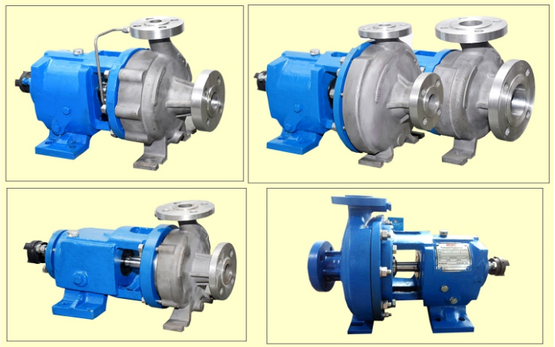
Vertical "In-Line" Self-Priming Liquid Ring Centripetal pump

MODEL- NSTP SERIES

- Low NPSH Required.
- Negative Suction lift upto 5 mts.
- Low Speed.
- Available in S.S.316 Investment Casting and Cast Iron.
- Compact Design.
- Excellent For Handling Solvents From The Drum and Tank Farm.

Chemical Process Pump in INVESTMENT CASTINGS TYPE-SCP-NSM



- HIGHER EFFICIENCY.
- BETTER SURFACE FINISH.
- FREE FROM CASTING DEFECT.
- FASTER DELIVERIES.

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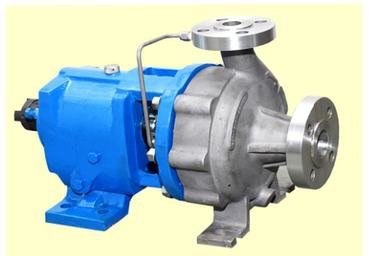

D-32, DSIIDC COMPLEX KALYANPURI, DELHI-110091

E-Mail:- jkpumps3@gmail.com, web: www.jkpumps.co.in

Mob: 9711132398, 9313090485

Specifications

Casing
Top Centre line Discharge, Self-venting Casing, arranged for back pull-out fully confinced PTFE gasket. Foot support under casing for maximum resistance to misalignment and distortion from pipe loads, working pressure upto 2550 KPa. Minimum 3 mm corrosion allowance, for maximum corrosion-erosion resistance. Casing is supplied without tapped openings, but drain plug openings are provided only when specified.

Impeller
Fully open, has partial shrouds for maximum vane support without high thrust inherent in full shroud designs. Matched to casing for high efficiency and low NPSH. Impeller is tightened on shaft with nut and threads are sealed by a PTFE O Ring. Impeller nut assures non opening of impeller with wrong rotation of motor. Large smoothly contoured flow passages combine best slurry and solid handling ability. All impellers are statically and dynamically balanced.

Stuffing box cover
Encloses back of casing and] contains stuffing box chamber. Cover is fastened to frame or adapter so that a spare back pull-out assembly can be stocked completely assembled. Cover can be supplied with jacket for cooling stuffing box chamber in high temperature services. jacket can also be used for heating viscous or high freezing point liquids. Packed box has 4 rings of packing and a lantern ring. Quench gland with taps and an auxiliary ring of packing is standard. Gland is splif for easy removal. Tapped openings to lantern ring permit "In and out sealing, external flushing or lubrication as required.
Suffing box is completely machined formechanicalseal installation,either originallyor as a field conversion.Inside, out-side, unbalanced, balanced, single, double or tandem seals with any required gland, throat bushing, throttle bushing and flushing lines furnished to meet individual sealing problems. Gland completely confines stationary mating ring gasket.

Bearing frame
Sturdy cast iron construction provides rigid bearing alignment and shaft support. Contains large oil reservoir with water jacket. oli level is maintained by constant level oiler with visible oil supply. Oil seals on each end and oil breather fully protects oil from contamination while allowing for expansion or contraction of air caused by ambient temperature change. To handle liquids above 175 C, cast integral cooling chamber is designed for 600 KPa working pressure or 900 KPa test pressure.

Shaft
A single piece shaft is designed for 0.05mm maximum deflection at stuffing box face. All critical surfaces ground to less than 0.8micron.

Shaft sleeve
Renewable shaft sleeve is positive driven, key way type with one end free to expand with temperature variations. PTEE O - ring prevents leakage under sleeve. Sleeve permits application of inside balance mechanical seals where required. Sleeve is hard chrome Plated & Ground for maximum seal & Gland life.

