



ATTOCK PETROLEUM LIMITED

PORT QASIM TERMINAL PROJECT

PROCUREMENT PACKAGE

FOR

PRODUCT PUMPS PHASE 1

Submitted By:



Zishan Engineers (Pvt.) Ltd.

An ISO 9001-2015, 14001-2004 & 18001-2007 certified company

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ATTOCK PETROLEUM LIMITED

PORT QASIM BULK OIL TERMINAL PROJECT

MATERIAL REQUISITION FOR PRODUCT PUMPS PHASE 1



0	30-03-2019	Issued for Tender	SZ	IN	SAA
Rev.	Date	Description	Prepared By	Checked By	Approved By

MATERIAL REQUISITION FOR PRODUCT PUMPS (PHASE-I)

CLIENT: ATTOCK PETROLEUM LIMITED

PROJECT: PORT QASIM BULK OIL TERMINAL PROJECT

ITEM: PRODUCT PUMPS (PHASE-I)

ITEM	MATERIAL DESIGNATION	QTY.	UNIT	RATE /UNIT SUPPLY			LOADING, TRANSPORTATION AND UNLOADING COST TO APL TERMINAL WAREHOUSE/ YARD AT PORT QASIM (Pak.Rs.)	TOTAL PRICE (PAK.Rs)		NOTES
				(C&F KARACHI PORT) INCLUDING INSURANCE & INSPECTION ETC.		(EX-WORKS BASIS FOR LOCAL MANUFACTURERS) (Pak Rs.)		IMPORTED ITEMS (Pak Rs.)	LOCALLY MANUFACTURED ITEMS (Pak Rs.)	
				(USD)	(USD To Pak Rs.)					
				B1	B2	B3		C	D=AxB2 +C	
	<p>THE SUPPLIED PUMPS SHALL COMPLY WITH THE FOLLOWING DOCUMENTS ATTACHED. ANY DEVIATION SHALL BE CLEARLY HIGHLIGHTED & JUSTIFIED BY THE SUPPLIER. OWNER'S DECISION REGARDING THE DEVIATION SOUGHT BY BIDDER SHALL BE FINAL. ALL PRICES SHOULD BE INCLUSIVE OF GST.</p> <p>GENERAL PURCHASE CONDITIONS (DOC. NO. 151-6-GCC-007)</p> <p>INSTRUCTIONS TO BIDDERS (DOC. NO. 151-6-ITB-007)</p> <p>DATA SHEETS 151-6-DSM-016</p> <p>1.0 <u>PMG/ HSD TRANSFER PUMPS (P- 0203 A/B/C/D)</u></p> <p>1.1 CENTRIFUGAL PUMP ELECTRIC MOTOR DRIVEN, MOUNTED ON A COMMON BASE FRAME COMPLETE WITH COUPLING AND ACCESSORIES AS PER DATA SHEET NO. 151-6-DSM-016, ATTACHED.</p> <p>1.2 COMMISSIONING SPARES WITH LIST TO BE PROVIDED SEPARATELY.</p> <p>1.3 SPARES FOR 2 YEARS NORMAL OPERATION WITH LIST TO BE PROVIDED SEPARATELY.</p>	A							<p>INSPECTION OF SUPPLIED PUMPS, REVIEW OF CERTIFICATES , DIMENSIONAL, QUALITY, QUANTITY AND PACKING LIST CHECK SHALL BE WITNESSED BY THE 3RD PARTY INSPECTORS FROM A REPUTED INSPECTION COMPANY HIRED BY THE OWNER (IF REQUIRED), SUPPLIER SHALL SUBMIT DETAILED MANUFACTURING SCHEDULE, QUALITY CONTROL PLAN AND INSPECTION AND TEST PROCEDURES ALONG WITH THE BID. FINAL ACCEPTANCE OF PUMPS WILL BE SUBJECT TO APPROVAL FROM THE 3RD PARTY INSPECTION COMPANY AND THE OWNER REPRESENTATIVE (IF REQUIRED). QUOTED PUMPS SHALL BE LOCAL OR IMPORTED. IN CASE OF LOCAL PUMPS ACCEPTABLE BRAND IS KSB AND FOR IMPORTED PUMPS THE ORIGIN SHOULD BE WESTERN EUROPE, JAPAN, USA. PUMP VENDOR SHALL BE RESPONSIBLE TO PROVIDE PUMPS PERFORMANCE CURVE AND SHALL CONFIRM THE REQUIRED FLOW RATES AT SPECIFIED HEADS MENTION IN DATA SHEET. PUMPS SHALL BE SUPPLIED WITH DIMENSIONAL DRAWINGS, INSTALLATION, OPERATION AND COMMISSIONING MANUAL, STARTER DOL OR STAR DELTA CONNECTIONS. PUMP VENDORS SHALL BE RESPONSIBLE TO ASSIST PUMP ALIGNMENT WITH AND WITHOUT CONNECTION OF PIPING AND COMMISSIONING WORKS. THE SUCTION AND DISCHARGE FLANGES ON PUMPS SHALL BE IN ACCORDANCE WITH ASME B16.5 UNLESS OTHERWISE SPECIFIED ELSE MATING FLANGES SHALL BE PROVIDED BY VENDOR. VENDOR'S QUOTED CHARGES SHALL ALSO INCLUDE THE SUPERVISION RATES FOR INSTALLATION AND COMMISSIONING OF VENDOR'S PERSONNEL AT PORT QASIM BULK OIL TERMINAL SITE.</p>	
				TOTAL						

