

Voith Turbo

VOITH

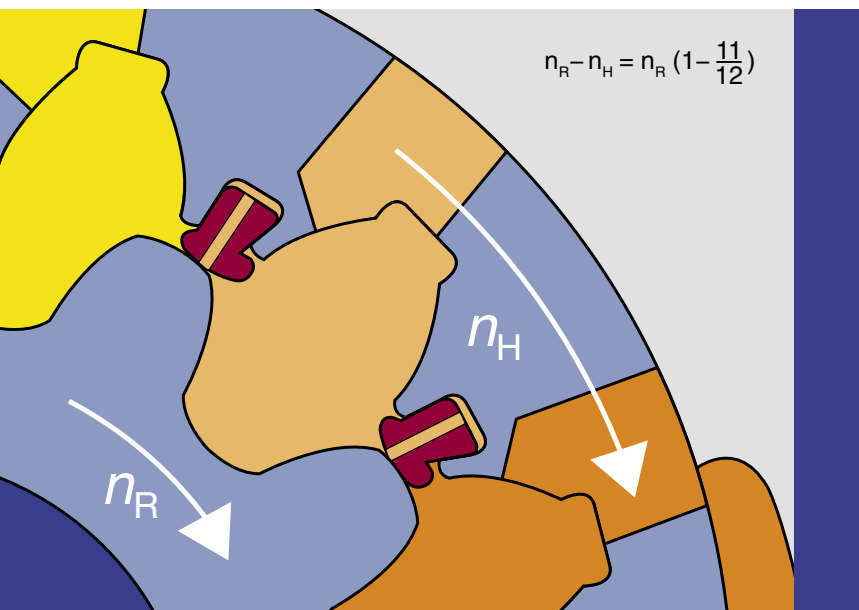
**Further developments in internal gear pumps:
IPM, IPNE/ME, IPVS**



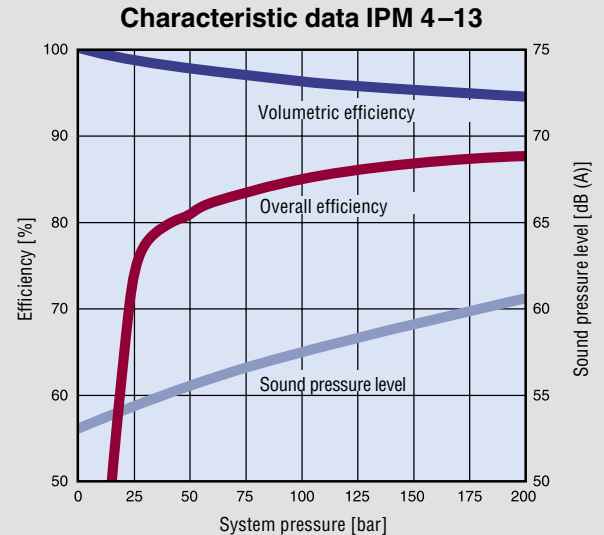
Type IPM internal gear pump – ideal for the medium-pressure range

IPN low pressure pumps, with the Voith Superlip® for radial gap compensation, have proven themselves successfully in the market for many years. An additional axial compensation led to a significant rise in permitted pressure: 175 bar continuous and 210 bar peak. And so the IPM pump series was created – an ideal addition to the IPC series with respect to pressure and delivery. A further plus for the new IPM pump: its excellent price/performance ratio.

Superlip® Principle



Efficiency and sound pressure levels IPM 4-13



The Voith Superlip® Principle

- Patented radial gap compensation
- Pinion shaft and internal gear involute geared
- Displacement process over a range of 180°
- Displacement cavity sealed by two or three pinion tooth contacts
- Compensation elements in pinion tooth of the internal gear
- Pressure strength and radial movement of the sealing element are limited
- Sealing element and tooth geometry of the pinion shaft reduce compression oil, thereby lowering pressure peaks as well as noise development in the process
- Sealing procedure in the gear meshing proceeds at a sliding speed of almost 0 m/s
- Sealing elements only touch the pinion head over a small angle of rotation range. This ensures low levels of wear during operation and a long service life (in comparison with vane pumps, for example).

