Benefits that convince

Internal gear pumps from Voith Turbo H + L Hydraulic are working reliably in hundreds of thousands of machines worldwide. Sophisticated technology, robust design and cost-efficient operation have convinced thousands of customers to trust Voith. Based on that trust, we have become the world market leader for high-pressure internal gear pumps with gap compensation.

Features that count

The market requires hydraulic pumps that are quiet and compact with minimal pressure pulsations at simultaneously high efficiencies. Voith Turbo H + L Hydraulic has met these requirements with the IPV pumps, which feature radial and axial sealing gap compensation with volume-optimized involute gearing.

Machines that run

Rarely seen, but hard at work in countless machines, Voith Turbo H + L Hydraulic internal gear pumps reliably provide high pressures. Their main applications are machines in the plastics and sheet-metal processing sectors, presses as well as conveying and lifting equipment. These pumps are also in demand for shipbuilding, municipal vehicles, power plants and special machine building.
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**Design and Function**

**Design features**
- Internal gear principle
- Sleeve bearing
- Radial and axial sealing gap compensation
- Volume-optimized involute gearing

**Product characteristics**
- Long life
- High volume efficiency
- High overall efficiency
- Very low pump flow and pressure pulsation
- Low noise level
- Compact dimensions
- Low weight
- Large speed range
- Very good suction properties
- High allowed viscosity
- Simple maintenance
- Multiple pumps and pump combinations are possible
- Suitable for variable-speed drives (variable volume flow!)
- Motor operation possible (energy recovery!)

**Function**
Rotation of the gears within the pump draws in the pressure fluid (usually hydraulic oil) into the space between the pinion and internal gear. The two smooth running gears help to ensure excellent intake behaviour.

In the radial direction, the gear chambers are closed by gear meshing and the filler piece. In the axial direction, the axial plates seal the pressure chamber with the minimal possible gap. This design minimizes volume losses and increases efficiency.

When the gears rotate, the tooth heads enter the gaps between teeth and displace the pressure fluid.

**Combinations**
IPV pumps can be combined to form dual or multi-flow pumps.

Combinations with other Voith Turbo H + L Hydraulic pump series are also possible. Used in conjunction with pumps from the medium and low-pressure series, Voith equipment can handle a wide range of potential applications.

For further information on possible combinations, refer to page 9 and brochure G1714 (Voith multi-flow pumps).

Combinations with third-party products are generally possible. We'll be happy to discuss your needs.

**Variable volume flow**
We supply complete hydraulic units with IPV pumps, asynchronous motors and frequency converters (EPA/EPAF system) to generate variable volume flows. For further information, refer to our brochure G1420 (Voith EPA system).
## Performance data

### Technical data

<table>
<thead>
<tr>
<th>Design</th>
<th>Internal gear pump with radial and axial sealing gap compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>IPV</td>
</tr>
<tr>
<td>Mounting types</td>
<td>SAE hole flange; ISO 3019/1 or VDMA hole flange; ISO 3019/2</td>
</tr>
<tr>
<td>Line mounting</td>
<td>SAE suction and pressure flange J 518 C Code 61</td>
</tr>
<tr>
<td>Sense of rotation</td>
<td>Right or left-hand rotation</td>
</tr>
<tr>
<td>Mounting position</td>
<td>any</td>
</tr>
<tr>
<td>Shaft load</td>
<td>For details of radial and axial drive shaft loads please contact your Voith Turbo H + L Hydraulic representative</td>
</tr>
<tr>
<td>Input pressure</td>
<td>0.6…3 bar absolute pressure</td>
</tr>
<tr>
<td>Pressure fluid</td>
<td>HLP mineral oils DIN 51524, part 2 or 3</td>
</tr>
<tr>
<td>Viscosity range of the pressure fluid</td>
<td>10…100 mm²s⁻¹ (cSt)</td>
</tr>
<tr>
<td>Permissible start viscosity</td>
<td>max. 2000 mm²s⁻¹ (cSt)</td>
</tr>
<tr>
<td>Permissible temperature of the pressure fluid</td>
<td>-20…+60 °C</td>
</tr>
<tr>
<td>Required purity of the pressure fluid according to NAS 1638</td>
<td>Class 8</td>
</tr>
<tr>
<td>Filtration</td>
<td>Filtration quotient min. ( \beta_{20} \approx 75 ), recommended ( \beta_{10} \approx 100 ) (longer life)</td>
</tr>
<tr>
<td>Permissible ambient temperature</td>
<td>-10…+60 °C</td>
</tr>
</tbody>
</table>

