

Voith Turbo

VOITH

Voith multiple flow pumps – Programme



Voith – Our company

Voith is a reliable partner to essential industries. We set standards worldwide for paper making technology, power transmission, power plant equipment and for industrial services. With annual sales of approx. € 3.3 billion, 24,000 employees and 180 locations worldwide Voith is one of the large family-owned companies in Europe.

We want to be
our customers' preferred supplier
and business partner



Quality, reliability and
soundness are key concepts
of our identity.

These are expressed in three words:
Voith – Engineered reliability.



Our markets are the markets of the future

The world's demand for paper,
energy, mobility, automation and
technical services will continue
to grow over the next few years.
Voith will participate in this coming
growth.

Pioneering innovations from Voith – to our customers' advantage

1873
1st Voith
Francis turbine

1903
Niagara (largest
turbines at the time)

1927
Voith-Schneider-
Propeller

1952
Voith water tractor,
Voith automatic
transmission (DIWA)

1869
1st Voith patent
(Refiner)

1881
1st Voith
paper machine

1922
Kaplan turbine

1929
Voith turbo
transmission

The engine of our strong growth: innovative power and reliability

Voith has operated in the black since its founding on January 1, 1867. The dynamic development and the growth over the last few years confirm that we have taken the right steps.

Voith engineers have again and again written new chapters in the history of technology. Today, Voith holds over 7000 active patents worldwide. Approximately 400 new ones are added every year.

Business relations – spanning generations



- For example, since
- 1897 Zanders, Germany (Paper)
 - 1904 Scheufelen, Germany (Paper)
 - 1905 Haindl, Germany (Paper)
 - 1909 Yunnan Power, China (Hydro)
 - 1914 EnBW, Germany (Hydro)
 - 1930 Bodensee-Schiffsbetriebe, Germany (Marine Technology)
 - 1950 Renault, France (Turbo)
 - 1955 MAN, Germany (Turbo)

We will continue to expand our worldwide dedication to our markets. The fundamentals of our dealings are the values and long-term strategies of Voith, one of Europe’s large family-owned companies.

1960
Hydrodynamic brake, flotation deinking process

1965
Turbo reversing transmission for shunting locomotives

1978
Itaipú (largest hydro power plant in the world)

1985
1st Voith Vorecon

1995
Fishfriendly turbine

2001
One Platform Concept for the paper production process

2002
Aquatarder

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Voith internal gear pumps setting standards



Applications:

The market requires hydraulic pumps to be compact and requires a further reduction of noise level and pressure pulsation at high efficiency.

Voith internal gear pumps have a large range of applications where low operation noise, high efficiency, compact dimensions and light weight are required.

Plastics engineering

Plastics injections moulding and blow moulding machines

Metal working machines

Press brakes, shears, punching machines

General press manufacturing

Materials handling

Crane construction, lifting platforms, electric fork lifts

Shipbuilding

Steering gear, stabilizers, deck cranes

Public service vehicles

Refuse-collecting vehicles, special vehicles

Power generation

Hydrostatic support and lifting of gas, steam, and water turbine runners and generators

1 Single pumps

1.1 Procedure for selection of single pumps



In order to be able to select an internal gear pump the following parameter are required:

- continuous pressure in the system
- maximum pressure in the system
- capacity per revolution or absolute flow-rate at the given speed.

The following data sheets are available:

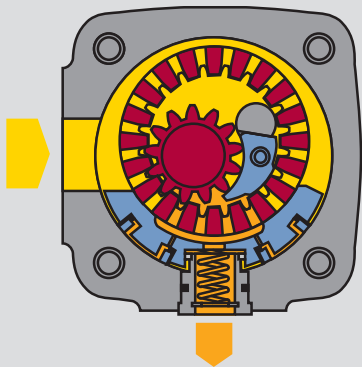
- | | |
|----------------------------------|---|
| ■ data sheets for IPH 4 to IPH 6 | leaflet G 1209 internal gear pump |
| ■ data sheets for IPC 4 to IPC 7 | leaflet G 1209 internal gear pump |
| ■ data sheets for IPV 3 to IPV 7 | leaflet G 1485 high pressure internal gear pump model IPV |
| ■ data sheets for IPN 4 to IPN 6 | leaflet G 1418 low pressure internal gear pump IPN with the Voith Superlip System |

The model code for the single pumps can be found on the following pages.

It is made up of the pump model, size, capacity and a 3 digit design number.

Order description and model Code

1.2 Model IPH



IPH 4 - 20 1 0 1 Example of order description

Shaft end
0 Toothed shaft ANSI B92.1a
1 Feather key

Fastening flange
0 SAE 2-hole
1 SAE 4-hole

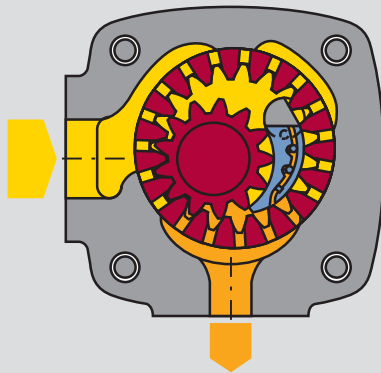
Direction of rotation and suction
1 Clockwise rotation
Radial suction mounting
6 Anti-clockwise rotation
Radial suction mounting
4 Special design pumps,
clockwise rotation
9 Special design pumps,
anti-clockwise rotation

Capacity [m³/rev.]
20 40 80
25 50 100
32 64 125

Size
4 5 6

Internal gear pump model **IPH**

1.3 Model IPV



IPV 3 - 3,5 1 0 0 Example of order description

Shaft end
0 Toothed shaft ANSI B92.1a
1 Feather key

Fastening flange
0 SAE 2-hole
1 SAE 4-hole
4 VDMA 2-hole, DIN/ISO 3019/2
5 VDMA 4-hole, DIN/ISO 3019/2
7 SAE 2-hole
(except for IPV 4 with differing
centering diameter)

Direction of rotation and suction
1 Clockwise rotation
Radial suction mounting
6 Anti-clockwise rotation
Radial suction mounting
4 Special design pumps,
clockwise rotation
9 Special design pumps,
anti-clockwise rotation

Capacity [m³/rev.]
3.5 13 32 64 125
5 16 40 80 160
6.3 20 50 100 200
8 25 64 125 250
10 32

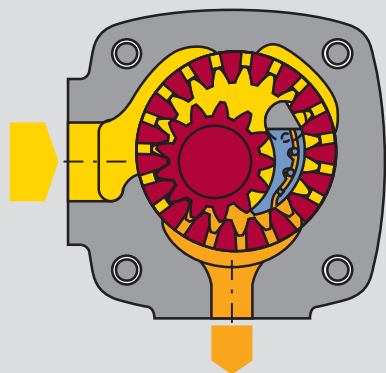
Size
3 4 5 6 7

Internal gear pump model **IPV**

For identification data and identification size
model IPH see individual catalogue G 1209.

For identification data and identification size
model IPV see individual catalogue G 1485.

