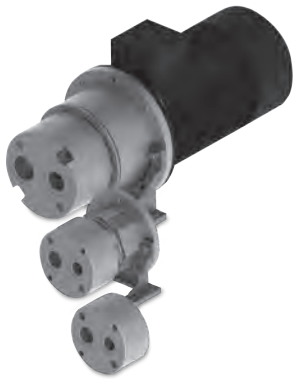
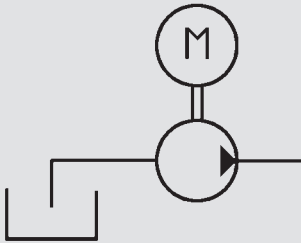


# HYDAC INTERNATIONAL



## Symbol



## General

The feed pumps from the VP series are low-noise, single-stroke vane pumps with constant flow rate.

Using a damped bell housing (PT) enables noise levels to be reduced.

## Product Features

- Pump with bell housing and coupling
- Optional with flange-mounted motor
- Low-noise version

## Application Field

- Filter circuits
- Cooling circuits
- Lubrication technology
- Pump transfer units

## Feed Pumps VP/VPB/VPBM

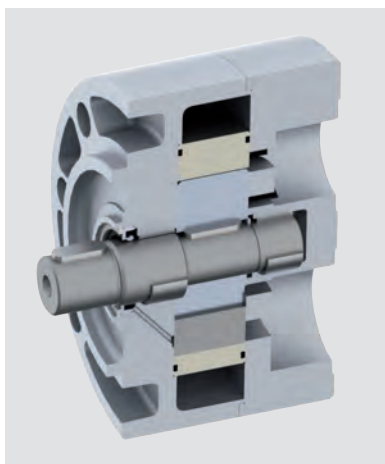
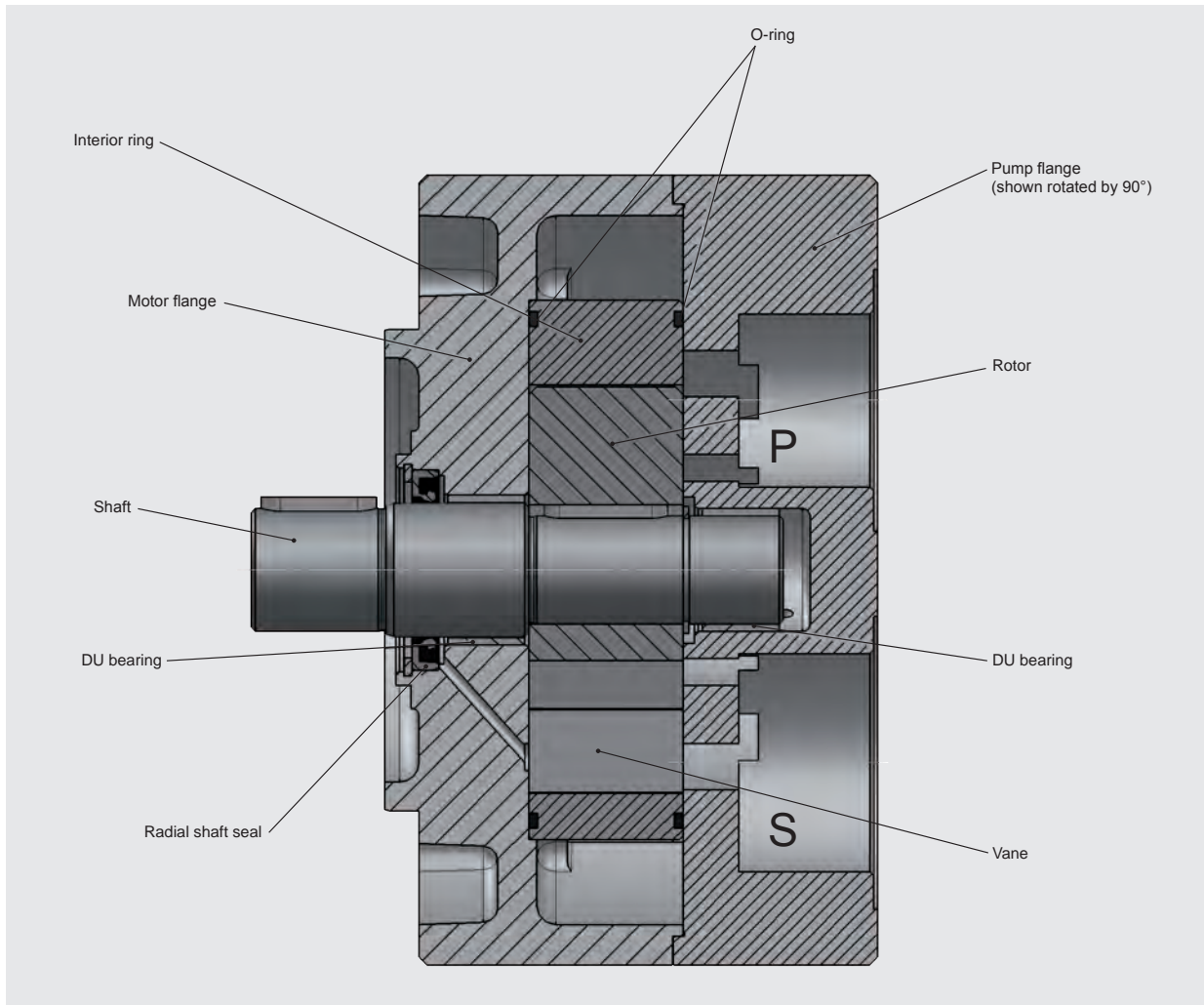
## Operation Data

