

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

Annexure - III

SN	Description	Specifications	Required Documentation	QAP Requirements	Indicative Frequency Req. (TPI) - One/ Model
Specification for all types of Dispensing unit & Tank System (Applicable Parameters): General					
A1	Basic Models	Suitable for DEF (Typically Aqueous solution comprised of 32.5% high purity urea and of 67.5% de-ionized water complying with ISO: 22241) Dispensers – Pressure/ Suction type Mono/ DUO as per requirement.	Manufacturer's/Vendor Certification	Certificate Verification by TPIA	Yes
A2	Configurations	<u>Duty:</u> Standard Pressure/Suction type Mono	Vendor shall confirm to the technical Specifications parameters applicable to specific type of DUs. In addition to visual graphic design & overall 2D & 3D structural design approval is mandatory from HPCL before commencement of supplies.	Certificate Verification by TPIA	Yes
A3	Structure	Preferably rectangular in shape with island model overall height should not be more than 2100 mm . Different heights for tank & DU modules is also acceptable Common Enclosure for tank & DU shall be preferable.	Successful Vendor shall submit the proposed 2D & 3D drawing of the structure with HPCL color scheme which shall be reviewed by HPCL for overall standardized look & feel of DUs	Verification by TPIA for HPCL approvals.	Yes
Models					
A4-1	Mono's	Island oriented Pre set Mono/ Dual dispensers with Electronic Register Assembly, displaying sale amount, quantity and rate along with inbuilt side mounted Thermal Printer DISPENSING PUMP(<i>Vendor shall have choice of providing Suction/ Pressure type integrated system as per their design philosophy</i>) 1Px1Hx1D DUTY - STD – Pressure/ Suction	Vendor Certification	Certificate Verification by TPIA	Yes
A5	Units Of Measurement	Litres	Vendor Certification	Certificate Verification by TPIA	Yes
A6	Humidity	Maximum 95%	Vendor Certification	Certificate Verification by TPIA	Yes
A7	Ambient Temp.	-10 deg C to +50 deg C (Vendor to ensure that entire system including tank/ DU/ pipeline etc. is maintained in temperature range of 20 deg C to 32 Deg. C at all times to maintain the quality of product and may provide any suitable system to meet the requirement at all times)	Vendor to submit requisite certification as a supporting document for ambient temperature = -10 Deg C to +50 deg C.	Certificate Verification by TPIA.	Yes
A8-1	Electricals	All electrical fittings, relays, including switches, junction boxes and glands etc. shall be of standard make and suitable capacity ISI approved. The above should be housed in ATEX approved flameproof enclosures (Exd/Exm). The composition of materials used in the Zone 1 or in the place where they are in contact or bound to get exposed with the DEF liquid should be as per approved materials stated in ISO 22241-3 Dispenser design to comply EN13617-1. <u>PESO approval for individual component enclosures shall be required.</u> Note: Reference of all such PESO approvals must be engraved clearly at relevant places on component enclosures.	Vendor to submit requisite certification	Verification by TPIA with Certificates and approvals as stipulated	Yes
A8-2	Electricals	The incoming power supply cabling to Electronics shall be totally independent Cu cables. Internal wiring shall be of high grade Copper wire and conforming to ATEX requirements. The lower power junction box terminating the power cables shall have one entry fitted with Exd cable glands for inlet connection for the ERA. The Incoming Power Junction Box shall be separate from the Communication Junction Box. All testing/ inspection parameters within scope of 3rd party inspection shall be conducted at min. 220 V AC. However, ERA system to be protected for 110V to 260 V +/- 5% fluctuation. Party to provide inbuilt protection within DU to take care of these mentioned voltage limits". It is further also elaborated in ERA section.	Vendor to submit manufacturer datasheet/ specs sheet as a supporting document alongwith electrical circuit certifying compliance the above parameters through a Reputedelectrical TPI after witnessing the desired requirement at Manufacturer premises.	Verification by TPIA with Certificates and approvals as stipulated	Yes
A8-3	Electricals	Specific Internal surge protection device of suitable capacity must be provided for protecting electronic computing head from fluctuations and high voltage surges above the testing norms specified below and should be compliant to respective IEC standard. Within the surge test norms the DU should work uninterrupted in spite of the surges. The protection provided in the dispensing units for motor as well as electronics against surges/spikes shall be specified. The evidence of protection of ERA against the various interferences shall be provided from NABL accredited lab.	Necessary certification NABL accredited lab as per the tests & norms specified to be submitted. <i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i>	Verification by TPIA with Certificates and approvals as stipulated	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

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A8-4	Electricals	<p>Appropriate provision for Earthing shall be provided within the dispenser, with provision to connect to the site earth pit. All key elements like Pulsar, ERA, body including every gasketed element like the ERA doors etc shall be specifically wired / linked to the main earthing point on the DU.</p> <p>The DU earthing scheme shall be submitted separately along with the QAP.</p> <p>In addition to the MCB, a RCCB of suitable capacity shall be provided within the DU at each power in-comer for ensuring protection against voltage faults & earthing fault for ensuring continuous earthing</p> <p>Note: MCB/ RCCB shall be mandatory for local safety on dispensers and enhance the life of electrical & electronic components. This also helps in increasing the uptime for dispenser operation.</p>	<p>DU earthing scheme shall be submitted separately along with the QAP.</p> <p><i>Document shall be submitted before commencing the supply.</i></p>	Verification by TPIA along with Certificates and approvals as stipulated.	Yes
A9	Emergency Stop Button	The activation of the emergency Stop Button must cut off the Power to the DU. The Button to be provided at a convenient location easily accessible in an emergency. Emergency Stop Button –The activation of the Emergency Stop Button will stop the fueling from the dispensing unit.		Verification by TPIA	Yes
A10	Ingress Protection Of Structure:				
A10-1	For Electronics Enclosure	<p>Min. IP – 54 for Electronics enclosure. Dispenser design to comply EN13617-1. Certification from NABL accredited lab to be submitted. The composition of materials used in the Zone 1 or in the place where they are in contact or bound to get exposed with the DEF liquid should be as per approved materials stated in ISO 22241-3</p> <p>Note: Wherever valid ATEX reports are available - separate NABL reports are not required to be submitted</p>	<p>Necessary supporting Certifications from NABL accredited lab to be submitted.</p> <p><i>Document shall be submitted before commencing the supply.</i></p>	Verification by TPIA with Certificates and approvals as stipulated	Yes
A10-2	For Hydraulics Enclosure	<p>Min. IP – 23 for Hydraulics enclosure. Dispenser design to comply EN13617-1. Certification from NABL accredited lab to be submitted. The composition of materials used in the Zone 1 or in the place where they are in contact or bound to get exposed with the DEF liquid should be as per approved materials stated in ISO 22241-3</p> <p>Note: Wherever valid ATEX reports are available - separate NABL reports are not required to be submitted</p>	<p>Necessary supporting Certifications from NABL accredited lab to be submitted.</p> <p><i>Document shall be submitted before commencing the supply.</i></p>	Verification by TPIA with Certificates and approvals as stipulated	Yes
A11	Vibration	Pump should withstand the rigorous of transportation and tough operating conditions in the field.		OEM Certificate Verification by TPIA & general Observations	Yes
A12	Sheet Metal & Fixtures				
A12-1	Painting	<p>Panels and enclosures should be powder coated to withstand hostile corrosive climate. The colour scheme and other graphics/printing should be as per HPCL's approved colour scheme for dispensing pumps which shall be provided to successful vendors only.</p> <p>The composition of painting material used should be as per approved materials stated in ISO 22241-3</p>		OEM Certificate Verification by TPIA & general Observations	Yes
A12-2	Surface preparation:	Surface preparation to be by 7 tank pre-treatment process.		OEM Certificate Verification by TPIA & general Observations	Yes
A12-3	Method of painting:	Powder coating,		OEM Certificate Verification by TPIA & general Observations	Yes
A12-4	Coating thickness:	<p>Minimum thickness of 50 Microns for powder coating. The coating thickness measurement must be measured as per SSPC-PA-2-2004 (latest revisions) standards.</p> <p>Note: Powder coating plant, if not under possession of DU vendor, shall be ISO 9001:2000 certified and all process parameters maintained as per IS 13871:1993, with latest revisions if any.</p>		Verification by TPIA along with Certificates	Yes
A12-5	Finish:	Glossy Finish		OEM Certificate Verification by TPIA & general Observations	Yes
A12-6	Graphic Art Work	<p>Artwork / Graphics should be screen printed on approved makes of Gasoline resistant Vinyl's with suitable UV overcoat in approved colours. Product stickers also should be made using the same material in approved colour. 5 Year Warranty should be submitted for all the Artwork / Graphics.</p> <p>Warranty Certificate must be signed and sealed by the authorized representative of Vinyl manufacturers. Prior approval of Artwork should be taken from HPCL. Process of</p>	<p>Warranty Certificate</p> <p><i>Document shall be submitted before commencing the supply.</i></p>	OEM Certificate Verification by TPIA	Yes

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		Artwork must be as approved by the manufacturer and HPCL			
A13-1	Memo Printer	<ul style="list-style-type: none"> 🚩 Low noise thermal printer. 🚩 Easier maintenance with self-diagnosis. 🚩 Equipped with Saw tooth Cutter 🚩 Supports text & graphic printing 🚩 Easy paper rolls installation 🚩 Low Paper/No Paper sensor 🚩 LED Indication for communication status/errors <p>As a "Go Green initiative" alternatively, soft copy of the invoice can also be shared to the consumer to his/her pre-registered email ID or to WhatsApp number.</p>	<p>OEM Certificate</p> <p><i>Document shall be submitted before commencing the supply.</i></p>	OEM Certificate Verification by TPIA	Yes
A13-2	Memo Printer	<p>The Printer should allow by keypad command one re- print of the ticket; the second copy shall be marked as "COPY/DUPLICATE". The required details of ticket/cash memo are in the printer specs.</p> <p>Vendor to provide details of after sales service support available in India. If after sales service support is from an Indian contractor or contractor of an Indian vendor, a copy of agreement with the same Indian contractor to be provided for the duration of the warranty.</p> <p>Repair & Maintenance including replacement if required due to operational wear & tear & ambient conditions shall form part of scope of vendor during warranty/ CAMC period.</p>	<p>Vendor to provide details of after sales service support available in India along with details of spares and the price list for each component including complete printer.</p> <p><i>Document shall be submitted before commencing the supply.</i></p>	OEM Certificate Verification by TPIA	Yes
A14-1	Spares & Service	<p><u>Availability of spares.</u></p> <p>Vendor shall be in a position to supply or provide spares on need basis after completion of warranty/CAMC. The spare support shall be available for minimum 10 years from supply of last dispenser under this order.</p> <p>The vendor shall clearly undertake and declare that all parts, components and sub-assemblies of discrete, proprietary and non- common assemblies such as Electronics, Pulsers, Metering Units, forming part of the DU manufacture or its maintenance activity in the field shall be the Intellectual Property of the vendor and manufactured, quality assured and supplied under the direct intellectual control of the vendor.</p> <p><u>Further Scope & conditions of Warranty/ Comprehensive Annual Maintenance Contract shall be separately defined in the Tender documents</u></p>	<p>Vendors Undertaking for 10 years warranty/ CAMC spare support</p> <p><i>Document shall be submitted before commencing the supply.</i></p>	OEM Certificate Verification by TPIA	Yes
A14-2	Spares & Service	<p>During the annual calibration of the DUS which shall be mandatorily technically assisted by DU vendor shall encompass a complete audit of the DU including electronic systems/ cards/ Firmware/ software by competent engineer of the OEM. The format for audit of DU may be as per local legal metrology requirements / as required by HPCL.</p> <p>DU vendor to certify that DU is as per specifications & factory conditions during all such calibration & audit exercise. Any deviations to be immediately reported to HPCL with details of deviations without undertaking the calibration exercise.</p> <p>Note: All such reports shall be jointly signed by OEM representative & authorized signatory of the dealer with date, name, stamp & designation details.</p>		OEM Certificate Verification by TPIA	NA
A15-1	Glass	<p>Toughened glass with rubber beading / silicone sealant or suitable Polycarbonate material provided it ensures that the complete unit is water proof & edge corrosion of sheet metal is also prevented.</p> <p>In case of display based displays the glass protection used should be vandal proof.</p>	<p>Vendor undertaking/ OEM Certificate as applicable.</p> <p><i>Document shall be submitted before commencing the supply.</i></p>	OEM Certificate Verification by TPIA & general Observations	Yes
A15-2	Thickness Type	4 mm (min.). Only in case of Polycarbonate sheet same can be of 2 to 4 mm thickness		Verification by TPIA	Yes
A16-1	Approvals	All models of Dispensing Pumps shall have valid approval of:			Yes
A16-2	Safety	ATEX/UL/PESO (electrical component enclosures) in case of Zone 1 or hazardous environment, OIML for metering unit and Weights & Measures/ Legal Meteorology or any other relevant law of the land, whichever is applicable.	Approvals as per requirement for individual enclosures.	Verification by TPIA	Yes