1.4 Model IPC



IPC 5 - 40 1 7 0 Example of order description

Shaft end
0 **Toothed shaft ANSI B92.1a**
1 Feather key

Fastening flange
0 SAE 2-hole
1 SAE 4-hole
5 VDMA 4-hole, DIN/ISO ...
7 **SAE 2-hole**
(except for IPC 4 with differing centering diameter)

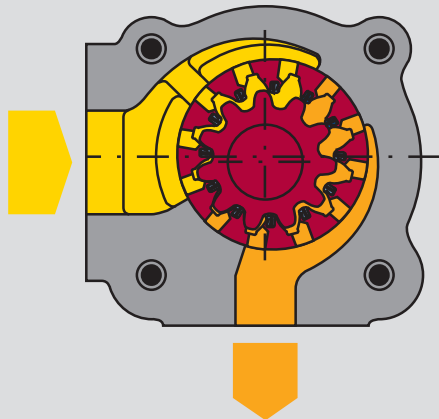
Direction of rotation and suction
1 **Clockwise rotation**
Radial suction mounting
6 Anti-clockwise rotation
Radial suction mounting
4 Special design pumps,
clockwise rotation
9 Special design pumps,
anti-clockwise rotation

Capacity [m³/rev.]
20 **40** 80 160
25 50 100 200
32 64 125 250

Size
4 **5** 6 7

Internal gear pump model **IPC**

1.5 Model IPN



IPN 4 - 32 1 4 1 Example of order description

Shaft end
0 Toothed shaft ANSI B92.1a
1 **Feather key**

Fastening flange
0 SAE 2-hole
4 **VDMA 2-hole, DIN/ISO ...**

Direction of rotation and suction
1 **Clockwise rotation**
Radial suction mounting
6 Anti-clockwise rotation
Radial suction mounting
4 Special design pumps,
clockwise rotation
9 Special design pumps,
anti-clockwise rotation

Capacity [m³/rev.]
32 64 125
40 80 160
50 100 200

Size
4 5 6

Internal gear pump model **IPN**

For identification data and identification size
model IPC see individual catalogue G 1209.

For identification data and identification size
model IPN see individual catalogue G 1418.

2. Multiple flow pumps

2.1 Procedure for determining multiple-flow pumps

Please unfold page 29 to enter your order details.

1 Fill in the selected pump stages on the order details form;
Assistance can be taken from the single pump catalogues

2 Check the torque with the assistance of the selecting criteria point 2.5

3 Select the intermediate housing, see selecting criteria point 2.6

4 Fill in the direction of rotation and suction points and order code

5 Selection of the fastening flange with order code (see single pump catalogue)

6 Selection of the end of the drive shaft

7 **Points 1-6 form the complete order description**

10/11 Connecting dimensions of two and three pump combinations see point 2.9 page 22

8/9 Selection of the suction or pressure flanges see single pump and/or intermediate housing

1 Selection of the pump stages
Establishing the pump sequence and practicability *Page 6-7, 12-13*

2 Checking the torque for reliability *Page 14-15*

3 Establishing the intermediate housing and the resulting suction *Page 16-19*

4 Determining the direction of rotation *Page 6-7, 10*

5 Determining the fastening flange corresponding to primary pump *Page 6-7, 10*

6 Determining the end of the drive shaft corresponding to the primary pump *Page 6-7, 10*

7 Order description for the multiple-flow pump combination *Page 11-13*

8 Suction and/or pressure flange required
no Yes

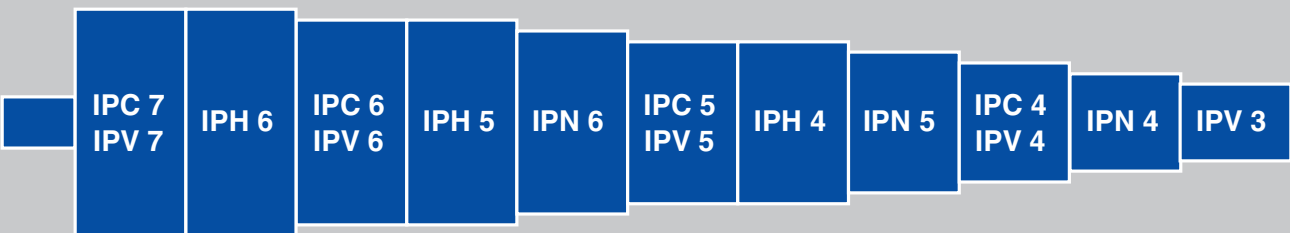
9 Selection of suction and pressure flange *Page 20-21*

10 Connection dimension required
no Yes

11 Determining the connection dimension *Page 22-23*

12 **Multiple flow pump combination selected**

2.2 Determining pump sequence for multiple-flow pump combinations



Combining IP pumps

IP pumps of the same or of different sizes can be combined to multiple-flow pumps. All sizes listed as single pumps with the respective capacities are available as two and three pump combinations ordered in ascending order according to size and flow-rate.

It is important to observe the sequence of pumps shown above according to model and size. It is possible to skip over sizes.

With the same models (V,C.N) and the same sizes (3,4,5,6,7) the pump with the bigger flow-rate is placed next to the drive.

Possible pump combination can be find out on table on page 12-13.

Mounting and assembly

As a rule the multiple-flow pumps are fastened to the drive by means of fastening flanges. It is possible to select between different fastening flanges, see individual catalogues. The same applies to the shaft ends. The intermediate housings required can be found on pages 16-19.

In addition to pump combinations of two or three pumps it is possible to combine four pumps, but this requires agreement from the manufacturers.

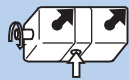
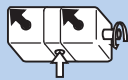
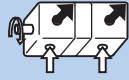
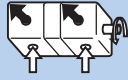
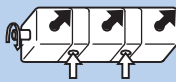
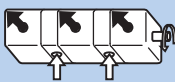
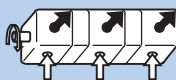
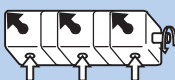
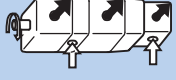
Suction connections for multiple-flow pumps

With combinations of IPV and/or IPC pumps it is partly possible to select between suction connection at the intermediate housing and/or at the pump stages.

With IPN pumps the suction connection is always at the single pump.

See individual catalogue for determination of the 3-digit design number
for direction of rotation, suction, fastening flange, shaft end

(See individual catalogue G1485, G1209, G1418, or page 6, 7 and 11)

Designs										
Direction of rotation and suction					Fastening flange			Shaft end		
clockwise										
		2	7							
		1	6			0			1	0
		2	7			4			5	5
		1	6			7			See individual pump sheets for dimensions	
		3	8			See individual pump sheets for designs and dimensions				
		3	8							
Special design		4	9	Special design		1 = 4-hole SAE 5 = 4-hole VDMA 0 + 7 = 2-hole SAE 4 = 2-hole VDMA			See individual pump sheets for dimensions	

2.3 Order description of multiple-flow pumps

Two pump combination

Example of order description

IPV/N 7/5 - 200/80 111
pump 1 IPV 7-200 111
pump 2 IPN /5-/80

IPV/N 7/5 - 200/80 1 1 1

- Shaft end
1 Cylinder shaft end with feather key.
- Fastening flange
1 SAE 4-hole flange.
- Direction of rotation and suction
1 one suction connection per pump stage
Is determined according to required intermediate housing.
Clockwise rotation
- Flow rate of the individual pump stages see point 2.2 to 2.5 of the individual pumps.
200 80
- Size of the individual pump stages.
7 5
- Two internal gear pump combination consisting of **model IPV, IPN.**

