

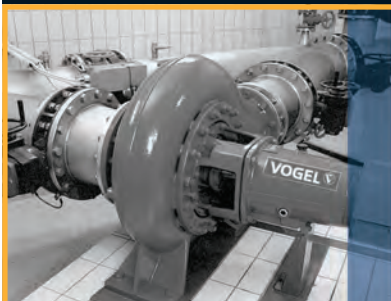
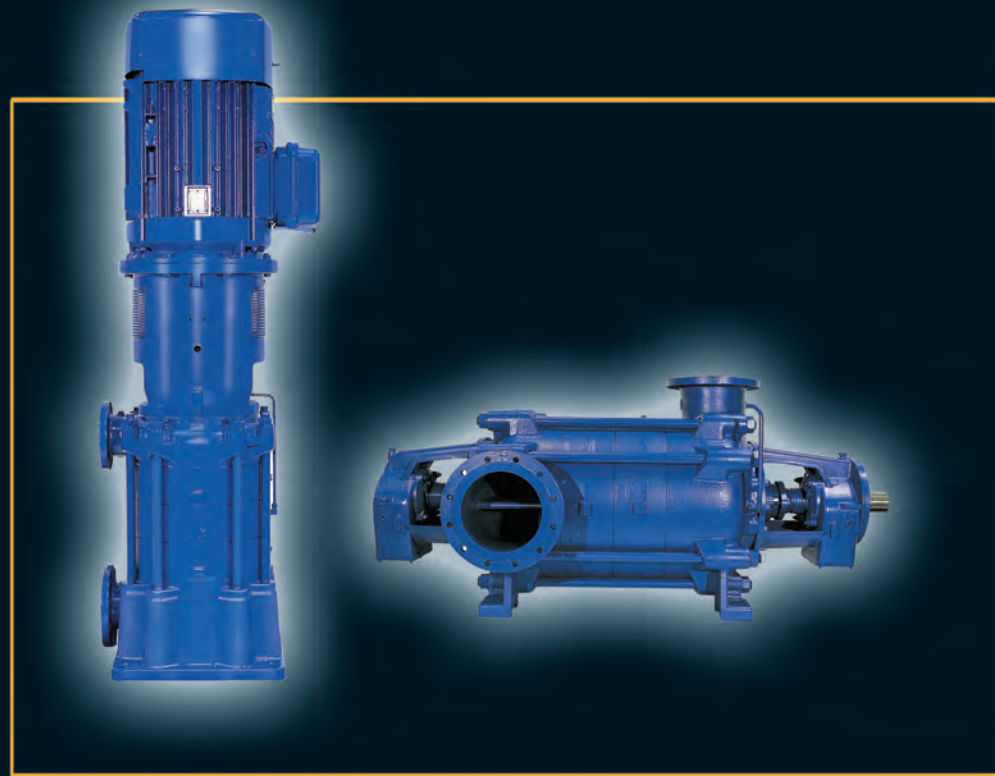


# ITT

## Vogel - Multistage Pumps

Design P, PVa, MP 300

Sizes DN 80 - DN 300



*Engineered for life*



## VOGEL MULTISTAGE PUMPS

### Performance range:

Capacities up to 1800 m<sup>3</sup>/h (8800 USgpm)

Head up to 300 m (1000 feet)

Max. speed up to 1750 min<sup>-1</sup> (1750 r.p.m)

Multistage pumps of series MP with smaller capacities and max. speed up to 3.600 min<sup>-1</sup>, refer to brochure 2200.1.B.

### Sizes:

DN 80 up to DN 300 (from 3" to 12")  
discharge

### Max. temperature:

140°C (280°F)

### Max. casing pressure:

45 bar (650 psig)

For more detailed information about operation limits with regard to material of construction and operating conditions please refer to data sheets or actual quotations.

### Handled liquids:

Pure as well as slightly contaminated media  
such as:

hot and cold water

condensate

oil suspensions

acids as well as their watery solutions

caustic solutions

brine

### Application:

water supply

booster systems

irrigation

fire fighting

cooling circuits

boiler feed

condesate

district heating

osmosis and ultra filtration

spray water systems

cleaning systems

mining



Since 1910 multistage pumps  
have been developed and manufactured.

Our application and manufacturing  
expertise provide you with the BEST  
SOLUTION to meet your pumping needs.





## VOGEL MULTISTAGE PUMPS

VOGEL Multistage pumps utilize a modular design concept which maximizes component interchangeability. As such, multiple design configurations can be engineered to meet customer requirements without compromise to repair part inventories.

### Modular system:

The entire performance range is covered by 7 mechanical sizes that hold 9 different hydraulics.