TOTAL IN WORDS FOR API PUMPS : _____

SIGNATURE OF BIDDER WITH SEAL



ATTOCK PETROLEUM LIMITED

GENERAL TERM & CONDITIONS FOR
SUPPLY OF EQUIPMENTS / MATERIALS, PHASE I

ISSUED FOR
TENDER

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1.0 **SCOPE**

This document covers general conditions governing the manufacture and supply of equipments for Port Qasim Terminal of M/s. Attock Petroleum Limited (APL). The terms mentioned here form integral part of the Purchase Order.

2.0 **DEFINITIONS**

2.1 **Owner**

Attock Petroleum Limited (APL)

7th & 8th Floor,
Attock House,
Morgah, Rawalpindi
Pakistan

2.2 **Vendor**

Means the company, firm or agency with whom has order been placed the supply of Equipments.

2.3 **Bidder**

A potential supplier of Equipment and material who has been invited to bid.

3.0 **INSTRUCTIONS**

This general specification for the supply of equipment and material apply to all procurement and shall be considered an integral part of the purchase order. These may be modified by particular conditions stipulated in the purchase order and/or through attached technical documents. Where requirements of the general specification deviates from the said particular conditions and/or purchase orders, later shall govern.

No deviation from the general specifications for the supply of equipment and material will be acceptable unless special exception is agreed and notified in writing to the manufacturers/suppliers by the Owner.

These general conditions shall supersede any conditions indicated by the manufacturer in his bid unless such conditions have been specifically included in the Purchase Orders.

4.0 **APPLICABLE TECHNICAL DOCUMENTS**

The applicable technical specifications, data sheets, respective codes, standards and general specifications enclosed to the purchase order, form integral part thereof. All the equipment supplied against such purchase orders shall strictly conform to the aforementioned technical documents.

5.0 **LIMITS OF SUPPLY**

The scope of supply shall include the manufacture and supply of equipment, fabrication, painting, testing of equipment and packing, all in accordance with the applicable drawings/specifications, Data Sheets and Standards. In case the equipment is to be assembled at site, the procedures and facilities for assembly, necessary spare parts needed at site and experts personnel for supervision during erection/commissioning (where required) is also included in the scope of supply.

When a purchase order includes two or more similar items the supplier shall ensure maximum interchange ability of components such as couplings, electric motors etc.

5.1 **Spare Parts**

Vendor shall guarantee the supply of spare parts for a minimum of 10 years. The vendor is required to provide complete spare part list accompanied by all sectional drawings and other documents needed for the identification of the spare parts. Price of spare parts for Two 02 years shall be quoted as per material requisition.

5.2 **Lubricants**

Vendor shall provide detailed list of lubricants, specifying the quantities and grades to be used for "**first fill**" and for subsequent operations.

5.3 **Commissioning Spares**

All the spares required for the successful commissioning of the equipment / material shall be supplied by the vendor and the priced list shall be submitted along with the bid.

6.0 **TESTING & INSPECTION**

Vendor shall carryout all tests on equipment as per international practices and those specified in the technical documents, attached to the purchase order. Testing procedure of Equipments shall be given in the technical documents attached to the purchase order.

Where such procedures are not given, following test and checks shall be carried out

according to applicable codes and standards and relevant test certificates issued to the Owner.

- Performance Test of all equipment.
- Tests and inspection on electrical equipment as generally prescribed in industrial practices, codes standards etc.
- Hydrostatic test on all equipment operating under pressure/static head.
- Dimensional checks.

Material / Mill Test Certificates shall be submitted as per EN 10204/3.1 B.

It will be OWNER's right to have a 'Pre-inspection meeting' with the Vendor in order to discuss the Construction and/or test plans in details. They shall have free access to the premises of the manufacturer and their sub-supplier, and vendor shall ensure that all possible help and assistance is made available to such representative.

Inspectors of OWNER and/or those appointed by them, shall witness the tests required by the purchase order and/or by the specifications. Any waiver of witnessing the tests will be notified to vendor in writing only. Such waivers will not relieve the vendor of his liabilities.