Exception:
If all pump stages are the same pump model use the model in the order description only once.
Example: IPV 5/3-50/10 111
pump 1 IPV 5-50 111
pump 2 IPV /3-/10

Three pump combination

Example of order description

IPV/N/V 7/5/3 - 200/80/10 111
pump 1 IPV 7-200 111
pump 2 IPN /5-/80
pump 3 IPV /3-/10

IPV/N/V 7/5/3 200/80/10 1 1 1

- Shaft end
1 Cylinder shaft end with feather key.
- Fastening flange
1 SAE 4-hole flange.
- Direction of rotation and suction
1 one suction connection per pump stage
Is determined according to required intermediate housing.
Clockwise rotation
- Flow rate of the individual pump stages see point 2.2 to 2.5 of the individual pumps.
200 80
- Size of the individual pump stages.
7 5
- Two internal gear pump combination consisting of **model IPV, IPN.**

Exception:
If all pump stages are the same pump model use the model in the order description only once.
Example: IPV 5/4/3-64/25/8 211
pump 1 IPV 5-64 111
pump 2 IPV /4-/25
pump 3 IPV /3-/8

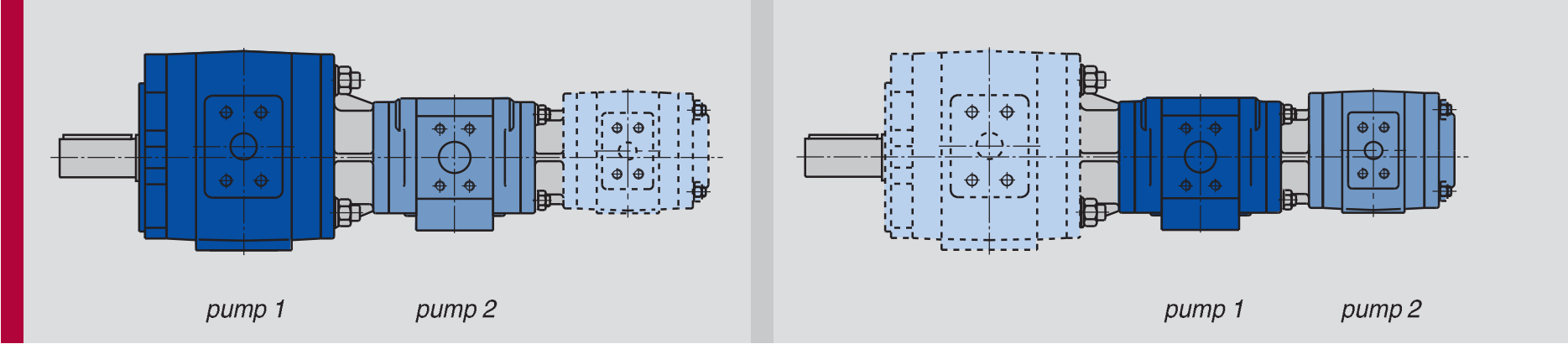
2.4 Possible pump combinations of two or more pumps

● Example of selection IPV/N/V 7/5/3-200/80/10 111.

Possible pump combinations.

Pump sequence in any order (as chosen) with the same model size sequence of the flow-rates in any order (as chosen).

		capacity [m³/rev.]	3,5-5-6,3-8-10	13-16-20-25-32	32-40-50-64	64-80-100-125	125-160-200-250	20-25-32	40-50-64
		pump 2	IPV /3	IPV /4	IPV /5	IPV /6	IPV /7	IPC /4	IPC /5
pump 1	capacity [m³/rev.]								
IPV 3	3,5-5-6,3-8-10	IPV 3/3-...							
IPV /3		IPV /3/3-...							
IPV 4	13-16-20-25-32	IPV 4/3-...	IPV 4/4-...					IPV/C 4/4-...	
IPV /4		IPV /4/3-...	IPV /4/4-...					IPV/C /4/4-...	
IPV 5	32-40-50-64	IPV 5/3-...	IPV 5/4-...	IPV 5/5-...				IPV/C 5/4-...	IPV/C 5/5-...
IPV /5		IPV /5/3-...	IPV /5/4-...	IPV /5/5-...				IPV/C /5/4-...	IPV/C /5/5-...
IPV 6	64-80-100-125	IPV 6/3-...	IPV 6/4-...	IPV 6/5-...	IPV 6/6-...			IPV/C 6/4-...	IPV/C 6/5-...
IPV /6		IPV /6/3-...	IPV /6/4-...	IPV /6/5-...	IPV /6/6-...			IPV/C /6/4-...	IPV/C /6/5-...
IPV 7	125-160-200-250	IPV 7/3	IPV 7/4-...	IPV 7/5-...	IPV 7/6-...	IPV 7/7-...		IPV/C 7/4-...	IPV/C 7/5-...
IPV /7		IPV /7/3-...	IPV /7/4-...	IPV /7/5-...	IPV /7/6-...	IPV /7/7-...		IPV/C /7/4-...	IPV/C /7/5-...
IPC 4	20-25-32	IPC/V 4/3-...	IPC/V 4/4-...					IPC 4/4-...	
IPC /4		IPC/V /4/3-...	IPC/V /4/4-...					IPC /4/4-...	
IPC 5	40-50-64	IPC/V 5/3-...	IPC/V 5/4-...	IPC/V 5/5-...				IPC 5/4-...	IPC 5/5-...
IPC /5		IPC/V /5/3-...	IPC/V /5/4-...	IPC/V /5/5-...				IPC /5/4-...	IPC /5/5-...
IPC 6	80-100-125	IPC/V 6/3-...	IPC/V 6/4-...	IPC/V 6/5-...	IPC/V 6/6-...			IPC 6/4-...	IPC 6/5-...
IPC /6		IPC/V /6/3-...	IPC/V /6/4-...	IPC/V /6/5-...	IPC/V /6/6-...			IPC /6/4-...	IPC /6/5-...
IPC 7	160-200-250	IPC/V 7/3-...	IPC/V 7/4-...	IPC/V 7/5-...	IPC/V 7/6-...	IPC/V 7/7-...		IPC 7/4-...	IPC 7/5-...
IPC /7		IPC/V /7/3-...	IPC/V /7/4-...	IPC/V /7/5-...	IPC/V /7/6-...	IPC/V /7/7-...		IPC /7/4-...	IPC /7/5-...
IPH 4	20-25-32	IPH/V 4/3-...	IPH/V 4/4-...					IPH/C 4/4-...	
IPH /4		IPH/V /4/3-...	IPH/V /4/4-...					IPH/C /4/4-...	
IPH 5	40-50-64	IPH/V 5/3-...	IPH/V 5/4-...					IPH/C 5/4-...	IPH/C 5/5-...
IPH /5		IPH/V /5/3-...	IPH/V /5/4-...					IPH/C /5/4-...	IPH/C /5/5-...
IPH 6	80-100-125	IPH/V 6/3-...	IPH/V 6/4-...					IPH/C 6/4-...	IPH/C 6/5-...
IPH /6		IPH/V /6/3-...	IPH/V /6/4-...					IPH/C /6/4-...	IPH/C /6/5-...
IPN 4	32-40-50	IPN/V 4/3-...							
IPN /4		IPN/V /4/3-...							
IPN 5	64-80-100	IPN/V 5/3-...	IPN 5/4-...					IPN/C 5/4-...	
IPN /5		IPN/V /5/3-...	IPN /5/4-...					IPN/C /5/4-...	
IPN 6	125-160-200	IPN/V 6/3-...	IPN/V 6/4-...	IPN/V 6/5-...				IPN/C 6/4-...	IPN/C 6/5-...
IPN /6		IPN/V /6/3-...	IPN/V /6/4-...	IPN/V /6/5-...				IPN/C /6/4-...	IPN/C /6/5-...



dark blue: primary pump at double pumps
First secondary pump at triple pumps

light blue: First secondary pump at double pumps
Second secondary pump at triple pumps

2.5 Torque control

With pump combinations of three or more pumps the torque occurring between the pump stages can reach high values that are not permissible and, if left unheeded, will lead to damage to the pumps! The sum of the torques of the single pump stages may not exceed the permissible values!