Size	Discharge branch DNd [mm]	Suction branch DNs [mm]	Capacity at BEP Q [m <sup>3</sup> /h]	
			50 Hz	60Hz
P, PVa 84	80	100	120	140
P, PVa 104	100	125	170	200
P, PVa 124	125	150	250	300
P, PVa 154	150	200	420	500
P, PVa 204	200	250	660	790
P 253	250	300	800	900 <sup>1)</sup>
P 254	250	300	980	1100 <sup>1)</sup>
MP 300.1	300	400	1200	-
MP 300.2	300	400	1400	-

1) upon request

### Hydraulics:

Sizes 84-254, closed radial type impellers designed for casing wear ring on both sides. Axial thrust minimized by balance holes for minimum bearing loads and a maximum bearing lifetime. Size MP 300.1 and MP 300.2 thrust balanced by a balancing drum.

Size 84-104 P: one piece design for diffuser and casing. Size 124 PA-254 P and MP 300.1, 300.2: two piece design for diffuser and casing. Balanced radial forces, minimum shaft deflection, minimum vibrations.

**Heavy duty design for long term  
operation in industrial applications.**

**All design versions acc. to ISO 5199 / EN 25199.**

**ISO 9001 certification guarantees high quality  
standards and reliability of our products.**

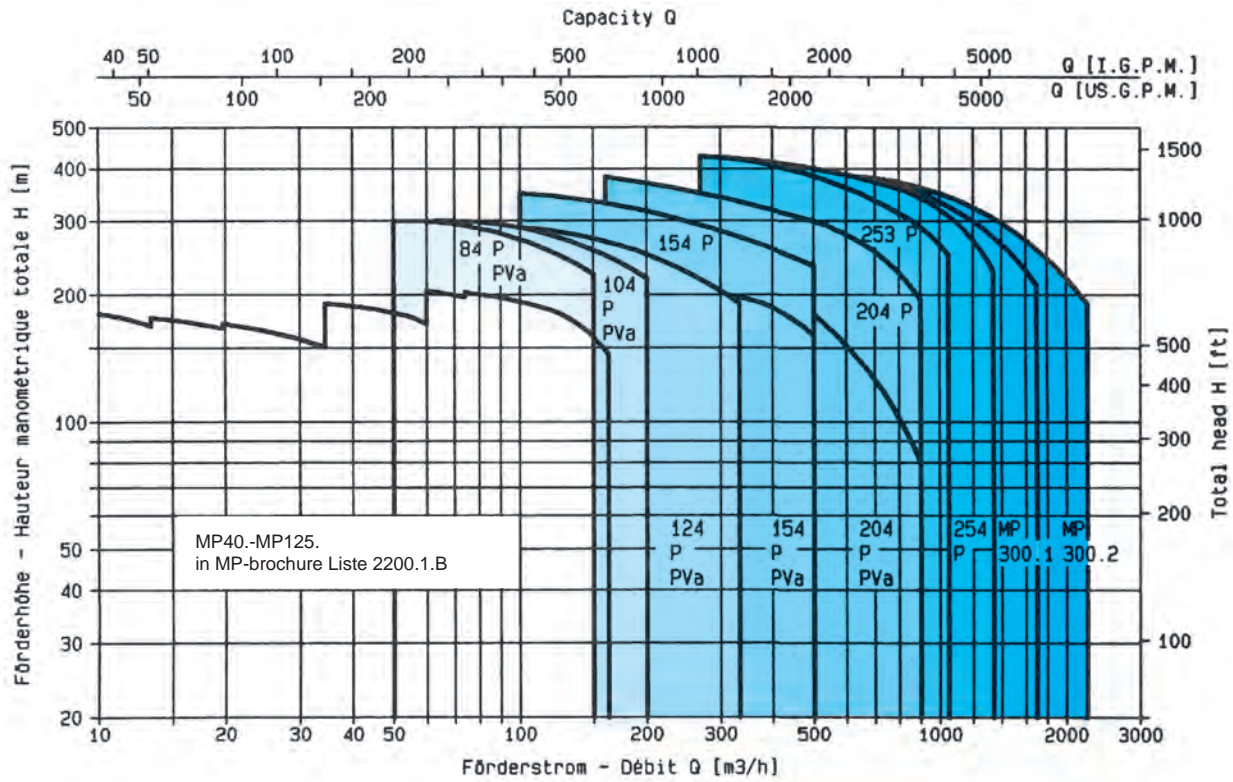




# VOGEL MULTISTAGE PUMPS

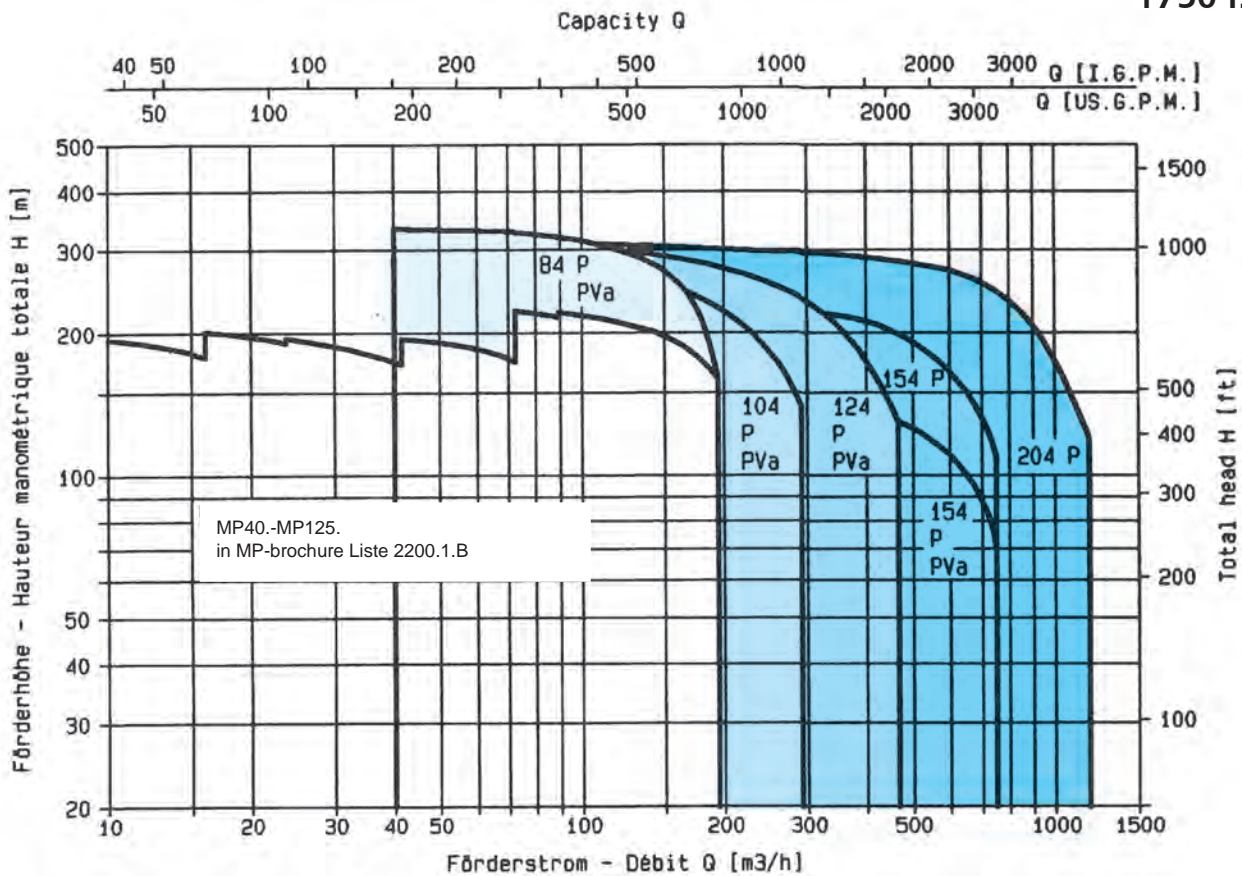
Performance range - 50 Hz

1450 r.p.m.



Performance range - 60 Hz

1750 r.p.m.





## VOGEL MULTISTAGE PUMPS

### Design versions:

#### Type P, PA, MP 300:

Horizontal shaft with bearings at both ends, drive-end at discharge side (standard), rotation clockwise, with suction branch left and discharge branch radially upwards, oil lubrication. Counter clockwise rotation and other flange orientations are available as an option.

Sectional drawing page 6

#### Type PVa:

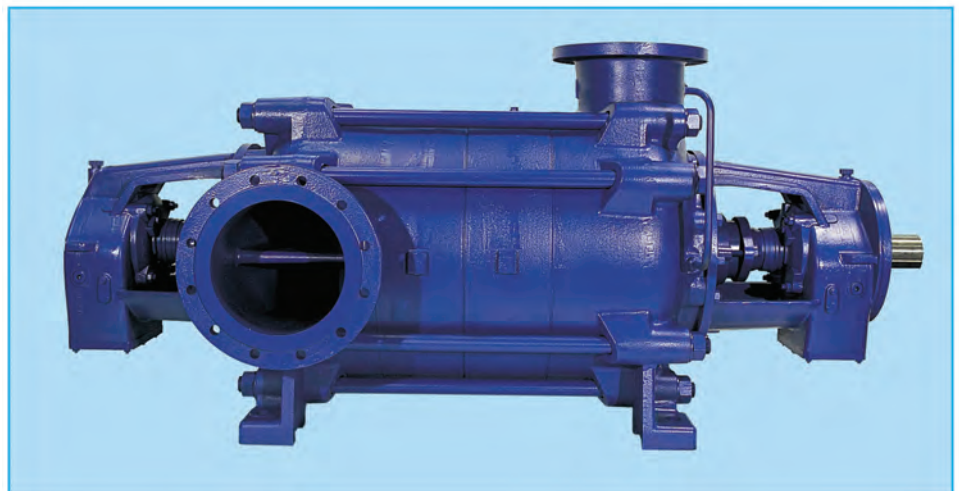
Vertical design with separate thrust bearing and flexible coupling between motor and pump. Standard IEC motors, up to 315 kW.

