

HVBW
Volute casing pumps

VOLUTE CASING PUMPS HVBW

VOLUTE CASING PUMPS

HVBW pumps are designed for pumping of clean liquids, eventually lightly polluted by mechanical impurities within 3% of liquid volume and with maximum grain size of 0,3 mm. The temperature of pumped media can vary from – 20 °C to + 180 °C, operational pressure to 2,5 MPa and density to 1050 kg.m³.

Within the pump design, construction elements required by API 610 standard are used.

HVBW pumps may pump various liquids: food material, potable water, used water, hot water, cooling water, desalinated water, oils, alkalines, eventually condensate. Other operational conditions possible only after approval by pump manufacturer.

DESIGN

The pump design follows technical requirements for pumps according to ISO 9908 class III standard, by special demand to ISO 5199 standard.

The pump stator is designed for **PN16 (PN25)** .

The pump rotor is balanced following grade G6.3 as per ISO 1940-1 standard.

The pump is of volute-type with single-suction impeller. The suction branch follows the pump axis. The suction elbow or suction casting are connected to suction branch. The discharge branch is located tangentially, upright to side.

The pump stator consists of volute, replaceable front and rear sealing rings, dividing wall and seal. The pump stator is tested by hydrostatic water test.

The pump rotor consists of shaft and impeller with replaceable sealing rings. The pump rotor is

supported on roller bearings, laid in removable bearing housing.

In default design, the pumps are equipped with mechanical seal. The design of their sealing rooms follows ISO 3069 standard. The mechanical seals design follows the nature of pumped media, operational conditions and customer's requirements. The default design is single seal.

The bearing housing is designed in a way to cover several pump sizes. The whole pump line features various bearings sizes made by SKF, lubricated by „plastic grease“. The bearings lifetime exceeds 40 000 operational hours. The bearing housing is sealed through felt padding.

The pumps are manufactured in several design options. Elements, which may be combined upon customer's requirements, are:

Suction part

Strainer, foot suction elbow, welded suction elbow, welded suction elbow embedded in concrete.

Discharge part

Cast volute welded with cast diffuser, cast volute with removable cast diffuser, cast segment volute with cast diffuser embedded in concrete.

Bearing part

Bearing housing with roller bearings, for flows $Q > 3000$ l/s bearing housings with slide bearings.

The pump connection with pump drive is made by flexible multi - disc coupling. The longest spacer size is 7 metres, by application of guiding bearings up to 4 x 7 metres.

The pump drive may be located on pump base frame on the ceiling of machinery room or directly above the pump on concrete pillars (the shortest coupling design).

Designation explanation

400-HVBW-705-58/2-S5

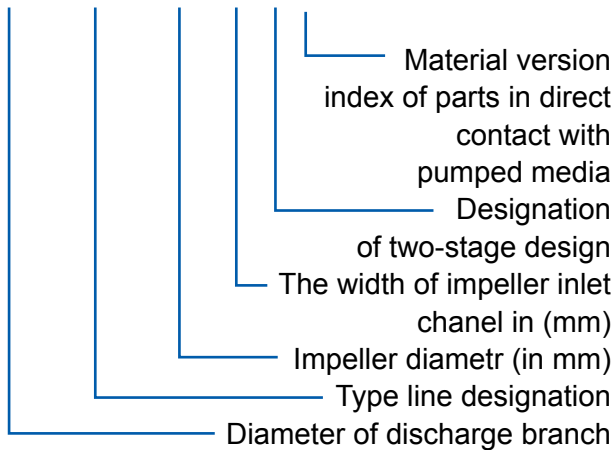


TABLE OF MATERIAL VERSIONS INDEXES

The volute casing pumps HVBW are by default manufactured of material versions, which cover the most applications needed. Upon demand it is possible to combine various material versions or to replace the default materials by customer's ones. For the application of pumping aggressive solutions it is possible to apply epoxide, nickel, titane or teflon as a surface treatment.