Bearings
Inboard bearing is pressed on shaft and is free to flaot axially in frame - carries radial load only. Outboard bearing is shouldered and locked on shaft with locknut and star washer and in bearing housing to carry radial and any unbalanced thrust load. All bearing fits are precision board. Inboard bearing is single row, deep groove. Outboard bearing is double row, deep groove angular contact. Both bearings are sized for two year minimum life.

Base plate
M.S fabricated drip rim type. Only nine sizes of base plates accommodate all pump sizes and all applicable IS or IEC frame size motors.

Coupling
A spacer type coupling is provided to take full advantage of the back pull-out feature. Standard RATHI (love joy) make RRS-type coupling is supplied unless otherwise specified.

Frame adapter
Heavy cast iron construction and precision machined to keep bearing frame & casing in perfect alignment. Furnished with lifting eye-bolt for ease in maintenance. Open construction gives easy access to the stuffing box area. Either frame adapter or drip tray may be piped drain Jack Bolt tapping are standard for easy removal of casing for maintenance.

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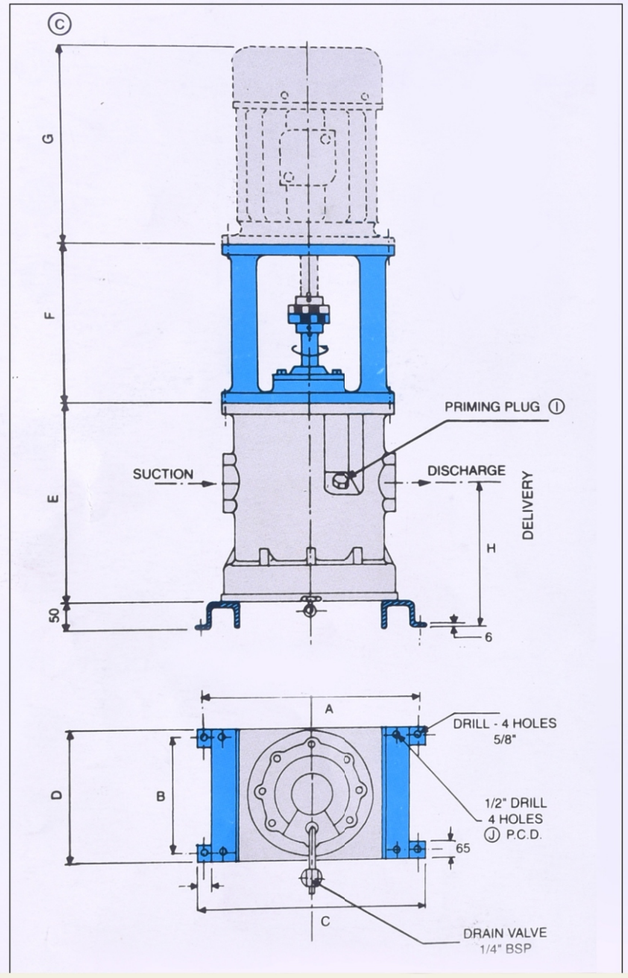
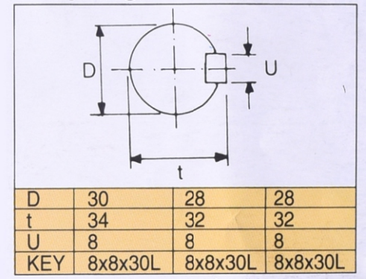
ALL DIMENSION ARE IN MM



Pump model

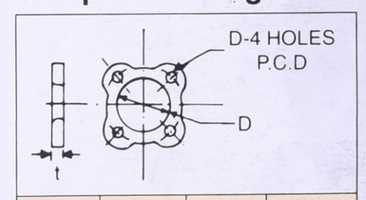
	STP-25	STP-40	STP-65
A	320	330	335
B	180	185	195
C	380	362	380
D	235	245	265
E	228	254	393
F	149	160	181
G	303	310	380
H	193	213	335
I	3/8"BSP	1/2"BSP	1/2"BSP
J	200 SQ	210 SQ	225 SQ