Sectional drawing page 7

#### Type PT

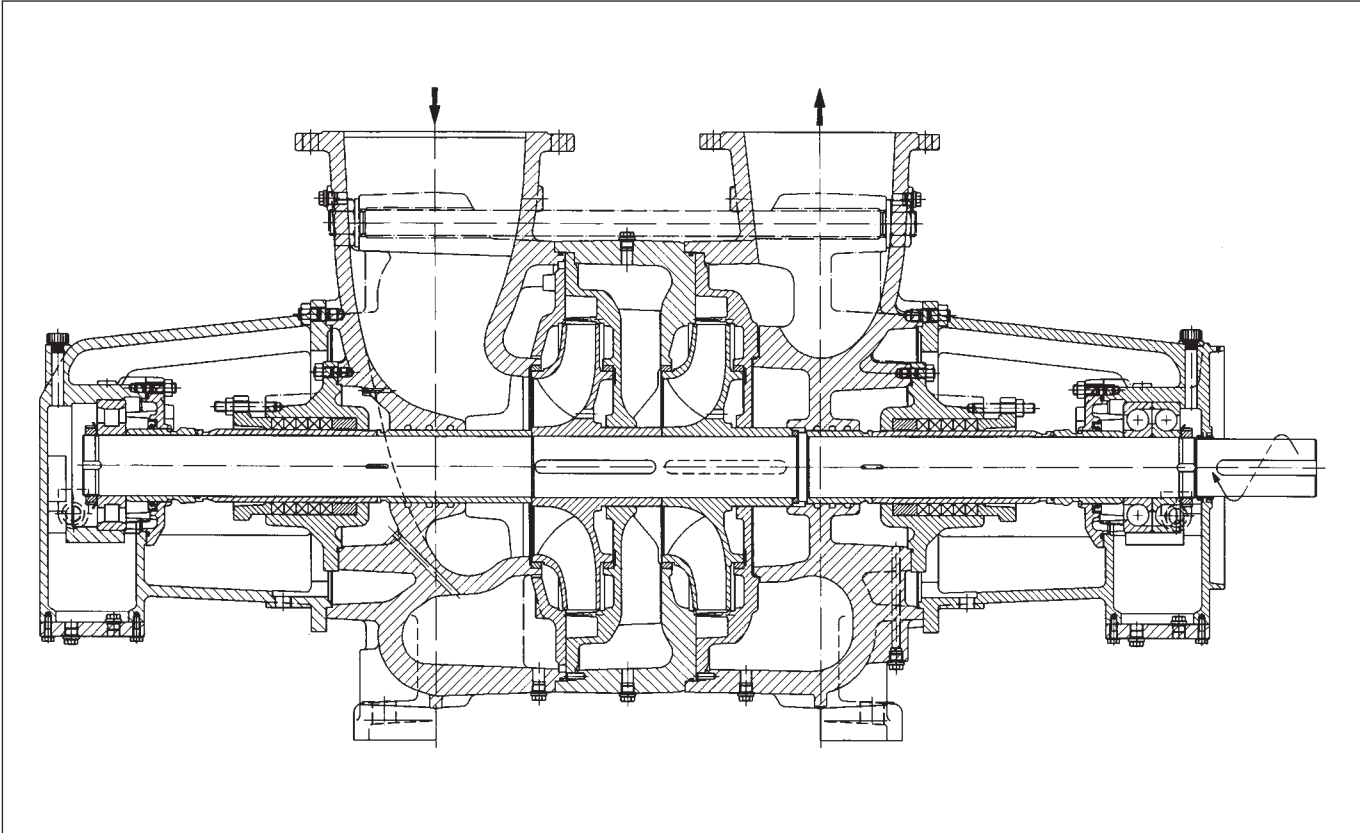
Vertical wet pit configuration length: max. 10 m - 1450 / 1750 r.p.m. Inducer design available.

Sectional drawing page 8



## VOGEL MULTISTAGE PUMPS

### TYPE P:



- Horizontal configuration with outer bearings on both sides.
- Driven by electric motors, combustion engines or steam turbines, via flexible coupling.
- Drive side discharge, clockwise rotation (drive side suction and counter clockwise rotation available).
- Branch directions: suction left viewed from drive end, discharge radially upwards. Branches can be adjusted to meet customer requirements in 90° increments.
- Drive side thrust bearing, two angular contact ball bearings. Suction side roller bearing as floating bearing. Oil lubrication with large capacity oil sump.
- Thermal expansion of the pump rotor will be balanced internally without affecting the shaft alignment.
- Shaft sealing arrangements (mechanical seal or gland packing) see pages 9 and 10.
- Maintenance friendly design. Bearings and shaft seal are maintainable without pump disassembly.