Operating pressure	max. 16 bar				
Pressure at the suction port	max. -0.4 bar for mineral oil				
Medium	Mineral oil to DIN 51524 Part 1 and Part 2				
Permissible contamination	≤ NAS 12				
Temperature of medium	-20 °C to +80 °C for mineral oil				
Viscosity	See characteristic curves				
Ambient temperature	-20 °C to +40 °C				
Mounting position	Ideally horizontal				
RPM	<ul style="list-style-type: none"> <li>● min. 1,000 rpm</li> <li>● max. 2,000 rpm</li> </ul> Direction of rotation – right-turning (view of motor fan)				
Drive (only VPBM)	Drive type: electric motor Current type: three-phase current Power and voltage: see model code Protection type: IP 55 Insulation class: F				
Volumetric efficiency	>90% (at $v = 40 \text{ mm}^2/\text{s}$ )				
Weights					
	VP-2			5.0 kg	
	VP-3			13.0 kg	
	VPB-2			8.5 kg	
	VPB-3	2.20 - 4.0 kW		18.0 kg	
	VPB-3	5.50 - 7.5 kW		19.5 kg	
	VPBM-2	0.75 kW		18.0 kg	
	VPBM-2	1.50 kW		24.0 kg	
	VPBM-3	2.20 kW		39.0 kg	
	VPBM-3	4.00 kW		49.0 kg	
	VPBM-3	5.50 kW		60.0 kg	
	VPBM-3	7.50 kW		79.0 kg	
Noise levels in dB(A)		ccm/rev	1 bar	6 bar	10 bar
	Size 2	20	57	60	63
		30	60	61	64
		40	61	62	64
	Size 3	70	62	64	67
		100	66	67	69
		130	68	69	70

Test fluid: ISO VG46 at +40 °C (40 mm<sup>2</sup>/s)  
 Measurements with damped pump mount  
 The noise level values serve as guidelines,  
 as room acoustics, connections, viscosity and reflection  
 affect the level of noise.

The low-noise pumps from the VP series can be combined with various hydraulic pumps. For specific details, contact the specialist department.

## Design



### Note regarding tubing pressure differences (flow loss)

$$\Delta p \text{ [bar]} = 5.84 \cdot \frac{l \text{ [m]}}{d^4 \text{ [mm]}} \cdot Q \text{ [l/min]} \cdot \gamma \text{ [mm}^2/\text{s]}$$

- Influence of the interior diameter on flow losses with the following example values:  
 $l = 1 \text{ m}$ ,  $Q = 150 \text{ l/min}$ ,  $\gamma = 200 \text{ mm}^2/\text{s}$

	Internal diameter [mm]		
	$d_i$ (38)	$d_i$ (32)	$d_i$ (25)
$\Delta p$ [bar]	0.084	0.167	0.45

- Observations apply only for straight pipes
- Additional threaded joints and pipe bends increase flow loss.