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A16-3	Measurement	<p>They must also carry the relevant OIML certification In addition, the models must also carry approvals from the Department of Weights & Measures, India (Model Approval) and also relevant licenses to Manufacture, Sell and Repair DUs issued by the respective State Controller of Legal Metrology of the state of manufacture.</p> <p>The manufacturer shall also apply for and obtain relevant licenses to repair their DUs from the Controllers of Legal Metrology of states where such a repairer's license is mandatory.</p> <p>The bidder's application seeking Model approval from WM will clearly mention that "In-built automation communication protocol shall not have any influence or ability to change any WM controlled parameter of DU". The various automation features of the Electronic Fuel Dispensing Pump covering control and retrieval of transactional data from the DU by automation host machine should be reviewed.</p> <p>Relevant licenses to Manufacture, Sell and Repair DUs issued by the respective State Controller of Legal Metrology of the state of manufacture should be available.</p>	<p>Relevant licenses to Manufacture, Sell and Repair DUs issued by the respective State Controller of Legal Metrology of the state of manufacture should be available.</p> <p>Document shall be submitted before commencing the supply.</p>	Verification by TPIA	Yes
A16-4	Approval references / Amendments	<p>Vendor to validate all listed approvals (As per the Law of land) from time to time and indemnify HPCL for any loss arising out of non-renewal/adherence of such statutory approvals/ laws of the land.</p> <p>In case there is an amendment required in the approvals to meet the mentioned specifications the same shall be obtained & provided before the closure of the tender.</p>	<p>Undertaking validating all approvals (As per the Law of land) from time to time and indemnify HPCL for any loss arising out of non renewal/adherence of such statutory approvals/ laws of the land</p> <p>Document shall be submitted before commencing the supply.</p>	Verification by TPIA	Yes
A17	Packing	<p>Pumps to be covered with polythene bags and packed in wooden boxes or corrugated boxes or equivalent, with covering of suitable transparent plastic sheet to withstand multiple loading/unloading/handling and transportation.</p> <p>In case of wooden box packing/ corrugated box, additional polythene cover shall be placed on top of packed pumps covering minimum 300 mm on all four sides to prevent any ingress of water from top edges/any other side.</p>		Verification by TPIA	Yes
A18	Addl. Points	<p>As and when any card/s are changed, it should be mandatorily informed by the vendor to HPCL on weekly/Fortnightly basis or whenever required by HPCL. There can be a common access portal where in HPCL authorized representatives can login and pull out the reports which are updated to the nearest possible real time.</p> <p>The reports should have Region/State/District/Taluka/Village/Location/RO/DU wise options to select the reports. Dashboard based data reporting has to be made available in this login.</p> <p>Option to download the reports basis the Region/State/District/Taluka/Village/Location/RO/DU for a predefined period of day/week/month/quarter/year of a pre-defined time period should be made available in the portal.</p> <p>Vendor to mandatorily inform HPCL with explanatory notes whenever any software modifications carried out on monthly basis/whenever required by HPCL. Same has to be done in separate report DU wise indicating the previous change and the reasons for the last and present change on monthly basis for DUs wherever such changes are made. This history card shall be maintained throughout the life cycle of the DU and updated card shall be submitted in the month any changes are made.</p> <p>Along with the other details name of service engineer and the RO Manager present at RO during such changes shall also be mentioned.</p>	<p>Monthly reports of changed cards to be submitted to DRSM of HPCL.</p>		
A19	Access Control to Hydraulic & Electric Panels/ sections.	<p>Should be independent of the DU Electronics. The access to the electronics panels inside the DU should be made accessible to only authorized service engineers/service partners of the OEM</p> <p>Note: In ERA enclosure, Power card & mother board should be enclosed in lockable enclosures permitted by LM department. Wherever such permissions are presently not available, provision of locking the same box should be available for future.</p>	<p>Vendor Undertaking to be verified by TPI.</p> <p>Document shall be submitted before commencing the supply.</p>	Verification by TPIA	Yes
A20	Foundation Frame Cum Templates	<p>Supply of the foundation frame is not in the scope of the DU Vendor but the foundation bolts will be supplied by the DU vendor (along with DU in a segregated secured</p>	<p>Submission of drawing.</p>	Verification by TPIA	Yes

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		<p>packing which can be accessed without disturbing the main DU packing). However, it is the responsibility of the DU Vendor to check the alignment before installation of the DU.</p> <p>Before commissioning of the DU, HPCL will intimate the DU vendor with maximum 2 days notice, who in turn will depute their service engineer during the commissioning / installation of DU at the respective Retail Outlet. No separate payment will be made for this activity.</p> <p>W&M stamping support shall be provided through a separate visit/s as per requirement without any additional cost & consequences to HPCL and shall form part of the scope of work of vendor.</p>	<i>Document shall be submitted before commencing the supply.</i>		
A21	Flexible Connections	All Suction models of the Dispensing Pumps offered shall have a suitable flexible connector at the inlet of the PUMP. The composition of materials used in the Zone 1 or in the place where they are in contact or bound to get exposed with the DEF liquid should be as per approved materials stated in ISO 22241-3		Verification by TPIA	Yes
A23	Testing of DU with ERA assembly	<p>HPCL or its authorized representative may do the testing of DU with ERA assembly (at any stage post dispatch) on random basis at its own cost. However, in case of any non-compliance/ deviation same shall be debited to vendor besides other action as per tender terms.</p> <p>Due to constraints, if any, with any lab premises for testing of Dispensing units or testing of multiple models with same electronics shorter version of DU shall be permitted for testing".</p> <p>DU protocol shall be required to be shared for communication with retail automation system and HPCL vendors with NDA signed by HPCL/ Testing agencies, if required.</p> <p>No simulator is required to be provided to HPCL. However DU vendor to ensure the availability of simulators to Automation vendors at DU OEMs premises or at Retail Outlets or Testing agencies premises as per the requirement for development of solutions for integration with automation systems at no additional cost implications".</p>	<p>OEM Test Report or report from authorized Lab.</p> <p><i>Test certificates from stipulated lab shall be submitted before commencing the supply.</i></p>	Verification by TPIA	Yes
A24	ERA HANDLING	<p>Environmental Type testing shall be carried out at ERTL / Govt Approved - NABL Certified Lab for each model with the entire dispenser i.e. With liquid dispensing provision.</p> <p>Above certified environmental testing report for one model representing all the components under this order shall be submitted. HPCL/ TPI reserve the right to witness the inspection/testing and to get the same tested even after installation at any independent lab.</p> <p>Internal wiring shall be of high grade Copper wire and conforming to ATEX, PESO approved makes, if installed in hazardous zone.</p> <p>OEM should ensure the internal wiring path and the components used are as per approved materials stated in ISO 22241-3</p>	<p>Relevant certificates from Concerned Labs.</p> <p><i>Test certificates from stipulated lab shall be submitted before commencing the supply.</i></p>	Verification by TPIA	Yes
Technical Specification for Thermal Printers					
B1	General features	<p>Low noise thermal printer, easier maintenance with self-diagnosis Equipped with auto-cutter Supports text & graphic printing, easy paper roll installation</p> <p>Alternatively, As a "Go Green initiative"" alternatively, soft copy of the invoice can also be shared to the consumer to his/her pre-registered email ID or to WhatsApp number.</p>	OEM Certificate	OEM Certificate Verification by TPIA	Yes
B2	Make / Model	Printer mechanism - Fujitsu/ Seiko. (Preferable) <i>(Any other Superior/ equivalent mechanism acceptable provided certified by technical expert)</i>	<i>Document shall be submitted before commencing the supply.</i>	OEM Certificate Verification by TPIA	Yes
B3	Printing method	Direct thermal line printing			Yes
B4	Label width	50 mm – 79.5 mm (party to specify)	Vendor to submit Manufacturer's certification for compliance.		Yes
B5	Character per line	32		OEM Certificate Verification by TPIA	Yes
B6	Print font ASCIIcode Print graphicfont	16 X 24 dots, 1.50 mm (W) X 3.00 mm (H) 24 X 24 dots, 3.00 mm (W) X 3.00 mm (H).	<i>Document shall be submitted before commencing the supply.</i>		Yes

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B7	Dimensions (WxDxH)	Party to specify			Yes
B8	Effective print width	Party to specify			Yes
B9	Print speed	50 mm /sec (min)			Yes
B10	Interfaces	RS 485 & RS 232 for future connectivity to automation & Third party equipment system (Dispenser to have separate communication ports - minimum 2 nos. (1 no for Automation and 1 no. spare for future requirement)". However, DU to have provision for Ethernet/wireless communication port for remote connections with suitable power supply arrangement to any Wi-fi device placed outside the DU. DU to have provision for Ethernet/wireless communication port for remote connections also. Provision for Encrypted communication to Automation System (FCC/ Automation platform hosted in a remote server) for future to be kept ready in terms of system capability.			Yes
B11	Power supply	Built in power supply or external AC adaptor (input supply in the range of 170 V AC to 250 V AC +/- 5%). The vendors have the option for their own mode of built in power supply.			Yes
B12	Print density	384 dots per line			Yes
B13	Print head duration	50 km (approx.)			Yes
B14	Operating temperature	The printer operating temperature shall be 0 to +50 deg C as that of DU			Yes
B15	Paper status warning	Status warning on no paper/less paper			Yes
B16	Saw Tooth Cutter	Saw tooth cutter to be provided			Yes
B17	Printer output should include the details	Name of the outlet, Address & Tel no. Logo/ Date/ Time Vehicle no. (Alpha numeric) Bill No for each transaction GST nos./ PAN No. etc. Product Rate – Rs. per litre Volume – Litres Amount – Rs. Thanks Come/Visit Again, Address/ Toll Free No. of HPCL Printer should be able to print additional information in the receipt for pump/ nozzle no. & attendant identification from automation system as and when required. Presently this information shall not be printed in case of non -automated RO. DU should have programmable facility to customize RO/ DU wise printing details out of above. However provision for modification of any item as per requirement should be available. DUs should have programmable facility to print single or duplicate receipt for same transaction. Duplicate will have "Duplicate Copy" printed at TOP.	Vendors Undertaking	Verification by TPIA	Yes
B18	Print output on demand	Print output on demand on completion of transaction through keypad on FRONT/REAR or Nozzle Boot Side of DU			Yes
B19	Printer enclosure	Printer enclosure. To protect the equipment from moisture/dust. Printer should deliver under Indian ambient working conditions with regard to dust/moisture.	Vendor to submit Manufacturer's certification for compliance.	OEM Certificate	Yes
B20	Additional features required	Support printing from automation system with provision of scalable character when connected from automation system. Two indicator LEDs (Power & Error) Mountable on a DU / stand mounted or alternatively error can also be displayed on the LCD display.	<i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA	Yes
Technical Specification of all types of Dispensing Units - Mechanical Parts					
A	Pumping Unit				
C1	Type	Rotary positive displacement Vane or Internal Gear type with suction strainer, built in or additional check valve, integral air separator and adjustable by-pass valve /Alternatively it can be submersible remote pump with bottom suction with requisite attachments. Strainer shall be of removable type with mesh of minimum 100-micron size. Mesh material to be of non-corrosive metal and be non-reactive to products for which the DUis in use. Design of Unit and location in housing to ensure that no product spills over any electrical component, Motor in particular, while carrying out any servicing related to Suction Filters, By-pass Valves and Rotor Housing. Suitable drip trays with metal	OEM approved design duly vetted by TPI (Mechanical Expert) <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA	Yes

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		tubing outlets shall be provided, as required, to lead such spills to the outside of the pump enclosure. Vendor to specifically confirm compliance with this feature. Position of drip tray should be at the bottom of the dispensing unit. Each pumping unit must have a distinct and unique identification serial numbering (embossed or Engraved) available for physical verification of Pumping Unit. Metering Unit should have unique identification sr. No. With non-alterable type. OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3			
C2	Suction Port location	To be located such that it facilitates free use of tools to fasten/unfasten suction bellow Coupling			Yes
C3	Suction Connection	Suitable for 50 mm nom. Bore pipeline. The dispensing pump shall be fitted with suitable flexible stainless steel bellow connector at the pump inlet and a counter flange with 2" BSP inlet threading for connecting to inlet riser pipe. For Dispensing Pumps Shear valve must be included and the level of the shear plane shall be same as the bottom of the DU frame. Preferably, shear valve mounting should be secured with separate Ground Frame and Sump to ensure the force transfer in the event of impact. Alternatively, vendor to develop foolproof mechanism for shear valve mounting on the DU to ensure the force transfer in the event of impact. OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3 Note: HPCL appointed third party inspection agency shall vet the availability as per the documentation	OEM approved design duly vetted by TPI (Mechanical Expert) Document shall be submitted before commencing the supply as per conditions stipulated.	Verification by TPIA	Yes
C4	Suction length in Mtrs.	Minimum 30 meters of Suction Pipeline with factory test bed conditions. (applicable for non-integral units i.e. without tanks only)		Verification by TPIA	Yes
C5	Suction lift in Mtrs.	Minimum 3.0 meters with factory test bed conditions. (All Dispensing Units offered for inspection shall be tested under these minimum conditions.)		Verification by TPIA	Yes
C6	Discharge side 2nd stage filter after Pumping Unit	Position shall be just before entry of liquid to Metering Unit: This Pre- meter filter of 80 micron (min.) Size for HD & SD. Mesh material to be of non-corrosive metal and be non-reactive to products specified in Sr. No. 1 above. The filtration system to be specified by the vendor to ensure smooth operations of Dispenser.	OEM approved design duly vetted by TPI (Mechanical Expert) Document shall be submitted before commencing the supply	Verification by TPIA	Yes
C7	Pressure rating of system	The pump should be designed such that the maximum system pressure does not exceed 3.5 kg/cm2. All flanged joints, pipe fittings and liquid carrying components shall resist leakage at internal pressure of 3.5kg/cm2 as per ATEX norms *Vendor to provide in- house facility to test on 100 % basis (*Vendor to ensure pressure --- of system. HPCL reserves its right to witness testing/to get the same tested after receipt at HPCL premises/installation at any third party labs. In case of deviation to meet the maximum desired built in pressure, all pumps of the batch will have to be replaced by vendor at his own cost. In spite of HPCL witnessing testing, vendor cannot be absolved of its responsibility to supply meeting minimum desired specs) at operating pressure and demonstrate on random basis to HPCL or its designated inspecting agency. HPCL / its representative will witness type test and routine test for the castings at the sub-vendor's premises on sample basis.	OEM approved design duly vetted by TPI (Mechanical Expert) Document shall be submitted before commencing the supply 100% test check certificates by OEM. Radom witnessing by TPI as per sample size.	Verification by TPIA	Yes
C8	Pressure Gauge Adaptor	1/4" or 3/8" or M8/M10/M18 tapped and plugged entry to be provided for pressure gauge in Pre- Meter section of hydraulic system within pump enclosure. OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3	OEM approved design duly vetted by TPI (Mechanical Expert)	Verification by TPIA	Yes
C9	Air/Vapour Separation:	Under normal site and installation conditions, the air/vapour separation system shall efficiently separate and purge air and vapour to ensure accuracy of the metering system within the limits of accuracy specified in metering section. The air separation shall be	Necessary testing certificate. Document shall be submitted before	Verification by TPIA	Yes