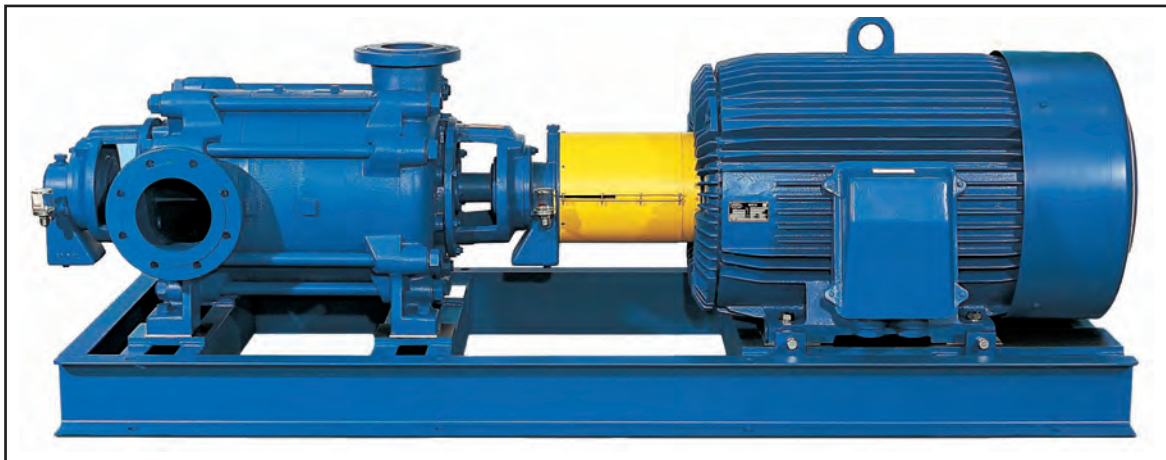


## VOGEL MULTISTAGE PUMPS

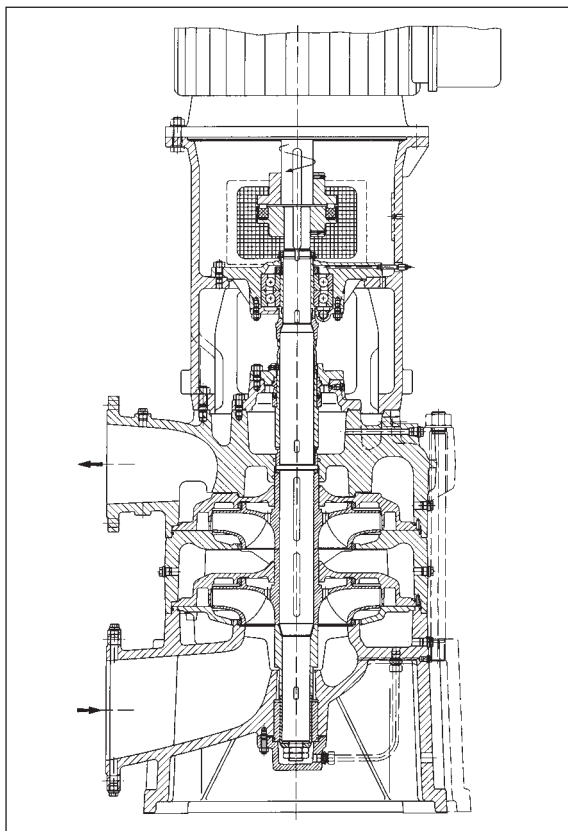
### Pumps sets:

#### Accessories availables

- baseframes
- couplings
- coupling guards
- motors
- minimum flow valves
- speed control
- special accessories to meet customer requirements



