<table>
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<th>Technical Specification for MPD Tender 2017</th>
<th>Bidder's Comments</th>
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</table>
| 1  | **TYPE:**  
High Hose Version Dispensers without pumping Unit suitable for Submersible Pumps. 
Submersible pumps are not in Vendor's Scope. | |
| 1.a| **MODEL NAME:** Vendor to conform for the following MPDs:  
Item: 2 PROD X 4H x 2 DISP (Std Duty) , 2PRODx4Hx4DISP without printer,and 3 PROD X 4H X 2 DISP (Std Duty)with Printer On Either Sides i.e. total two printers per MPD. | |
| 1.b| **Inlet Connection** shall be 38 mm for all MPDs except Heavy Duty. For Heavy Duty Inlet connection would be between 38mm to 50mm However the delivery flow rates as referred in 2.a. should be achievable with FE PETRO / RED JACKET or equivalent make STPs of .75 HP. |
| 2  | **DELIVERY RATE**  
Minimum 30 litres/minute per nozzle when one side and one product in operation for Std Duty.  
Minimum 60 litres/minute per nozzle when one side and one product in operation for Heavy Duty. | |
| 2.a| Vendor to provide Model Nomenclature sheets to interpret the offered Models suitably to our requirement. | |
| 3  | **METERING UNIT**  
Positive Displacement Type, with two or four Piston with Integrated or Separate Pulse Generator. The shaft connecting pulser and metering unit should be in one piece without any transmission gears. The pulser must be an integral part of the metering unit i.e. there should not any gear or wire drive from the meter to the pulser. | |
| 3.a| **Working Pressure** – MAX 3.50 Kg/SQL CM for all MPDs | |
| 3.b|  
**ACCURACY**  
Provision for 10 lts should also be incorporated. | |
| 3.c| Two consecutive readings out of three reading should be within accuracy limits of variation. | |
| 3.d| All measuring units should be only electronically calibrated. Metering unit accuracy shall be adjusted by electronic head in the range as per W&M laws. The electronic calibration must be possible only when W&M seal is broken. | |
| 3.e| **The range of calibration** shall be maximum of 1% on the Negative side (short delivery). Vendor to specify the range in %age for the Positive side | |
| 3.f| **Accuracy of the Meter shall be +/- 0.3% or better when checked along with the total system**  
(pipeline/valves /Hose/nozzle/ etc.) | |
| 4  | **HOSE**  
Hoses would be black in colour | |
| 4.a| 4 M long – 19 MM FOR Standard duty and 25 MM FOR Heavy Duty Nozzles. | |
| 4.b| To be of petrol resistant type of superior quality suitable for Petrol blended with Ethanol of Max 10% | |
| 4.c| Hose shall be hard wall only confirming to BS EN 1360 Type III/UL 330/KHK or Equivalent | |
| 4.d| Hose hook (Material SS304 SGHC(JIS G 3302 / plastic material of adequate strength & longevity) to be provided to hold the hose in position so as to prevent it from rubbing against the ground. | |
| 4.e| Hose would be black in colour | |
| 5  | **REGISTER UNIT**  
Electronic microprocessor control and display unit for 1 to 4 hydraulic modules with non volatile memory. | |
| 5.a| All power handling devices including transformer and power correction / protection will be on separate board ( Power/ SMPS card ) so as to enable replacement of only power/SMPS card in the event of any power related failures. BPC has installed high quality UPS at all their ROs, from which power is fed to electronics of MPDs. Hence warranty and post warranty AMC will cover all items including all electronics. In nut shell, all spares during warranty and post warranty AMC will be on vendor’s account, regardless of the reason for such spares failure. All exceptions to this rule is listed in Service Level Contract appended.  
PLEASE REFER SPECIFICATIONS OF ‘UPS SYSTEM’ | |
| 6  | **PANELBOARD WITH MICROPROCESSOR / MICROCONTROLLER**  
Electronic microprocessor control and display unit for 1 to 4 hydraulic modules with non volatile memory. | |
| 6.a| All power handling devices including transformer and power correction / protection will be on separate board ( Power/ SMPS card ) so as to enable replacement of only power/SMPS card in the event of any power related failures. BPC has installed high quality UPS at all their ROs, from which power is fed to electronics of MPDs. Hence warranty and post warranty AMC will cover all items including all electronics. In nut shell, all spares during warranty and post warranty AMC will be on vendor’s account, regardless of the reason for such spares failure. All exceptions to this rule is listed in Service Level Contract appended.  
PLEASE REFER SPECIFICATIONS OF ‘UPS SYSTEM’ | |
| 7  | **DISPLAY**  
**Liquid Crystal Display** Capable of withstanding temperatures ranging from -20 Degree C to +80 Degree C . It must be visible during day and also at night with backlighting. | |
| 7.a| **1) The size of the characters displayed product should be as follows:**  
Amount: 40 mm  
Volume: 40 mm  
Unit Price: 25 mm  
Density: 25 mm  
Amount and volume will be on a common screen with character height of min 40 mm. | |
| 7.b| **1) The configuration of the display shall be as under:**  
Amount: 9999,999.99 Rs  
Volume: 9999.999 Its  
Unit Price: 999.99 Rs/R  
Density: 999.9 kg/m³ |
7.d The Electronic Display should have masking of readings allowed upto 30 ml.