Index	Description
S-5	steel version on the basis of carbon steel, cast suction elbows of EN-GLJ-250 material
S-6	steel version on the basis of carbon steel with an impeller of 12% chrome steel, cast suction elbows of EN-GLJ-250 material
S-8	steel version on the basis of carbon steel with an impeller of chrome-nickel-molybdenum austenitic steel 18/9/2, cast suction elbows of EN-GLJ-250 material
C-6	alloyed version on the basis of 12% chrome stainless steel
A-7	alloyed version on the basis of chrome-nickel austenitic steel 18/8

Index	Description
A-8	alloyed version on the basis of chrome-nickel-molybdenum austenitic steel 18/9/2
D-1	duplex version

COOLING (HEATING)

Due to the fact that the HVBW pumps are designed for pumping of hot or cool media, they feature several ways of cooling (heating).

An informative division based on individual assessment of each operation modes:

- without cooling up to approx. 120°C
- cooling by water through dividing wall cooling chamber
- cooling by water through dividing wall cooling chamber, inner seal circulation via external cooler
- cooling by water through dividing wall cooling chamber, inner seal circulation via external cooler and flushing of pad and flange by cooling water

Similar ways are used in case of pumping cold media with low temperatures starting by -40°C.

COUPLING

In order to connect the pump with the electric motor flexible multi-disc couplings are used. They enable perfect connection with electric motor even in case of big shaft radial offsetting caused by thermal dilatation. The coupling consists of spacer, which enables the drive torque transmission up to the distance of 7 metres (without guidance bearing) and 4 x 7 metres with guidance bearings.

VOLUTE CASING PUMPS HVBW

BASE FRAME

The base frame is welded under each pump foot and electric motor. The passage through machine hall ceiling enables partial installation of dismantled pump in vertical direction.


QUALITY ASSURANCE

For nuclear power plant applications the pumps are delivered following special instructions upon customer's requirements.

As for ISO 9908 (ISO 5199) standards, the pump production process is checked within Quality Plan (QP), which is prepared by QA department, independently on production. The scope of QP is approved by the customer before manufacture start. Upon special request it is possible to carry out inspections, tests and documents checks upon customer's requests.

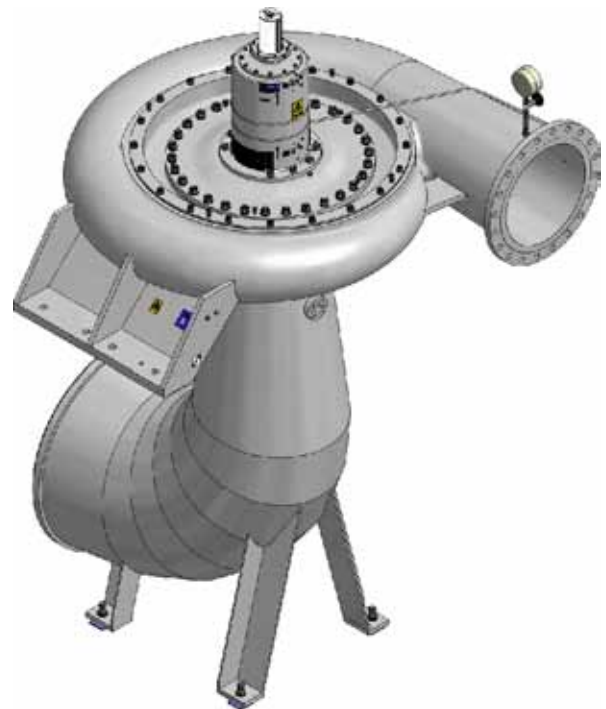
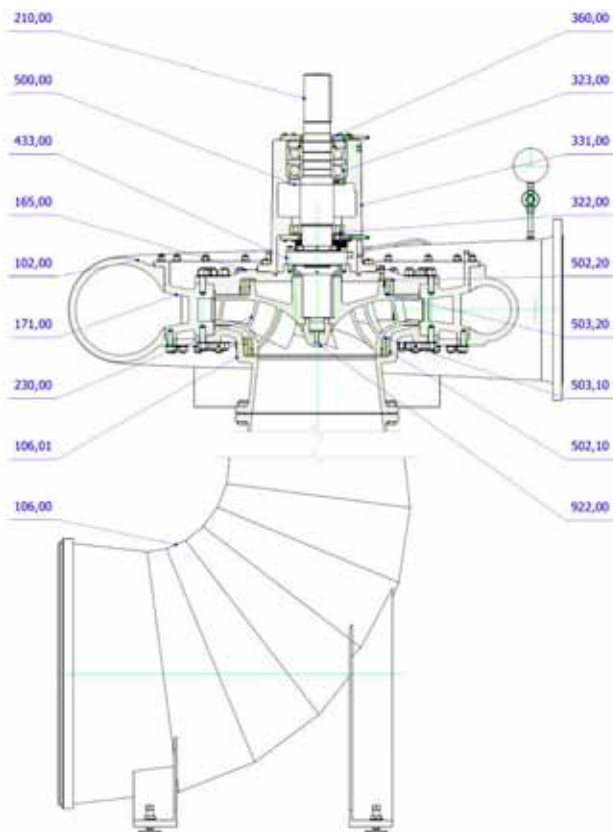
APPLICATION OF PUMPS IN AN EXPOSIVE ATMOSPHERE ATEX



