


RAIL COACH FACTORY KAPURTHALA

MD35131

Dated : 22-12-2104

Sub: Issue of specification no. MDTS-206 Rev-'02', Schedule of requirements of water purifier system (RO system)

Please find enclosed a copy of specification no. MDTS-206 Rev-'02 for schedule of requirements of water purifier system (RO system), for information and necessary action at your end.


Dy CME/D-1

*Sub
22/12/14
(2 copies received)*
CQM, CPLE, CWE (FUR), CMM/HSQ, CMM/TKJ, Dy. CMM/Fur/LHB, Dy CCMT,
DY.CPLE-III

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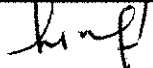
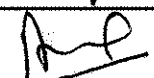
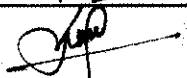
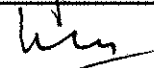
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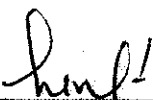
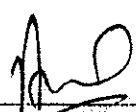
CDE

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Specification	TECHNICAL SPECIFICATION FOR WATER PURIFIER SYSTEM (RO SYSTEM) FOR LHB DESIGN LHB COACHES.	MDTS206 REV-02 PAGE 1 OF 6 DATED 18.12.2014
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NAME	DESIGNATION	SIGNATURE	DATE	LEVEL
Harish Kumar	SSE/ Design		18/12/2014	Prepared
Joginder Singh	SME/Dev-I		18/12/2014	Agreed
Suraj Prakash	Dy CME/D-1		18.12.14.	Reviewed
Parmanand Singh	CDE		18/12/14.	Approved

Rev. No.	Details of Changes	Date
01	<ol style="list-style-type: none"> 1. Clause 2.3 (b) revised 2. Clause 2.6 revised. 3. Clause 2.11 added and previous clause 2.11 changed to clause 2.12. 4. In clause 2.12.6 Pore size of membrane corrected to .0001 micron. 5. Clause 3.4 revised. 6. Clause 4 revised to add clause for Supply, Installation and commissioning of the system along with one year AMOC. 7. Clause 4.9 and 4.10 added. 8. Clause 1.1, 2.12 & clause 4 revised to make the system six stage filtration. 9. As per clause 2.12. 4 Antiscalant Filter added. 10. Clause 8 added 	30.07.2010
02	1.0 Specification revised	18-12-2014

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 Agreed By _____

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1.0 Introduction :

- a. This schedule covers the technical requirements / provision relating to material & tests and does not include all the necessary provisions of contract.
- b. This schedule may draw reference to some of the relevant ASTM, DIN, BS, AS , ISO, UIC and other Indian Standard specification. The latest version of the relevant specifications shall be taken as reference.

2.0 Scope :

This schedule of technical requirements specifies RO system/ equipment requirements, installation/commissioning, operation and maintenance of RO water purifier system required to be fitted on Indian railway passengers coaches.


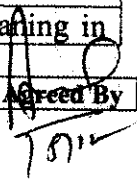
3.0 Eligibility Criteria:

- 3.1 Tenderer shall be either OEM or an authorized dealer of OEM and shall submit the proof of authorisation certificate and contact details (address, phone no., fax no., e-mail) of OEM along with the offer.
- 3.2 The tenderer should be either reputed manufacturer of industrial RO systems with National or International repute with after-sales & service network across India OR should have supplied and commissioned such RO system on Railway Coaches on IR or other International railways.

3.2 While quoting, the tenderer shall submit the following details along with the offer:

- Part No., Brand and OEM of offered product
- Technical and safety data-sheets
- Credentials and performance of the OEM.
- Clause-wise comments on the specification.
- Deviation statements with respect to specification, if any.
- Tenderer must submit separately the detailed break-up of supply, installation, commissioning & comprehensive Annual Operation and maintenance for one year (including warranty period). Generally following replacement frequencies for various filtration elements to ensure effective and efficient filtration process should be carried out:

Sr.	Type of element	Replacement frequency
1	Pre Sediment filter	Replace every month
2	Pre-carbon filter	Six months
3	Sediment filter	Replace every two months and cleaning in

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		alternative months
4	Post Carbon filters	Six months
5	RO Membrane	3500 working hrs.
6	Booster Pump	3500 working hrs.