8. COMMUNICATION PORT

8.a The unit shall have an RS 485 port for communication with POS/OPT/any Automation system. For makes that support Current Loop as the default mode of communication, one RS 485 port shall also be provided with an option to switch to RS 485 or back to Current Loop (using jumper settings). Vendor to ensure that communication port remains protected when connected to FCC of DOMS, POSTEC, Pine Labs, NCR or any other make of repeater for automation purposes.

8.b The communication to the local printers shall be through RS 232/R5485. The printer shall work independent of the automation system. The receipt printing should be done by activating a button provided on the pump, the communication should be directly between the pump controller board and the local printer board, using RS232/R5485. This will ensure receipt printing whether there is automation or not.

8.c

1) The below requirement is applicable only for 2x4x2, 2x4x4 and 3x6x2 MPDs:

(i) A prompt should appear on the LCD screen or Key pad of the DU to enter the Vehicle Number (alphanumeric), before printing of the cash memo. Cash memo must depict Vehicle Number (alphanumeric).

(ii) If a prompt is on LCD, all details of last transaction should reappear after Vehicle number is entered or skipped.

(iii) MFD should have password protected option to stop dispensing unless bill of previous transaction is not printed.

2) If Vehicle number is skipped, cash Memo must depict "Not entered" against Vehicle number.

9. COMMUNICATION PROTOCOL

9.a For pumps working with POS or RO automation, following data must be available from dispenser on request from POS using an industry standard protocol or proprietary protocol:

- The delivery data, i.e., delivery amount and delivery volume message that provides updated information in real time as to the current delivery, amount marked upon the Microcontroller and volume delivered at Microcontroller respectively. If not possible, at least one of these data will be transferred on real-time basis, while other data will be transferred at the end of each delivery. The data transmitted to the host are identical to those displayed on the Microcontroller.
- The overall total volume, i.e. the total number of liters delivered by each Microcontroller.
- Density values entered in three digits + one decimal (in Kg/m³).
- Motor enable/disable: Suspends/ resumes delivery.
- Motor enable/disable - Suspension/ resumption of delivery.
- Product identification.
- Nozzle out.
- The protocol shall support remote change of unit rates for all products in the MFD. This is in order to enable remote price change of products through Automation system.

9.b

- The protocol shall support remote change of unit rates for all products in the MFD. This is in order to enable remote price change of products through Automation System.

9.c Pre-delivery status signals required are:

- Host generated block (authorization from POS)
- Product identification
- Nozzle out

9.d Error status signals required:

- Display 1,2 connectivity error
- Totaliser
- Single sensor error
- Twin sensor error

These error signals are illustrative only, and not exhaustive. Vendor to provide Error List.

9.e Under delivery status required for MFDs are:

- Nozzle out

9.f The Communication Protocol of the Dispensing Unit shall be given to BPCL for business use. BPCL is ready to sign non-disclosure agreement (NDA).

