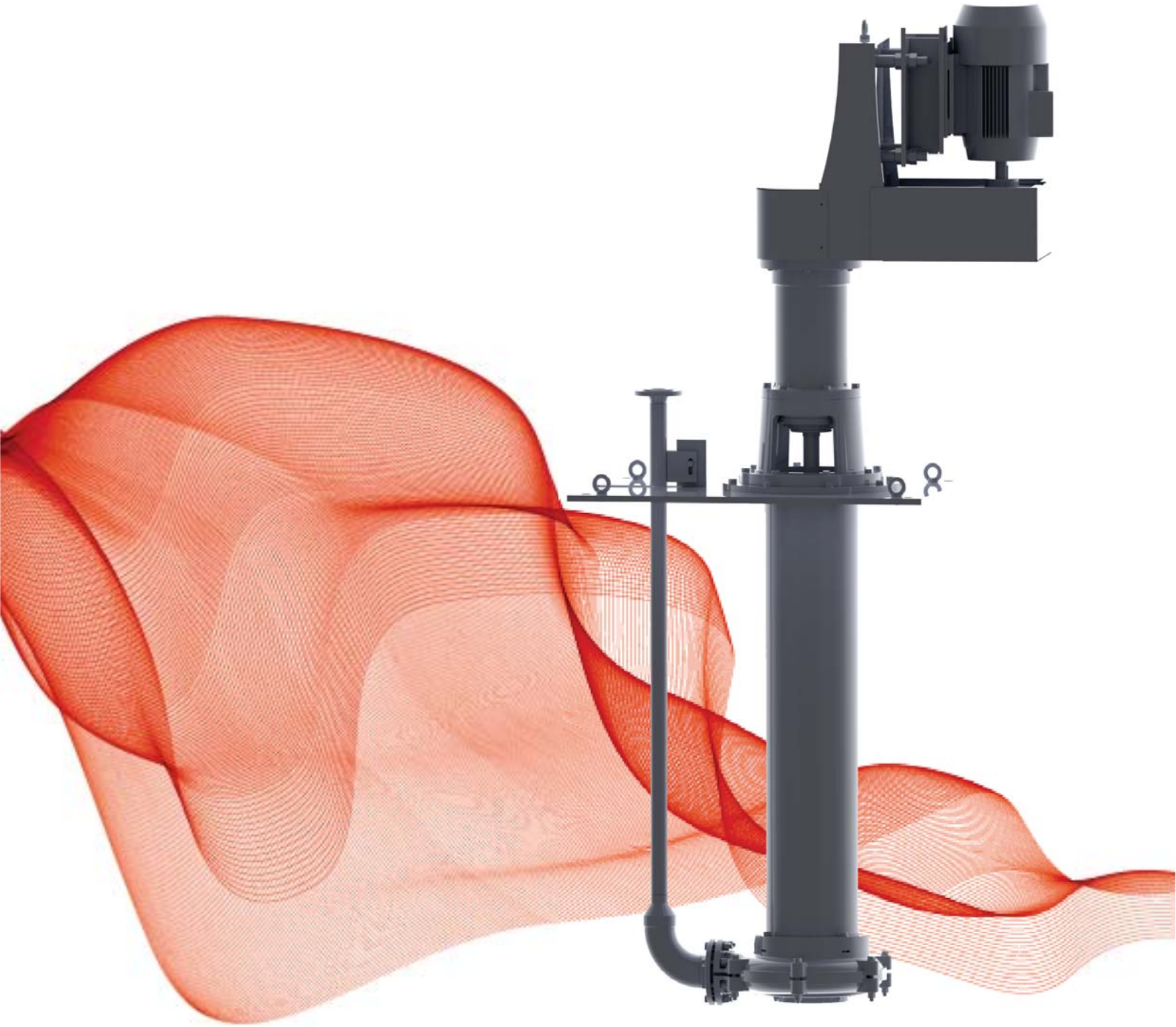
VS4/SL Series

Technical Catalogue

2015



Our Vision

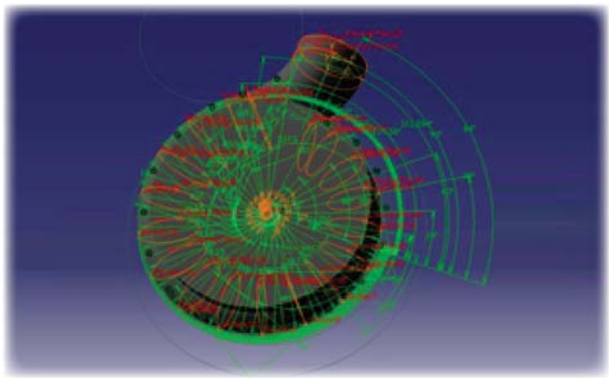
ASK's vision is to be a recognized leader in innovative, sustainable, engineered, and customer-focused solutions for performance critical applications in the oil and gas, hydrocarbon processing, power generation, pulp and paper, and other selected industries.

Our mission

ASK aims to be a multi-industry company with a strong brand, which provides solutions that combine products, services, engineering, and customer-application expertise. The corporation is close to the customer by being direct-sales driven.
Engineering, innovation, and technology are cornerstones. ASK strives to be an attractive employer and to create an environment where employees can excel. The company focuses on creating value for its customers.

ASK Innotec

The research and development unit of ASK supports the other divisions of the company and industrial companies in their development projects by providing a contract including research and special technical services like diagnostics and certified testing as well as one-off production and engineering. ASK innotec has expertise in materials and surface engineering, fluid technology, as well as in mechanics. Its core competencies in research contract also lie in these classical disciplines.



Certification

Certified quality management ISO 9001 with scope of "Design and manufacturing of process centrifugal pumps according to API standard 610".

Product Description

The models VS4/SL are vertically suspended, rubber or abrasion resistant alloy lined, radially split volute casing, semi-open or closed impeller, centrifugal slurry pumps.