In petrochemical industry, as one of main branches of these pumps applications, often occurs a potentially explosive atmosphere (explosion danger of flammable gases, vapours or mists). For such atmospheres pumps with explosion protection of category 2G for zone 1 or of the 3G category for zone 2 are applicable. For ordering of pumps for a potentially explosive atmosphere a full specification of classification of surrounding flammable atmosphere, i.e. its temperature class (from T1 up to T6) and subgroup (IIA, IIB, IIC) is necessary together with the specification of the category and zone. Factory production label of pumps intended for application in a potentially explosive atmosphere contains the symbol  and further necessary data.

CROSS - SECTIONAL DRAWING OF HVBW PUMP

One-stage version with a removable diffuser and welded segment suction elbow. Suction elbow embeded in concrete.



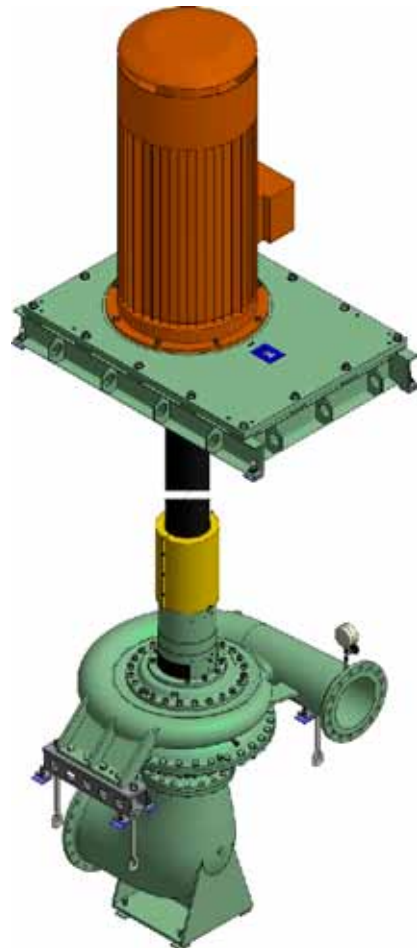
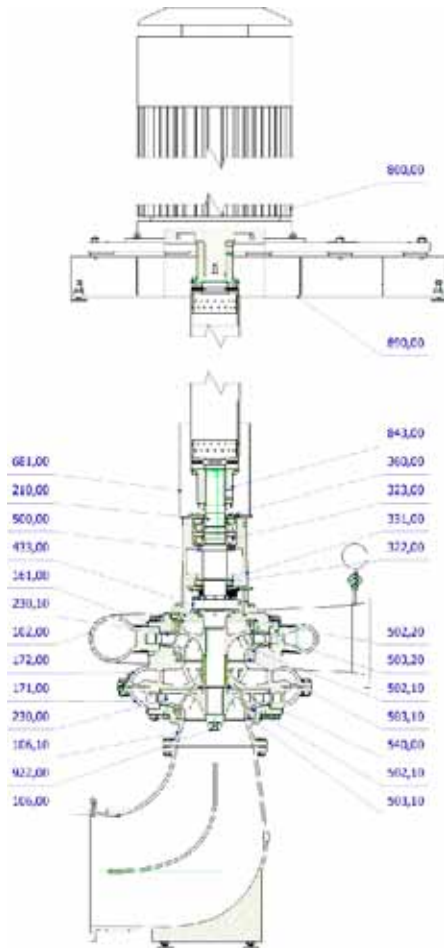
Position	Name
102.00	Volute
106.00	Suction elbow
106.01	Suction cover
161.00	Dividing wall
171.00	Diffuser
210.00	Shaft