9.g The basic protocol for any specific model of the MFD shall remain unchanged even if there are version upgrades.

9.h POS commands to Microcontroller to work as under:

- Command from POS:
  - Action by Micro Controller

  1) Recognize change in the nozzle position from IN to OUT: Activation of Delivery starts procedure.
  2) Emergency Block delivery: Delivery fuel to be blocked at microcontroller
  3) Preset amount to be delivered: Memorization of "Preset by POS" function.
  4) Preset volume to be delivered: Memorization of "Preset by POS" function.
  5) Unit price setting: Memorization of price received from POS visualization of new price received & activation of procedure of writing new price
  6) Motor enable/disable - Suspension/resumption delivery.

  7) Density values entered in three digits + one decimal (in Kg/m³): The values entered from POS must be displayed on MFD on the LCD screen.

10. PRINTERS

10.a 1. 3x4x2 and 3x6x2

MPD should be provided and supplied with Two built Thermal Printers i.e. one on either side.

10.b The RS 232/R5485 com port of the MFD shall enable communication with printers.

10.c The printers to be provided 1.2m above ground level

10.d Printer specs and Cash Memo template would be as per details given on Page 31 and Page 32 of this Annexure.

10.e The printer should allow one reprint of the ticket; the second copy shall be marked as "COPY/DUPLICATE".

The required format of the ticket/cash memo is enclosed with the printer specs.

11. PULSE & SAFETY FEATURE

11.a Pulser resolution of minimum 10 ml per pulse should consist of two/three pairs of magnetic sensors. Pump to stop functioning if sensor(s) fail.

11.b Pump to give error message and stop functioning if sensor(s) fail.

11.c Pump to give error message and stop functioning if any additional circuitry or chips inserted in Pulser Unit.
If pulser unit/Card or CPU removed during power off of MPD, MPD should stop functioning after power on.

The pulser or any of its child/parent component(s) should not contain or comprise of any moving part(s).

Pulsar should be Magnetic sensing with Bi-Polar Hall affect sensor. Pulsar unit should be Non Operable, Potted, Self destructive (physically or electronically). Tamperproof against manipulation like addition of external circuit/software. Any such manipulation if attempted on the pulsar, the pulsar should stop functioning and get damaged physically or electronically. Pulsar should be non-repairable. Vendor to provide detail of Pulsar functionality in tender for the same. Vendor has to explain the concept of tamper proof ness intended to be achieved in the technical bid.

All the pulsar card communication to ERA shall be in secured and standard 128 Bit encryption with AES Type or Equivalent (Certified from Approved Agency). Pulp or provide certification on implemented encryption standard from any of the globally reputed agencies.

They are to be flame proof/ explosion proof if they are placed with in the hazardous area.

If uni-directional pulsar is not used, and there is a situation of reverse movement in pulsar, the pump should display an error message and stop dispensing. In case of change in the magnetic field or failure of the sensor, warning signal to be generated to stop the transaction.

There should be provision for sealing of the entire pulsar unit.

TOTALISER

12. a. Electronic Totaliser are to be provided for each meter with alternate arrangement in case of any failure.

12. b. Electronic Totalisers should be irreversible type. The Electronic Totaliser must be in tamper proof enclosure with sealing arrangement.

12. c. Electronic totaliser should be readable from outside without removing the panel/doors

12. d. Minimum 12 digits including two decimal digits Electronic Totaliser for all MPDs 2×4×2, 2×4×4 & 3×6×2 MPDs.

12. e. BPCL desires to have an additional alternate arrangement for safe Electronic Totalizer reading in case of existing Electronic Totalizer fails. Vendor to offer their solution for the same.

13. Required as a standard feature for all the MPDs. Preset would be for Volume (lts) and Value (In Rs)

13. b. 1. Preset shall have least count of 1 Litter by Volume and Rs 10/- by amount.

13. c. 3 preset keys in addition to all numeric keys in the key pad will be provided for fixed amount as well as volume configurable at site. This is required for three most frequent transactions.