Vendor shall carryout the inspections/tests required by the purchase order and/or attached specifications and inspection data sheets. Vendor shall notify OWNER in writing or by fax at least 30 days before the date established for the testing/inspection. However, the presence of OWNER inspectors and/or those appointed by them does not relieve the vendor of any of his responsibilities/liabilities.

The sub-vendor's inspection and test are the vendor's obligation and responsibility. However, OWNER reserves the right to carry out their own inspection at the sub-vendor's workshop and to witness the tests on such vendor.

Any or all tests/inspection may also be witnessed by official institutions.

Within 15 days of the final successful tests the Vendor must send to OWNER one original and 3 copies of all material and test certificates.

6.1 **Expediting**

Expeditors of OWNER will carry out the expediting of the order, by visiting or otherwise contacting the vendor. Vendor shall appoint a "Vendor's Co-ordinator"

responsible for giving complete and reliable information on the purchase order status. The information will include supply schedule, design and work progress, issuance and progress status of any sub-orders, critical sub-orders and the expected delivery date.

7.0 **VENDOR'S TECHNICAL DOCUMENTS**

Upon receipt of the purchase order, the vendor is required to furnish the following:

- a) The Vendor shall furnish within one week, the schedule of manufacture and delivery program in two copies. The schedule shall indicate the time table of the activities including, manufacturing stages, assembly, testing and delivery of the equipment. Within 2 weeks of the receipt of purchase order the Vendor shall supply to OWNER, the fabrication specifications and drawings for its comments/approval and shall commence the fabrication work only after the receipt of comments/approval on such drawings/specifications. The Vendor shall also submit weekly progress reports indicating the manufacturing status report.
- b) Vendor shall furnish within 3 weeks of the receipt of purchase order, 4 sets with one reproducible of each certified equipment mounting and dimensional drawings and equipment weight for the purpose of foundations/piping design.
- c) The Vendor shall furnish, upon delivery:
 - 1) All drawings and specifications developed for the equipment in 4 copies and one reproducible.
 - 2) 4 copies of complete equipment data books which will include material mill test certificates, inspection certificates, radiographic reports, hydro-static test certificates etc.
 - 3) 4 copies of Installation, Operations and Maintenance Manuals.
- d) In addition to the instructions provided in the technical specifications/data sheets, Vendor shall comply with the following requirements for Installations, Operations and Maintenance Manuals.
 - 1) The front cover, spine and inside page shall state the purchase order number and Vendor's reference number.
 - 2) The inside front page shall carry an index listing the contents of each section of the manual.
 - 3) Individual sections shall be complete and shall refer to equipment actually supplied.

- 4) Published data shall be included, including published data for bought-in items.
- 5) Devices requiring adjustment and settings shall be fully documented and settings listed.
- 6) A punch list of 'do's" and don'ts" shall be included.
- 7) Full details for installation and setting up shall be included.
- 8) Recommended test data shall be stated, covering initial and also regular testing.
- 9) Items requiring regular inspection, checking, testing and maintenance shall be listed and the time scale clearly indicated.
- 10) Important items shall be cross referenced to other parts of the manual as necessary.

8.0 **PACKING & SHIPPING**

8.1 **General**

Vendor shall ensure that all items of equipment shall be delivered in proper air/rail/road/sea worthy packing, (as applicable) and where special protection is required, Vendor shall so arrange accordingly. Packing shall be arranged by Vendor and cost to be included in the price of this purchase order. The Vendor shall be liable for any damage to the equipment caused by:

- a) Bad or ineffective packing or deterioration/ corrosion as a result of incorrect or inadequate protection during transportation and storage not exceeding eighteen (18) months in total.
- b) Corrosion as a result of the Vendor's failure to indicate storage recommendations.
- c) Loading or unloading resulting from Vendor's failure to provide any or adequate instructions.

During packing Vendor shall ensure that:

- 1) A packing list is enclosed with all closed packages.

- 2) The packages are marked according to specifications.
- 3) Certificates of origin, where required are available.

8.2 **Preparation for Delivery to Site**

- a) After final hydrostatic test, where applicable, the equipment shall be dried and cleaned thoroughly inside and outside to remove grease, loose scale, rust and dirt.
- b) All finished surfaces and surfaces which are not protected by blind flanges shall be coated with rust preventive.
- c) All flanges opening which are not provided with covers shall be protected by suitable steel plates.
- d) Threaded openings shall be plugged.
- e) For internal parts (where applicable) suitable supports shall be provided to avoid damage during shipment.
- f) Bolts and nuts shall be coated with water proof lubricant.
- g) Equipments shall be clearly identified by painting the order and item number in a conspicuous location on the packing.
- h) Small parts which are to be delivered loose shall be bagged or boxed and marked with the purchase order and item number of the equipment.
- i) Vessel fabricator shall take all necessary precautions in loading by blocking and bracing the vessel and furnishing all necessary material to prevent damages during transport.
- j) Packing dimensions will be restricted by the inland transport facilities and passage limitations.
- k) Marking Instructions:
 - The packages shall carry marking on top and on three sides; an arrow shall indicate top of equipment.