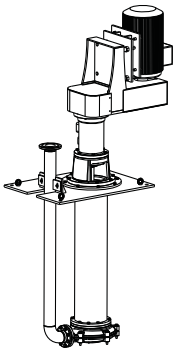
Field of Application

The pumps are designed for heavy continuous handling of highly abrasive slurries whilst submerged in sumps or pit.

VS4/SL pumps find application in:

- Mineral processing industry
- Paper and pulp industry
- Effluent treatment plants
- Sand beneficiation plants
- Ore beneficiation plants
- Plywood industry
- Sugar industry
- Power stations
- Glass and picture tube industry

Product Overview

Construction	Heavy duty modular design, maximizing flexibility to meet rigorous customer requirements	
Design methodology	Advanced computer techniques including 3D modeling, FEA & CFD	
Design standard	Factory standard	
Design pressure rating	Up to 16 bar g @ 20 ˚C	
Operating temperature	Up to 80 ˚C	
Flow rate	Up to 250 m^3/h	
Differential Head	Up to 70 m	
Spead	Up to 2200 rpm	
Configuration	Long coupled pump	
	V-belt driven pump	
	Bare shaft pump	
Length	Up to 2 m (from skid to pump suction)	
Discharge Sizes	Up to DN 100	

Parts Description

Part	Description
Volute casing	Includes front and rear casing made in grey cast iron, A 48 Class 40B.
Volute liner	Includes front and rear liners made in rubber or abrasion resistant alloy. these liners are removable.
Impeller	Rubber lined with grey cast iron core or fully made in abrasion resistant alloy, semi-open or closed.
Shaft	Robust cantilever design with minimum deflection, made in carbon steel (A 576 Gr1045)or stainless steel (type 420)
Shaft sealing system	Soft packed
Bearing	Heavy duty anti-friction bearings with minimum life of 25,000 hours, grease lubricated.
Bearing housing	Heavy duty construction, made in grey cast iron.

