching, stewing, roasting, deep fat frying and shallow frying

15.3. Technical requirements :- Construction / dimensions of the deep freezer shall generally conform to drawing no LH72262

a)	Overall dimensions of Brat Pan	
	Height	840 mm
	Depth	900 mm + handle
	Width	1200 mm
b)	Max Power	Firm shall advise the maximum power rating at Tender stage. It shall not exceed 12000 Watts
c)	Operating voltage	3 Ph, 415 V ± 10 %, 50 Hz ± 3 %,
d)	Thermostatic control	50-320 DegC
e)	Safety	Over temperature cut out
f)	Capacity	150 litres

15.4. Constructional details of the Brat Pan

15.4.1. General Layout of the modular unit shall generally conform to the OGA drawing no LH72262 complete with splash back and side panels of 1.20 mm thick stainless steel. The unit shall have tilting mechanism (spring balanced lid hinge system) with rotary handle on the front.

15.4.2. The unit shall be fabricated from 1.20 mm thick for outer and 1.00 mm for inner walls of grade SS-304 S1 to IS: 6911 (Latest Edition) with PVC lamination for protection and transportation. In case the specified size is not available next higher sizes per IS shall be used.

15.4.3. The pan shall be made of high thickness plate (2mm minimum) for uniform cooking.

15.4.4. Water Inlet pipe shall be provided on the bottom side of the unit as indicated in the drawing no LH72262

15.4.5. The water load tap shall be provided on the back side of the top and rounded shape of the tank to make it easy to be cleaned.

16. COMBI OVEN

16.1.1. The unit along with stainless steel table shall be of Rational make to catalogue no SCC 101 E (10 trays)/ FAGOR or any other approved make. The firm shall however take prior approval for any other make and shall submit the technical detail of the unit offered.

16.1.2. The unit shall be suitable for automatic cooking as a mixed load with hot air steamer (combi-steamer mode) for optional use of steam/hot air in succession or in combination.

16.1.3. The control panel shall be preferably touch screen type for easy and intuitive operation

16.1.4. The unit should have automatic cleaning and de-scaling of the steam generator.

16.1.5. The door shall be rear ventilated type, two hinged inside panes with heat reflecting coating.

16.1.6. The unit shall have LED cooking cabinet and rack lighting.

16.1.7. The unit shall have cool down function to have fast cooling

16.1.8. The rating of the combi. oven shall be 18600 Watts (approx.) at 415 volts, 3-phase, 50 Hz.

17. **FRIDGE** :-

17.1. The fridge shall be frost free, shiny steel finish, double door 310 L capacity of M/s LG / Samsung / Voltas make. Any other make offered by the firm shall have prior approval of CEDE/RCF

17.2. The shelf / tray shall be of toughened glass for easy handling and shall be adjustable preferably.

17.3. The unit shall be with five star rating as per BEE rating with smart inverter compressor.

18. DEEP FREEZER :-

18.1. The modular pantry unit shall have 200 litres capacity deep freezer with permanent setting of at least -18 Deg. C to be used for freezing / preserving ice cream / meat and food etc. The temperature range shall be from – 18 Deg. C to -25 Deg. C

18.2. Technical requirements :- Construction / dimensions of the deep freezer shall generally conform to drawing no LH72263

i)	Overall dimensions of the Deep Freezer	
	Height	840 mm
	Depth	600 mm
	Width	1420 mm
j)	Max Power	Firm shall advise the maximum power rating at Tender stage. It shall not exceed 500 W
k)	Operating voltage	230 V ± 10 %, 50 Hz ± 3 %,
l)	Thermostat	Danfoss KP-61/ Alco / Honeywell – 18 Deg. C to -25 Deg. C
m)	Condenser & Evaporator coils	These shall be of suitable size comprising of copper tubes to IS:10773 and Aluminium fins and shall withstand a pressure of 30 Kg/Sq.cm to fulfil the functional requirements
n)	Condenser Fans	Suitable size and capacity of the condenser fan of M/s Fergas or ebm-Nadi make shall be provided to achieve uniform temperature and air circulation
o)	Compressor	R134a charged compressors shall be of standard make i.e Model No KCN415 LAG or ECZ416 LG of M/s Emerson or equivalent Tecumshah / Maneouroup. The capacity and make of the compressor shall be got approved by CEDE/RCF before fitment. Heat Load Calculation in proof of capacity shall also be submitted
p)	Thermal Insulation	Foamed Polysterene (Styrofoam) with close cell structure or polyurethane foam consist of two components conforming to fire prevention class B-1 flame resistance to PA-111 2.1001 in accordance with Din 4102

18.3. Constructional Details of the Deep Freezer

18.3.1. The unit shall have removable type partitions inside the cabinet as shown in the drawing to keep the vegetarian and non-vegetarian food separately.

18.3.2. The unit shall be fabricated from 1.20 mm thick for outer and 1.0 mm for inner walls of grade SS-304 S1 to IS: 6911 (Latest Edition) with PVC lamination for protection and transportation. In case the specified size is not available next higher size as per IS shall be used.

18.3.3. D-type neoprene airframe profile of silicon grey gasket to part ref no 41 of M/s FERMOD & Darshana make for sealing purpose shall be provided. Doors shall be provided with chrome plated edge hinges and edge locks as shown in the drawing. Edge hinges and edge locks shall be of M/s STUV / Southco / Hafele & Darshana make only and get approved before fitment from CEDE/RCF

18.3.4. Necessary anti vibration pads as recommended by the OEM of compressor shall be provided. It shall be possible to attend to the components of the equipment module and to remove the module from the front of the refrigerating unit by removing the screws of front panel. The shut off valves (if provided) for charging/maintenance shall be accessible from the front and shall be possible to charge the gas without dismantling the pantry from the coach

18.3.5. Deep freezer unit shall have individual power and control box of identical shape and size and provided symmetrically. This control box shall house indicator green colour LED type 22.5 mm dia of M/s Schneider/Siemens/Teknic make. ELCB 25A.30Ma of M/s Siemens/L&T/MDS make, Rotary switch 16 Amp,2 Pole,2way with OFF of M/s Siemens/ Salzer/ Kaycee. The switchgear provided on the front panel shall have adequate length of cables to ensure easy maintenance.

18.3.6. Individual thermostatic control in each cooling area shall be provided to maintain preset temperature within the specified temp ranges

18.3.7. Mounting channel with holes 5x100x100mm shall be provided for fixing of the unit and perforated sheet (2mm) shall be screwed in the front side of the channel as indicated in the drg.no. LH72263.

19. STORAGE COMPARTMENT WITH SINKS :-

19.1. In the modular unit of kitchen, front open able cupboard/racks with adjustable type shelves shall conform to OGA in drawing nos. LH72264 & LH72266 shall be provided. Stainless steel drawn type sink of the following bowl sizes shall be provided.

i)	610x460x254	03 No.	Jumbo of M/s. Niroli or equivalent approved make

19.2. The sink unit shall be provided with fixed type splash guards suitably integrated with the units as shown in drawing. The height of splash guards shall be kept as 175mm.

19.3. Stainless steel fabricated top openable waste bins with covering lids shall be provided in the storage racks as shown in drawing No. LH72267. The overall size of the containers shall be as follows:

Length - 500mm
Width - 530mm
Height - 300mm

19.4. The containers shall be of sliding type design with suitable handles for frequent and easy removal and cleaning purpose. Suitable measures shall be taken to prevent ratting sound of these containers. The other storage rack shall be without waste bins; however the general construction shall be kept as per drawing No. LH72267

19.5. The top of the racks shall provide a continually smooth work surface with finely curved edge at the front side while in completely assembled conditions inside the coach

19.6. Construction

19.6.1. The storage compartment unit shall be manufactured with sound engineering practices making use of stainless steel frame of angles and shall be of robust design. The top surface of the storage racks shall be subject to heavy thrusts while in use by heavy utensils; hence it shall be adequately reinforced by suitable means so that does not sag by the passage of time

19.6.2. The accessories for the storage racks shall be of international quality. The design of the accessories shall be so selected and provided in such a way that none of these protrude outside the overall dimensions of the modular unit. The doors and the partitions shall be double walled type and each door shall be provided with the following:

i) Flush type handles of M/s. Hafele/Southco/Dirak/EBCO & Darshana make
ii) Industrial locks to part No. 235.78.207 suitable for square profile key to part no. 235.76.909 of M/s. Hafels or M/s Dirak make
iii) Continuous piano type hinge of M/s. Hafele/Darshana industries make

19.6.3. A suitable flexible drain pipe as show in drawing shall be provided with the sink for water drainage

20. WATER BOILER

20.1. Water boiler of 30 liters capacity generally conforming to IS:3412 shall be provided along with a control box and necessary plumbing and tap arrangement on a common base plate. There shall be four nos. of such boilers provided on the side wall of the coach. The two nos. shall be Horizontal type provided as per drawing no LH72211 and two nos. mounted vertically on a common base to drawing no LH72265 with layout as per drawing no LH90018 alt-a. The inlet to one of the boilers shall be connected to the overhead tank of the coach through water filter and shall be used for preparing tea/coffee. The base plate and plumbing shall be suitably modified to suit provision of water filter. The other two water boilers shall be connected directly to the overhead tank of the coach with the help of flexible pipes. These shall be mainly used for cleaning purpose.

20.2. The water filter cum purifier shall be industrial grade, ultraviolet type of M/s. Eureka Forbes or equivalent RCF approved make and shall be sufficient to feed at least two water boilers for normal use. Water taps for normal filtered water shall also be provided.

20.3. Technical requirement

a)	Overall dimensions		
	Horizontal Type Drg. no LH72211 alt-b		
	Height	=	650 mm (without taps)
	Depth	=	397 mm
	Width	=	900mm
	Vertical Type (twin) Drg. no LH72265		
	Height	=	650 mm (without taps)
	Depth	=	397 mm
	Width	=	900mm

b)	Capacity	30 litres
c)	Power supply	230 V ± 10 %, 50 Hz ± 3 %,
d)	Heating element	2.0 KW tube type immersion type heating element.
e)	Thermostat	40°C to 110°C to IS:3017 of M/s. AI/Elcon make.
f)	Thermal insulation	Rock wool plate/bonded mineral wool
g)	ELCB	25 Amps, 30mA Siemens/MDS/L&T

20.4. CONSTRUCTIONAL DETAILS

General guidelines for construction, design, operating conditions, selection of components etc. are given below:

20.4.1. The outer housing of the water boiler shall be fabricated from 1.20mm thick rust proof special grade poly propylene/stainless steel to grade SS304 S1 to IS:6911 (latest edition) for body.

20.4.2. The inner container shall be made of 2mm thick stainless steel to grade SS304 S1 to IS:6911(latest edition) plasma T.G. welded. The case the specified size is not available, next higher size as per IS shall be used.

20.4.3. The water boiler shall have Rock wool plate/bonded mineral wool having bulk density of material 40-50 Kg/Cum to IS 8183-93 for conforming to any EN/VDE standard insulation sandwiched in between the inner container and the outer housing and secured in such a manner that it does not sag during service conditions over a passage of time.

20.4.4. The water boiler shall be provided with multifunction safety with pressure relief, non return, antic vacuum and drainage.

20.4.5. Immersion type water heater of capacity 2KW working on single phase 230 volts, 50 HZ to IS:368 (latest edition) shall be provided.

20.4.6. The water heater assembly shall consist of water heater, tap arrangement, interconnecting flexible water hoses, stainless steel plumbing and accessories. All these sub assemblies shall be mounted on a mounting frame fabricated from 2.0mm thick stainless steel sheet Gr. 304 S1 to IS:6911 (latest edition), as per drawing No. LH72221 & LH72265.

20.4.7. The hot water taps shall be identified with red color paint marks and with different knob arrangement for safety.

20.4.8. Ball valve of size 15mm bore pipe M/s. "Star-Italy"/RB-Italy/COMAP-France/Zolo to shall be provided at the inlet of individual water boiler to isolate from main water supply for maintenance purpose. Prior approval for make of ball valve shall be taken from CEDE/RCF.

20.4.9. The height of water inside the water boiler is to be maintained such as the heating element is immersed in water in all conditions.

21. CUP BOARD

21.1. The unit shall be generally conforming to OGA drawing no LH72267.

21.2. The storage compartment unit shall be manufactured with sound engineering practices making use of stainless steel frame of angles and shall be of robust design. The top surface of the storage racks shall be subject to heavy thrusts while in use by heavy utensils; hence it shall be

adequately reinforced by suitable means so that does not sag by the passage of time

21.3. The accessories for the storage racks shall be of international quality. The design of the accessories shall be so selected and provided in such a way that none of these protrude outside the overall dimensions of the modular unit. The doors and the partitions shall be double walled type and each door shall be provided with the following:

i) Flush type handles of M/s. Hafele/Southco/Dirak EBCO & Darshana make

ii) Industrial locks to part No. 235.78.207 suitable for square profile key to part no. 235.76.909 of M/s. Hafele or M/s Dirak make

iii) Continuous piano type hinge of M/s. Hafele/Darshana industries make

22. FLYING INSECT KILLER

22.1. Flying insect killer shall be industrial type suitable for 230 volts, 1-phase 50 Hz supply with minimum two numbers of UV tubes wall mounted type

23. **ENHANCED CAPACITY CHIMNEY** :-

23.1. The chimney shall be as per RCF specification EDTS-447 (copy enclosed)

24. Tests

24.1. TEST & INSPECTION

24.1.1. **Type Test**

24.1.1.1. All the type tests mentioned in respective table shall be carried out on a prototype unit. The firm manufacturing for first time shall get prototype approval from CEDE/RCF.

