



OH1 SL models

2012-13



Product Description

The models OH1/SL are a heavy duty rubber lined horizontal end-suction, single stage centrifugal pumps designed for handling highly abrasive slurry.

Fields of Application

The pumps find application in the mineral processing industry for transferring highly abrasive, corrosive slurry like iron ore, gold, zinc, lead, chromate, phosphate ores & ash and many other types of slurry.

Pumps also find application in :

- Paper and pulp industry
- Effluent treatment plants
- Sand beneficiation plants
- Ore beneficiation plants
- Plywood industry
- Sugar industry
- Glass and picture tube industry and many other applications where pump has to handle the solids



Parts Description

Part	Description
Volute casing	Includes front and rear casings made in grey cast iron, A 48 Class 25. Internal sectors lined with NBR or Neoprene rubber. Rubbers are removable
Impeller	Rubber lined with Grey cast iron core. Semi open or enclosed impeller are options
Shaft	Robust design with minimum deflection. Carbon steel (A 576 gr 1045) and stainless steel (A 276 type 420) are options.
Shaft sleeve	Stainless steel rubber lined to protect shaft from abrasion.
Shaft sealing system	Soft packed, zero leakage packing and expeller are options
Bearings	Heavy duty antifriction bearings with minimum life of 25,000 hrs. Grease nipple and oil ring lubrication are options
Bearing housing	Heavy duty construction, Grey cast iron, removable from bearing bracket without removing of foundation bolts
Bearing bracket	Heavy duty grey cast iron with fully machined pedestals to achieve maximum shaft alignment. Electric motors can install upside it.

Designation

Example: OH1/SL F 100-315 / 37 4 R1 (P1.08) AC / 0.8

OH1/SL	F	100	315	37	4	R1	P1.08	AC	0.8
Type series	Impeller type	Discharge nominal diameter mm	Impeller diameter mm	Motor power kW	No. of poles	Material code	Shaft sealing code	Options	Speed ratio
OH1/SL Rubber Lined Horizontal Centrifugal Pump	K: non clogging F: Vortex (semi closed)	50 100 150 200	315 400	Up to 200 kW	2: 3000 rpm 4: 1500 rpm 6: 1000 rpm 8: 750 rpm 10: 600 rpm	R1: NBR Lined R2: Neoprene Lined	See individual table	A: Grease nipple B: Oil Ring C: V-Belt Drive D: Long Coupled	Pump speed Motor speed

Material Options

Material Code	Volute Casing	Volute Liner	Impeller	Shaft	Shaft Sleeve
R1	A 48 Class 25	Nitrile Rubber	NBR Lined	A 576 gr 1045	NBR Lined
R2	A 48 Class 25	Neoprene	Neoprene Lined	A 276 type 420	Hard Rubber

Material Description:

Nitrile Rubber: is a synthetic rubber which is generally used in applications involving fats, oils and waxes. Nitrile Rubber has moderate erosion resistance.

Neoprene: Polychloroprene (Neoprene) is a high strength synthetic elastomer with dynamic properties only slightly inferior to natural rubber. It is less affected by temperature than natural rubber, and has excellent weathering and ozone resistance. It also exhibits excellent oil resistance.

Shaft Sealing Code

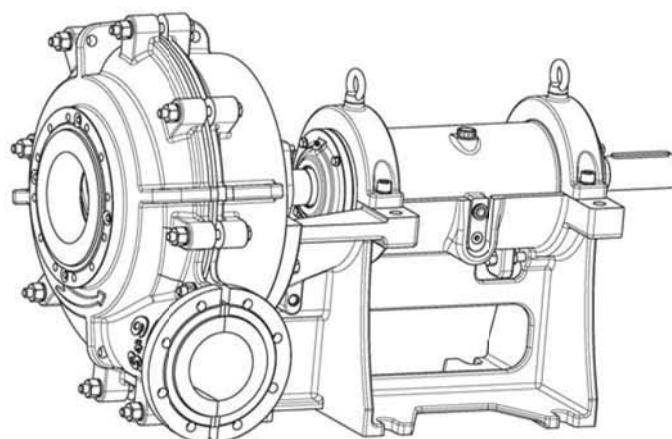
Row	Description code	Description	API Plan	Explanation
1	P1.08	Fluid from an external source	Plan 32	Soft packing – P1
2	P1.04-61	Circulation fluid via cyclone (with internal return); dirty line to pump inlet	31	Soft packing – P1 Basic arrangement – 04, Cyclone – 61
3	P2.00	No piping, internal circulation	Plan 01	Zero leakage packing – P2
4	E1.00	No piping, Centrifugal (or Dynamic) seal	Plan 01	Expeller – E1