- Name of OWNER and OWNER's mark shall be atleast at two positions on the case:

(EQUIPMENT NAME)
 ATTOCK PETROLEUM LIMITED
 RAWALPINDI
 PAKISTAN

letters minimum 75 mm high unless impracticable.

- At least two position on the case:

Package number, part number and number of pieces and purchase order number, weight (Gross) and net weight.

- Insurance Policy No. Package stackable Yes/No.
- Warning marks (fragile, top, keep dry etc.).

All markings shall be in indelible ink/paint and easily readable.

8.3 **Shipping Papers**

The Vendor shall submit full shipping documents via airmail by registered post to the Owner, preferably in two separate registered covers. All shipping documents shall be airtailed within a week after the ship has sailed so as to reach the Owner in advance of the arrival of the ship. Responsibility for delay in the receipt of shipping documents shall rest with the Vendor, who shall pay all demurrage and port storage charges accruing as a result of late receipt of shipping documents.

The shipping documents shall be sent as follows:

	No. of Copies Required
1. Payment Invoice	4
2. Original B/L	2
3. Non-Negotiable B/L	3
4. Packing List	4
5. Package-Wise Weighing & Measuring Certificates	4
6. Guarantee & Test Certificates	3
7. Certificate of Origin	3
8. Freight Payment Receipt Invoice	4
9. Insurance Payment Receipt / Invoice	3

9.0 **GUARANTEES**

The Vendor shall guarantee that all Equipments to be supplied shall strictly comply with the characteristics, requirements and specifications referred to in the Purchase Order, that the materials used are new and free from apparent and latent defects, that the manufacture is carried out in accordance with the best working practices and up to-date techniques and complies with all specifications stipulated in the Purchase Order.

Approval and/or comments by OWNER on manufacturer specifications, drawings and technical documents will in no way release the manufacturer of his full responsibility regarding his supply as stipulated in the purchase order. Inspection and or witnessing tests by OWNER and their acceptance, of such tests and of supply of equipment/material thereof will in no event relieve the manufacturer from his responsibility contained therein.

The warranty shall be for a period of 12 months from the date of initial commissioning or for a period of not less than 18 months from the date of shipment/dispatch of supplied Equipment / Material, whichever is earlier.

The manufacturer shall deliver to the Owner, at the time of delivery, the written warranty in a form satisfactory to OWNER that the equipment/material being supplied is brand new, has been manufactured in accordance with the drawings, specification and other documents and that, should any defect develop during the warranty period due to but not limited to the improper material, workmanship, instruction, practices, assembly or arrangement of the same, together with any other work effected in correcting such defects will upon written notice, be made good by the manufacturer at no cost to OWNER. All such items of equipment/material repaired or replaced shall be like-wise warranted by the manufacturer for 12 months from the date of completion of such repair or replacement.

If defects are found and the Vendor is not in a position to take the necessary action to carry out the repairs within the time required by OWNER and agreed upon between OWNER and Vendor according to OWNER requirements. OWNER shall have such modification and repairs made by others and the resultant expenses will be charged to the Vendor. It is understood that in this case the Vendor shall not be relieved of guarantee contractual obligations.



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ATTOCK PETROLEUM LIMITED

PORT QASIM BULK OIL TERMINAL PROJECT

SPECIFICATION FOR LOW VOLTAGE AC MOTORS



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0	29-01-2019	Issued for Construction	MHK	MAK	MMM
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1.0 **GENERAL**

1.1 **Scope**

This specification covers the minimum design requirements and testing of low voltage squirrel cage induction motors rated up to 150 kW.

1.2 Technical Requirements include all applicable Engineer supplied data sheets, drawings, attached specifications and other Purchase Order documentation.

1.3 **Errors or Omissions**

1.3.1 The review and comment by the CONSULTANT of any SUPPLIER's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve the SUPPLIER of its obligations to comply with the requirements of this specification and other related parts of the contract documents.

1.3.2 Any errors or omissions noted by the SUPPLIER in this Specification shall be immediately brought to the attention of the COMPANY.

1.4 **Deviations**

All deviations to this specification, other specifications or attachments shall be brought to the knowledge of the COMPANY in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of the COMPANY prior to execution of the work. Such deviations shall be shown in the documentation prepared by the SUPPLIER.

1.5 **Conflicting Requirements**

In the event of conflict, inconsistency or ambiguity between the contract scopes of work, this Specification, National Codes & Standards referenced in this Specification or any other documents, the SUPPLIER shall refer to the COMPANY whose decision shall prevail.

