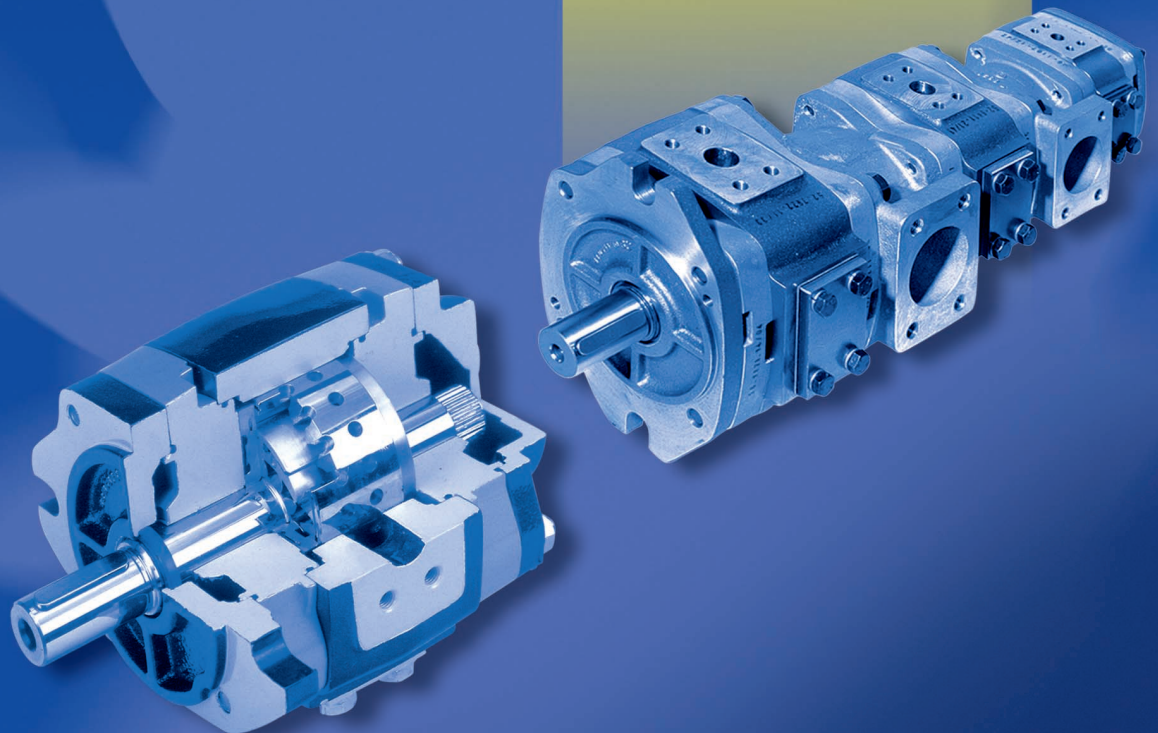


VOITH TURBO

High-Pressure Internal Gear Pumps Type IPV

*Dimension
sheet catalogue
for single and
multiple-flow pumps*

*Combination of
IP high, medium,
and low-pressure
pumps*



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Voith Internal Gear Pumps Type IPV

The market requires hydraulic pumps to be compact and silent and to have a low pressure pulsation and high efficiency.

Based on the proven IPC medium-pressure pumps with radial and axial sealing gap compensation Voith Turbo has developed its high-pressure internal gear pumps series IPV to meet these requirements of the market.

IPV high-pressure internal gear pumps are suitable for all applications where a low noise emission, high efficiency, compact design, and low weight are required, among other things.

Typical applications:

Plastics engineering

Plastics injection moulding and blow-moulding machines

Metal working machines

Press brakes, shears, punching machine

General press manufacture

Materials handling

Crane construction, lifting platforms, electric fork lifts

Shipbuilding

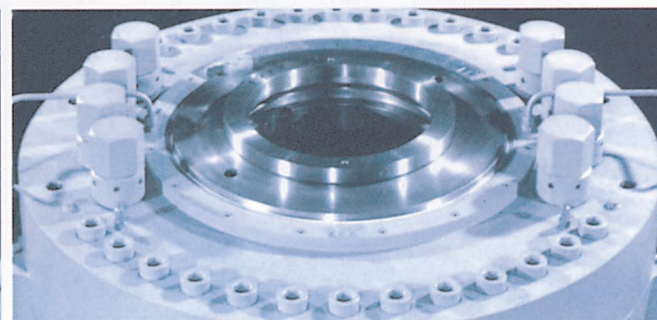
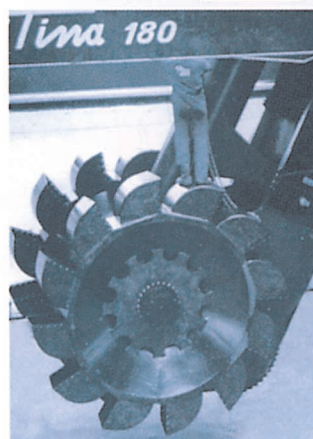
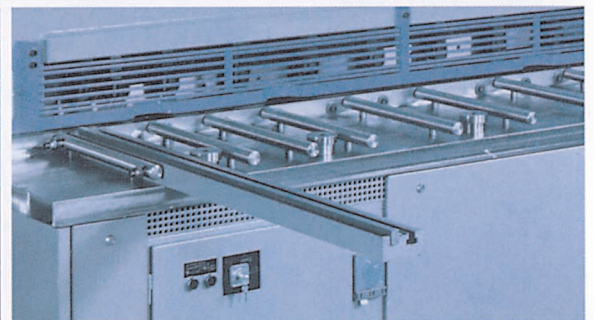
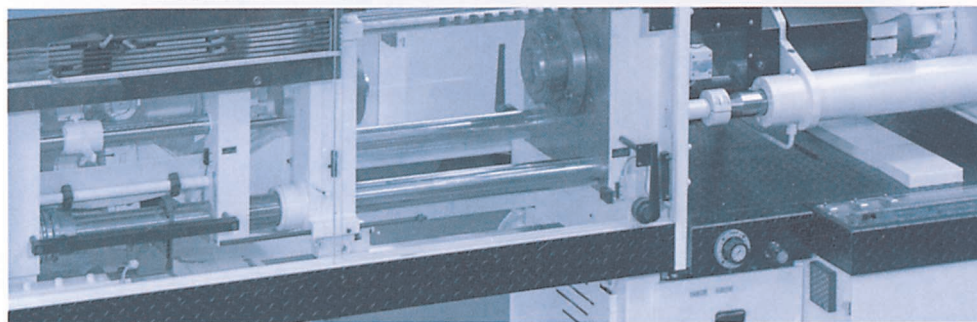
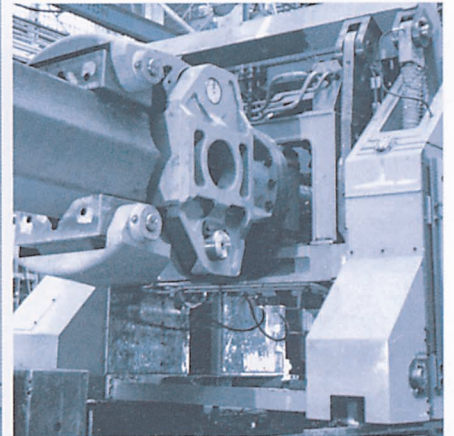
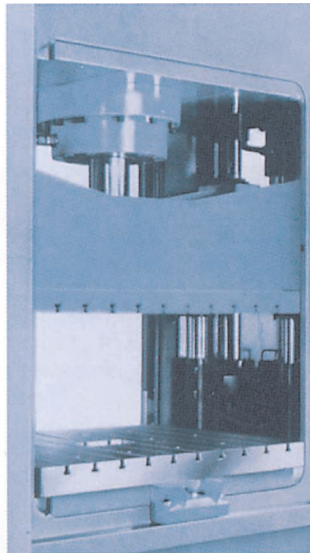
Steering gear, stabilizers, deck cranes

Public service vehicles

Refuse-collecting vehicles, special vehicles

Power generation

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



Features and operation, design and combinations

Features

The most striking design features of IPV pumps are: internal splines, plain bearings, radial and axial gap compensation. They guarantee smooth operation and a low-pulsation flow. The proven involute splines optimized in terms of volumes permit a compact design.

Operation

When the gears are rotating, oil is sucked into the housing and into the space between the pinion and internal gear. The two gears run totally freely over a wide range of their circumference, which guarantees an excellent suction behaviour of the pump.

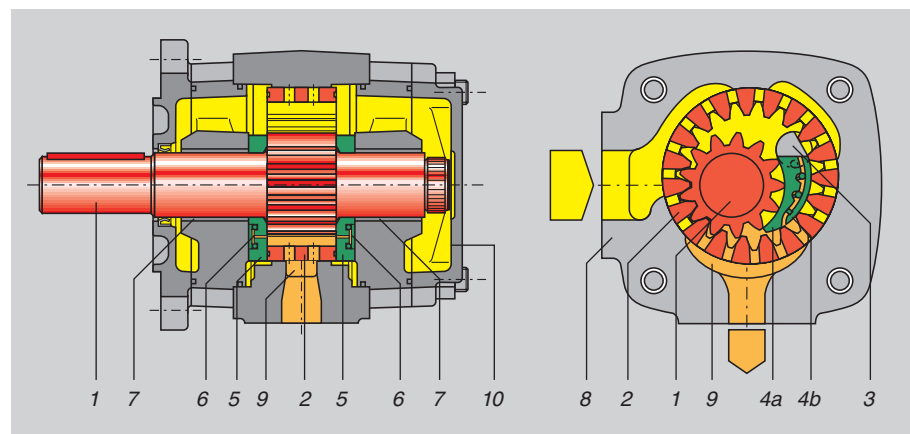
In circumferential direction, the tooth spaces are sealed off by the meshing teeth and the filler. Axially, an almost gap-free sealing is achieved by axial discs. The volumetric losses are therefore minimal. The oil sucked into the pump is displaced by the tooth tips entering the tooth spaces.

The user benefits from the new pump series in the following ways, among other things:

- Extremely low noise emission
- Extremely favourable size/displacement ratio
- Long service life owing to plain bearings and balancing of forces
- High overall efficiency
- Suitable for building up multiple-flow pump units.

Design

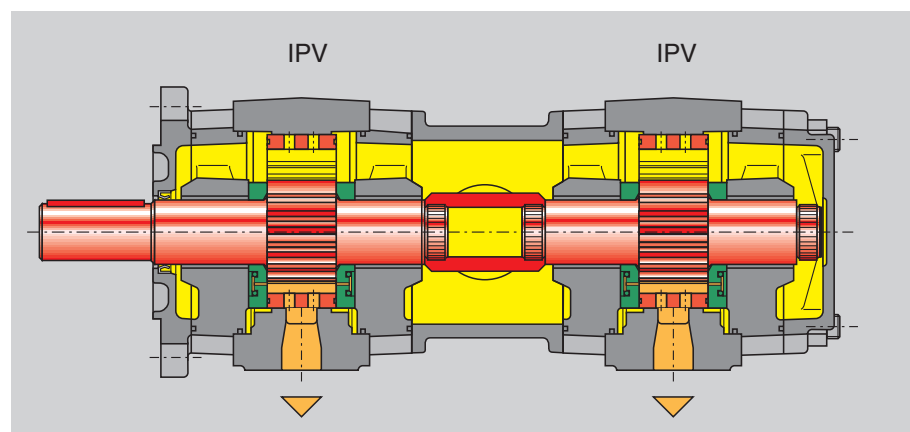
- 1 Pinion shaft
- 2 Internal gear
- 3 Filler pin
- 4a Filler-segment carrier
- 4b Filler-sealing segment
- 5 Axial disc
- 6 Axial pressure area
- 7 Plain bearings
- 8 Housing
- 9 Hydrostatic bearing
- 10 Cover with bleeder screw



Combinations

IPV pumps of the same size or of different sizes can be combined with each other to form double pumps or multiple-flow pumps. The possibility of combining them with Voith medium and low-pressure pumps results in a particularly wide field of applications.