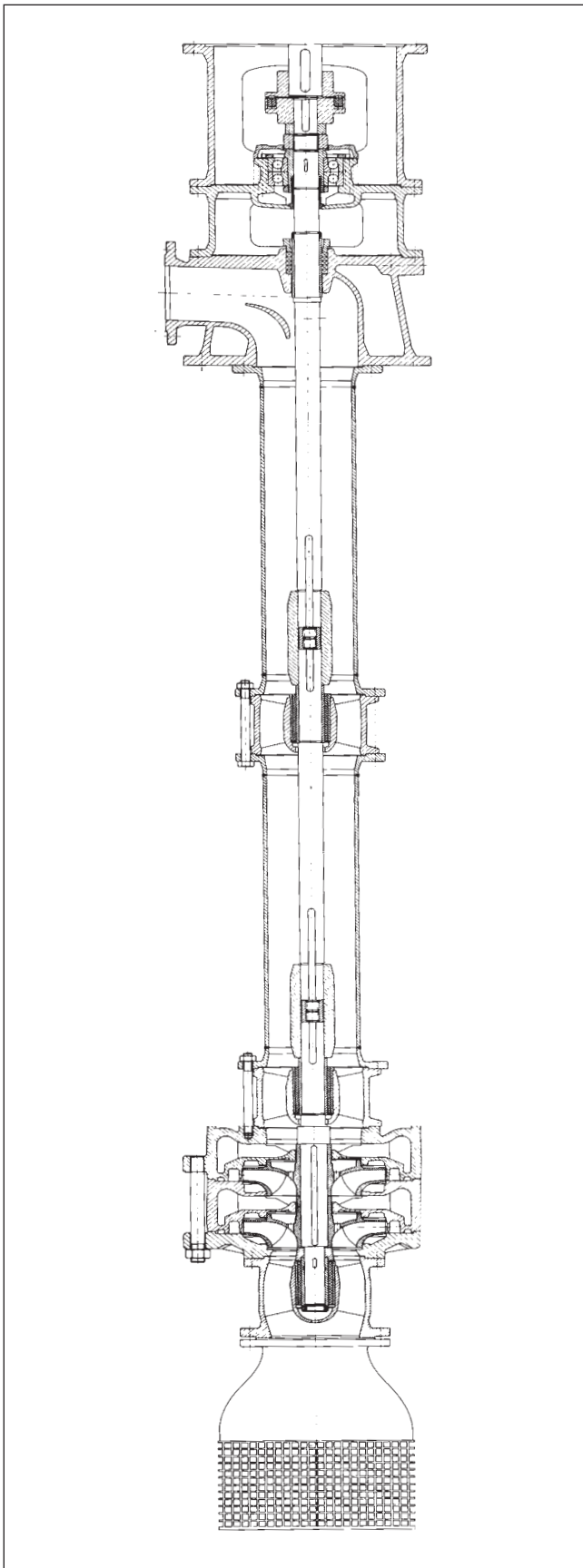
Sizes 84 up to 204 P are available in a space saving vertical design.



### Type PVa:

- Vertical configuration with a separate thrust bearing. Grease lubricated with grease nipples.
- Standard motor according to IEC, design V1, up to 315 kW
- Flexible coupling between pump and motor
- Medium lubricated sleeve bearing in suction casing
- Maintenance friendly design. Bearings and shaft seal are maintainable without pump disassembly.

## VOGEL MULTISTAGE PUMPS



### Type PT:

- Vertical wet pit design
- Installation length:  
1450/1750 r.p.m. - max. 10 m
- Separate grease lubricated thrust bearing with grease nipples
- Standard motors according to IEC, design V1
- Flexible coupling between pump and motor
- Drive and discharge branch always above liquid level
- Medium lubricated sleeve bearings in pump body and shaft section. Number of bearings depending on installation length
- Suitable for variable speed control
- Mechanical seal or gland packing available
- Maintenance friendly design
- Suction bells, suction strainers or foot valves available
- Can design available when pumping hot or volatile media
- Inducer design available for low NPSH applications when pumping volatile and warm liquids



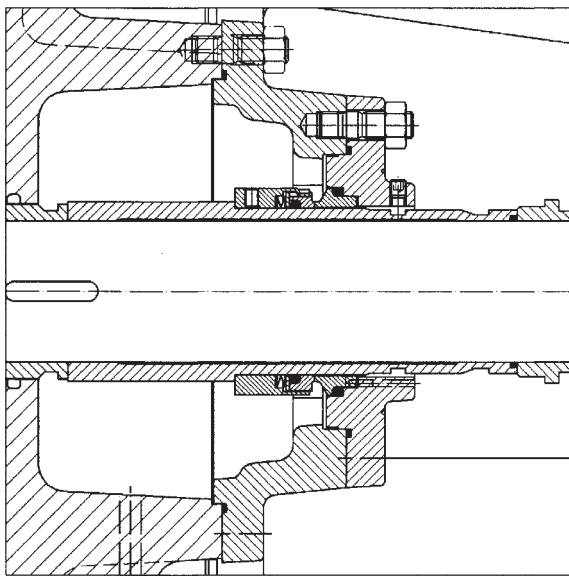
## VOGEL MULTISTAGE PUMPS

### Shaft seal options:

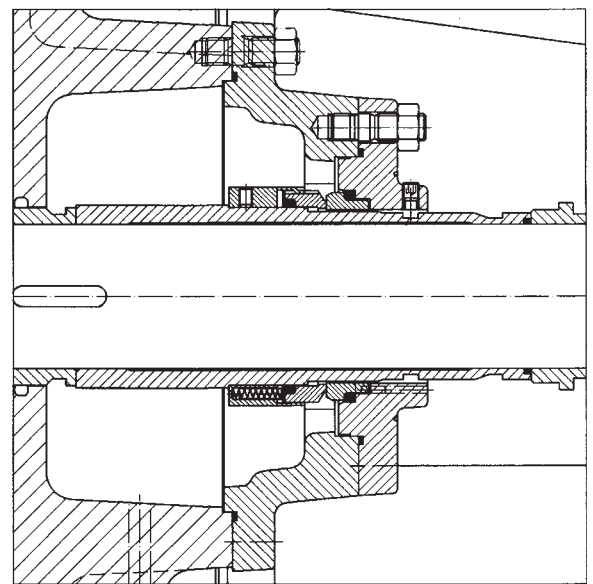
#### Mechanical seals:

Seal chamber dimensions with comply ISO 3096. Mechanical seals of all brands that comply with this standard and EN 12756, version „k“ can be used without modification of the standard parts.