Pump shaft details at coupling end



D	30	28	28
t	34	32	32
U	8	8	8
KEY	8x8x30L	8x8x30L	8x8x30L

Companion flange



D	65	40	25
d	5/8"	1/2"	1/2"
P.C.D.	140	98	78
t	16	12	12

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Part List

Sr no	Description	M.O.C
1	Priming Chamber	S.S-316/C.I
2	Impeller Cover	S.S-316
3	Impeller	S.S-316
4	Impeller Cage	S.S-316
5	Motor Support	Cast Iron
6	Bearing Cover	Cast Iron
7	Base	Steel
8	Shaft	S.S-316
9	Oil Seal	P.T.F.E
10	Distance Bush	Steel
11	Gasket	P.T.F.E
12	Cup	S.S-316
13	Drain Valve	S.S-316
14	Hardwares	S.S-316
15	Key	S.S-316
16	"o" ring	P.T.F.E
17	Ball Bearing	Steel
18	Flat Gasket	P.T.F.E
19	Flexible Coupling	Rathi(Lovejoy)
20	Coupling Spider	Rubber
21	Stationary Ring	Ceramic
22	Rotary Unit	GFT/Carbon Face

internal mounted mechanical seal with GFT/Carbon Face.
All Cast Iron Parts are painted with Eppoxy Paint
Coupling-RATHI make (love Joy) Flexible Coupling.
Coupling Guard is of Aluminium/M.S. Powder Coated.

Construction Detail

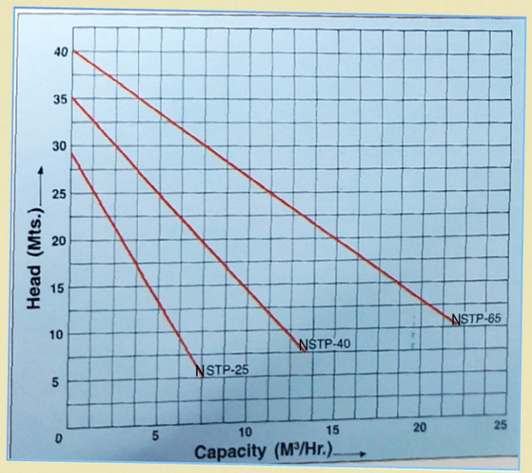
		NSTP-25	NSTP-40	NSTP-65
Impeller	Diameter	160	170	185
	Thickness	10	16	20
	No. Of Vanes	24	24	18
Shaft	Dia at Impeller	25	25	30
	Dia at Mech.Seal	29.95	29.95	34.95
	Dia at Bearing Span	37.5	37.5	43.5
	Dia at Coupling	28	28	30
Bearing	Inboard/Outboard	6306-ZZ	6306-ZZ	6307-ZZ
Clearance	Both Sides	0.05	0.05	0.05
Key	Impeller Side	5X5X30L	5X5X30L	5X5X35L
Mech.Seal	Rotory Face	30 mm	30 mm	1.375"
Power		2 Hp	3/5 Hp	7.5 Hp
Weight	(Approx).	35	45	52

ALL dimensions are in mm.

Performance Range

> Capacity upto	- 21 M3/HR
> Head Upto	- 35 Mts
> Power Upto	- 5.5 Kw

Performance Curve (at 1450 RPM - 50 HZ)