Combination with pumps from different manufacturers is possible as well.



Technical data

The performance data refer to the delivery of mineral oils with a viscosity of 20...40 cSt and a pump intake pressure of 0.8 bar (min) and 3 bar (max).

The size mentioned together with the type designation corresponds roughly to the displacement in cm³/rev given in the table.

Calculation of delivery

$$Q = V_{g\ th} \cdot n \cdot \eta_v \cdot 10^{-3} \text{ [l/min]}$$

Calculation of power

$$P = \frac{Q \cdot \Delta p}{600 \cdot \eta_g}$$

Q = Delivery in l/min
 $V_{g\ th}$ = Displacement in cm³/rev
 n = Speed in rev/min
 η_v = Volumetric efficiency
 η_g = Overall efficiency
 P = Power in kW
 Δp = Pressure in bar

Data

Sizes Frame size	Displacement cm ³ /rev *	Speed rev/min		Delivery l/min at 1500 rev/min	Pressure bar		
		min**	max		Continuous pressure	Peak pressure at 1500 rev/min	Peak pressure at n_{max}
IPV 3-3.5	3.6	400	3600	5.4	330	345	345
IPV 3-5	5.2	400	3600	7.8	330	345	345
IPV 3-6.3	6.4	400	3600	9.6	330	345	345
IPV 3-8	8.2	400	3600	12.3	330	345	345
IPV 3-10	10.2	400	3600	15.3	330	345	345
IPV 4-13	13.3	400	3600	19.9	330	345	345
IPV 4-16	15.8	400	3400	23.7	330	345	345
IPV 4-20	20.7	400	3200	31.0	330	345	345
IPV 4-25	25.4	400	3000	38.1	300	330	330
IPV 4-32	32.6	400	2800	48.9	250	280	280
IPV 5-32	33.1	400	3000	49.6	315	345	315
IPV 5-40	41.0	400	2800	61.5	315	345	315
IPV 5-50	50.3	400	2500	75.4	280	315	280
IPV 5-64	64.9	400	2200	97.3	230	250	250
IPV 6-64	64.1	400	2600	96.1	300	330	300
IPV 6-80	80.7	400	2400	121.0	280	315	280
IPV 6-100	101.3	400	2100	151.9	250	300	270
IPV 6-125	126.2	400	1800	189.3	210	250	250
IPV 7-125	125.8	400	2200	188.7	300	330	300
IPV 7-160	160.8	400	2000	241.2	280	315	280
IPV 7-200	202.7	400	1800	304.0	250	300	270
IPV 7-250	251.7	400	1800	377.5	210	250	250

Note:

The permissible peak pressures are based on a duty cycle of 15 %, the maximum cycle time being 1 min.

* Due to manufacturing tolerances displacement can be up to 1.5 % less.

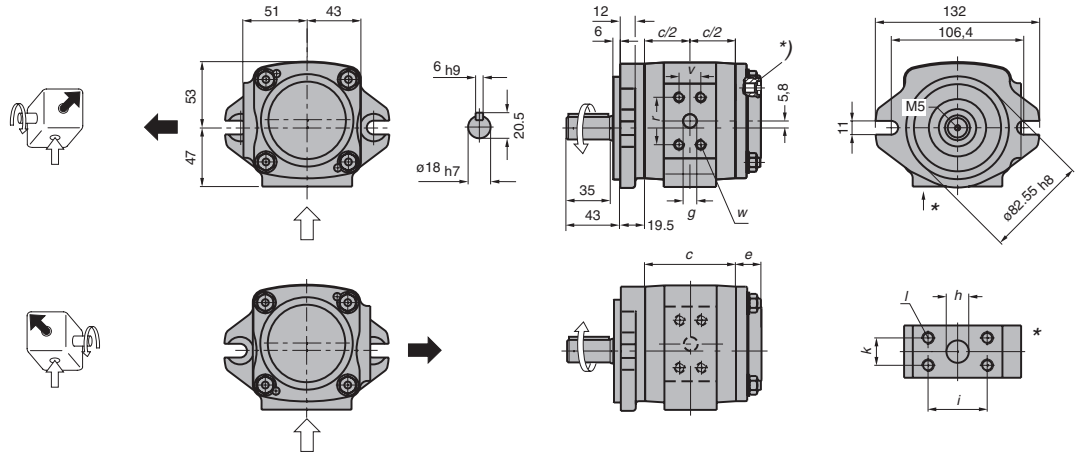
** Please contact us for information about the permissible peak pressures at speeds lower than <400 rev/min or between 1500 rev/min and n_{max} .

Characteristics

Design	Internal gear pump
Mounting	SAE or VDMA flange
Pipe connection	SAE J 518 c code 61
Direction of rotation	Clockwise or anti-clockwise
Inlet pressure	0.6 to 3 bar absolute
Shaft loading	In the event of radial or axial shaft loadings, please contact the manufacturer
Installation position	Any
Viscosity range	10-100 cSt, perm. starting visc. 2000 cSt
Pressure medium	Mineral oil as per DIN 51524, part 2 or 3
Pressure medium temp.	- 20° C to + 80° C
Contamination	Max. perm. contamination of pressure medium as per NAS 1638, class 8. Filter with minimum retention rate of $\beta_{20} \geq 75$. For longer service life we recommend using a filter with a minimum rate of $\beta_{10} \geq 100$
Ambient temperature	-10° C to + 60° C

IPV 3

Standard design



Weights and dimensions

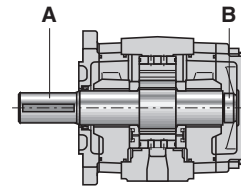
	<i>c</i>	<i>e</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>k</i>	<i>l</i>	<i>r</i>	<i>v</i>	<i>w</i>	<i>kg</i>
IPV 3-3.5	66	20.5	9	14	38.1	17.5	M8x13	38.1	17.5	M8x13	4,0
IPV 3-5	70	20.5	11	14	38.1	17.5	M8x13	38.1	17.5	M8x13	4,2
IPV 3-6.3	73	20.5	11	19	47.5	22	M10x15	38.1	17.5	M8x13	4,4
IPV 3-8	77.5	20.5	13	19	47.5	22	M10x15	38.1	17.5	M8x13	4,6
IPV 3-10	82.5	20.5	13	21	52.4	26.2	M10x15	38.1	17.5	M8x13	4,8

SAE flange no.

SAE flange no.	SAE flange no.
10	10
10	10
10	11
10	11
10	12

Permissible drive torques in Nm

	Drive shaft A	Secondary shaft B
IPV 3	160	80



Type	Size	Direction of rotation Radial suction port
IPV 3	3.5	1
	5	
	6.3	6
	8	
	10	
IPV 3		

Mounting flange	Shaft end
Standard SAE-2-bolt flange Dimensions as above	Dimensions as above 35 43
Variants 0 0 12 7 109 132 36 19.5	Shaft end Dimension as above Involute splines ANSI B92. 1a 11 T 16/32 DP 30° 30 37.9 28 36 5 h9 18 16 h7
VDMA 24560 DIN ISO 3019/2, 2-bolt flange 12 7 109 132 36 19.5	4 1 28 36 5 h9 18 16 h7

Designations for ordering: see p. 19

*) Opening must be closed during operation. Tightening torque MA = 18 Nm.
 Before the pump is taken into service, the opening can be used as filling or deaeration, depending on the installation of the pump. Screw plug M10x1, hexagon socket, width across flats 6.

IPV 3

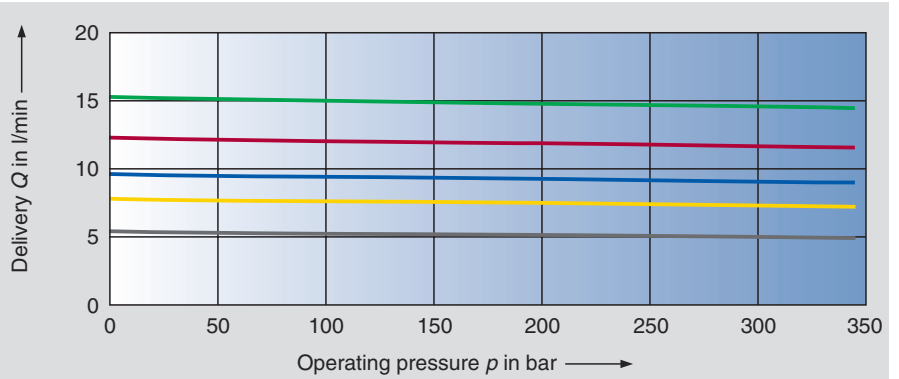
Performance curves

Measuring conditions:

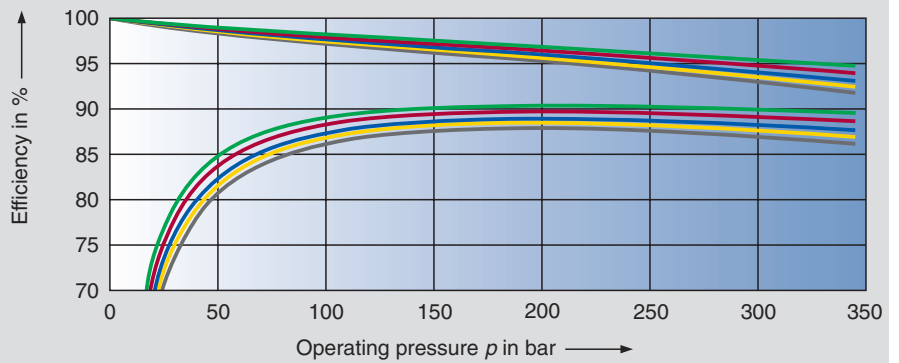
Speed $n = 1500 \text{ min}^{-1}$
 Viscosity $\nu = 46 \text{ cSt}$
 Operating temperature $t = 40^\circ \text{ C}$