13. d. Solenoid Valve shall be of two stages or Proportional stages. Vendors to confirm the cut-off level of the first stage. The Solenoid valve used shall be working satisfactorily in minimum 1000 numbers. Vendors to enclose proof for the same. (Vendors to provide Letter of Satisfactory Performance from User(s) for MPD/DUs having these Solenoid Valves. Vendor to give declaration that these MPD/DUs are fitted with solenoid valves of the same make)

14. OPERATING ENVIRONMENT

14. a. Pump shall be capable of operating in tropical conditions & in open atmosphere without over head canopy. Humidity of max. 95% and ambient temperature of 20 to 50 deg C.

15. b. The microcontroller and ICs connected to Microcontroller shall be surface mounted on the PCBs. Other ICs and Circuits not directly effecting Microcontroller can be Non surface Mounted.

15. c. The manufacturer should have his mark on the mother board for identification. It shall be mounted on the structure through a screw, bolt and the whole mounting will be a sealed wire system with manufacturer’s seal on it.

15. d. Display of Software version: The pump software version should be readable on the LCD screen as and when required.

15. e. Minimum 5 levels of security required for accessing various functions through the MPD keypad/Remote Control as below.

2. Level 1: For density, Shift totaliser clearance, Price changes – Dealer

3. Level 2: For Price and History of all price & Density changes with date, totalizer and time for last 100 entries – BPCL

4. Level 3: Change in mode (Automatic /Manual) – At separate level – BPCL

5. Level 4: for software changes , Maintenance etc. only with manufacturer – OEM

There should be flexibility to shift functions from one access level to other level or add additional functions if any required in future.

Vendor to provide Password Control Matrix

15. f. The output going from Pulser unit to Pump controller card should be secured so as to prevent manipulation of pulsar signals.

Encrypted Communication must be used from pulser to Control Card (CPU) and all other electronic data communication among the cards must be on a secure and 128 Bit encrypted platform. Encrypted communication must be used from pulser to control card, keypad to ERA, E-CAL card to ERA, ERA to display card and any other electronic card. Data communication must be on safe and secured 128 Bit encryption platform Vendor to provide full details. All intelligent cards must communicate between them with 128 Bit Encryption.

BPCL desires pulser encrypted feature Vendor to provide full details. Tamper proof electronics to avoid unauthorized programming replacement of components. Details to be provided.

15. g. History of last 100 rate changes shall be stored in the CPU Memory of the ERA and shall be recalled on the pump display through keypad/Remote control. There shall also be an option for printing the same using the local printer. The microcontroller must also be capable of communicating the details to a POS terminal/Automation System when the unit is automated.

15. h. Tamper proof electronics to avoid unauthorized programming replacement of components. Replacement of any IC Card should be controlled by OTP based solutions Vendor needs to produce detailed concept of OTP or equivalent functionality.
### 15. Stand Alone and Auto mode:
The MPD should be able to be taken to auto or stand alone mode through MPD’s keypad/Remote Control and the access will be with higher level of security.

Software on the controller should not be altered by any agency. However, in case of updates, the same would be approved by BPCL Retail Eng (HQ) Dept. BPCL expects the vendor to ensure that the pump software/microcontroller program and highest level pass word remains strictly confidential. Vendor to ensure tight security with suitable internal processes to prevent the software from being disclosed to any outside party. BPCL reserves the right to put the vendor on holiday list as per corporate policy and debar the vendor for all future tenders till holiday listing period in the event where BPCL has discovered that the same has come into the possession of any undesired person or agency. In such case, vendor shall load new software or replace manipulated motherboard with new motherboard free of charge as per BPCL’s requirement without any cost to BPCL. Further penalty clause shall be levied as per tender terms and conditions.

### 15.k Family Integration Concept for I card:
System shall stop functioning in case:
1. Any additional card is inserted in the system
2. Any card is removed from the system
3. Any new software or hardware or external circuitry or External chips is introduced in the system
4. Access/Authority for any change for I card in family concept will be with OEM through OTP concept. Process to define secrecy/functionality of OTP is under scope of Supplier. If any changes happen (externally/ Internally) on account of failure of family concept or OTP in intelligence card during Warranty or CMC period, penalty clause shall be levied.

### 15.l Definition of Intelligent Cards:
- Pulser Card
- Control Card/CPU/ERA
- Display Cards
- E Cal Card
- Any other cards within the dispensing unit which communicates data.