The following procedure is to check and calculate the torque values.

2.5.1 Calculation of the torque of a hydraulic pump

$$M_d = \frac{V_{gth} \times \Delta p}{2\pi \times 10}$$

M_d = input torque in Nm

V_{gth} = capacity in m³/rev.

Δp = pressure in bar

2.5.2 Calculation of the total torque of a pump combination

$$M_{dges} = M_{dA} + M_{dB} + M_{dC}$$

M_{dA} = input torque A pump
(1st pump)

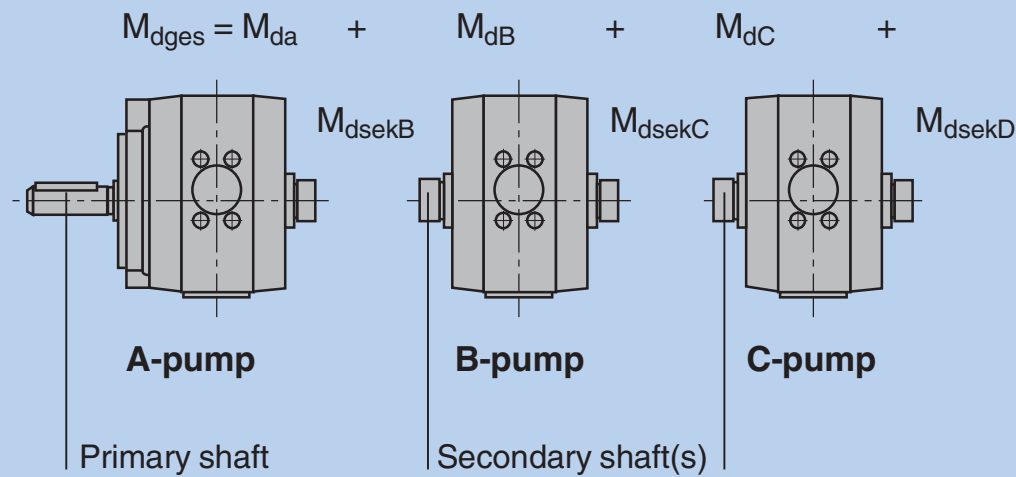
M_{dB} = input torque B pump
(2nd pump)

M_{dC} = input torque C pump
(3rd pump)

The maximum permissible torque at each secondary shaft can be taken from table 3.5.4.

The torque at the secondary shaft of the B pump is the critical torque: $M_{dsekB} = M_{dB} + M_{dC}$

2.5.3 Torque calculation at the secondary shaft (connecting sleeves)

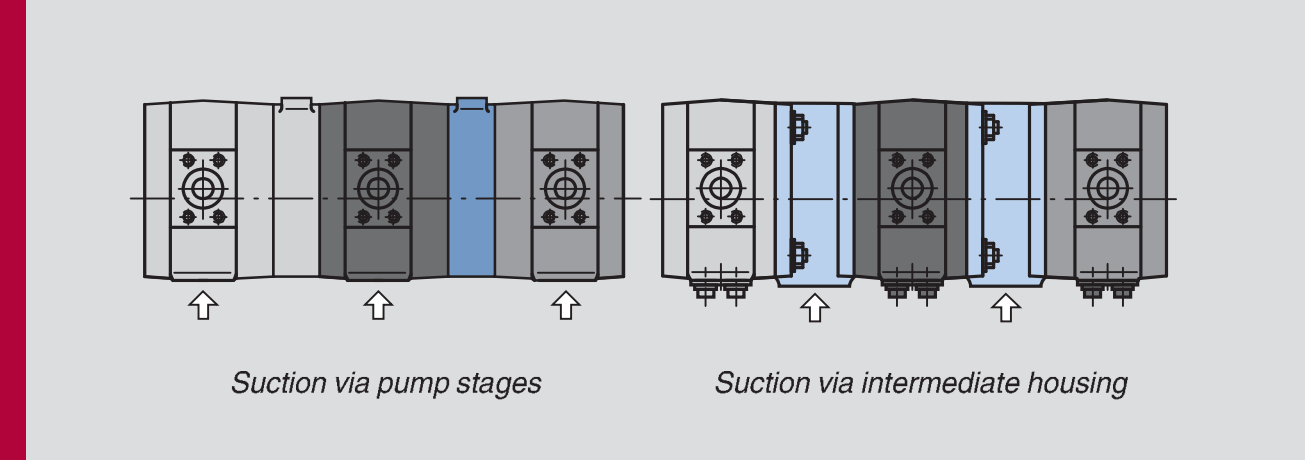


2.5.4 Permissible input torques for Voith internal gear pumps	Permissible input torque M_d in Nm		
	Type	Primary shaft	Secondary shaft
If the check shows that the permissible values are exceeded it is primary to check whether the pressures occur at the same time. If necessary please contact Voith.	IPH 4	450	300
	IPH 5	800	540
	IPH 6	1350	800
	IPV 3	160	80
	IPV 4	335	190
	IPV 5	605	400
	IPV 6	1050	780
	IPV 7	1960	1200
	IPC 4	335	190
	IPC 5	605	400
	IPC 6	1050	780
	IPC 7	1960	1200
	IPN 4	160	100
	IPN 5	295	200
	IPN 6	605	400

2.6 Determining the intermediate housing

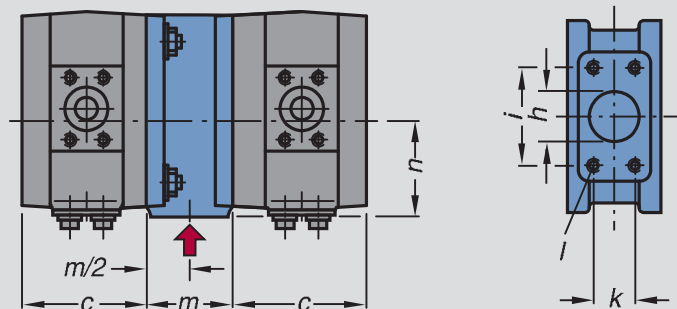
- Example of selection IPV/N/V 7/5/3-200/80/10 111.
- Suction only via pump stages.
- Suction only via intermediate housing.
- Suction only possible via intermediate housing or pump stages.