Designation

Example: VS4/SL F 100-315 / 30 4 R1 P01 C / 0.8

VS4/SL	F	100	315	30	4	R1	P	01	C	0.8
Pump type	Impeller option	Discharge nominal dia. in millimeters	Impeller nominal dia. in millimeters	Nominal power of installed driver in kW	No. of poles	Material class	Seal type	Seal plan code	Options	Spead ratio
VS4/SL: vertically suspended, lined radially split volute casing, centrifugal slurry pumps	**F:** Semi-open (vortex) **K:** Closed (Non-cloging)	Up to 100mm	Up to 315mm	up to 45kW	**6:** 1500rpm **4:** 1000rpm	**R1:** NBR lined **R2:** Neoprene lined **A1:** Ni-hard **A2:** High chromium cast iron	**P:** Soft packing	**01:** No piping **32:** External flushing	**A:** No option **B:** Bare shaft **C:** V-belt drive **D:** Long coupled	Pump spead ÷ Motor spead

Material Description

Nitrile Rubber (NBR):
NBR is a synthetic rubber and it offers moderate resistance to abrasion with excellent ability to handle oils and hydrocarbons. It is attacked by ozone, ketones, esters, aldehydes, and chlorinated and nitro-hydrocarbons.

Polychlorene (Neoprene):
Neoprene, a DUPONT trademark for polychlorene, is superior to natural rubber in its resistance to oils and chemicals, and for higher-temperature applications. Although Neoprene has a lower resistance to abrasion than narural rubber.The tip speed for impellers is 33 m/s (or 6496 ft/sec).

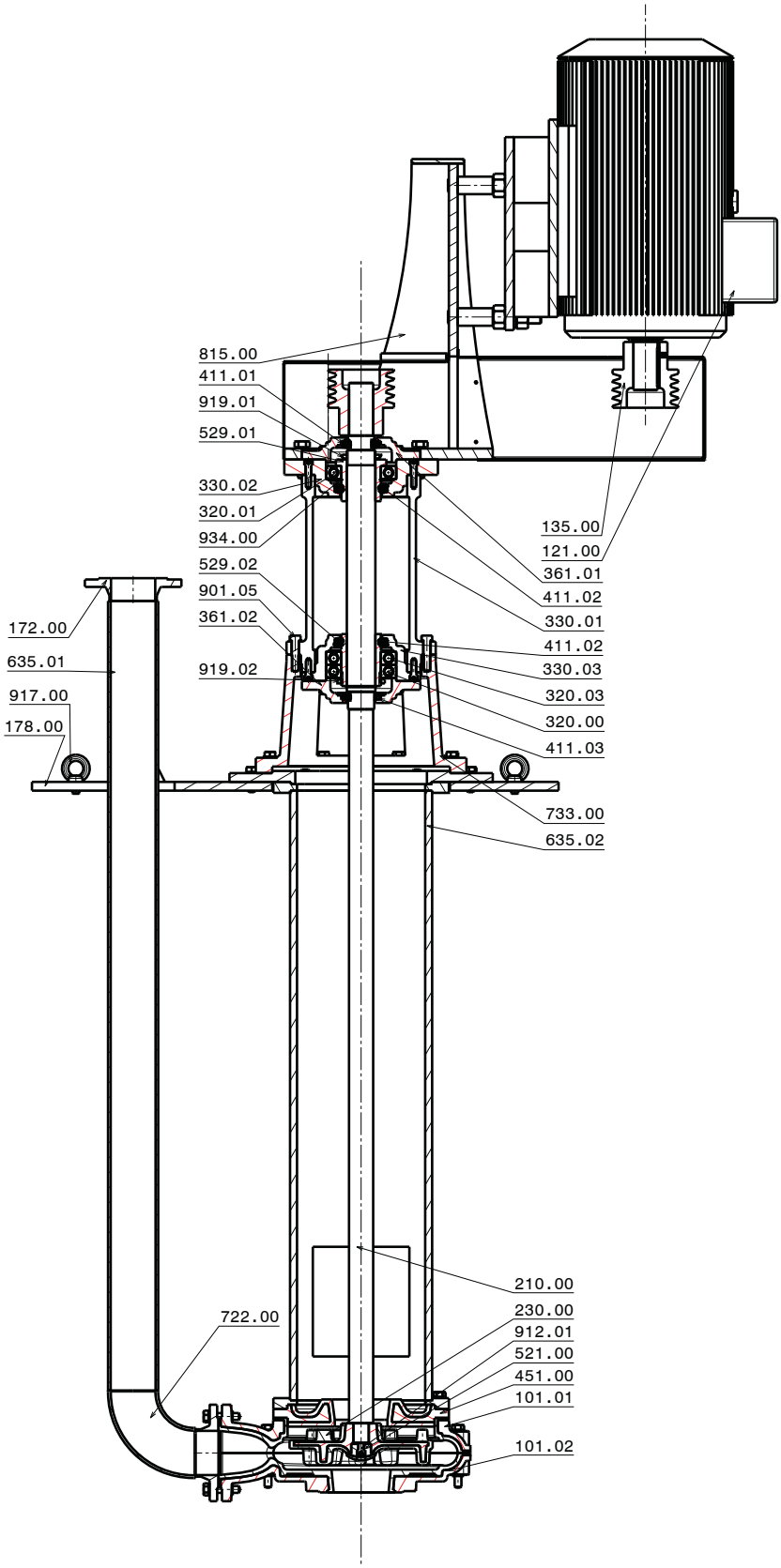
Ni-hard:
The International Nickel Company developed special alloys of white iron with nickel. These are called Ni-hard and a number of alloys such as Ni-hard 1 to Ni-hard 4 are now produced. The presence of nickel increases the hardness but it also ensures the transformation of the austenite to martensite after proper heat treatment. The selection of alloying elements is based on the intended use and on the thickness of the cast part. The maximum carbon content is 3.2–3.6%, but when impact resistance is important, the carbon should be trimmed to 2.7–3.2%.