2.0 **REFERENCES**

The following publications form a part of this specification. Unless otherwise specified herein, use the latest edition.

2.1 **IEC – International Electro technical Commission**

IEC 60034	Rotating Electrical Machines
IEC 60072	Dimensions and Output Series for Rotating Electrical Machines
IEC 60079	Electrical Apparatus for Explosive Gas Atmospheres
IEC 60085	Recommendations for the classification of Materials for the Insulation of Electrical Machinery and Apparatus in Relation to their Thermal Stability in Service
IEC 60529	Degrees of Protection Provided by Enclosures (IP Codes)

2.2 **ANSI / ABMA Standards**

- Load Rating and Fatigue Life for Ball Bearings.
- Load Rating and Fatigue Life for Roller Bearings.

3.0 **DOCUMENTATION**

3.1 **Motor Data**

Motor data specified in data sheet shall be furnished to SUPPLIER with all proposals. All the same data shall be furnished with final drawings and data corrected to apply to the actual motor furnished. Guaranteed or published values are acceptable for motors that do not require a certified test report.

4.0 **AMBIENT CONDITIONS**

- 4.1 All material and equipment supplied and installed shall be designed, manufactured and tested to meet the following ambient conditions unless specifically stated otherwise for any material/ equipment.

4.2 **Site Ambient / Environmental Conditions**

- Average Temperature: 80.7 °F during day time
- Peak Temperature: 120 °F
- Relative Humidity: Equipment shall be suitable for high humidity 0% to 95% RH, and dusty harsh weather conditions.
- System Power Supply:
 - Power Supply Voltage : 400V AC \pm 10% (for 3 phase)
 - Power Supply Voltage : 230V AC \pm 10% (for 1 phase)
 - Power Supply Frequency : 50 Hz

5.0 **DESIGN REQUIREMENTS**

5.1 **General**

- 5.1.1 Electric motors for installation in hazardous areas shall be squirrel cage induction motors supplied in accordance with EEMUA Publication No. 132 (published by the engineering equipment and materials users association) and BS 5501.
- 5.1.2 Motors for use in Zone 1 hazardous areas shall be certified EExd (flameproof) or equal. Motors of “Increased Safety Type” (EExe) are not acceptable.
- 5.1.3 Motors for use in Zone 2 hazardous areas shall be certified Exn (Type n non-sparking) or shall be as specified for Zone 1 areas.
- 5.1.4 Motors for use in “safe” areas shall be of squirrel cage induction motor type and suitable for non-classified area.
- 5.1.5 Motors shall be rated for a design ambient temperature of 50°C. Insulation to Class F shall be used with Class B temperature rise i.e. a permissible temperature rise of 70°C over the 50°C design ambient temperature.
- 5.1.6 Service factor for Motors shall preferably considered as 1.15

- 5.1.7 All motors shall be fitted with sun-shades designed so as not to restrict the flow of cooling air over the machine.
- 5.1.8 Motors shall have delta connected stator windings. For all motors less than 15kW (20hP) shall have DOL starter while motors equal or above 15kW (20hP) shall have soft starter on all pump motors.
- 5.1.9 Motors with ratings from 0.37 kW and above capacity shall be supplied at 400 volts, 3-PH, 50Hz. Motors rated below 0.37 kW shall be supplied at 230V, 1-Phase, 50Hz.
- 5.1.10 Motors shall be manufactured in accordance with the applicable national and local authority standards and certified as such by approved by a recognized testing agency.
- 5.1.11 All motors shall be heavy duty, industrial class, and continuous duty suitable for installation in a petrochemical process facility.
- 5.1.12 All motors shall be provided with side mounted terminal boxes one size larger than the SUPPLIER's standard and have threaded bottom cable entrances. This shall include terminal boxes for all auxiliary devices (i.e. anti-condensation heaters, etc. if specified in datasheet). All auxiliary devices shall be wired to properly labeled terminal blocks in a terminal box. All boxes shall be arranged for rotation so that cable entry can be from any side. Gaskets shall be provided when required for flameproof protection between the box and cover and between the box and the motor frame.
- 5.1.13 Motors shall be securely mounted to the mounting base of equipment or to a rigid, flat surface, preferably metallic and the mount type shall be defined as follows.
- a) Rigid base
 - b) Resilient base
 - c) NEMA C face mount
 - d) NEMA D flange mount
 - e) Type M or N mount
 - f) Extended through-bolt

5.2 **Insulation, Conductors and Leads**

- 5.2.1 Unless otherwise specified, motor insulation shall be Class F with Class B temperature rise. Motor leads in the terminal boxes shall have the same insulation class as the windings.
- 5.2.2 The winding shall have a minimum of two (2) dips and bakes of polyester varnish.
- 5.2.3 Phase insulation in addition to varnish shall be used between the phases of random windings.