### Calculations

- **Pump flow**
  \[ Q = V_{\text{th}} \cdot n \cdot \eta_v \cdot 10^{-3} \text{ [l/min]} \]
- **Power**
  \[ P = \frac{Q \cdot \Delta p}{600 \cdot \eta_g} \text{ [kW]} \]
- **\( V_{\text{th}} \)**: Pump volume per revolution [cm³]
- **\( n \)**: Speed [min⁻¹]
- **\( \eta_v \)**: Volumetric efficiency
- **\( \eta_g \)**: Overall efficiency
- **\( \Delta p \)**: Differential pressure [bar]
### Technical data

**Design**
- Internal gear pump with radial and axial sealing gap compensation

**Pump flow**

\[ Q = V_g \cdot n \cdot \eta_v \cdot 10^{-3} \text{ [l/min]} \]

**Power**

Type: IPV

**Mounting types**
- SAE hole flange; ISO 3019/1 or VDMA hole flange; ISO 3019/2

**Pump volume per revolution**

\[ V_g = \text{[cm}^3\text{]} \]

**Speed**

\[ n = \text{[min}^{-1}\text{]} \]

**Volumetric efficiency**

\[ \eta_v = \text{[min}^{-1}\text{]} \]

**Overall efficiency**

\[ \eta_g = \text{[min}^{-1}\text{]} \]

**Sense of rotation**
- Right or left-hand rotation

**Mounting position**
- any

**Differential pressure**

\[ \Delta p = \text{[bar]} \]

**Shaft load**
- For details of radial and axial drive shaft loads please contact your Voith Turbo H + L Hydraulic representative

**Input pressure**

\[ 0.6...3 \text{ bar absolute pressure} \]

**Pressure fluid**
- HLP mineral oils DIN 51524, part 2 or 3

**Viscosity range of the pressure fluid**

\[ 10...100 \text{ mm}^2\text{s}^{-1} \text{ (cSt)} \]

**Permissible start viscosity**

\[ \text{max.} 2000 \text{ mm}^2\text{s}^{-1} \text{ (cSt)} \]

**Permissible temperature of the pressure fluid**

\[ -20...+80 \text{ °C} \]

**Required purity of the pressure fluid**
- according to NAS 1638 Class 8

**Filtration**

**Filtration quotient min.**

\[ \beta_{20} \geq 75, \beta_{10} \geq 100 \text{ (longer life)} \]

**Permissible ambient temperature**

\[ -10...+60 \text{ °C} \]