24.1.2. **Acceptance Test**

24.1.2.1. Acceptance tests shall be carryout out as mentioned in t he respective table by an inspecting authority nominated by the purchase of the works of the manufacturer, on each unit. In this case inspection shall be done by CEE's authorized representative for the order being executed for the first time

24.1.3. **Routine Test**

24.1.3.1. Routine tests mentioned respective tables shall be carried out by the manufacturer at his premises to ensure compliance with the specification and the drawing

24.1.3.2. Valid calibrated measuring instruments shall be made available for conducting the test

24.1.3.3. Firm shall be responsible to get the testing done by the inspecting engineer/authority as per the schedule mentioned below and submit the copy of test certificate duly signed by the inspecting authority for acceptance of material

24.1.3.4. All the tests shall be governed by the respective Indian Standard

TABLE-I TESTS FOR DEEP FREEZER

Sr.	Test	Type test	Accept. test	Routine test	CL of IS :7872 -1975
1	Door seal test	Yes	Yes	Yes	6.2.1
2.	Test for mechanical strength of shelf & similar comp	Yes	No	No	6.2.2
3.	Thermal insulation test	Yes	No	No	6.2.3
4.	Pressure Test	Yes	Yes	No	6.2.4
5.	High voltage test	Yes	Yes	Yes	6.2.5
6.	Insulation resistance test	Yes	Yes	Yes	6.2.6
7.	Performance test	Yes	Yes	No	6.2.7
8.	Product load test	Yes	No	No	6.2.8
9.	Thermostat test	Yes	Yes	Yes	6.3.1
10.	Earth Fault Test	Yes	Yes	No	Checking of the protective device by simulating earth fault during testing

TABLE-II (TESTS FOR HOT CASE)

Sr. No	Test	Type Test	Accep Test	Routine Test	Clause of IS 302-1979
1	Visual Inspection / dimensional/construction al test	Yes	Yes	Yes	22
2.	High Voltage Test	Yes	Yes	No	16
3.	Insulation Resistance Test	Yes	Yes	Yes	16
4.	Clearance and creep - age distance check	Yes	Yes	Yes	29
5.	Operational/ Performance test	Yes	Yes	Yes	10&11
6.	Uniformity of temperature	Yes	Yes	Yes	This Spec.
7.	Check of protective devices	Yes	Yes	Yes	27, APP-G
8	Earth Fault Test	Yes	Yes	No	Checking of the protective device by simulating the earth fault during testing

TABLE-III (TESTS FOR HOT WATER BOILER)

Sr.	Test	Type Test	Accep test	Routine Test	Clause of IS: 302- 1979
1	Visual Inspection / dimensional / constructional test	Yes	Yes	Yes	Cl 20 of SPEC
2.	Insulation Resistance Test	Yes	Yes	Yes	16
3.	Clearance and creepage distance check.	Yes	Yes	Yes	29
4.	High voltage test	Yes	Yes	No	13
5.	Operational/ performance test	Yes	Yes	Yes	10 &11
6.	Check of protective devices	Yes	Yes	Yes	27 App-G
7.	Pressure test	Yes	Yes	No	22.101 of IS 302-2-21
8.	Endurance test	Yes	No	No	18
9	Earth Fault Test	Yes	Yes	No	Checking of the protective device(ELCB) by simulating actual earth fault during testing

TABLE-IV (TESTS FOR INDUCTION EQUIPMENT)

Sno	Test	Type Test	Accept Test	Routine Test	Clause no.
1	Visual and Dimensional check	Yes	Yes	Yes	24.2.1
2	Checking of documents for the purchase of glass ceramic	Yes	Yes	Yes	24.2.2
3	Insulation Test	Yes	Yes	Yes	24.2.3
4	HV Test	Yes	Yes	Yes	24.2.4
5	Over-Voltage Protection	Yes	Yes	Yes	24.2.5
6	Surge Protection	Yes	Yes	No	24.2.6
7	Temperature Rise Test	Yes	Yes	No	24.2.7
8	Fire Retardant Test	Yes	Yes	No	24.2.8
9	Test of All Protection	Yes	Yes	Yes	24.2.9
10	Dry Heat and Damp Test	Yes	Yes	No	As per IEC60571

24.2. TEST DETAILS

24.2.1. **Visual and Dimensional Test** :- The units shall be checked visually for all dimensions as per approved drawing. General Workmanship should be good, all the components shall be properly secured and sharp edges

shall be rounded off. Check the marking and quality of workmanship visually. Check the rating and the make of Electronic items

24.2.2. **Checking of the Documents of purchase of Glass Ceramic** :- check documents of the purchase of Glass Ceramic along with validation by the manufacturer that it meets all the requirements of the para 9.2.3. Test certificates of manufacturer for test parameters shall be provided by the supplier

24.2.3. **Insulation resistance test** :- The insulation resistance of the unit between Earth and current carrying parts shorted together shall not be less than 2Mohms when measured with 500 V Meggar

24.2.4. **HV Test**: - immediately after the insulation resistance test, 2kV rms (1500 + 2x rated voltage) of sine wave form of 50 Hz shall be applied for 1 min. between the live parts and frame. There shall not be any kind of breakdown, flashover or tripping of supply.

24.2.5. **Over-Voltage Protection**:- The units shall withstand overvoltage condition at 300 V for two minutes.

24.2.6. **Surge protection** :- it shall withstand a surge of 1.5 kV ± 3 % for 50 microseconds ± 20 % at the input terminals for all types

24.2.7. **Temperature Rise Test**:- Temperature rise test shall be conducted with full load at room temperature. The rise shall be recorded by temperature detectors mounted at the specified reference points on the body of semiconductors, capacitors and other components as agreed between the purchaser and manufacturer. The maximum recorded temperature under worst conditions shall be corrected at 55DegC and compared with maximum permissible temperature (for power devices at the junction). The thermal margin available shall be compared with the safety margin declared by the manufacturer. Under loading conditions as specified above, the corrected temperature of the power devices shall have a safety margin of minimum 10 Deg. C. Temperature at the junction shall not exceed 125 Deg. C when corrected to 55 Deg. C. The maximum temperature of the electronic devices on the PCB shall not be more than 20 Deg. C for industrial grade components suitable for 85 DegC environment. In case of exceeding limit, use of MIL grade components shall be considered. Test certificate conforming all above shall be submitted by the supplier

24.2.8. **Fire retardant Test** :- The test shall be conducted as per IEC 60332 of the wire used in the fitting. Test Certificate conforming to above shall be submitted by the supplier

24.2.9. **Test for all Protections** :- All protections shall be tested for ensuring their efficacy

25. MARKING

25.1. The following information shall be distinctly and indelibly marked on the housing of induction heating equipments

- Indian Railway Insignia
- Year of manufacture/Batch number/serial Number (MMYY/XX/ABCD)
- Name of manufacturer
- Rated watt and voltage (input)
- Rated Watt – out put
- Working Frequency Range

26. GUARANTEE/WARRANTY

26.1. The unit shall be guaranteed for satisfactory performance and manufacturing defects for a period of 36 months from the date of commissioning of 48 months from the date of supply whichever is earlier. All the arising defects should be attended by the supplier within 24 hours of information

27. INFRINGEMENT OF PATENT RIGHTS

27.1. Indian Railways shall not be responsible for infringement of patent rights arising due to similarity in design, manufacturing process, use of the components used in design, development and manufacturing of these light fittings and any other factor which may cause such dispute. The responsibility to settle any issue rises with the manufacturer

28. IRIS Conditions

The clause is added to incorporate the IRIS conditions in the specification. The following clause are added

28.1. First Article Inspection

28.1.1. First Article Inspection (FAI) will be done in case of first time manufactured and approved by CEDE/RCF before bulk supplies

28.1.2. External Provider shall carry out FAI at their premises as per ISO/TS 22163:2017 requirements and submit the report along with documents to RCF, Kapurthala prior to FAI by the Purchaser. The following documents shall be submitted:-

a) FAI Report
b) QAP (Quality Assurance Plan)
c) Details of special processes and their compliance

28.1.3. Special Processes are as under

a) Welding
b) Brazing
c) Crimping

28.1.4. On completion of the First Article Inspection in-house by the firm and submission of documents to RCF, the representative of the purchaser shall be nominated to carry out FAI along with validation of the above three special processes at the firm's premises

28.1.5. Validation of outsourced special processes shall also be carried out as per requirement of the ISO/TS 22163:2017

28.1.6. Audit inspection shall be done during the regular production in the firm for certify quality of Modular Integrated Pantry Unit for LHB type Buffet coaches

28.1.7. Firm has to fulfil all the requirements as mentioned in the IRIS Standard ISO/TS 22163:2017

28.2. RAMS (Reliability, Availability, Maintainability and Safety)

28.2.1. Reliability targets :-

The achieved level of reliability shall ensure MDBF of 2,00,000 kms or more after initial reliability growth period of one year. The following fleet average levels of MDBF shall be achieved after the mentioned period of time

- MDBF > 80,000 kms after 06 months
- MDBF > 2,00,000 Kms after 12 months

For this purpose, any equipment shall be counted as available for calculation only after a stabilization period of 6 months after putting the train into revenue service

28.2.2. Availability Requirements

The availability of the coach calculated on quarterly basis and considering unscheduled repairs for the equipment should not be less than 96%.

28.2.3. Maintainability

The maintenance program prepared by EPPPS shall have the following objectives:-

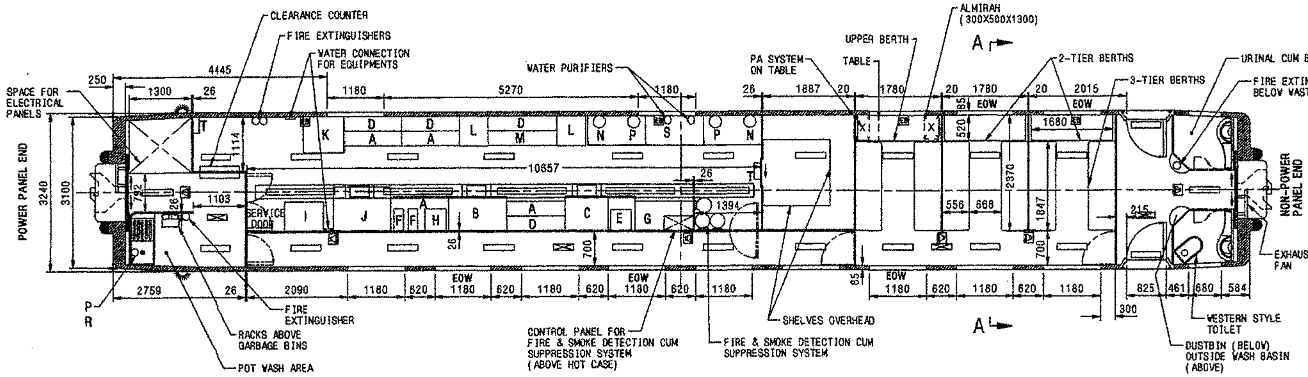
- Enhancement of Rolling stock availability
- Minimisation of the maintenance costs
- Minimisation of the coach downtime/MTTR (mean time to restore serviceability)

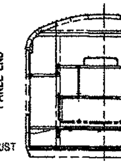
EPPS shall submit the basic maintenance schedules for the equipment. The minimum interval between overhauls at workshop be as per the maintenance manual / Schedule for LHB coaches issued by CAMTECH.