		capacity [m³/rev.]								
		3,5-5-6,3-8-10								
		13-16-20-25-32								
		32-40-50-64								
		64-80-100-125								
		125-160-200-250								
		20-25-32								
		40-50-64								
		pump 2	IPV /3	IPV /4	IPV /5	IPV /6	IPV /7	IPC /4	IPC /5	
pump 1	capacity [m³/rev.]									
IPV 3 IPV /3	3,5-5-6,3-8-10	101								
IPV 4 IPV /4	13-16-20-25-32	102	103					103		
IPV 5 IPV /5	32-40-50-64	104	105	106				105	106	
IPV 6 IPV /6	64-80-100-125	107	108	109	110	231		108	109	
IPV 7 IPV /7	125-160-200-250	111	112	113	114		115	232	112	113
IPC 4 IPC /4	20-25-32	102	103					103		
IPC 5 IPC /5	40-50-64	104	105	106				105	106	
IPC 6 IPC /6	80-100-125	107	108	109	110	231		108	109	
IPC 7 IPC /7	160-200-250	111	112	113	114		115	232	112	113
IPH 4 IPH /4	20-25-32	122	123					123		
IPH 5 IPH /5	40-50-64	124	125					125	128	
IPH 6 IPH /6	80-100-125	126	127					127	129	
IPN 4 IPN /4	32-40-50	201								
IPN 5 IPN /5	64-80-100	202	203					203		
IPN 6 IPN /6	125-160-200	204	205	206				205	206	



80-100-125	160-200-250	20-25-32	40-50-64	80-100-125	32-40-50-64	64-80-100	125-160-200	
IPC /6	IPC /7	IPH /4	IPH /5	IPH /6	IPN /4	IPN /5	IPN /6	
					208			
					209	210		
110 231					211	212	213	
114	115 232				214	215	216	
					208			
		116			209	210		
106		117	118 233		211	212	213	
109	115 232	119	120	121 234	214	215	216	
113		131 235			217	218		
		132	133 236		219	220	221	
130		134	135	136 237	222	223	224	
					225			
					226	227		
		207			228	229	230	

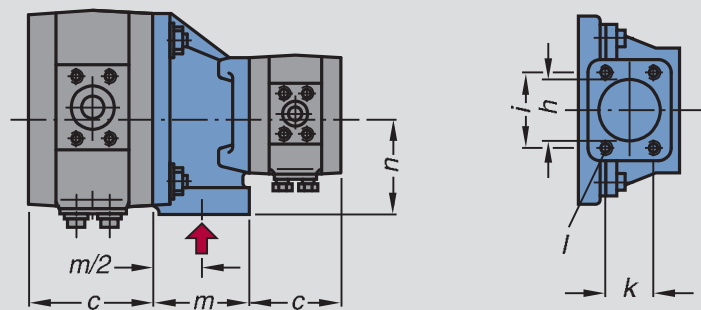
2.7 Dimensions of intermediate housing for multiple-flow pumps



Intermediate housing with joint suction
from 2 pump stages, the same size.

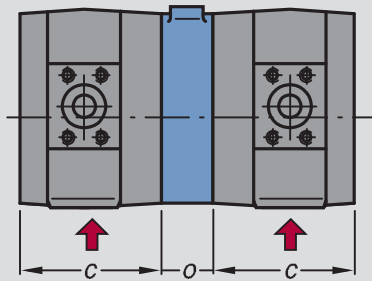
Selection of the intermediate housing
see point 2.6.

No.	m	m/2	n	h	i	k	l	SAE Suction flange No.
101	45	22,5	65	25	52,4	26,2	M 10x15 deep	12
103	66	33	70	40	70	36	M 12x20 deep	30
106	90	45	82	60	89	50,8	M 12x20 deep	16
110	110	55	100	76	106,3	62	M 16x25 deep	17
115	140	70	120	100	130,2	77,8	M 16x25 deep	18
116	90	45	82	60	89	50,8	M 12x20 deep	16
118	110	55	100	76	106,3	62	M 16x25 deep	17
121	140	70	120	100	130,2	77,8	M 16x25 deep	18
131	70	35	74,3	40	70	36	M 12x20 deep	14
133	90	45	90	60	89	50,8	M 12x20 deep	16
136	110	55	110	76	106,3	62	M 16x25 deep	17



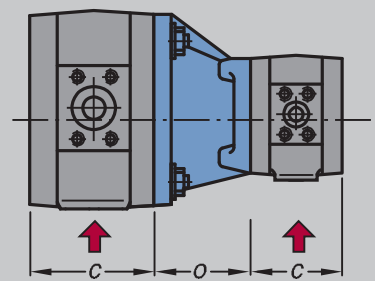
Intermediate housing with joint suction
from 2 pump stages of different sizes.

No.	m	m/2	n	h	i	k	l	SAE Suction flange No.
102	66	33	70	40	70	36	M 12x20 deep	30
104	80	40	82	50	77,8	42,9	M 12x20 deep	15
105	90	45	82	60	89	50,8	M 12x20 deep	16
107	90	45	90	60	89	50,8	M 12x20 deep	16
108	110	55	110	76	106,3	62	M 16x25 deep	17
109	110	55	110	76	106,3	62	M 16x25 deep	17
111	110	55	110	76	106,3	62	M 16x25 deep	17
112	110	55	110	76	106,3	62	M 16x25 deep	17
113	110	55	110	76	106,3	62	M 16x25 deep	17
114	140	70	120	100	130,2	77,8	M 16x25 deep	18
117	110	55	100	76	106,3	62	M 16x25 deep	17
119	110	55	110	76	106,3	62	M 16x25 deep	17
120	110	55	100	76	106,3	62	M 16x25 deep	17
122	66	33	74,3	40	70	36	M 12x20 deep	30
123	70	35	74,3	40	70	36	M 12x20 deep	30
124	80	40	90	50	77,8	42,9	M 12x20 deep	15
125	90	45	90	60	89	50,8	M 12x20 deep	16
126	90	45	110	60	89	50,8	M 12x20 deep	16
127	110	55	110	76	106,3	62	M 16x25 deep	17
128	90	45	90	60	89	50,8	M 12x20 deep	16
129	110	45	110	76	106,3	62	M 16x25 deep	17
130	110	55	110	76	106,3	62	M 16x25 deep	17
132	90	45	90	60	89	50,8	M 12x20 deep	16
134	110	55	110	76	106,3	62	M 16x25 deep	17
135	110	55	110	76	106,3	62	M 16x25 deep	17



No.	o
201	46
203	60
206	64
208	52
210	64
213	72
225	48
227	62
230	67
231	55
232	56
233	55
234	56
235	48
236	55
237	56

Intermediate housing with separate suction from 2 pump stages, the same size.



No.	o
202	50
204	58
205	64
207	64
209	60
211	60
212	70
214	60
• 215	70
216	72
217	60
218	64
219	60
220	70
221	72
222	60
223	70
224	72
226	54
228	63
229	66

Intermediate housing with separate suction from 2 pump stages, different sizes.

• Example of selection

2.7.1 SAE mounting flange

Suction flange no.