- IPV 3-3,5
- IPV 3-5
- IPV 3-6,3
- IPV 3-8
- IPV 3-10

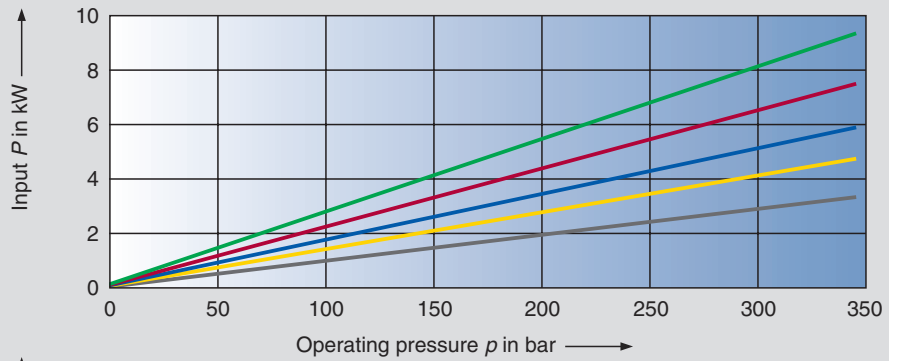
Delivery Q



Efficiency η_{ges} and η_{vol}



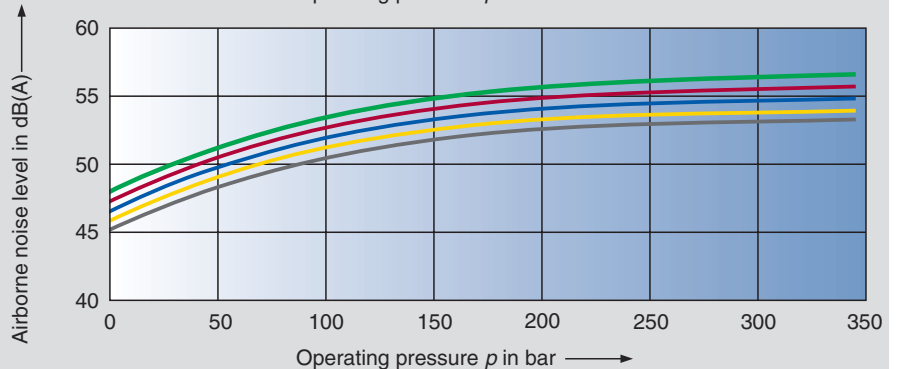
Input power P



Airborne noise level

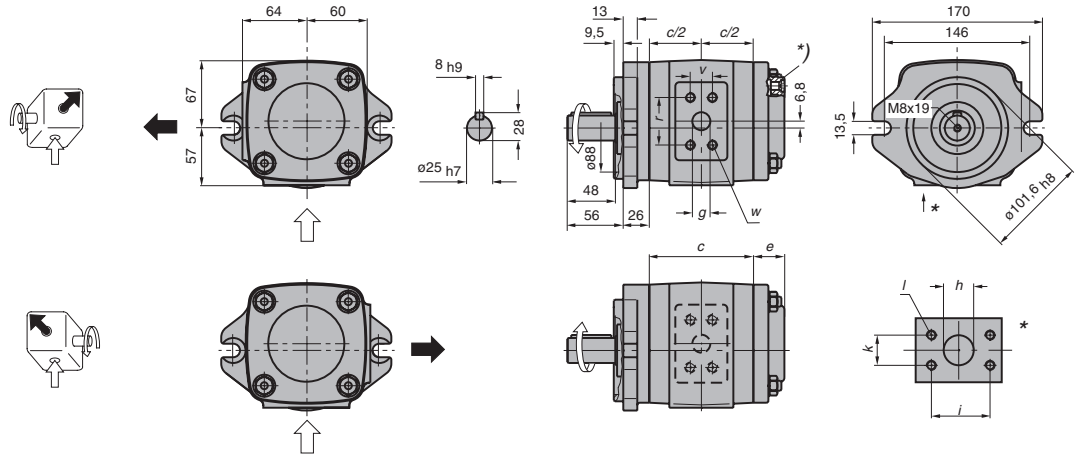
Measuring location 1 m axial

Note:
 Voith sound-measuring room (low-reverberation room). In an anechoic room the values will be 5 dB(A) lower.



IPV 4

Standard design



Weights and dimensions

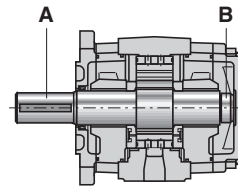
	c	e	g	h	i	k	l	r	v	w	kg
IPV 4-13	88.5	31	13	23	52.4	26.2	M10x15	38.1	17.5	M8x13	8,6
IPV 4-16	92.5	31	14	25	52.4	26.2	M10x15	38.1	17.5	M8x13	9,0
IPV 4-20	98	31	18	27	58.7	30.2	M10x15	47.5	22	M10x15	9,6
IPV 4-25	104	31	18	30	58.7	30.2	M10x15	47.5	22	M10x15	10,2
IPV 4-32	113	31	18	32	58.7	30.2	M10x15	47.5	22	M10x15	11,0

SAE flange no.

SAE flange no.	SAE flange no.
10	12
10	12
11	13
11	13
11	13

Permissible drive torques in Nm

	Drive shaft A	Secondary shaft B
IPV 4	335	190



Type	Size	Direction of rotation Radial suction port	Mounting flange	Shaft end
IPV 4	13	1	Standard SAE-2-bolt flange Dimensions as above	Dimensions as above
	16		Variants SAE 4-bolt flange Dimensions as above	7 0 Shaft end Dimension as above Involute splines ANSI B92. 1a 15 T 16/32 DP 30°
	20	6 1 1 VDMA 24560 DIN ISO 3019/2, 4-bolt flange Dimensions as above		
	25			5 1
	32			
IPV 4				

Designations for ordering: see p. 19

*) Opening must be closed during operation. Tightening torque MA = 18 Nm.
 Before the pump is taken into service, the opening can be used as filling or deaeration, depending on the installation of the pump. Screw plug M10x1, hexagon socket, width across flats 6.

IPV 4

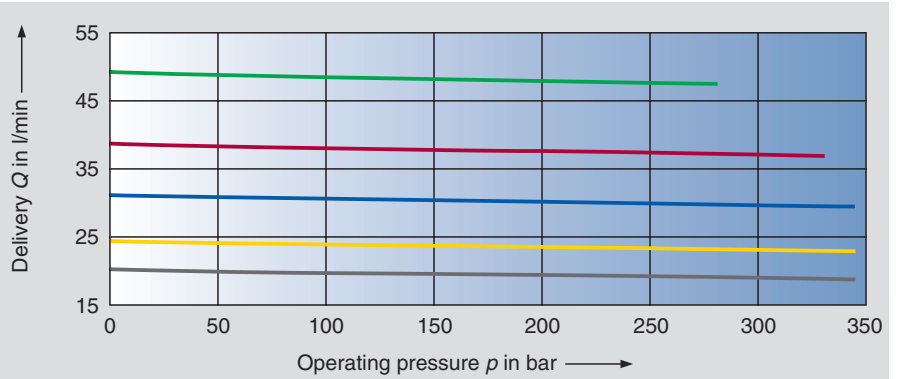
Performance curves

Measuring conditions:

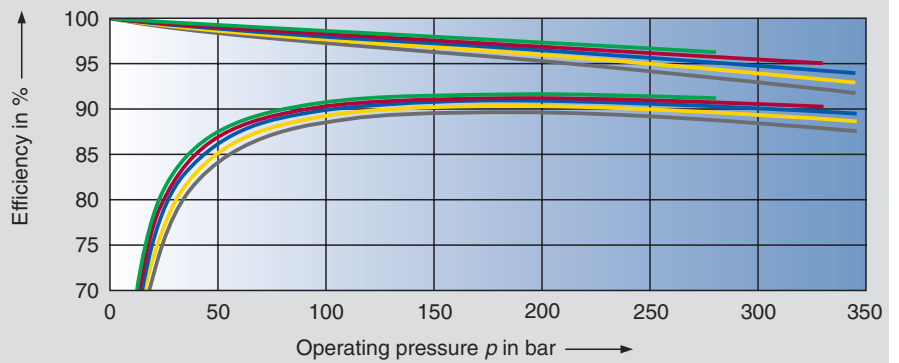
Speed $n = 1500 \text{ min}^{-1}$
 Viscosity $\nu = 46 \text{ cSt}$
 Operating temperature $t = 40^\circ \text{ C}$

- IPV 4-13
- IPV 4-16
- IPV 4-20
- IPV 4-25
- IPV 4-32

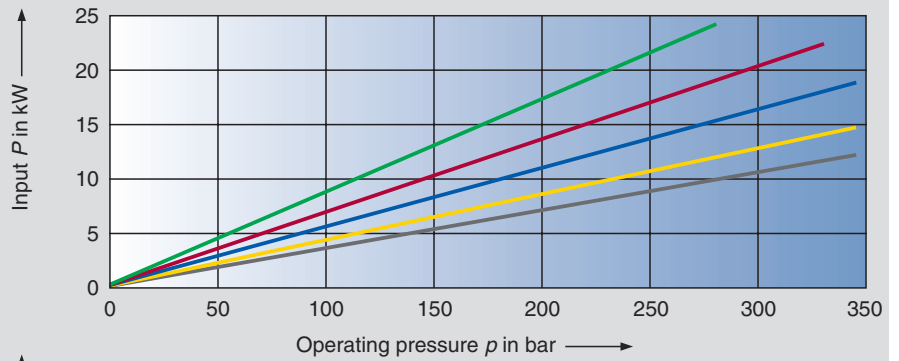
Delivery Q



Efficiency η_{ges} and η_{vol}



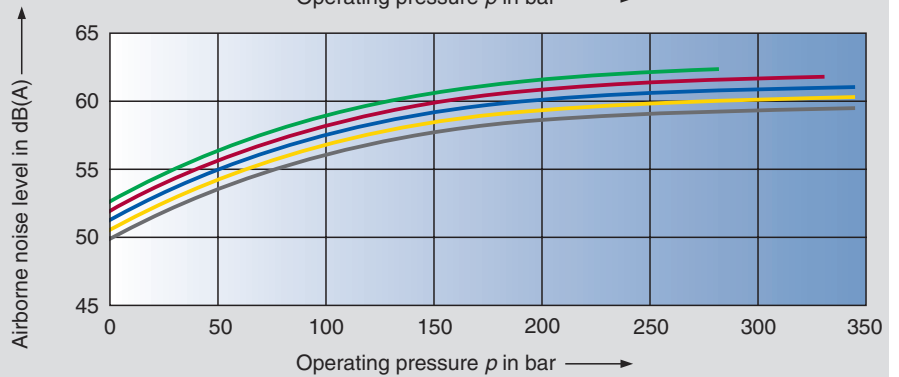
Input power P



Airborne noise level

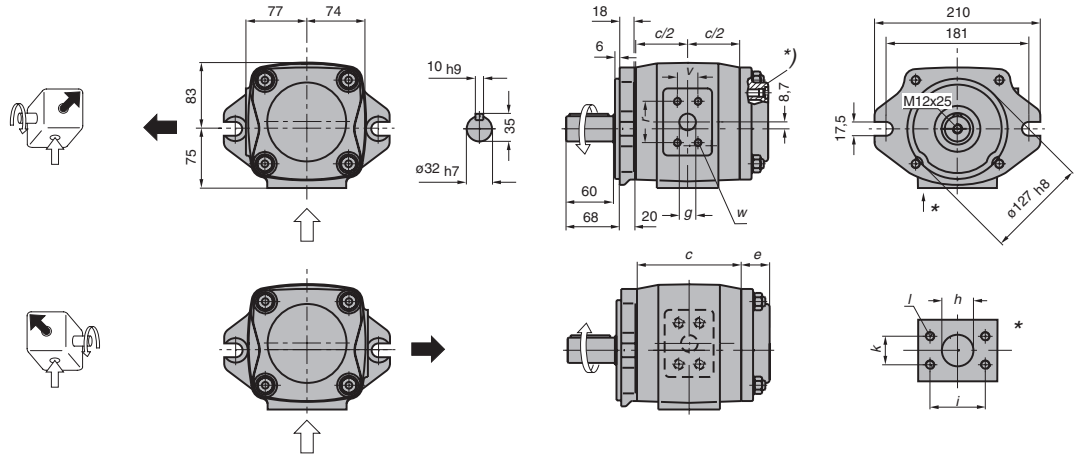
Measuring location 1 m axial

Note:
 Voith sound-measuring room (low-reverberation room). In an anechoic room the values will be 5 dB(A) lower.



IPV 5

Standard design



Weights and dimensions

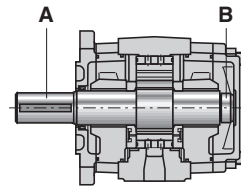
	c	e	g	h	i	k	l	r	v	w	kg
IPV 5-32	119	36	18	32	58.7	30.2	M10x15	47.5	22	M10x15	15,5
IPV 5-40	125	36	19	35	70	36	M12x20	52.4	26.2	M10x15	16,3
IPV 5-50	132	36	21	40	70	36	M12x20	52.4	26.2	M10x15	17,4
IPV 5-64	163	36	23	40	70	36	M12x20	52.4	26.2	M10x16	18,7

SAE flange no.

SAE flange no.	SAE flange no.
11	13
12	30
12	30
12	30

Permissible drive torques in Nm

	Drive shaft A	Secondary shaft B
IPV 5	605	400



Type	Size	Direction of rotation Radial suction port	Mounting flange	Shaft end
IPV 5	32	1	Standard SAE-2-bolt flange 	 Dimensions as above
	40			
	50	6	Variants SAE-2-bolt flange 	 Involute splines ANSI B92.1a 14 T 12/24 DP 30°
	64			
IPV 5			SAE-4-bolt flange 	
			VDMA 24560 DIN ISO 3019/2, 4-bolt flange 	

Designations for ordering: see p. 19

*) Opening must be closed during operation. Tightening torque MA = 18 Nm.
 Before the pump is taken into service, the opening can be used as filling or deaeration, depending on the installation of the pump. Screw plug M10x1, hexagon socket, width across flats 6.