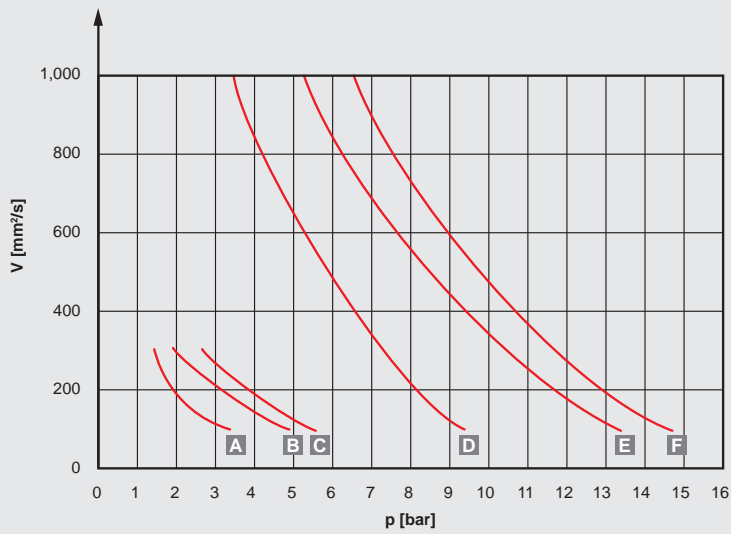
### Note:

- As few threaded connections as possible
- Few pipe bends – where bends are used, with large bending radius
- Difference in height between pump and oil level as small as possible
- Hoses must be suitable for a vacuum of min. 5,000 mmW (e.g. by means of steel wire insert)
- Do not reduce the pipe cross-section determined by the threaded connection.



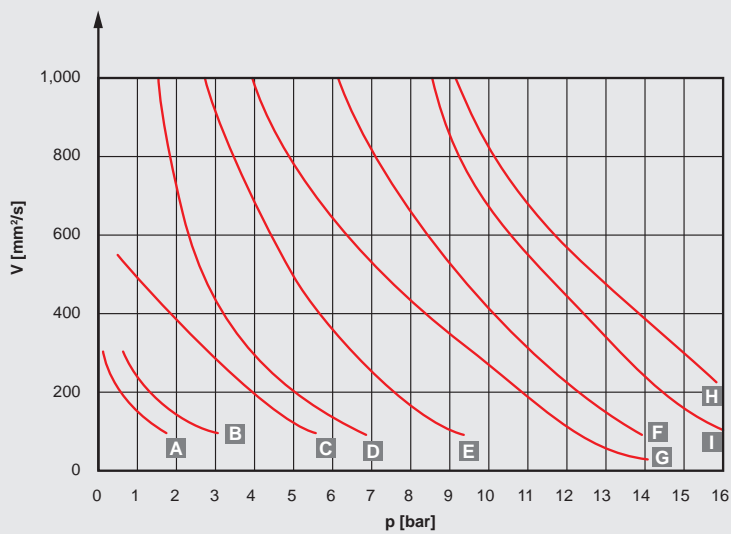
## Control Curves

VP-2



- A 40 cm<sup>3</sup> / rev - 0.75 kW
- B 30 cm<sup>3</sup> / rev - 0.75 kW
- C 20 cm<sup>3</sup> / rev - 0.75 kW
- D 40 cm<sup>3</sup> / rev - 1.50 kW
- E 30 cm<sup>3</sup> / rev - 1.50 kW
- F 20 cm<sup>3</sup> / rev - 1.50 kW