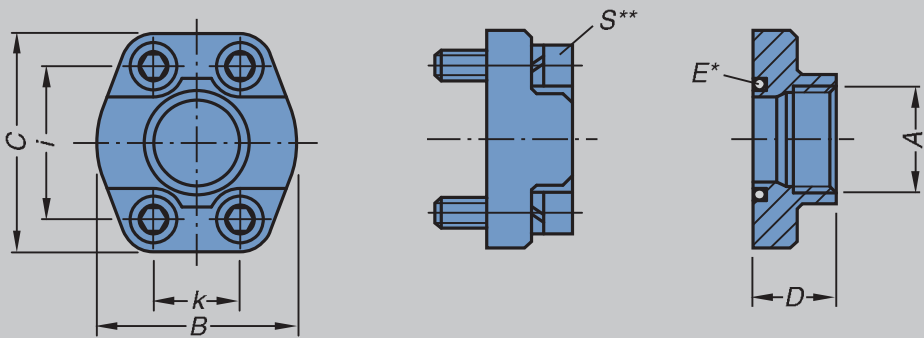
	Capacity																		
	3,5	5	6,3	8	10	13	16	20	25	32	40	50	64	80	100	125	160	200	250
IPV 3	10	10	11	11	12														
IPV 4						12	12	13	13	13									
IPV 5										13	30	30	30						
IPV 6													30	15	15	15			
IPV 7																15	16	16	17
IPC 4								13	13	13									
IPC 5											30	30	30						
IPC 6														15	15	15			
IPC 7																	16	16	17
IPH 4								13	13	13									
IPH 5											30	30	30						
IPH 6														15	15	15			
IPN 4										13	30	30							
IPN 5													30	15	15				
IPN 6																15	16	17	

Pressure flange no.

	Capacity																		
	3,5	5	6,3	8	10	13	16	20	25	32	40	50	64	80	100	125	160	200	250
IPV 3	10	10	10	10	10														
IPV 4						10	10	11	11	11									
IPV 5										11	12	12	12						
IPV 6													12	14	14	14			
IPV 7																14	14	14	14
IPC 4								11	11	11									
IPC 5											12	12	12						
IPC 6														14	14	14			
IPC 7																	14	14	14
IPH 4								11	11	11									
IPH 5											12	12	12						
IPH 6														14	14	14			
IPN 4										12	12	13							
IPN 5													13	13	30				
IPN 6																30	30	15	

2.8 SAE suction and pressure flanges

corresponding to SAE J518c, Code 61



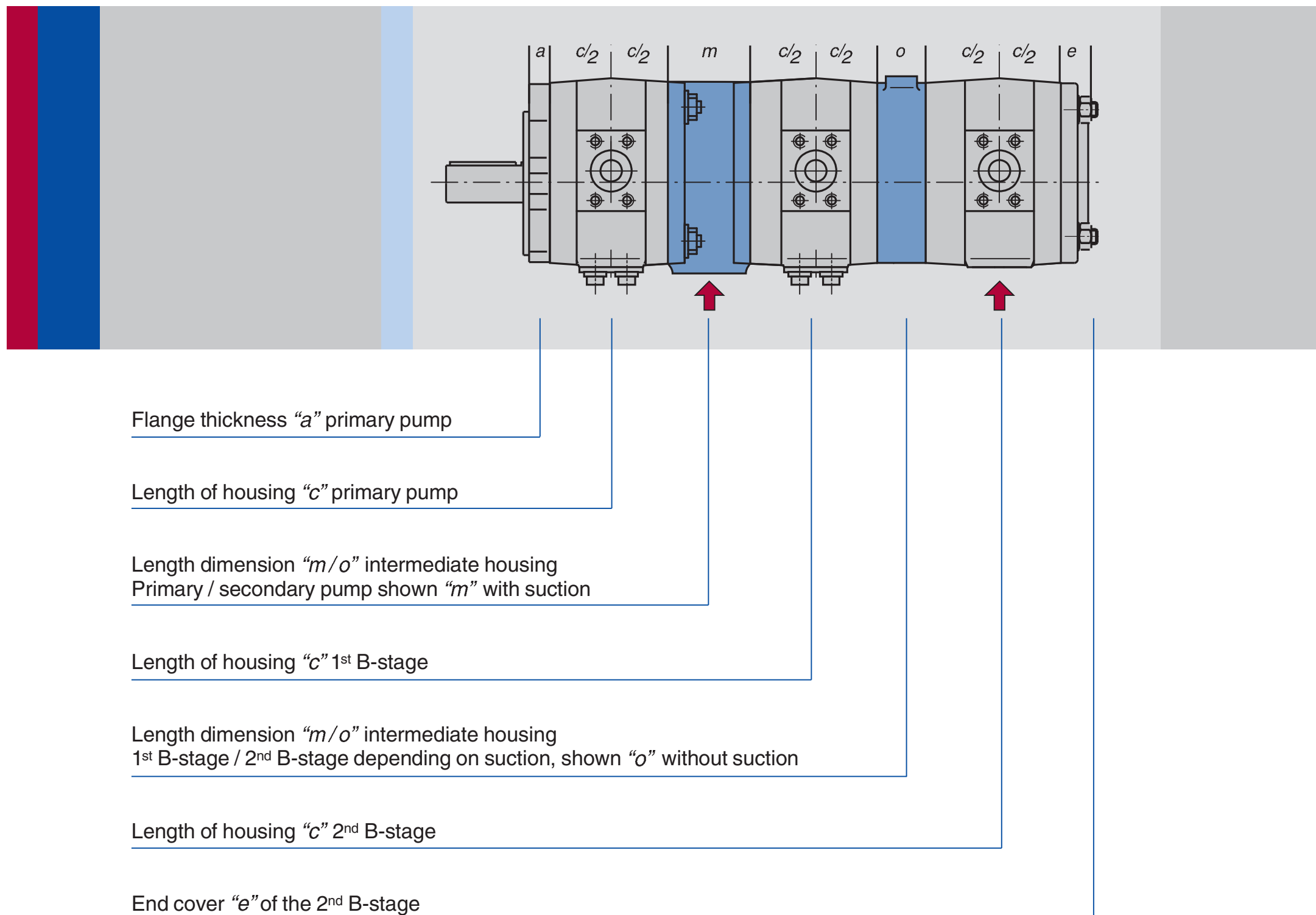
One-piece SAE flange

Flange no.	Dimensions								perm. pressure [bar]
	A	B	C	D	E*	i	k	S**	
10	G 1/2"	46	54	36	18,66 – 3,53	38,1	17,5	M 8	345
11	G 3/4"	50	65	36	24,99 – 3,53	47,6	22,2	M 10	345
12	G 1"	55	70	38	32,92 – 3,53	52,4	26,2	M 10	345
13	G 1 1/4"	68	79	41	37,69 – 3,53	58,7	30,2	M 10	276
14 ¹⁾	G 1 1/2"	82	98	50	47,22 – 3,53	70	36	M 12	345 ¹⁾
30	G 1 1/2"	78	93	50	47,22 – 3,53	70	36	M 12	207
15	G 2"	90	102	45	56,74 – 3,53	77,8	42,9	M 12	207
16	G 2 1/2"	105	114	50	69,44 – 3,53	89	50,8	M 12	172
17	G 3"	124	134	50	85,32 – 3,53	106,3	62	M 16	138
18	G 4"	146	162	48	110,72 – 3,53	130	77,8	M 16	34

Scope of supply: flange, O-ring,
fillister head cap screw and spring washers.

* O-ring ISO-R 1629 NBR (Buna N)
** Fillister head cap screw DIN 912, material 8.8
¹⁾ Voith special design,
differing from SAE J 518 C Code 61

2.9 Dimension chains for pump combinations calculation of total length



The example shows a combination of three pumps.

The dimensions for a combination of two pumps can be determined correspondingly.