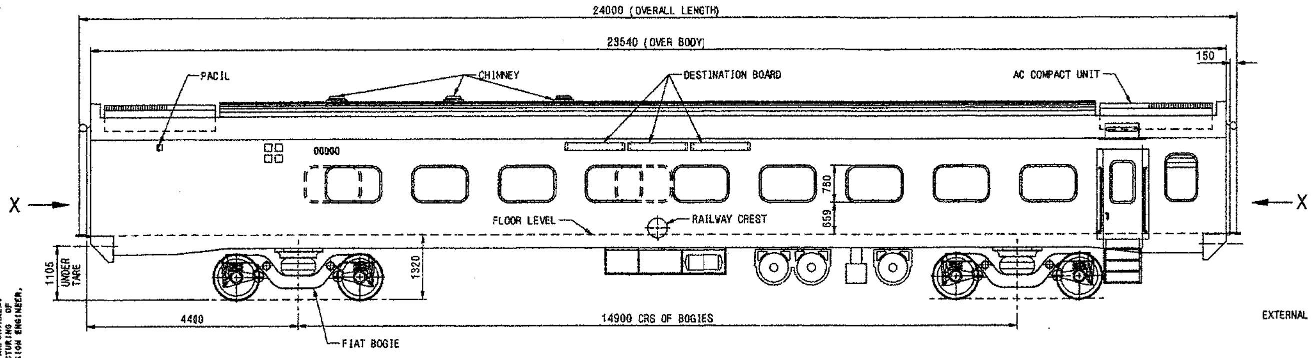
29. ENCLOSURES

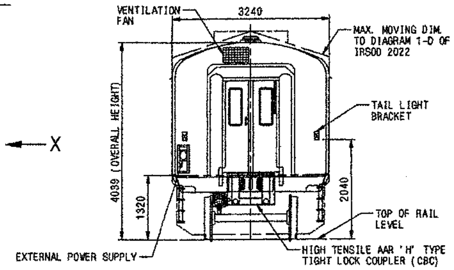
1. Layout drawing no LH90018 alt a
2. Work table with Hot under storage LH72254
3. Work table with Hot under storage LH72255
4. Induction Hot Plate LH72256
5. Induction Hot Plate LH72257
6. Overhead Shelf LH72258
7. Induction WOK with Table LH72259
8. Hot Case LH72260
9. Wall shelf LH72261
10. Brat Pan LH72262
11. Deep Fridge LH72263
12. Sink LH72264
13. Wall mounted geyser LH72265
14. Sink LH72266
15. Cup Board LH72267
16. Deep Fryer LH72268
17. Wall mounted geyser LH72211
18. Chimney EDTS-447

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
a	26/09/2023	ALL	1. ALL COACH ITEMS MIRRORED LONGITUDINALLY EXCEPT ELECTRICAL PANELS. 2. WINDOWS & EMERGENCY BRAKE POINTS LOCATION KEPT SIMILAR TO EXISTING LHB AC HOT BUFFET FOR RAJDHANI 3. ONLY ONE SMALLER WINDOW OF SIZE 680X760 HAVE BEEN ELIMINATED IN POT WASH AREA. 4. POT WASH AREA HAVE BEEN SHIFTED FROM KITCHEN AREA TO OUTSIDE KITCHEN AREA (I.E. GANGWAY AREA). 5. LOCATION OF THE ALL OTHER KITCHEN ITEMS HAVE BEEN RE-LOCATED. 6. CUP-BOARD & FLYING INSECT KILLERS HAVE BEEN ADDED IN KITCHEN AREA. 7. SIZES OF VARIOUS KITCHEN ITEMS PROVIDED/UPDATED. 8. CABIN PARTITIONS HAVE BEEN EXTENDED UP TO SIDE WALL. 9. CHIMNEYS SHOWN.	DY.CME/DP









VIEW FROM - 'X'

SYMBOL	ITEM DESCRIPTION	QPC	LENGTH	WIDTH	HEIGHT
A	WORK TABLE WITH HOT/COLD UNDER STORAGE	4	1200	600	840
B	HOT PLATE	1	1200	700	840
C	HOT PLATE	1	900	700	840
D	OVERHEAD SHELF	4	1200	300	---
E	INDUCTION WOK WITH TABLE	1	425	425	150
F	DEEP FRYER	2	190	455	350
G	HOT CASE	1	1200	600	840
H	SALAMANDAR	1	450	450	300
I	WALL SHELF	1	800	600	1400
J	BRATPAN	1	1200	900	840
K	COMBINATION OVEN WITH TABLE	1	847	771	1042
L	FRIDGE	2	590	610	1500
M	DEEP FRIDGE	1	1420	600	840
N	SINK	2	1200	600	840
P	WALL MOUNTED BOILER	3	965	375	650
R	SINK	1	940	600	840
S	CUP BOARD	1	1200	600	600
T	FLYING INSECT KILLER	2	---	---	---

- LOUD SPEAKER
- LED LIGHT FITTING (PACIL)
- EMERGENCY BRAKE
- LED LIGHT FITTING
- ACCIDENTAL EMERGENCY LIGHT UNIT (AEL)
- LED LIGHT FITTING (TYPE-D)
- EOW — EMERGENCY OPENING WINDOW

NOTE :-
1. BERTH CAPACITY — 23
2. NO. OF DOORS ASIDE — 01
3. NO. OF LAVATORIES — 01
4. URINAL CUM BATH ROOM — 01

ENTERED INTO DATA BASE
29 SEP 2023

WELD LENGTH: NIL M	ITEM: NIL	DESCRIPTION & DIMENSIONS: NIL	QPASSLY: NIL	DETAIL DRG: NIL	MATL. & SPEC.: NIL / REMARKS: NIL
WEIGHT: NIL KG	GROUP: COACH LAYOUT & INSTALLATION	SUPERSEDES: LH90018 ALT NIL			
S.AREA: NIL M²	FILE: \\LH90018a.Prt (20)				
LENGTH/DIA: NIL M	LAYOUT OF LHB AC HOT BUFFET		SCALE 1:50		
WIDTH/THICK.: NIL M	RAIL COACH FACTORY, KAPURTHALA		REFERENCE NO. LH90001		
HEIGHT: NIL M	रेल कोच फैक्टरी कपूरथला	IRS	PL NO. NIL		
			DRG.NO. LH90018	ALT. a	SIZE A1 SHEET 1/1

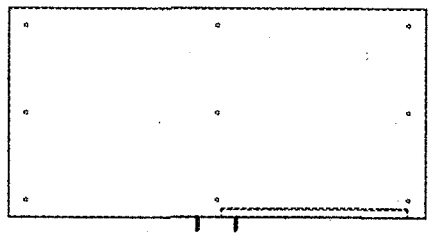
ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

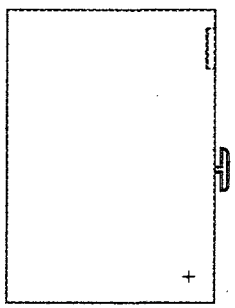
DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE

DATE OF FIRST ISSUE 03/03/2020 CGM BY

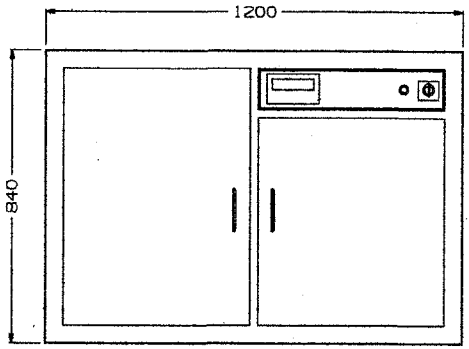
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL



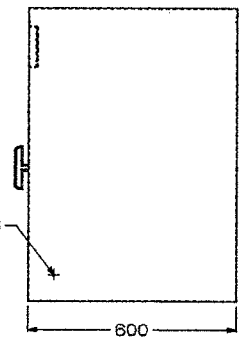
TOP VIEW



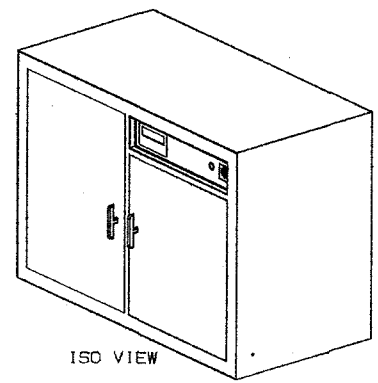
LEFT VIEW



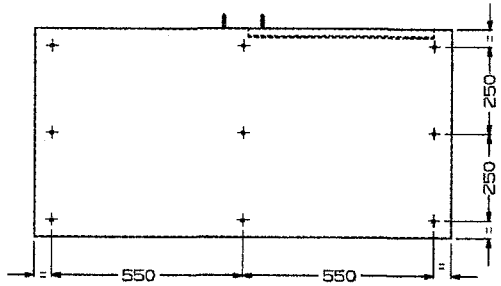
FRONT VIEW



RIGHT VIEW



ISO VIEW



BOTTOM VIEW

NOTE:-
1. ALL DIMENSIONS IN MM.

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

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE | 09/11/2023

ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
		NIL	NIL	NIL	NIL

WEIGHT	NIL KG	GROUP	ELECTRICAL
S.AREA	NIL M²	FILE	D:\PANTRY\LH\LH72254.prt
~~LENGTH / DIA~~	NIL M	SUPERSEDES:	NIL
~~WIDTH / THICK~~	NIL M		
HEIGHT	NIL M		

WORK TABLE WITH HOT UNDER STORAGE FOR HIGH CAPACITY HOT-BUFFET LHB TYPE COACH

RAIL COACH FACTORY, KAPURTHALA

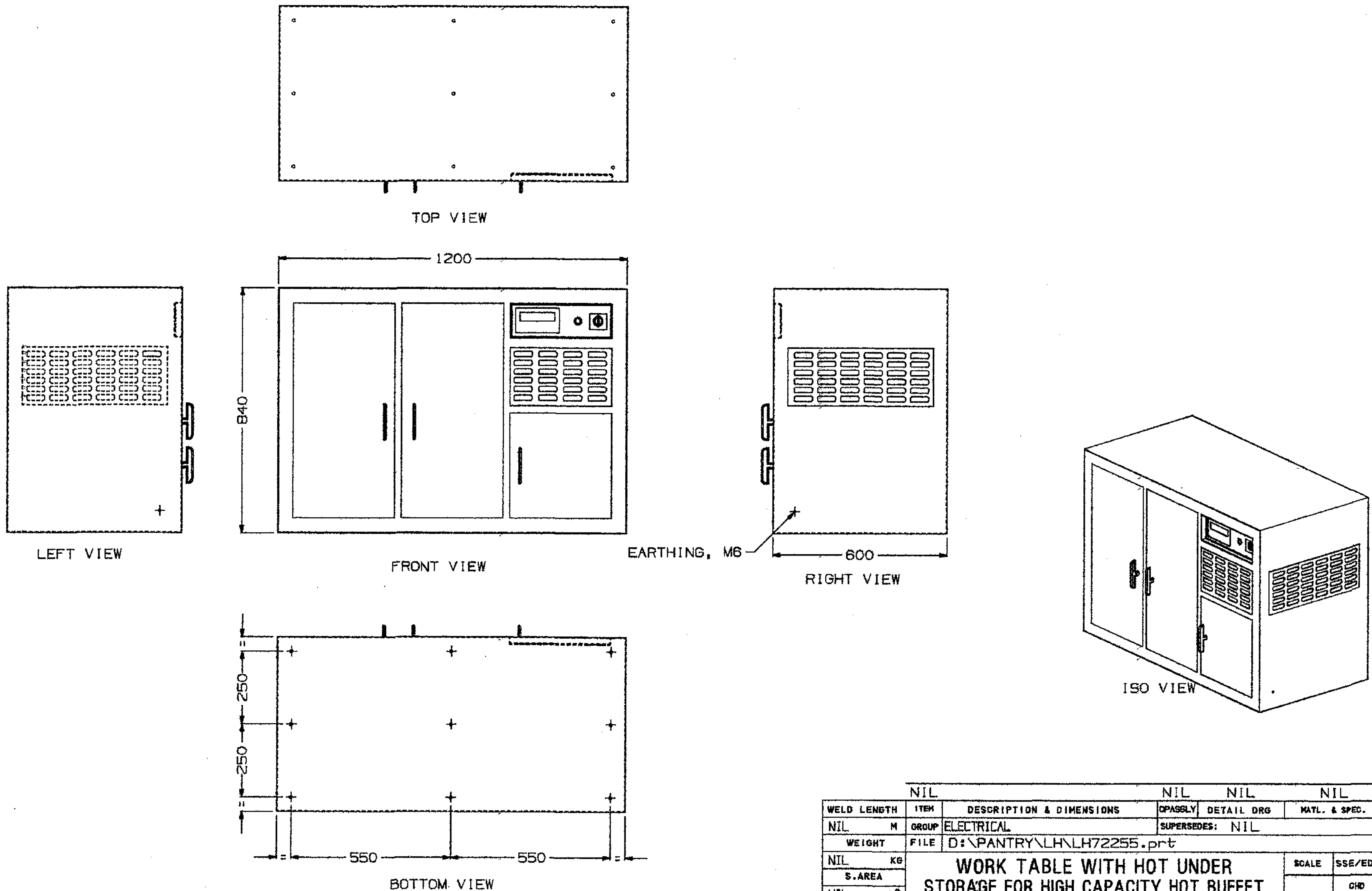
SCALE	SSE/ED
	CHD
	DRN
REF.DRG.No.	NIL
PL NO.	NIL
DRG.NO.	LH72254
ALT.	NIL SIZE A2 SHEET 1/1

रेलकोच फैक्टरी कपूरथला | IRS

SEE/D&D | DY.CEE/D&D

5/16

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



NOTE:-
1. ALL DIMENSIONS IN MM.

