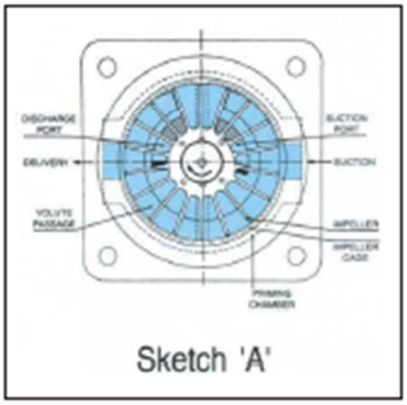
Vertical "In-line" Self-Priming liquid ring Centripetal pump TYPE – VICP

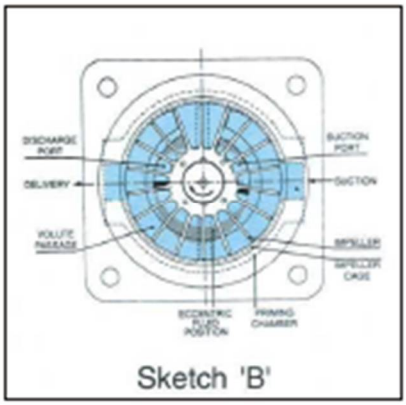
Excellent for handling solvents from the drum and tank farm

- Low NPSH required
- Negative suction lift upto 5 mts.
- Low speed
- Compact design
- Available in SS - 316 Investment Casting and Cast Iron

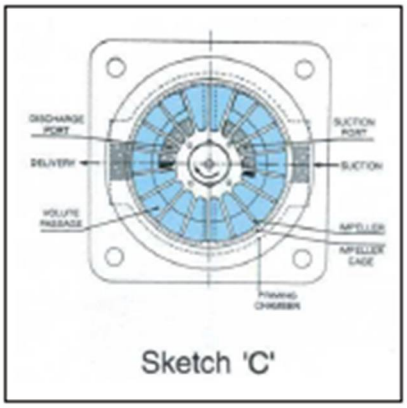
Description of priming and pumping principle



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 center 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 center 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. The 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.

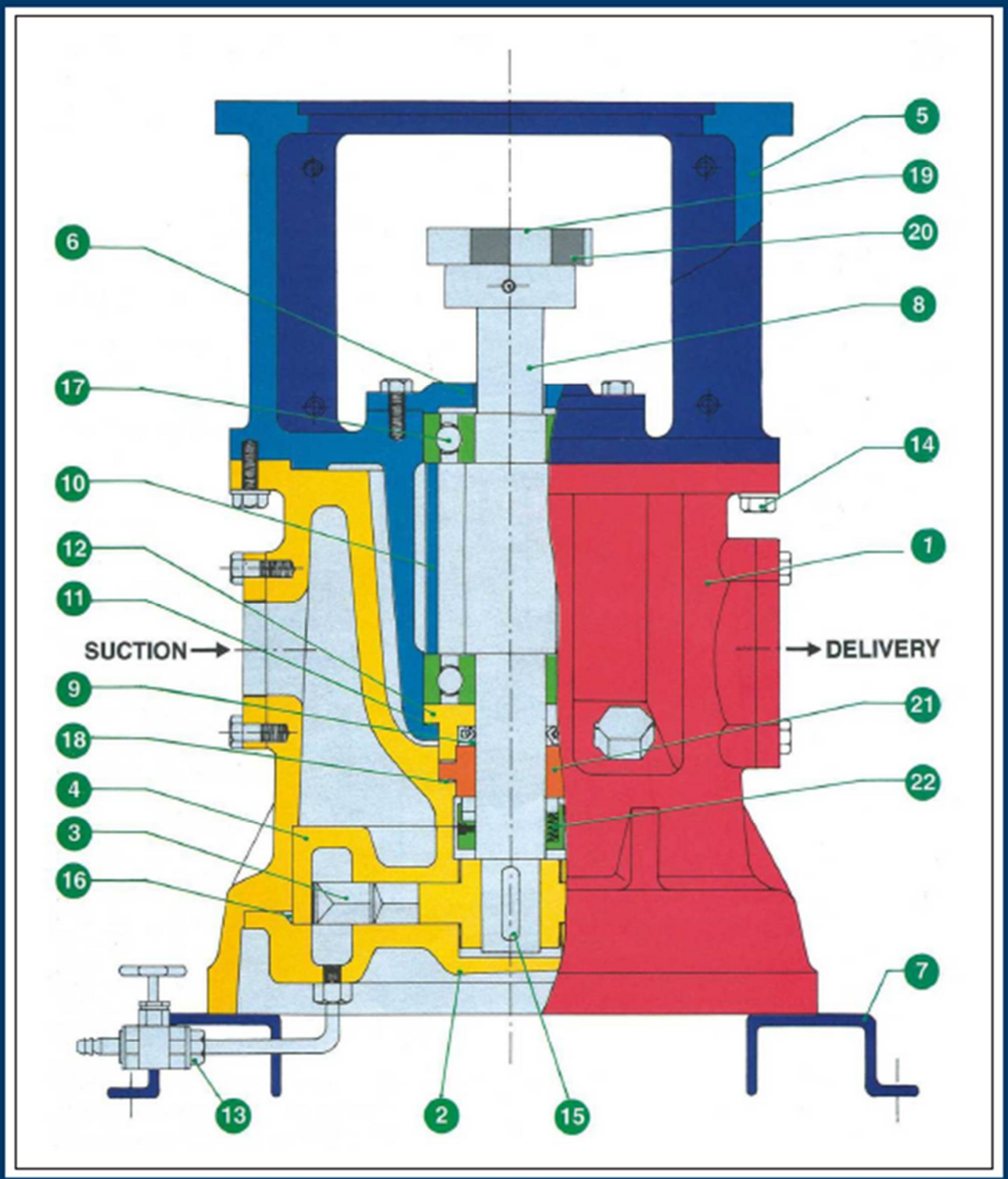
This again provides the positive liquid piston action away from the center of the pump, reducing the pressure over the suction port and air in the suction pipe is forced up into the pump as a result. This action, continues until all air has been evacuated from the suction line. Sketch 'B' shows the air 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 and is the reason for its positive 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 effect 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 running fit. Therefore, its service life will be the same as that of a centrifugal pump under same working conditions.