### 15.o PRESET ONLY MODE:
The MPD shall have the option to operate in “PRESET ONLY MODE”. The option should be configurable and password protected.

### 15.p No Print No Dispensing (NPND):
The MPD shall have the option to operate in “NPND” mode. The next fueling transaction should be allowed only after the PRINT of the previous transaction has been taken place. Fueling should stop in case of printer errors like Paper Jam, Paper Out, printer not working etc. The option should be configurable and password protected.

### 16 PAINTING

**TOP Space of the MPD unit should be provided with ACM/MS Panel (Non lit - Removable Type) with 3M or Avery vinyl screen printed graphics or silk screen directly printed on metal body. The graphic design will be provided by BPCL. Vendor to give five years warranty for loss of colour and gloss not below 80% level.**

- **SS surface will not be painted. Non SS surfaces to be coated as under:**
  - a) External surface of bottom panel (front and rear) and “MPD Top Fascia” to be finished for pasting of screen printed vinyl.
  - b) All external surface, other than (a) above, will be 50 micron pure polyester powder coated white.

### 17 STATUTORY LOCAL APPROVALS

**Model Approvals from Weights & Measure and Certification / Approvals from Chief Controller Of Explosives, Govt Of India (Vendor to enclose Model Approvals & CCOE approval copies for offered models)**

**Vendor to validate CCDE & W&Ms approvals from time to time. Vendor to indemnify BPCL for any loss arising out of expiry of such statutory approvals. Vendor to provide solutions for new concept of E-calibration & E-Sealing if any implemented by Legal Metrology in future. Changes in hardware/software of supplied MPDs on account of new concept of calibration shall be made by OEM without any cost within a stipulated time. Provision for two parallel password should be incorporated for activation of calibration mode.**

**If BPCL suggests during technical evaluation, requires fresh ATEX or UL approval for any component, vendor will obtain the same and amended certificate can be submitted post supply of MPDs, but not later than one year from the date of PO.**

**Vendor to confirm that in all Models the position of CRIND will remain same.**
Warranty period of MPDs is two year from last despatched and CAMC Period for MPDs is 8 year post warranty period.

Vendor to provide details of after sales service support available in India. If after sales service support is given in India vendor, a copy of agreement with the Indian vendor to be provided.

Vendor to train and certify BPCL Engineers, technicians for carrying out maintenance. Vendor to provide standard operating process for repating, calibration and disposal of critical spares parts if any removed from MPDs.

Vendor to obtain desired license from approved authority for calibration of MPDs if any required.

Vendors to provide Sample Test/Inspection Report

Vendors to provide Quality Assurance plan for testing of MPDs.

Vendors to provide Test/Inspection Report

Vendors to provide Quality Assurance plan for testing of MPDs.

PACKING:

Please confirm that BPCL may purchase “Out of Warranty spares” directly from the manufacturers without PACKING/MARKING.

PACKING/MARKING

OTHER REQUIREMENTS

Vendor to provide details of after sales service support available in India. If after sales service support is given in India vendor, a copy of agreement with the Indian vendor to be provided.

Vendor to train and certify BPCL Engineers, technicians for carrying out maintenance. Vendor to provide standard operating process for repating, calibration and disposal of critical spares parts if any removed from MPDs.

Vendor to obtain desired license from approved authority for calibration of MPDs if any required.

Vendors to provide Sample Test/Inspection Report

Vendors to provide Quality Assurance plan for testing of MPDs.

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PACKING

Dispensers / Pumps to be covered with polythene covers and packed in a wooden box / crate to withstand multiple loading/unloading and transportation from :-

Dispensers / Pumps to be covered with polythene covers and packed in a wooden box / crate to withstand multiple loading/unloading and transportation from :-

Alternately, Vendor can offer Sturdy Corrugated Packing with multiple Plys to deliver same performance as outlined above in regards to multiple handling. However, the responsibility of any damage in both the cases (Wooden Packing or Corrugated Box Packing) till the point of use will remain vested with the Supplier.