Typical IPM characteristics

Type, size – delivery	Displacement per revolution [cm ³]	Speed n		Delivery	Pressures within the range $n_{\min} - n_{\max}$	
		min.	max.	at 1500 min ⁻¹	Continuous pressure	Peak pressure
		[min ⁻¹]	[min ⁻¹]	[l/min]	[bar]	[bar]
IPM 4 – 6.5	6.7	400	3000	10.1	175	210
IPM 4 – 8	8.2	400	3000	12.3	175	210
IPM 4 – 10	10.4	400	3000	15.6	175	210
IPM 4 – 13	13.1	400	3000	19.7	175	210
IPM 4 – 16	16.2	400	3000	24.3	175	210
IPM 4 – 20	20.1	400	3000	30.2	175	210
IPM 5 – 25	25.2	available soon				
IPM 5 – 32	32.3					
IPM 5 – 40	40.4					
IPM 6 – 50	50.3					
IPM 6 – 64	64.1					
IPM 6 – 80	80.3					

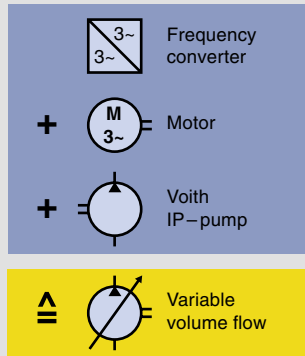
Features

- Voith Superlip® Principle with additional axial compensation
- High efficiency levels
- Very low flow and pressure pulsation
- Low noise levels
- Compact design
- Multiple pumps and pump combinations possible (even with other manufacturers!)
- Suitable for variable-speed drives (variable volume flow)

Applications

- Applications which require cost-effective medium-pressure pumps
- Medium-pressure pump in combination with other series of pumps

Type IPNE/ME internal gear pump – innovative for low-viscosity media and cooling lubricants



Voith EPAF system

With the low-pressure pump IPN and the medium pressure pump IPM, two high-quality pumps with an excellent price/performance ratio have been launched on the market. Adapted and improved materials have allowed these pump series to be optimized for the pumping of coolants and lubricants. Nothing stands in the way of using the new IPNE/ME pumps in metal cutting machining areas any longer. In conjunction with the Voith EPAF system for drive speed control, variable volume flows can be created economically.

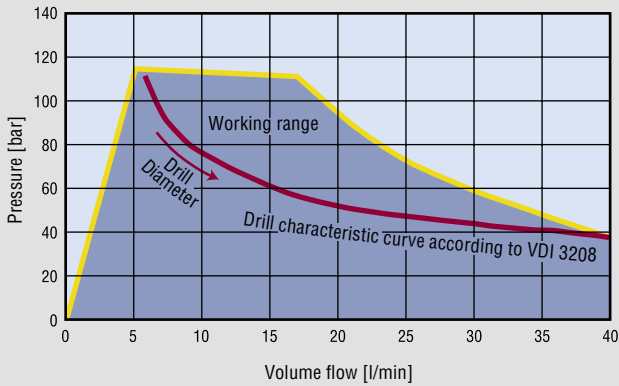
EPAF components

- Frequency converter
- Asynchronous motor
- Voith internal gear pump
- Control unit

Generation of variable volume flows with a constant flow pump

Advantages

- Cost-effective dimensioning of cooling lubricant circuits
- Reduced connected power
- Energy savings



Example:
Internally cooled tools
with EPAF system

A variable-speed IPNE/ME pump
produces the required cooling lubricant
flow through the drilling tool in the whole
working area.

Advantages:

- Energy savings
- Fewer components required
- Automatic wear compensation

Features

- Voith Superlip® Principle with additional axial compensation
- Viscosity ranges of the pressure fluids:
 - IPNE: 10 – 300 mm²s⁻¹ (cSt)
 - IPME: 1 – 300 mm²s⁻¹ (cSt)
- High efficiency
- Very low flow and pressure pulsation
- Low noise levels
- Compact design
- Multiple pumps and pump combinations possible (even with other manufacturers!)
- Suitable for variable-speed drives (variable volume flow)

Applications

- Applications with low-viscosity media as pressure fluid
- Pumping of cooling lubricants in the machine tool industry, e.g.:
 - deep-hole drilling machines
 - machining centers
 - transfer lines

Typical IPNE/ME characteristics

Type, size – delivery	Displacement per revolution [cm ³]	Speed n		Delivery [l/min]	Pressures within the range n _{min} – n _{max}		
		min.	max.		Continuous pressure [bar]	Peak pressure [bar]	
		[min ⁻¹]	[min ⁻¹]				
IPNE 4 – 32	32.1	400	3600	48.1	60	60	
IPNE 4 – 40	40.1	400	3600	60.1	50	50	
IPNE 4 – 50	50.2	400	3600	75.3	40	40	
IPNE 5 – 64	64.2	400	2500	96.3	60	60	
IPNE 5 – 80	79.9	400	2500	119.8	50	50	
IPNE 5 – 100	100.2	400	2500	150.3	40	40	
IPNE 6 – 125	125.0	400	2000	187.5	60	60	
IPNE 6 – 160	159.9	400	2000	239.8	50	50	
IPNE 6 – 200	199.7	400	2000	299.5	40	40	
IPME 4 – 13	13.1	400	3600	19.7	1 – 10 cSt: 100 10 – 300 cSt: 125	1 – 10 cSt: 100 10 – 300 cSt: 125	
IPME 5 – 25	25.2	available soon					
IPME 6 – 50	50.3						

Type IPVS internal gear pump – optimal for the highest pressures

IPV high pressure pumps with radial and axial sealing gap compensation as well as volume-optimized involute gearing provide extremely high pressures in countless machines. By using even higher quality materials and refining the design, it has again been possible to raise their permitted peak pressures by more than 20%. This makes the new IPVS pumps the optimal components for systems which require peak pressures of up to 420 bar and continuous pressures of up to 345 bar.