---

### Characteristics

<table>
<thead>
<tr>
<th>Type, size-delivery</th>
<th>Displacement per revolution</th>
<th>Speed</th>
<th>Delivery at 1.500 rpm</th>
<th>Continuous</th>
<th>Peak at 1.500 rpm</th>
<th>Peak at ( n_{\text{max}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[cm(^3)]</td>
<td>[min(^{-1})]</td>
<td>[min(^{-1})]</td>
<td>[l/min]</td>
<td>[bar]</td>
<td>[bar]</td>
</tr>
<tr>
<td>IPV 3 – 3.5</td>
<td>3.6</td>
<td>400</td>
<td>3,600</td>
<td>5.4</td>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>IPV 3 – 5</td>
<td>5.2</td>
<td>400</td>
<td>3,600</td>
<td>7.8</td>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>IPV 3 – 6.3</td>
<td>6.4</td>
<td>400</td>
<td>3,600</td>
<td>9.6</td>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>IPV 3 – 8</td>
<td>8.2</td>
<td>400</td>
<td>3,600</td>
<td>12.3</td>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>IPV 3 – 10</td>
<td>10.2</td>
<td>400</td>
<td>3,600</td>
<td>15.3</td>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>IPV 4 – 13</td>
<td>13.3</td>
<td>400</td>
<td>3,600</td>
<td>19.9</td>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>IPV 4 – 16</td>
<td>15.8</td>
<td>400</td>
<td>3,400</td>
<td>23.7</td>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>IPV 4 – 20</td>
<td>20.7</td>
<td>400</td>
<td>3,200</td>
<td>31.0</td>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>IPV 4 – 25</td>
<td>25.4</td>
<td>400</td>
<td>3,000</td>
<td>38.1</td>
<td>300</td>
<td>330</td>
</tr>
<tr>
<td>IPV 4 – 32</td>
<td>32.6</td>
<td>400</td>
<td>2,800</td>
<td>48.9</td>
<td>250</td>
<td>280</td>
</tr>
<tr>
<td>IPV 5 – 32</td>
<td>33.1</td>
<td>400</td>
<td>3,000</td>
<td>49.6</td>
<td>315</td>
<td>345</td>
</tr>
<tr>
<td>IPV 5 – 40</td>
<td>41.0</td>
<td>400</td>
<td>2,800</td>
<td>61.5</td>
<td>315</td>
<td>345</td>
</tr>
<tr>
<td>IPV 5 – 50</td>
<td>50.3</td>
<td>400</td>
<td>2,500</td>
<td>75.4</td>
<td>280</td>
<td>315</td>
</tr>
<tr>
<td>IPV 5 – 64</td>
<td>64.9</td>
<td>400</td>
<td>2,200</td>
<td>97.3</td>
<td>230</td>
<td>250</td>
</tr>
<tr>
<td>IPV 6 – 64</td>
<td>64.1</td>
<td>400</td>
<td>2,600</td>
<td>96.1</td>
<td>300</td>
<td>330</td>
</tr>
<tr>
<td>IPV 6 – 80</td>
<td>80.7</td>
<td>400</td>
<td>2,400</td>
<td>121.0</td>
<td>280</td>
<td>315</td>
</tr>
<tr>
<td>IPV 6 – 100</td>
<td>101.3</td>
<td>400</td>
<td>2,100</td>
<td>151.9</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>IPV 6 – 125</td>
<td>126.2</td>
<td>400</td>
<td>1,800</td>
<td>189.3</td>
<td>210</td>
<td>250</td>
</tr>
<tr>
<td>IPV 7 – 125</td>
<td>125.8</td>
<td>400</td>
<td>2,200</td>
<td>188.7</td>
<td>300</td>
<td>330</td>
</tr>
<tr>
<td>IPV 7 – 160</td>
<td>160.8</td>
<td>400</td>
<td>2,000</td>
<td>241.2</td>
<td>280</td>
<td>315</td>
</tr>
<tr>
<td>IPV 7 – 200</td>
<td>202.7</td>
<td>400</td>
<td>1,800</td>
<td>304.0</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>IPV 7 – 250</td>
<td>251.7</td>
<td>400</td>
<td>1,800</td>
<td>377.5</td>
<td>210</td>
<td>250</td>
</tr>
</tbody>
</table>

---

**Notes:**
- Peak pressures apply for 15% of operating time with a maximum cycle time of 1 minute.
- Please inquire about peak pressures at non-standard speeds.
- Due to production tolerances, the pump volume may be reduced by up to 1.5%.

---

**The values given apply for:**
- Pumping of mineral oils with a viscosity of 20...40 mm²s⁻¹
- An input pressure of 0.8...3.0 bar absolute
**IPV 3**

**Standard Design**

### Design and dimensions

<table>
<thead>
<tr>
<th>Design</th>
<th>c (mm)</th>
<th>e (mm)</th>
<th>g (mm)</th>
<th>h (mm)</th>
<th>i (mm)</th>
<th>k (mm)</th>
<th>l (mm)</th>
<th>r (mm)</th>
<th>v (mm)</th>
<th>w (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV 3 – 3.5</td>
<td>66</td>
<td>20.5</td>
<td>9</td>
<td>14</td>
<td>38.1</td>
<td>15.5</td>
<td>M8x13</td>
<td>38.1</td>
<td>17.5</td>
<td>M8x13</td>
<td>4.0</td>
</tr>
<tr>
<td>IPV 3 – 5</td>
<td>70</td>
<td>20.5</td>
<td>11</td>
<td>14</td>
<td>38.1</td>
<td>17.5</td>
<td>M8x13</td>
<td>38.1</td>
<td>17.5</td>
<td>M8x13</td>
<td>4.2</td>
</tr>
<tr>
<td>IPV 3 – 6.3</td>
<td>73</td>
<td>20.5</td>
<td>11</td>
<td>19</td>
<td>47.5</td>
<td>22</td>
<td>M10x15</td>
<td>38.1</td>
<td>17.5</td>
<td>M8x13</td>
<td>4.4</td>
</tr>
<tr>
<td>IPV 3 – 8</td>
<td>77.5</td>
<td>20.5</td>
<td>13</td>
<td>19</td>
<td>47.5</td>
<td>22</td>
<td>M10x15</td>
<td>38.1</td>
<td>17.5</td>
<td>M8x13</td>
<td>4.6</td>
</tr>
<tr>
<td>IPV 3 – 10</td>
<td>82.5</td>
<td>20.5</td>
<td>13</td>
<td>21</td>
<td>52.4</td>
<td>26.2</td>
<td>M10x15</td>
<td>38.1</td>
<td>17.5</td>
<td>M8x13</td>
<td>4.8</td>
</tr>
</tbody>
</table>

* Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation. Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

### SAE flange no.

#### Design

- **IPV 3 – 3.5**
- **IPV 3 – 5**
- **IPV 3 – 6.3**
- **IPV 3 – 8**
- **IPV 3 – 10**

### Allowed input torques:

- Input shaft A: 160 Nm
- Secondary shaft B: 80 Nm

---

**Delivery Q**

![Delivery Q graph](image1)

**Efficiency $\eta_v$ and $\eta_g$**

![Efficiency graph](image2)
Design and dimensions

Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation.

Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

<table>
<thead>
<tr>
<th>Type</th>
<th>Pump sizes</th>
<th>Rotation, suction connection</th>
<th>Mounting flange</th>
<th>Shaft end</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV 3</td>
<td>3.5</td>
<td>Clockwise rotation, radial suction port</td>
<td>SAE 2-hole flange, dimensions on left</td>
<td>Parallel shaft with keyway connection,</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td>dimensions on left</td>
</tr>
<tr>
<td></td>
<td>6.3</td>
<td>Anti-clockwise rotation, radial suction port</td>
<td></td>
<td>Involute gearing with SAE 2-hole flange</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
<td></td>
<td>ANSI B92.1a</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td>11T 16 / 32 DP 30°</td>
</tr>
</tbody>
</table>

Designation according to type code

Type code/order designation, see page 17

---

Input power $P$

![Graph of input power vs. operating pressure](image)

Airborne noise level

![Graph of airborne noise level vs. operating pressure](image)

Measurement conditions

- Speed: 1,500 rpm
- Viscosity of pressure fluid: 46 mm²/s
- Operating temperature: 40 °C

Characteristic curves:
- IPV 3 – 3.5
- IPV 3 – 5
- IPV 3 – 6.3
- IPV 3 – 8
- IPV 3 – 10

**Note:** Measurement taken in a low-noise room.
In an anechoic room, the measurements are approx. 5 dB(A) lower.
**IPV 4**

**Standard Design**

### Design and dimensions

<table>
<thead>
<tr>
<th>Design</th>
<th>Dimensions</th>
<th>SAE flange no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>c (mm)</td>
<td>e (mm)</td>
</tr>
<tr>
<td>IPV 4 – 13</td>
<td>88.5</td>
<td>31</td>
</tr>
<tr>
<td>IPV 4 – 16</td>
<td>92.5</td>
<td>31</td>
</tr>
<tr>
<td>IPV 4 – 20</td>
<td>98</td>
<td>31</td>
</tr>
<tr>
<td>IPV 4 – 25</td>
<td>104</td>
<td>31</td>
</tr>
<tr>
<td>IPV 4 – 32</td>
<td>113</td>
<td>31</td>
</tr>
</tbody>
</table>

* Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation. Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

**Allowed input torques:**
- Input shaft A: 335 Nm
- Secondary shaft B: 190 Nm

### Performance charts

**Delivery Q**

**Efficiency η_v and η_g**
### Design and Dimensions

* Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation.

Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

<table>
<thead>
<tr>
<th>Designation</th>
<th>SAE flange no.</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[mm]</td>
<td>[mm]</td>
</tr>
<tr>
<td>IPV 4 – 13</td>
<td>88.5</td>
<td>31</td>
</tr>
<tr>
<td>IPV 4 – 16</td>
<td>92.5</td>
<td>31</td>
</tr>
<tr>
<td>IPV 4 – 20</td>
<td>98</td>
<td>31</td>
</tr>
<tr>
<td>IPV 4 – 25</td>
<td>104</td>
<td>31</td>
</tr>
<tr>
<td>IPV 4 – 32</td>
<td>113</td>
<td>31</td>
</tr>
</tbody>
</table>

**Allowed input torques:**
- Input shaft A: 335 Nm
- Secondary shaft B: 190 Nm

---

### Type Code/Order Designation

For more information, see page 17.
**IPV 5**

**Standard Design**

**Design and dimensions**

* Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation. Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