Shaft Seal Description

Soft packing or gland seal: The gland seal comprises a number of soft packing rings, compressed against a chamber (stuffing box) and a protective wear sleeve which is fitted to the pump shaft. This type seal requires continuous clean liquid lubrication and cooling between the rotating shaft sleeve and the compressed packing to prevent overheating due to the friction.

Zero leakage packing: Unique chemical resistant compound based on pure PTFE fibres and expanded PTFE pellets, mixed with special tixotropic lubricants. A great sealant achieving close to zero leakage conditions in packed pumps with a peripheral speed of up to 8 m/sec.

Centrifugal (or dynamic) seal: The centrifugal seal is a dynamic, dry seal that only operates while the pump is rotating and has no seal effect when the pump is stationary. A secondary seal maintains the liquid within the pump when it is stationary. The secondary seal can be either a rubber lip seal or a grease lubricated packing.



Pump Selection

Selecting the appropriate slurry pump depends to various parameters. ASK set a methodology to determine performance characteristic of slurry pumps.

Determination of equivalent water performance:

Head ratio (HR): Head of slurry / head of water

Efficiency ratio (ER): Efficiency on slurry / Efficiency on water

$$HR = 1 - \{0.1cd [a \ln (d_{50}) + b]\}$$

$$HR < 0.5 \rightarrow HR = 0.5, HR > 1 \rightarrow HR = 1$$

$$ER = 1 - \{0.1cde [a \ln (d_{50}) + b]\}$$

$$ER < 0.5 \rightarrow ER = 0.5, ER > 1 \rightarrow ER = 1$$

Where:

Parameters	Description	Dimension
d_{50}	Average particle size	mm.
SG_s	Specific Gravity of solids	—
CV	Concentration of solids in slurry by true volume	%
D	Impeller Diameter	mm.

Formula	Condition (s)
$a = 0.114 SG_s$	—
$b = 0.26 + 0.8 (SG_s - 1.1)$	$SG_s < 1.1 \rightarrow b = 0.26$
$c = 0.21 + 0.05 (CV - 5)$	$CV < 5 \rightarrow c = 0.21$
$d = 1.5 \exp^{22(d_{50}/D)} - 1$	$d > 2.5 \rightarrow d = 2.5$
$e = 1 + 0.014 (CV - 20)$	$CV < 20 \rightarrow e = 1$

Determination of the electromotor power

$$P_N = P_{BHP} \times (F_s \times F_A \times F_T) / \eta_T$$

For special conditions other parameters such as air humidity, dusts and discontinuity of operation maybe take into account.

$$P_{BHP} = SG_m \times 9.81 \times \text{Capacity} \times \text{Head of slurry} / \text{Efficiency on slurry}$$

P_N : Minimum name plate power (kW)

P_{BHP} : Break horse power for given condition (kW)

F_s : Safety factor or de-rating factor

F_T : Temperature factor

F_A : Altitude factor

η_T : Efficiency of power transmission components

SG_m : Specific gravity of slurry mixture

Capacity (Q) express in m^3/s

Head of slurry in meters

Efficiency on slurry express in 0 to 1

F_T determine from table 2:

	Ambient temperature (°C)				
	≤ 40	45	50	55	60
F_T	1.00	1.04	1.08	1.15	1.20

Table 2: Determination of F_T

To determine F_A use table 3:

	Altitude above sea level (m)				
	≤ 1000	1500	2000	3000	4000
F_A	1.00	1.03	1.06	1.16	1.3

Table 3: Determination of F_A

η_T may be selected according to table 4:

	Power transmission component				
	Flexible couplings	Gear boxes spur, helical, bevel	Universal joints	V belt	Closed coupled
η_T	0.95 – 0.97	0.98 – 0.99	0.95 – 0.99	0.90 – 0.94	1.00

Table 4: Determination of η_T

If centrifugal pump start at open valve, we should consider end curve power ($P_{Power\ end}$) of the pump:

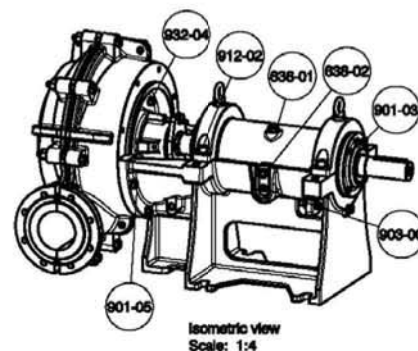
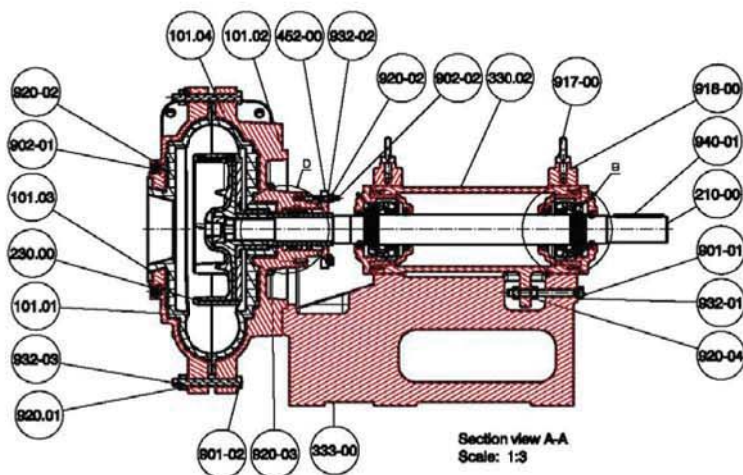
$$\text{Open valve starting; } P_N < P_{Power\ end} \rightarrow P_N = P_{Power\ end}$$

Discharge pipeline diameter

Parameter	Description	Dimension
DN_{max}	Maximum pipeline diameter	mm.
DN_{min}	Minimum pipeline diameter	mm.
V	Slurry velocity	m/s
VL	Settling velocity	m/s

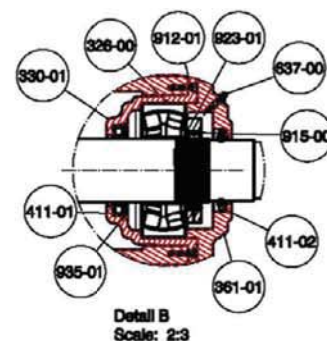
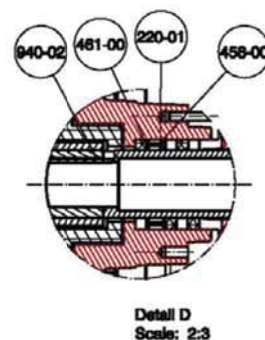
Formula	Dimension
$DN_{max} = 26.3 [Q^2 / (SG_s - 1)]^{0.2}$	Q: m^3/hr , DN_{max} : mm
$DN_{min} = 8 Q^{0.5}$	Q: m^3/hr , DN_{min} : mm
$V = 354 Q / DN^2$	V: m/s, Q: m^3/hr , DN: mm
$V_L = 0.1 [DN (SG_s - 1)]^{0.5}$	V_L : m/s, DN: mm