- Offers without AMOC offer may be summarily rejected. AMOC work has to be carried out at base depot which will be informed to the contractor after dispatch of the coach from RCF.

In absence of above details for the offered product, offer may not be considered

3.3 Up-gradation of design: Suppliers may offer alternate design of RO system for all or any of the requirements mentioned in this spec. with a view to upgrade design/concept. Clause wise justification shall be given by the supplier in such case. Specification details for the subject item may be deviated from those specified above, if sufficient technical justification is provided. However, RCF's decision on all such matters shall be final and binding. The tenderer may offer alternate design subject to approval of RCF.


4. General Requirement:

4.1 Water purifier (RO system) shall work on Reverse Osmosis process i.e. with six stage filtration process viz. pre sediment, pre carbon, sediment, anti scalant, reverse osmosis and post carbon.

4.2 The RO system shall be wall mounted installed within the space envelope, available on coach and as per schematic shown at fig '1'. Supplier should get the design of system approved for envelope & mounting from RCF before supply.

4.3 RO system shall meet the following requirements :

- a. Purified water capacity 25-30 liter per hour.
- b. To purify water to output quality with TDS level between 50-100 PPM (with variable control for adjustment to desired level) and other characteristic as per Table 1 of 10500-1991 Editions 2.2 (2003-09) with totally free from bacteria and viruses conforming to 10500-1991 Editions 2.2 (2003-09). During service if flow rate falls below 20 liters per hour and TDS content of water increases beyond 100 PPM before specified maintenance schedule then required spares are to be replaced irrespective of maintenance schedule by the contractor at his own cost under warranty/AMOC.
- c. Discharge water management: Discharged water shall be recycled to the under slung water tanks through a flexible pipe and one no NRV to be connected to over flow pipe coming from Aux. water tank to under slung.


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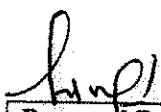

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- 4.4 RO system shall be simple and safe to operate and shall have protection from pilferage and smooth trouble free usage.
- 4.5 All metallic, structural parts and frame work shall be made of Stainless Steel to AISI 304.
- 4.6 All fasteners should be of self-locking type and should not get loose from coach vibration.
- 4.7 Storage water tank shall be approximately 10 liter capacity made up of AISI-304 or food grade sandwich material.
- 4.8 **Configuration requirements:**

Six stage industrial grades RO Water purification system with following configuration is required:

S>No	Technical Parameter	Specification/requirement
4.8.1	Pre Sediment filtration	Poly Propylene Yarn filters (10-15 Microns) with casing.
4.8.2	Pre-carbon filtration	Activated carbon granules with casing
4.8.3	Sediment filtration	Spun filters (5 micron)
4.8.4	Anti-scale Filter	Anti-scale Filter Capsule
4.8.5	Booster Pump	Open flow rate – 1.8 LRM
4.8.6	Reverse Osmosis	RO membrane encased in Stainless Steel body Pore size < 0.0001 micron
4.8.7	Post Carbon filter	Activated carbon granules with casing
4.8.8	Water storage capacity	Approx. 10 liter capacity made up of AISI-304 or food grade sandwich material
4.8.9	Low pressure cut-out switch	Cut-in pressure 7-9 PSI
4.8.10	Solenoid flow control valve	As per system requirement.
4.8.11	Float valve with micro-switch	-do-
4.8.12	Flow Restrictor	-do-
4.8.13	Pipes and fittings	-do-

