

Price Schedule of Various Types of Pumps with Base Frame

Sl No. (1)	Description of the Goods (2)	Unit (3)	Quantity (4)	FOB Value Per Unit (5)	Total FOB Value (4X5=6)	Freight (7)	Total CFR (6+7=8)
01.	Scrubbing Liquor Pump with Base Frame Model no.: 3196 MTi or Equivalent Size: 1 X 2-10 Capacity: Rated - 25 m ³ /hr Head: 80 m Speed: 2900 rpm	Set	01				
02.	Sulfuric Acid Pump with Base Frame Model no.: IHE-50-32-250 or Equivalent Capacity: Rated - 4 m ³ /hr Head: Duty Point 61 m Speed: 2900 rpm	Set	01				
03	Cyclonic Column Feeding Pump with Base Frame Model no.: LC200/410 or Equivalent Capacity: Min ^m -200 m ³ /hr Normal- 395m ³ /hr Rated -460m ³ /hr Head: -50m, Max .-70 m Speed: 1450 rpm	Set	01				

Scrubbing Liquor Pump (P-500)
Single Stage Centrifugal Pump
Model NO. 3196MTi, Size : 1× 2-10 Or Equivalent

Operation Conditions

1. Liquid : Inc. H₂O, H₂SO₄, P₂O₅, NH₃, F, Dust.
2. Liquid : Corrosive and Errosive.
3. Temperature : Normal 70°C
4. Service : Continuous.
5. Density : 1000 ~ 1100 Kg/m³
6. Viscosity : 5.000 Cp.
7. Vapor Pressure : 15.00 kPa abs.
8. Specific Gravity : 1.450

Performance

1. Capacity : Normal - 20 m³/hr, Rated - 25 m³/hr
2. Head: 80 m
3. Rated Power : 17.73 KW
4. Speed : 2900 RPM
5. Published Efficiency : 47.5 % (CDS)
6. Rated Efficiency : 44.5 % with Dynamic seal
7. Disch. Pressure : 1181.0 kPa g
8. NPSHr : 1.7 m (Available NPSH is 8.9)
9. Mim^m Flow : 4.72 m³/hr
10. Lubrication : Flood oil

Impeller : Open Type, Dia Max^m - 254 mm, Min^m - 127, Dia Rated - 241 mm

Case : Bracket Mounting, Max^m Casing Pressure - 1891.4 kPa g,

Bearing : SKF 6309 (Inboard Bearing) SKF 5309A/C3 (Outboard Bearing),

Sealing method : Dynamic Seal-Checkseal (Repeller dia - 165 mm).

Material : Case-CD4MCu, Impeller- CD4MCu, Shaft-SAE 4140, Sleeve- SAE 4140.

ST.Box Cover : CD4MCu.

<u>Spare Parts</u> : Impeller	-	02 Pcs.
Shaft	-	01 Pc.
Sleeve	-	02 Pcs.
Mechanical Seal	-	02 Pcs.
O-ring and Gasket	-	02 Sets
Bearings	-	01 Set

(hr)





Sulfuric Acid Pump (P-902)
Single Stage Centrifugal Pump
Model NO. IHE-50-32-250 Or Equivalent

Operation Conditions

1. Liquid to be Pumped : 98.5 % H₂SO₄
2. Liquid : Corrosive.
3. Solid Conc. : 0 % w/w (Dust).
4. Temperature : Normal
5. Service : Continuous.
6. Density : 1840 kg/m³
7. Viscosity : 10– 50 Cp.

Performance

1. Capacity : Min^m & Normal - Manufacturing Design, Rated - 4 m³/hr
2. Head : Rated - 6.4 m, Max.^m - 70 m
3. Shaft Power : Rated - 2.6 KW, Max. - 4.8 KW
4. Speed : 2900 RPM
5. Efficiency (Rated) : 20 %
6. Suction Pressure : Min^m - 0.01 MPa, Normal - 0.09 MPa, Max^m - 0.11 MPaG
7. Delivery Pressure : 1.4 MPaG (14.5 Kg/cm²G)
8. Diff. Pressure : Manufacturer's Design
9. NPSHa : 4 m

Impeller : Single Suction, Close Type, Dia Max^m - 240 mm, Dia Rated - 220 mm

Case : Foot Mounting, Design Pressure : 1.6 MPaG, Hydrotest - 2.5 MPaG.

Bearing : Radial-Ball, Thrust - Ball, Oil Lubrication, Air Cooling.

Sealing system : Mechanical Seal.

Material : Case-SUS 316, Impeller- SUS 316, Shaft- SUS 316, Sleeve- SUS 316, Wear plate - CD4MCu.