<table>
<thead>
<tr>
<th>Design</th>
<th>Dimensions</th>
<th>SAE flange no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV 5 – 32</td>
<td>c 119 e 36 g 18 h 32 i 58.7 k 30.2 l r v 47.5 Thread M10x15 w 22 Thread M10x15</td>
<td>Weight 15.5 11 13</td>
</tr>
<tr>
<td>IPV 5 – 40</td>
<td>c 125 e 36 g 19 h 35 i 70 k 36 l r v 52.4 Thread M12x20 w 26.2 Thread M10x15</td>
<td>Weight 16.3 12 30</td>
</tr>
<tr>
<td>IPV 5 – 50</td>
<td>c 132 e 36 g 21 h 40 i 70 k 36 l r v 52.4 Thread M12x20 w 26.2 Thread M10x15</td>
<td>Weight 17.4 12 30</td>
</tr>
<tr>
<td>IPV 5 – 64</td>
<td>c 163 e 36 g 23 h 40 i 70 k 36 l r v 52.4 Thread M12x20 w 26.2 Thread M10x16</td>
<td>Weight 18.7 12 30</td>
</tr>
</tbody>
</table>

**Allowed input torques:**

Input shaft A: 605 Nm
Secondary shaft B: 400 Nm

**Delivery Q**

**Efficiency \( \eta_v \) and \( \eta_g \)**

---

*Voith Turbo | IPV Catalog | G 1485 en*
**Design and dimensions**

- Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation.

- Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

---

### Design Dimensions SAE flange no.

<table>
<thead>
<tr>
<th>Type</th>
<th>Pump sizes</th>
<th>Rotation, suction connection</th>
<th>Mounting flange</th>
<th>Shaft end</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV 5</td>
<td>32</td>
<td>Clockwise rotation, radial suction port</td>
<td>SAE 2-hole flange, dimensions on left</td>
<td>Parallel shaft with keyway connection, dimensions on left</td>
</tr>
<tr>
<td>IPV 5</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPV 5</td>
<td>50</td>
<td>Anti-clockwise rotation, radial suction port</td>
<td>SAE 2-hole flange, variant</td>
<td>Involute gearing</td>
</tr>
<tr>
<td>IPV 5</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Allowed input torques:**

- Input shaft A: 605 Nm
- Secondary shaft B: 400 Nm

---

### Type Pump sizes Rotation, suction connection Mounting flange Shaft end

- **IPV 5 – 32**
  - Standard
  - Clockwise rotation, radial suction port
  - SAE 2-hole flange, dimensions on left
  - Parallel shaft with keyway connection, dimensions on left

- **IPV 5 – 40**
  - Standard
  - Clockwise rotation, radial suction port
  - SAE 2-hole flange, dimensions on left
  - Parallel shaft with keyway connection, dimensions on left

- **IPV 5 – 50**
  - Standard
  - Clockwise rotation, radial suction port
  - SAE 2-hole flange, dimensions on left
  - Parallel shaft with keyway connection, dimensions on left

- **IPV 5 – 64**
  - Standard
  - Clockwise rotation, radial suction port
  - SAE 2-hole flange, dimensions on left
  - Parallel shaft with keyway connection, dimensions on left

**Designation according to type code**

- Design according to type code
- Type code/order designation, see page 17

**Measurement conditions**

- Speed: 1,500 rpm
- Viscosity of pressure fluid: 46 mm²/s
- Operating temperature: 40 °C

**Characteristic curves:**

- IPV 5 – 32
- IPV 5 – 40
- IPV 5 – 50
- IPV 5 – 64

**Note:** Measurement taken in a low-noise room.
In an anechoic room, the measurements are approx. 5 dB(A) lower.
**IPV 6**

**Standard Design**

### Design and dimensions

*Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation.*

Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

### Design Dimensions SAE flange no.

<table>
<thead>
<tr>
<th>Design</th>
<th>c</th>
<th>e</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>k</th>
<th>l</th>
<th>r</th>
<th>v</th>
<th>w</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV 6 – 64</td>
<td>140</td>
<td>40</td>
<td>23</td>
<td>40</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
<td>52.4</td>
<td>26.2</td>
<td>M10x15</td>
<td>29.2</td>
</tr>
<tr>
<td>IPV 6 – 80</td>
<td>148</td>
<td>35</td>
<td>23</td>
<td>45</td>
<td>77.8</td>
<td>42.9</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
<td>30.7</td>
</tr>
<tr>
<td>IPV 6 – 100</td>
<td>158</td>
<td>35</td>
<td>27</td>
<td>50</td>
<td>77.8</td>
<td>42.9</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
<td>32.6</td>
</tr>
<tr>
<td>IPV 6 – 125</td>
<td>170</td>
<td>40</td>
<td>30</td>
<td>50</td>
<td>77.8</td>
<td>42.9</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M10x16</td>
<td>35.0</td>
</tr>
</tbody>
</table>

**Allowed input torques:**

- Input shaft A: 1,050 Nm
- Secondary shaft B: 780 Nm

### Delivery Q and Efficiency \( \eta_v \) and \( \eta_g \)

**Operating pressure \( p \) [bar]**

**Delivery \( Q \) [l/min]**

**Efficiency**

- \( \eta_v \) (yellow)
- \( \eta_g \) (red)

---

*Voith Turbo | IPV Catalog | G 1485 en*
**Design and dimensions**

Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation.