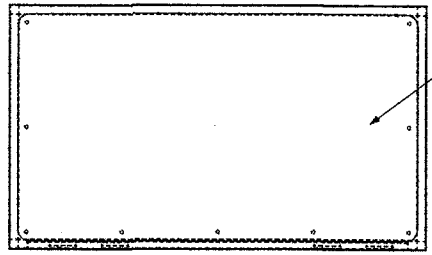
NIL				NIL	NIL	NIL	NIL
WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS		QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M	GROUP	ELECTRICAL		SUPERSEDES: NIL			
WEIGHT	FILE	D:\PANTRY\LH\LH72255.prt					
NIL KG	WORK TABLE WITH HOT UNDER STORAGE FOR HIGH CAPACITY HOT BUFFET LHB TYPE COACH			SCALE	SSE/ED		
S.AREA					CHD		
NIL M²					DRN		
~~LENGTH~~ / ~~DIA~~							
NIL M	RAIL COACH FACTORY, KAPURTHALA			REF.DRG.No. NIL			
~~WIDTH~~ / ~~THICK~~	रेल कोच फैक्टरी कपूरथला		IRS	PL NO.	NIL		
NIL M				DRG.NO.	LH72255		
HEIGHT							
NIL M	SEE/D&D		DY.CEE/D&D	ALT. NIL	SIZE A2	SHEET 1/1	

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

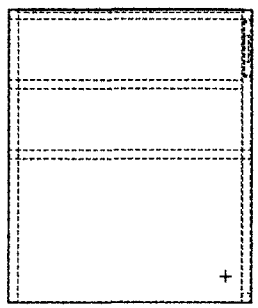
ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE | 09/11/2023

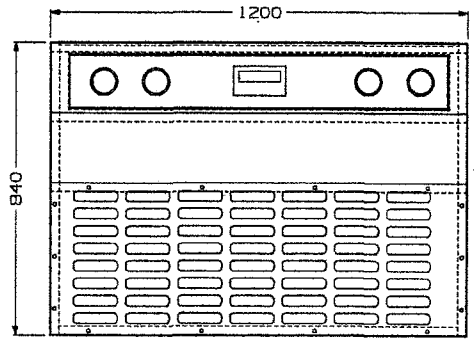
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL



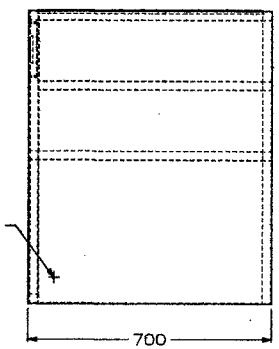
TOP VIEW



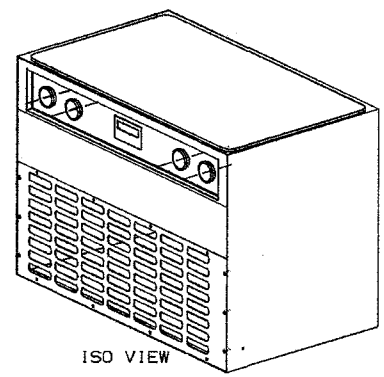
LEFT VIEW



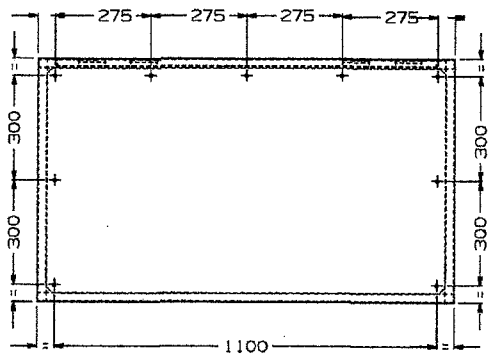
FRONT VIEW



RIGHT VIEW



ISO VIEW



BOTTOM VIEW

NOTE:-
1. ALL DIMENSIONS IN MM.

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FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE | 09/11/2023

	NIL	NIL	NIL	NIL	NIL
WELD LENGTH	ITEM DESCRIPTION & DIMENSIONS	QP/ASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M	GROUP ELECTRICAL	SUPERSEDES: NIL			
WEIGHT	FILE D:\PANTRY\LH\LH72256.prt				
NIL KG					
S.AREA					
NIL M^2					
~~LENGTH / DIA.~~					
NIL M					
~~WIDTH / THICK~~					
NIL M					
HEIGHT					
NIL M					

INDUCTION PLATE FOR
HIGH CAPACITY HOT-BUFFET LHB TYPE COACH
RAIL COACH FACTORY, KAPURTHALA

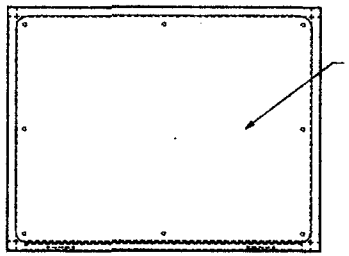
रेलकोच फैक्टरी कपूरथला | IRS

SEE/D&D | DY.GEE/D&D

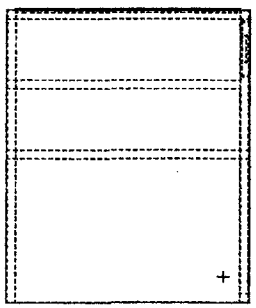
SCALE	SSE/ED
	CHD
	DRN
REF.DRG.No.	NIL
PL NO.	NIL
DRG.NO.	LH72256
ALT. NIL	SIZE A2 SHEET 1/1

5/14

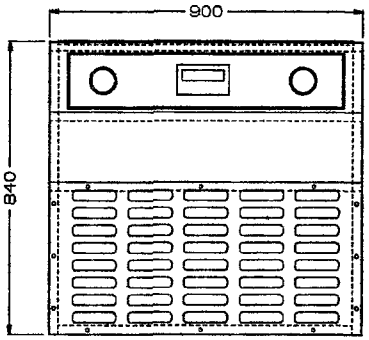
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL



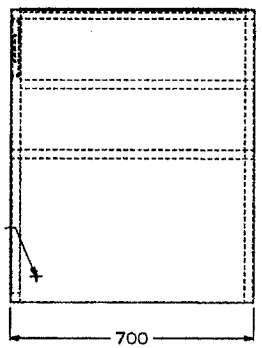
TOP VIEW



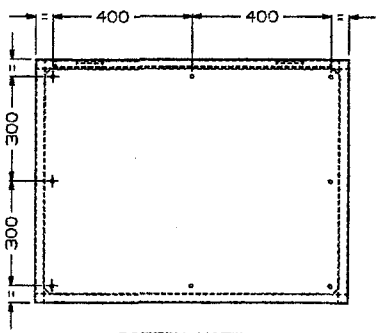
LEFT VIEW



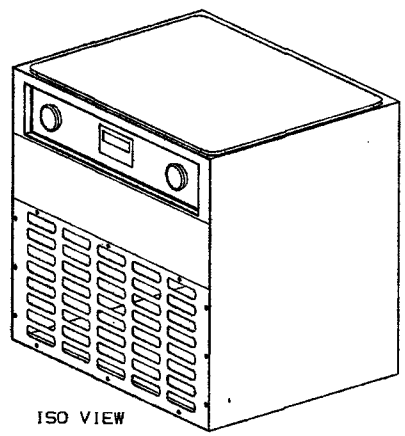
FRONT VIEW



RIGHT VIEW



BOTTOM VIEW



ISO VIEW

NOTE:- 1. ALL DIMENSIONS IN MM.

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

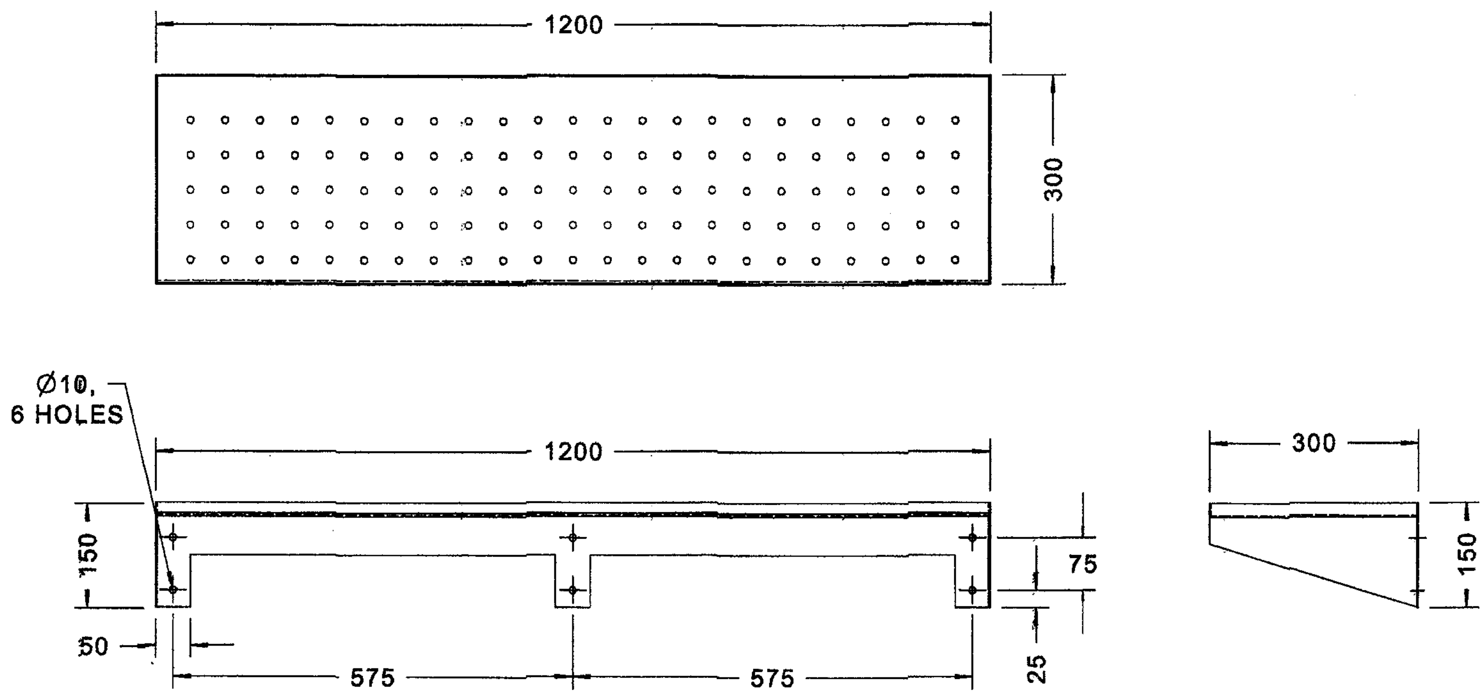
ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE 09/11/2023

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
		NIL	NIL	NIL	NIL	NIL
NIL M	GROUP	ELECTRICAL	SUPERSEDES: NIL			
WEIGHT	FILE	D:\PANTRY\LH\LH72257.prt				
NIL KG		INDUCTION PLATE FOR			SCALE	SSE/ED
S.AREA						CHD
NIL M²		HIGH CAPACITY HOT-BUFFET LHB TYPE COACH				DRN
~~LENGTH / DIA~~		RAIL COACH FACTORY, KAPURTHALA			REF.DRG.No.	NIL
NIL M						
~~WIDTH / THICK~~		रेलकोचफैक्टरीकपूरथला IRS			PL NO.	NIL
NIL M						
HEIGHT		SEE/D&D		DY.CEE/D&D	DRG.NO.	LH72257
NIL M					ALT. NIL	SIZE A2 SHEET 1/1

5/13

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



NOTE:- 1. ALL DIMENSIONS IN MM.

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

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FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE 09/11/2023

ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL		NIL	NIL	NIL	NIL

WELD LENGTH: NIL M
WEIGHT: NIL KG
S.AREA: NIL M²
LENGTH / DIA: NIL M
WIDTH / THICK: NIL M
HEIGHT: NIL M

GROUP: ELECTRICAL
SUPERSEDES: NIL
FILE: D:\PANTRY\LH\LH72258.prt

OVERHEAD SHELF FOR HIGH CAPACITY HOT-BUFFET LHB TYPE COACH

RAIL COACH FACTORY, KAPURTHALA

रेल कोच फैक्टरी कपूरथला

IRS

SCALE | SSE/ED | CHD | DRN

REF.DRG.No. NIL

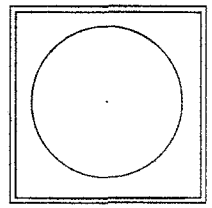
PL NO. NIL

DRG.NO. LH72258

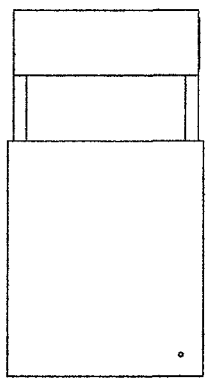
SEE/D&D | DY.CEE/D&D

ALT. NIL | SIZE A2 | SHEET 1/1

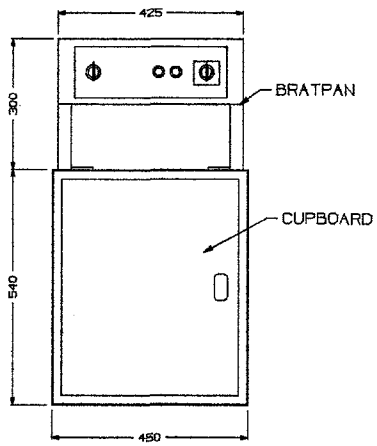
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL



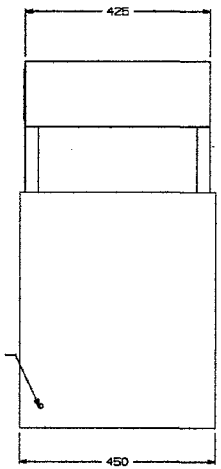
TOP VIEW



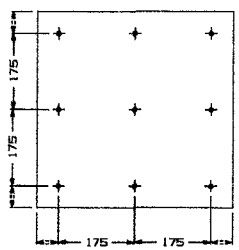
LEFT VIEW



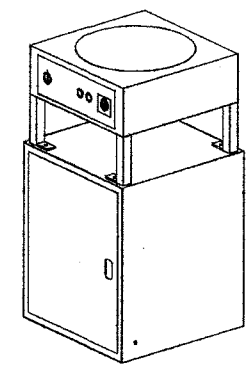
FRONT VIEW



RIGHT VIEW



BOTTOM VIEW



NOTE:-
1. ALL DIMENSIONS IN MM.