<u>Spare Parts</u> : Impeller	-	02 Pcs.
Shaft	-	01 Pc.
Sleeve	-	02 Pcs.
Mechanical Seal	-	02 Pcs.
O-ring and Gasket	-	02 Sets
Bearings	-	01 Set

(M)

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Cyclonic Column Feeding Pump (P-566)

Single Stage Centrifugal Pump

Model NO. LC-200/410-FP-B-000 Or Equivalent

Operation Conditions

1. Liquid : Inc. H_2O , H_2SO_4 , P_2O_5 , NH_3 , F Dust.
2. Liquid : Corrosive and Errosive.
3. Solid Conc. : 2 ~ 10 wt % (Dust).
4. Temperature : Normal 3 ~ 45°C, Max.^m - 45°C
5. Service : Continuous.
6. Density : 1000 ~ 1100 Kg/m³
7. Viscosity : 3(45°C) Cp.
8. Vapor Pressure : 7.5 (45°C) kPaA

Performance

1. Capacity : Min^m - 200 m³/hr, Normal - 395 m³/hr, Rated - 460 m³/hr
2. Head : Rated - 50 m, Max. - 70 m
3. Shaft Power : Rated - 104.5 KW, Max. - 115 KW
4. Speed : 1450 RPM
5. Efficiency : 60%
6. Suction Pressure : Min^m - 0.04 MPa, Normal - 0.042 MPa, Max^m - 0.045 MPa
7. NPSHa : 12 m
8. Disch. Pressure : 0.7 MPa ~ 0.9 MPa

Impeller : Single Suction, Close Type, Dia Max^m - 405 mm, Dia Rated - 400 mm

Case : Bracket Mounting, Design Pressure - 1.0 MPaG, Hydrotest - 1.5 MPaG.

Bearing : Radial-Ball, Thrust - Roller, Grease Lubrication, Air Cooling.

Sealing system : Stuffing Sealing.

Material : Case-CD4MCu, Impeller- CD4MCu, Shaft-316L, Sleeve-316L

<u>Spare Parts</u> : Impeller	-	02 Pcs.
Shaft	-	01 Pc.
Sleeve	-	02 Pcs.
Stuffing Seal	-	01 Pc.
O-ring and Gasket	-	02 Sets
Bearings	-	01 Set

Technical Terms & Conditions:

1. Country of Origin and port of shipment must be mentioned with the technical offer.
2. Manufacturer's Original Color printed Catalogue and operation manual indicating Manufacturer Standard and Code in English must be submitted along with the technical offer.
3. Manufacturer Company Profile must be submitted along with the technical offer.
4. Manufacturer's Updated ISO Certificate must be submitted along with the technical offer.
5. Manufacturer must be needed minimum 10 (Ten) years of experience for Manufacturing such type of items.
6. Manufacturer Test Certificate must be submitted along with the supply of goods.
7. Authorization Certificate from the Manufacturer must be submitted along with the technical offer.
8. At least 3 Nos. of provenness certificate i.e. End User Certificate with detail address of (web side, email, phone, fax etc.) of end user (other than manufacturer own country) must be submitted along with the technical offer.
9. Bearing as a spare parts must be SKF/ FAG/RHP/INA branded not another branded.

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29-9-19

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DAP FERTILIZER COMPANY LTD. (DAPFCL).
RANGADIA, CHITTAGONG-4000, BANGLADESH.
TECHNICAL SCHEDULE

1. TECHNICAL SPECIFICATIONS & QUANTITY FOR PUMPS.

- A : One Scrubbing Liquor Pump with Structural base assembly.
 Item No. P-500 (Enclosed page no ~~24-27~~)
- B : One Sulfuric Acid Pump with Structural base assembly.
 Item No. P-902 (Enclosed page no ~~28-29~~)
- C : Cyclonic Column Feeding Pump with Structural base assembly.
 Item No. P-566 (Enclosed page no. ~~30-31~~)

ELIGIBILITY FOR BIDDING : Manufacturer's/Bidder's who Manufacture /supply pumps suitable for handling fluids as mentioned below are Eligible for Bidding.

Fluid for Scrubbing Liquor Pump. (Item no. P-500)

Liquid Scrubbing Liquor (Inc. H₂O, H₂SO₄, P₂O₅, NH₃, F, DUST), Temp. 70° deg. C, (Norm. 70.° deg. C), Vapor Press. 15.0 kpa abs.. Sp. Gr. 1.450, Viscosity 5.000 Cp.

Fluid for Sulfuric Acid Pump (Item No. P-902)

Fluid : Sulfuric Acid. Concentration : 98.50%. Specific Gravity : 1.84. Viscosity : 25 Cp. Vapor Pressure : 0. Pumping Temp. : Ambient (70°F)

Fluid for Cyclonic Column Feeding Pump. (Item no. P-566)

Liquid Scrubbing Liquor (Inc. H₂O, H₂SO₄, P₂O₅, NH₃, F, DUST), Vapor Press. 7.5 (45°C) kpa abs., Density : 1000-1100 Kg/m³, Viscosity : 3 (45°C)- Cp.