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		100% OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3	<i>commencing the supply.</i>		
C10	Material Composition of	Body – Stainless steel, Cast Iron or aluminum Rotor/stator - cast iron Vaness – Carbon / graphite compounds Bushes – PTFE impregnated carbon/ graphite or bronze OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3		Verification by TPIA	Yes
C11	Pumping unit linkage to motor	Belt driven with suitable arrangement for belt tensioning		Verification by TPIA	Yes
C12	Rated Discharge (LPM Litres per Minute)	Minimum throughput of Dispensers: 20-35 LPM for Std. Duty as per requirement.			Yes
C13	Pressure setting of bypass valve in nozzle shut condition	Standard Duty – 1.2 to 2.0 kg/cm ²	Necessary testing certificate. <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA	Yes
C14	Dry Vacuum reading	Min 10" to 15" Hg			Yes
C15	Pumping unit OIML	The model of the Pumping unit must be referred in the OIML approvals Documentary evidence shall be submitted			Yes
B	Metering Unit Assembly				
C16	Type	Positive Displacement Piston Type/LOBE/ Screw Type/ MFM. Metering Unit shall be designed and constructed so as to be free of any external ratio gears affecting accuracy. Each metering unit must have a distinct and unique identification serial numbering available for physical verification. Pumping Unit and Metering Unit should have unique identification sr. no. With non-alterable type. Metering unit should have 2 MMQ or better capability at 10 LPM. Suitable metering technology should be complying with OIML R117. OIML of accredited lab certificate to be provided by the bidder with certification covering 1 million litres of actual fuel testing OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3	OIML accredited lab certificate to be provided by the bidder with certification covering 1 million litres of actual fuel testing. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA	Yes
C17	Max. Permissible error	While Stamping as well as verifications the DU shall be as per specification of WM guidelines. As per Legal Metrology Act 2009, whenever the legal metrology act undergoes a change, its compliance has to be ensured. "Maximum Allowable E-calibration range for K-factor (+/-1%): +/-50 ml for 5 litres can size and +/-200 ml for 20 litres can size. Defined Legal Meteorology upper tolerance limits shall include equipment operational tolerance in ambient conditions also". The history of such 50 calibrations / error correction shall be stored. Dispensing unit shall be tested as per OIML R 118 –1. Accuracy shall follow local W&M regulation	Metering unit shall be tested as per OIML R 118-1. Certificate to be provided from stipulated Lab. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA	Yes
C18	Meter Calibration	Electronic calibration to be incorporated. Appropriate WM approvals to be to this effect. There shall be specific information stickers on the DU indicating e.g. "Sealing Points - Meter with Pulsar & Electronic Calibration Point" "Electronically Calibrated DU - No Calibration on Meter". DU Vendor should provide sealing procedure.	<i>Document shall be submitted before commencing the supply</i>	Verification by TPIA	Yes
C19	Material construction of	Meter Body and Covers – Aluminum pressure die casting Cylinder Liners – Stainless Steel (slit/slit less) Piston Cup – PTFE compound.		Verification by TPIA	Yes
C20	Pressure Resistivity	All rubber seals (with probability for coming in contact with product) shall be compatible	Rubber seal OEM manufacturer test certificate.	Verification by TPIA	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

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		with DEF. Castings to withstand internal hydrostatic pressure of 3.5 kg/cm ² for 5 minutes without any evidence of leakage or physical damage as per ATEX norms. Vendor to provide in- house facility to test all such castings on 100 % basis prior to assembly and demonstrate on random basis to HPCL or its designated inspecting agency.	OEM test certificate for hydraulic testing for 100% units. <i>Document shall be submitted before commencing the supply.</i>		
C21	Specify detailed principle and mechanism of fluid measurement employed	Vendor to specify.	To submit the document at the time of model approval. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA	Yes
C22	Sealing Arrangement	To include single wire sealing of Metering Unit as per stipulation of Weights & Measures Dept. The DU should be capable of handling new tamper- proof sealing arrangement approved by W&M dept. Vendor to submit detailed schematic arrangement of sealing employed to cover Metering Unit along with the Pulser. There shall be specific information stickers on the DU indicating e.g. "Sealing Points - Meter with Pulser, MB, And Electronic Calibration Point" "Electronically Calibrated DU - No Calibration on Meter".	To submit the document at the time of model approval with W&M vetting for sealing arrangement. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA	Yes
C23	Volume Calibration	Electronic Calibration only. No provision on meter to calibrate mechanically. Refer the ERA section for details.		Verification by TPIA	Yes
C24	Material of Construction	CRCA / SS Sheets for panels & Frames and approved materials as shared in ISO 22241-3			Yes
C25	Specified thickness	Specified thickness of CRCA grade steel sheets as per IS 513 or its foreign equivalent for imported pumps.			Yes
C26	Load bearing frames	As per IS 513 or equivalent		Verification by TPIA	Yes
C27	Base Frame	As per IS 513 or equivalent	<i>Document shall be submitted before commencing the supply.</i>		Yes
C28	Lower and Upper Panels	As per IS 513 or equivalent			Yes
C29	Fasteners and hardware:	All fasteners and hardware to be zinc plated and passivated for weather protection.			Yes
C30	Filling Cap Holder	To be provided near the nozzle boot to place the vehicle fuel cap to return same to vehicle fill pipe after delivery. OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3		Verification by TPIA	Yes
C31	Hose	Single braid, Hard wall, (High Tensile Steel wire braided) compatible with DEF. OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3		Verification by TPIA	Yes
C32	Bore Diameter:	Standard Duty: 19 mm bore.		Verification by TPIA	Yes
C33	Color of Hose	Black color hoses for all models of Dispensing units		Verification by TPIA	Yes
C34	Make	UL/ATEX approved hoses from reputed manufacturers in case of hazardous zone 1 deployment suitable for DEF deployment.	UL/ ATEX approval of the hosepipe to be submitted. <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA	Yes
C35	Testing	All Hose Assemblies (Hose and End Fittings) shall be done and tested at works prior to dispatch. No such work shall be undertaken at site or by staff not duly trained for it.	Certificate to be submitted. <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA	Yes
C36	Markings	The following information shall be clearly marked on the hose surface in intervals of one meter: a) Name or brand of manufacturer, b) Relevant standards Compliance, c) Year of manufacturer, d) Product handled shall be identified by a sticker over the hose at both ends Every length of the hose should have the minimum manufacturer name, logo and the approvals/ certifications compliance marked clearly on the hosepipe.		Verification by TPIA	Yes
C37	Test Certificates	A copy of the manufacturer's batch test certificate for each batch of hoses that	Test Certificates to be provided	Verification by TPIA	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

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		will be supplied with Dispensing Units must be made available as part of QA Plan.		with OEM Certificates	
C38-1	BREAK AWAY COUPLING	ATEX or UL / KHK approved breakaway coupling of "Re-usable" and "Site Re-connectable" at site type of suitable size in case of hazardous Zone 1 deployment OEM should ensure the materials and the components used are as per approved materials stated in ISO 22241-3	ATEX or UL / KHK approved breakaway coupling certificate. <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA with OEM Certificates	Yes
C38-2	Makes	OPW (US/India)/ Elaflex/ Emco Wheaton/ Kaanra/ Tatsuno make with requisite approvals suitable for DEF. A Breakaway coupling manufactured by OEM of DU supplier to HPCL can also be provided having due approval of ATEX/UL/KHK.	ATEX or UL / KHK approved certificate. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA with OEM Certificates	Yes
C38-5	Detailed Specifications Shear valve	<u>Technical Specification of Shear Valve</u> <u>(Minimum technical requirement - Superior/ equivalent product acceptable - Certification to be obtained from any reputed educational institute (IIT/ NIT or any Govt. Engg college).</u> Emergency Shut off Valves which are installed on fuel supply lines beneath dispensers to minimize hazards associated with collision or fire at the dispenser. <ul style="list-style-type: none"> ➤ Material of construction: Compatible to DEF ➤ Disc and seal : M-19/Viton ➤ Inlet & outlet thread: 1 1/2"(4cm) NPT or 1.5"BSPT threads ➤ Fire Protection; A fusible link nickel plated/zinc aluminum alloy, Teflon coated/ stainless steel main steam trips the valve closed at 165 degree Fahrenheit to shut off fuel supply to dispenser. ➤ Integral Test Port; a 3/8" (9.5mm) Test Port allow the piping system to be air tested without breaking any piping connection. ➤ Packing nut; brass, Teflon coated. ➤ Poppet spring; Stainless steel. ➤ Precision Machined Shear Groove, ensures consistent break point; competition uses cast grooves that are inconsistent in thickness and thus inconsistent in how they break ➤ E-Coated (epoxy paint combination) casting inside and out, protects product from aggressive fuels. ➤ Versatile Mounting Options Easy availability of replacement part like link, retaining screw and hold open link to be ensured.	ATEX or UL / KHK approved certificate & Other requirements <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA with OEM Certificates	Yes
C39-1	NOZZLES	Automatic cut-off Nozzle, pressure sensitive type with ATEX or UL or KHK approval, compatible to DEF	ATEX or UL / KHK approved certificate. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA with OEM Certificates	Yes
C39-2	Makes	Shall be of OPW (US)/OPW (India)/ ZVA/EMCO WHEATON/ TATSUNO / Kaanara/ Catlow Make/ as approved by HPCL at a later date under "Make in India concept", compatible to DEF Specify make and country of origin. Also submit relevant approvals with bid. Specify the make, model no. & part no. Of nozzles to be supplied.	Relevant approvals to be submitted. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA with OEM Certificates	Yes
C39-3	Size:	Standard Duty: 3/4" threaded inlet		Verification by TPIA	Yes
C39-4	Spout OD –	13/16" for Std. Duty		Verification by TPIA	Yes
C39-5	Material Construction: of	Internal parts shall be made of corrosion proof material. All 'O' Rings and Gaskets should be of "VITON" make or equivalent with prior approval only, compatible to DEF. Spout - Aluminium or Brass Body - Die Cast Aluminium material should be compatible with DEF.		Verification by TPIA	Yes
C39-6	Features	The following features should also be available: <ul style="list-style-type: none"> 🔥 Nozzles shall be lightweight and easy to operate. 🔥 Nozzles shall be suitable for all types of Fuels including Blended Fuels for which the DU is in use. 🔥 Nozzles shall have 'Hold Open Device'. 	Relevant approvals to be submitted. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

SN	Description	Specifications	Required Documentation	QAP Requirements	Indicative Frequency Req. (TPI) - One/ Model
		<ul style="list-style-type: none"> 🚩 Nozzles shall have replaceable spout. 🚩 Nozzles shall have Two Stage lever mechanism for +ve shut off. 🚩 Nozzles shall have-KHK or UL-or ATEX CE approval in case of hazardous Zone 1 deployment as applicable suitable for DEF. 			
C39-8	Detailed Specifications - STANDARD DUTY NOZZLES with Double Poppet	<p><u>STANDARD DUTY NOZZLES with Double Poppet</u></p> <p><u>(Minimum technical requirement - Superior/ equivalent product acceptable - Certification to be obtained from any reputed educational institute (IIT/ NIT or any Govt. Engg college).</u></p> <p>Nozzles must be designed such that as a mini-mum spouts, latches, guards, and hand insulator.</p> <p>Nozzles must be equipped with spouts with stainless steel tips and should have double poppet to take care of penny dispensing so as to have better control on delivery of fuel at exact amount.</p> <p>The nozzle will not open until the pumping system is pressurized and close when the pressure is removed.</p> <ol style="list-style-type: none"> 1) Size of Spout: Standard Duty Nozzle - Size of the spout 13/16” (20 mm) with flow rate 20-35 LPM. 2) NPT end fittings threads suitable for hose coupling. No Teflon should be used for sealing 3) Material of Construction: Compatible to DEF <ol style="list-style-type: none"> i. Internal parts shall be made of corrosion proof material. ii. All 'O' rings and gaskets should be of 'VITON' make only (Compatible to DEF) iii. Nozzle should be light weight and easy to operate iv. Nozzle shall be suitable for DEF v. Nozzle shall have replaceable spout vi. Nozzle should have a Flow lock design/safety valve. vii. Spout poppet can be made of high density fuel resistant plastic with required approvals. viii. Spout should have a shear groove ix. Hand Insulator should have roundets with HPCL logo. 4) Nozzles should be cycle tested and proven to last longer than 3 million cycles in test lab. 5) Manufacturer should have facility in India to take care of after Sales Service to reduce the total cost of ownership. Nozzles must be repairable. (Either on or off site) 6) Nozzle shall have UL approval OR EN13012 approval 7) Approved Make: OPW / Elaflex / CATLOW /Kaanra/ Tatsuno, Compatible to DEF with requisite approvals. <p>Note: Any sub-component of reputed make which is compatible to DEF and has requisite approvals can be utilized with prior approval of HPCL.</p>	<p>Test Certificates & Other documents, ATEX approval.</p> <p>A copy of manufacture’s batch test certificate for each batch of Nozzles must be available.</p> <p>Copy of Certificate of origin should be attached with invoice with following details:</p> <ul style="list-style-type: none"> 🚩 Make and Model 🚩 Sourced from Factory Details 🚩 Certificate No. & date 🚩 Validity 🚩 Issuing Authority <p>Document shall be submitted before commencing the supply</p>	<p>Verification by TPIA with OEM Certificates</p>	<p>Yes</p>
C43	Protection against interference	<p>Vendor’s internal QA procedure must consist of among others, carrying out the type tests specifically for the ERA Box of each model as per the following IEC procedures:</p> <p>The Testing norms to be as mentioned below (OIML - R117) Testing reports from government approved NABL certified lab shall be provided (Type Test approval)</p> <p>NOTE: HPCL will Test any DU (both Hydraulics & ERA) and if found not meeting the parameters. The lot will be rejected and party will have to remove the same at their cost.</p>	<p>Test Certificate as stipulated.</p> <p>Test certificates from stipulated lab shall be submitted before commencing the supply.</p>	<p>Verification by TPIA</p>	<p>Yes</p>
C44	RUBBER COMPONENTS	<p>Compatibility of rubber compounds to products dispensed:</p>	<p>Test Certificate by OEM.</p> <p>Document shall be submitted before commencing the supply</p>	<p>Verification by TPIA with Certificates</p>	<p>Yes</p>
Technical Specification of all types of Dispensing Units - Electronic Parts					
D1	Electrical Supply	<p>230 Volts 50 Hz. Single phase. Expected voltage fluctuation under installation is 110 volts to 260 volts AC (+/- 5%) or through UPS of standard configuration.</p>	<p>Manufacturer test certificate.</p>	<p>Verification by TPIA with OEM Certificates</p>	<p>Yes</p>