Depending on the pump position, filling or ventilation is possible here prior to commissioning.

<table>
<thead>
<tr>
<th>Design Dimensions SAE flange no.</th>
<th>c</th>
<th>e</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>k</th>
<th>l</th>
<th>r</th>
<th>v</th>
<th>w</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight [mm] [mm] [mm] [mm] [mm] [mm] Thread [mm] [mm] Thread [kg]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPV 6 – 64</td>
<td>140</td>
<td>40</td>
<td>23</td>
<td>40</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
<td>52.4</td>
<td>26.2</td>
<td>M10x15</td>
</tr>
<tr>
<td>IPV 6 – 80</td>
<td>148</td>
<td>35</td>
<td>23</td>
<td>45</td>
<td>77.8</td>
<td>42.9</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
</tr>
<tr>
<td>IPV 6 – 100</td>
<td>158</td>
<td>35</td>
<td>27</td>
<td>50</td>
<td>77.8</td>
<td>42.9</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
</tr>
<tr>
<td>IPV 6 – 125</td>
<td>170</td>
<td>40</td>
<td>30</td>
<td>50</td>
<td>77.8</td>
<td>42.9</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M10x16</td>
</tr>
</tbody>
</table>

**Allowed input torques:**

- Input shaft A: 1,050 Nm
- Secondary shaft B: 780 Nm

**Type**

- **Pump sizes:** IPV 6 – 64, IPV 6 – 80, IPV 6 – 100, IPV 6 – 125

**Rotation, suction connection**

- **Standard**
  - Clockwise rotation, radial suction port
- **Variants**
  - Anti-clockwise rotation, radial suction port

**Mounting flange**

- Standard: SAE 2-hole flange, dimensions on left
- Variants: SAE 4-hole flange

** Shaft end**

- Parallel shaft with keyway connection, dimensions on left

<table>
<thead>
<tr>
<th>Type</th>
<th>Pump sizes</th>
<th>Rotation, suction connection</th>
<th>Mounting flange</th>
<th>Shaft end</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV 6</td>
<td>64</td>
<td>Clockwise rotation, radial suction port</td>
<td>SAE 2-hole flange, dimensions on left</td>
<td>Parallel shaft with keyway connection, dimensions on left</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>125</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Designation according to type code**

- Type code/order designation, see page 17

**Input power P**

- Graph showing input power vs. operating pressure

**Airborne noise level**

- Graph showing airborne noise level vs. operating pressure

**Measurement conditions**

- Speed: 1,500 rpm
- Viscosity of pressure fluid: 46 mm²/s
- Operating temperature: 40 °C

**Characteristic curves:**

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

*Note: Measurement taken in a low-noise room. In an anechoic room, the measurements are approx. 5 dB(A) lower.*
**IPV 7**

**Standard Design**

**Design and dimensions**

* Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation.

Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

<table>
<thead>
<tr>
<th>Design</th>
<th>Dimensions</th>
<th>SAE flange no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>c</td>
<td>e</td>
</tr>
<tr>
<td>IPV 7 – 125</td>
<td>152</td>
<td>48</td>
</tr>
<tr>
<td>IPV 7 – 160</td>
<td>162</td>
<td>48</td>
</tr>
<tr>
<td>IPV 7 – 200</td>
<td>174</td>
<td>46</td>
</tr>
<tr>
<td>IPV 7 – 250</td>
<td>188</td>
<td>42</td>
</tr>
</tbody>
</table>

**Allowed input torques:**

Input shaft A: 1,960 Nm
Secondary shaft B: 1,200 Nm
Design and dimensions

- Ensure the M10x1 plug screw, hexagon socket SW5, is tightened to a torque of 10 Nm during pumping operation.

- Dependent on the pump position, filling or ventilation is possible here prior to commissioning.