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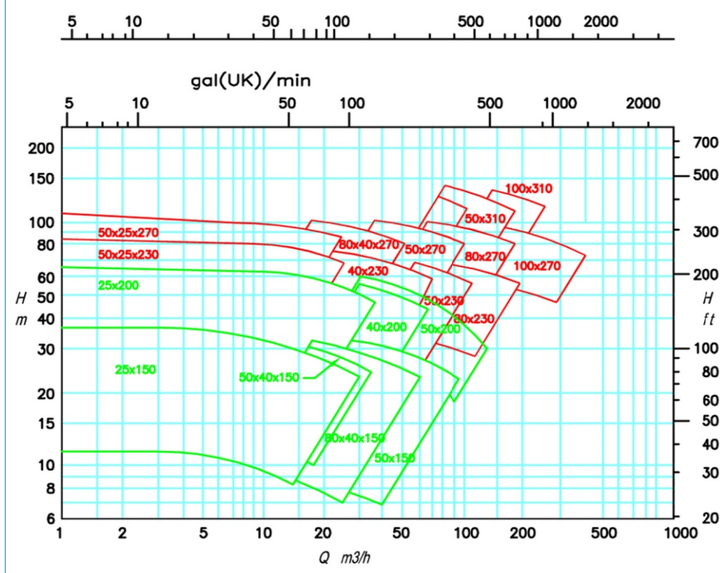
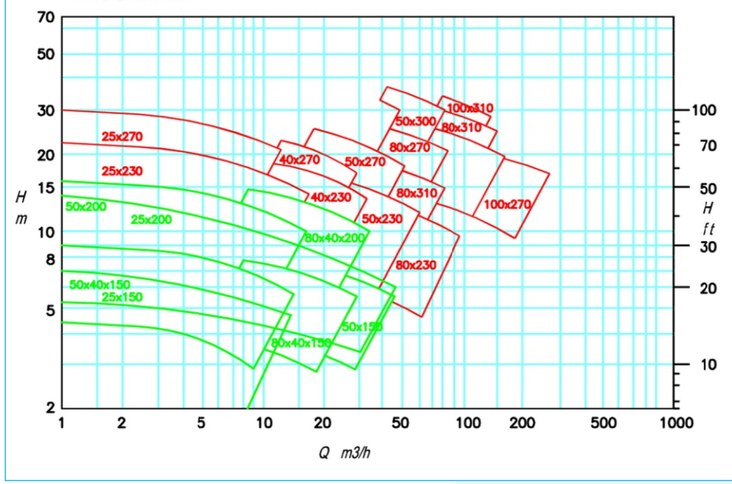
COMPOSITE PERFORMANCE CURVE