High chromium cast iron:
By adding chrome in the range of 12 to 28%, together with nickel and molybdenum, allows the casting of abrasion-resistant alloys that are tough and can be cast in large sizes to match the needs of the mining industry. Eutectic carbides in the form of M_7C_3 in combination with an austenitic, martensitic, or pearlitic matrix gives a full range of alloys. Some of the components are cast pearlitic to allow machining, then heat treated to obtain an abrasion-resistant martensitic structure. They are often called by the foundries 16% and 27% chrome.

Product Benefits & Options

- Optimum material selection
- Ease of maintenance
- Robust shaft
- Heavy duty bearing assembly
- Replaceable casing components
- No submerged bearings
- Several arrangements for pump and motor available
- Several methods of power transmission available
- Local control panel and instrumentation optional

General Sectional Drawing

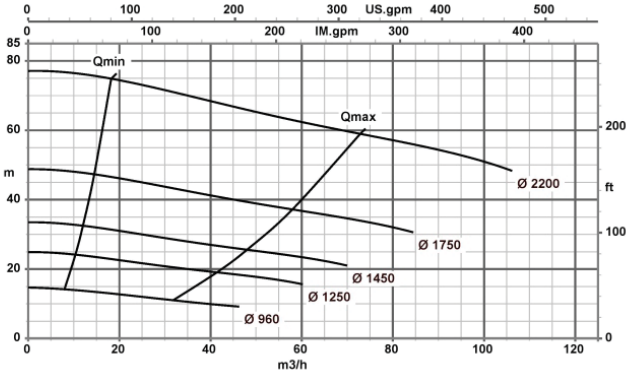


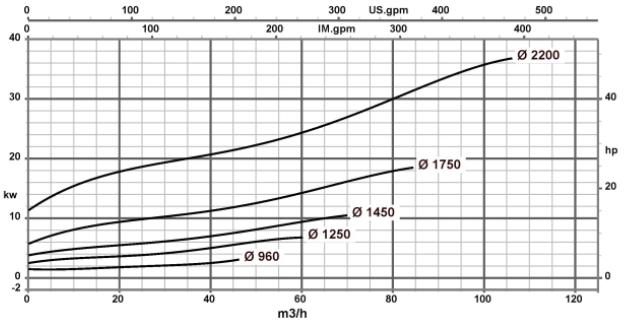
Part no.	Part name
101.01	Casing upper side
101.02	Casing lower side
121.00	Electro motor
135.00	Pulley
172.00	Discharge Curve
178.00	Bearing housing support
210.00	Shaft
230.00	Impeller
320.01	Deep groove ball bearing
320.02	Deep groove ball bearing
320.03	Deep groove ball bearing
330.01	Bearing housing
330.02	Bearing housing
330.03	Bearing housing
361.01	Bearing cover
361.02	Bearing cover
411.01	Lip seal
411.02	Lip seal
411.03	Shaft seal ring
451.00	Casing cover
521.00	Impeller bush
529.01	Bearing sleeve
529.02	Bearing sleeve
635.01	Discharge pipe
635.02	Column
722.00	Weld bend
733.00	Connector piece
815.00	Electro motor support
912.00	Cylinder head cap screw
917.00	Lifting eye bolt
919.01	Chuck nut
919.02	Chuck nut
920.00	Hexagon head nut
920.02	Hexagon head nut
932.00	Spring washer
934.00	Circlip
937.01	Chuck nut washer
937.02	Chuck nut washer

Performance Curves

VS4/SL F 50 – 315 (Water performance)

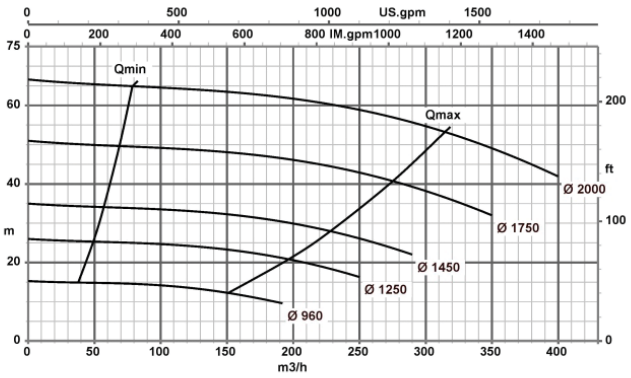
2200 rpm					
Q (m3/hr)	0.0	22.8	37.9	60.7	106.2
H (m)	77.1	73.7	69.1	62.2	48.3
P (kW)	7.0	18.3	20.4	24.5	36.8
1750 rpm					
Q (m3/hr)	0.0	18.1	30.2	48.3	84.5
H (m)	48.8	46.6	43.7	39.3	30.6
P (kW)	3.5	9.2	10.3	12.3	18.5
1450 rpm					
Q (m3/hr)	0.0	15.0	25.0	40.0	70.0
H (m)	33.5	32.0	30.0	27.0	21.0
P (kW)	2.0	5.2	5.8	7.0	10.5
1250 rpm					
Q (m3/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 (m3/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