- Dimension “a” thickness of flange see individual catalogue G 1485 or table 2.9.1.
- Length of housing “c” see individual catalogue G 1485, G 1209, G 1418 or the following table.
- Length dimension intermediate housing “m” or “o” see pages 18/19 depending on suction.
- Dimension “e” end cover see individual catalogue G 1485 or the following table.

2.9.1 Length dimensions of Voith IP pumps [mm]

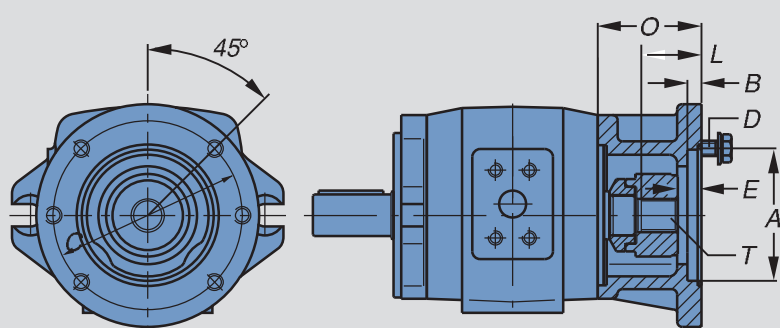
IPV					IPC				
Size	m³/rev.	“a”	“c”	“e”	Size	m³/rev.	“a”	“c”	“e”
3	3,5	19,5	66	20,5					
	5		70						
	6,3		73						
	8		77,5						
	10		82.5						
4	13	26	88,5	31	4		18	98	25
	16		92,5						
	20		98						
	25		104						
5	32	20	113	36	5		20	125	31
	32		119						
	40		125						
	50		132						
6	64	22	143	40	6		22	148	35
	64		140						
	80		148						
	100		158						
7	125	63	170	48	7		63	170	40
	125		152						
	160		162						
	200		174						
	250		188	42		250		188	42

“a” = Thickness of flange
“c” = Length of housing
“e” = Thickness of cover

IPH					IPN				
Size	m³/rev.	“a”	“c”	“e”	Size	m³/rev.	“a”	“c”	“e”
(2)	3,5	19	64	19,5					
	5		69						
	6,3		73						
	8		78						
(3)	10	22	88	25					
	13		94						
	16		99						
4	20	20	102	36	4	32	20	100,5	31
	25		108			40		113,5	
	32		116			50		130	
5		22		35	5	64	26	119,5	33,5
	40		138			80		135	
	50		145			100		155	
6	64	26	155	47	6		24		40
	80		171			125		151	
	100		181			160		172,5	
	125		193			200		197	

3. Combining Voith IP pumps with pumps from other manufacturers

3.1 Mounting pumps from other manufacturers on to Voith IP pumps



L = Max. possible shaft length
T = Tooth number of the toothed hub with involute flank (ANSI B 92, 1a) pressure angle 30°

Dimensions for Voith internal gear pumps IPV 4 to 7, IPC 4 to 7 and IPH 4 to 6 can be taken from the dimension sheet for the individual pump, dimensions for pumps of other designs can be taken from the respective manufacturer's catalogue.

The choice of possibilities for mounting flange and shaft end correspond to the data on the single pump sheets.

Combinations of Voith internal gear pumps model IPN with pumps from other manufacturers on request.

Model	Inter-mediate housing	O	A	B	C	D	O-Ring	E	L	T	pitch
IPC 4/	100	64	82,55 ^{G7}	7	106,5±0,3	M 10	83x3	18	38	11	16/32
IPH 4/	101	80	82,55 ^{G7}	8	106,5±0,3	M 10	83x3	18	38	11	16/32
IPV 5/											
IPC 5/	102	92	82,55 ^{G7}	8	106,5±0,3	M 10	83x3	18	38	11	16/32
IPH 5/											
IPV 6/	103	92	82,55 ^{G7}	8	106,5±0,3	M 10	83x3	18	38	11	16/32
IPC 6/											
IPH 6/	104	80	101,6 ^{G7}	10	146±0,3	M 12	102x3	17	41	13	16/32
IPV 5/											
IPC 5/	105	92	101,6 ^{G7}	10	146±0,3	M 12	102x3	17	41	13	16/32
IPH 5/											
IPV 6/	106	92	101,6 ^{G7}	10	146±0,3	M 12	102x3	17	41	13	16/32
IPC 6/											
IPH 6/	107	80	101,6 ^{G7}	10	146±0,3	M 12	102x3	17,5	46	15	16/32
IPV 7/											
IPC 7/	108	92	101,6 ^{G7}	10	146±0,3	M 12	102x3	17,5	46	15	16/32
IPH 5/											
IPV 6/	109	92	101,6 ^{G7}	10	146±0,3	M 12	102x3	17,5	46	15	16/32
IPC 6/											
IPH 6/	110	92	127 ^{G7}	13	181±0,3	M 16	126x3	8	59	14	12/24
IPV 7/											
IPC 7/	111	92	127 ^{G7}	13	181±0,3	M 16	126x3	8	59	14	12/24
IPH 5/											
IPV 6/	112	92	127 ^{G7}	13	181±0,3	M 16	126x3	8	63	17	12/24
IPC 6/											
IPH 6/	113	92	127 ^{G7}	13	181±0,3	M 16	126x3	8	63	17	12/24
IPV 7/											
IPC 7/	114	150	152,4 ^{G7}	13	228,6±0,3	M 18	150x3	8	118	13	8/16
IPH 6/											

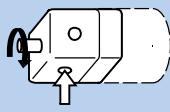
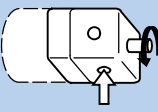
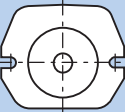
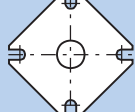
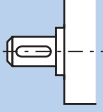
Fastening bolts and O-ring are part of the Voith scope of supply.

3.1.1 Intermediate housing with coupling

Combinations consisting of Voith internal gear pumps model IPV, IPC or IPH and intermediate housing with coupling, suitable for mounting of pumps with mounting flange to DIN ISO 3019-1 and drive shaft with involute splining to ANSI B 92.1a.

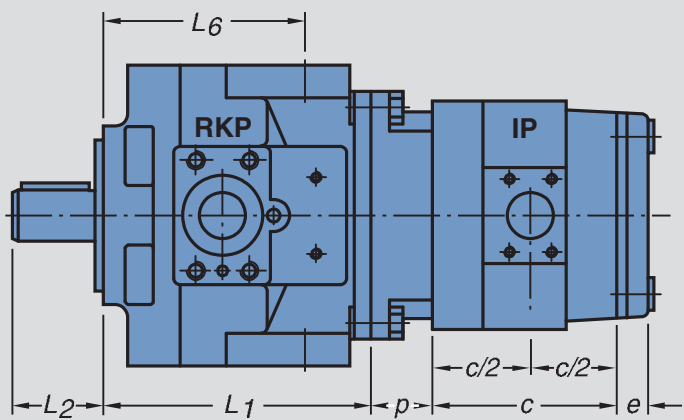
Ordering example
IPV 5-50 with intermediate housing 104 rotating clockwise with SAE-2-hole flange and cylindrical drive shaft with feather key.