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D2	Operating Environment	Dispensing unit shall be capable of operating in tropical conditions	<i>Document shall be submitted before commencing the supply</i>	Verification by TPIA with OEM Certificates	Yes
D3	FLP Motor (if applicable)	Suitable for 230 Volts, Single Phase, 50 Hz, min 0.75 HP, Continuous duty, flameproof I explosion proof, with thermostat protection.		Verification by TPIA with OEM Certificates	Yes
D4	BIS Certificate (if applicable)	Motor shall be designed to perform as per IS 996 (1979) and constructed to conform to the requirements of IS/IEC60079-0 and IS/IEC60079-01. RP Motor (low inertia motor) shall conform to the requirements of IS/IEC60079-0 and IS/IEC60079-01. Latest revision of the BIS specs to be incorporated if any.	Motor BIS certificate <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA with OEM Certificates	Yes
D5	Approvals (if applicable)	They shall carry the ATEX approval and such approval/Motor shall be endorsed by CCOE/PESO for use in dispensing units. Approvals of CMRI / CCOE / ATEX to be embossed on Name Plate. Attach CMR1 report / ATEX / CCOE Approval certificates for FLP/ non- FLP shall be applicable as per OEM Design	Motor ATEX certificate <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA with OEM Certificates	Yes
D6	Voltage Range	ERA system to be protected for 110V to 260 V +/- 5% fluctuation. Motor to withstand 180 V to 250 V +/- 5% fluctuations. Party to provide inbuilt protection within DU to take care of these mentioned voltage limits". Electronics of the DU cuts off the supply to motor in the event of the voltage exceeding 250 V. Vendor to design the power distribution of the DU accordingly.	Manufacturer test certificate. <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA with OEM Certificates	Yes
D7	Capacity	To withstand 75 Starts/Stops per Hour			Yes
D8	Insulation	Motor winding must comply with class F insulation range of up to 155 deg. C. Thermostat rating to be 135 +/- 5 deg. C Following details shall be furnished with model approval and TPI inspections: KVA Input; KW Consumed; Power Factor	Manufacturer test certificate. <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA with OEM Certificates	Yes
D9	Protection including Surge (if applicable)	"The Motor shall be protected for Voltage fluctuations 180 to 250 V (+5%)". It is also to be ensured that DU electronics is also protected through a surge protection device as per latest codes. Specifications of the Surge Protection Device: Protections at the entry of 230V AC power supply at Dispenser unit end: <ul style="list-style-type: none"> The device shall be single shield high duty discharge capacity Zinc Oxide Varistor between L-N and single shield high discharge capacity spark gap between N-Earth. The device shall be suitable for 1 phase TT system with nominal voltage parameters of 230 Vac ±10% between L-N The device shall be capable to discharge lightning impulse (10/ 350 μs) limp of 12 kA (N-PE) and discharge current (8/20 μs) I_{max} of 40 kA The device shall have voltage protection level of ≤ 1.5 KV. The device shall have Follow current extinguishing capability [N-PE] : 100Arms The device shall have max. mains-side over current protection ISCCR of 25 kArms The device shall have mechanical indication for both the states (green for 'healthy' and red for failure) on all modules (L-N and N-PE) The device shall be pluggable type and free from re-wiring in case of any replacement activities. The device shall be tested for vibration and shock test. The device shall be certified by KEMA, VDE, UL, VdS as per IEC 61643-11.			Yes
D10	Power Switch	Motor Power supply to be thru a 2 pole MCB of suitable rating (recommended minimum 10 A, 250 V). Relay/SSR driven switching desired. Additionally a RCCB of suitable capacity shall be provided at each power incomer. MCB and RCCB of appropriate rating are required for the ERA assembly. RCCB and Earthing Relay of appropriate rating also need to be installed to take care of any earthing defects and proper earthing. Note: All electrical devices shall be ISI marked or equivalent for the items that are imported.	OEM Test Certificates <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA with OEM Certificates.	Yes

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D12	Electronic Register Assembly (ERA)	<p>Expected voltage fluctuation 110 volts to 260 volts AC. Electronic circuit should be protected for this input voltage fluctuation.</p> <p>The Incomer to be thru MCB & RCCB of appropriate rating Inspection of insulation of motors shall be carried out at sub- vendor's premises.</p> <p>In addition to the MCB, a RCCB of suitable capacity shall be provided within the DU at each power incomer for ensuring protection against voltage faults & earthing fault for ensuring continuous earthing.</p> <p>Note: <i>All electrical devices shall be ISI marked or equivalent for the items that are imported.</i></p> <p>Specific Internal surge protection device complaint to relevant IEC code of suitable capacity must be provided for protecting electronic computing head from fluctuations and high voltage surges above the testing norms specified below. Within the surge test norms the DU should work uninterrupted in spite of the surges The protection provided in the dispensing units for motor as well as electronics against surges/spikes shall be specified. The Evidence of protection of ERA against the various interferences shall be provided from a Government approved NABL lab.</p> <p>HPCL may do the testing of DU with ERA assembly on random basis. Due to constraints at ERTL premises, shorter version of DU shall be permitted. In case of foreign vendors, the DUs shall be tested at any of the certified laboratories of their country of origin.</p>	<p>Test certificates from NABL accredited Lab</p> <p>Document shall be submitted before commencing the supply.</p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D13	ERA & Electronics - Protection against interference	<p>Vendor's internal QA procedure must consist of among others carrying out the type tests specifically for the ERA Box of each model as per the following IEC procedures: The Testing norms to be as mentioned below (OIML - R117) Testing reports from government approved NABL certified lab shall be provided for each model ERA of this Order (Type Test approval)</p> <p>NOTE: HPCL may Test any DU (both Hydraulics & ERA) and if found not meeting the parameters the lot will be rejected and vendor will have to remove the same at their cost. a) Electro Static Discharge Test ESD IEC Procedures - IEC 61000-6-1 standard IEC 61000- 4-2.</p> <p>Testing Norms - ESD - 6 KV Contact Discharge, 8 KV Air Discharge Latest revision of the IEC specs to be incorporated if any.</p> <p>Radiated EM Field IEC Procedures - IEC 61000-4-3.</p> <p>Testing Norms - 26 MHz - 1000 MHz, 80% IS @ 1 KHz, 3V/m (26 MHz- 500 MHz) & 1 V/m (500MHz- 1000MHz). Latest revision of the IEC specs to be incorporated if any.</p> <p>Electrical Fast Transient Test IEC Procedures - IEC 61000-6-1 standard IEC 61000- 4-4 Testing Norms - 2 KV Amplitude.</p> <p>Latest revision of the IEC specs to be incorporated if any.</p> <p>Surge Test: IEC Procedures - IEC 61000-6-1 standard IEC 61000-4-5. Testing Norms - line-to-Line - 1KV, // Line to Ground - 2KV. Latest revision of the IEC specs to be incorporated if any.</p> <p>Voltage Interruptions and dips IEC Procedures - IEC 61000-6-1 standard IEC 61000- 4-11.</p> <p>Latest revision of the IEC specs to be incorporated if any. Testing Norms - Nom. Voltage (230V)+ 10% and Nom. Voltage (230V) - 15%f) Short Time Voltage Reduction: 100% voltage interruption for 0.5 cycle, 50% voltage interruption for 1 cycle) Conducted RFIEC Procedures - IEC 61000-4-6 Testing Norms - 0.15 - 80 MHz, 3 V/m, 80% AM @ 1 KHz</p>	<p>Test Certificates & Other documents.</p> <p>Document shall be submitted before commencing the supply.</p>	Verification by TPIA	Yes
D14	ERA Cabling from Electrical Panel	Cabling to the electronic system ERA within the pump shall be independent of the motor power supply right from the incoming mains Junction Box. This incoming power shall be thru an RCCB & MCB of suitable capacity.			Yes
D15	Real Time Clock	Must have a real time clock to log date and time for stamping errors & events. Change of parameters referred in History log section should be logged and auditable under	Test certificates from requisite lab	Verification by TPIA	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

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		password protection as described in the section below. RTC should have a long life inbuilt battery as per standard practice in intelligent system. The life of inbuilt battery can be vendor specific, however vendor to ensure its replacement (at no extra cost) in case of any failure within the warranty & CAMC period. In case of any stamping requirement during change of battery, same shall be borne by vendor and duly documented. History of last 20 changes in DATE/TIME shall be stored in the CPU Memory of the ERA and shall be recalled on the keypad display/LED display. There shall also be an option for printing the same using the local printer or stored in the remote machine against the DU ID. The microcontroller must also be capable of communicating the details to a POS terminal/Automation System when the unit is automated.	<i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i>		
D16-1	Pulser (As applicable)	a) The components such as Pulsers must be flameproof / explosion proof if they are inside the hazardous Zone 1 area of the Dispenser. b) They shall be house in ATEX / CCOE approved enclosure and carry the approval reference of CCOE/PESO for use in Zone 1 of Dispensing Units. Certificate proof for the same shall be furnished by the Vendor c) The Pulser unit should be designed so that it is either integral part of Metering Unit as a single unit or top/side mounted with common drive shaft coupled with metering unit without any gears to make the pulser unit inaccessible for manipulation/infringement. d) Pulser to have inbuilt check for uni-directional rotation.	Certificate <i>Document shall be submitted before commencing the supply.</i>	Verification by TPIA	Yes
D16-2	Pulser Type (As applicable)	<u>Pulser with magnetic sensors (Hall effect sensors)</u> The Pulser unit must have features to make it tamper proof (non openable, Self-destructive (Physical & Electronic) & Black Potted), such as the sensor embedded in a proprietary IC giving encrypted output with no access to the actual sensor outputs, with warning signal and stoppage of pump for failure of the sensor. Vendor to have total control / ownership over the inputs & outputs of IC. The design can be vendor specific. Any tampering/opening/ change/ of the above Pulser (once connected and enabled by OEM) should result in stopping the DU and destruction of Pulser unit (changeable as one single unit). Any defect in pulser should necessarily require change of the pulser unit. New Pulser unit can be operated/ replaced only after authentication through OTP by OEM with prior permission & thereafter mandatory reporting to HPCL in writing after change is made. Any disconnection/ re-connection of the above Pulser (once connected and enabled by OEM) shall generate non - erasable logs which shall be retrievable as per requirement, minimum in power on condition or with power capacitor. Potting (Applicable to potting in all cards of dispensing units as per stated requirement of level (partial/ full) of potting): The entire Pulser unit must be encapsulated as a single unit which should be tamper proof and should self destruct (unusable under any circumstances). Potting must cover all critical components inside the pulser unit - total potting in compliance ATEX approval norms <i>Black potting restricts any visibility to the internal circuitry. As the PCB layout, components & part numbers are not seen through, it provides complete restriction from any tampering/replicating of the internal circuitry. Any attempt to tamper black potting would be easily noticeable/ viewable.</i> In addition, the pulser unit shall form integral part of family integrity at DU Level. All LM requirements over and above HPCL minimum requirement to be complied with.	<i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i> OEM undertaking. In addition detailed QAP for testing the same to be developed and tested and validated.	Verification by TPIA	Yes
D16-3	Pulser Communication to ERA	<u>The Pulser communication to ERA:</u> Pulser communication to ERA shall be secured & encrypted with AES-128 bit encryption or better. The encryption should be there in all intelligent electronics cards (e.g. Key Pad, Display, control card (s) and Pulser). Necessary certification from globally accepted agencies like NII or equivalent (credentials of the agency to be submitted to HPCL or alternatively same can be tested by HPCL appointed agency for which all source codes/ requirements shall be provided under direct NDA at vendors cost) to this effect to be provided when required by HPCL.)	<i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i>	Verification by TPIA	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

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		<p>Therefore it is preferable that usage of advanced hashing algorithm like SHA-2 (SHA 256 algorithm with a 1024 bit length or better) for the generation of firmware signature is mandatorily implemented in the software.</p> <p>SHA 256 software signature: Software signature for each module calculated at runtime and verified at power on.</p> <p>Intelligent cards of the DU which are microcontroller based (e.g. Key pad, Display, Control Cards shall be partially potted for sensitive areas (probable areas of manipulation) with unique Serial number impression/ RIFD Tag on the potted area in compliance ATEX approval norms</p> <p>Same are to be replaced by vendor as per requirement of his solution against this tender in case of any manipulation observed during the currency of the contract. Further, any card which is replaced during the normal warranty/ CAMC period as per original contracts with HPCL shall have above minimum envisaged features without any additional cost implication to HPCL.</p> <p>Vendor to have total control / ownership over the inputs & outputs of IC. The design can be vendor specific.</p> <p>Note: <u>Certification of encryption</u> from globally accepted agencies like NII or equivalent (credentials of the agency to be submitted to HPCL or alternatively same can be tested by HPCL appointed agency for which all source codes/ requirements shall be provided under direct NDA at vendors cost) to this effect to be provided for all the versions of the software deployed in the field against this tender (HPCL envisages that all DUs shall be on single software version encompassing all the latest minimum software features as per HPCL specified features in the current tender.)</p> <p>OEM shall submit how they have implemented 128 AES bit encryption or better in the system to expert agencies like CDAC etc during complete testing and validation of Dispensing Unit while obtaining Model approval and compliance of the various Electronic Features of DUs in line with the contract conditions. Same shall be vetted for compliance & implementation of 128 AES bit encryption or better by expert agencies like CDAC (NDA as per requirement can be signed with testing agency.</p>			
D16-4	Securing Pulser against unauthorized opening at retailer premises	<p><u>Securing Pulser against unauthorized opening at retailer premises:</u></p> <p>a) The Pulser should have a life cycle of at least 10 years. In case of any malfunction, the Pulser should only be replaced and not repaired at retailer premises.</p> <p>b) However, if Pulser is opened for any reason, it should deactivate the DU and render the Pulser in-operative. Such events should be logged in the non-volatile memory of the controller with timestamp. The DU can now be brought back to normal operation only by authentication from the Vendor's server (through one-time- password or OTP) after replacement with new Pulser only as stipulated above. Self-destruction shall be supported during power down situation as well.</p> <p>c) A self contained battery with long shelf life and enough charge to destroy the private key when required should be used.</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D16-5	Securing through OTP DU	<p><u>Securing the DU through OTP :</u></p> <ol style="list-style-type: none"> OTP should be used for authentication whenever Pulser and other intelligent cards (e.g. Key Pad, Display, control card (s)) is originally installed/ newly replaced. OTP should also be used for enabling electronic K-factor Calibrations at intervals stipulated by the Dept of W&M. OTP Features: OTPs should be DU specific (i.e. for each Metering Unit). <u>Additional features for OTP</u> <ul style="list-style-type: none"> ✓ Higher authority person will receive the intimation for the OTP event along with details like user, mobile no, reason for OTP etc. ✓ Each OTP request will be valid for a time period of 15mins only, any operation after that will display a "timeout" message on the DU. ✓ Two OTP entries are required for Calibration; One during Entry & One during Exit. ✓ In case if Exit is not done, the DU will not allow any further deliveries. ✓ Invalid tries of OTP are restricted to 3 entries, further entries will lock the DU. ✓ The unlock can be requested from the DU, but the OTP will be sent to the higher authority person. 	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes

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		<p>Note: Test certificates from CDAC/ BEL/ ECIL/ SAMEER/ ARAI/ NII.</p> <p>Suggested Procedure for OTP Generation: (Vendor can have technologically better/ equivalent solution to ensure security of the DU at his end- This scheme is only illustrative)</p> <p>OTP Vendor's server should store the serial numbers of the installed DUs, with serial numbers of the Pulser(s) and controller cards and metering units.</p> <ol style="list-style-type: none"> 1. Secret keys are stored in both the server and the DU memory in a particular order. These codes are DU specific and for a given serial number the keys match. Minimum 150 such keys will be required for each metering unit, so as to cover all the secure operations during the 10 year life time of the DU. these keys should be made for specific function – i.e. one set of keys for pulser validation and another set for Electronic calibration. 2. OTP request should specify the operation to be authorized/ validated, i.e. whether it is pulser validation or whether it is authorization for electronic calibration. That way the individual operations can be identified at the server end. This will enable a trail of the secure operations of a DU, so as to take note of unauthorized activities, if any. The server keeps track of the serial number of the secret keys used, nozzle-wise. 3. When request for an OTP comes to the server from the registered mobile number of the field engineer, with details such as DU serial number, Nozzle number and operation to be carried out, it pulls out one of the keys at the next serial number, and expands it using a non-linear and non-invertible function to a large integer. A large alpha-numeric code corresponding to this number is sent as the OTP. It is suggested that a code of minimum 8-characters, consisting of four sets of two characters, as used by Microsoft and others be used as the OTP (e.g. 2X-8D-3K-3W). This OTP is keyed into the DU through the keypad. The DU now expands this to the original large number as generated at the server end. It also in parallel expands the corresponding secret key at the serial number to the large number using the same non-linear and non-invertible function. The number received (and expanded) from the server and the one created at the DU are compared. If they match, the specific operation is validated; else an error message is created and logged. 4. The secret keys in the DU are written through fuse links and hence cannot be read back. Sever has a log of these keys and their serial numbers. Since these secret keys cannot be read back at the DU end, there is no way a match will be obtained by any other means. 5. 	<p>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	<p>Verification by TPIA</p>	<p>Yes</p>
D16-7	OTP Server	<p>Vendors should get their schemes verified by one of the reputed agencies to ensure that the main features as recommended are implemented in a secure way. The implemented scheme should ensure that each request from the service engineer is logged and a trail of all secure authentications is available for inspection.</p> <p>The server (dedicated) to HPCL at the Vendor's premises (In India) should be a secure server (redundant) with access only to the designated officer/s of the Vendor and adequate data base security shall be available with the vendor during entire period of warranty.</p> <p>The server should be mirrored for geo-redundancy at a separate physical location. The server should have automatic failover, switchover/ switchback facilities. The OTP management system should be developed with database and software duly licence in the name of the bidder.</p> <p>The server should be housed in a fire-safe & appropriate ambient temperature controlled environment to ensure no disruption of the OTP system. HPCL or its authorized third party will have access to the server and the premises as and when required by HPCL with prior intimation to the vendor for checking and auditing.</p> <p>Log information of all such authentications should be passed on to HPCL, once a month. In case of too frequent use of OTPs for authentications for a DU, the Vendor should investigate reasons for such use (say one OTP every month on the same nozzle. Normally only two or three OTPs will be required on a nozzle every year).</p> <p>Sever shall be capable of sharing the online logs also with HPCL (as per requirement at any later date), in case HPCL requires the same. Protocols & Development of software tools/ interface patch in case of HPCL software, as per requirement shall be developed</p>	<p>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions..</p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	<p>Verification by TPIA</p>	<p>Yes</p>

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		<p>by vendor. Server access for auto pulling of data in the desired file formats by HPCL server shall also be part of the scope of the vendor.</p> <p>Vendor OTP and other server shall be mandatorily audited annually for OTP management by TPI at no extra cost to HPCL with prior intimation of the inspection schedule, QAP and profile of inspecting agencies.</p> <p>Suggested format for OTP Log for access by HPCL: (70 char approx)</p> <p>State (2 char), City(6 char), Locality (6 char), RO Code, DU Ser No(8 char), Nozzle No(2 char), Operation Performed (15 char), Date: dd:mm:yy(8 char), 24hrTime stamp: hh:mm:ss(8 char),Totalizer reading (12 char)</p> <p>In addition, OEMs should submit DVDs of the above logs (in ASCII format) in monthly intervals to HPCL for inspection.</p>			
D16-8	Pulser sealing with Metering unit	<p>The Pulser Unit shall be sealed with the Metering Unit with a single wire sealing & the WM approval to specifically mention the same The Meter - Pulser link must be inaccessible under sealing. The same should be compatible for e-sealing at a later date.</p> <p>The ERA assembly shall be designed to operate from zero to 100 litres per minute.</p>	<p>Certification from OEM & LM Approval.</p> <p>Document shall be submitted before commencing the supply.</p>	Verification by TPIA	Yes
D17	Family Integrity and Secure communication	<p>All boards with Microcontroller chips shall have a unique identification by soft number and shall have secured communication between them</p> <p>Family Integrity: All microcontroller cards for a particular FDU shall comprise a family. In case the family of the FDU (has to be confined to the FDU) is broken through, a change of card/ software/ firmware from any source including cards from other / forged units, then the dispensing unit should stop working immediately without any exception. Keypad, Display cards, Pulser of metering unit, ERA card, Alternative memory/ E-cal cards (all microcontroller cards) shall be part of the family.</p> <p>All logic cards as stipulated i.e. boards with micro controller chips) shall always have secured communication between them which shall be AES 128 bit encrypted or better. Family integrity to be ensured. Family integrity implied that if any logic card (including Pulser) is replaced with another card or there is any change in the firmware or software (same version or different), the dispensing should stop and commence only on authentication of the dispenser. Any event of break in family integrity must be captured with a date and time stamp and the log with the relevant error code to be generated and captured in the DU.</p> <p>Any event of break in family integrity must be captured with the date and time stamp along with totalizer reading and the log with the relevant error code or card details must be captured and stored in the History Log.</p> <p>Family Integrity check shall be conducted by FDU with each power ON or any process during which DU is required to reboot even from inactive/ dormant mode without compromising on the starting time of the DUs. In the event of detecting breakage of integrity, FDU should stop dispensing and working. FDU will log such events as specified earlier and wait for authentic key entry from an authorized service engineer.</p> <p>The family integrity of all cards to be checked before every transaction</p> <p>Note:-The system boot up time should be less than 1 min for all type of boot up. Successive rebooting should also be honoured the requirement of less than 1 min.</p> <p>Secure Communication: All logic cards (Keypad, Display cards, Pulser of metering unit, ERA card, Alternative memory/ E-cal cards, i.e. all boards with micro-controller chips) shall have secured communication between them. This communication must be AES 128- bit encrypted or better.</p> <p>Necessary certification from globally accepted agencies (credentials of the agency to be submitted to HPCL or alternatively same can be tested by HPCL appointed agency for which all source codes/ requirements shall be provided under direct NDA at vendors cost) to this effect to be provided when required by HPCL.</p> <p>Vendors have the option to upgrade dispensers once in three years for strengthening It</p>	<p>Certification from globally accepted agencies</p> <p>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</p>	Verification by TPIA	Yes

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		<p>against tampering with no additional outgo to HPCL to make their Dus more secure.</p> <p>DU to have provision for Ethernet/wireless communication port for remote connections also.</p> <p>Provision for Encrypted communication to Automation System for future to be kept ready in terms of system capability.</p> <p>Family integrity to be ensured for any change in software (version / code)</p>			
D18	PCB	<p>Vendor has to guarantee declaration of all the PCBs should be of latest technology. All PCBs to bear Vendor's Company logo & Identification mark.</p> <p>Provision shall be available for storing the hardware history of changes / replacement made in any of the processors boards of the DU.</p> <p>Inspection of QA plan for the dispensing units and HPCL and its authorized inspectors must be allowed to peruse the QA plans as well as the implementation of QA Plans for ERAs.</p>	<p>Test certificates from reputed agencies.</p> <p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D19	LCD	<p>Quality Assurance process for the manufacture and testing of LCDs used in the DUs manufactured by the vendor shall form a part of QA plan for the DUs offered by the vendor/ Touch screen displays with a minimum of 14" and above can also be used with vandal proof display screen.</p>	<p>Test certificates from reputed agencies</p> <p><i>Document shall be submitted before commencing the supply.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D20	Firmware Upgradation	<p>All software should reside in the active components of the intelligent boards, which should be identifiable through a unique number and can form part of family integrity checks.</p> <p>Every Software version must have a firmware signature generated using advanced hashing algorithm like SHA-2 (SHA 256 algorithm with a minimum bit length of 1024) & this number must be made known to HPCL.</p> <p>This firmware signature must be verifiable on the keypad LCD screen or main touch screen display any other screen of DU and must also be readable from FCC".</p> <p>Any event of break in family integrity must be captured with a date and time stamp along with totalizer reading and the log with the relevant error code to be generated and captured in the DU. The family integrity of all card to be checked before every transaction.</p> <p>Any change in hardware / software must be authenticated by the vendor. In case any non- authenticated hardware/software is used the DU would stop functioning. A log with the relevant error code to be generated. The same is also to be reported to HPCL in writing immediately. It may be noted that Hardware/ software changes refers to the electronic cards / electrical cards/ memory chips/ processors in intelligent cards/ encryption keys which impacts the accuracy of fuel delivery and W&M / other statutory parameters ". The Log with the relevant error code to be reported to HPCL (at concerned DO) immediately.</p> <p>Vendor to submit roadmap in 7 days of encountering any such situation for mitigation and immunization of the same in the entire population of the FDU susceptible for manipulations along with detailed report. All such immunization shall be done at noextra cost to HPCL in a mutually agreed time frame.</p> <p>Detailed factory analysis, if any, required shall be done with permission of HPCL, HO and shall also be open for inspection of the same by HPCL/ or it's appointed agencies.</p> <p>Any Mother board software download/ upload, or change in hardware must be protected by a security dongle. The Current Software Version must be auditable on the Keypad LCD screen under HPCL password. Any software/firmware version change should require authentication through OTP also.</p> <p>In the event of failure of DU, processor / controller card if required to be replaced, the</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes

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		same should be done with card of same or higher version.			
D21	History logs	<p>The History logs with following number of changes must be recorded (in non-volatile memory) for:</p> <ul style="list-style-type: none"> a) latest 100 Unit Price changes (Date, Time, New Rate, Rupee Totaliser, Litre Totaliser, User Level) per product b) 10 calibrations K factor changes (K Factor, Rupee Totaliser, Litre Totaliser, User Level, Date, Time) per nozzle c) 20 Dispensing Mode Change - Auto or Manual (New Mode, User Level, Date & Time) d) 10 Sale Transactions (Transaction Number, Rupee Sale, Litre Sale, Rate, Date, Time) per nozzle e) 20 Error codes (Error / Event Number, User Level, Date & Time) should be stored and it must be possible to recall both the old and latest. f) ERROR codes to be flashed on the screen key pad and not on the main display. <p>Compatibility with Dynamic Pricing-Scheduling of Rate Change facility should be available in MPDs. The history for last min 100 logs per product for price change with date, time and totalizer meter reading should be made available</p>	<p>There should be a monthly file of logs which is to be stored in the server of vendors and shall have provision to be sent to CMS in future through Automation.</p> <p>HPCL should be retrieve upto 1 year backup of logs wherever automation provides such features.</p> <p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D22	Password Protection	<p>All the programming parameters to be accessed thru multi Level Password of minimum four digits, as per admissible rights.</p> <ul style="list-style-type: none"> a) User Level i.e. RO User. b) Supervisory level i.e. for DU OEM Engineer for maintenance purpose c) Factory (OEM) level i.e. for DU OEM for factory working. d) W&M user for E-Calibration etc. e) HPCL user for changing DU mode. <p>Right for changing DU mode from Auto to Manual and for viewing the history logs shall rest with HPCL user only.</p> <p><u>Software version:</u> The software version should be viewable under HPCL and / or Supervisory Password.</p> <p>Additionally there shall be a Changeable Password to, enable the following:</p> <p>Dispenser Mode Selection - Manual / Auto Mode. Also refer Functional Design Specification for Event, Error & Exception Logs & Audit Trails with minimum requirement provided in the Tender doc. This password shall be changeable through DU Keypad only.</p> <p>Note: Vendors are advised to develop the solution for HPCL requirement for future tenders.</p> <p>DU should have provision under HPCL password both for initiation of compulsory printing for every transaction and / or on demand printing. In case of mode of compulsory printing, the DU should not enable next transaction unless and until a printout for the previous transaction is generated. Similarly, in case of "Paper out" also, if the mode of compulsory printing has been selected, then DU should not enable next transaction. The printer should also for printing the second copy for the transaction, if required and shall be marked as "DUPLICATE".</p> <p>Password Protection - Operator Level, Supervisory level & Automation level. Also refer Functional Design Specification (Retail Automation) for Event, Error & Exception Logs & Audit Trails with minimum requirement provided in the Tender document.</p> <p>Automation password will be for the sole use of HPCL and shall exclusively control NANF related functions unless configured for additional rights, as & when desired by HPCL.</p> <p>Calibration history shall be viewable through both automation as well as supervisory password. Preset to the pump if initiated through local keypad can be changed through local keypad only and not through Automation system and vice versa.</p> <p>Depending on the nature of additional feature, DU would be tested with automation system for any change in FCC, if required. It is clarified that selectable option will allow direct printing from the Forecourt Controller (FCC). In case, the Forecourt Controller stops communicating, the printer will take command from the DU to enable local printing. Facility to input and broadcast the last numeric part (4 digits or less) of vehicle</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes

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		<p>number in the DU shall be provided. New protocol command set / logic for the same shall be furnished by the DU vendor. Changes, if any, at automation end would be carried out to allow polling by the FCC/POS computer/remote machine. The NANF event logs & audit trails along with date / time shall be accessible by Automation and Supervisory password.</p> <p>However, all Event Logs and Audit Trails shall be configurable at HPCL discretion. Present indicative list is attached for immediate implementation.</p>			
D23-1	Volume Calibration	<p>Facility shall be incorporated to correct any error in volumes dispensed by DU through ELECTRONIC CALIBRATION only.</p> <p>The Electronic Calibration shall be part of the electronic System housed within the ERA box (or part of pulser sealed W&M seal) and shall be under supervisory level access. Physical access to same to be given to W & M as required by the Dept. of Weights and Measures.</p> <p>E calibration should be possible in both automation and manual mode. As per protocol E cal, K factor must be a read only parameter. The K factor in no way must be changeable from any external means and also no manual entry of K factor must be allowed.</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D23-2	Volume Calibration	<p>The Typical Electronic calibration procedure to generate K Factor to be as defined below (illustrative but typical parameters, accuracy, storage, automation etc. requirements shall be mandatory irrespective of calibration method):</p> <ul style="list-style-type: none"> 🔧 After due intimation to / approval from W&M, Unseal Calibration device. 🔧 Enter calibration mode thru a switch on the PCB & then only option for entering into E-cal should be activated on the Key Pad through relevant password. 🔧 Once in E-Cal mode, DU shall not dispense any fuel. 🔧 Choose the can size: 5 Litres, 10 Litres or 20 Litres. 🔧 Start filling the can, after the can is filled enters confirmation. 🔧 The system should ask if the reading is valid or not. 🔧 Then start the second filling. 🔧 And then 3rd filling 🔧 The system should ask whether the calibration factor is to be based on the average of 3 or any one particular reading. 🔧 Decide and enter your choice 🔧 After this the system should show what the calibration factor (k factor) is. <p><u>Other parameters:</u></p> <ul style="list-style-type: none"> 🔧 "Maximum Allowable E-calibration range for K-factor (+/-1%): +/-50 ml for 5 litres can size and +/-200 ml for 20 litres can size. Defined Legal Meteorology upper tolerance limits shall include equipment operational tolerance in ambient conditions also". The history of such 50 calibrations / error correction shall be stored. 🔧 In case the variation is beyond the above defined values, the DU shall not accept the E-Cal value and shall stop fuelling and Vendor has to replace the Metering Unit. 🔧 Enter operation mode through password. 🔧 There should be no provision for direct entry of K factor. 🔧 The history of such 50 calibrations / error correction shall be stored in the CPU memory of the ERA and shall be recalled in the two-line keypad display board and also printed through receipt printer "ON Demand". 🔧 The key press steps to view E-cal K Factor shall be minimum & must be displayed via a sticker on the side of the Dispenser. 🔧 This is an auditable information and to be under HPCL changeable password. Automation password will be for the sole use of HPCL and shall exclusively control NANF related functions unless configured for additional rights, as & when desired by HPCL. 🔧 Calibration history shall be viewable through automation as well as supervisory/ X level password. 🔧 For each electronic calibration following data will be mapped and preserved. <ul style="list-style-type: none"> a) K factor b) Date & Time of Electronic calibration <p>Vendor to enable above parameters to be captured by HPCL in their RDB & Automation wherever enabled.</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D23-3	Electronic Cumulative totalizer:	<p>Electronic Cumulative totalizer:</p> <ul style="list-style-type: none"> ✓ As the EMT has been removed for ready reference of the Totaliser value 	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender</i></p>	Verification by TPIA	Yes

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		<p>respective Electronic Totaliser value shall be enabled to be displayed on the Key pad LCD for 20 seconds as and when a specific Nozzle is kept back in the boot. This Value shall be read from the same basic motherboard memory storage.</p> <ul style="list-style-type: none"> ✓ An additional Back Up of the Electronic Totaliser Value of each nozzle shall be maintained on a board, other than the Mother Board and this must be readable when required in case of the Mother Board Memory failure due to any reason. It is to be ensured that it must be available at least in two locations in non- volatile memory with the primary storage under W&M seal. Totalizer data must also be displayed on LCD or main display. In the event of a need to replace any or all cards, reference of the latest totalizer reading must be available for incorporation and updating of records. ✓ Electronic Totalizer should be of 12 digits (including decimals) concurrent with 2 digits after decimal, i.e. Nine full digits and Two digits after decimal point. ✓ Electronic Totalizer reading should be a non-resettable/ irreversible even by the programmer. ✓ This totalizer shall be recalled on main display or Keypad display through key pad commands. ✓ Electronic totalizer shall not be reversible by any means. There shall be no provision what so ever to feed or change the Electronic Totalizer value. Vendor to confirm non-reversibility. ✓ In case nozzle resting in boot condition, totalizer readings should display on the keypad or main display ✓ 12-digit electronic totalizer reading to be stored into 2 separate locations (Separate electronic cards) of the DU This value of the totalizer to be recalled as and when requested through keypad menu & it should be possible to read this on ERA LCD or keypad LCD or any other LCD display or any other main display associated in the DU. <p>Calibration count: Cal count is a counter register which is non reversible or non - tamperable event by the design. Whenever the electronic calibration is done this count will increment by one. The latest count must show the total number of changes made so far.</p> <p>There shall be specific information stickers on the DU indicating e.g. "Sealing Points - Meter with Pulser, MB, Electronic Calibration Point" "Electronically Calibrated DU - No Calibration on Meter" Calibrated DU - No Calibration on Meter"</p>	<p><i>conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>		
D23-4	Enforcing Daily Test Delivery	<p>As stipulated, each nozzle of a DU should enforce through program a 'Test delivery mode' of 5 litres once in 24 hours. In case this is not done in a 24-hour period, the DU should stop operating in the normal mode at the end of 24 hours and give an alarm/message.</p> <p>The DU should be in the Test mode at the time of carrying out this activity daily. The test reports should be maintained locally</p> <p>In such cases normal delivery can happen only after doing the test delivery. In case the 24-hour span after the last test delivery happens during an ongoing delivery, the present delivery should be completed and then the DU should go into the 'Test delivery mode'.</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D24-2	ERA - Automation	<p>In Automation mode the pump must be a slave to the FCC/ automation platform & Pump Motor shall not start (i.e. DU shall not get authorized) until the authorization command is received from automation system in Call state while fueling in remote preset mode.</p> <p>The DU OEM should provide the Simulator with protocols (for the offered DUs) to HPCL, as and when required.</p> <p>Shall provide to HPCL appointed automation vendor, if required on chargeable basis. Vendor shall assist HPCL appointed automation vendor for its DU integration through Lab Testing and field assistance, if any.</p> <p>Electronic components should be capable of withstanding without damage test conditions as specified below for extreme ambient operating temp. Of -10.0 deg C to +55.0 deg C.</p> <p>Environmental Type testing shall be carried out at ERTL / Govt Approved - NABL Certified Lab for each model with the entire dispenser i.e. With liquid</p>	<p><i>Document shall be submitted before commencing the supply.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

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		<p>dispensing provision.</p> <p>Above certified environmental testing report for one model representing all the components under this order shall be submitted. HPCL/ TPI reserve the right to witness the inspection/testing and to get the same tested even after installation at any independent lab.</p> <p>Internal wiring shall be of high grade Copper wire and conforming to ATEX approved makes, if installed in hazardous zone.</p>			
D25	Preset Key Pad	<p>Alphanumeric ruggedized Metallic keypad to be provided for various commands and vehicle no. Entry. Additional two lines. LC Display shall be provided along with keypad in case the functionalities can be displayed in any other displays connected in the DU.</p> <p>Specific keys for Totaliser viewing must be provided & the key press sequence shall be basic & simple e.g. "Totaliser" Key + "1" key gives the Nozzle 1 Totaliser Volume & Amount readings viewable on either the ERA LCD display or Key pad LCD screen, this data must be printable on demand by press of the Print key. Similarly for the other nozzles 2,3,4,5,6,7,8, etc.</p> <p>Note: It is advisable to use metallic keypad for long life and reduced downtime. It also helps to discharge ESD and helps in safety.</p>	<p>Document shall be submitted before commencing the supply.</p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D26	Specify the details	<ul style="list-style-type: none"> High / low voltage protection for Electronic Circuit. Method of pulse counting. Temperature range 	At the time of Model approval and TPI inspections/ validations	Verification by TPIA	Yes
D27	Displays:	<p>DU to be provided with backlit LED (static display type and not multiplexed) readable both during day and night and even under direct sunlight.</p> <p>High end media displays (Optional) integrated should have high visibility of content shown both during day and night and even under direct sunlight.</p>			Yes
D28	Character Height:	<p>Volume & Sale Value: 35 - 40 mm Nominal Rate per Litre: - 25 mm Nominal Density : 20mm Nominal (Optional) Temperature: 20mm Nominal (Optional)</p>	OEM certification.		Yes
D29	Number of Digits:	<p>The Unit rate of each product available on MPD should be visible before commencement of dispensing fuel. However, during dispensing operation, only Unit rate of product of active hose must be on display. (Dynamic daily price change). Optional -> display density and temperature or any value content that can be shown.</p> <p>Sale Value- 7 digits; To read up to Rs. 99999.99 (excluding decimal) Non floating Volume- 6 digits; To read up to 9999.99 ltrs (excluding decimal). Rate per ltr. - 5 digits; To read up to Rs. 999.99 per litre (excluding decimal).</p>	<p>Document shall be submitted before commencing the supply.</p>	Verification by TPIA	Yes
D30	Remote Display provision	The ERA shall have port provision for separate remote display with larger LED / LCD digit panel or Media display to be integrated at a later stage wherever feasible after suitable modifications.			Yes
D31	Quality of LCD:	Industrial Grade Type to withstand up to 80° C.			Yes
D32	Specify make.	Vendor to specify make and furnish certificate of compliance to above rating from sub-vendor, if outsourced.			Yes
D33	Mounting of Micro Controller	<p>All micro controller and programmable ICs carrying the pump software shall be Surface Mount Devices and shall be directly soldered on the respective PCBs to ensure that unauthorized access or change to micro controller or such other components is rendered impossible.</p> <p>The manufacturer should have their Tag - logo printed along with the Board serial number on the motherboard for identification. It shall be mounted on the structure through a screw/ bolt and the whole mounting to be under sealed with manufacturer's seal on it.</p> <p>There shall be specific information stickers on the DU indicating "this is a Electronic Totaliser enabled DU, No EMT /MT provided"</p>	<p>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes

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D34	Pre-set facility.	<p>DU nozzle should operate only after Presetting. The Preset amount / quantity should be displayed on keypad display and not on main display. Pre-Set facility with alpha numeric & additional function keypads to enable customer to choose between litre and rupee value modes as required and also to enable the pump attendant to enter the vehicle no. Which is needed to appear in the cash memo to be printed in the printer attached to DU. The default vehicle no. If not entered, should read, "Not Entered".</p> <p>If the Preset delivery is manually aborted (not due to power failure - In this case log shall be available in error history indicting the power failure) before it is completed, the log of the Preset quantity, and actual quantity dispensed should be mandatorily logged with time stamp. A log trail of the last 200 aborted Preset deliveries should be available at recall.</p> <p>In remote preset the Local Key pad must be totally disabled & the remote preset value must not be alterable from the Local Key pad. Preset to the pump if initiated through local keypad can be changed through local keypad only and not through Automation system and vice versa.</p> <p>Preset Mode shall be configurable. Default settings shall be in Pre set mode.</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA	Yes
D35	Display and Memory Retention	<p>Non volatile memory to support data backup under power failure. Display backup should be supported for minimum 15 min as per OIML 117. After power failure super capacitors to support display backup and no external battery is acceptable.</p> <p>In other words, DU CPU/ Control Card should be provided with super capacitors for internal power backup to protect the same from power surges/ intermittent power failure to protect the transaction data.</p> <p>The status of power back up availability has to be checked by the electronics before each transaction, so as to ensure availability of backup in case of any power failure during the transaction. All other measures (in case of any power failure or when the super capacitor is low) as per specification to be ensured.</p> <p>In case of low/no power the display must have the provision to retain the last transaction for a period of 15mins. This is to be demonstrated during TPI Inspection by disconnecting the power to the DU and checking the display retention for 15 mins as per OIML 117.</p> <p><u>External Lead acid batteries are not required for display backup.</u></p>	<p>Relevant Test certificates & TPI Reports.</p> <p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p>	Verification by TPIA along with Certificates	Yes
D36	External Batteries	<p>No external battery is permitted.</p> <p>All data including backup for electronic totalizer & logs should be available at all times and to be retained even after power disruption.</p>		Verification by TPIA.	Yes
D37	DU Protocols	<p>The relevant DU protocols and details of firmware version shall be provided to HPCL (in hardcopy as well as in electronic form on a physical media). DU vendors to change the software version during the supply of dispensing units with due approval from HPCL.</p> <p>The History logs with number of changes must be recorded for latest transactions as stipulated. It must report both initial & final totalizer with transaction details to Automation system. DU idle time setting, NANF setting should be feasible to be changed through HPCL password by FCC /HPCL server with through Automation system remotely.</p> <p>Any change in Hardware/Software to be logged into the non-volatile memory of the DU along with the totalizer stamp. The same logs must be available to FCC on request.</p> <p>The last totalizer reading shall be the starting reading after any software version change.</p>	<p><i>Document shall be submitted before commencing the supply</i></p>	Verification by TPIA.	Yes
D38	Automation Interface	<p>It is clarified that selectable option will allow direct printing from the Forecourt Controller (FCC) or from automation platform installed in a remote client. In case, the Forecourt Controller stops communicating, the printer will take command from the DU to enable local printing. Facility to input and broadcast the last numeric part (10 digit alphanumeric vehicle number) of vehicle number in the DU shall be provided. New protocol command set / logic for the same shall be furnished by the DU vendor.</p> <p>Changes, if any, at automation end would be carried out to allow polling by the FCC/POS computer/automation platform installed in a remote client. The NANF event logs & audit trails along with date/ time shall be accessible by Automation and Supervisory password.</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA.	Yes