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

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE | 10/11/2023

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M			NIL	NIL	NIL	NIL
	GROUP	ELECTRICAL	SUPERSEDES: NIL			
WEIGHT	FILE	D:\PANTRY\LH\LH72259.prt				
NIL KG						
S.AREA						
NIL M²						
~~LENGTH / DIA~~						
NIL M						
~~WIDTH / THICK~~						
NIL M						
HEIGHT						
NIL M						

INDUCTION WOK WITH TABLE
FOR HIGH CAPACITY HOT-BUFFET
LHB TYPE COACH

RAIL COACH FACTORY, KAPURTHALA

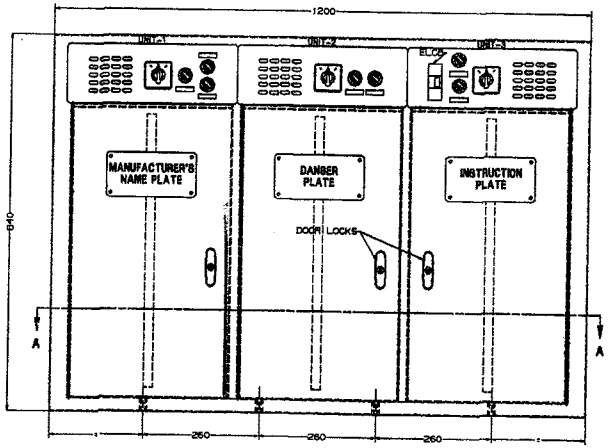
रेलकोच फैक्टरी कपूरथला | IRS

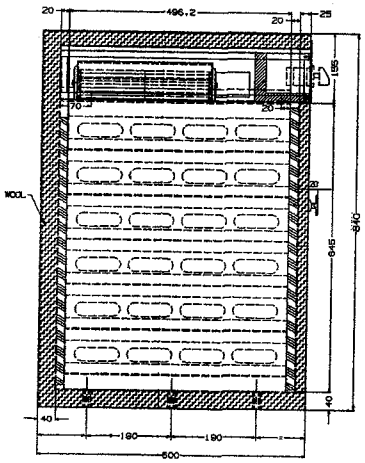
SEE/D&D | DY.CEE/D&D

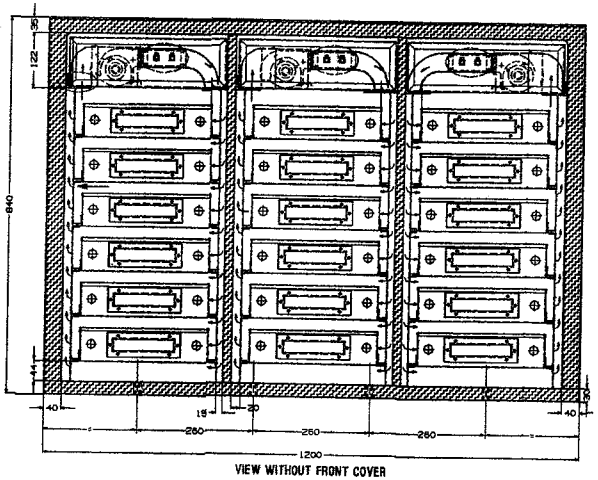
SCALE	SSE/ED	
	CHD	
	DRN	
REF.DRG.No.	NIL	
PL NO.	NIL	
DRG.NO.	LH72259	
ALT. NIL	SIZE A2	SHEET 1/1

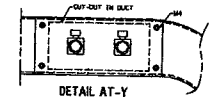
11/5

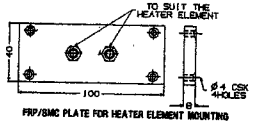
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL

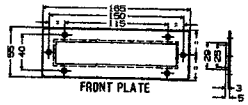


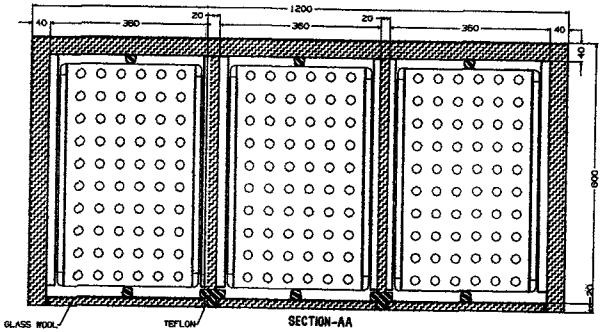


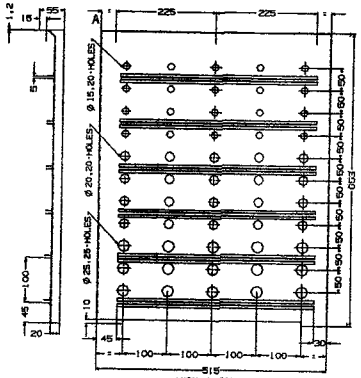


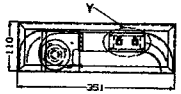


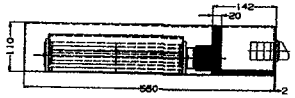


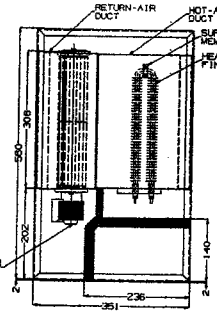


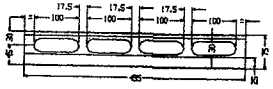


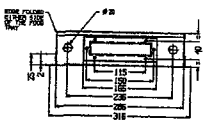


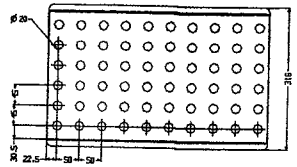


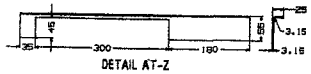






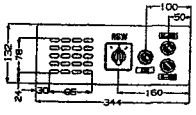


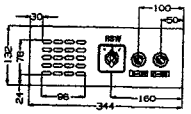


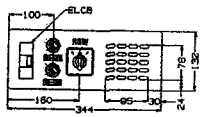


INSTRUCTIONS

1.ENSURE BLOWER 'ON' BEFORE SWITCHING ON TO POSITION - 3 OF ROTORY SWITCH.
2.DO NOT SWITCH 'ON' THE HEATER IN CASE OF BLOWER DOES NOT OPERATE.







NOTE:- 1.ALL DIMENSIONS ARE IN MM.
2.ELCB SHALL BE PROVIDED AT INPUT.
3.ALL ELECTRICAL ITEM SHALL BE PROPERLY EARTHED.

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

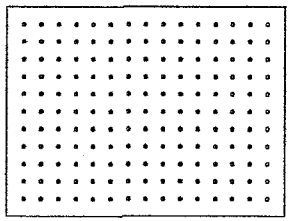
FOR UNTOLERANCED DIMENSIONS REFER MDG0008

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

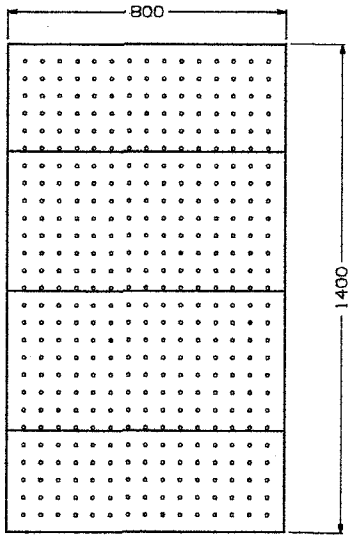
DATE OF FIRST ISSUE 10/11/2023

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	SPARES/ ASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M	GROUP	ELECTRICAL	SUPERSEDES:		NIL	
WEIGHT	FILE	D:\PANTRY\LH\LH72260.prt				
NIL KG		HOT CASE FOR HIGH CAPACITY HOT BUFFET LHB TYPE COACH			SCALE	SIZE/SED
S.AREA					CHD	
NIL M²					DRN	
LENGTH/DIA		RAIL COACH FACTORY, KAPURTHALA			REFERENCE	NIL
NIL M		रेल कोच फैक्टरी कपूरथला IRS			PL NO.	NIL
WIDTH/THICK.						
NIL M					DRG.NO.	LH72260
HEIGHT					ALT.	NIL SIZE A SHEET 1/1
NIL M						

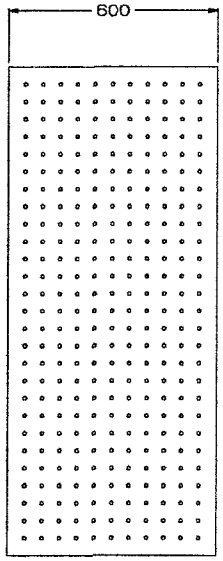
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL



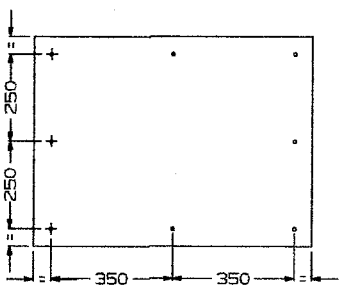
TOP VIEW



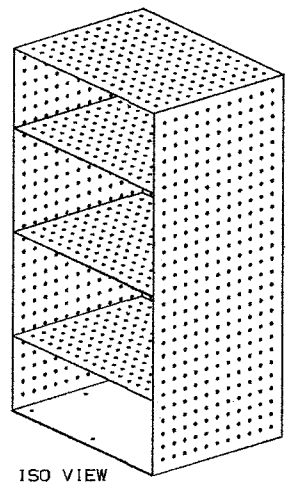
FRONT VIEW



RIGHT VIEW



BOTTOM VIEW



ISO VIEW

NOTE:-
1. ALL DIMENSIONS IN MM.

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FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE | 10/11/2023

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M			NIL	NIL	NIL	NIL
	GROUP	ELECTRICAL	SUPERSEDES:	NIL		
WEIGHT	FILE	D:\PANTRY\LH\LH72261.prt				
NIL KG						
S.AREA						
NIL M²						
~~LENGTH / DIA~~						
NIL M						
~~WIDTH / THICK~~						
NIL M						
HEIGHT						
NIL M						

WALL SHELF
FOR HIGH CAPACITY HOT BUFFET
LHB TYPE COACH

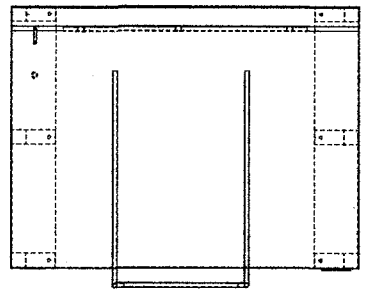
RAIL COACH FACTORY, KAPURTHALA

रेलकोच फैक्टरीकपूरथला | IRS

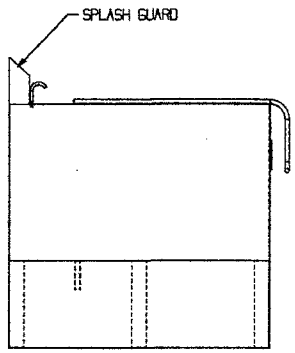
SEE/D&D | DY.CEE/D&D

SCALE	SSE/ED	
	CHD	
	DRN	
REF.DRG.No.	NIL	
PL NO.	NIL	
DRG.NO.	LH72261	
ALT. NIL	SIZE A2	SHEET 1/1

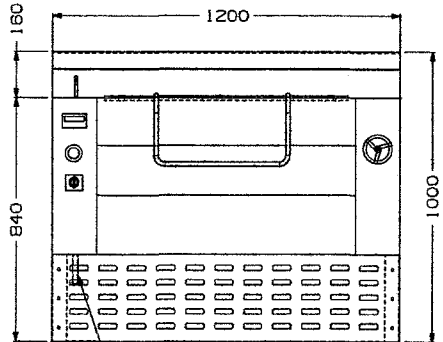
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL



TOP VIEW

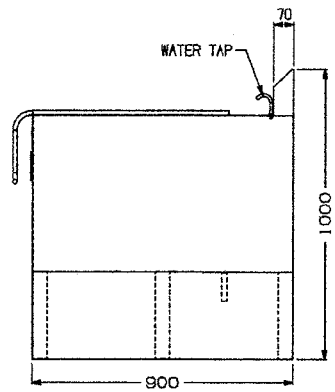


LEFT VIEW

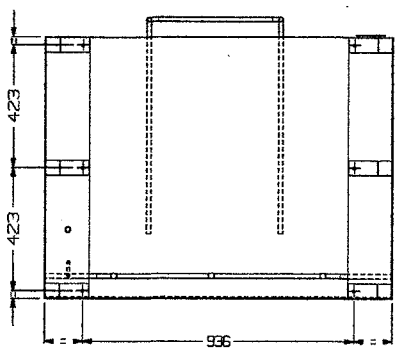


FRONT VIEW

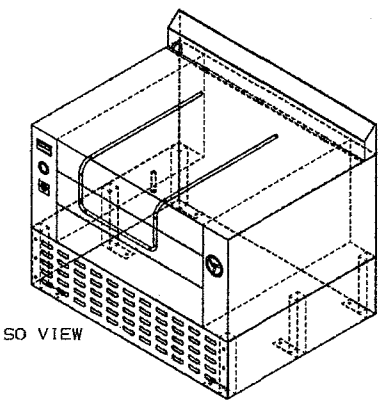
WATER INLET PIPE



RIGHT VIEW



BOTTOM VIEW



ISO VIEW

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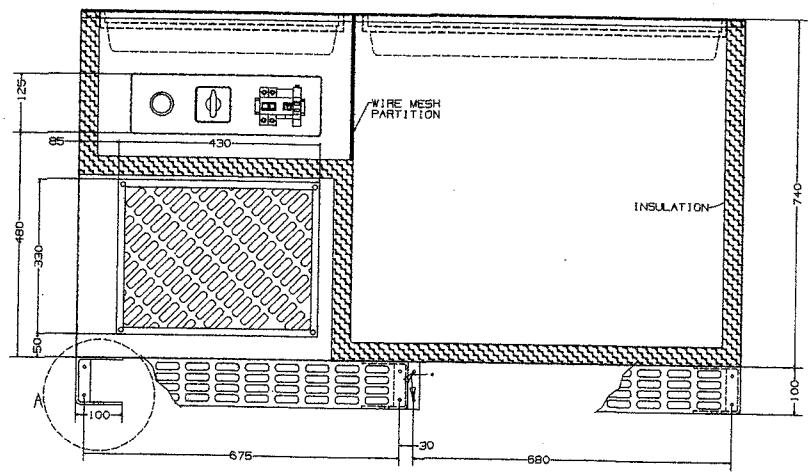
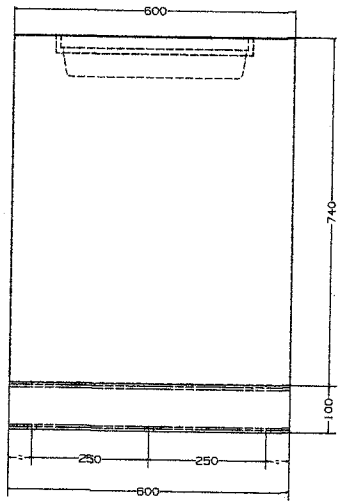
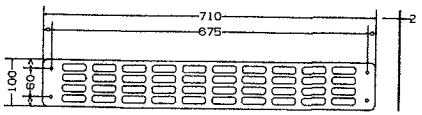
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE | 10/11/2023

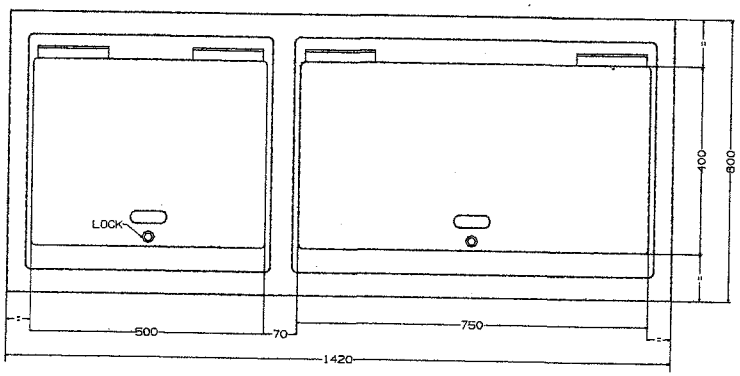
WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M			NIL	NIL	NIL	NIL
WEIGHT	GROUP	ELECTRICAL	SUPERSEDES: NIL			
NIL KG	FILE	D:\PANTRY\LH\LH72262.prt				
S.AREA		BRATPAN FOR HIGH CAPACITY HOT BUFFET LHB TYPE COACH	SCALE	SSE/ED		
NIL M²				CHD		
~~LENGTH / DIA~~				DRN		
NIL M		RAIL COACH FACTORY, KAPURTHALA	REF.DRG.No.	NIL		
~~WIDTH / THICK~~		रेल कोच फैक्टरी कपूरथला IRS	PL NO.	NIL		
NIL M			DRG.NO.	LH72262		
HEIGHT		SEE/D&D DY.CEE/D&D	ALT.	NIL	SIZE A2	SHEET 1/1
NIL M						

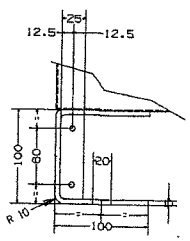
ALT.NO	ALT. DATE	ZONE	ALTERATIONS	AUTHORITY
NIL	NIL	NIL	NIL	NIL











DETAIL-A

NOTE:- 1. ALL DIMENSIONS IN MM.

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FOR UNTOLERANCED DIMENSIONS REFER MDG0008

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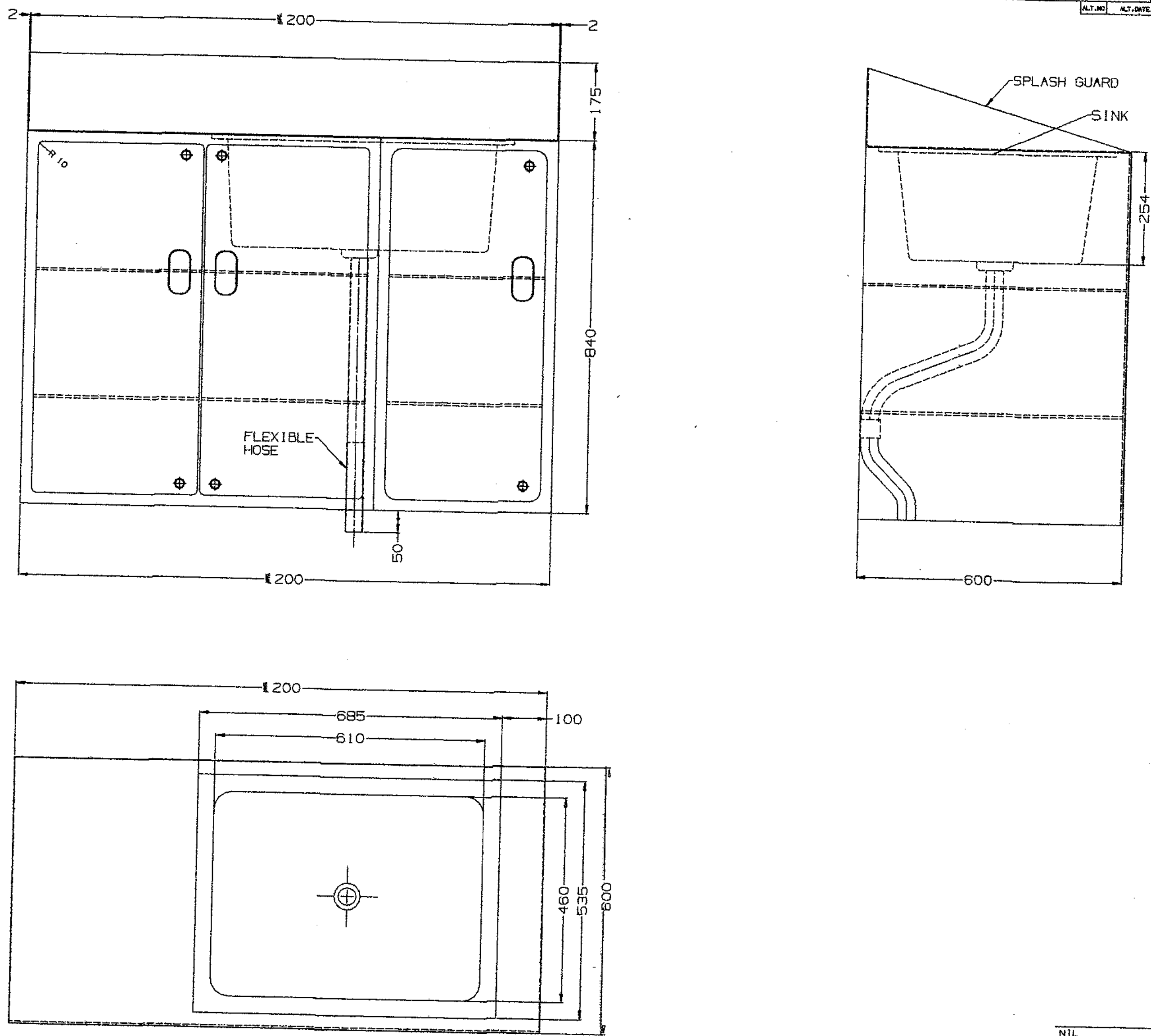
DATE OF FIRST ISSUE 09/11/2023

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M	GROUP	ELECTRICAL	SUPERSEDES:		NIL	
WEIGHT	FILE	D:\PANTRY\LH\LH72263.prt				
NIL KG		DEEP FRIDGE FOR HIGH CAPACITY HOT-BUFFET LHB TYPE COACH			SCALE	SSE/ED
S.AREA						GRD
NIL M²						DRN
LENGTH/DIA.		RAIL COACH FACTORY, KAPURTHALA			REF.DRG.NO.	NIL
NIL M						
WIDTH/THICK.		रेलकोच फैक्टरी कपूरथला IRS			PL NO.	NIL
NIL M						
HEIGHT					DRG.NO.	LH72263
NIL M		DESIGNED DY.CEE/DSD			ALT. NIL	SIZE A1 SHEET 1/1



THIS DRAWING IS THE INTELLECTUAL PROPERTY OF RAIL COACH FACTORY, KAPURTHALA. THIS DRAWING SHOULD NOT BE REPRODUCED, ALTERED, USED FOR MANUFACTURING OF COMPONENTS, SOLD OR TRANSFERRED WITHOUT PERMISSION FROM CHIEF DESIGN ENGINEER, RAIL COACH FACTORY, KAPURTHALA.

NOTE:-
1. ALL DIMENSIONS IN MM.
2. THE DOORS TO BE DOUBLE WALLED WITH PUF.

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

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

DATE OF FIRST ISSUE 09/11/2023

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY

ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL		NIL	NIL	NIL	NIL

WELD LENGTH: NIL M
GROUP: ELECTRICAL
SUPERSEDES: NIL
WEIGHT: NIL KG
FILE: D:\PANTRY\LH\LH72264s1.prt
S.AREA: NIL M²
LENGTH/DIA: NIL M
WIDTH/THICK: NIL M
HEIGHT: NIL M