IPV 5/104-50/... 101

Model	Inter- mediate housing	Direction of rotation and suction		Mounting flange		Shaft end*
						
		clockwise	anti-clockwise			
		1	6	0	1	1
IPC 4/	100	1	6	0	1	1
IPH 4/ IPV 5/ IPC 5/	101	1	6	0	1	1
IPH 5/ IPV 6/ IPC 6/	102	1	6	0	1	1
IPH 6/ IPV 7/ IPC 7/	103	1	6	0	1	1
IPH 4/ IPV 5/ IPC 5/	104	1	6	0	1	1
IPH 5/ IPV 6/ IPC 6/	105	1	6	0	1	1
IPH 6/ IPV 7/ IPC 7/	106	1	6	0	1	1
IPV 5/ IPC 5/	107	1	6	0	1	1
IPH 5/ IPV 6/ IPC 6/	108	1	6	0	1	1
IPH 6/ IPV 7/ IPC 7/	109	1	6	0	1	1
IPH 5/ IPV 6/ IPC 6/	110	1	6	0	1	1
IPH 6/ IPV 7/ IPC 7/	111	1	6	0	1	1
IPV 6/ IPC 6/	112	1	6	0	1	1
IPH 6/ IPV 7/ IPC 7/	113	1	6	0	1	1
IPV 7/ IPC 7/	114	1	6	0	1	1

* Further possibilities of selection
see dimension sheets for the single pumps.

3.2 Mounting Voith IP pumps on to pumps from other manufacturers



Mounting Voith internal gear pumps on to

- Wepuko radial piston pumps
- Moog adjustable piston pumps, only with heavy through-drive.
- Combinations of IPN with radial piston pumps on request.

Ordering example
for mounting pump, intermediate housing
and drive shaft.

IPV /5 508-/40 129

IPV /5/5 508-/50/40 229

Dimension table 1 (RKP)

Model	L ₁	L ₂	L ₆	Supplier
RKP 16 RKP 19	See Moog data sheets for dimensions			Moog
RKP 32 RKP 45	See Moog data sheets for dimensions			Moog
RKP 63 RKP 80	See Moog data sheets for dimensions			Moog
RKP 90 RKP 100	See Moog data sheets for dimensions			Moog
RKP 140 RKP 110	See Moog data sheets for dimensions See Wepuko data sheets for dimensions			Moog Wepuko
RKP 125 RKP 160	See Wepuko data sheets for dimensions			Wepuko
RKP 180 RKP 250	See Wepuko data sheets for dimensions			Wepuko

Dimension table 2 (length of intermediate flange) and description of intermediate flange

	RKP 16/19		RKP 32/45		RKP 63/80/90/100		RKP 140		RKP 110/125/160/180		RKP 250	
	p	Des.	p	Des.	p	Des.	p	Des.	p	Des.	p	Des.
IPV 3	50	500	50	501	50	502	50	503	17	–	17	–
IPC 4/IPV 4	–	–	55	504	55	505	55	506	17	–	17	–
IPC 5/IPV 5	–	–	55	507	55	508	55	509	40	–	17	–
IPC 6/IPV 6	–	–	–	–	55	510	55	511	66,5	–	72,5	–
IPC 7/IPV 7	–	–	–	–	–	–	56	512	66,5	–	72,5	–

Please refer to the data sheets for the single pumps for IP dimensions.

RKP 110 to 250		RKP 16 to 140
Supplier RKP	Wepuko	Moog
Supplier of mounting parts	Wepuko	Voith
Supplier of IP pump	Voith	Voith

Dimensions of the RKP pumps L₁, L₂, L₆ are to be requested from the respective manufacturers.

3.2.1 Order description for Voith IP pumps on to pumps from other manufacturers

Example of order description IPV-Pump on RKP					
IPV	/5	508-/40	1	2	9
Description of shaft extension for mounting on Moog RKP with heavy through-drive.					
Description of pump with mounting flange for Moog RKP.					
Direction of rotation of the IPV pump.					
Capacity B stage 40 m³/rev.					
Description of mounting flange for Moog RKP 63/80/90/100.					
Size 5					
Product group IPV					

IPV /5/5 508-50/40 229		Example of order description for combination of two IPV pumps on RKP
IPV		Product group
/5		Size 1 st B-stage
/5		Size 2 nd B-stage
/50		Capacity 1 st B-stage
/40		Capacity 2 nd B-stage
2		Direction of rotation clockwise, joint suction for IPV 5/5.
2		Description of pump with mounting flange for Moog RKP.
9		Description of shaft extension for mounting on Moog RKP with heavy through-drive.

Order details

Original form for copying

Pump 1

continuous pressure in system _____ bar

maximum pressure in system _____ bar

capacity/rev. _____ bar

Pump 2

continuous pressure in system _____ bar

maximum pressure in system _____ bar

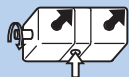
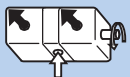
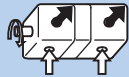
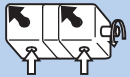
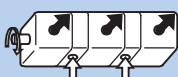
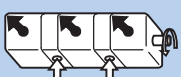
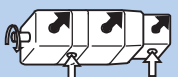
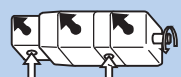
capacity/rev. _____ bar

Pump 3

continuous pressure in system _____ bar

maximum pressure in system _____ bar

capacity/rev. _____ bar

Internal gear pumps			Sizes	Capacity	Direction of rotation Suction	Faste-ning flange	Shaft end																																																																
Pre-selection	primary pump	IP																																																																					
Pump- sequence	1 st B pump	IP /	/	/																																																																			
	2 nd B pump	IP /	/	/																																																																			
Direction of rotation anti-clockwise, clockwise																																																																							
Suction connection joint, separate, mixed				Order code /																																																																			
Direction of rotation and suction  2 7   1 6   2 7   1 6   3 8   3 8  clockwise  anti-clockwise  Special design 4 9 Special design <tr><td colspan="2">Intermediate housing</td><td colspan="6">Intermediate housing no. _____ / _____</td></tr><tr><td colspan="2">Torque control</td><td colspan="6">Maximum torque occurring at secondary shaft _____ Nm Permissible torque at secondary shaft _____ Nm</td></tr><tr><td colspan="2">Fastening flange</td><td colspan="2">SAE 2-hole</td><td>SAE 4-hole</td><td>Order code</td><td>/ </td><td></td></tr><tr><td colspan="2"></td><td colspan="2">VDMA/DIN ISO 2-hole</td><td>VDMA/DIN ISO 4-hole</td><td></td><td></td><td></td></tr><tr><td colspan="2">Shaft end</td><td colspan="2">cylindrical shaft end</td><td>involute splining</td><td></td><td></td><td>/ </td></tr><tr><td colspan="8">Final</td></tr><tr><td colspan="2">sequence of the pump stages</td><td colspan="6">two pump combination IP / / - / </td></tr><tr><td colspan="2"></td><td colspan="6">three pump combination IP / / / / - / / </td></tr>								Intermediate housing		Intermediate housing no. _____ / _____						Torque control		Maximum torque occurring at secondary shaft _____ Nm Permissible torque at secondary shaft _____ Nm						Fastening flange		SAE 2-hole		SAE 4-hole	Order code	/				VDMA/DIN ISO 2-hole		VDMA/DIN ISO 4-hole				Shaft end		cylindrical shaft end		involute splining			/	Final								sequence of the pump stages		two pump combination IP / / - /								three pump combination IP / / / / - / /					
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