<table>
<thead>
<tr>
<th>Design Dimensions SAE flange no.</th>
<th>c</th>
<th>e</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>k</th>
<th>l</th>
<th>r</th>
<th>v</th>
<th>w</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV 7 – 125</td>
<td>152</td>
<td>48</td>
<td>30</td>
<td>50</td>
<td>77.8</td>
<td>42.9</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
<td>46.5</td>
</tr>
<tr>
<td>IPV 7 – 160</td>
<td>162</td>
<td>48</td>
<td>30</td>
<td>56</td>
<td>89</td>
<td>50.8</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
<td>50</td>
</tr>
<tr>
<td>IPV 7 – 200</td>
<td>174</td>
<td>46</td>
<td>34</td>
<td>62</td>
<td>89</td>
<td>50.8</td>
<td>M12x20</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
<td>54</td>
</tr>
<tr>
<td>IPV 7 – 250</td>
<td>188</td>
<td>42</td>
<td>38</td>
<td>72</td>
<td>106.3</td>
<td>62</td>
<td>M16x25</td>
<td>70</td>
<td>36</td>
<td>M12x20</td>
<td>59</td>
</tr>
</tbody>
</table>

- Allowed input torques:
  - Input shaft A: 1,960 Nm
  - Secondary shaft B: 1,200 Nm

Type Pump sizes Rotation, suction connection Mounting flange Shaft end

**IPV 7**

- **125**
  - Clockwise rotation, radial suction port
  - SAE 4-hole flange, dimensions on left
  - Parallel shaft with keyway connection, dimensions on left

- **160**

- **200**
  - Anti-clockwise rotation, radial suction port
  - Involute gearing with SAE 4-hole flange

- **250**
  - Involute gearing with SAE 4-hole flange
  - ANSI B92.1a
  - 15T
  - 8 / 16 DP 30°

- VDMA 4-hole flange

Designation according to type code

Type code/order designation, see page 17

- **Input power P**

- **Airborne noise level**

- **Measurement conditions**
  - Speed: 1,500 rpm
  - Viscosity of pressure fluid: 46 mm²/s
  - Operating temperature: 40 °C

**Characteristic curves:**
- IPV 7 – 125
- IPV 7 – 160
- IPV 7 – 200
- IPV 7 – 250

- **Note:** Measurement taken in a low-noise room.
  - In an anechoic room, the measurements are approx. 5 dB(A) lower.
## SAE Suction and Pressure Flanges

**according to SAE J 518 C Code 61**

### SAE flange, single-piece

![Diagram of SAE flange]

<table>
<thead>
<tr>
<th>SAE flange no.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E&lt;sup&gt;1)&lt;/sup&gt;</th>
<th>i</th>
<th>k</th>
<th>S&lt;sup&gt;2)&lt;/sup&gt;</th>
<th>max. pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>G 1/2</td>
<td>46</td>
<td>54</td>
<td>36</td>
<td>18.66 – 3.53</td>
<td>38.1</td>
<td>17.5</td>
<td>M 8</td>
<td>345</td>
</tr>
<tr>
<td>11</td>
<td>G 3/4</td>
<td>50</td>
<td>65</td>
<td>36</td>
<td>24.99 – 3.53</td>
<td>47.6</td>
<td>22.2</td>
<td>M 10</td>
<td>345</td>
</tr>
<tr>
<td>12</td>
<td>G 1</td>
<td>55</td>
<td>70</td>
<td>38</td>
<td>32.92 – 3.53</td>
<td>52.4</td>
<td>26.2</td>
<td>M 10</td>
<td>345</td>
</tr>
<tr>
<td>13</td>
<td>G 1-1/4</td>
<td>68</td>
<td>79</td>
<td>41</td>
<td>37.69 – 3.53</td>
<td>58.7</td>
<td>30.2</td>
<td>M 10</td>
<td>276</td>
</tr>
<tr>
<td>14</td>
<td>G 1-1/2</td>
<td>82</td>
<td>98</td>
<td>50</td>
<td>47.22 – 3.53</td>
<td>70</td>
<td>36</td>
<td>M 12</td>
<td>345&lt;sup&gt;3)&lt;/sup&gt;</td>
</tr>
<tr>
<td>15</td>
<td>G 2</td>
<td>90</td>
<td>102</td>
<td>45</td>
<td>56.74 – 3.53</td>
<td>77.8</td>
<td>42.9</td>
<td>M 12</td>
<td>207</td>
</tr>
<tr>
<td>16</td>
<td>G 2-1/2</td>
<td>105</td>
<td>114</td>
<td>50</td>
<td>69.44 – 3.53</td>
<td>89</td>
<td>50.8</td>
<td>M 12</td>
<td>172</td>
</tr>
<tr>
<td>17</td>
<td>G 3</td>
<td>124</td>
<td>134</td>
<td>50</td>
<td>85.32 – 3.53</td>
<td>106.3</td>
<td>62</td>
<td>M 16</td>
<td>138</td>
</tr>
<tr>
<td>18</td>
<td>G 4</td>
<td>146</td>
<td>162</td>
<td>48</td>
<td>110.72 – 3.53</td>
<td>130</td>
<td>77.8</td>
<td>M 16</td>
<td>34</td>
</tr>
</tbody>
</table>