2900 RPM

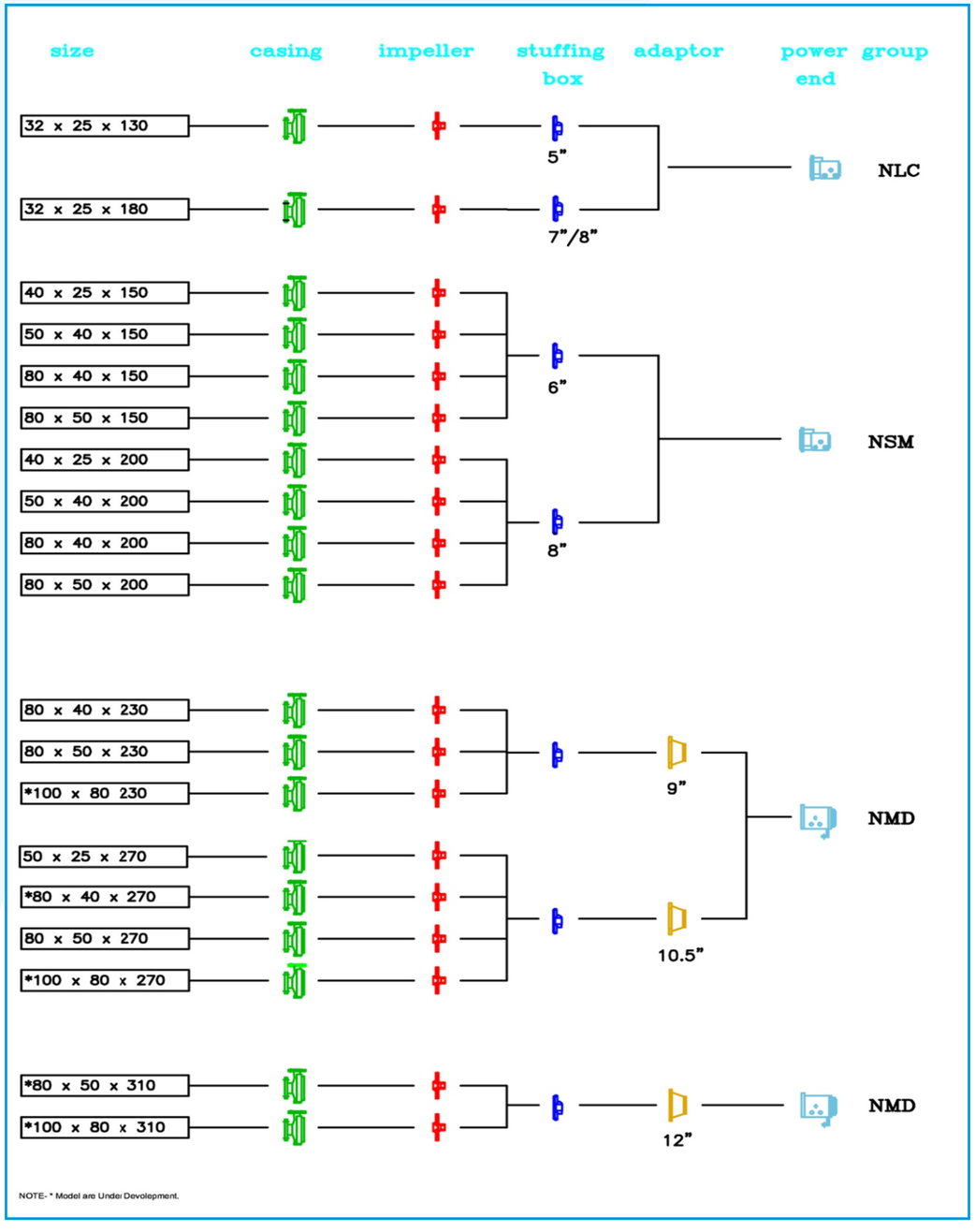


1450 RPM



FEATURES

- All the wetted parts are Made from investment Castings using lost wax Process, giving excellent Surface finish, sound Castings, Giving minimum Resistance to flow resulting In better efficiencies.
- Maximum interchabgeability, gives minimum spare parts inventory.
- Hydraulic performance Maintained by simple External axial adjustment of Impeller wear.
- Exclusive balanced thrust.
- Standard dimensions, cut Layout design cost.
- Standard foundation save Installation and drawing Time, talent and money.
- Fully open impeller with Back pump-out vanes Reduces stuffing box Pressure and prevents Entrances of solids and Meets low NPSH Requirements.
- Greater quality control and Accuracy in production of Every pump with the modern Machining operations.
- Back pull-out design, Permits quick inspection or Repairs of rotating elements Without disturbing electrical And piping connections Resulting in minimum Down-time.



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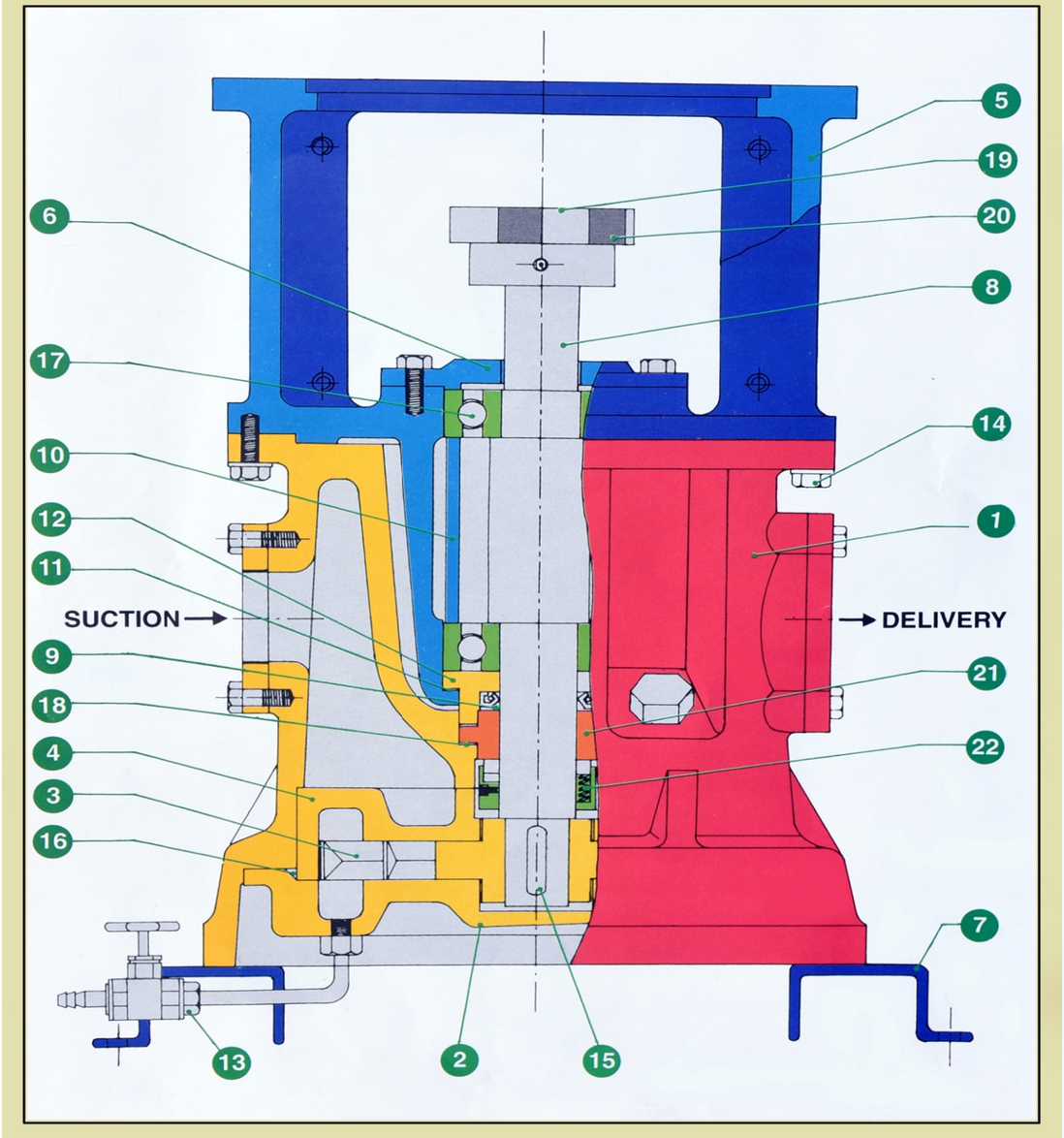
CROSS SECTIONAL VIEW