5.3 **Bearings and Lubrication**

- 5.3.1 Unless otherwise specified, all motors shall be grease lubricated.
- 5.3.2 Motors with regreasable bearings shall:
 - a) Be single shielded, capable of being regreased in service.
 - b) Be capable of operating for at least 8,000 hours without requiring addition of grease or a complete change of grease.
 - c) Be equipped with external relief or drain plugs. Alternative arrangements for expelling or collecting used grease may be proposed for COMPANY approval.
 - d) Have seals provided to prevent loss of lubricant.
- 5.3.3 All bearings shall be single row Conrad type (no filling slots) with C3 diametrical clearance. Non-metallic (plastic or phenolic) cages are not acceptable.
- 5.3.4 Anti-friction bearings shall have an L_{10} rated life of at least 100,000 hours for all direct connected horizontal motors and at least 17,500 hours for normally loaded belt-connected motors.

5.4 **Lifting Provisions**

All motors weighing more than 50 kg shall be provided with one or more lifting eyebolts, rings, or lugs capable of supporting the weight of the motor. If lugs are concealed by enclosure, nameplates shall be attached to both sides of the motor warning against improper lifting.

5.5 **Nameplate**

5.5.1 Motor data plate material shall be stainless steel.

5.5.2 Nameplate information as called for by IEC 60034, part 1, section 9.

5.5.3 Additional information, either on the same or on an additional nameplate is required as follows:

- a) Purchase order number / project identification
- b) Equipment item / tag number
- c) Service description
- d) Area classification
- e) Certification number and national authoritative body
- f) Type of flameproof protection for both motor and terminal boxes (if applicable)
- g) Cooling method code
- h) Mounting code
- i) Weather Protection (IP- XX) for motor and terminal box
- j) Lubrication information

5.6 **Terminal Boxes**

An earthing terminal shall be provided inside the main motor lead terminal box for termination of the earthing conductor as per IEC 60034, part 1, section 10.

5.7 **Terminal Boxes**

For motors 7.5 kW and larger, the motor frame shall be drilled and tapped for an additional corrosion resistance external bolt for an earthing connection to the skid main structural steel.

6.0 ENCLOSURE REQUIREMENTS

- 6.1 All motors shall be totally enclosed fan-cooled as per IEC 60034 cooling code IC 411, unless an alternative enclosure is specified. For installation in hazardous areas, motors shall be classified as per motor data sheets.
- 6.2 All enclosure parts and terminal boxes shall be of cast iron.
- 6.3 Fan enclosure shall be guarded type.
- 6.4 Fan covers shall be cast iron, stainless steel or pressed sheet steel.
- 6.5 The degree of protection for all motors and terminal boxes shall be sufficient to provide protection against harmful dust deposits and protection against water projected from a nozzle. The minimum enclosure rating for all motors shall be IP65.
- 6.6 Fans shall be non-sparking (Ex-‘n’).

7.0 ADDITIONAL REQUIREMENTS FOR VERTICAL MOTORS

- 7.1 Drip covers shall be provided on the non-drive end of all vertical motors. Waterproof bearing covers shall be provided to prevent water entering the bearings. Covers shall prevent direct entrance of rain into the motor interior. Covers shall also block entrance of snow and sleet to prevent freeze-up of external fans on non-operating motors.
- 7.2 Motors with rolling element bearings, designed for radial or axial loads transmitted from the pump, shall be designed with bearings as follows:
 - a) Bearings shall be selected to give a basic rating life, L_{10} , of at least:
 - i) 25,000 hours with continuous operation at pump rated conditions.
 - ii) 16,000 hours when carrying the maximum loads (radial or axial or both) imposed with internal pump clearances at twice the design values and when operating at any point between minimum continuous stable flow and rated flow.

- b) The thrust bearings shall be in the non-drive end and shall limit axial float to 0.005 in. (125 μm). Both upthrust and downthrust capability shall be handled at the non-drive end. Bearings shall be designed to carry the maximum thrust the pump may develop while starting, stopping, or operating at any capacity.

7.3 Motors with rolling element bearings, driving pumps with integral thrust bearings, shall meet the following:

- a) Thrust and radial bearings shall be selected to give a minimum L_{10} rating life of at least 40,000 hours with no external pump thrust or radial loads being imposed.
- b) The non-drive end bearing shall be the fixed bearing to carry the rotor weight and limit axial float to 0.005 in. (125 μm).

8.0 **ROTOR BALANCE AND VIBRATION**

8.1 Motor rotor shall be dynamically balanced to achieve a bearing housing unfiltered radial vibration level not to exceed 0.12-inch per second (3-mm per second), peak at motor rated speed and no-load, measured in compliance with IEC 60034, Part 14. No discrete vibration frequency shall exceed 0.08-in per second (2-mm per second), peak.