IPV 5

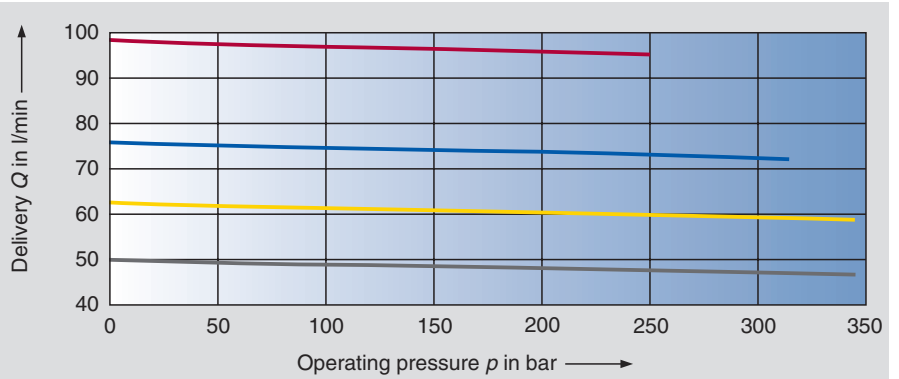
Performance curves

Measuring conditions:

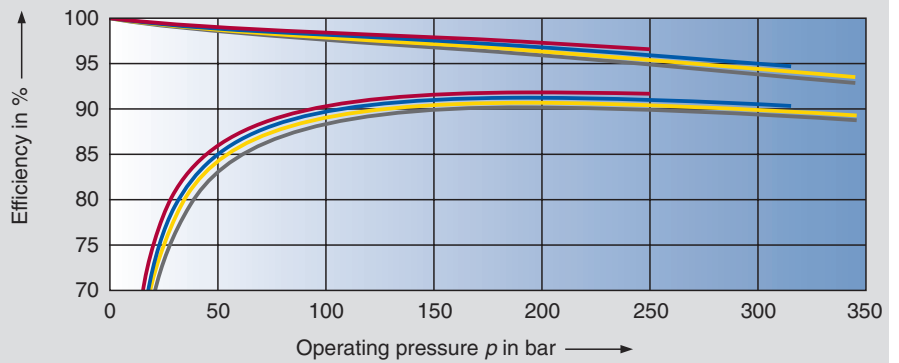
Speed $n = 1500 \text{ min}^{-1}$
 Viscosity $\nu = 46 \text{ cSt}$
 Operating temperature $t = 40^\circ \text{ C}$

— IPV 5-32
 — IPV 5-40
 — IPV 5-50
 — IPV 5-64

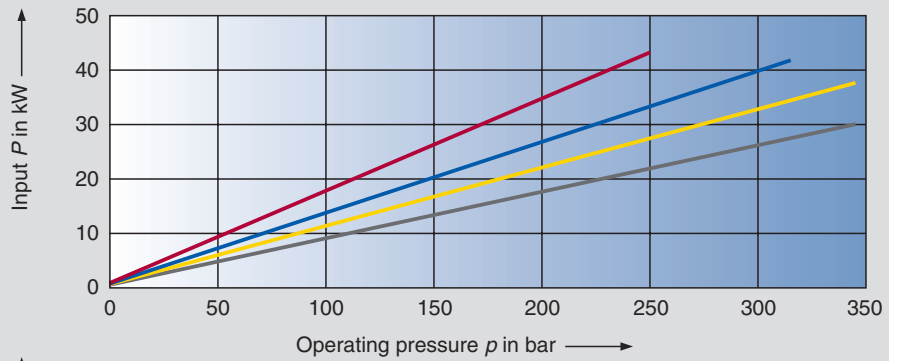
Delivery Q



Efficiency η_{ges} and η_{vol}



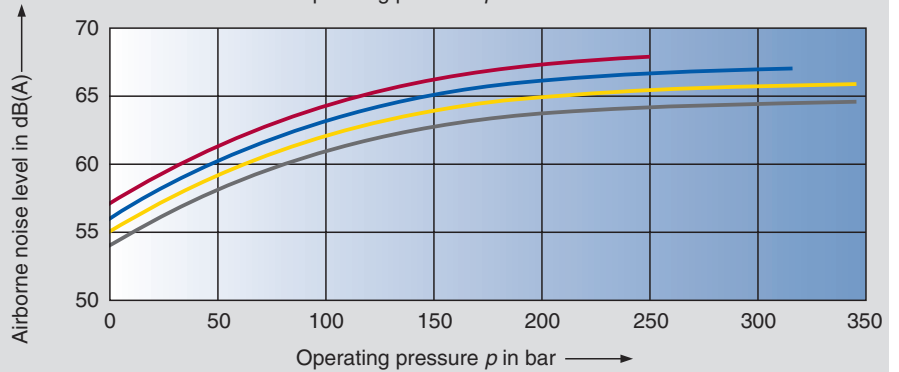
Input power P



Airborne noise level

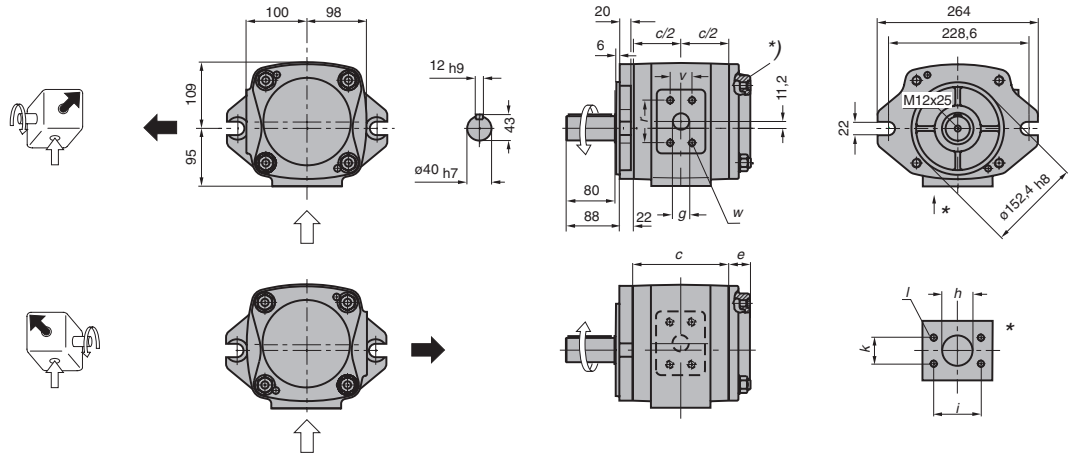
Measuring location 1 m axial

Note:
 Voith sound-measuring room (low-reverberation room). In an anechoic room the values will be 5 dB(A) lower.



IPV 6

Standard design



Weights and dimensions

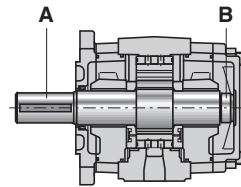
	c	e	g	h	i	k	l	r	v	w	kg
IPV 6-64	140	40	23	40	70	36	M12x20	52.4	26.2	M10x15	29,2
IPV 6-80	148	35	23	45	77.8	42.9	M12x20	70	36	M12x20	30,7
IPV 6-100	158	35	27	50	77.8	42.9	M12x20	70	36	M12x20	32,6
IPV 6-125	170	40	30	50	77.8	42.9	M12x20	70	36	M12x20	35,0

SAE flange no.

SAE flange no.	SAE flange no.
12	30
14	15
14	15
14	15

Permissible drive torques in Nm

	Drive shaft A	Secondary shaft B
IPV 6	1050	780



Type	Size	Direction of rotation Radial suction port
IPV 6	64	1
	80	
	100	6
	125	
IPV 6		

Mounting flange	Shaft end
Standard	
SAE-2-bolt flange	
<p>Dimensions as above</p>	<p>Dimensions as above</p>
Variants	
SAE-2-bolt flange	
<p>Dimensions as above</p>	<p>Involute splines ANSI B92. 1a 17 T 12/24 DP 30°</p>
SAE-4-bolt flange	
<p>Dimensions as above</p>	
VDMA 24560 DIN ISO 3019/2, 4-bolt flange	
<p>Dimensions as above</p>	

Designations for ordering: see p. 19

*) Opening must be closed during operation. Tightening torque MA = 18 Nm.
Before the pump is taken into service, the opening can be used as filling or deaeration, depending on the installation of the pump. Screw plug M10x1, hexagon socket, width across flats 6.

IPV 6

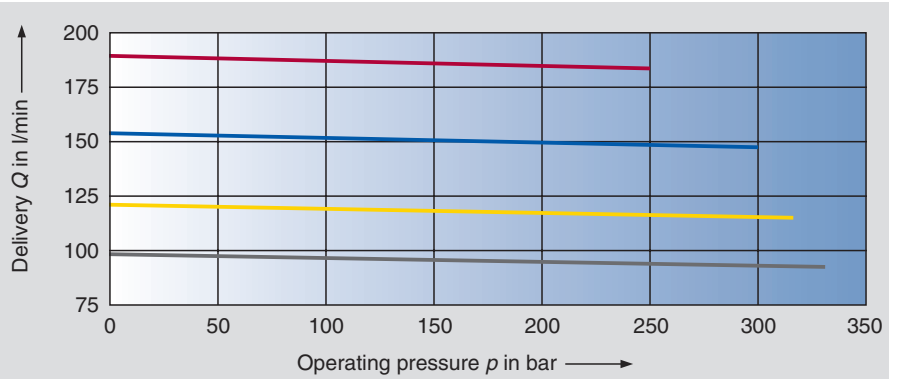
Performance curves

Measuring conditions:

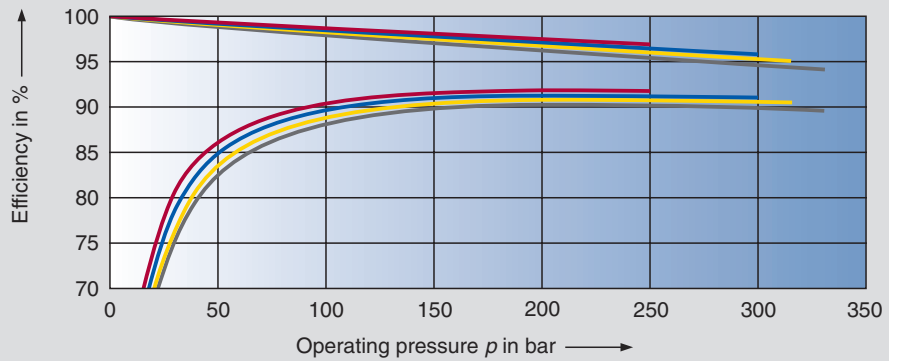
Speed $n = 1500 \text{ min}^{-1}$
 Viscosity $\nu = 46 \text{ cSt}$
 Operating temperature $t = 40^\circ \text{ C}$