Sectional view



Part list

Sr. No.	Description	M.O.C.
01	Priming Chamber	SS - 316/C.I.
02	Impeller cover	SS - 316
03	Impeller	SS - 316
04	Impeller nuts	SS - 316
05	Motor Support	Cast iron
06	Bearing Cover	Cast iron
07	Base	Steel.
08	Shaft	SS - 316
09	Oil Seal	P.T.F.E
10	Distance bush	Steel
11	Gasket	P.T.F.E.
12	Cup	SS - 316
13	Drain Valve	SS - 316
14	Hanhuaras	SS - 316
15	Key	SS - 316
16	'O' ring	P.T.F.E.
17	Ball bearing	Steel.
18	Flat gasket	P.T.F.E.
19	Flexible Coupling	RATHI (love joy)
20	Coupling Spider	Rubber
21	Stationary ring	Ceramic
22	Rotary Unit	Carbon face

Internal mounted mechanical seal with Ceramic / Carbon face.

All Cast iron parts are painted With epoxy paint.

Coupling- RATHI make (love joy) flexible coupling.

Coupling guard is of Aluminium.

Construction detail

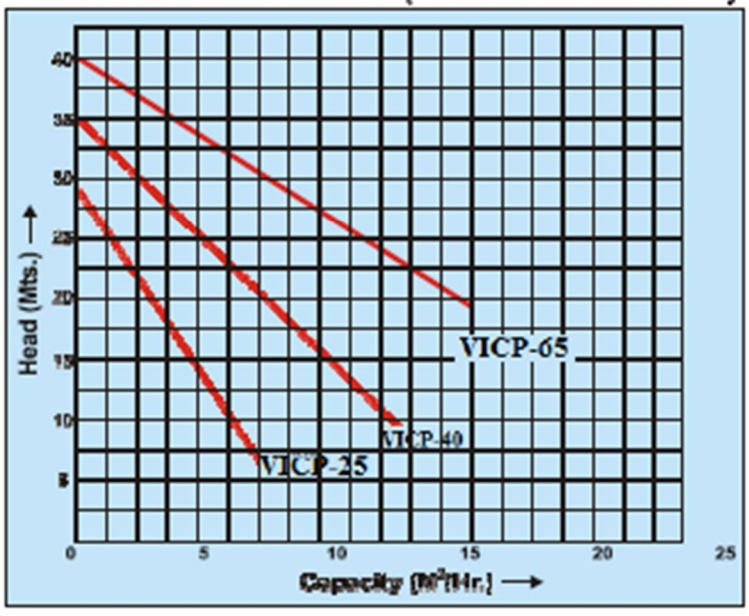
		VICP-25	VICP-40	VICP-65
Impeller	Diameter	160	170	185
	Thickness	10	18	20
	No. of vanes	24	24	18
Shaft	Dia. at impeller	25	25	30
	Dia at mech. Seal	20.95	20.95	34.93
	Dia at bearing span	37.5	37.5	43.5
	Dia at Coupling	26	26	30
Bearing	Inboard / Outboard	6305-ZZ	6306-ZZ	6307-ZZ
Clearance	Both sides	0.05	0.05	0.05
Key	Impeller Side	5x5x30L	5x5x30L	5x5x35L
Mech. Seal	Rotary face	30 mm	30 mm	1.375"
Power		2hp	3/5hp	7.5 hp
Weight	(approx.)	35	45	52

All dimensions are in mm.