An internal flush system guarantees optimum lubrication and cooling of the seal faces.



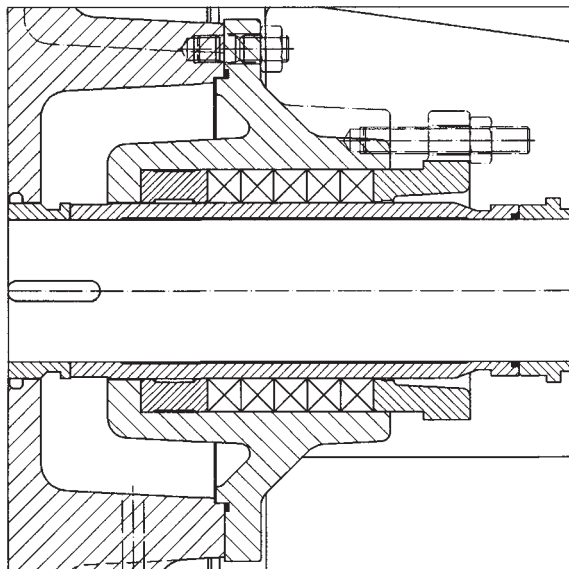
Single mech. seal, Design U  
unbalanced up to max. 16 bar



Single mech. seal, Design B  
balanced up to max. 45 bar

For more detailed information about operation limits with regard to material configuration and operation conditions please refer to data sheets or actual quotations.

#### Gland packing:



The availability of gland packings is limited to max. operation pressure of 25 bar.

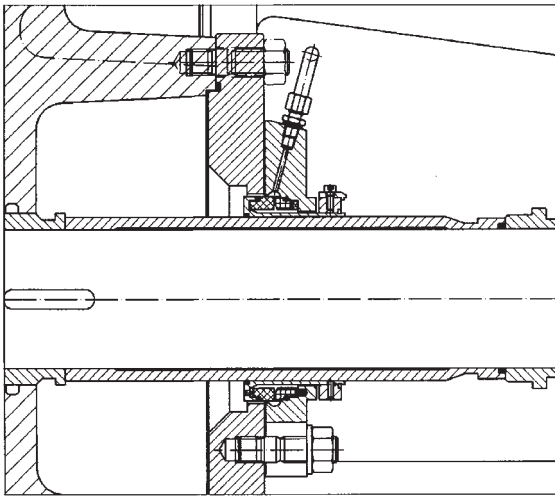
Above 25 bar operation pressure only mech. are available.

## VOGEL MULTISTAGE PUMPS

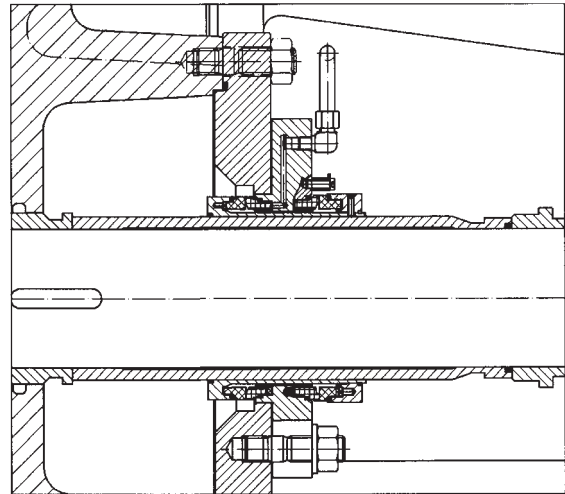
### Shaft seal options:

#### Cartridge mechanical seal

Cartridge seals are pre-assembled units that guarantee trouble free mounting as well as reliability. Cartridge seals also minimize the maintenance cost arising while changing the seal.



Single mechanical seal cartridge,  
also available with Quench.