2. INFORMATIONS TO BE PROVIDED IN THE TECHNICAL PROPOSAL.

- 2.a. Manufacturing Country.
- 2.b. Name of the Manufacturer, Model number, serial number etc.
- 2.c. Country of origin.
- 2.d. Number of years the quoted pump is under production.
- 2.e. Port of shipment (Must be in the Manufacturing Country)

3. DOCUMENTS TO BE PROVIDED ALONG WITH TECHNICAL PROPOSAL.

- 3.a. Printed product catalog(s), manual(s), brochure(s) etc. containing detailed specifications of the Pump to be supplied. (Photocopy & print from computer download are not acceptable).
- 3.b. Assembly drawing of the offered pump, like the typical one as illustrated in the enclosed pages showing part number, part name & part material, nominal size & ANSI rating for both suction & delivery flanges. For equivalent Material details chemical composition against the DAPFCL Material grade must be mentioned.
- 3.c. Manufacturer's credential & company profile

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[Signature]

Technical offer must include separate list for spare parts of two years consumption for each pump. Acceptance/rejection or fixing quantity are sole discretion to DAPFCL authority. Vendor must accept partial offer for spare parts. The spare parts list shall contain at least the following but not limited to.

Shaft, Sleeve, Impeller, Mech. seal, O-ring and gaskets, Bearings etc.

Shaft, Sleeve, Impeller, Complete Mechanical Seal, O-ring and gaskets, Bearings etc.

Impeller, Shaft, Sleeve, Stuffing Seal, O-ring and gaskets, Bearings etc.

Unit & total price (C&F Chattogram) for each item in the list shall be mentioned in the commercial offer as follows :

Sl. No.	Part No.	Part Name	Material	Unit	Qty.	Unit Price C&F Chattogram	Total Price C&F Chattogram
A. Scrubbing Liquor Pump. Item no. : P-500 (Drawing number : By manufacturer).							
To be mentioned in the technical & Commercial offer						To be mentioned in the Commercial offer	
B. Sulfuric Acid Pump. Item no. : P-903 (Drawing number : By manufacturer).							
To be mentioned in the technical & Commercial offer						To be mentioned in the Commercial offer	
C. Cyclonic Column Feeding Pump. Item no. P-566 (Drawing number : By manufacturer).							
To be mentioned in the technical & Commercial offer						To be mentioned in the Commercial offer	
Total C&F Chattogram Price:							

Operating conditions

SERVICE LIQUID

Scrubbing Liquor Pump

Liquid Scrubbing Liquor (Inc. H₂O, H₂SO₄, P₂O₅, NH₃, F, DUST)

Temp. 70.0 deg C (N.m. 70.0 deg C), Vapor Pres. 15.00 kPa abs,

SP.GR 1.450, Viscosity 5.000 cp

CAPACITY Norm./Rate HEAD

20.0 / 25.0 m³/hr

80.0 m

Performance at 2900 RPM

PUBLISHED EFFY

47.5% (CDS)

RATED EFFY

44.5% with dynamic seal

RATED POWER

17.73 kW (incl. Dynamic seal drag 0.75). (Run out 19.90 kW)

NPSHR

1.7 (available NPSH is 8.9) (m)

DISCH. PRESSURE

1181.0 (1312.2 @ Shut off) Based on 45.0 Suc.press (kPa g)

PERF. CURVE

5018-2 (Rotation CW viewed from coupling end)

SHUT OFF HEAD

89.2 m

MIN FLOW

4.72 (m³/hr)

Materials

CONSTRUCTION

CD4MCU

CASING

CD4MCU max. casing pres. @ rated temperature 1891.4 kPa g

ST. BOX COVER

CD4MCU

IMPELLER

CD4MCU - Open (241 rated (mm), max=254, min=127)

CASING GASKET

Aramid Fiber with EPDM Rubber

IMPELLER O-RING

Teflon

SHAFT

SAE 4140

LUBRICATION

Flood oil

ST. BOX TYPE

Standard for dynamic seal

BEARINGS

SKF 6309 (Inboard Bearing) SKF 5309 A/C3 (Outboard Bearing)

Sealing Method

DYNAMIC SEAL

Checkseal (Repeller dia. 165 mm)

Flanges

150# raised face

Liquid end features

Impeller balance holes

Impeller single plane balanced to ISO G6.3

St. box-Seal chamber feat.

Repeller 1 hole seal flush

Frame features

Ductile Iron frame adapter

Labyrinth oil seals - Inpro VBXX-D

Waco roller

Testing

Impeller balance report

Non witnessed casing hydrostatic test

Driver: Electric motor

RATING

22.00 kW (29.5 HP)