SINK WITH CUPBOARD
FOR HIGH CAPACITY HOT-BUFFET
LHB TYPE COACH

RAIL COACH FACTORY, KAPURTHALA

रेल कोच फैक्टरी कपूरथला

IRS

SCALE | SSE/ED | CHD | DRN

REF.DRG.No. NIL

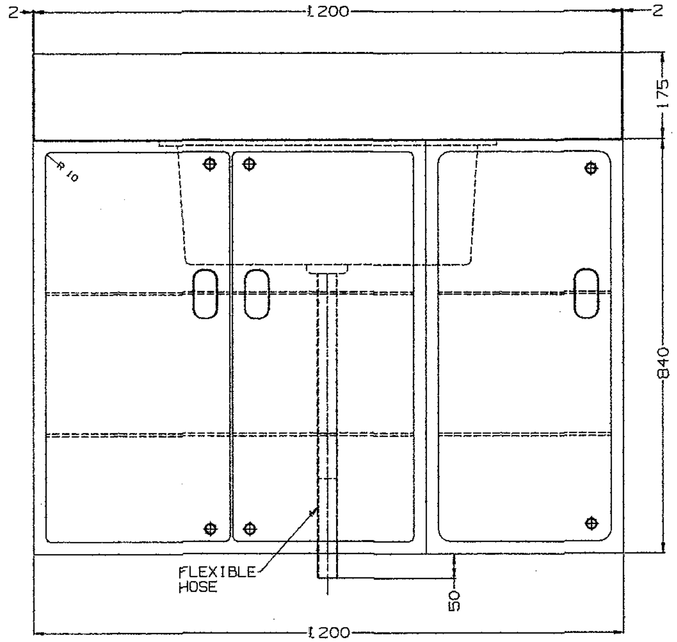
PL NO. NIL

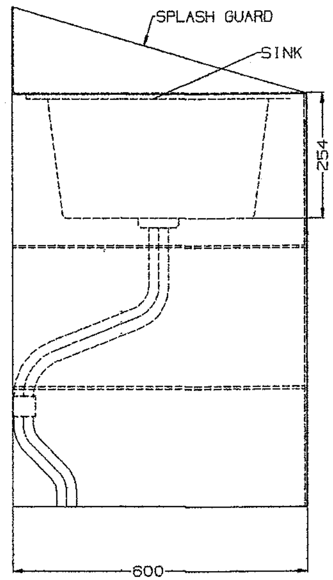
DRG.NO. LH72264

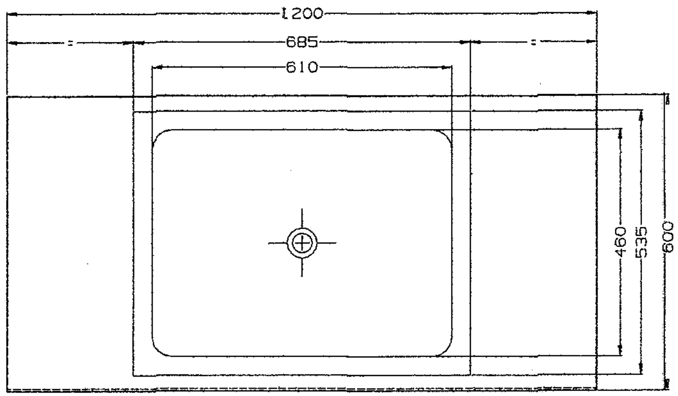
ALT. NIL | SIZE A | SHEET 1/2

SSE/D&D | DY.CDE/D&D

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







NOTE:-

1. ALL DIMENSIONS IN MM.
2. THE DOORS TO BE DOUBLE WALLED WITH PUF.

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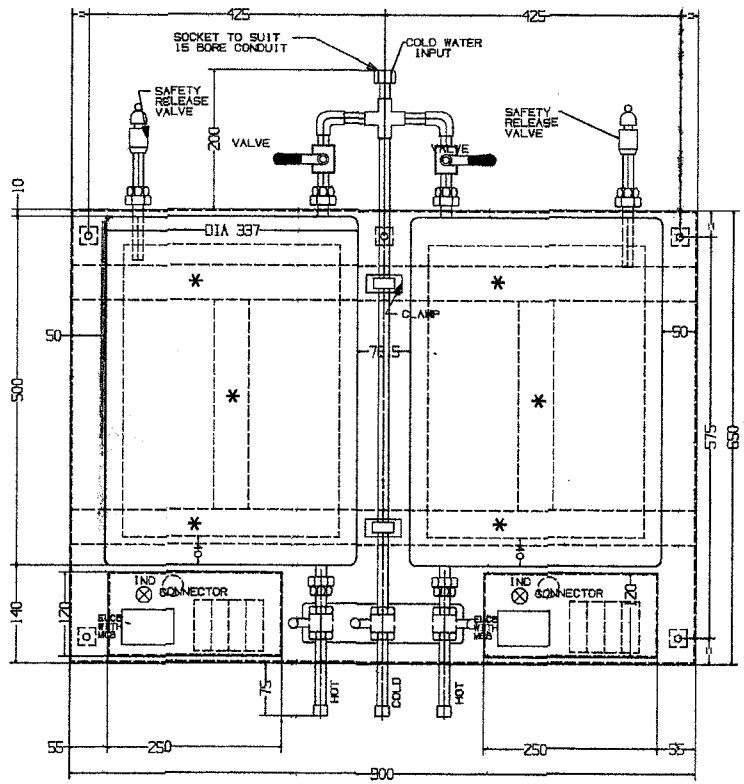
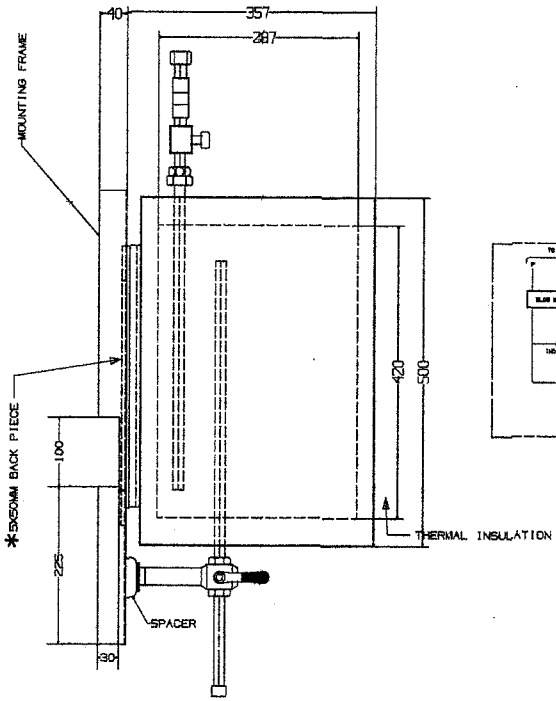
FOR UNTOLERANCED DIMENSIONS REFER MDG0008

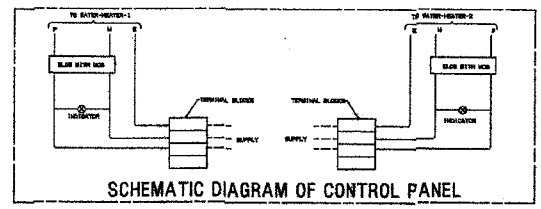
DATE OF FIRST ISSUE

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
		NIL	NIL	NIL	NIL	NIL
NIL M	GROUP	ELECTRICAL	SUPERSEDES:	NIL		
WEIGHT	FILE	D:\PANTRY\LH\LH72264s2.prt				
NIL KG		SINK WITH CUPBOARD FOR HIGH CAPACITY HOT-BUFFET LHB TYPE COACH	SCALE	SSE/ED		
S.AREA				CHD		
NIL M²				DRN		
LENGTH/DIA		RAIL COACH FACTORY, KAPURTHALA	REF.DRG.No. NIL			
NIL M		रेल कोच फैक्टरी कपूरथला	IRS	PL NO.	NIL	
WIDTH/THICK.				DRG.NO.	LH72264	
NIL M						
HEIGHT		SE/D&D	SSE/D&D	ALT. NIL	SIZE A1	SHEET 2/2
NIL M						

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







SCHEMATIC DIAGRAM OF CONTROL PANEL

TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTIONS	CAT.NO.	QTY/FITTING
TERMINAL BLOCK	284-901	8
END STRIP	249-118	2
DIN RAIL	210-229	2

*4. BACK PIECES TO SIZE 5X50MM AS INDICATED IN DRAWING SHALL BE PROVIDED IN THE BACK SICE OF THE MAIN FRAME FOR STRENGTHENING.
3. TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO MAKE OR ANY OTHER APPROVED MAKE AS INDICATED IN TABLE-1.
2. SHAPE OF TAP SHOWN FOR INDICATION PURPOSE ONLY.
NOTE:- 1. ALL DIMENSIONS IN MM.

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WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
		NIL	NIL	NIL	NIL	NIL
NIL M	GROUP	ELECTRICAL	SUPERSEDES: NIL			
WEIGHT	FILE	D:\PANTRY\LH\LH72265.prt				
NIL KG						
S.AREA						
NIL M²						
~~LENGTH / DIA~~						
NIL M						
~~WIDTH / THICK~~						
NIL M						
HEIGHT						
NIL M						

WATER HEATER (30X2 LTRS.)
FOR HIGH CAPACITY HOT-BUFFET
LHB TYPE COACH

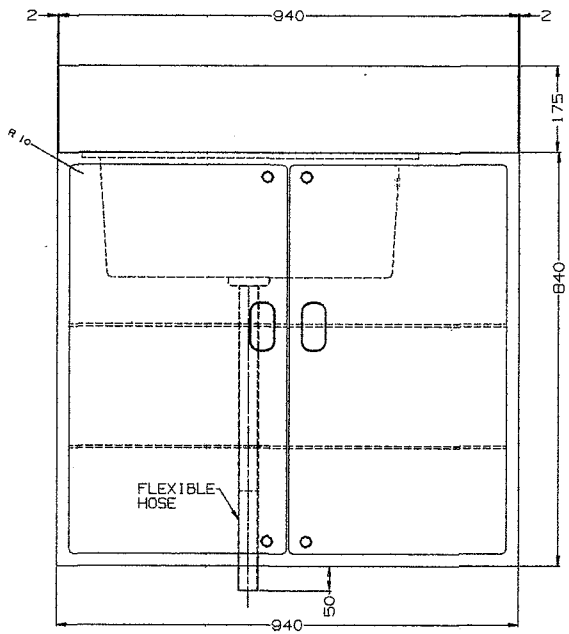
RAIL COACH FACTORY, KAPURTHALA

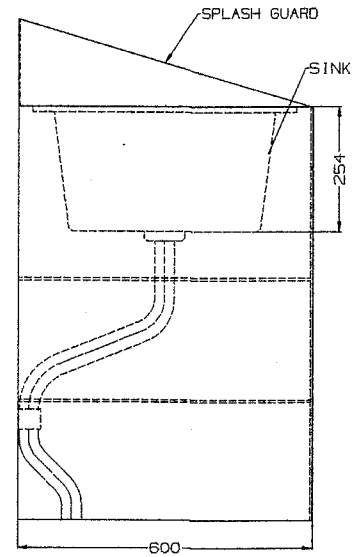
रेलकोच फैक्टरी कपूरथला IRS

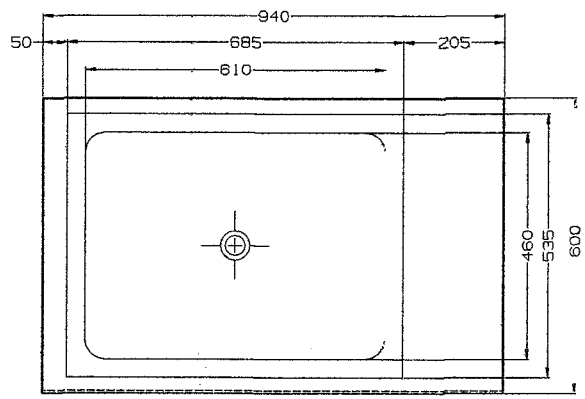
SEE/D&D DY.CEE/D&D

SCALE	SSE/ED
	CHD
	DRN
REF.DRG.No.	NIL
PL NO.	NIL
DRG.NO.	LH72265
ALT. NIL	SIZE A2 SHEET 1/1

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







NOTE:- 1. ALL DIMENSIONS IN MM.
2. THE DOORS TO BE DOUBLE WALLED WITH PUF.

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\lh72266.prt				
S.AREA		SINK WITH CUPBOARD FOR HIGH CAPACITY HOT-BUFFET LHB TYPE COACH			SCALE	SSE/ED
NIL	M²					CHD
~~LENGTH/DIA.~~						DRN
NIL	M	RAIL COACH FACTORY, KAPURTHALA			REF.DRGS.	NIL
~~WIDTH/THICK.~~		रेलकोच फैक्टरी कपूरथला	IRS		PL NO.	NIL
NIL	M				DRG.NO.	LH72266
HEIGHT					ALT.	NIL SIZE A SHEET 1/1
NIL	M	BEE/DAO	CHKD/DAO			

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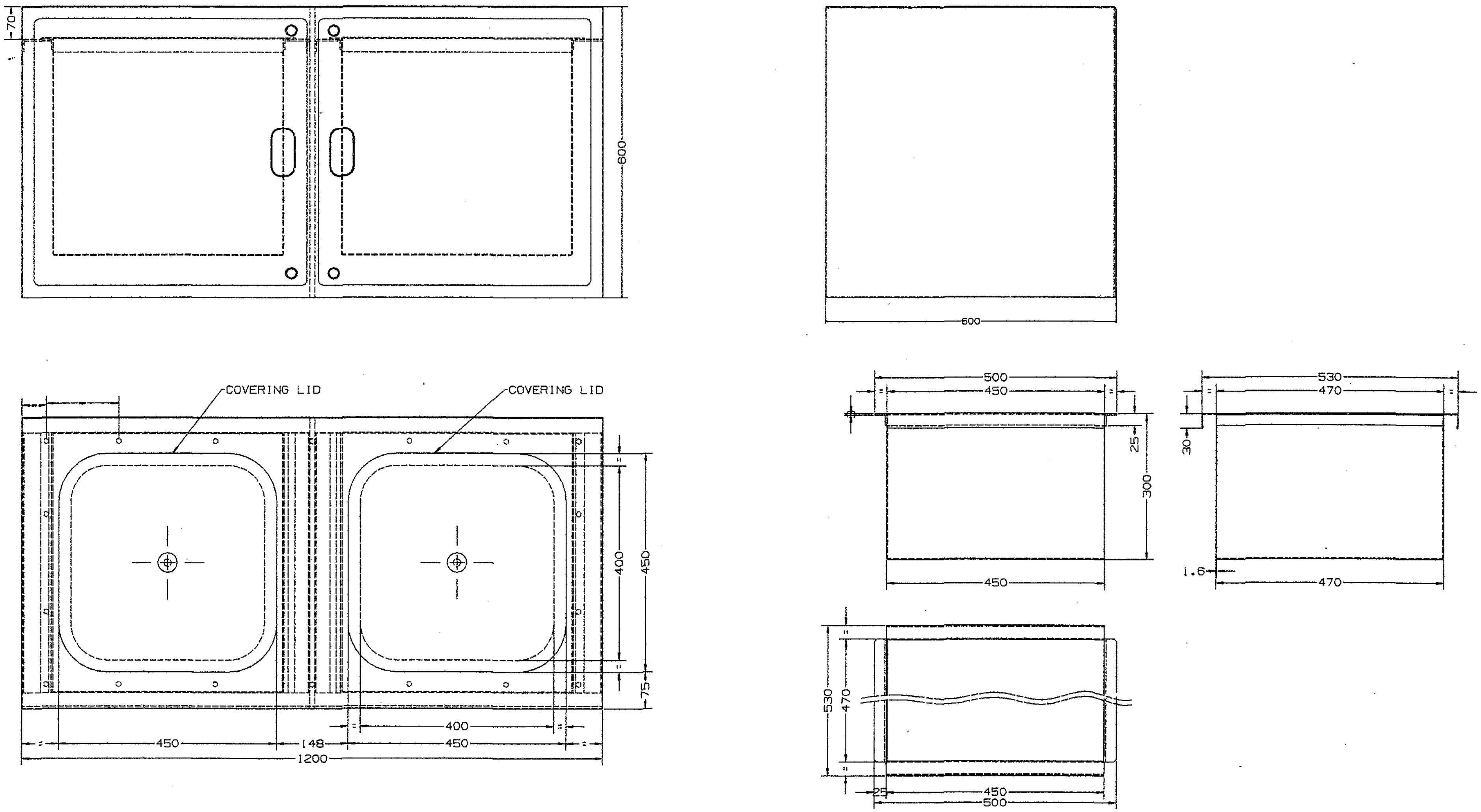
DATE OF FIRST ISSUE 10/11/2023

