SPECIFICATION FOR CENTRIFUGAL PUMPS

PUMP P-07 (Haifa)
PUMP P-04 (Hadera)

P^2	9/2/2023	Preliminary	E. Kaganowski	E. Kaganowski	
P^1	5/2/2023	Preliminary	E. Kaganowski	E. Kaganowski	
P^O	30/1/2023	Preliminary	E. Kaganowski	E. Kaganowski	
REV.	**DATE**	**DESCRIPTION**	**BY**	**CKD**	**APPROVED**

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תשתיות אנרגיה

CONTENT:

ATTACHMENTS:

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1. GENERAL:

Ths document covers the technical requirements for design, manufacture, supply and delivery of two (2) horizontal BB3 type centrifugal pumps to be installed in Hadera & Haifa fuel station.
The pumps and pumps auxiliaries shall meet the requirements of AP1 610 standard, this specification and the attached data sheet and documents.

2. SITE CONDITIONS:

The pumps shall be installed outdoor.
Sites altitude is about 5 m' above sea level.
Ambient temperature varies between 0^0C- 48^0C.
Relative humidity varies between 40% - 95%.
Rain falls around 550 mm' / year.
The site is close to the sea and at corrosive industrial atmosphere.

3. LIQUID PETROLIUM:

The pump should be handling all type of commercial hydrocarbons distillate described hereafter or blending of those products as follow:

DIESEL:

o Specific gravity @ 15^0 C	<0.845
o Kinematics viscosity @ 37.8^0 C (cst)	<4.5
o Sulphur content	10 ppm max.
o Filter plugging point (^{0}C)	5 (max summer) -5 (max winter)
o Flash point:	55^0 C

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GASOLINES:

- Specific gravity @ 15^0 C — 0.73 –0.765
- Kinematics viscosity @ 37.8^0 C (cst) — 0.6
- Copper corrosion (2 hr./100 C) — 1 max
- Aromatics (vol %) — 60
- MTBE (%) — 15
- Sulphur content (wt%) — 0.15
- Vapor pressure winter — 80 kpa

KEROSENE:

- Density 15^0 C — 0.805
- Kinematics viscosity (CST at 15^0 C) — 3-4

4. PUMP CODE STANDARADS & DEVIATION:

- API 610 12th edition 2021, Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries.
- API 682 4th edition 2015, Shaft Sealing System for Centrifugal and Rotary Pumps.
- ANSI/ASME B16.5, Pipe Flanges and Flanged Fittings.
- ANSI/ASME B16.20 Metric Gasket for Pipe Flanges.
- ASTM A193/A193M Standard Specification for Alloy-Steel and Stainless-Steel Bolting for High Temperature or High-Pressure Service and Other Special Purpose Applications.
- ASTM A194/A194M-18 Standard Specification for Carbon Steel, Alloy Steel, And Stainless-Steel Nuts for Bolts for High Pressure or High Temperature Service, Or Both.

Should there will be conflict between the requirements, data sheet, specification codes and standard the supplier shall obtain a written clarifications from the client before proceeding.
The supplier shall identify and mark and any deviation, demands or requirement which he is unable to comply

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5. PUMP TECHNICAL REQUIERMENT:

5.1 General:

Design, manufacture, assembly, supply and delivery of **API 610 BB3** type multi stage, double volute design centrifugal pumps as well as all accessories and equipment.

Scope of supply includes but not limited to: pump, electrical motor, coupling, mechanical seal, steel fabricated common baseplate, complete mounted unit including all accessories, inspection, tests, painting, marking, packing, pump documentation including maintenance instruction and installation instruction and other technical document as needed, unit guarantee etc.'

5.2 Specification Requirement:

The pumps and pumps auxiliaries shall meet the requirements of AP1 610 standard, this specification, data sheet - **Attachments A**

5.3 Performance:

Hedera pump (P4): 400 m3/hr. @ 850 m'.

Haifa pump (P7): 400 m3/hr. @ 775 m'

5.4 Connection;

Suction and discharge branches shall be arranged inline

Flanges shall be raised face, class 600, according to ANSI B 16.5.

Gasket contact surface shall have serrated spinal grooves machined with a 0.8 mm' nominal radius rounded-nose tool producing a grooved pitch of 0.35-0.45 mm'.

The resulting surface roughness of between Ra 3.2 and 6.3 micron.

Any screwed pipe connections shall ne to ANSI B2.1

Auxiliary piping connection to the pump casing shall not ne less than 3/4" and pipe thick shall be not less than sch.80.

All valve shall be ball type.

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5.5 Baseplate:

The pump and the motor shall be installed at common baseplate fabricated from heavy duty steel profiles, fitted with motor align devices.

The pump shall have lifting lugs suitable for horizontal lifting.

5.6 Coupling:

The pump and motor shall be connected by "spacer" coupling and protected by non-sparking coupling guard.

The coupling materials should be resistible for liquid fuel.

The coupling shall allow complete removal of all parts as a unit, without removing the motor.

5.7 Mechanical seal:

The pump shall be supplied with API 682 double type mechanical seal manufacturer by John Crane or equivalent.

The mechanical seal shall be a complete unit including seal flush and external seal quench.

The replacement of the mechanical seal shall be done on both side without having the need to disassemble the pump.

The unit shall include leak detection and alarm system contact.

Flange gaskets for cooling mechanical seal piping device shall be spiral wound type fitted with graphite.