Position	Name
230.00	Impeller
322.00	Journal bearing
323.00	Thrust bearing
331.00	Bearing housing
360.00	Cover
433.00	Mechanical seal

Position	Name
500.00	Sprayer
502.10	Housing sealing ring - front
502.20	Housing sealing ring - rear
503.10	Impeller sealing ring - front
503.20	Impeller sealing ring - rear
922.00	Impeller nut

CROSS - SECTIONAL DRAWING OF HVBW PUMP

Two-stage version with cast suction elbow.



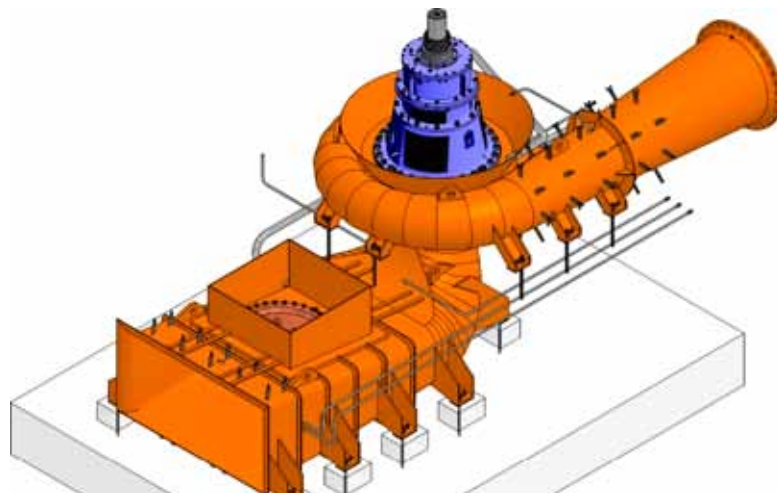
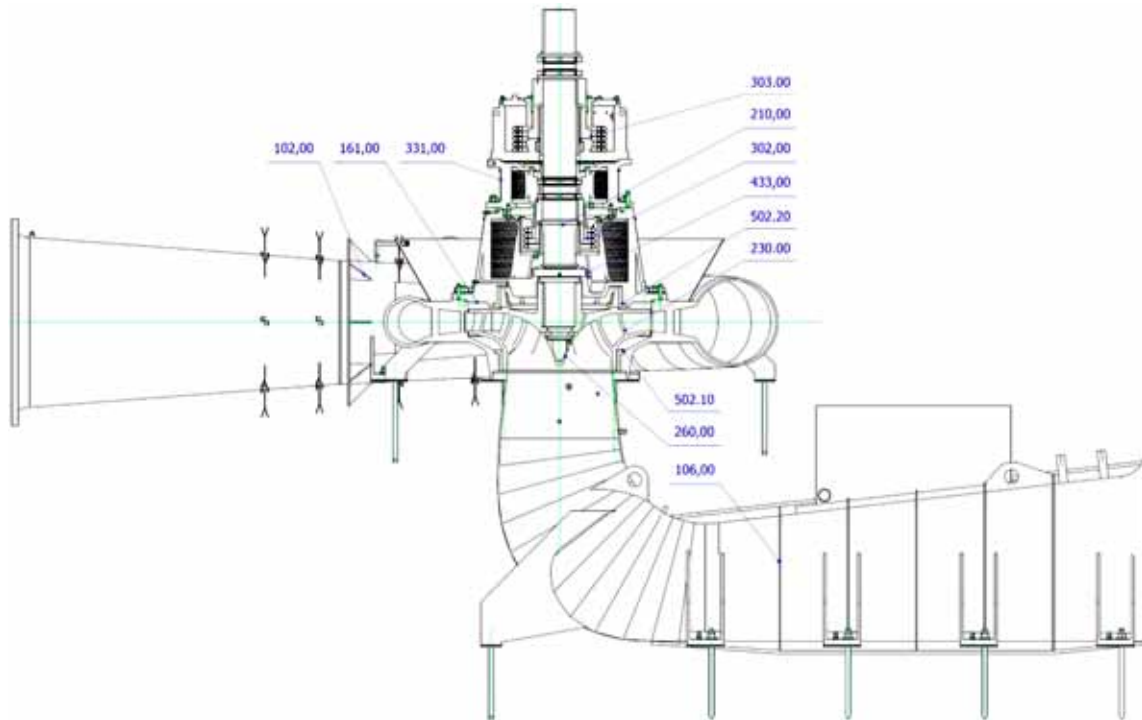
Position	Name
102,00	Volute
106,00	Suction elbow
106,10	Suction cover
161,00	Dividing wall
171,00	Diffuser 1°
172,00	Converter 1°
210,00	Shaft
230,00	Impeller 1°