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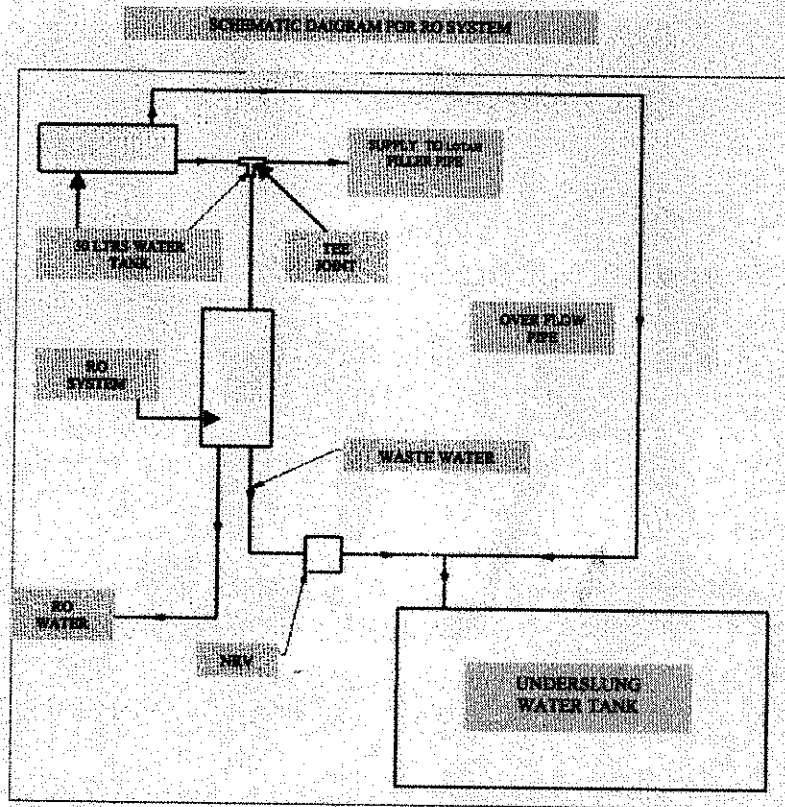


Figure-1

5 Working Conditions :

5.1 Ambient Conditions:

-4⁰C to 55⁰C with 100% humidity and dust. System should not get failed in extreme conditions. Temperature variations can be quite high in the same journey or short period of time. Most coaches are based in coastal areas, with continued exposure to salt laden air.

5.2 Water Supply :

One no's water tank of 30 ltr capacity is available over the lavatory roofs at each end, at a height of about 2030 mm from coach floor level. 30 liter tank is connected to under slung water tanks of capacity between 1370 liter and 1820 liter through mono-block pumps. The offered RO system shall be able to operate at water head of minimum one foot.

5.3 Power Supply: The system shall operate on 110 Volt AC +/- 30% of fluctuation.

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6. Scope of Supply:

The main system components in the scope of supply are:

- 6.1 Supply, Installation and commissioning of RO system along with one year AMOC and items covered in para 4.8.
- 6.2 Complete mountings including hardware.
- 6.3 Mounting plate and covering plate . Mounting arrangement to be got approved from RCF before supply.
- 6.4 Water piping: Inlet Piping: RO inlet system will be connected through flexible pipe to a T-Joint in the outlet pipe of the 30 liter tank. T-joint will be approximately 1.5 meter from RO system from RO system to user outlet.
- 6.5 Storage tank of capacity approximately 10 liters made up of food grade sanwitch material or stainless steel.
- 6.5 Electrical wiring from power panel to RO system, which shall be in RCF scope.
- 6.6 Any other components required for proper functioning of the system as required.
- 6.7 Operation, installation, maintenance and trouble shooting manual with colored illustrations.

7.0 MARKING:

Manufacturer's name with the serial/batch number along with month and year of manufacture shall be marked at a visible location for identification.

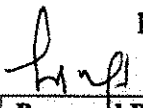

8.0 TESTING AND APPROVAL OF PROTOTYPE

8.1 Firm should submit prototype sample after placement of PO for approval by CDE/RCF before bulk supply along with following documents.

- Authorisation certificate from OEM in case the supplier is a autorised dealer of the OEM
- Technical and safety data-sheet indicating functional detail and
- Detailed drawings of system
- Mounting plate and covering plate for covering the system shall be submitted for approval . Only after approval of the same , bulk shall be under taken.

9. Packing:

The material shall be packed in neat and dry condition. The material shall be securely packed so as to ensure safe transportation.

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