



SHIRAZ OIL REFINING COMPANY
WASTE WATER TREATMENT UNIT

SHIRAZ OIL
REFINING
COMPANY

TECHNICAL
SERVICES
DEPARTMENT

PROJECT DOCUMENT NO.

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

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DOCUMENT TITLE: ENGINEERING STANDARD SPECIFICATION FOR “ ”

**ENGINEERING STANDARD SPECIFICATION
FOR
PAC PUMPS**



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INTRODUCTION

Shiraz Oil Refining Company intends to purchase two sets of reciprocating piston-diaphragm pumps and their drivers as per attached data sheets.

REFERENCES

1. Project specification
2. IPS-M-EL-131 (Low voltage induction motors)
3. API 674 (Positive Displacement Pumps-Reciprocating), Latest Edition.
4. IPS-M-PM-130 (Positive Displacement Pumps-Reciprocating)

DESIGN & SITE CONDITIONS

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

Wind Velocity:	120 km/h
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 the supply of the entire unit consisting of pump, base plate, coupling, electric motor, etc.

PUMP GENERAL NOTES

1. Vendor should specify the 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 the pump supplier.
4. Vented suction chambers to prevent vapor binding shall be provided.



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5. Sealed gland or stuffing box to eliminate air intrusion shall be provided.
6. Provide 8 copies of instructions, 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 multidisc, flexible coupling.
10. Shaft sleeve is required on pump, with standard mechanical seal installation.
11. Vendor shall complete and submit the forms: API 674.

GUARANTEE

1. Vendor shall guarantee that equipment is free from fault in design, workmanship and material to fulfill the operating conditions specified satisfactorily.
2. 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.
3. 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

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

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PUMPING FLUID

Operating case:	Start of Run/End of Run	
Fluid circulated:	Liquid Poly Aluminium Chloride (PAC)	
Corrosive/erosive agents:	Yes	
Pumping temperature:	AMB	°C
Density (P.T.):	1380	kg/m ³
Viscosity (P.T.):	~40-80	cP
P.H. (1% Water Soluble):	~3.5-5	

OPERATING CONDITION

Normal flow:	5	L/h
Design flow:	60	L/h
Suction pressure:	0.86	Bar
Discharge pressure:	6	Bar
Differential pressure:	5.14	Bar
Differential head:		m
NPSH _A :		m
Normal hydraulic power:		kW

PUMP

Number and type:	2 Reciprocating Piston-Diaphragm (1 Operating + 1 Spare)	
Assumed efficiency:		%
Normal shaft power (Estimated) :		kW
Material:	API STANDARD	

DRIVER

Type:	Operating	Electrical
	Spare	Electrical
Nominal power (Estimated) :		kW
Consumption (Estimated) :		kW



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PROJECT SPECIFICATION PUMPS AND DRIVERS	Rev.	1	2	3
	Date	08/10/2022		
	By	Process Eng. Dep.		
	Appr.			
	Sheet	1	of	1
Service		Waste Water Treatment Dosing Pump		
Quantity:	3			
Operating pumps/item:	2			
Spare pump/item:	1			
Driver: operating pumps:	Motor			
Driver: spate pump:	Motor			
Driver furnished by:				
Driver mounted by:				
Fluid pumped		Liquid Poly Aluminium Chloride (PAC)		
Corrosive or Erosive:	Yes			
P.H. (1% Water Soluble) :	~ 3.5-5			
Pumping Temperature (P.T.) :	AMB			°C
S.G. @ P.T. :	1.38			
Viscosity @ P.T. :	~ 40-80			cP
Vapor pressure @ P.T. :				Bar
Flow rate @ P.T. :	Normal	5		
	Design	60		
Suction pressure:	0.86			
Discharge pressure:	6			
Differential pressure:	5.14			
Differential head @ P.T. :	38			
NPSH _A :				m
Estimated efficiency @ design:				
Estimated BHP Required:				KW
Estimated BHP of motor:				KW
Estimated BHP of turbine:				KW



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PROJECT SPECIFICATION PUMPS AND DRIVERS	Rev.	1	2	3
	Date	11/27/2022		
	By	A. Mehran		
	Appr.			
	Sheet	1	of	1
Item:				
Type Of Pump:	Reciprocating Piston Diaphragm			
Suction Type (Single/Double) :				
Stages:				
Shaft Arrangement:				
Casing Split:				
Pump Support (W/C) Water Cooled:				
Coupling Type:				
Casing:				
Suction: Size & ASA Rating				
Discharge : Size & ASA Rating				
Impeller:				
Impeller Type:				
Casing Wearing Rings:				
Impeller Wearing Rings:				
Diffuser Or Intermediate Cover:				
Balancing Drum:				
Balancing Sleeve:				
Shaft:				
Shaft Sleeve:				
Stuffing Box:				
Mechanical Seal:				
Mechanical Seal Faces:				
Mechanical Seal Metal Parts:				
Seal Shaft Packing:				
Gland(V) Vent(Q) Quench (D)Drain:				
Gland Throttle Bushing:				
Cage Ring:				
Throat Bushing:				
Stuffing Box Packing (100% Spare No) :				
Packing Lubrication:				
Bearings , Radial:				
Bearings Lubrication:				
Oil Cooler:				
Gland Seal Piping:				
Flushing Oil Piping:				
Cooling Water Piping:				
“API” Material Class:				
Mechanical Seal Code:				
Note: Accordance to API 682				
Sound pressure limit	Pump	87		dB
	Pump + Driver	90		dB



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INDUCTION MOTOR SPECIFICATION SHEET

GENERAL DATA

Document No.:	*	
Tags:	FMP-PAC A/B/C	
Duty:	S1	
Installation:	Outdoor	
Operating machine:	PUMP	
Coupling type:	DIRECT OR *	
Manufacturer:	Siemens (Germany), ABB (Finland), GEC (U.K.), Mitsubishi (Japan) OR AVL	
Ref. Code & Standard:	IEC, NIOEC SPECS 60-2, IPS	
Test:	According to IEC and SPC/E2103	
Site condition:	Climate	Continental dusty
	Altitude	More than 1550 m above sea level
	Min/Max ambient temperature	-12/ +44 C
	Hazardous Atmosphere	
	Class	1
	Division	2
	Group	D

RATING AND CHARACTERISTICS

Rated power:	* OR 0.18 Kw
Frequency:	50 Hz
Operation voltage:	230V SINGLE PHASE
Full load current:	*
No. of poles:	*
Full load speed:	*
Power factor:	>=0.9
Efficiency:	>=0.95
Insulation class/Temp. Rise:	F/B
Starting:	DOL
Enclosure:	IP-55 EexdllCT4
Shape	*
Cooling method:	Self-ventilated, No sparking fan
Lubrication method:	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- Inspection: Motor test shall be witnessed by owner inspector, at no extra cost.
- 5- All parts shall be according to standards that mentioned above.
- 6- The motor’s cable box assembly shall withstand the effects of faults of 6.5 MVA S.C.P. for 0.15 second.

Project engineer: M.A.