NOTE :

1. Packing should capable to withstand rough sea weather for a minimum period of 4 to 6 months and should be commensurate with best commercial export practices. All packing shall be done in such a manner as to reduce the volume as much possible. Fragile articles should be adequately packed with special packing materials depending on type of materials.

2. All delicate surface and electrical equipment and other heavy article should be carefully protected and painted with protective paint/ compound and wrapped to prevent rusting and damage.

3. All mechanical and electrical equipment and other heavy articles should be securely fastened to the bottom of the case and shall be blocked and braced to prevent movement.

4. Attachments and spare parts of equipments and all small pieces shall be packed separately in wooden cases with adequate protection inside the case and wherever possible should be sent along with the main equipment. Each item shall be tagged so as to identify it with the main equipment and part number and reference number shall be indicated.

5. All protrusions shall be suitably protected and opening shall be blocked by wooden covers.

6. Wherever required equipment/materials shall be packed in polythene bags and silica gel or similar dehydrating compound shall be put inside the bags to protect them.

7. Pipes/tubes made of stainless steel/copper etc. Shall be packed in wooden cases irrespective of sizes.

8. The supplier shall be held liable for all damages or breakages to the goods due to the defective or insufficient packing as well as for corrosion due to insufficient packing.

9. Detailed packing list in waterproof envelope shall be inserted in each package together with equipment/materials. One copy of “detailed packing list”, shall be fastened outside of the package in water proof envelope and covered by the metal cover.
### Marking:

1. Each package shall be marked on four sides, with proper paint/indelible water proof inks as follows:

   - Packing slip (with minimum following details):
     - To:
     - M/S BHARAT PETROLEUM CORPORATION LTD.
     - DESTINATION:
     - MUMBAI/ DELHI/ CHENNAI/ KOLKATA
     - SHIPPING MARK: BPCL (M) MUMBAI
     - PURCHASE ORDER NO
     - DATE
     - ITEM NO OF P.O MODEL
     - NO
     - ITEM DESCRIPTION AS PER PO
     - PD
     - NETWEIGHT KGs.GR.WT

2. Additional marking such as “Handle with care” “This side up”, “Fragile” or any other additional indication for protection and safe handling shall be added depending on the type of material. All cases will have warning signs on the outside denoting ‘Center of gravity and sling mark’

3. Name plate on each of the MPDs (02 nos. name plates on each MPDs- one on each side ) with minimum following details:
   - a. Purchase Order Number /date:
   - b. Model No:
   - c. Sr. No:
   - d. Mfg. Date:
   - e. Mfg. by M/s:
   - f. Date verified and stamped by W&M legal Metrology:
   - g. CCOE certificate:
   - h. Capacity:
   - i. W&M no:

### Junction Boxes

21. There will be two separate junction boxes inside MPDs one for electrical input catering to MPD electronics, lights etc. and another to terminate the MPD communication cable. The location of the junction boxes shall be in the bottom enclosure of the MPD.

22. The electronic and electric circuit of MPDs must conform to UL 87 or ATEX CE or equivalent standards. BPC would like these standards to be certified to this extent. Only exception to UL 87 would be motor trigger linked with nozzle instead of having a separate activation mechanism for motor.

22. The power condition in India calls for a high degree of noise insulation for electronic and communication circuitry in the dispensing units. BPC would prefer to have CE standards followed in this regard. The equivalent US standards may also be acceptable.

22. All Measuring Units should be OIML certified or equivalent.

23. The pulsar unit should adhere to CE standards.

23. RS 485 should be Magnetically isolated.

### Measurement Check

23. MPDs should have functions for compulsory measure testing once in 24 hours with provision of enabled/disabled functionality. If testing not done within defined time MPD should stop delivery of product. provision for 100 Logs of product testing should be available with date and time.

### Dynamic Pricing

24. Compatibility with Dynamic Pricing. Scheduling of Rate Change facility should be available in MPDs. The history for last min 200 logs for price change with date, time and totalizer meter reading should be made available.

### Mechanical Pad Lock provision for Electronic Top Box of MPDs

25. MPDs- electronic top box should have provision to fix Mechanical Pad Lock for future requirement. If require key management of Pad lock can be handed over to supplier.