Position	Name
230,10	Impeller 2°
322,00	Journal bearing
323,00	Thrust bearing
331,00	Bearing housing
360,00	Cover
433,00	Mechanical seal
500,00	Sprayer
502,10	Housing sealing ring - front

Position	Name
502,20	Housing sealing ring - rear
503,10	Impeller sealing ring - front
503,20	Impeller sealing ring - rear
540,00	Bearing
681,00	Coupling cover
800,00	Electric motor
890,00	Base frame
922,00	Impeller nut

CROSS-SECTIONAL DRAWING OF HVBW PUMP

One-stage version with welded segment volute, welded suction housing and bearing housing with slide bearings. Suction housing and volute embedded in concrete.



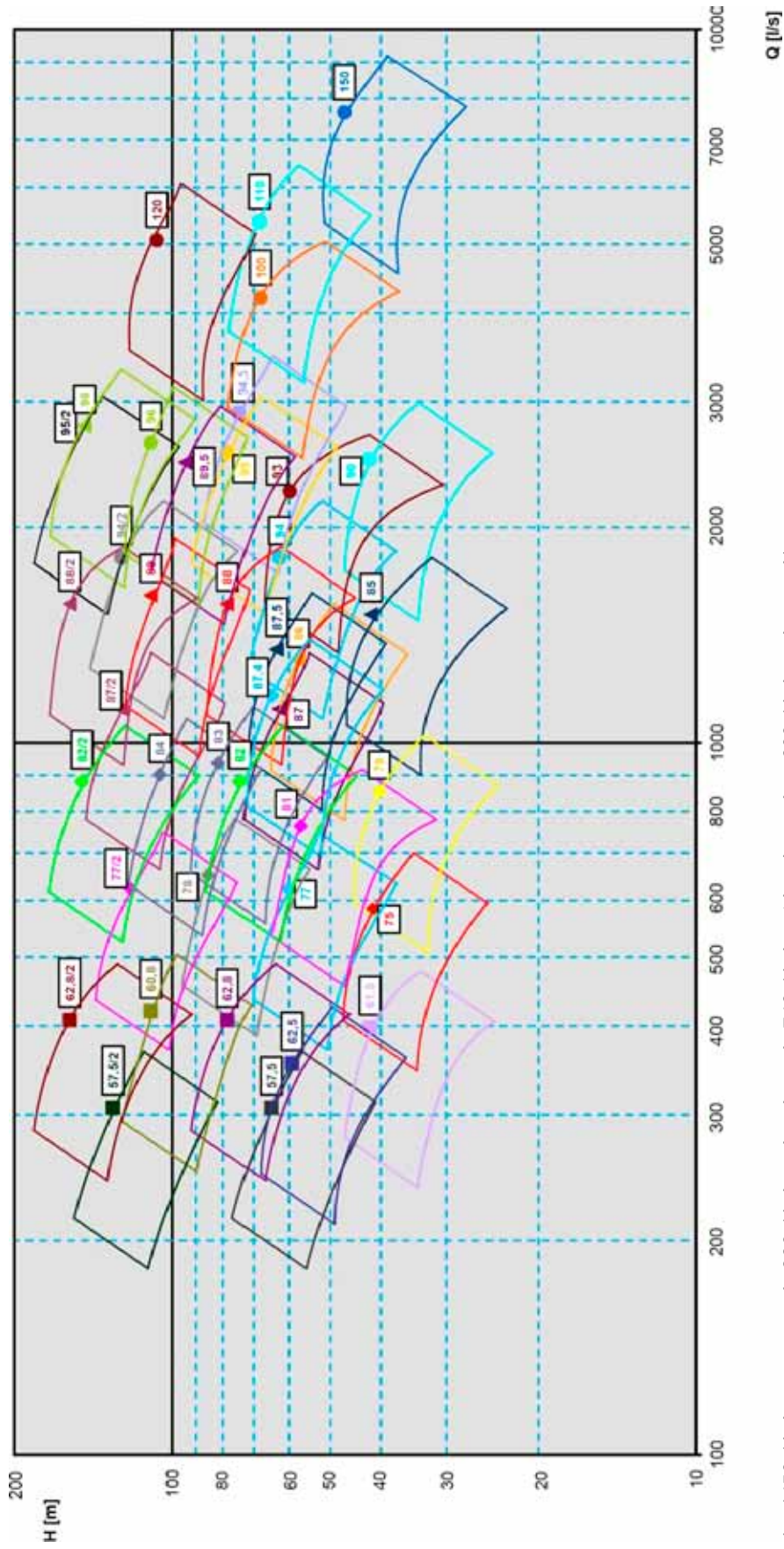
Position	Name
102.00	Volute
106.00	Suction housing
161.00	Cover
210.00	Shaft

Position	Name
230.00	Impeller
302.00	Journal bearing
303.00	Thrust bearing
331.00	Bearing housing