PHASE/FREQ/VOLTS

3/50 Hz/400

INSULATION/SF

F/1.00

ENCLOSURE

IEC TEFC IP55

SPEED

3000 RPM

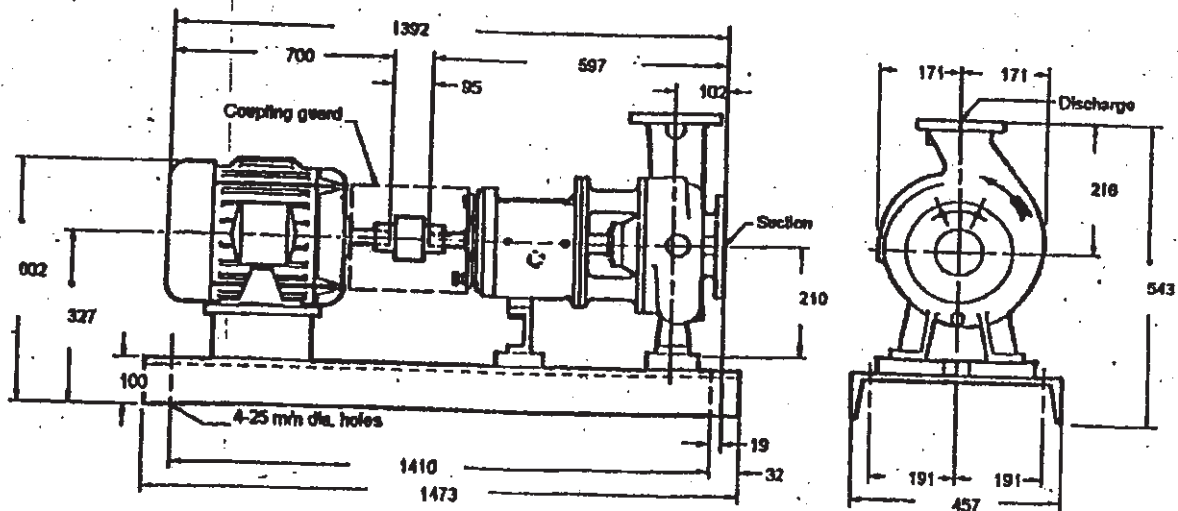
FRAME

180M48

Weights

TOTAL NET UNIT WEIGHT 105.8 Kg

TOTAL GROSS UNIT WEIGHT 333.0 Kg



Pump specification

SUCT.FLANGE SIZE 2"	DRILLING ANSI 150B	FACING RF	FINISH SERRATED
DISCH.FLANGE SIZE 1"	DRILLING ANSI 150B	FACING RF	FINISH SERRATED
PUMP ROTATION (LOOKING AT PUMP FROM MOTOR)	CW		
TYPE OF LUBRICATION	FLOOD OIL		COOLED NO
TYPE OF STUFFING BOX	STANDARD FOR DYNAMIC SEAL		COOLED NO
TYPE OF SEALING	DYNAMIC SEAL		

Weights and Measurements

PUMP	99.8 kg
MOTOR/CPLG	215.0/6.0 kg
BASEPLATE	137.4 kg
TOTAL	458.2 kg
GR.VOLUME w/BOX	0.708 m ³
GR.WEIGHT w/BOX	514.9 kg

Motor specification

MOTOR BY PUMP MFG	MOUNT BY PUMP MFG	MFG.	PUMP MFG'S CHOICE JMS
FRAME Y180M-2	POWER	22.00 kW	HPM 3000
PHASE 3	FREQUENCY	50 Hz	VOLTS 400
INSULATION F	S.F.	1.00	
ENCLOSURE IEC TEFC IP55			

Auxiliary specification

COUPLING BY PUMP MFG	CPLG TYPE DISC COUPLING D4-22
CPL GUARD BY PUMP MFG	CPLG GUARD MATL NON SPRAYING ALUMINUM
BASEPLATE	FABRICATED STEEL TO ANSI B73.1M 1991 D07091A
DYN.SEAL	CHECK SEAL

Anchor Bolt: 4-M20x350

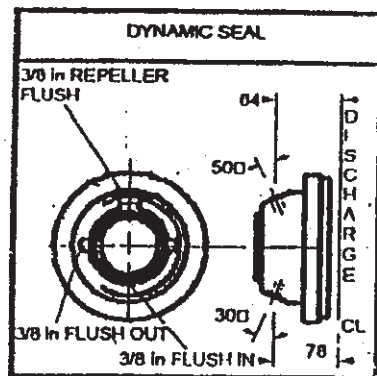
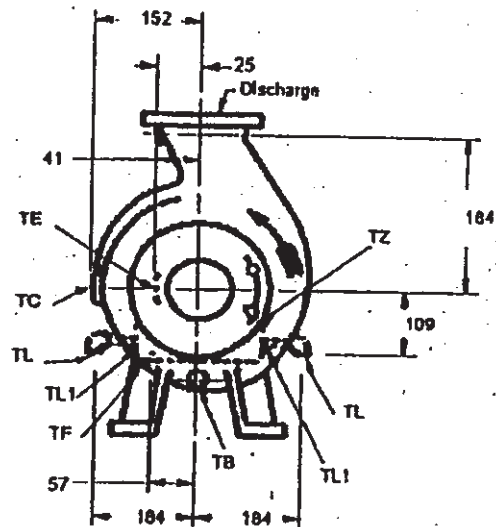
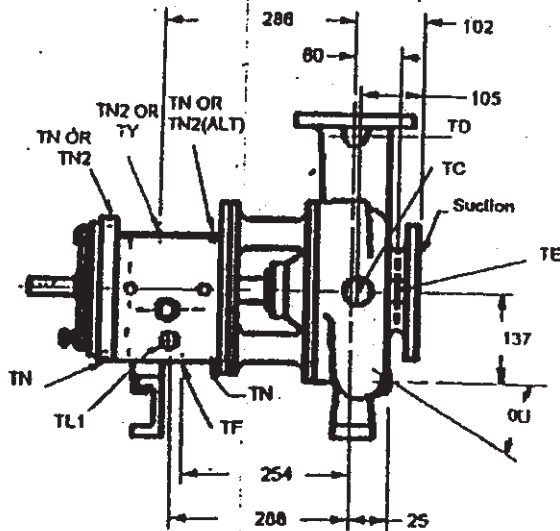
All dimensions are in mm.
Drawing is not to scale
Weights (kg) are approximate