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Advantages At A Glance

- low NPSH Require
- Life lubricating bearings,covered from both ends so minor leakage from pump side does not affect bearings.
- Being low speed (1450 RPM) pump,less maintenance is needed.
- Installation is easier since motor required is vertical flage type and is directly coupled to the pump,cooupling alignment is simpler.
- Low overhang shaft arrangement giving minimum deflection at seal faces.
- Floating type impeller reduces noise and vibration.
- Available only with mechanical seal (internal mounted),rotary faces of carbon and glass filled teflon (GFT) are optional.
- Seal cooled and flushed by process fluid itself.
- Minor leakage at suction side does not affect pump performance.
- Biggest advantage from installation poin of view is that since it is an "in line"type pump,it can be fitted as a valve and hence it will not require any suction or delivery piping efforts

Features

>High head low capacity pump.
>Available in S.S316 INVESTMENT CASTING and Cast Iron with all wetled parts of S.S.316.
>Excellent for handling solvents from barrels and from tank farms to the charging vessals.
>Seal lekage can easily be detected from window in priming chamber.
>Pump can take negative lift from 3 to 5 meters.
>Compact design-requires less space,no grouting required.

NOTE : Since the pump is habving close tolerence and always fitted with mechanical seal it is advisable to have a suitable strainer before pump inlet.

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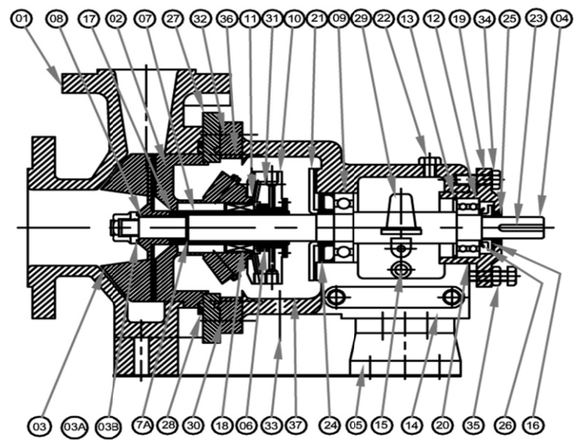
SECTIONAL VIEW