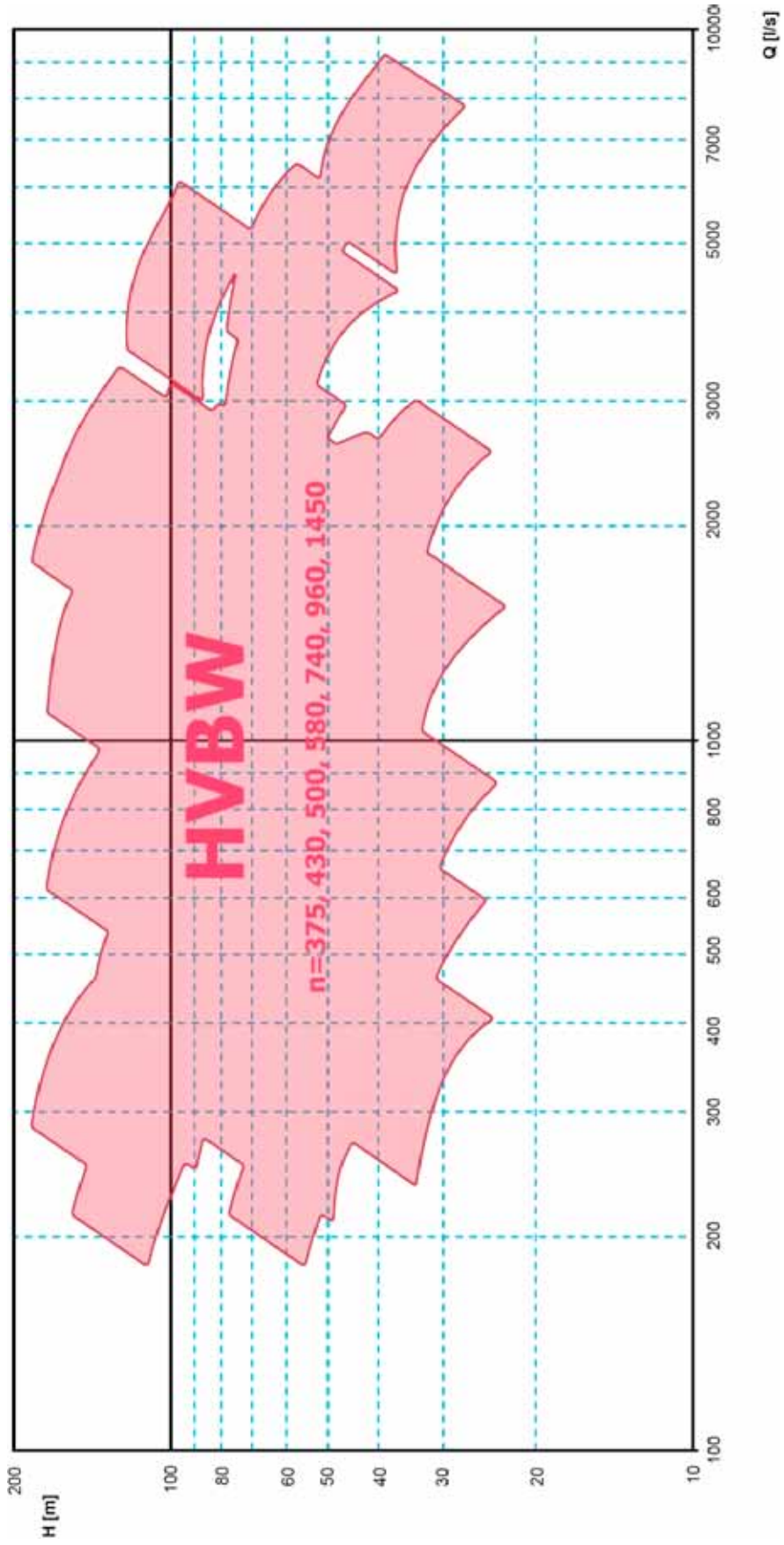
Position	Name
433.00	Mechanical seal
502.10	Housing sealing ring - front
502.20	Housing sealing ring - rear
260.00	Impeller head