TAPPED OPENINGS

Page : 6 of 16

TAPPED OPENINGS

NO.	SIZE	QTY.	PURPOSE	FURNISHED	NO.	SIZE	QTY.	PURPOSE	FURNISHED
				YES/NO					YES/NO
TB	1/2	1	CASING DRAIN	NO	TL1	—	2	FRAME COOLER ACCESS	YES
TC	1/2	1	BY-PASS CONNECTION	NO	TN	1/4	4	GREASE FITTING	YES
TD	3/8	1	DISCH. GAUGE CONNECTION	NO	TN2	1/4	2	OIL MIST INJECTION PORT	YES
TE	3/8	1	SUCTION GAUGE CONNECTION	NO	TY	1/2	1	OIL FILL	YES
TF	3/8	1	BEARING FRAME DRAIN	YES	TZ	1/4	1	BOTTLE OILER CONN.	YES
TL	1/2	2	FRAME COOLING CONNECTION	NO					



All dimensions are in mm.
Drawing is not to scale

DAP FERTILIZER CO. LTD.

Rangadia, Chittagong-4000, Bangladesh.

Page : 11 of 16

Data sheet for Sulfuric Acid Pump. Item no. P-902.

Process operating conditions.

1. Liquid : 98.5%. 2. Corrosive. 3. Solid Conc. : 0 wt% (dust). 4. temp. : Normal.
5. Density : 1840 Kg/M³. 6. Viscosity: 10 - 50 CP. 7. Capacity Min & Normal :
Manufacturer's design. Rated 4 m³/hr. 8. Service : Continuous. 9. Suction Press. : Min.
0.01, Nor. 0.09, Max. 0.11 MPaG. 10. Delivery Press. : 1.4 MPaG (14.5 Kg/Cm²G).
11. Differential Press. : Manufacturer's design. 12. Total head : Manufacturing design.
13. NPSHa : - 4 m.

Site and utility data

14. Location : Out door. 15. Barometer : 750 mm Hg. 100 KPa (A). 16. Ambient temp.:
Min^m. Max^m. : 8.3/38.9 °C. 17. Ex-Proof area classification : CL GR DIV.

Performance

18. Capacity Min. Continuous : Manufacturing design. Rated 4 m³/h. 19. Head (rated
impeller) : Rated 6.4, Max^m. 70m. 20. Efficiency (rated) : 20%. 21. Shaft power : Rated
2.6 Max^m 4.8 KW. 22. Rotational speed: 2900 r/min. Pump stage no. 1

Construction

- Impeller.** 23. Dia: Max^m 240 mm. Rated 220 mm. 24. Closed type. 25. Single
suction. 26. Wear ring : No.
27. Driving type: Direct. 28. Base plate : Common. 29. Rotation (viewed from coupling end)
: CC.
Mech. Seal 30. Model : To be stated by manufacturer. 31. Double. 32. Outer & unbalance
33. Flush : cooler.
Case 34. Foot mounting. 35. Split : Radial. 36. Wear (Ring/Plate) : No.
37. Design Press. : 1.6 MPaG. 38. Hydrotest : 2.5 MPaG.
Bearing 39. Radial : Ball. 40. Thrust : Ball. 41. Lubrication : Oil. 42. Cooling : Air
43. Cooling Jacket : No.

Material

44. Case : SUS 316. 45. Impeller : SUS 316. 46. Shaft : SUS 316. 47. Sleeve : SUS316.
48. Wear plate : CD₄MCu.

Driver (Electric motor)

49. Rated output (KW) : Manufacturer's design. 50. Volts/Phase/Hertz : 400V/ 3Ph/ 50Hz.
51. Speed (r min): Manufacturer's design. 52. Enclosure: IP54. 53. Insulation: F
Explosion proof.