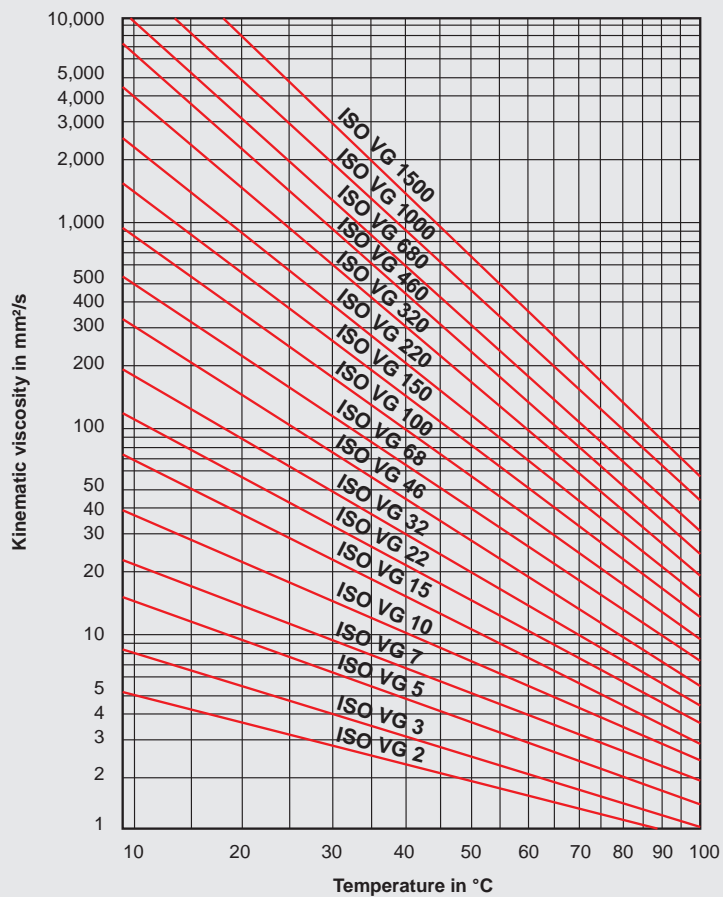
VP-3



- A 130 cm<sup>3</sup> / rev - 2.2 kW
- B 130 cm<sup>3</sup> / rev - 2.2 kW
- C 70 cm<sup>3</sup> / rev - 2.2 kW
- D 130 cm<sup>3</sup> / rev - 4.0 kW
- E 100 cm<sup>3</sup> / rev - 4.0 kW
- F 70 cm<sup>3</sup> / rev - 4.0 kW
- G 130 cm<sup>3</sup> / rev - 5.5 kW
- H 130 cm<sup>3</sup> / rev - 7.5 kW
- I 100 cm<sup>3</sup> / rev - 5.5 kW



Viscosity-temperature graph  
to DIN 51519 viscosity index 50



### Design

Pump (VP, VPB or VPBM) selected in accordance with customer specifications.

#### Example:

Flow rate: 190 l/min  
Counter-pressure: 5 bar  
Viscosity: 200 cSt  
Motor voltage: 400 V – 50 Hz

#### Selection:

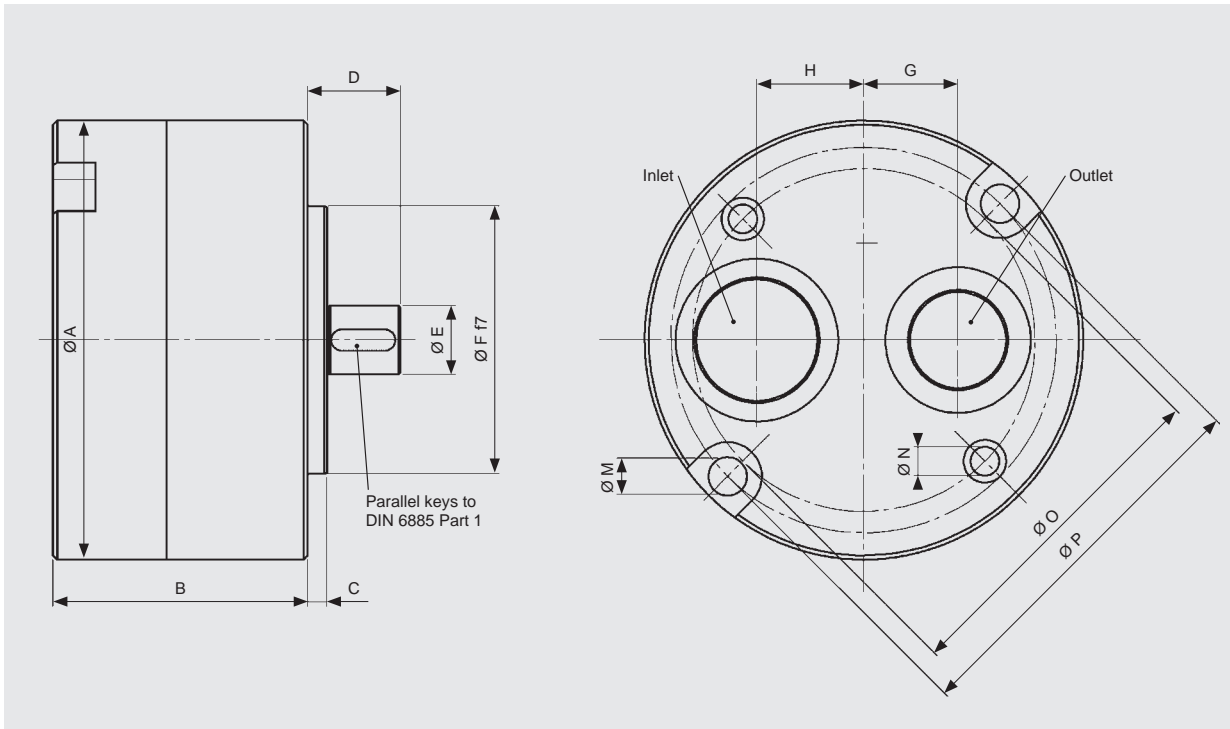
190 l/min → VP-3 / VPBM-3 (approx. 130 ccm/rev at 1,500 rpm)  
5 bar and 200 cSt → drive power 4 kW (= motor size 112)

