



**SPECIFICATION FOR VERTICAL  
CENTRIFUGAL PUMP**

**PUMP P-30 (Ashdod)  
(Ver 001)**

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P <sup>0</sup>	27/2/2023	Preliminary	E. Kaganowski	E. Kaganowski	
<b>REV</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>BY</b>	<b>CKD</b>	<b>APPROVED</b>
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## 1. GENERAL:

This document covers the technical requirements for design, manufacture, supply and delivery of one (1) vertical VS6 type centrifugal pumps to be installed in Ashdod fuel station.

The pump and pump auxiliaries shall meet the requirements of API 610 standard, this specification and the attached data sheet and documents.

## 2. SITE CONDITIONS:

The pumps shall be installed outdoor.

Sites altitude is about 10 m' above sea level.

Ambient temperature varies between 5<sup>0</sup>C- 40<sup>0</sup>C.

Relative humidity varies between 10% - 80%.

Rain falls around 450 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:**

- |  |                   |
|--|-------------------|
| ○ Specific gravity @ 15 <sup>0</sup> C             | <0.845            |
| ○ Kinematics viscosity @ 37.8 <sup>0</sup> C (cst) | <4.5              |
| ○ Sulphur content                                  | 10 ppm max.       |
| ○ Filter plugging point (°C)                       | 5 (max summer)    |
|  | -5 (max winter)   |
| ○ Flash point:                                     | 55 <sup>0</sup> C |



#### **GASOLINES:**

○ Specific gravity @ 15 <sup>0</sup> C	0.73 –0.765
○ Kinematics viscosity @ 37.8 <sup>0</sup> 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 <sup>0</sup> C	0.805
○ Kinematics viscosity (CST at 15 <sup>0</sup> C)	3-4

#### **4. PUMP CODE STANDARDS & DEVIATION:**

- API 610 12<sup>th</sup> edition 2021, Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries.
- API 682 4<sup>th</sup> 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 REQUIREMENT:**

### **5.1 General:**

Design, manufacture, assembly, supply and delivery of **API 610 VS6** type vertical multiple 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 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.'

The new pump (P30) shall be installed parallel to an existing two vertical pumps P10 & P20. The new pump (P30) shall be identified to the existing pumps. Attached are drawings of the existing pumps as well as pumps performance diagrams – **Attachments A**

### **5.2 Specification Requirement:**

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

### **5.3 Performance:**

Ashdod pump (P30): 300 m<sup>3</sup>/hr. @ 93.5m'

### **5.4 Connection:**

Suction and discharge branches shall be arranged inline

Flanges: Raised face, class 150, according to ANSI B 16.5.

Gasket contact surface shall have serrated spiral 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 be to ANSI B2.1

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

All valve shall be ball type.



#### 5.5 Coupling:

The pump and motor shall be connected by 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.

#### 5.6 Mechanical seal:

The pump shall be supplied with API 682 single type plan 11 mechanical seal manufacturer by John Crane or equivalent.

The mechanical seal shall be a complete unit including all seal parts and accessories.

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.

#### 5.7 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.

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

#### 5.9 Operation:

The pump shall be operated as a transfer pump from storage tank to high pressure pumps.

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.

5.10 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.

5.11 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 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
- All tapped holes shall be plugged including seal, vent and drain connection.

5.12 Materials:

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

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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 containing 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 weight as well as the main components weight such as but not limited: motor, pump fitted with all pump's axillary.

## 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

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610 requirements. Test procedure will require to be approved by the client.

8.2 The tests shall be witnessed by an independent 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 purchaser representative to be present.

## **9. PAINTING:**

All external surfaces, other than austenitic steel surface shall be coated by an Epoxy painting system, UV protection according to manufacturer standard.

Dray painting shall be not less than 300 microns.

## **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.

10.5 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 and 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 D** 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.

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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