INSPECTION AND TESTING

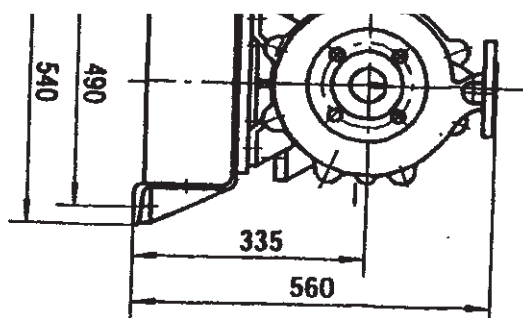
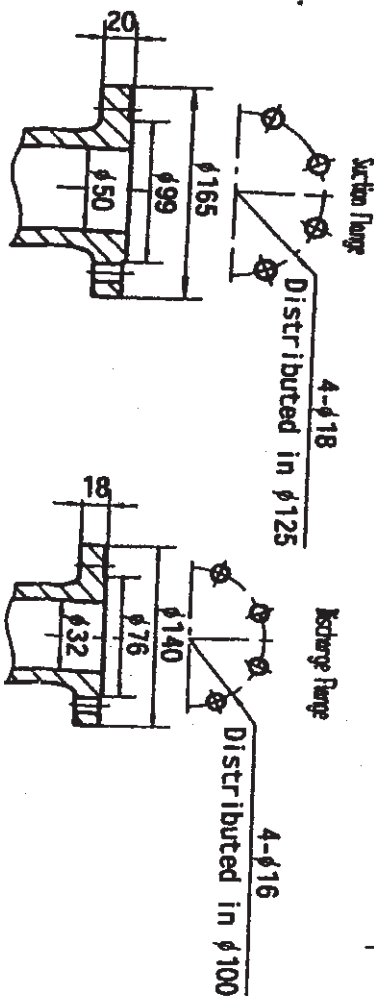
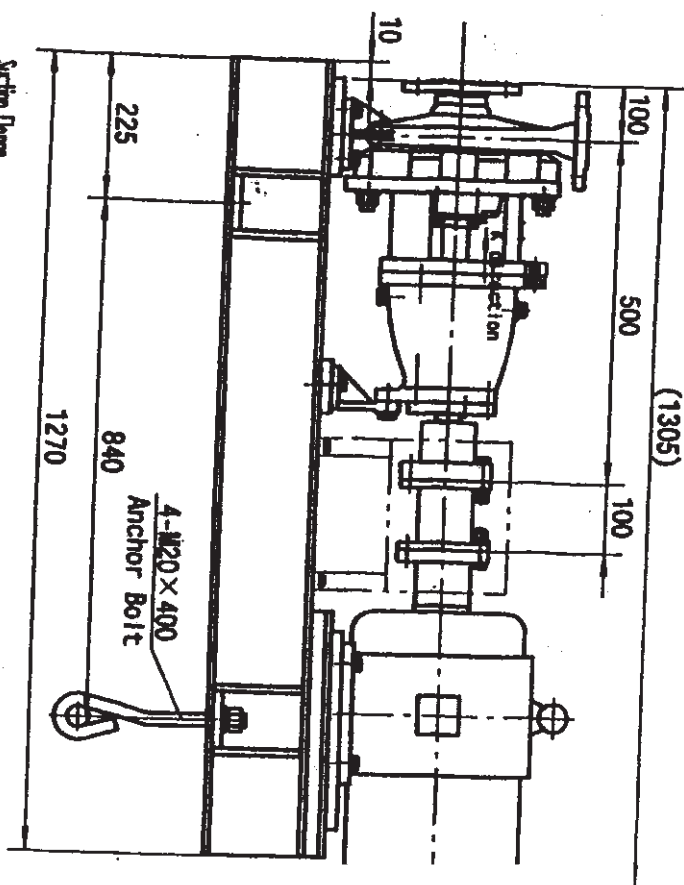
54. Performance. 55. Hydrostatic test. 56. Running test.

Supply scope

57. Pump. 58. Driver. 59. Anchor bolts & nuts. 60. Coupling & guard. 61. Dynamic seal.
62. Base plate. 63. Special tools (if any). 64. Spare parts for commissioning. 65. Spare
parts for two years operation.