---

1) Round seal ring (O-ring) ISO-R 1629 NBR

2) Machine screw EN ISO 4762

3) Special design, deviating from SAE J 518 C Code 61
Type Code

Order Designation

Example: IPV - 3.5 100

Shaft end
0 Splined gear shaft ANSI B92.1a
1 Parallel shaft with keyway

Mounting flange
0 SAE 2-hole
1 SAE 4-hole
4 VDMA 2-hole
5 VDMA 4-hole
7 SAE 2-hole, variant

Rotation, suction port
1 Clockwise rotation, radial suction port
6 Anti-clockwise rotation, radial suction port
4 Clockwise rotation, special design
9 Anti-clockwise rotation, special design

Delivery

<table>
<thead>
<tr>
<th>Frame size</th>
<th>delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3.5 5 6.3 8 10</td>
</tr>
<tr>
<td>4</td>
<td>13 16 20 25 32</td>
</tr>
<tr>
<td>5</td>
<td>32 40 50 64</td>
</tr>
<tr>
<td>6</td>
<td>64 80 100 125</td>
</tr>
<tr>
<td>7</td>
<td>125 160 200 250</td>
</tr>
</tbody>
</table>

Frame size
3 4 5 6 7

Type of internal gear pump
IPV
Multi-flow Pumps

Pump Combinations

Combinations of IPV pumps
- IPV pumps of identical or different sizes can be combined in multi-flow pumps.
- All sizes of the relevant pump volume are available as two- or three-flow pumps; four-flow pumps must be designed by Voith Turbo H + L Hydraulic.
- The pumps are arranged in increasing order according to frame size and delivery.

Combinations of IPV/IP...-pumps
- It is possible to combine IPV pumps with other Voith Turbo H + L Hydraulic pump series (e.g. medium-pressure pumps IPC or low-pressure pumps IPN).
- The pumps are arranged by types and sizes as shown in the illustration above.
- If identical types or identical sizes follow each other, the pump with the higher pump flow is placed closer to the drive.

Selection
1. Determine pressure ranges and define the appropriate pump serie(s).
2. Determine pump volume and select the appropriate size(s).
3. Define sequence of the pumps.
4. Check the torques.
5. Determine rotation and suction.
6. Specify mounting flange and shaft end.

Mounting, assembly
- Multi-flow pumps are generally mounted to the drive by means of a flange. All information about the flange designs and shaft ends is found in the catalog of the relevant pump series.
- For more information, for example about definition of the adapter housings, refer to brochure G 1714 (Voith multi-flow pump).
# Designs

<table>
<thead>
<tr>
<th>Rotation and suction</th>
<th>Mounting flange</th>
<th>Shaft end</th>
</tr>
</thead>
<tbody>
<tr>
<td>clockwise 🔄 anti-clockwise 🔄</td>
<td>🔄 2 7 🔄</td>
<td>🔄 1 0 🔄</td>
</tr>
<tr>
<td>SAE 2-hole-flange 🔄</td>
<td>🔄 1 6 🔄</td>
<td>🔄 1 0 🔄</td>
</tr>
<tr>
<td>VDMA 2-hole-flange 🔄</td>
<td>🔄 2 7 🔄</td>
<td>🔄 1 0 🔄</td>
</tr>
<tr>
<td>SAE 4-hole-flange 🔄</td>
<td>🔄 1 6 🔄</td>
<td>🔄 1 0 🔄</td>
</tr>
<tr>
<td>VDMA 4-hole-flange 🔄</td>
<td>🔄 3 8 🔄</td>
<td>🔄 1 0 🔄</td>
</tr>
<tr>
<td>SAE 2-hole-flange 🔄</td>
<td>🔄 3 8 🔄</td>
<td>🔄 1 0 🔄</td>
</tr>
</tbody>
</table>

For designs and dimensions, see catalog of the relevant pump series.

Special design 🔄 4 9 🔄 Special design 🔄 1 0 🔄
Additional applications:

- Die casting machines
- Packing presses
- Shears
- Ground drilling machines
- Test rigs
- Hydraulic presses
- Crane building
- Lifting devices
- Garbage collection vehicles