Part No.	Description	STANDARD MATERIAL						
		CS	CF8M	CF3M	CF4MCu	A–20	HC	HB
01	Casing	CS	CF8M	CF3M	CF4MCu	A–20	HC	HB
02	Stuffing Box Cover/Bback Plate	CS	CF8M	CF3M	CF4MCu	A–20	HC	HB
03	Impeller	CS	CF8M	CF3M	CF4MCu	A–20	HC	HB
03A	Impeller Nut	CS	CF8M	CF3M	CF4MCu	A–20	HC	HB
03B	Nut Gasket	PTFE						
04	Shaft	EN–8	S.S.316					
05	Support Foot	C.I.						
06 *	Stuffing Box Packing	TIWA/GRAFOIL/PTFE						
07 *	Shaft Sleeve	SS–410	CF8M	CF3M	CF4MCu	A–20	HC	HB
07A *	Sleeve Gasket	PTFE						
08 *	Impeller Key	S.S.316						
09 *	Bearing Inboard (6309)	Steel						
10	Gland Pusher	CS	CF8M	CF3M	CF4MCu	A–20	HC	HB
11 *	Gland Pusher Seal Ring	PTFE						
12 *	Bearing Outboard (3309)	Steel						
13 *	Retaining Ring/Circlip	Steel						
14	Bearing Frame	C.I.						
15	Bearing Oil Drain Plug	Steel						
16	Bearing Lock Nut	Steel						
17 *	Impeller Seal Ring	PTFE						
18 *	Lantern Ring	Glass Filled PTFE						
19	Bearing Cover Out board	C.I.						
20 *	'O' – Ring	Neoprene						
21	Deflector	S.S.304						
22	Oil Breather	Steel						
23	Key–Coupling Seal	S.S.316						
24 *	Oilseal Inboard	Buna Rubber						
25 *	Oilseal Outboard	Buna Rubber						
26	Bearing Lock Washer	Steel						
27	Adaptor	C.I.						
28 *	Gasket Casing to St.Box Cover	PTFE						
29	Constant Level Oiler	Plycarbonate/Aluminium						
30	Stud/Nut–Casing	Steel						
31	Bolt–SBCvr to Gland	Steel						
32	Stud/Nut–SBCvr to Bearing Frame	Steel						
33	Stud/Nut–Gland	Steel						
34	Bolt–Brg Cover to Brg Frame	Steel						
35	Bolt/jam Nut–Impeller Adj.	Steel						
36	Bolt–adpt to Brg Frame	Steel						
37	Jack Bolt	Steel						
38	Bearing Cover Inboard	C.I.						

* Part normally stocked by costomers for emergency repairs.
□ 4 nos required when pump is supplied with mechanical seal.

SERVICE COVERAGE

- **J.K.PUMPS** make SCP pump covers 90% of all process industy requirements.

The pump covers a wide range of chemical services:

Chemical:
caustic transfer,acid unloading,monomer and polymer transfer,molten sulphur and urea,liquid ammonia,liquid nirogen.

Petrochemical:
aromatics,low specific gravity hydrocarbons, gas oil.

Pulp and paper:
Digester make-up-green and white liquor,black liquor recovery,coating slurries-clay,titanium dixoide and alum transfer.

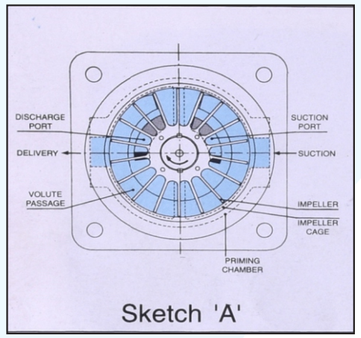
Primary metals:
Waste acid recovery scrubber sevices,pickle liquor circulation.

General:
Textile,food,pharmaceutical and polution control-chilled water,condensate return,acid recovery,stack scrubbers,filter feed dm water plant.

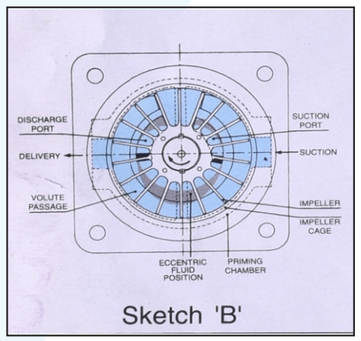
RANGE OF COVERAGE

CAPACITY - 350 M3/HR
HEAD - 150 MTS
TEMPERATURE - -210 C to 260 C
WORKING PRESSURE - 2550 KPA

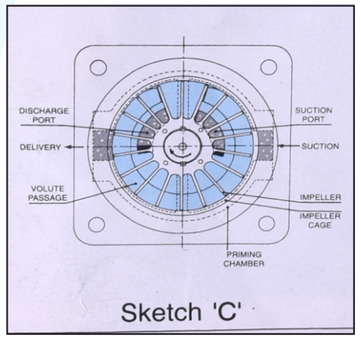
Description of Priming and Pumping Principle



Sketch 'A'



Sketch 'B'



Sketch 'C'

The initial prime is accomplished by partially filling pump priming chamber with liquid as in Sketch 'A'. This shows pump not in operation but the initial prime can just as readily be effected while pump is actually running.

