



**SHIRAZ OIL REFINING COMPANY
LIGHT NAPHTHA HYDROTREATING UNIT**

SHIRAZ Oil Refining Co.

PROJECT DOCUMENT No.

TECHNICAL SERVICES DEPARTMENT

PROJECT	FACILITY	UNIT	DOCUMENT	DISCIPLINE	SEQUENCE	REVISION
SHIRAZ	01	2000	DSH	ME		D0

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DOCUMENT TITLE: ENGINEERING STANDARD SPECIFICATION FOR FP-2023D

**ENGINEERING STANDARD SPECIFICATION
FOR
FP-2023 D**

0	4/05/2020	Issued for comment	F.Ravosh	S.Shojaeian	
REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED



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INTRODUCTION

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Shiraz Oil Refining Company , Intends to purchase one set of centrifugal pump and its driver as per attached data sheets..

REFERENCES

- 1) Project specification
- 2) API STD. 610 , Latest Edition
- 3) IPS-M-PM-105(Centrifugal Pumps For Process Services)
- 4) IPS- M-EL-132(2)(medium and high voltage induction motors)

DESIGN & SITE CONDITIONS

Pumps and drivers shall be designed , fabricated and tested in accordance with the above references , and to be suitable for the following site conditions:

Wind Velocity	120 km/hr
Elevation.	1555 m
Minimum temperature (metallurgical design)	-16 °C
Maximum ambient temperature	44°C
Average relative humidity of the year	43%
Maximum air dust concentration	1200 mg/m ³

EXTENT OF WORK

Vendor shall be responsible for the engineering and supply of the entire unit , consisting pump , base plate , coupling , electric motor and etc.

GENERAL NOTES FOR PUMP



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- 1-Vendor should specify minimum flow rate at P.T.
- 2- The equipment will be installed outdoor.
- 3-All accessories(Motor, Base plate ,Coupling , etc.)shall be supplied by pump supplier.
- 4-Vented suction chambers to prevent vapor binding shall be provided.
- 5-Sealed gland or stuffing box to eliminate air intrusion shall be provided .
- 6- Provide 8 copies of instruction , maintenance and spare parts list in English.
- 7- Supplier shall provide spare parts for 2 years of continuous operation .
- 8- Pump material shall be indicated in equivalent to ASTM specification .
- 9- Coupling shall be fail safe , stainless steel multidisk , flexible coupling .
- 10-Shaft sleeve are required on pump , with standard mechanical seal Installation .

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11- ELECTRICAL :

- 11-1 Electric Power : 6000 V-3PH – (50HZ)
- 11-2 The electric motors shall be selected , sized and supplied as per the project specification "Three Phase Squirrel Cage Induction Electric Motors" including IPS M-EL-132(2).
- 11-3 Vendor shall retain full responsibility for motor sizing ,mounting and alignment and ensure compatibility with driven equipment . all inspection testing and data requirement , etc . shall be the responsibility of the vendor , who shall ensure that the motor sub vendors meet all requirements as specified .
- 11-4 All motors shall be suitably sized so as to deliver required output under frequency variations of -5% , +2% of nominal value coincidental with voltage variation of $\pm 5\%$ of the nominal value .



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11-5 Motor terminal box shall be suitable for size and numbers of purchaser's cables (the cable entries shall be metric type) .

11-6 Supply of cable glands which are mounted on motors terminal boxes are excluded from vendor's scope .

11-7 All electric motors shall be suitable for classified safe areas , with certificate for 45^oC ambient temperature from one of the cenelec members .

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11-8 The motor rating shall have at least the following percentage of pump design point brake kW as specified in relevant sheet .

Motor rating (kW)	Percent of pump BKW
19 and less	130%
22.5 to 56	120%
75 and above	115%

11-9 The electric motors are subject to test by Owner or third party inspector as specified in the attached " MOTOR DATA SHEET " document .

11-10 The electric motor data sheets attached to IPS-M-EL-132(2) shall be completely filled –out for each motor and submitted to purchaser.

11-11 Each skid shall be provided with at Least two earthling points and one on right hand side of motor enclosure for connecting to earth grid . Earth continuity of all metallic parts of skid shall be guaranteed to be done by vendor .



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11-12 Cable gland entries shall be iso metric with 1.5mm pitch and minimum thread length of 15mm . vendor will be informed of number and size of entries during detail engineering stage . However vendor shall follow the size and numbers calculated by purchaser .

11-13 The insulation class of motors shall be "F" and their temperature rise shall be limited to class "B" for 45°OC ambient temperature .

11-14 The winding of Motors shall be in " STAR " connected .

11-15 Drawing and documents of Motors shall be furnished in English.

GUARANTEE

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Vendor shall guarantee that equipment is free from fault in design , workmanship and material to fulfill satisfactorily the operating conditions specified .

Should any defect in design, material , workmanship or operating characteristics developed after 12 months of operation or after 24 months following shipment from supplier's plant , whichever occurs later , vendor guarantees to make all necessary or desirable alterations , repairs and replacements free of charge .

If the defect or failure to function cannot be corrected , vendor guarantees to replace promptly , free of charge , said equipment or to remove the equipment and refund the full purchase price.