Sectional Drawing and Part List



Part List

Part No.	Part Name	Part No.	Part Name
101.01	Front casing	637	Grease nipple
101.02	Rear casing	638.01	Oil plug
101.03	Rubber casing	638.02	Oil indicator
101.04	Rubber casing	901	Hex-head bolt
210	Shaft	902	Double end stud
220	Shaft sleeve (Rubber lined)	903	Oil drain plug
230	Impeller (Rubber lined)	940	Head cup screw
326	Angular contact roller bearing	915	Hex. Set screw
330	Bearing housing	917	Lifting eye bolt
333	Bearing bracket	918	Lifting finger
361	Bearing cover	920	Hex. Nut
411	Oil seal	923	Tightening nut
452	Seal gland	932	Springy washer
458	Lantern ring	935	Circlips
461	Soft packing	912	Shaft key



OH1/SL F 50 – 315

(Water performance)

2200 rpm

Q (m ³ /hr)	0.0	22.8	37.9	60.7	106.2
H (m)	77.1	73.7	69.1	62.2	48.3
P (kW)	7.0	18.3	20.4	24.5	36.8

1750 rpm

Q (m ³ /hr)	0.0	18.1	30.2	48.3	84.5
H (m)	48.8	46.6	43.7	39.3	30.6
P (kW)	3.5	9.2	10.3	12.3	18.5

1450 rpm

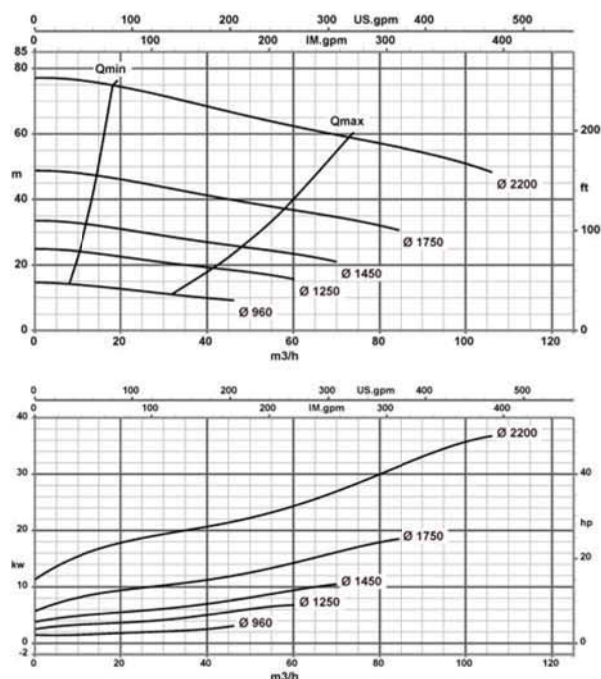
Q (m ³ /hr)	0.0	15.0	25.0	40.0	70.0
H (m)	33.5	32.0	30.0	27.0	21.0
P (kW)	2.0	5.2	5.8	7.0	10.5

1250 rpm

Q (m ³ /hr)	0.0	12.9	21.6	34.5	60.3
H (m)	24.9	23.8	22.3	20.1	15.6
P (kW)	1.3	3.4	3.7	4.5	6.8

960 rpm

Q (m ³ /hr)	0.0	9.9	16.6	26.5	46.3
H (m)	14.7	14.0	13.2	11.8	9.2
P (kW)	0.6	1.5	1.7	2.0	3.1



OH1/SL F 100 – 315

(Water performance)

2000 rpm

Q (m ³ /hr)	0.0	113.1	262.1	331.0	400.0
H (m)	66.6	64.3	58.0	51.4	41.9
P (kW)	26.2	44.0	63.8	79.9	86.1

1750 rpm

Q (m ³ /hr)	0.0	99.0	229.3	289.7	350.0
H (m)	51.0	49.2	44.4	39.3	32.0
P (kW)	17.6	29.5	42.7	53.5	57.7