#### Result:

VP-3/1.0/P/-/130  
VPBM-3/1.0/P/112/130/4/400-50

## Dimensions

VP



Assembly	Flow rate l/min 1,500 rpm	A	B	C	D	E	F	G	H	M	N	O	P
VP-2	30 – 60	160	79.5	7	44	22	100	30	35	13.5	11.0	125	140
VP-3	100 – 200	205	119.0	7	44	32	125	44	50	17.0	13.5	160	180

### Ports

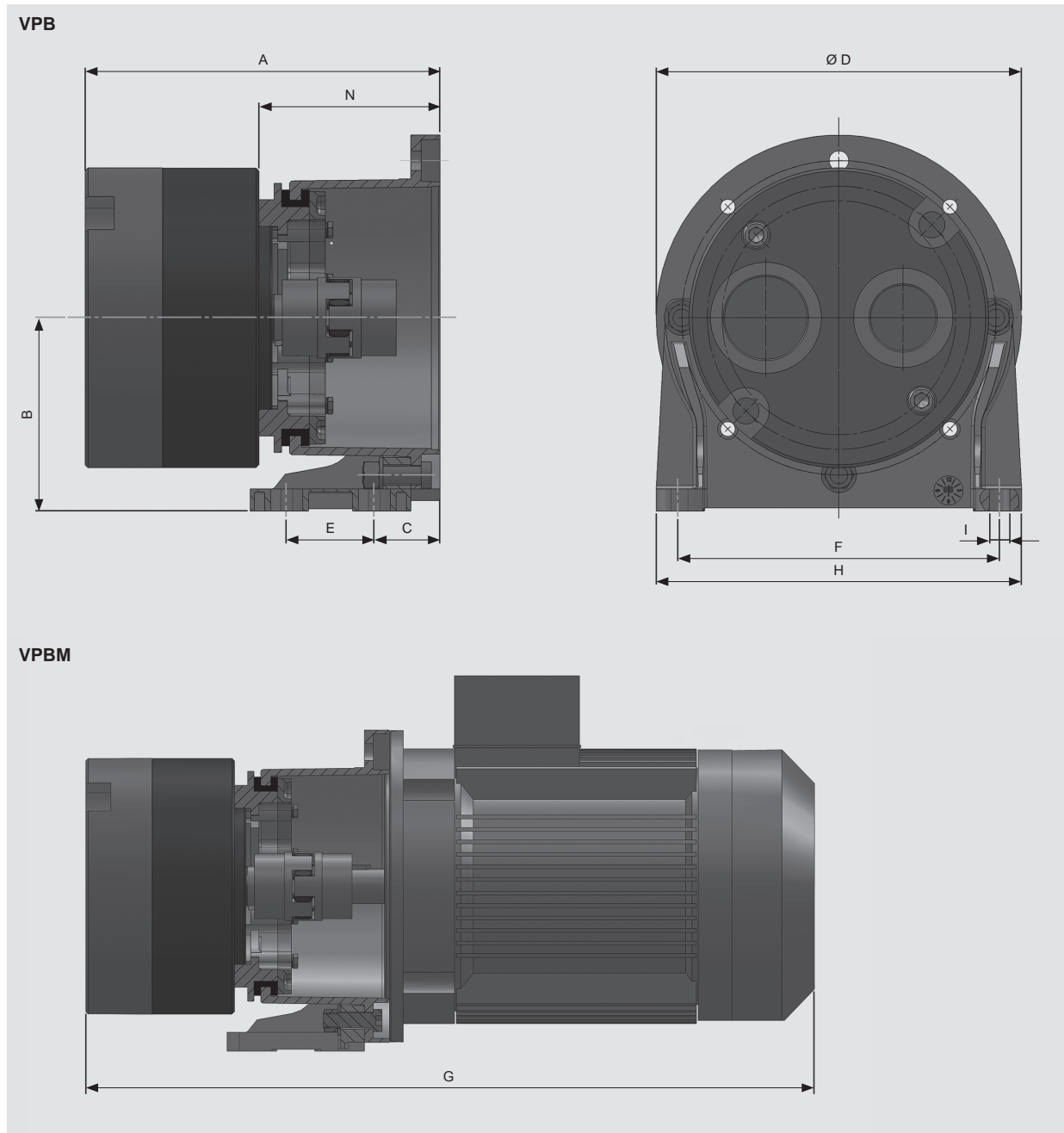
#### VP-2

Inlet: G 1¼"  
 Outlet: G 1"

#### VP-3

Inlet: G 2"  
 Outlet: G 1½"

## Dimensions



Size	Motor size		A	B	C	D	E	F	G	H	I	N
2	80	0.75 kW	192.5	112	19	200	60	180	480	210	11	113
	90	1.50 kW	192.5	112	19	200	60	180	485	210	11	113
3	100	2.20 kW	243.0	132	40	250	60	220	560	250	14	124
	112	4.00 kW	243.0	132	40	250	60	220	580	250	14	124
	132	5.50 kW	263.0	160	39	300	80	260	680	290	14	144
	132	7.50 kW	263.0	160	39	300	80	260	680	290	14	144

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### Model Type

VPBM-2 - 1.0 - P - 90/40 - 1.5/400-50

#### Pump

VP = pump  
VPB = pump + PT + coupling  
VPBM = pump + PT + coupling + motor  
(PT = bell housing)

#### Assembly

2  
3

#### Modification number

#### Seals

P = Perbunan  
V = Viton  
(other seals on request)

#### Motor size and flow rate

Assembly	Motor size	Motor rating	Flow rate in ccm/revolutions (other rates on request)					
			20	30	40	70	100	130
2	80	0.75 kW	•	•	•			
	90	1.50 kW	•	•	•			
3	100	2.20 kW				•	•	•
	112	4.00 kW				•	•	•
	132	5.50 kW					•	•
	132	7.50 kW						•

(Caution: maximum pressure 16 bar)

#### Motor power and voltage

(only VPBM)  
n = 1,500 rpm

#### Motor version:

B5

#### Size 2: motor power

0.75 kW  
1.50 kW

#### Size 3: motor power

2.2 kW  
4.0 kW  
5.5 kW  
7.5 kW