- IPV 6-64
- IPV 6-80
- IPV 6-100
- IPV 6-125

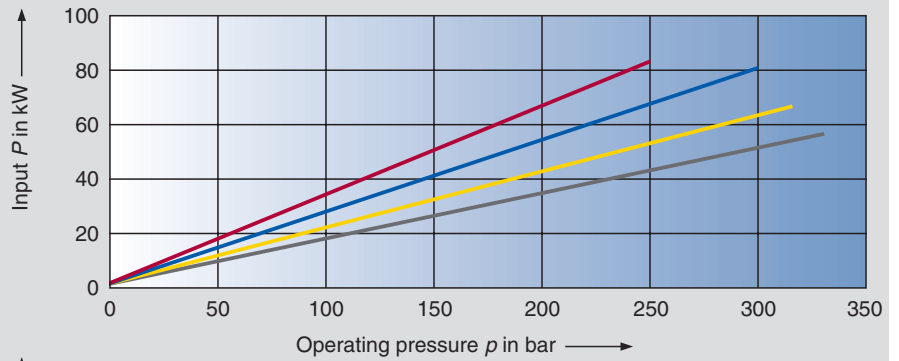
Delivery Q



Efficiency η_{ges} and η_{vol}



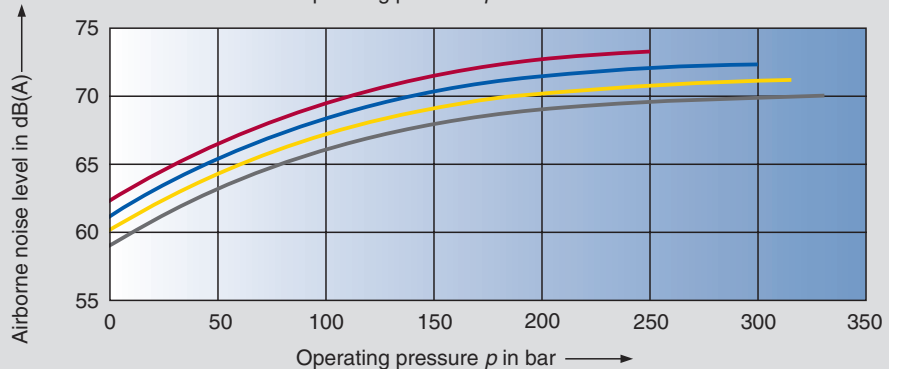
Input power P



Airborne noise level

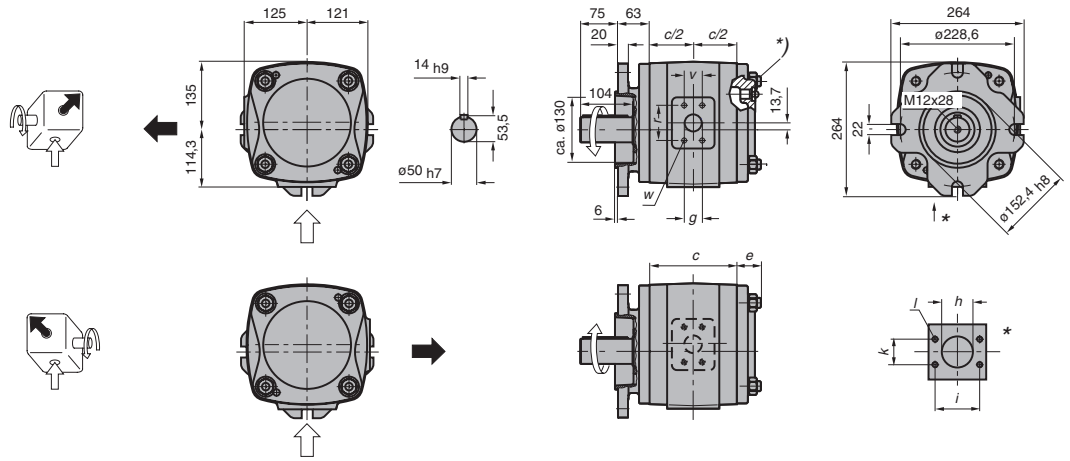
Measuring location 1 m axial

Note:
 Voith sound-measuring room (low-reverberation room). In an anechoic room the values will be 5 dB(A) lower.



IPV 7

Standard design



Weights and dimensions

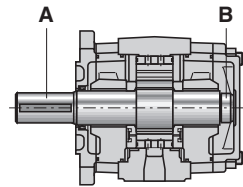
	c	e	g	h	i	k	l	r	v	w	kg
IPV 7-125	152	48	30	50	77.8	42.9	M12x20	70	36	M12x20	46,5
IPV 7-160	162	48	30	56	89	50.8	M12x20	70	36	M12x20	50
IPV 7-200	174	46	34	62	89	50.8	M12x20	70	36	M12x20	54
IPV 7-250	188	42	38	72	106.3	62	M16x25	70	36	M12x20	59

SAE flange no.

SAE flange no.	SAE flange no.
14	15
14	16
14	16
14	17

Permissible drive torques in Nm

	Drive shaft A	Secondary shaft B
IPV 7	1960	1200



Type	Size	Direction of rotation Radial suction port	Mounting flange		Shaft end
			Standard	SAE-4-bolt flange	
IPV 7	125	1	Standard	SAE-4-bolt flange	Dimensions as above
	160				
	200	6	Variants	Involute splines ANSI B92. 1a 15 T 12/24 DP 30°	
	250				
IPV 7			VDMA 24560 DIN ISO 3019/2, 4-bolt flange		

Designations for ordering: see p. 19

*) Opening must be closed during operation. Tightening torque MA = 18 Nm.
Before the pump is taken into service, the opening can be used as filling or deaeration, depending on the installation of the pump. Screw plug M10x1, hexagon socket, width across flats 6.

IPV 7

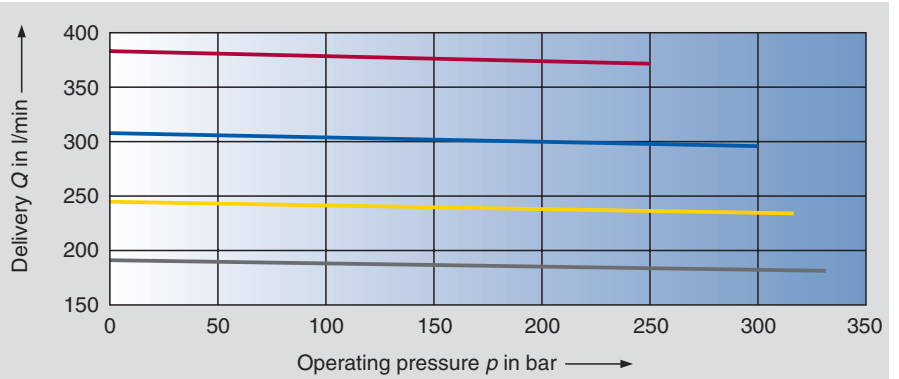
Performance curves

Measuring conditions:

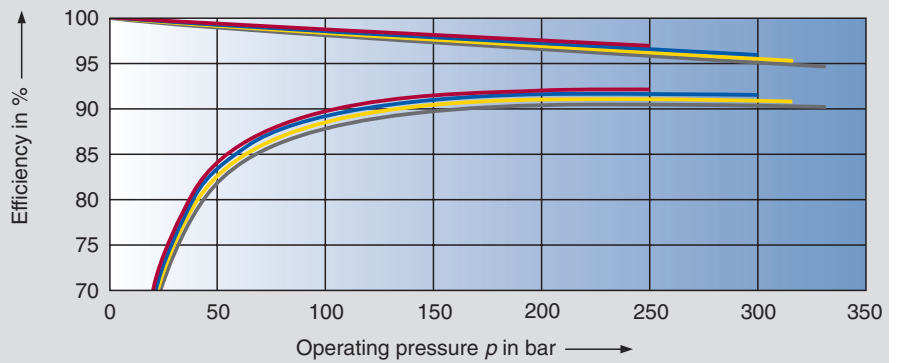
Speed $n = 1500 \text{ min}^{-1}$
 Viscosity $\nu = 46 \text{ cSt}$
 Operating temperature $t = 40^\circ \text{ C}$

— IPV 7-125
 — IPV 7-160
 — IPV 7-200
 — IPV 7-250

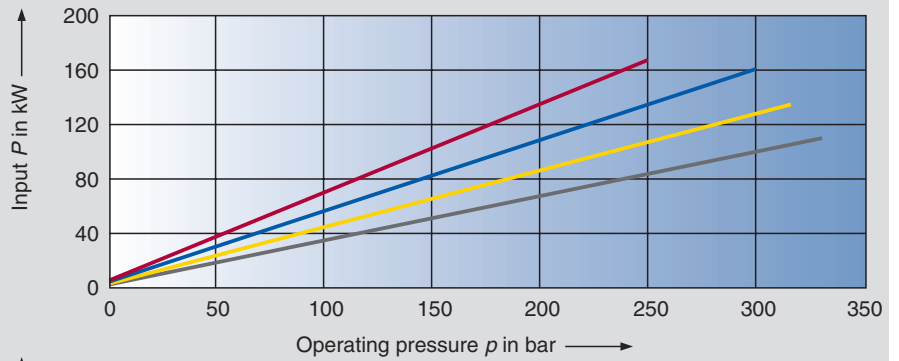
Delivery Q



Efficiency η_{ges} and η_{vol}



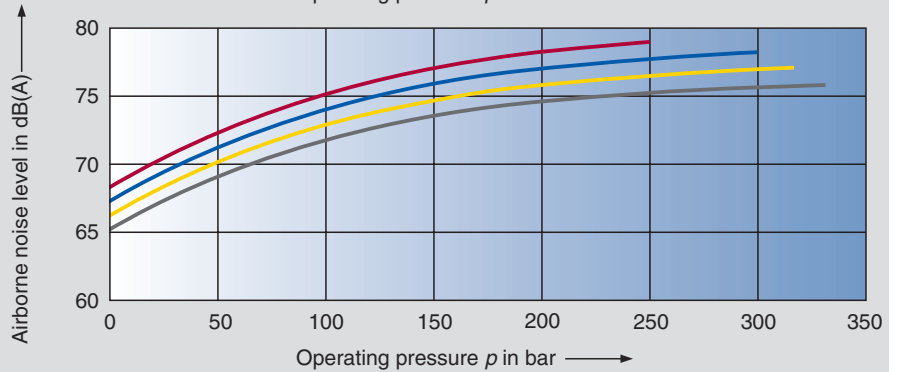
Input power P



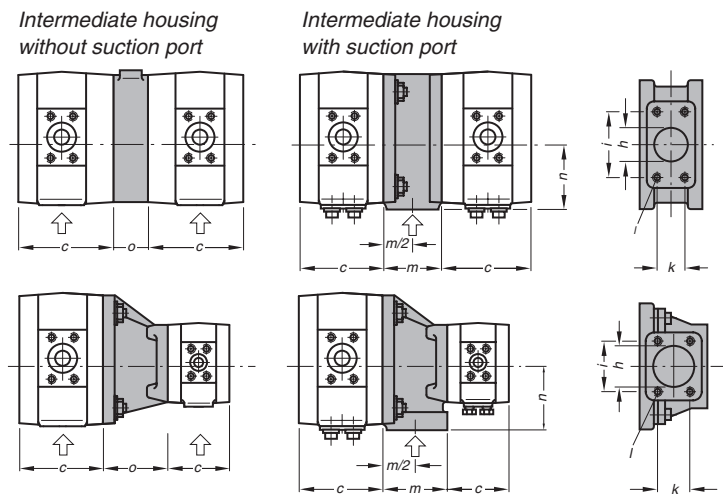
Airborne noise level

Measuring location 1 m axial

Note:
 Voith sound-measuring room (low-reverberation room). In an anechoic room the values will be 5 dB(A) lower.