Performance range

- Capacity upto ..... 21 M^3/Hr
- Head upto ..... 35 Mts
- Power upto ..... 5.6 Kw

Performance curve (at 1450 RPM-50Hz)



Advantages at a glance

- Low NPSH required
- Life lubricating bearings, covered from both the ends so minor leakage from pump side does not affect bearings
- Being a low speed (1450 RPM) pump, Less Maintenance is needed
- Installation is easier since motor required is vertical flange type and is directly coupled to the pump, coupling alignment is simpler
- Low overhang shaft arrangement giving minimum deflection at the seal faces
- Floating type impeller reduces noise and vibration
- Available only with mechanical seal (internal mounted), rotary faces of Carbon and High alumina Ceramic (Al_2O_3)
- Seal cooled and flushed by process fluid itself
- Minor leakage at suction side does not affect pump performance
- Biggest advantage from installation point 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 SS -316 INVESTMENT CASTING and Cast Iron with all wetted parts of SS - 316
- Excellent for handling solvents from barrels and from tank farms to the charging vessels
- Seal leakage can easily be detected from window in priming chamber
- Pump can take negative lift from 3 to 5 meters
- Maintenance is easier, Drain arrangement is standard
- Compact design - requires less space, No grouting required

Note : Since the pump is having close tolerance and always fitted with mechanical seal it is advisable to have a suitable strainer before pump inlet.

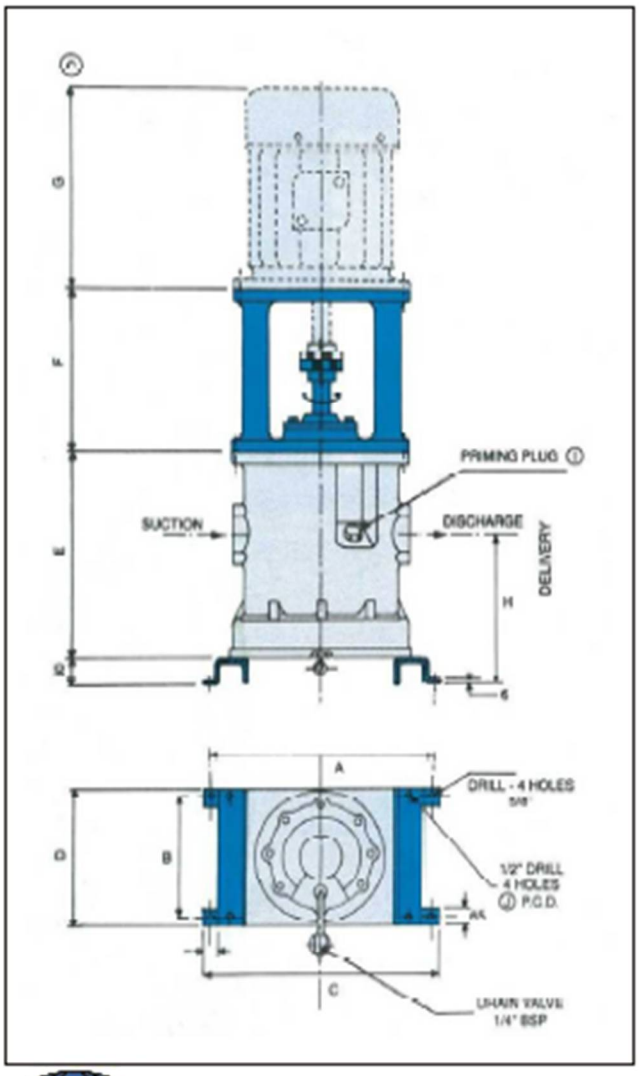
Available with trolley for *MOBILE* application

Keeping in view the fastest growing demand for transfering various types of solvents from the barrels to the overhead reaction vessel in pharmaceutical, bulk drugs and other process industries, VIP-25, model is developed and is supplied with trolley for mobility.

- **MODEL VIP 25**
- **100 LPM at 22 MWC.**
- **1.5 Kw/1450 RPM.**

Dimensions

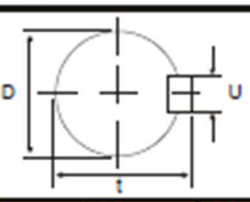
All dimensions are in mm.



Pump model

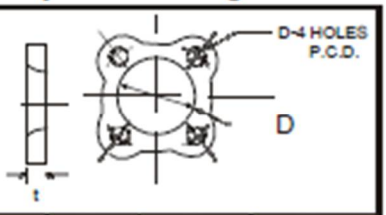
	VICP-25	VICP-40	VICP-65
A	320	330	335
B	180	185	195
C	380	362	380
D	235	245	265
E	228	254	393
F	149	160	181
G	303	310	380
H	193	213	335
I	3/8"BSP	½"BSP	½"BSP
J	200 SQ	210 SQ	225 SQ

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"	½"	½"
P.C.D.	140	98	78
t	16	12	12

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