1450 rpm

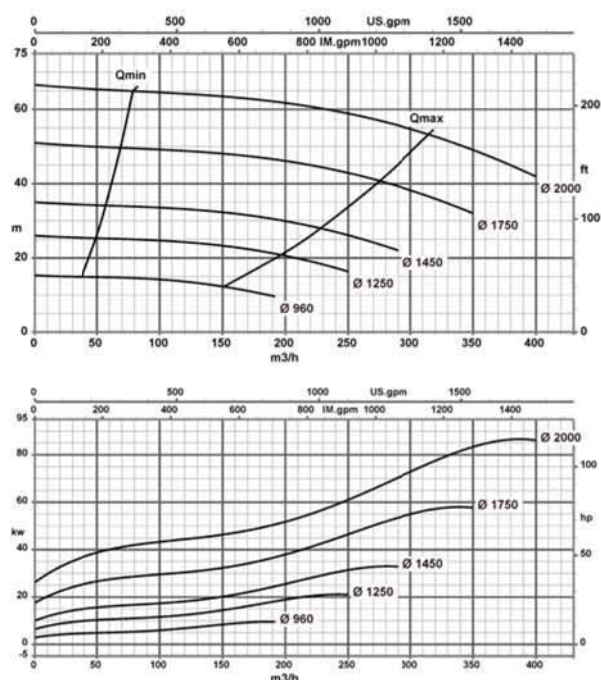
Q (m ³ /hr)	0.0	82.0	190.0	240.0	290.0
H (m)	35.0	33.8	30.5	27.0	22.0
P (kW)	10.0	16.8	24.3	30.4	32.8

1250 rpm

Q (m ³ /hr)	0.0	70.7	163.8	206.9	250.0
H (m)	26.0	25.1	22.7	20.1	16.3
P (kW)	6.4	10.8	15.6	19.5	21.0

960 rpm

Q (m ³ /hr)	0.0	54.3	125.8	158.9	192.0
H (m)	15.3	14.8	13.4	11.8	9.6
P (kW)	2.9	4.9	7.1	8.8	9.5



OH1/SL F 150 – 400

(Water performance)

1700 rpm

Q (m ³ /hr)	0.0	234.5	410.3	527.6	703.4
H (m)	61.9	60.5	58.0	55.0	48.1
P (kW)	56.4	96.6	111.8	121.6	151.2

1600 rpm

Q (m ³ /hr)	0.0	220.7	386.2	496.6	662.1
H (m)	54.8	53.6	51.4	48.7	42.6
P (kW)	47.0	80.5	93.2	101.4	126.0

1450 rpm

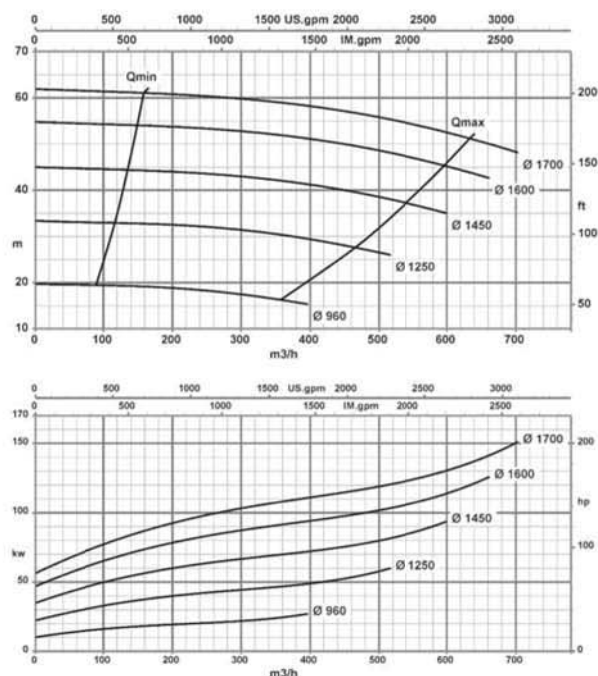
Q (m ³ /hr)	0.0	200.0	350.0	450.0	600.0
H (m)	45.0	44.0	42.2	40.0	35.0
P (kW)	35.0	60.0	69.4	75.5	93.8

1250 rpm

Q (m ³ /hr)	0.0	172.4	301.7	387.9	517.2
H (m)	33.4	32.7	31.4	29.7	26.0
P (kW)	22.4	38.4	44.5	48.3	60.1