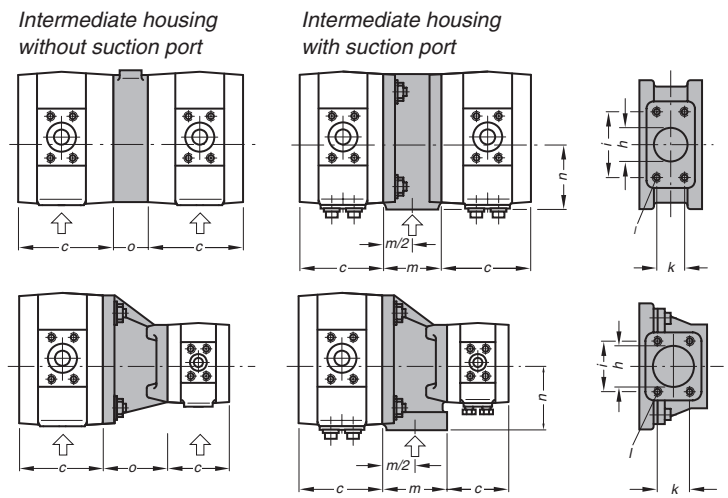


Intermediate housings for multiple-flow pumps



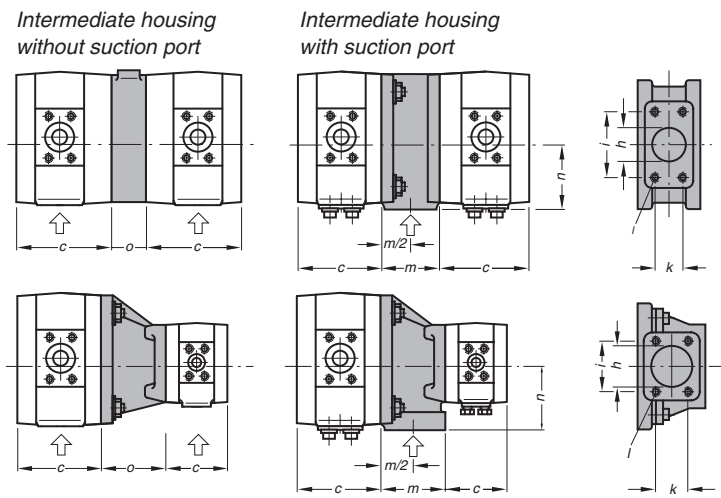
Type	Size	<i>m</i>	<i>m/2</i>	<i>n</i>	<i>o</i>	<i>h</i>	<i>i</i>	<i>k</i>	<i>l</i>	SAE suction flange no.
IPV	7/7	140	70	120	—	100	130,2	77,8	M 16 x 25 deep	18
IPV/C	7/7	—	—	—	56	—	—	—	—	—
IPC	7/7	—	—	—	—	—	—	—	—	—
IPV	7/6	140	70	120	—	100	130,2	77,8	M 16 x 25 deep	18
IPV/C	7/6	—	—	—	—	—	—	—	—	—
IPC/V	7/6	—	—	—	—	—	—	—	—	—
IPC	7/6	—	—	—	—	—	—	—	—	—
IPV/N	7/6	—	—	—	72	—	—	—	—	—
IPC/N	7/6	—	—	—	—	—	—	—	—	—
IPV	7/5	110	55	110	—	76	106,3	62	M 16 x 25 deep	17
IPV/C	7/5	—	—	—	—	—	—	—	—	—
IPC/V	7/5	—	—	—	—	—	—	—	—	—
IPC	7/5	—	—	—	—	—	—	—	—	—
IPV/N	7/5	—	—	—	70	—	—	—	—	—
IPC/N	7/5	—	—	—	—	—	—	—	—	—
IPV	7/4	110	55	110	—	76	106,3	62	M 16 x 25 deep	17
IPV/C	7/4	—	—	—	—	—	—	—	—	—
IPC/V	7/4	—	—	—	—	—	—	—	—	—
IPC	7/4	—	—	—	—	—	—	—	—	—
IPV/N	7/4	—	—	—	60	—	—	—	—	—
IPC/N	7/4	—	—	—	—	—	—	—	—	—
IPV	7/3	110	55	110	—	76	106,3	62	M 16 x 25 deep	17
IPC/V	7/3	—	—	—	—	—	—	—	—	—
IPV	6/6	110	55	100	—	76	106,3	62	M 16 x 25 deep	17
IPV/C	6/6	—	—	—	55	—	—	—	—	—
IPC	6/6	—	—	—	—	—	—	—	—	—

Intermediate housings for multiple-flow pumps



Type	Size	<i>m</i>	<i>m/2</i>	<i>n</i>	<i>o</i>	<i>h</i>	<i>i</i>	<i>k</i>	<i>l</i>	SAE suction flange no.
IPV/N	6/6	–	–	–	72	–	–	–	–	–
IPC/N	6/6	–	–	–	72	–	–	–	–	–
IPV	6/5	–	–	–	–	–	–	–	–	–
IPV/C	6/5	110	55	100	–	76	106,3	62	M 16 x 25 deep	17
IPC/V	6/5	110	55	100	–	76	106,3	62	M 16 x 25 deep	17
IPC	6/5	–	–	–	–	–	–	–	–	–
IPV/N	6/5	–	–	–	70	–	–	–	–	–
IPC/N	6/5	–	–	–	70	–	–	–	–	–
IPV	6/4	–	–	–	–	–	–	–	–	–
IPV/C	6/4	110	55	100	–	76	106,3	62	M 16 x 25 deep	17
IPC/V	6/4	110	55	100	–	76	106,3	62	M 16 x 25 deep	17
IPC	6/4	–	–	–	–	–	–	–	–	–
IPV/N	6/4	–	–	–	60	–	–	–	–	–
IPC/N	6/4	–	–	–	60	–	–	–	–	–
IPV	6/3	90	45	90	–	60	89	50,8	M 12 x 20 deep	16
IPC/V	6/3	90	45	90	–	60	89	50,8	M 12 x 20 deep	16
IPN	6/6	–	–	–	67	–	–	–	–	–
IPN/V	6/5	–	–	–	64	–	–	–	–	–
IPN/C	6/5	–	–	–	64	–	–	–	–	–
IPN	6/5	–	–	–	66	–	–	–	–	–
IPN/V	6/4	–	–	–	64	–	–	–	–	–
IPN/C	6/4	–	–	–	64	–	–	–	–	–
IPN	6/4	–	–	–	63	–	–	–	–	–
IPN/V	6/3	–	–	–	58	–	–	–	–	–
IPV	5/5	–	–	–	–	–	–	–	–	–
IPV/C	5/5	90	45	82	–	60	89	50,8	M 12 x 20 deep	16
IPC	5/5	–	–	–	–	–	–	–	–	–

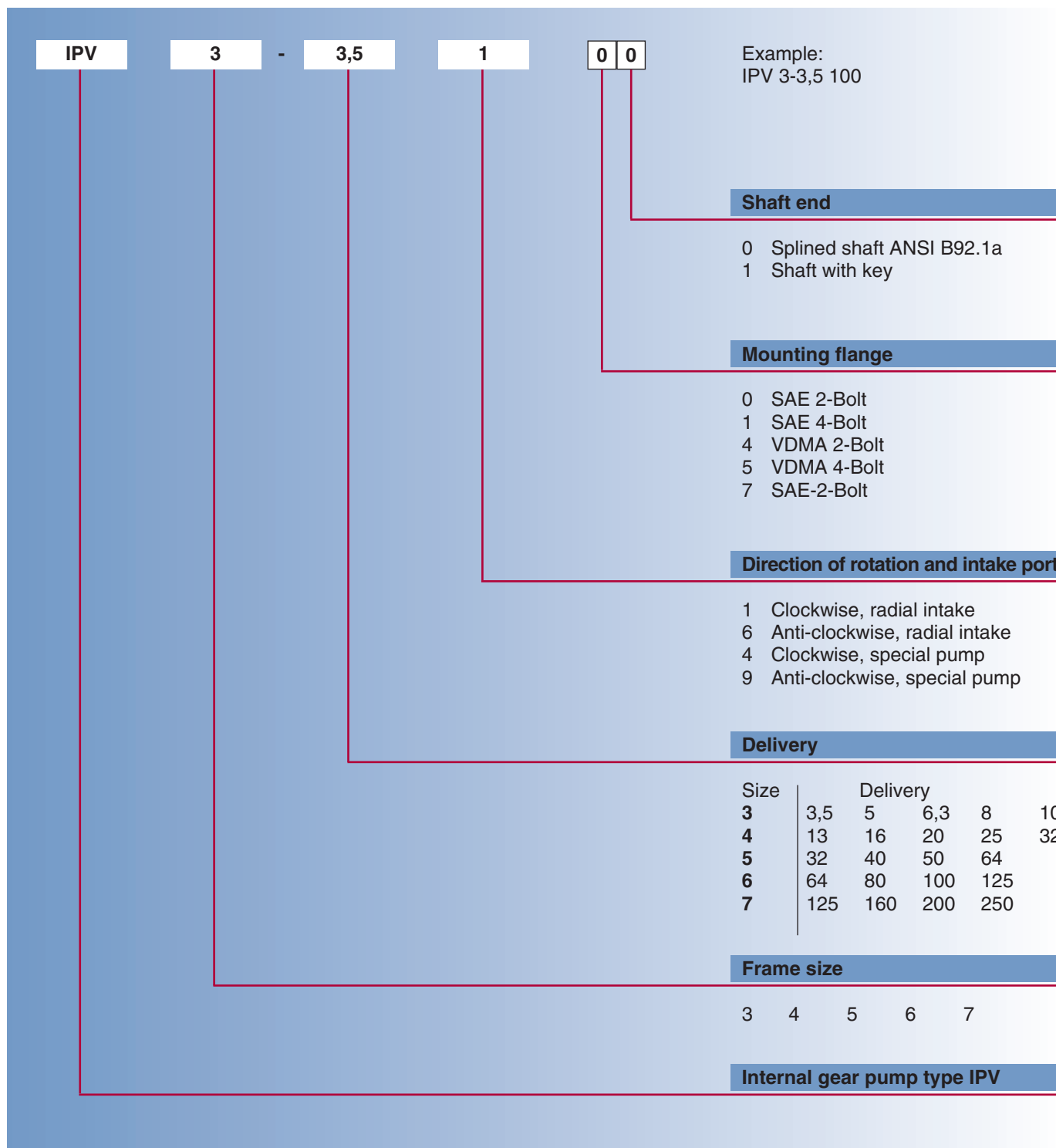
Intermediate housings for multiple-flow pumps



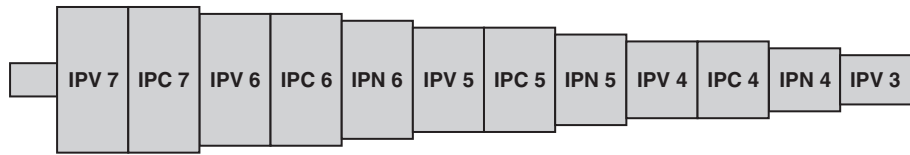
Type	Size	<i>m</i>	<i>m/2</i>	<i>n</i>	<i>o</i>	<i>h</i>	<i>i</i>	<i>k</i>	<i>l</i>	SAE suction flange no.
IPV/N	5/5	–	–	–	64	–	–	–	–	–
IPC/N	5/5	–	–	–	64	–	–	–	–	–
IPV	5/4	–	–	–	–	–	–	–	–	–
IPV/C	5/4	90	45	82	–	60	89	50,8	M 12 x 20 deep	16
IPC/V	5/4	–	–	–	–	–	–	–	–	–
IPC	5/4	–	–	–	–	–	–	–	–	–
IPV/N	5/4	–	–	–	60	–	–	–	–	–
IPC/N	5/4	–	–	–	60	–	–	–	–	–
IPV	5/3	80	40	82	–	50	77,8	42,9	M 12 x 20 deep	15
IPC/V	5/3	–	–	–	–	–	–	–	–	–
IPN	5/5	–	–	–	62	–	–	–	–	–
IPN/V	5/4	–	–	–	60	–	–	–	–	–
IPN/C	5/4	–	–	–	60	–	–	–	–	–
IPN	5/4	–	–	–	54	–	–	–	–	–
IPN/V	5/3	–	–	–	50	–	–	–	–	–
IPV	4/4	–	–	–	–	–	–	–	–	–
IPV/C	4/4	66	33	70	–	40	70	36	M 12 x 20 deep	30
IPC	4/4	–	–	–	–	–	–	–	–	–
IPV/N	4/4	–	–	–	52	–	–	–	–	–
IPC/N	4/4	–	–	–	52	–	–	–	–	–
IPV	4/3	66	33	70	–	40	70	36	M 12 x 20 deep	30
IPC/V	4/3	–	–	–	–	–	–	–	–	–
IPN	4/4	–	–	–	48	–	–	–	–	–
IPN/V	4/3	–	–	–	46	–	–	–	–	–
IPV	3/3	45	22,5	65	–	25	52,4	26,2	M 10 x 15 deep	12

Type codes

Designations for ordering



Multiple-flow pump combinations



Pump combinations in order of size and type.

Combinations with IPV pumps

IPV pumps of identical or different sizes may be combined into multi-flow pumps. All sizes listed as single pumps with their relevant displacements are available as dual and triple-flow pumps, arranged in rising order of size and displacement volume.