PERFORMANCE RANGE

**HVBW type – pumps with a diffuser,
n = 375, 430, 500, 580, 600, 740, 960, 1450 1/min**

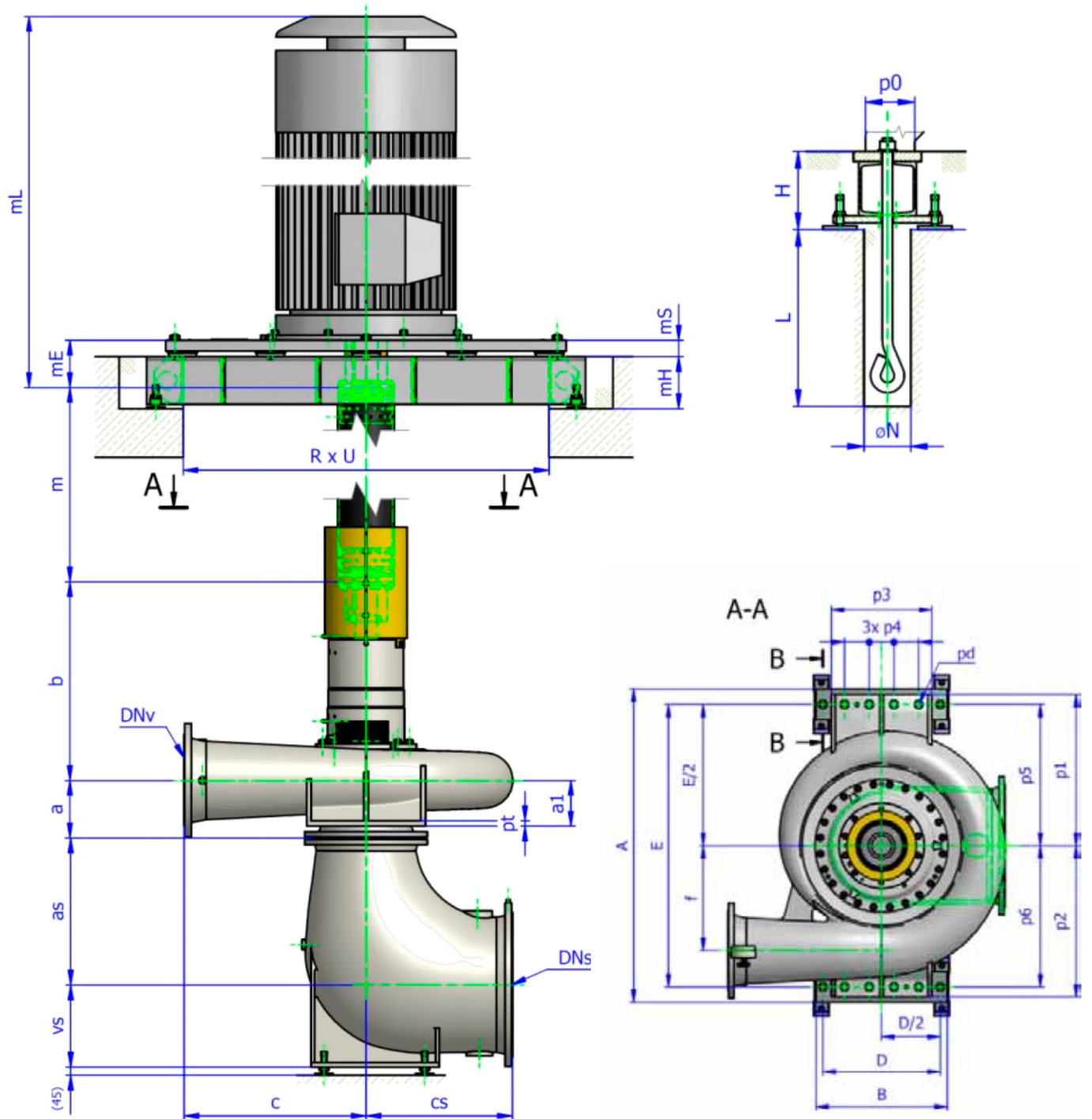


(n=1450 1/min square mark, 960 1/min = rhomb mark, 740 1/min = triangle mark, < 600 1/min = ring mark)
Guaranteed parameters of pumps with flows starting by 3000l/s are verified on a model pump. For such units there is a new hydraulic size made.
Pumps sizes „XX/2“ are two-stage versions of „XX“ size.



HVBW – vertical, centrifugal, volute-type pumps with a diffuser according to ISO 9908, (ISO 5199), for pumping of clean and lightly polluted liquids with temperature $-15 + 140^{\circ}\text{C}$. Branches PN25 (PN16, 10, 6).

BASIC DIMENSIONS





SIGMA GROUP a. s.
Jana Sigmunda 79
783 49 Lutín, Česká republika
+420 585 652 011, +420 585 652 060
+420 585 652 051, +420 585 944 294
info@sigma.cz
2014

www.sigma.cz