960 rpm

Q (m ³ /hr)	0.0	132.4	231.7	297.9	397.2
H (m)	19.7	19.3	18.5	17.5	15.3
P (kW)	10.2	17.4	20.1	21.9	27.2



OH1/SL F 200 – 400

(Water performance)

1450 rpm

Q (m ³ /hr)	0.0	271.9	528.6	830.7	1133
H (m)	45.6	43.3	38.8	35.4	30.8
P (kW)	51.7	80.3	101.6	123.2	158.5

1250 rpm

Q (m ³ /hr)	0.0	234.4	455.7	716.1	976.6
H (m)	33.9	32.2	28.8	26.3	22.9
P (kW)	33.1	51.4	65.1	78.9	101.5

960 rpm

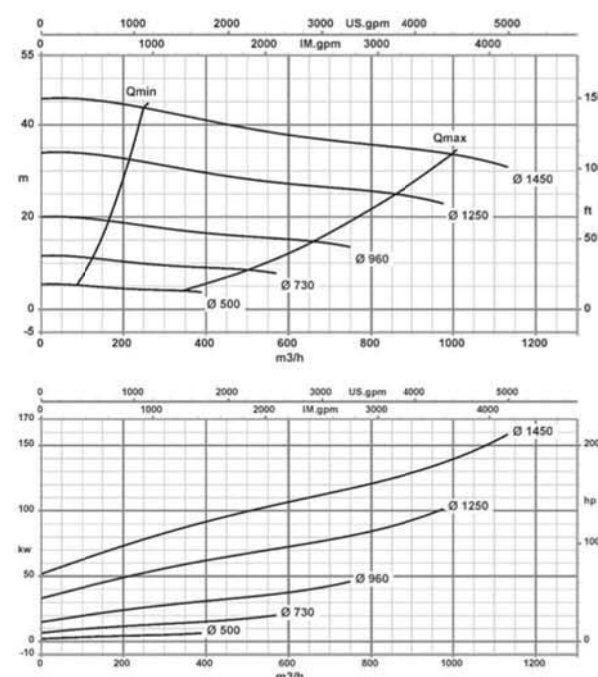
Q (m ³ /hr)	0.0	180.0	350.0	550.0	750.0
H (m)	20.0	19.0	17.0	15.5	13.5
P (kW)	15.0	23.3	29.5	35.7	46.0

730 rpm

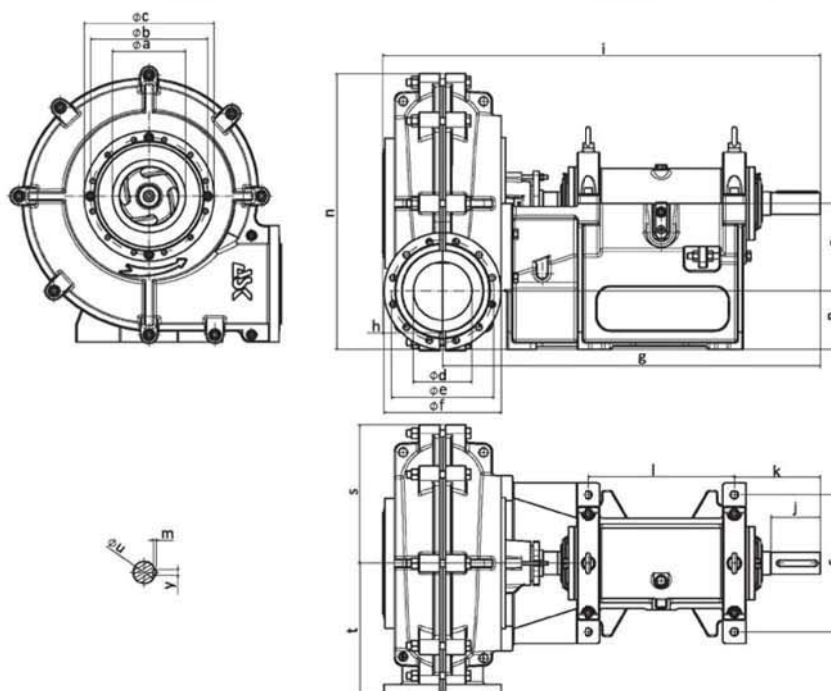
Q (m ³ /hr)	0.0	136.9	266.1	418.2	570.3
H (m)	11.6	11.0	9.8	9.0	7.8
P (kW)	6.6	10.2	13.0	15.7	20.2