8.2 Motor unfiltered axial vibration shall not exceed 0.08-inch per second (2-mm per second) on the bearing housing. This limit shall not apply to motors with roller bearings.

9.0 **PERFORMANCE REQUIREMENTS**

9.1 Performance characteristics, with rated voltage and frequency applied, shall be as specified in individual data sheets.

9.2 Noise level shall not exceed 85 dB(A) in any mode of operation. The options and cost of supplementary noise suppression if required, shall be referred to the COMPANY for approval.

10.0 **TESTING**

10.1 Induction motors shall be given a short (routine) test at the motor SUPPLIER's plant per IEC 60034. For a multi-speed motor, test shall be made at each rated speed. Test shall include the following:

- a) Measurement of speed and current at no load
- b) Determination of locked rotor current
- c) Winding test
- d) Initial torque
- e) High potential test
- f) Observation of bearings and mechanical operation at no load
- g) Measurement of vibration per the standard specified IEC-60034-14



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ATTOCK PETROLEUM LIMITED

PORT QASIM BULK OIL TERMINAL PROJECT

DATA SHEET FOR HSD/PMG TRANSFER PUMP (P- 0203A/B/C/D)

Rev.	Date	Description	Prepared By	Checked By	Approved By
1	23-05-2019	Revised as per Client Comment	MKK / WA	IN	SAA
0	30-03-2019	Issued for Tender	WA	IN	SAA