Combination IPV pumps with IP pumps

IPV pumps may also be combined with IPC (medium-pressure) and IPN (low-pressure) pumps. The pumps should be arranged in order of type and size, as mentioned above. It is permissible to skip one size, i.e. it is not necessary to combine pumps in adjacent group sizes.

Combinations with other pump systems are possible (see pp. 22 to 25).

With identical sizes (V, C, N) and identical displacements (3, 4, 5, 6, 7), the pump with the larger displacement volume is arranged nearest to the drive.

Mounting and assembly

Multi-flow pumps are usually flange-mounted to the drive unit. The customer can choose from a variety of flanges (see separate data sheets, IPC catalogue G 1209, and IPN catalogue G 1418). The same applies to shaft ends.

The relevant intermediate housings are on pages 16 – 18.

Apart from double and triple flow pumps, quadruple flow pumps are also possible, but require manufacturer's approval.

Suction connection for multiple flow pumps

With combinations of IPV and/or IPC pumps, the customer may in some cases choose between units where the intake port is located in the intermediate housing and units where it is located on a pump stage.

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

Step-by-step selection guide

1. Determine pressure range = type (V, C, N)
2. Determine displacement = size (3, 4, 5, 6, 7)
3. Determine pump order (see illustration at the top of this page)
4. Determine direction of rotation and intake port (see table below)
5. Determine mounting flange and shaft end (see individual data sheets for pump types)
6. Check order details

Ordering details

Type	Size	Configurations		
		Direction of rotation and intake	Mounting flange	Shaft end
IPV IPC	See data sheets of individual pumps	2 7	0 1 1	1 0
IPV IPC IPN		1 6	4 5 5	
IPV IPC		2 7	7	
IPV IPC IPN		1 6		
IPV IPC IPN		3 8		
		3 8		
		Clockwise Anti-clockwise		

Variants and dimensions as per data sheets for individual pumps

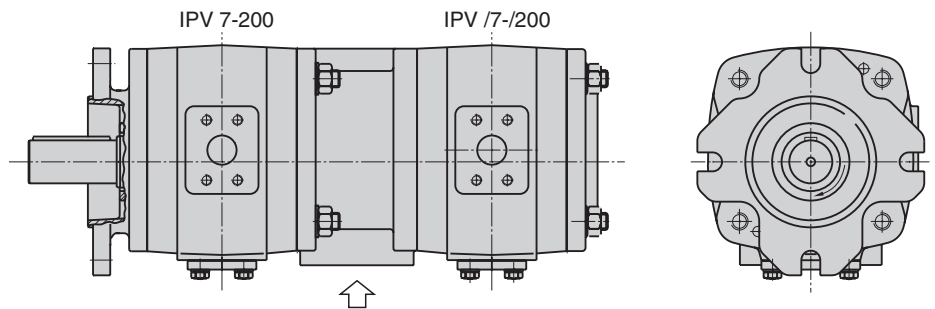
Dimensions as per data sheets for individual pumps

Ordering details

Ordering examples

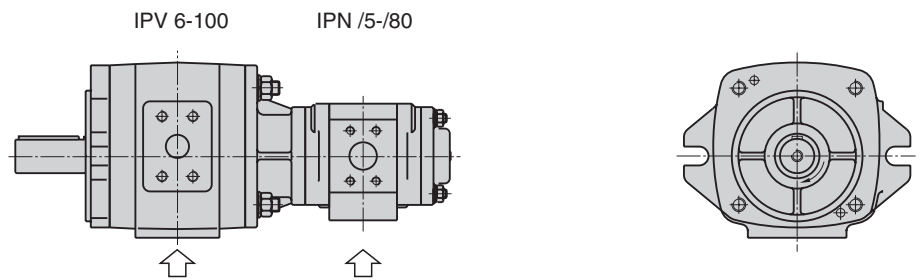
IPV 7/7 – 200/200 211

- IPV = Type: high pressure
- 7/7 = Sizes
- 200/200 = Displacement sizes (approx. displacement volume in cm³/U)
- 2 = Rotation clockwise, suction port in intermediate housing
- 1 = SAE-4-bolt flange
- 1 = Shaft end with key



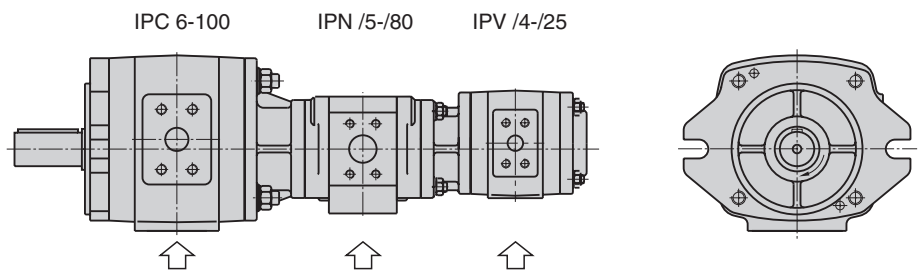
IPV/N 6/5 – 100/80 101

- IPV = Type: high pressure
- N = Type: low-pressure
- 6/5 = Sizes
- 100/80 = Displacement sizes (approx. displacement volume in cm³/U)
- 1 = Rotation clockwise, suction port on each pump stage
- 0 = SAE-2-bolt flange
- 1 = Shaft end with key



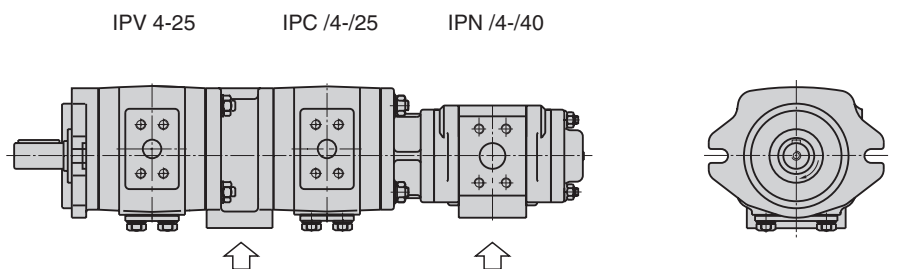
IPC/N/V 6/5/4 – 100/80/25 101

- IPC = Type: medium-pressure
- N = Type: low-pressure
- V = Type: high-pressure
- 6/5/4 = Sizes
- 100/80/25 = Displacement sizes (approx. displacement volume in cm³/U)
- 1 = Rotation clockwise, suction port on each pump stage
- 0 = SAE-2-bolt flange
- 1 = Shaft end with key



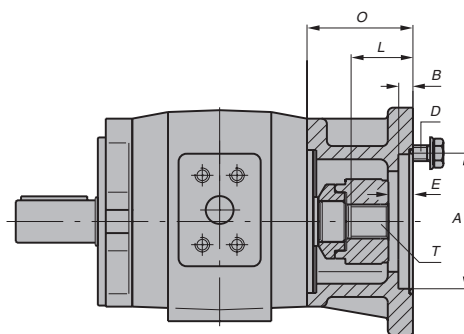
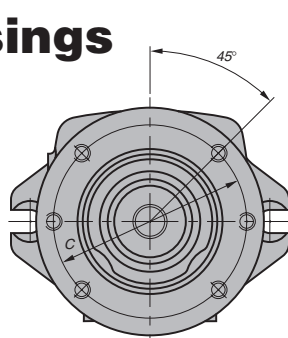
IPV/C/N 4/4/4 – 25/25/40 371

- IPV = Type: high-pressure
- C = Type: medium-pressure
- N = Type: low-pressure
- 4/4/4 = Sizes
- 25/25/40 = Displacement sizes (approx. displacement volume in cm³/U)
- 3 = Rotation clockwise, suction port in intermediate housing and pump stage
- 7 = SAE-2-bolt flange
- 1 = Shaft end with key



Intermediate housings with coupling

Voith internal gear pumps type IPV, IPC, or IPH can be combined with pumps of a different design. They can also be used for different operating media.



L = Max. possible shaft length
 T = Number of teeth of the splined hub with involute flanks (ANSI B 92.1a)
 Pressure angle 30°
 B = available length to centre

Dimensions

The dimensions of Voith internal gear pumps type IPV 4 to 7, IPC 4 to 7, and IPH 4 to 6 can be seen from the data sheets for the corresponding individual pump. The dimensions of pumps of a different design are listed in the catalogues of the manufacturer concerned.

The options available in respect of mounting flange and shaft end correspond to the information in the data sheet for the individual pump.

Intermediate housing	O	A	B	C	D	O-ring	E	L	T	Pitch
IPC 4/ IPH 4/ IPV 5/ IPC 5/	100	82,55 ^{G7}	7	106,5±0,3	M 10	83x3	18	38	11	16/32
IPH 5/ IPV 6/ IPC 6/	102	82,55 ^{G7}	7	106,5±0,3	M 10	83x3	18	38	11	16/32
IPH 6/ IPV 7/ IPC 7/	103	82,55 ^{G7}	7	106,5±0,3	M 10	83x3	18	38	11	16/32
IPH 4/ IPV 5/ IPC 5/	104	101,6 ^{G7}	9	146±0,3	M 12	102x3	17	41	13	16/32
IPH 5/ IPV 6/ IPC 6/	105	101,6 ^{G7}	9	146±0,3	M 12	102x3	17	41	13	16/32
IPH 6/ IPV 7/ IPC 7/	106	101,6 ^{G7}	9	146±0,3	M 12	102x3	17	41	13	16/32
IPV 5/ IPC 5/	107	101,6 ^{G7}	9	146±0,3	M 12	102x3	17,5	46	15	16/32
IPH 5/ IPV 6/ IPC 6/	108	101,6 ^{G7}	9	146±0,3	M 12	102x3	17,5	46	15	16/32
IPH 6/ IPV 7/ IPC 7/	109	101,6 ^{G7}	9	146±0,3	M 12	102x3	17,5	46	15	16/32
IPH 5/ IPV 6/ IPC 6/	110	127 ^{G7}	9	181±0,3	M 16	126x3	8	59	14	12/24
IPH 6/ IPV 7/ IPC 7/	111	127 ^{G7}	9	181±0,3	M 16	126x3	8	59	14	12/24
IPV 6/ IPC 6/	112	127 ^{G7}	9	181±0,3	M 16	126x3	8	63	17	12/24
IPH 6/ IPV 7/ IPC 7/	113	127 ^{G7}	9	181±0,3	M 16	126x3	8	63	17	12/24
IPV 7/ IPC 7/	114	152,4 ^{G7}	9	228,6±0,3	M 18	150x3	8	118	13	8/16

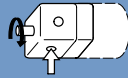
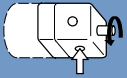



Fastening bolts and O-ring are included in the scope of supply of the Voith pump.

Intermediate housings with coupling

Combinations

consisting of Voith internal gear pumps type IPV, IPC, or IPH and intermediate housings with coupling suitable for mounting pumps with a mounting flange as per DIN ISO 3019-1 and a drive shaft with involute splines as per ANSI B 91.1a.

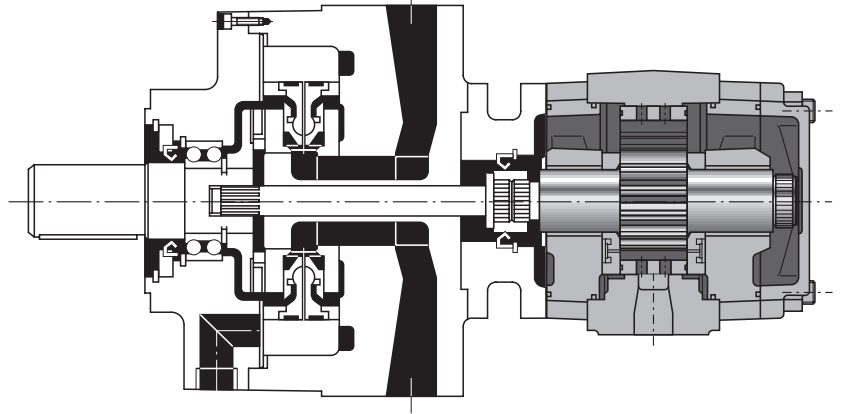
* For further options see dimension sheets of individual pumps.