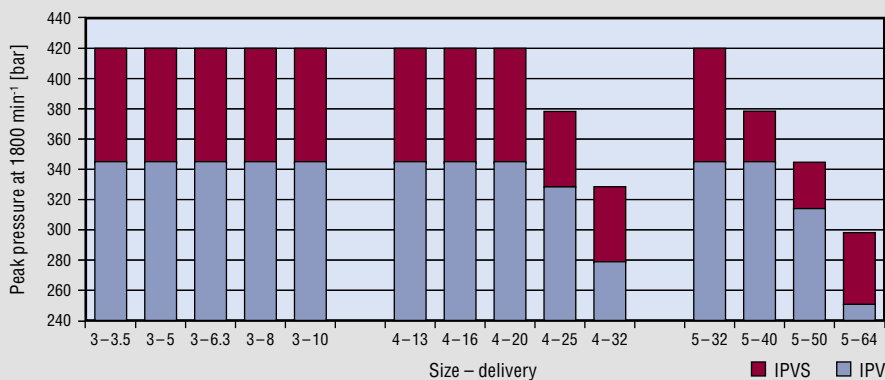
Features

- Radial and axial sealing gap compensation
- Volume-optimized involute gearing
- High efficiency
- Very low flow and pressure pulsation
- Low noise levels
- Compact design
- 6 000 psi pressure port
- Multiple pumps and pump combinations possible (even with other manufacturers!)
- Suitable for variable-speed drives (variable volume flow)

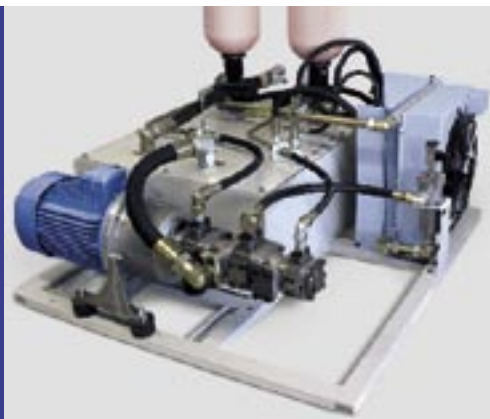
Applications

- Applications which require very high continuous and peak pressures
- Equipment with fast switching valves
- Systems with high pressure rise gradients and peak pressure values
- Accumulator charging operation

Increase in peak pressure



Hydraulic unit



Typical IPVS characteristics

Type, size – delivery	Displacement per revolution [cm ³]	Speed n		Delivery	Continuous pressure	Peak pressure	Peak pressure	
		min.	max.	at 1500 min ⁻¹	in range n _{min} – 1800 min ⁻¹	in range n _{min} – 1800 min ⁻¹	at n _{max}	
		[min ⁻¹]	[min ⁻¹]	[l/min]	[bar]	[bar]	[bar]	
IPVS 3 – 3.5	3.6	400	3600	5.4	345	420	345	
IPVS 3 – 5	5.2	400	3600	7.8	345	420	345	
IPVS 3 – 6.3	6.4	400	3600	9.6	345	420	345	
IPVS 3 – 8	8.2	400	3600	12.3	345	420	345	
IPVS 3 – 10	10.2	400	3600	15.3	345	420	345	
IPVS 4 – 13	13.3	400	3600	19.9	345	420	345	
IPVS 4 – 16	16.3	400	3400	24.4	345	420	345	
IPVS 4 – 20	20.7	400	3200	31.0	345	420	345	
IPVS 4 – 25	25.4	400	3000	38.1	315	380	330	
IPVS 4 – 32	32.6	400	2800	48.9	280	380	280	
IPVS 5 – 32	33.1	400	3000	49.6	345	420	315	
IPVS 5 – 40	41.0	400	2800	61.5	330	380	315	
IPVS 5 – 50	50.3	400	2500	75.4	300	345	280	
IPVS 5 – 64	64.9	400	2200	97.3	265	300	250	
IPVS 6 – 64	64.1	in development						
IPVS 6 – 80	80.7							
IPVS 6 – 100	101.3							
IPVS 6 – 125	126.2							
IPVS 7 – 125	125.8							
IPVS 7 – 160	160.8							
IPVS 7 – 200	202.7							
IPVS 7 – 250	251.7							

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