Consultant		Data Sheet			
 ZISHAN ENGINEERS (PVT.) LTD.	DATA SHEET FOR PMG/HSD TRANSFER PUMPS (P- 0203 A/B/C/D)				
	Document No.		Revision	DATE	
Client		151-6-DSM-016		1	23-05-2019
 ATTOCK PETROLEUM LIMITED	Prepared by		Checked by	Approved by	SHEET
	MKK / WA		IN	SAA	2 OF 2
Applicable To: <input checked="" type="radio"/> Proposals <input type="radio"/> Purchase <input type="radio"/> As Built Note: <input type="radio"/> Indicates information to be completed by purchaser. <input type="radio"/> Indicates information to be completed by manufacturer.					
For PREMIER GASOLINE/HIGH SPEED DIESEL PUMPS		Site PORT QASIM, KARACHI			
Unit PMG/HSD TRANSFER PUMPS		Service PMG/HSD PIPELINE TRANSFER			
No. Pumps Req'd.	4	No. Motors Req'd	4		
Item No.	P-0203 A/B/C/D				
No. Engines Req'd.	---	No. Turbines Req'd	----		
Pump Mfr.					
		Provided By	Mtd By		
		Item Description			
		Provided By	Mtd By		
		Size and Type	Serial No.		
OPERATING CONDITIONS, EACH PUMP			PERFORMANCE (VTA)		
Liquid	PREMIER GAS./HIGH SPEED DIESEL		Flow at PT. m ³ /hr (gpm) Nor.	625 (2751.8) Rated	
PT.(°F) Nor.	95	Max. 130	Disch. Press. Bar G (Psig)	4.023 (58.33)	
Sp.Gr. at PT.	0.74 - 0.84		Suct. Press.Bar G (psig) Min	-0.174 (-2.52) Max 1.2 (17.4)	
Vap. Press. at PT. (psia)	10 - 2		Diff. Press. Bar (psi)	4.2 (60.9)	
Viscosity at PT cP	0.74 - 5.5		Diff. Head m (ft)	50.97 (167.2)	
Corr/Eros. Caused by			NPSHA m (ft)	6 (19.7)	
Location:	<input type="radio"/> Indoor	<input checked="" type="radio"/> Outdoor	Hyd.KW (Hp)	73 (97.8)	
Working:	<input type="radio"/> Continuous	<input checked="" type="radio"/> Intermittent	Area:	<input type="radio"/> Safe	<input checked="" type="radio"/> Hazardous
				<input type="radio"/> Random	
CONSTRUCTION			SHOP TESTS		
Nozzles	Size	Rating	Facing	Location	
Suction	VTS	VTS	RF		
Discharge	VTS	VTS	RF		
Case-mount:	<input checked="" type="radio"/> Centerline	<input type="radio"/> Foot	<input type="radio"/> Bracket	<input type="radio"/> Vert. (Type)	
- Split:	<input type="radio"/> Axial	<input checked="" type="radio"/> Rad; (Note-8)	Volute Type:	<input type="radio"/> SGL	<input type="radio"/> DBL
- Press:	<input type="radio"/> Max. Allow,	psig @	°C;	<input type="radio"/> Hydro Test	psig
- Connect:	<input type="radio"/> Vent	<input type="radio"/> Drain		<input type="radio"/> Gage	
Impeller Dia. :	<input type="radio"/> Rated	<input type="radio"/> Max.	Type:		
Mount:	<input type="radio"/> Between Bearings	<input type="radio"/> Overhung			
Bearings-type:	<input type="radio"/> Radial	<input type="radio"/> Thrust			
Lube:	<input type="radio"/> Ring Oil	<input type="radio"/> Flood	<input type="radio"/> Oil Mist	<input type="radio"/> Flinger	<input type="radio"/> Pressure
Coupling:	<input type="radio"/> Mfr.	Flexible Disk Spacer Type	<input type="radio"/> Model		
Driver Mtd. By:	<input type="radio"/> Pump Mfr.	<input type="radio"/> Driver Mfr.	<input type="radio"/> Purchaser		
Packing:	<input type="radio"/> Mfr. & Type		Size/No. of Rings		
Mech. Seal:	<input type="radio"/> Mfr. & Model				
	<input type="radio"/> Mfr. Code				
AUXILIARY PIPING			VERTICAL PUMPS		
<input type="radio"/> C.W. Pipe Plan	<input type="radio"/> CU	<input type="radio"/> SS	<input type="radio"/> Tubing;	<input type="radio"/> Pipe	
<input type="radio"/> Total Cooling Water Req'd (m ³ /hr) req	gpm		<input type="radio"/> Sight F.I. Req'd		
<input type="radio"/> Packing Cooling Injection Req'd:	Total . gpm		<input type="radio"/> psig		
<input type="radio"/> Seal Flush Piping Plan	API plan 11 (VTC)	<input type="radio"/> CS	<input checked="" type="radio"/> SS	<input type="radio"/> Tubing	<input type="radio"/> Pipe
<input type="radio"/> External Seal Flush Fluid		<input type="radio"/> gpm	<input type="radio"/> psig		
<input type="radio"/> Auxiliary Seal Plan		<input type="radio"/> CS	<input type="radio"/> SS	<input type="radio"/> Tubing	<input type="radio"/> Pipe
<input type="radio"/> Aux. Seal Quench Fluid					
MOTOR DRIVER			VERTICAL PUMPS		
HP	VTS	RPM	VTS	Frame	VTS
Mfr.	ABB FINLAND/ SIEMENS GERMANY / WEG BRAZIL		Bearings	VTS	Volts/Phase/Cycles
Cooling Type	TEFC	Insulation	CLASS F	Full Load Amps	VTS
Cable Entries	VTS	Temp. Rise(°C)	75	Locked Rotor Amps	VTS
Enclosure	EEx d IIB, T3, IP65				
Starter Type	VFD	S.F 1.15			
Voltage Tolerance	+/- 10%				
			Pit or Sump Depth		
			Min. Submergence Req'd.		
			Column Pipe:	<input type="radio"/> Flanged	<input type="radio"/> Threaded
			Line Shaft:	<input type="radio"/> Open	<input type="radio"/> Enclosed
			Brgs:	<input type="radio"/> Bowl	<input type="radio"/> Line Shaft
			Brg.Lube	<input type="radio"/> Water	<input type="radio"/> Oil
			Float & Rod	<input type="radio"/> CS	<input type="radio"/> ss
			Float Switch	<input type="radio"/> BRZ	<input type="radio"/> None
			Pump thrust,lb.	<input type="radio"/> UP	<input type="radio"/> Down
			Approx. WT. Pump & Base		
			Motor	Turbine	

NOTES:

- 1) NPSH(A) at Pump suction Nozzle
- 2) VTA: Vendor to Advise
- 3) Temperature rise shall be adjusted for ambient temperature of 122 °F
- 4) Vendor shall comply all requirements of pumps and its accessories mentioned in API 610
- 5) VTS = Vendor To Specify
- 6) Motor to be selected for end of curve operation
- 7) The cable entry details shall be provided to the supplier after the detail design & finalization of Power cable size if the motor manufacturer / supplier is unable to accommodate the same in the motor terminal box, suitable arrangement reducer / expander to be provided.
- 8) Vendor to provide radially split casing with back pullout (Pump Type : OH-2).
- 9) VTC: Vendor to Confirm.
- 10) Vendor to provide casing drain with valve and blind flange.
- 11) Flanges to be drilled as per ANSI B16.5 or mating flanges to be provided by Vendor.
- 12) Pump with motor should be mounted on common base plate by manufacturer.
- 13) Tag no. for pumps with nameplate having pump details should be provided. Nameplate on motor with details should also be provided.
- 14) Supply of foundation bolts shall be in the scope of pump vendor.
- 15) Motor to be provide with space heater.
- 16) The Pump shall be sized for both Fluid HSD + PMG.