The rotation of the impeller throws the liquid out between the blades towards the periphery by centrifugal force and at the same time imparts velocity to the liquid in the volute passage. The air being lighter remains in the centre of the cage. The volute has its maximum cross-sectional area between points at the bottom section of the impeller cage and decrease in area in either direction from this point.

As a pair of blades approach the discharge, the liquid is forced (by centripetal action) between them, down towards the centre due to the decrease cross-sectional area of the volute. This, in effect, provides a positive liquid piston action, pushing the air at the center out through the discharge port and into the discharge pipe Tthe space between blades as they pass the extreme end of the discharge port, is now completely filled with liquid which is retained therein until the bridge or sealing surface between the discharge and suction ports has been crossed.

Once past the bridge, however, the liquid between the impeller blades is thrown out into the volute passage which increase in cross-sectional area.

This again provides the postive liquid piston action away from the center of the pump, reducung the pressure over the suction port and air in the suction pipe is forced up into the pump as a result. This action, continues until all air has been evacuated from the suction line. sketch 'B' shows the air pumping stage and illustrates the eccentric liquid ring effect formed within the casing. This actually amounts to definite suction and discharge strokes of liquid piston within the pump ans is the reason for its postive timing action..

After all the air has been evacuated from the suction line, the pump commences and will continue to pump liquid on exactly the same basis this being illustrated in Sketch 'C'. If the pump breaks suction, it will pump air until suction line is again submerged and then pick up the liquid again no foot or check valves are needed sketch 'C' shows bubbles of air in the liquid flowing through the pump. It has great air handling ability. Minor leaks in the suction line, therefore, do not affect operation neither will a loop in the suction line.

When the pump is stopped the liquid is retained in the pump casing and the pump is ready without any further priming to start pumping.

Mechanically the pump is similar to a conventional centrifugal design only two operating parts, impeller and shaft with the same runnig fit. Therefore, its service life will be the same as that of a centrifugal pump umder same working conditions.

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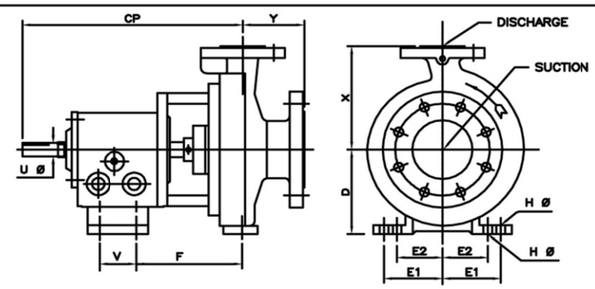
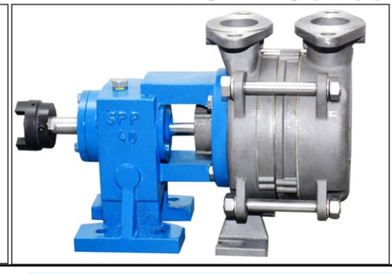
DIMENSIONS



GROUP	MODELS	D	X	Y	CP	U	V	PUMP FEET F	C E1	L E2	H
SCP-NSM	40 x 25 x 150 80 x 50 x 150 40 x 25 x 200 50 x 40 x 200 80 x 40 x 200 80 x 50 x 200	132	165	105	345	22	60	±5 195	–	80	M12
SCP-NMD	50 x 25 x 230 80 x 40 x 230 80 x 50 x 230 100 x 80 230 50 x 25 x 270 80 x 40 x 270 80 x 50 x 270 100 x 80 x 270	210	215 245 280 215 275	110 100 105 110 105	500 645 500	28	–	±5 300	125	91	M14
		255	– 285 317 –	– 105							
SCP-NLC	32 x 25 x 130 32 x 25 x 180	100 132	145 125 145 165	75	330 335	22	50	180 190	–	77.5	M10

NCIP Series

NSPP Series



NSTP Series