Type	Intermediate housing	Direction of rotation and intake port		Mounting flange		Shaft end*
		 Clock-wise 1	 6 Anti-clockwise	 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

Ordering example: IPV 5-50 with intermediate housing 104 for clockwise rotation with SAE 2-bolt flange and cylindrical drive shaft with key

IPV 5 / 104-50 / ... 101

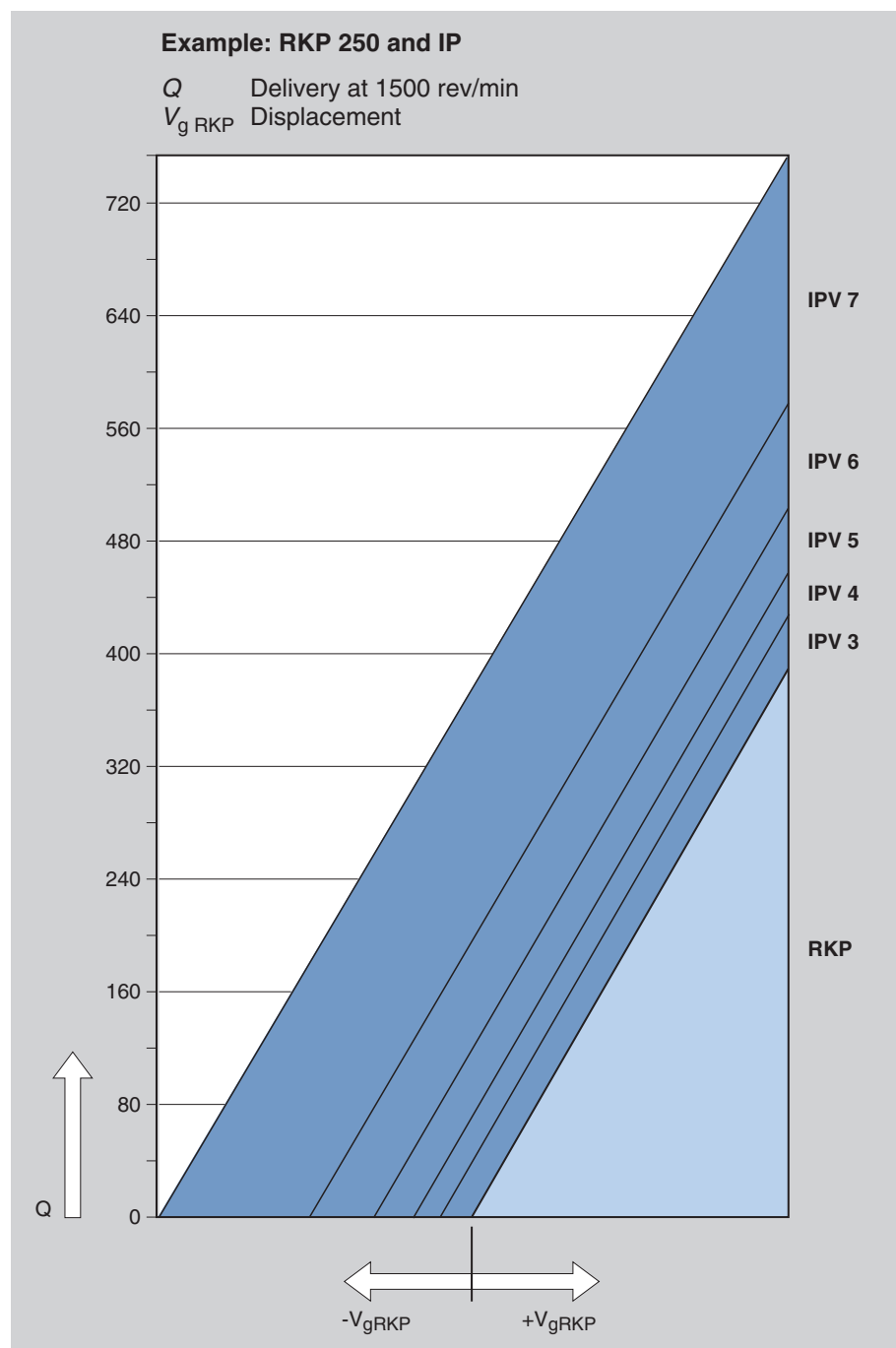
Combination of variable-displacement pumps with IP internal gear pumps



Advantages and possibilities

- An infinitely variable delivery flow is obtained by adding the flow of the variable displacement pump to that of the fixed displacement pump.
- Two independent delivery flows.

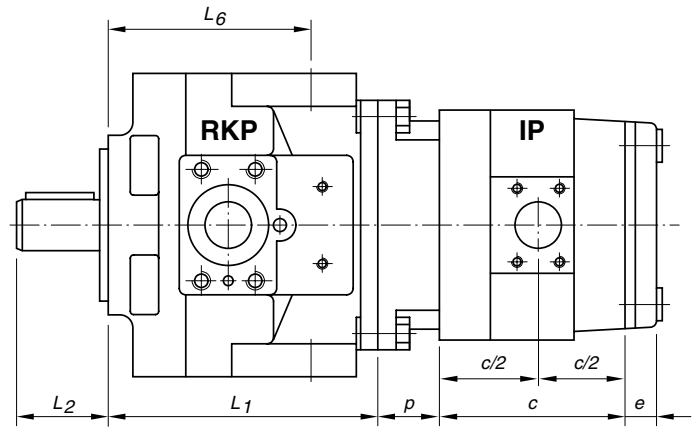
Addition of flows



Combination of variable-displacement pumps with IP internal gear pumps

Dimensions

IP pumps with intermediate flange and transaxle are also available separately.



Dimensions RKP

Type	L_1	L_2	L_6	Supplier
RKP 110 RKP 125	Dimensions as per Wepuko data sheets			Wepuko
RKP 160 RKP 180	Dimensions as per Wepuko data sheets			Wepuko
RKP 250	Dimensions as per Wepuko data sheets			Wepuko
RKP 32 RKP 45	Dimensions as per Moog data sheets			Moog Moog
RKP 63 RKP 80	Dimensions as per Moog data sheets			Moog Moog
RKP 90	Dimensions as per Moog data sheets			Moog

Length of adaptor flange IPV

	RKP 110/125 RKP 160/180 p	RKP 250 p	RKP 32/45 p	RKP 63/80/90 p
IPV 3	17	17	–	–
IPV 4	17	17	55	55
IPV 5	40	17	55	55
IPV 6	66,5	72,5	–	55
IPV 7	66,5	72,5	–	–

The IP dimensions can be seen from the dimension sheets for the individual pumps.

Ordering example

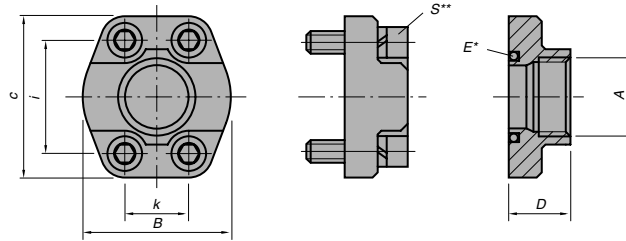
for combination pump, intermediate housing, and drive shaft

IPV /5 - /64 129 (Bosch RKP 63)

IPV /5/5 - /64/64 229 (Bosch RKP 63)

SAE suction and discharge flanges

as per SAE J 518 C
Code 61



Single-piece SAE flange – dimensions

	A	B	C	D	E*	i	k	S**	Perm. pressure [bar]
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	45	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

* O-ring
ISO-R 1629 NBR (Buna N)

** Bolt DIN 912

¹⁾ Special Voith design deviating from
SAE J 518 C Code 61

DBV pressure relief valves

Stepless mechanical adjustment
Externally unloadable
Control by solenoid or external pressure.

Brief description

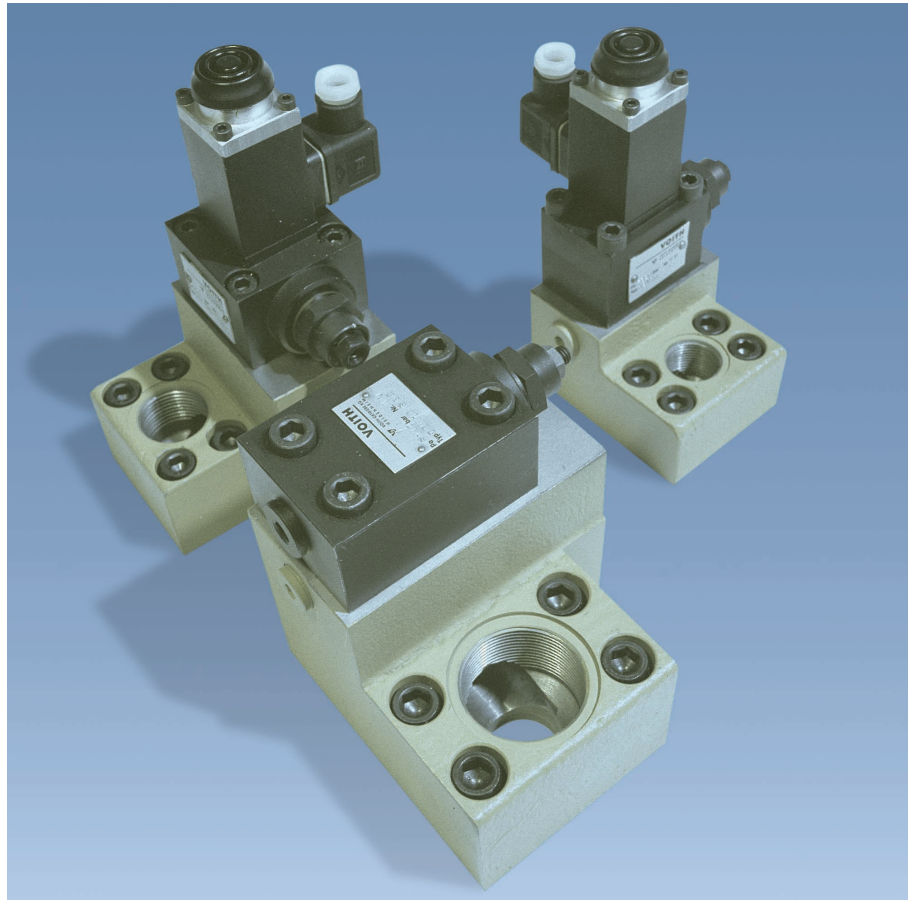
Pressure relief valves type DBV are designed for controlling and safeguarding operating pressure and volume flow in a hydraulic system.

Pressure limitation is performed by a steplessly mechanically adjustable spring-loaded seat valve. The valve opens when the maximum operating pressure is reached. The restricted control oil flowing off produces a pressure difference at the main piston causing it to open and connect the pump to the reservoir.

Independent of the adjusted maximum operating pressure the unit can be switched to open centre operation by hydraulic or electromagnetic means or via external control oil connection.

The DBV 50/60 effects an automatic pressure-dependent connection/disconnection of the delivery flow (hysteresis normally 10% of system pressure).

DBV valves are available with SAE flanges in four internal diameters (10, 16, 25, 32 mm) for direct mounting on hydraulic pumps, especially Voith pumps. The installation position is optional.



Features:

- Protection, control, and switching by one valve.
- Simple hydraulic circuits permit the use of fixed-displacement pumps for applications where variable-displacement pumps would otherwise have to be used.
- Maximum utilization of efficiency in the case of multiple-flow pumps.
- Suitable for systems where pressure is up to 320 bar.
- Cost-effective due to direct connection to the hydraulic pump.
- Optionally with electrical or hydraulic relief.
- Modular principle.
- Short response times.
- Trouble-free operation.
- Low pressure rise and minimum pressure peaks.

For technical data and dimensions see Voith brochure G 818.

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