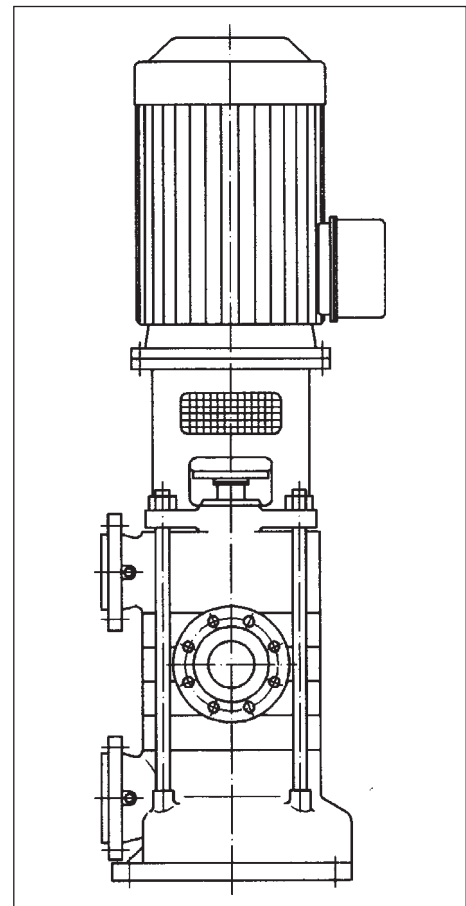
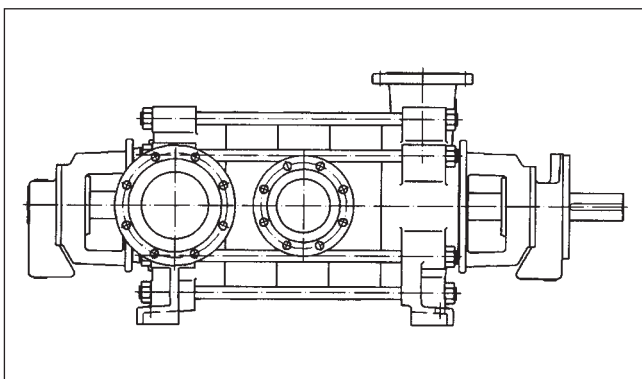


Double mechanical seal cartridge with  
connection for external flush.

### Pumps with more than one discharge - Multioutlet design:

Multistage pumps in Multioutlet design can be fitted with a random number of discharge branches. The pumps are mostly used in fire fighting application to serve different pressure zones with different pressure levels.

Multioutlet configurations are not only available in horizontal execution for design PM (PMA), but also in vertical execution for design PVAM.





## VOGEL MULTISTAGE PUMPS

### Materials:

Material Code	Impeller	Diffuser	Stage castings	Suction casing	Discharge casing	Casing wear rings	Shaft	Shaft sleeves
<b>Standard materials</b>								
N	0.6025	0.6025	0.6025	0.6025	0.6025	1)	1.4021	1.4021
SN	CC480K	0.6025	0.6025	0.6025	0.6025	1)	1.4021	1.4021
VN	1.4408	0.6025	0.6025	0.6025	0.6025	1)	1.4021	1.4021
VV	1.4408	1.4408	1.4408	1.4408	1.4408	1.4462	1.4462	1.4462
<b>Material options</b>								
NL	0.6025	0.6025	0.7040	0.7040	0.7040	1)	1.4021	1.4021
VL	1.4408	0.6025	0.7040	0.7040	0.7040	1)	1.4021	1.4021
NF	0.6025	0.6025	1.0619	1.0619	1.0619	1)	1.4021	1.4021
VF	1.4408	0.6025	1.0619	1.0619	1.0619	1)	1.4021	1.4021

1) Optional casing wear rings made of 1.4462 possible

### Elastics (O-rings) EPDM for hot water up to 140°C, optional VITON

(Pay attention to operation limits and chemical resistance)

Temperature and pressure operating limits depending on the material version, please refer to techn. data sheets.

### Materials - Comparison of various standards

DIN 17007	DIN 17006	ISO	BSI (UK)	AISI	ASTM
0.6025	EN-GJL-250 (GG 25)	185/Gr. 250	1452 Gr. 220		A 278 Class 30
0.7040	EN-GJS-400-15 (GGG 40)	1083/400-12			A 536 Gr. 60-40-18
1.0619	GP 240 GH (GS-C 25)		1504 161 Gr. 480		A 216 Gr. WCB
CC480K	G-CuSn10				B 584 C 90700
1.4021	X20Cr13	683-13-4	970 420 S 37	420	A 276 Type 420
1.4408	G-X6CrNiMo 18-10		3100-316 C 16	CF8M	A 743 CF8M
1.4462	X2CrNiMoN22-5-3		1503 318 S13		A 276 S31803

### Mechanical materials:

#### Standard materials

DIN Code	Mech. seal	Stationary ring	Elastics	Metal parts
BQ 1 EGG	Kohle 1)	SIC 2)	EPDM	1.4571
BQ 1 VGG	Kohle 1)	SIC 2)	Viton	1.4571
Q1 Q1 VGG	SIC 2)	SIC 2)	Viton	1.4571

1) Carbon resin impregnated

2) Pure silicon carbide (without free silicone)

Application limits regarding pressure, temperature and speed as well as chemical resistance refer to data sheets or actual quotations.

Optional materials upon request.

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### Liability of manufacturer and/or supplier

The mentioned limits of operation and/or application are only a general information and may not be applied for every case. The permitted range of operation and/or application for the specific case is to be obtained from our acknowledgement of order and/or the instructions for installation, operation and maintenance, sent with the goods.

**Liste 2300.1.B**  
6/2010-e



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