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		<p>However, all Event Logs and Audit Trails shall be configurable (Refer Pump Parameter Configuration of Functional Design Specification for Event, Error & Exception Logs & Audit Trails - minimum requirement provided in the Tender document.</p> <p>Software version The software version should be viewable under HPCL and / or Supervisory Password.</p>			
D39	History Logs	<p>History of logs as under to be recorded in non-volatile memory and stored for recall on keypad display or main display. DU should be capable of dumping the Logs in the Readable Format to the automation system. Logs to be displayed on the screen keypad with optionally on the main display. DU should be in position to export the data logs into an external device like USB Last 100 Unit Price changes (Count, Date, Time, New Rate, Rupee Totaliser, Litre Totaliser, User Level) - per product</p> <ul style="list-style-type: none"> 🔧 Last 20 Error codes (Count, Error / Event Number, User Level, Date & Time, Error description) should be stored and it must be possible to recall both the old and latest. 🔧 Log of the last 50 events of the 30 sec motor cutoff events 🔧 50 calibrations K factor changes (Count K Factor, Rupee Totaliser, Litre Totaliser, User Level, Date, Time) per nozzle. 🔧 Last 10 No. Sale Transactions (Count, Transaction Number, Rupee Sale, Litre Sale, Date, Time, Unit Price) per nozzle 🔧 Last 20 No. Dispensing Mode Change - Auto to Manual (Count, New Mode, User Level, Date, Time, Totaliser) 🔧 Log of the last 200 aborted preset delivery events and the quantity dispensed. 🔧 DU Testing 50 Logs. <p>No log is required for Memory error; it is to be displayed on the keypad display.</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA.	Yes
Specification of all types of Dispensing Units Related to Automation with DU Electronics					
E1	Firmware gradation Up	<p>Usage of advanced hashing algorithm like SHA-2 (SHA-256 algorithm with a minimum bit length of 1024 bit) for the generation of firmware signature & this Number/ character string must be made known to HPCL. This must be verifiable on the. Key pad LCD screen or any other display screen of DU.</p>	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA.	Yes
E2	Dispenser Mode Selection- Manual / Auto / Fixed Auto Mode	<p>Provision should be there for selection of the Dispenser Operating Mode i.e. In automation or manual. Access to changing the mode should only be thru a separate Highest Level of one time usable Password. Dispenser should log the timing & details of transactions carried out in Auto & Manual Mode.</p> <p>Working of DU in Auto / Manual Mode</p> <ol style="list-style-type: none"> 1. The default mode of DU when dispatched from OEM factory shall be in MANUAL and shall be changeable at the RO. On receipt of the Automation signal the DU shall work in Auto mode only. 2. There shall be 2 types of selections available through an entry-level changeable 4/6 digit numeric password inputted / fed through the DU keypad or through a remote control device by an authorized personal 3. These selections shall be: <ul style="list-style-type: none"> Selection I: Choice in mode of operation (Auto or Manual) 🔧 Choice I: - Manual (stand alone) 🔧 Choice II: - Change over to Automation Selection II: No choice except Automation. 🔧 Fixed Automation Mode thru a fixed known three-digit Key number. Enabling this selection shall be possible only with a specific key entry (non changeable, but will avoid accidental choice of this Selection). 4. Details enclosed for No Automation No fuelling concept The DU once in automation mode shall not revert to Manual mode in case of a power recycle. It should also be possible to reset/ change password through Automation system 5. The DU once in automation mode shall not revert to Manual mode in case of: <ol style="list-style-type: none"> a) A power recycle & / or ii. A failure of Automation signal Note: However, in order to bring the DU in manual mode, in case of automation signals failure, password to be used by HPCL. 	<p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p> <p>OEM undertaking having retained the same at the time of supply with each batch of DU.</p>	Verification by TPIA.	Yes

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		<p>b) In case of a transaction initiated by automation system and later automation system failed while transaction is in progress then DU should allow completion of the ongoing transaction initiated by automation system and then authorize HPCL to change to manual mode.</p> <p>6. In case, the DU is dispensing in manual mode and Automation signal is sensed on its communication port, the DU shall switch over to automation mode after completion of on- going delivery transaction in manual mode and pump comes to idle state.</p> <p>7. In remote preset the Local Key Pad must be totally disabled & remote preset to the pump if initiated through local keypad can be changed through local keypad only and not through Automation system.</p> <p>Retail Automation: Hardware change audit (except for DU controller card where the hardware change audit is stored) is required. Parameter stored: hardware description, date & time. The requirement of exporting the data logs into an external device like USB would be a desirable feature of DU or to an automation platform. However, DU has to be capable of exporting the data logs in the ASCII Text Format ontoan external device like Forecourt Controller / Site Controller or a hand held device or a centralized automation platform. DU vendors not to change the software version during the supply of dispensing units.</p> <p>Any specification and/or code mentioned in the document have to be as per the latest version.</p>			
E3	Communication Junction Box	<p><u>Communication Junction Box:</u></p> <p>Separate communication Junction Box (JB) with sufficient terminal blocks to be provided to terminate automation host communication cable in the Junction Box. This JB required to be provided at the bottom of the DU.</p> <p>Communication between such JB & DU's Control Card should be pre-wired, glanded, terminated and protected duly plugged at the other end.</p> <p>Provision to be made for providing standard power supply to the wireless equipment maintaining sanctity of the approvals and statutory compliance.</p> <p>Vendor to design for a maximum cable size of 2.5 sq. mm. as per relevant BIS standards or equivalent.</p>		Verification by TPIA.	Yes
E4	DU protocol	<p>The DU communication protocol shall be handed over to HPCL for its business use. Also, the pump manufacturer shall provide technical support with respect to protocol, pump electronics to HPCL and / or its nominated automation vendor, if required. The protocol must be robust, reliable and standard to support any automation system with start and stop byte, parity checks, baud rate, two way communication, checksum for error correction, acknowledgement, etc.</p> <p>The MPD must have a RS 485 Type of communication port (hardware -2 wire, 2 way communication) and a messaging protocol available, such that a host machine cancontrol and retrieve transactional data from the DU. DU should be able to communicate with standard automation systems in multi dropping mode (4 DUs multidropped on one node) and all basic parameters required by the automation system must be present inthe DU memory map.</p> <p>HPCL warrants the vendor to ensure that the pump software / SHA Signatures/ programme remain strictly confidential. Vendor to ensure tight security with suitable internal processes to prevent the software from being disclosed to any outside party.</p> <p>HPCL reserves the right to debar the vendor from all future tenders in the event HPCL has reasons to believe that the same has come into the possession of any undesired person or agency with or without the consent of vendor.</p> <p>In any case of detected manipulation in DU irrespective of the reasons, vendor shall load new software or replace the manipulated motherboards with new motherboard as per HPCL's requirement for all the susceptible DUs at no extra cost & consequences to HPCL in a time bound manner till the completion of CAMC/ warranty period.</p> <p>The relevant DU protocols and details of firmware version shall be provided to HPCL/</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p><i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions.</i></p>	Verification by TPIA.	Yes

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		<p>HPCL appointed automation vendor/ Testing Agency (in hardcopy as well as in electronic form on a physical media), under appropriate NDA.</p> <p>In addition to protocols during software testing necessary assistance and software details & codes to be provided to Testing agency under NDA preferably CDAC for final validation for all security features etc.</p> <p>The protocol shall support remote change of unit rates for all nozzles in the DU. This is in order to enable remote price change of products through Automation System if required. Viewing such changes shall be HPCL password protected. History of such changes shall be stored in CPU and be recalled when required.</p> <p>Summarized Additional/ Special Features in DU required for Automation Integration/ Information to be conveyed to FCC/ CMS/ Automation platform:</p> <ol style="list-style-type: none"> 1. All log details (of the DUs as stated above in various points in specs) including calibration changes and K factor needs to be captured in the Automation system. 2. Idle time out setting of the DU needs to be captured in the automation system nozzle wise. 3. Preset and actual delivery (volume & amount) to be captured in automation system. 4. Reports of deliveries that means transactions for which deliver quantities are zero against a given preset quantity to be captured. 5. Logs of DU, Auto mode to manual mode and vice versa to be captured. 6. DU Inbuilt NPND features - Status whether the feature is enabled or disabled is captured. 7. Logs of the prints from the DU inbuilt printer to be captured. 8. Price change log carried out at DU end through the DU keypad to be captured by the automation system. 9. Logs to be captured when the DU is in manual mode, when the DU reverts back to the auto made and communication with the automation system. 10. DU testing logs to be captured. 11. Provision for the DU for real time status (idling state/ fueling state, transaction completed state & printing state) <p><u>Note: HPCL shall prefer that DU protocol follow IFSF protocol over TCP/IP designed specifically for inter communication of all forecourt devices.</u></p> <p><u>In near tenders HPCL shall mandatorily switch over to IFSF protocol over TCP/IP. Vendor may develop solution accordingly and look for possibility in the solution for migration if required in future.</u></p>			
E5	Communication Protocol and Memory Mapping	<ol style="list-style-type: none"> a) Irrespective of the upgradation of versions of different DU models, the basic communication protocol and memory mapping of a specific DU make and model should remain unchanged, so that the same does not affect RO Automation system. b) Hard coding of any feature/functions/functionalities at any place in the Software code is NOT permissible. c) All functional parameters, which affect future expansion/modification/upgradation, shall be configurable to the best possible extent. Vendor to declare these configurable parameters in their offer. d) Vendor to avoid proprietary protocols/ standards/ configuration as far as possible. Whenever the use of the same is unavoidable, the Vendor to declare the same in their offer. <p>However, all Event Logs and Audit Trails shall be configurable at HPCL discretion. Present indicative list is attached for immediate implementation.</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes
E6	Communication Protocol	<ol style="list-style-type: none"> a) Should there be a need in future for generating additional read/ write parameters necessitating a new Software Version of the DU, the same should be possible without affecting the existing automation system drivers. In case the nature of upgradation necessitates a change in the memory map/ communication protocol, the same is acceptable subject to in time ha n Dover of DU protocol by the OEM. The requirement of exporting the data logs into an external device like USB would be a desirable feature of DU b) However, DU has to be capable of exporting the data logs in the ASCII Text Format onto an external device like Forecourt Controller/ Site controller or a hand held device. 	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes

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		However, bidders may also confirm that should there be a need to change the communication protocol and memory mapping in future, as desired by HPCL, vendor shall be able to implement the same.			
E8	Local printing onDU printer with command from FCC	<p>DU should, by default enable local receipt printing. Option should be available on auto as well as manual mode. Or alternatively as a Go green initiative support in sharing e- invoice copies/ soft copy of the invoice in non-editable format to the registered email ID Of the consumer or to the consumer whatsapp number.</p> <p>In the DU 'No Print No Delivery' (NPND) is mandatory. The disabling of NPND should be only through Supervisory level password. Facility to input and broadcast the last numeric part (4 digits or less) of vehicle number in the DU shall be provided. New protocol command set / logic for the same shall be furnished by the DU vendor.</p> <p>Additionally as an option if HPCL desires it should be possible to disable & disconnect local printing and connect the printer communication port directly to the FCC/ automation platform. In this case the print command to the DU Printer will be directly from the FCC/ automation platform & the DU Mother board will be totally bypassed. The Print out will be with the POS transaction ID.</p> <p>The FCC will be integrated to the printer protocols. The DU Vendor along with the DU protocols shall share the Printer Driver Protocols & Communication port details.</p> <p>Confirmation to FCC shall be sent to FCC for each printed/ non -printed transaction for enabling NPND.</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes
E9	Retail Automation - Interface	<p>For the above local printing option from FCC/e automation platform, DU vendors shall recommend the feasibility of modifying the protocols to accommodate the following:</p> <ol style="list-style-type: none"> 1) How taking the print can be prompted & taking the print can be made optional i.e. can be bypassed or okayed 2) If to be printed the method by which the Vehicle number shall be provided to the FCC using the preset key pad & printed on the receipt Printer automation mode: 3) After the completion of every transaction in auto mode and putting nozzle back in boot, Automation system shall issue the transaction 1D (16 digit), Customer Attendant ID by default to the DU. Date & time Stamp after every transaction will bethat of the DU & not from Automation. 4) Once print key is pressed on the DU keypad, it shall seek Vehicle no., Mobile No., to be entered by Customer Attendant. 5) DU's inbuilt printer or printer connected to the FCC/ automation platform shall print the relevant transaction receipt with the details provided by the AutomationSystem along with Vehicle No. And / or Mobile No., if entered. 6) On generation of the transaction print out, DU shall communicate back confirmation to Automation system that prints out has been taken against the Transaction ID along with relevant Vehicle no. And / or mobile no., if entered. 7) All other prints possible from the DU's in built printer will remain UN affected and shall attract no change. In case the automation system is not operative, printer shall continue to work independently and generate printout without the transaction ID issued by FCC. 8) DU should be able to capture electronic totalizer reading as soon as DU goes out of automation system and switches over to manual mode with the password provision. DU should also be able to capture electronic totalizer reading as soon as DU comes back in automation system from manual mode operation. 	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes
E10	Retail Automation - Interface	<p>Event logs and audit trails along with date and time are to be incorporated.</p> <p>Additional Points –</p> <ol style="list-style-type: none"> a) The NANF event logs & audit trails along with date/ time shall be accessible by Automation and Supervisory password. b) All Event Logs and Audit Trails shall be configurable (Pump Parameter Configuration of Functional Design Specification for Event, Error & Exception Logs & Audit Trails are provided along with complete FDS of Automation - attached separately. <p>However, all Event Logs and Audit Trails shall be configurable at HPCL discretion. Present indicative list is attached for immediate implementation.</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes

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E11	Retail Automation - Interface	<p><u>Retail automation points:</u></p> <p>Printing from DU printer While operating in Auto mode, whenever the DU goes to manual Mode, the DU has to store its totalizer reading and when the DU re- connects to FCC/ automation platform, this totalizer reading has to be communicated to FCC/ automation platform by the DU.</p> <p>Transaction of DU On completion of a transaction, the DU will get transaction ID from FCC/ automation platform... and will print this transaction ID when a transaction print is initiated from DU keypad. In case of communication failure while dispensing is in progress, DU has to generate transaction receipt for the transaction (whatever quantity /amount dispensed by the DU) at the DU- end. This printout from DU would be without any transaction ID from FCC. While operating in auto mode, the transaction ID from FCC shall be maximum 16 digits.</p> <p>DU manual mode However, while working in manual mode, ID will be generated by DU would be 4 digits as given in the tender document.</p> <p>DU logs, error and alarms All log/s, error/s and alarm's recorded by the DU would be sent to FCC through the native protocol of the DU.</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes
E12	Retail Automation - Interface	<p>DU Junction box DU Junction box should have additional spare terminal required for input of UPS power supply (for cable size 2.5 sq.mm) to RO Automation equipment. This terminal should be wired up to the top of DU in '0' zone. This end of the terminal will have terminal block for connection to the RO automation equipment. Another terminal for communication (for cable size of 2 pair x 0.5 sq. Mm) should be kept at the junction box in Zone '1'. In similar manner, it should be ensured that one pair of cables remain spare, even while wiring DUO pumps for automation equipment. Both the terminal blocks should be marked to have proper identification of power and communication.</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes
E13	DU Automation Interface protocol	<p>DU communication protocol shall be handed over to HPCL.</p> <p>The protocol must be robust, reliable and standard to support any automation system and shall have all details of errors, k factor, and logs, to be transferred to Automation System.</p> <p>In case of a communication failure, the FCC/ automation platform should wait only for a maximum of 30 sec. In such events there should be no dispensing and DU should stop. There should be no pre-authorization of nozzles. Pulser should also time out in 30 sec.</p> <p>The DU's memory map should have features to meet the broad requirement viz. start and stop byte, parity checks, baud rate, two way communication, checksum for error correction, acknowledgement, etc. Detailed requirements including error codes to be covered in DU protocol shall be discussed during pre- bid meeting.</p> <p>Also, the DU OEM shall provide technical support with respect to protocol, pump electronics to HPCL and / or its nominated automation vendor, if required for integration with RO Automation System. DU OEM shall also be responsible to provide one simulator for each model of the DU with HPCL.</p> <p>DU shall communicate with Automation System through RS 485 type of communication port (hard ware -2 wire, 2 way communication) or a secure communication channel established between DU and Automation Platform as per the DU communication protocol. DU should be able to communicate with Automation System in multi dropping mode (i.e. maximum 4 DUs multidropped on one node).</p> <p>DU OEM to ensure that the DU's software remains strictly confidential. DU OEM to ensure tight security with suitable internal processes to prevent the software from being disclosed to any outside party. HPCL reserves the right to debar the vendor from all future tenders in the event HPCL has reasons to believe that the DU's software has come into the possession of any undesired person or agency. In such case, DU OEM shall carry</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Documents shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes

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SN	Description	Specifications	Required Documentation	QAP Requirements	Indicative Frequency Req. (TPI) - One/ Model
		<p>out the following as per HPCL's requirement for proper functioning of the DU at no extra cost to HPCL:</p> <p>i. Load a new software or ii. Replace the manipulated motherboard with new motherboard.</p>			
E14	DU Automation Interface protocol	<p>Read & Write Parameters for communicating with Automation system Following parameters must be available in dispenser for integration with automation system, using an industry / vendor standard protocol. <u>Read Parameters:</u> i) DU Status ii) Running Quantity & Amount while dispensing iii) Sale transaction information, comp etc with Totalizer value Date; Time, Amount, Volume, Unit Price, Totaliser iv) Preset (Quantity/Amount) being keyed in at DU end. v) K Factor vi) Totalizer values for Quantity. (Idle call, authorized, fuelling, suspended, payable) <u>Write parameters from automation system:</u> i) Preset (Quantity / Amount) ii) Clear sale completion status iii) Price per unit Volume iv) Suspend sale v) Resume sale vi) Authorization vii) Cancel Preset</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes
E15	DU Automation Interface protocol	<p>A. By default the DU will be in Manual mode from Factory setting. B. On receipt of the Automation signal the DU shall work in Auto mode only. C. The DU once in automation mode shall not revert to Manual mode in case of: i. A power recycles & / or ii. A failure of Automation signal <u>Note:</u> i) However, in order to bring the DU in manual mode, in case of automation signal failure, password to be used by HPCL. ii) In case of a transaction initiated by automation system and later automation system failed while transaction is in progress then DU should allow completion of the ongoing transaction initiated by automation system and then authorize HPCL to change to manual mode. D. In case, the DU is dispensing in manual mode and Automation signal is sensed on its communication port, the DU shall switch over to automation mode after completion of on-going delivery transaction in manual mode and pump comes to idle state. E. In remote preset the Local Key pad must be totally disabled & the remote preset value must not be alterable from the Local Key pad. Similarly, Preset to the pump if initiated through local keypad can be changed through local keypad only and not through Automation system.</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes
E16	Local printing on DU printer	<p>Local printing on DU printer</p> <p>DU should enable local receipt printing on demand. Each print out should contain the transaction ID (maximum 8 digits) of the sale transaction. Facility to input and print the vehicle number shall also be provided through DU Alphanumeric keypad and LC Display. The default vehicle no. If not entered, should read "Not Entered".</p> <p>In case a transaction has been initiated with a preset value (volume or amount) either from automation system or from DU key pad, the same also needs to be printed on the receipt as "Preset (volume or amount)". If, preset is not given then the receipt should have "Preset not entered". Each receipt should bear a unique receipt number (maximum 5 digits associated with unique alpha-bet series for each month) linked to a counter. Automation system shall provide transaction ID (maximum 8 digits) on completion of each transaction which shall be printed on the receipt which shall override DU transaction ID</p> <p>In case of automation failure, the printer will take transaction ID (maximum 6 digits) from the DU and do local printing. DU should be in a position to send printing ID of the last transaction of the shift at every shift closure initiated by automation system. DU should generate alarms for the situations of "Low paper", "Paper out" & "Printer failure" and send the same to the automation system instantaneously on their</p>	<p>Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement.</p> <p>Document shall be submitted before commencing the supply</p>	Verification by TPIA.	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

SN	Description	Specifications	Required Documentation	QAP Requirements	Indicative Frequency Req. (TPI) - <i>One/ Model</i>
		occurrence. LED Indication for such alarm should be available locally at the DU end.			
E17	Miscellaneous.	In case of loyalty solution for a DU is Pre-authorized Mode, once RFID Ring is read by reader, the authorized /not authorized details to be communicated to DU display by FCC. The DU to dispense fuel accordingly.	Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with Automation vendors as per requirement. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA.	Yes
Other Features of DU					
F1	Complaint Management	Vendor to develop web page / portal containing details of RO wise DU details (Not in public domain - to be under password). Area wise details of the service engineer with competency mapping and details of the responsibilities like Preventive maintenance visits, nature of work done, K factor of DU, date of stamping, commissioning etc along with make and model of the DUs. All RO maintenance and call reports should be uploaded and accessible through the link to HPCL which can also be downloaded in pdf format within a period of 48 hours of the visit with time stamp. eCTS should be linked to this webpage on real time basis. HPCL officials shall, be given access to this web page to view DU details of the respective territory. It is proposed that the maintenance reports shall be form based on digital platform in future directly linked with existing e-CTS facility under RDBMS/ CRM. The report shall be fed into the system by the respective Service Engineer of OEMs & exceptions shall automatically be flagged to concerned HPCL officer. The same shall be linked to SAP for triggering online payments as per CAMC terms during the currency of the contract at various stages in from of progressive modules. Vendors shall be required to develop the backend modifications and implement the same in agreed reasonable period from time to time for system improvements including CRM without any additional cost implication to HPCL.	Vendor undertaking for compliance against each feature to be submitted. If required same can be tested with HPCL systems as per requirement from time to time. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA.	Yes
F2	Dual Locking arrangement for ERA	Provision for Dual Locking/ dual seal of ERA and Pulser unit through a unique Biometric/electronic Lock for top box & Hydraulics as locking arrangement with access logs and backup to be provided. Same to be also synchronized with KMS key management system. Vendor has to comply with the system required by HPCL within reasonable time for development as per HPCL system readiness from time to time. <u>Not Required presently.</u>	Necessary certifications etc. as per requirement Vendor undertaking for compliance against each feature to be submitted. If required same can be tested any agency as per requirement. <i>Document shall be submitted before commencing the supply as per conditions stipulated.</i>	Verification by TPIA.	Yes
F3	OTP for Price Change	DUs should have provision for sending details of price change with details as mentioned in specification clause when DU is made online on Automation. Vendors to design & provide solution accordingly. <u>No OTP for price change required presently.</u>	Vendor undertaking for compliance against each feature to be submitted. If required same can be tested as per requirement. <i>Document shall be submitted before commencing the supply</i>	Verification by TPIA.	Yes
F4	Dimensions	NA			
F5	Undertaking	OEMs should mention how they have implemented the crucial recommendations of the statutory bodies, such as Tamper free Pulser with facility to self-destruct, Family integrity check, and AES-128 encryption or better. This then could be vetted by any of the testing agencies mentioned for any non-compliance at sole discretion of HPCL. Note: OEM undertaking having retained the same at the time of supply with each batch of DU.	<i>Certification/ Document to be submitted mandatorily to be eligible for commencing the supply as per stipulated tender conditions in future.</i> OEM undertaking having retained the same at the time of supply with each batch of DU.	Verification by TPIA.	Yes
F6	Major Approvals	Major Approvals (List is indicative & nor comprehensive) ✓ OTP Certification - NII (Network Intelligence India Pvt. Ltd.) etc. ✓ 128 bit Encryption - NII (Network Intelligence India Pvt. Ltd.) etc.	Submissions as stipulated.	Verification by TPIA.	Yes

DIESEL EXHAUST FUEL DISPENSING UNIT WITH INTEGRATED TANK SPECIFICATIONS

SN	Description	Specifications	Required Documentation	QAP Requirements	Indicative Frequency Req. (TPI) - <i>One/ Model</i>
		<ul style="list-style-type: none"> ✓ ATEX Certificate ✓ OIML ✓ W&M ✓ EMI / EMC Certification for Model - ARAI (Automotive Research Association of India) ✓ Environmental Testing - Karandikar Lab ✓ All other component specific approvals/certifications. ✓ Detailed TPI Reports ✓ All relevant test certificates. 			
F7	Additional Note:	<p>The given specifications are minimum required. Any further improvement in prescribed specifications/ requirement with prior approval of HPCL. HPCL reserves its right to get the equipment tested at any third party lab to access specifications. In case of failure to meet minimum required specifications, equipments of that batch will have to be replaced by vendor at his own cost and penal actions as per terms of tender will be initiated.</p> <p>The specifications are only indicative and not exhaustive. Option of choosing the component with best specifications lies with DU vendor. Vendor has to ensure efficient and effective operation of DU for the entire period of warranty/CAMC i.e. 5 years.</p>			
	DEF Storage Tank Specifications				
G1	Tank capacity	1300- 1500 , 2200-2500, 4500- 4800 Litres (effective capacity 1KL/ 2KL/ 4KL after considering 20% dead stock/ re-order level respectively)	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G2	Tank Management System	On line Product Level Monitoring, Temperature, Overfill & Low level monitoring with interlocks for dispensing.	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G3	Pump type	Compatible to Submersible pump/ Suction Type as per solution provided with bottom suction considering negligible dead stock for suction. Adequate arrangement for periodic cleaning of the tank.	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G4	Product decantation method	Top filling with the connectable hose system (One nos to be supplied with each unit with couplings). In addition suitable kit for decantation of 220 l of barrel along with carriage with arrangement for full decantation of barrel in the tank safely to be provided as an inclusive item.	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G5	Dead stock level	Typical 20 % of tank capacity	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G6	Leak detection	Leak sensor preferably between outer shell and bund	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G7	Compartment	Triple compartment design for ultimate protection of the product and the environment	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G8	Weather protection	Weather proof with UV protection to enable installation without any additional roof or coverage. Closed roof with internal thermal insulation for better protection from UV, rain protection. Lateral Lockable doors for easy access and service to each block.	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G9	Dimensions <i>(Typical)</i> <i>Actual shall be as per OEM with prior approval of HPCL</i>	<p>1300 Litre tank - L: 2000 mm H:2400 mm W: 1200 mm 4500 Litre tank - L: 3800 mm H: 3500 mm W: 1140 mm</p> <p>Enclosure having Dispensing unit (Combined/ Separate) can have different dimension as per requirement.</p>	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G10	Access door for filling	Roof hatch for safer access to the inner tank	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G11	Tank inlet	1.25 / 2 inch stainless steel fill line with suitable coupler (designed for maximum 350 Litre per minute delivery)	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G12	Material Construction of	GRP/ PE/ SS or any other material certified for use with DEF with proven Track Record for DEF application.	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G13	Material Construction of Bund	GRP/ PE/ SS or any other material certified for use with DEF with proven Track Record for DEF application.	<u>Vendor / OEM Certification</u>	Verification by TPIA.	
G14	General	<p>Entire Tank & dispensing unit to be preferably housed in the single compact enclosure with suitable arrangement for maintaining temperature of 20 - 32 deg C for the complete system. All such arrangements should be energy efficient with minimum BE 4 star rating based on latest technology.</p> <p><i>Cooling arrangement should be such that it involves minimum electrical components in forecourt. All JB's/ DBs for cable connections to be housed in FLP housings/ enclosures.</i></p>	<u>Vendor / OEM Certification</u>	Verification by TPIA.	

Event Log			
SN	Description	Remarks	Number of changes to be recorded in event log
1.	Dispenser Mode Changes	Parameter stored: New Mode, User Level, Date and Time, Litre Totalizer.	20 (Twenty)
2.	Password Audit – Reset / Changes/Attempts	Password trail needed for Automation (HPCL) level controlling Auto / Manual mode of DU. Parameter stored: Type- change/reset/attempt, User Level, Date and Time.	10 (Ten) instances of 3 Consecutive wrong password entries in a day. 60 (Sixty) password attempts.
3.	Rate Change or Price Change	Parameter stored: Rupee Totalizer, Litre Totalizer, New Rate, User Level, Date and Time.	100 (One Hundred)
4.	Calibration Change or 'K' factor Change History.	Parameter stored: K Factor, Rupee Totalizer, Litre Totalizer, User Level, Date and Time.	50 (Fifty)
5.	OTP usage	Parameter stored: Nozzle no., Function: E- calibration/Card/Software Change, Date and Time, Rupee Totalizer, Litre Totalizer	100 (One Hundred)
6.	Hardware Change Audit (except for DU Controller Card where the hardware change Audit is stored)	Parameter stored: Hardware Description, Date and Time.	10 (Ten)
7.	Firmware Change Audit.	Parameter stored: Firmware version, checksum, Date and Time	10 (Ten)
8..	Sale Transaction Log - Last 10 deliveries	Parameter stored: Transaction Number, Vehicle No., Rupee Sale, Litre Sale, Rate, Date and Time.	10 (Ten)
10.	Preset sale termination (PST)	Parameter stored: PST Type, Date, Time.	200 (Two hundred)
11.	Daily Test Delivery	Parameter stored: Date and Time, Nozzle No., Litre Totalizer	120 (One hundred and twenty)
12.	RTC Change - Change in either Date or Time	Parameter stored: Date and Time (Old & New), Litre Totalizer, Rupee Totalizer	20 (Twenty)
13.	Preset Abort Delivery	Parameter stored: Date and Time, Nozzle No., Preset Value, Rupee Sale, Litre Sale, Rate, Litre Totalizer, Rupee Totalizer	50 (Fifty)
14.	Pump-motor Switch off due to Non-delivery for max 30 secs (configurable)	Parameter stored: Nozzle No., Date and Time, Litre Totalizer	200 (Two hundred)
15.	Errors & Warnings (to be stored in the event log file excluding those like password change, rate change for which separate event log is available)	Parameter stored: Error /Event number, Date & Time, Litre Totalizer	20 (Twenty)

DEF Bulk Dispenser & Storage Tank Specification