#### Standard voltages and frequencies for three-phase motors

Motor power 0.75 kW – 4 kW  
400 V star / 230 V delta – 50 Hz

Motor power 5.5 kW – 7.5 kW  
690 V star / 400 V delta – 50 Hz

Other voltages and frequencies on request.

**Design Data Sheet, Feed Pumps**

Project: \_\_\_\_\_  
Contact: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
E-mail: \_\_\_\_\_

Medium: \_\_\_\_\_ (Enclose data sheet for the medium)

Fluid temperature: \_\_\_\_\_ °C

Fluid purity: \_\_\_\_\_

Spec. materials prescribed? \_\_\_\_\_

Seal material:  Perbunan (NBR)  Viton (FPM)

Other: \_\_\_\_\_

Flow rate: \_\_\_\_\_ l/min

Suction height: \_\_\_\_\_ m

Operating pressure: \_\_\_\_\_ bar

Max. pressure: \_\_\_\_\_ bar (pressure limitation valve)

**Electrical data**

Motor rating: \_\_\_\_\_ kW

Voltage: \_\_\_\_\_ V \_\_\_\_\_ Hz

Speed: \_\_\_\_\_ rpm

Direction of rotation: \_\_\_\_\_

Installation position of the pump: \_\_\_\_\_

Installation space limited? \_\_\_\_\_

Permitted noise level: \_\_\_\_\_ dB(A)

Ambient temperature: \_\_\_\_\_ °C

Unit qty. per year: \_\_\_\_\_

**Remarks/miscellaneous:**

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**Niehues**

Hydraulik · Automation

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# Niehues

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## Note

The information in this brochure relates to the operating conditions and applications described.

For applications and operating conditions not described, please contact the relevant technical department.

Subject to technical modifications and corrections.

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