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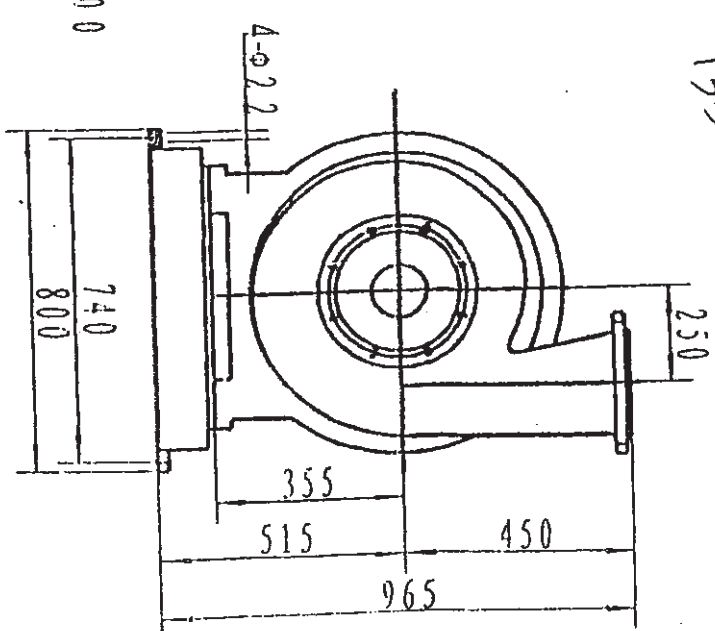
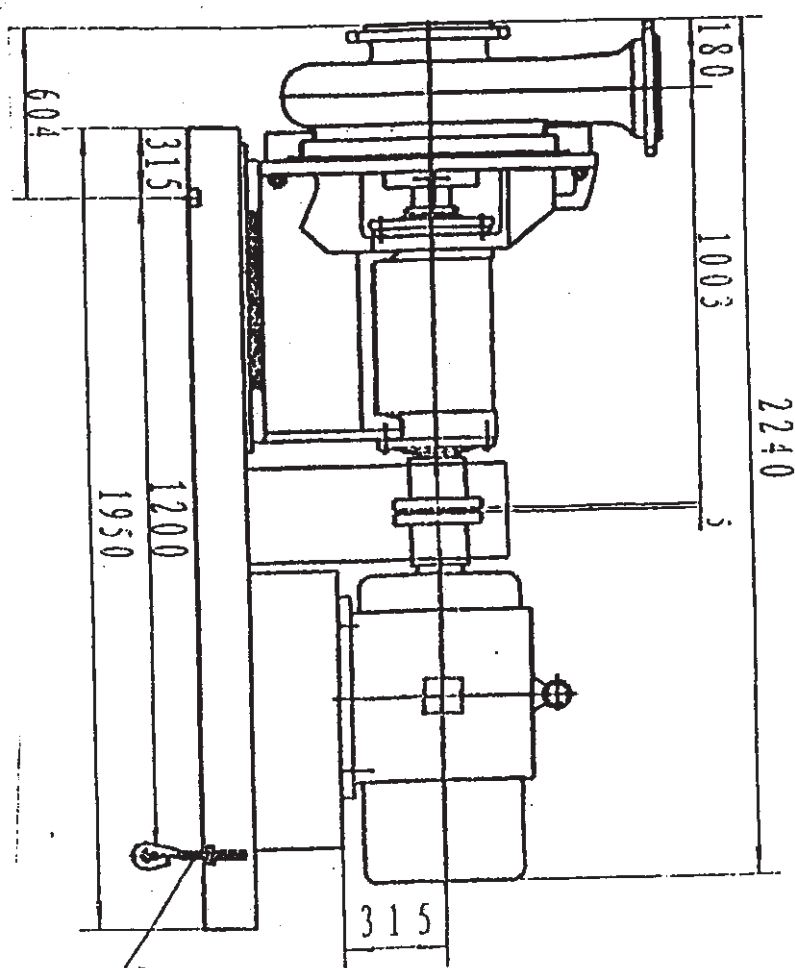
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Mech. Seal: single, no flushing water

Project	
Service	Sulfuric Acid Pump
Model	IHE50-32-250
Parameter	Q=47/h H=71-77m Total WT.: 327kg
Motor	YB-160M2-2/15kW
Draft	
Checked by	WUENU PUMP

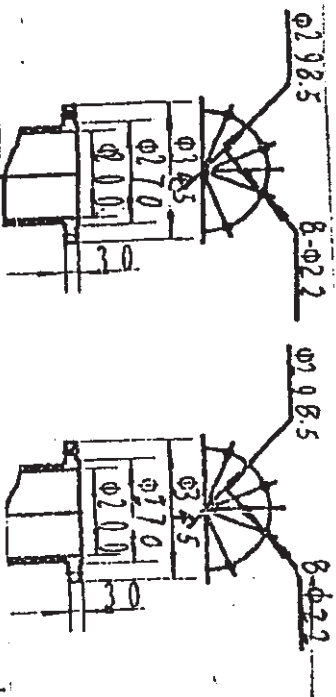
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Suction Flange

Discharge Flange



CYCLONIC COLUMN FEEDING PUMP
Item no. P-566.