DOCUMENTS

Pump supplier shall prepare and submit to Shiraz Oil Refining Co. The following documents :
8 Technical manual including technical data, drawing and maintenance catalogue , spare parts list , two copies of the final approved drawings.



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Service	FIRE WATER PUMP			
PUMP TYPE	CENTRIFUGAL PUMP			
Quantity	1			
Operating pumps – item	FP-2023D			
Spare pump – item	-			
Driver , operating pumps	MOTOR			
Driver , spare pump	-			
Driver furnished by				
Driver mounted by				
Fluid pumped	Fresh water			
Corrosive or Erosive				
Sp. Gr Gravity @PT	1			
Pumping temperature , °C	29			
Viscosity at P.T. - CP.	0.802			
Vapor pressure at P.T	kg/cm ²	0.043		
Flow rate	Normal	M3/Hr	818	
@ P.t.	MAX	M3/Hr	1226	
NPSH available	MT	6		
Suction pressure	bar g	0	(1)	
Process requirements :				
Discharge pressure ,	bar g	12.84		
Diff. pressure .	bar	12.84		
Diff. head @ P.T.	M	128.4		
Suction/Discharge		14"/12"		
Estimated efficiency	%	0.7		
Est. BHP required	KW	410		
Est. BHP motor	KW	500		
Est. BHP of turbine	KW			

Note:

- 1) Specified flow rates are process requirements excluding any mini-flow. Installation of mini-flow to be defined by vendor.
- 2) Design flow rate = 110 % of normal flow rate. Turndown flow rate = 50 % of normal flow rate.
- 3) Highest And lowest Absolute Barometric Pressure Are 0.870 And 0.843 , Respectively



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Item	FP-2023D	
Type Of Pump	Centrifugal	
Suction Type (Single) (Double)	double	
Stages	1	
Shaft Arrangement	Horizontal	
Casing Split	axial	
Pump Support(W/C) Water Cooled	foot	
Coupling Type	NOTE 1	
Casing	Cast iron	
Suction: ASA Rating	300 #	
Facing & Location	R.F.side	
Discharge : ASA Rating	300 #	
Facing & Location	R.F.side	
Impeller	BRONZE	
Impeller Type	Closed	
Casing Wearing Rings	BRONZE	
Impeller Wearing Rings	BRONZE	
Diffuser Or Intermediate Cover		
Balancing Drum		
Balancing Sleeve		
Shaft	AISI 1045	
Shaft Sleeve	AISI 420	
Stuffing Box		
Mechanical Seal		
Mechanical Seal Faces		
Mechanical Seal Metal Parts		
Seal Shaft Packing	PTEF	
Gland(V) Vent(Q) Quench (D)Drain	V & D	
Gland Throttle Bushing		
Cage Ring		
Throat Bushing		
Stuffing Box Packing (100% Spare No)		
Packing Lubrication	SELF	
Bearings , Radial	BALL	
Bearings Lubrication	OIL	
Oil Cooler		
Gland Seal Piping	Steel	
Flushing Oil Piping		
Cooling Water Piping		
"API" Material Class		
Mechanical Seal Code		

Notes :

- 1- ACCORDANCE TO API 682



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ELECTRO MOTOR GENERAL DATA

<i>No. of Motors</i>	1	
<i>Document No.</i>	*	
<i>Tags</i>	*	
<i>Duty</i>	S1	
<i>Installation</i>	Outdoor	
<i>Operating machine</i>	PUMP	
<i>Coupling type</i>	DIRECT OR*	
<i>Manufacturer</i>	Siemens(Germany)ABB(Finland)GEC(U.K.)Mitsubishi(Japan)	
<i>Ref. Code & Standard</i>	IEC, NIOEC spec 60-2,IPS	
<i>Test</i>	According to IEC and SPC/E2103	
<i>Site conditions</i>	<i>Climate</i>	Continental dusty
	<i>Altitude</i>	more than 1550m Above See Level
	<i>Min/Max ambient temperature</i>	-14 / +44 C
	<i>Hazardous atmosphere</i>	
	<i>Class</i>	
	<i>Division</i>	
	<i>Group</i>	

RATING AND CHARACTERISTICS

<i>Rated power</i>	500 kW * Or
<i>Frequency</i>	50 Hz
<i>Operation voltage</i>	6000V Star +5% / -5%
<i>Full load current</i>	*
<i>No. of poles</i>	*
<i>Full load speed</i>	1775 rpm * Or
<i>Power factor</i>	>=0.9
<i>Efficiency</i>	>=0.95
<i>Insulation class/Temp. Rise</i>	F/B
<i>Starting</i>	DOL
<i>Enclosure</i>	IP-55
<i>Shape</i>	IM B3 OR *
<i>Cooling method</i>	Self ventilated, No sparking fan
<i>Lubrication method</i>	Self lubricant

Notes:

- 1- "*" shall be modified and confirmed by vendor
- 2- Terminal box shall be located at right hand side when looking at D.E.
- 3- Motor test certificates shall be forwarded prior to shipment
- 4- All parts shall be according to standards that mentioned above.
- 5- The motor's cable box assembly shall withstand the effects of faults of 6.5 MVA s.c.p. for 0.15 second



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Project engineer

M.A.