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



NOTE:-

1. ALL DIMENSIONS IN MM.

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

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

DATE OF FIRST ISSUE 10/11/2023

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	SPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M	NIL		NIL	NIL	NIL	NIL

GROUP: ELECTRICAL

SUPERSEDES: NIL

WEIGHT: NIL KG

FILE: D:\PANTRY\LH\LH72267.prt

S.AREA: NIL M²

LENGTH/DIA: NIL M

WIDTH/THICK.: NIL M

HEIGHT: NIL M

CUP BOARD
FOR HIGH CAPACITY HOT BUFFET
LHB TYPE COACH

SCALE | SSE/ED | CHD | DRN

RAIL COACH FACTORY, KAPURTHALA

रेल कोच फैक्टरी कपूरथला IRS

PL NO. NIL

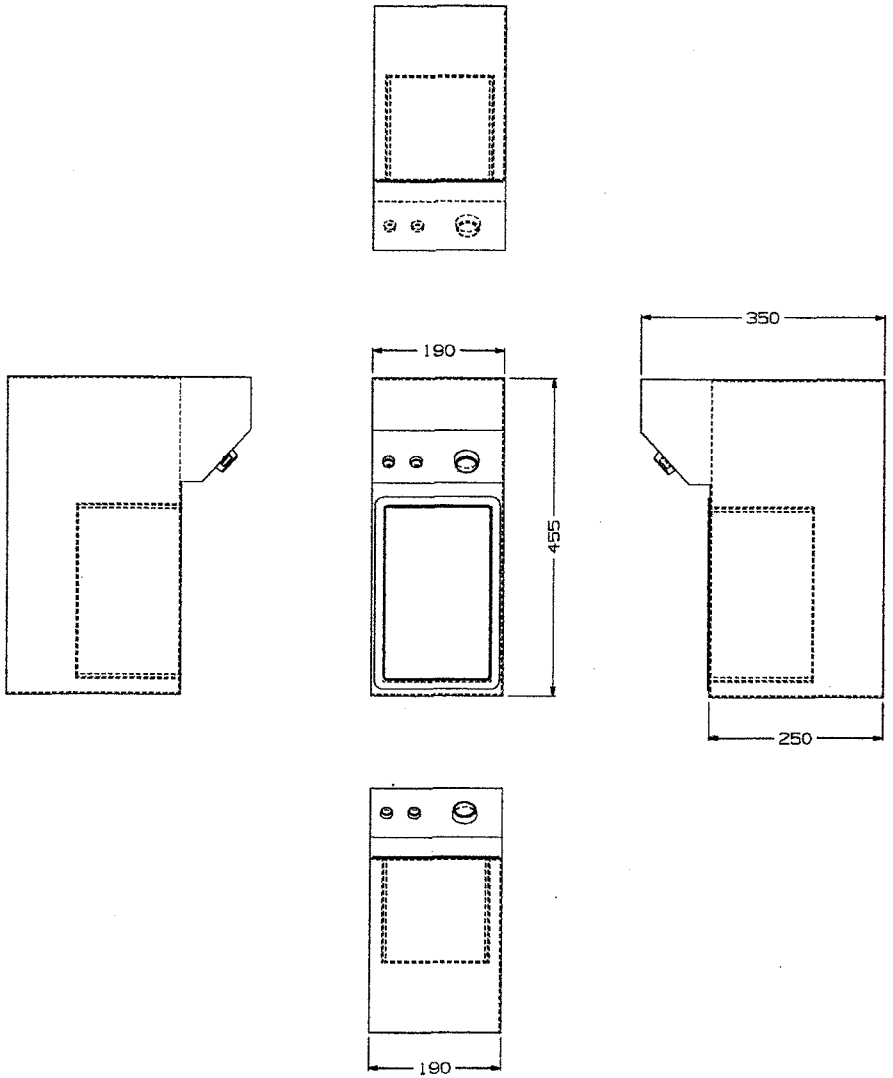
DRG.NO. LH72267

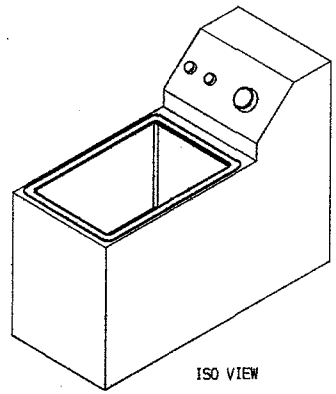
REF.DRG.NO. NIL

ALT. NIL | SIZE A1 | SHEET 1/1

SSE/D&D | DMSE/D&D

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





ISO VIEW

NOTE:-
1. ALL DIMENSIONS IN MM.

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

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE | 10/11/2023

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
		NIL	NIL	NIL	NIL	NIL
NIL M	GROUP	ELECTRICAL	SUPERSEDES:	NIL		
WEIGHT	FILE	D:\PANTRY\LH\LH72268.prt				
NIL KG						
S.AREA						
NIL M²						
~~LENGTH / DIA~~						
NIL M						
~~WIDTH / THICK~~						
NIL M						
HEIGHT						
NIL M						

DEEP FRYER
FOR HIGH CAPACITY HOT-BUFFET
LHB TYPE COACH
RAIL COACH FACTORY, KAPURTHALA

SCALE	SSE/ED	
	CHD	
	DRN	
REF.DRG.No.	NIL	

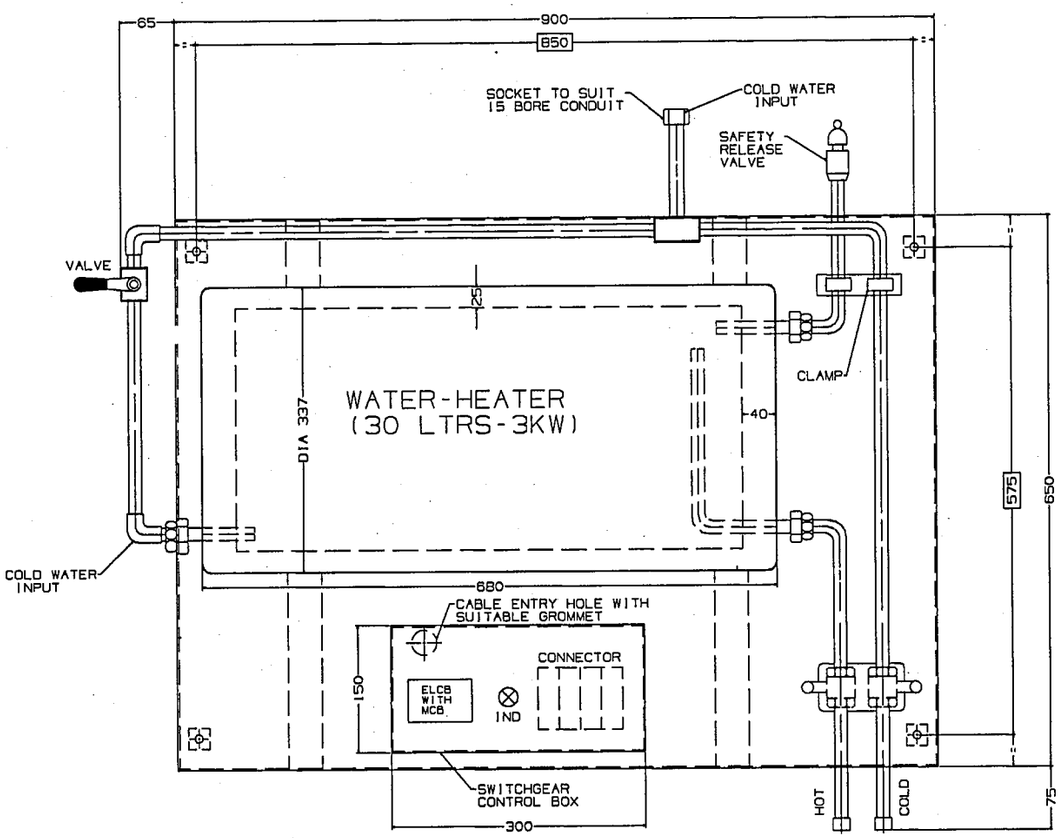
रेलकोच फैक्ट्री कपूरथला | IRS

SEE/D&D | SUV.CEE/D&D

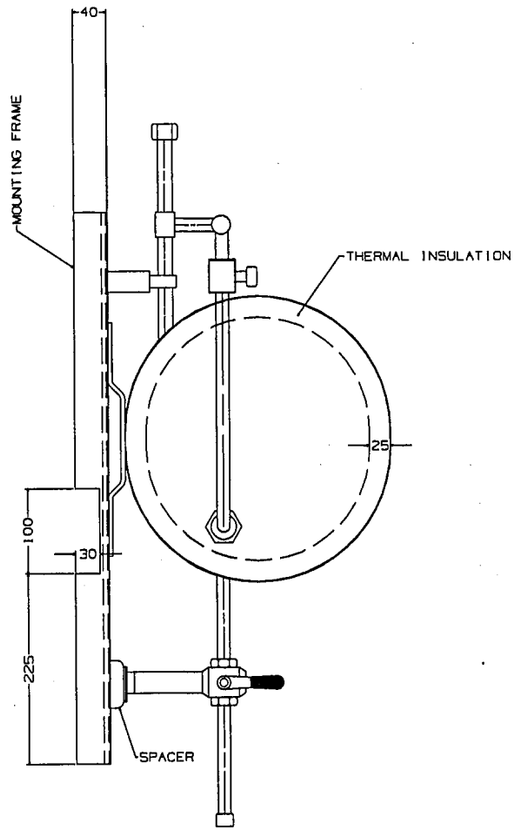
PL NO.	NIL
DRG.NO.	LH72268
ALT.	NIL SIZE A2 SHEET 1/1

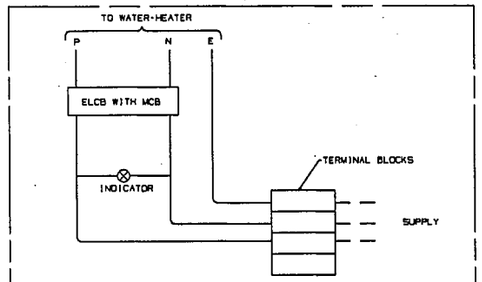
1/5

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
b	15/02/2011	ALL	1. DIMENSION FOR THERMAL INSULATION SHOWN IN THE DRAWING.	DIC.NO. EDII0002



FIXING ARRGT. FOR WATER-HEATER





SCHEMATIC DIAGRAM OF CONTROL PANEL

TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTIONS	CAT.NO.	QTY/FITTING
TERMINAL BLOCK	284-901	4
END STRIP	249-118	1
DIN RAIL	210-229	1

3. TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO MAKE OR ANY OTHER APPROVED MAKE AS INDICATED IN TABLE-1.
2. SHAPE OF TAP SHOWN FOR INDICATION PURPOSE ONLY.

NOTE:- 1. ALL DIMENSIONS IN MM.

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

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008 | DATE OF FIRST ISSUE

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL M	GROUP	ELECTRICAL	SUPERSEDES:	LH72211 ALT a		
WEIGHT	FILE	D:\jasb\lh72211slb.prt				
NIL KG						
S.AREA						
NIL M^2						
~~LENGTH / DIA~~						
NIL M						
~~WIDTH / THICK~~						
NIL M						
HEIGHT						
NIL M						

WATER HEATER (30 LTRS.-3KW)
TO SPEC. NO. EDTS-118
(FOR HOT BUFFET LHB TYPE COACHES)

RAIL COACH FACTORY, KAPURTHALA

INDIAN RAILWAYS STANDARD

SEE/D&D DY.CEE/D&D

SCALE	SSE/ED	
	CHD	
	DRN	1.08.11
REF.DRG.No.	NIL	
PL NO.	NIL	
DRG.NO.	LH72211	
ALT.	b	SIZE A2 SHEET 1/1

This amendment -1 is being issued to "Technical Specification for Modular Pantry Unit for LHB Type Hot Buffet Coaches" to Specification no. EDTS-446, Rev. 'Nil', to modify the technical requirements of Combi Oven and to add water purifier in Pantry coach as mentioned below:

Clause 16.1.9 added.

Clause 16.1.9: Combi Oven shall be installed with suitable in-line water softener to bring down the hardness of water to acceptable limits. Water hardness as available at various Zonal Railways / Shop is in the range 30 to 2027 mg/litre. The Softener shall limit the value of hardness from 300 to 600 mg/Litre.

Clause 20.5 added.

Clause 20.5: Total, 03 nos. of water filters shall be provided in Pantry Area.