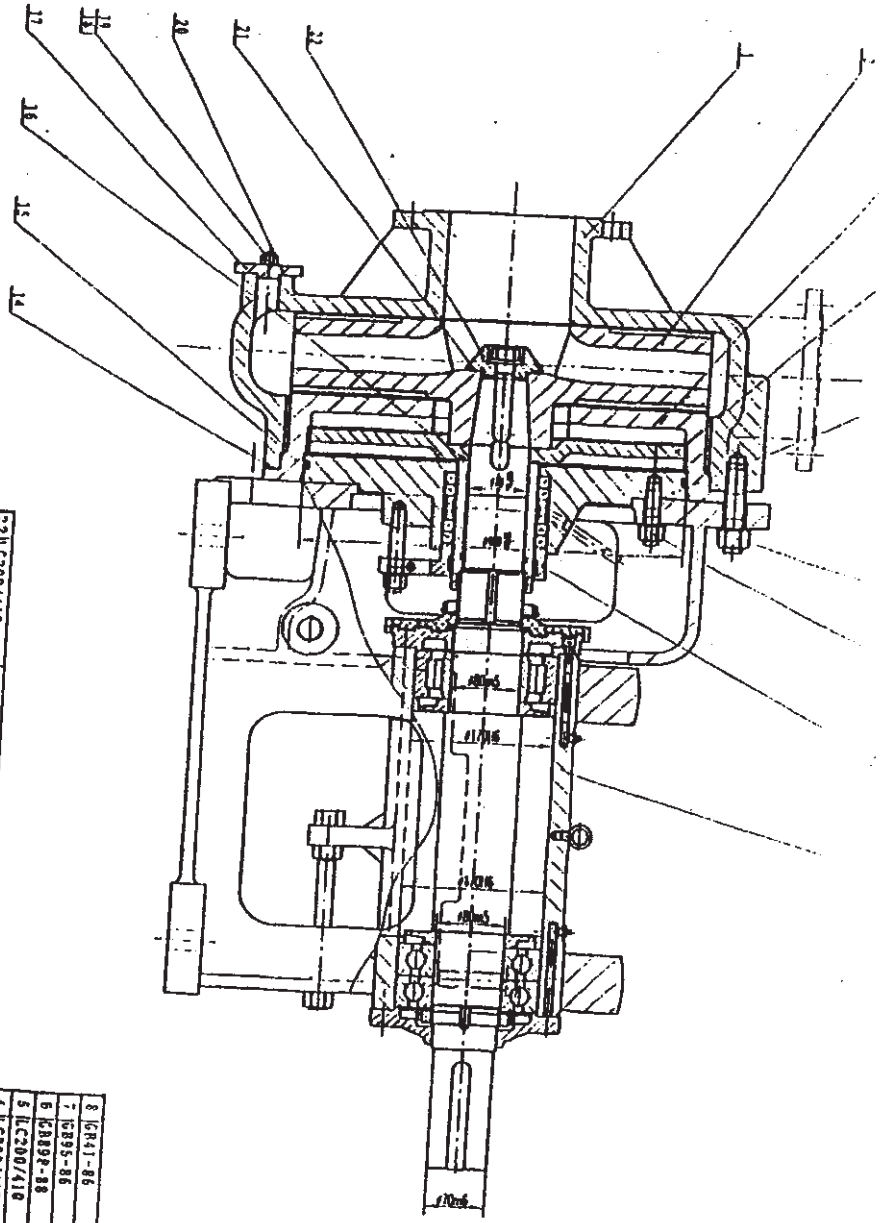
Rated Capacity : 460 m³/h

Head : 50 m (Rated) 70 m (Max^m)

Rotational Speed : 1450 rev./min.

Total Output of Electric Motor : 115 KW.

OUTLINE DRAWING



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13.5.19

22	LC200/410	Impeller cap	1	316L	1.01.0
21		O seal ring 5x3	1	fluorocarbon	000.002
20		Water 12x10x1	1	teflon	0.000.000
19	KB41-86	nut M12	2	10/18/1971	E.010.032
18	KB98-88	stud M12x30	2	12/18/1971	E.010.032
17	LC200-88-35-14	special flange 1	1	316L	10.510.51
16	KB2452-1-92	W seal ring 5x3 3/2	2	fluorocarbon	000.000
15		W seal ring 5x3 3/2	2	fluorocarbon	000.000
14		W seal ring 5x3 3/2	2	fluorocarbon	000.000
13	LC-355-F-000	Electric motor	1	teflon	P.010.014
12	LC-355-FP-000	Flange 12x10x1	1	12/13/21	13.512.5
11	KB41-86	nut M12	4	10/18/1971	E.010.032
10	KB98-88	stud M12x30	4	12/18/1971	E.010.032
9	KB98-88	stud M12x30	4	12/18/1971	E.010.032

8	KB41-86	nut M12	8	10/18/1971	E.010.032
7	KB98-88	stud M12x30	8	12/18/1971	E.010.032
6	KB98-88	stud M12x30	8	12/18/1971	E.010.032
5	LC200/410	cover 1	1	316L	10.510.51
4	LC200/410	auxiliary impeller 1	1	316L	10.510.51
3	LC200/410	auxiliary cover 1	1	316L	10.510.51
2	LC200/410	impeller	1	316L	10.510.51
1	LC200/410	impeller	1	316L	10.510.51

CYCLONIC COLUMN FEEDING PUMP
Item no. P-566
Rated Capacity : 460 m³/h
Head : 50 m (Rated) 70 m (Max)
Rotational Speed : 1450 rev./min.
Total Output of Electric Motor : 115 kW

OUTLINE DRAWING