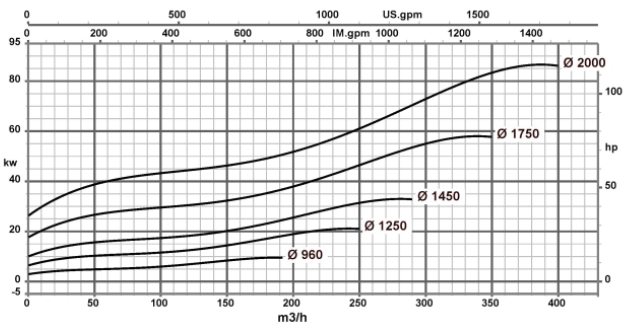


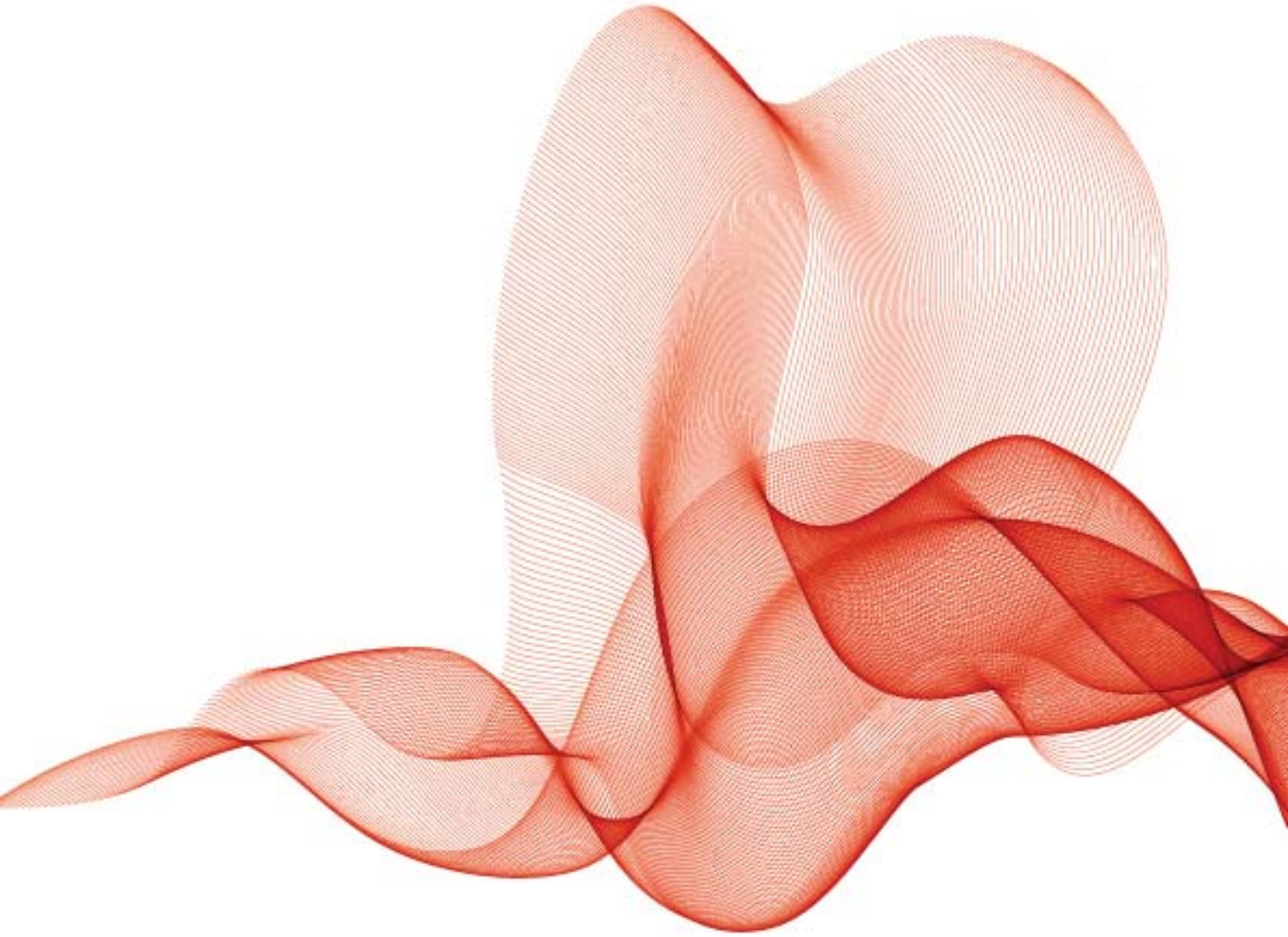


VS4/SL F 100 – 315 (Water performance)

2000 rpm					
Q (m3/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 (m3/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 (m3/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 (m3/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 (m3/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







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