5.8 Temperature Transmitters:

The pump shall be fitted with three element of temperature transmitters, two for pump bearing and one for pump casing,

Temperature transmitter type: PT100 3 wires.

All elements shall be wired to a common junction box.

The junction box shall have at least 10 spare connections for additional instruments connection.

5.9 All accessories such as valve pressure relief and auxiliary system shall be securely mounded or supported to avoid damage during operation or delivery time.

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5.10 Operation:

The pump shall be operated as a boosting pump
Pump shall be designed for continuously duty, 4000 hours per year. Bearing, shaft, seals and motor shall have minimum rated life of 25,000 hr.
The vendor shall specify time that the pump may operate at "no flow" condition as well as minimum continuous flow requirement.

5.11 Noise:

The noise generated by the pump and motor when operated at the duty point shall not exceeded 85 Dba @ 1 meters from the surface of the unit.

5.12 Pump Design

- The pump impeller diameter shall not exceed 95% of the maximum impeller diameter allowed for the pump.
- The pump efficiency at the design point shall not be less than 75%.
- Pump shall be suitable for parallel operation
- The head performance curve shall rise continuously.
  The vendor shall quote the pump curve reference to diesel or gasoline including efficiency, power and NPSH.
  The vendor shall quote pump performance curve for the installation of two pumps working in parallel.
- The pump duty point shall be to the left of B.E.P.
- The pump shall be selected that the duty points at the best efficiency point, at a satisfactory noise level and without cavitations.
- The impellers shall be mounted on the shaft and dynamically balanced.
- Discharge head shall be fabricated of steel and hydrostatically tested according to API 610.
- Oil lubricated system will include a sight level indication glass for checking the oil level

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- All tapped holes shall be plugged including seal, vent and drain connection.

5.13 Materials:

Materials of construction shall be according with API 610 standard recommendation table H-1, spec S-6

Pressure Casing:	Carbon Steel
Shaft:	AISI 410
Inner case parts:	12% chrome
Impeller:	12% chrome.
Case wear rings:	12% chrome.
Impeller wear ring:	12% chrome.
Casing gasket:	Spiral wound 316.

Material certificates: The vendor shall provide materials certification type including chemical composition and mechanical data EN 10204 3.1 type for all pressure contenting parts on pump.

Materials specification of all components listed in shall be clearly stated in supplier's proposal.

5.14 Pump Weight:

5.14.1 The vendor shall quote the total pump, motor and baseplate weight as well as the main components weight such as but not limited: motor, pump fitted with all pump's axillary and the common base plate.

5.14.2 No pump component such as motor; or the assembly of pump and baseplate shall weigh more than **3 tons** each.

6. ELECTRICAL MOTORS

Electrical motors shall be in according with the attached motor specification – **Attachment C**

7. PUMP NAME PALTE:

Pump name plate shall be of austenitic stainless-steel plate not less than 1.5 mm'. thick.
Name plate data information according to API 610 requirements.

8. INSPECTION & TESTS:

8.1 the pump shall be inspected and tested in according with API 610 requirements. Test procedure will require to be approved by the client.

8.2 The tests shall be witnessed by an in depended inspector approved by the purchaser. The manufacturer shall advise purchaser of the tests scheduled to be witnessed at least 14 days in advance to enable the putcher representative to be present.

9. PAINTING:

All external surfaces, other then austenitic steel surface shall be coated by an Epoxy painting system with UV protection according to manufacturer standard.
Dray painting shall be not less then 300 microns.

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10. PACKING

10.1 All openings are to be closed and sealed.
10.2 Nozzle flanges are to be closed by means of wooden plates with flexible gasket.
10.3 Any loose parts are to be packed and tagged with item number and part description.
10.4 Pumps are to be dowelled to baseplate.

10.5 Vulnerable threaded parts are to be coated with anti-corrosive paste and protected by suitable tape.
10.6 Pump assemblies are to be packed and firmly fixed in wooden crates suitable for ocean shipment.

11. SPARE PARTS:

The supplier shall specify the spare part need for each pump including the following:

11.2.1 Body gasket cut with bolts holes, 1 set for pump
11.2.2 Glass for lubricating bearing oil, 5 sets for pump
11.2.3 lubricant filter element, 10 sets for pump

12. GUARANTEE:

12.1 The manufacturer shall guarantee that all materials and workmanship is free of defect an conform to the appropriate specification.
12.2 Should any defect in performance, materials or workmanship become apparent within 12 months from the date of commissioning or 18 months from the date of delivery (whichever comes last), the manufacturer shall

repair or otherwise rectify the defect free of charge to the purchaser.

13. TECHNICAL DOCUMENTS:

In addition to the information called in **Attachment B** the bidder shall include:

13.1 Maximum allowable force and moments on pump nozzles.
13.2 Details of any deviations from this specification and pump data sheet.
13.3 Detailed performance curve.
13.4 Details datasheets for suggested pump assembly.
13.5 Pump main components assembly weight
14.6 Pump and motor data sheet
14.7 Dimensions drawing s (PDF & DWG), cut view drawings.
14.8 Hazardous areas classification drawings PDF & DWG
14.9 Reference list of similar pumps.
14.10 Manufacturers quality assurance program.
14.11 Any special tools or equipment as may be required for pump maintenance.
14.12 All document to be in English language.
14.13 List recommended spare parts.
14.14 Maintenance and Installation instruction