500 rpm

Q (m ³ /hr)	0.0	93.8	182.3	286.5	390.6
H (m)	5.4	5.2	4.6	4.2	3.7
P (kW)	2.1	3.3	4.2	5.0	6.5



General Dimensions and weight



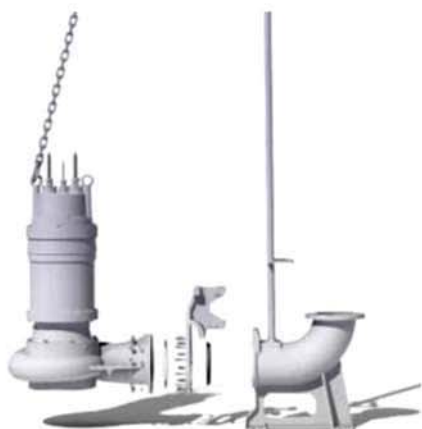
		Pump Models							
Description	Parameter	50 – 315 335 kg		100 – 315 350 kg		150 – 400 920 kg		200 – 400 935 kg	
Suction Flange, PN 10, RF	$\varnothing a$		80		125		200		250
	$\varnothing b$	4"	180	5"	210	10"	350	12"	400
	$\varnothing c$		220		250		400		445
Discharge Flange, PN 10, RF	$\varnothing d$		50		100		150		200
	$\varnothing e$	3"	160	4"	180	8"	295	10"	350
	$\varnothing f$		200		220		350		400
	g	767.5		775		1295		1295	
	h	87.5		90		205		205	
	i	855		865		1500		1500	
	j	100		100		170		170	
	k	192.5		192.5		295		295	
	l	285		285		500		500	
	m	8		8		12		12	
	n	544		565		905		945	
Eccentric volute	o	0		0		300		300	
	p	300		300		200		200	
	r	350		350		470		470	
	s	241.5		275		435		475	
	t	302.5		290		455		455	
Shaft Dia.	$\varnothing u$	42		42		75		75	
	y	12		12		20		20	

All dimensions in mm.

Not to be used for construction

A Leader in Engineered Pump Package Solutions

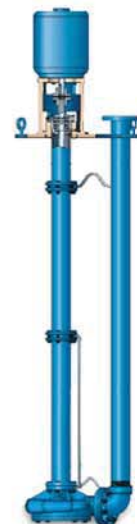
ASK Family of Pumps



Submersible Sewage Pump
SEW Series



Single Stage Vertical In-Line
Centrifugal Pump
OH3 Series



Vertically Suspended, Single Stage
Centrifugal Pump
VS4 Series



End Suction Horizontal Centrifugal Pump
Centerline Mounted
OH2 Series



Rubber Lined Horizontal
Centrifugal Pump
OH1/SL series



End Suction Horizontal
Centrifugal Pump
Foot Mounted
OH1 Series

ASK Series	Market Sector	Capacity m3/hr	TDH m	Temperature °C	Pressure barg
OH1	General Industries	1100	95	120	16
OH2	Oil	550	260	400	40
OH3	Gas	550	175	350	40
VS4	Petrochemical	1100	95	150	20
OH1/SL	Mining	1000	80	85	16
SEW	Water and Waste water	4500	95	70	16

PUMP & ELECTRO POWER SYSTEMS

Horizontal End-suction Centrifugal Pumps
Acc. to IS 9199
OH1 Models

PUMP & ELECTRO POWER SYSTEMS OH1 SL models

Horizontal End-suction Centrifugal Pumps
Acc. to IS 9199
OH1 Models



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