Product Datasheet	
Product	High Pressure Pump HPP 200
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HPP 200

High Pressure Pump for non-lubricating liquids- up to 200 bar

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Content

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1 High Pressure Pump HPP 200

1.1 Description

The Arens HDPS 200-DD is a very efficient and compact high-pressure pump, which is particularly suited to pressurization when feeding low-viscosity fluids. The basic version of the pump is designed for a continuous operating pressure of 200 bar. The structural segregation of the high-pressure circuit and the lubricated shaft drive facilitates the flow of non-lubricating fluids. During this process, no compromises may be made with respect to loading periods even at high rotational speeds. Areas of application range from deployment in small combustion engines with high-pressure direct injection to atomizing systems in the food industry. Upon request, we shall be pleased to examine the possibility of undertaking application-specific adaptation in relation to flow output or the chemical stability of the materials used.

The HDPS 200-DD is a valve-controlled radial piston pump with constant displacement volume. At the low-pressure Inlet, the pumped medium is conveyed into the pump under low pre-pressure. The pump shaft is rotated by an external drive, whereby the torque is transmitted by positive engagement on the drive journal. The pump shaft has an eccentric on which the plunger rests. The eccentric rotating with the pump shaft displaces the pressure plunger in an upwards or downwards movement, which alternately reduces and increases the volume in the high-pressure chamber. The control valves integrated in the pump ensure that the high-pressure chamber is filled with liquid during downward movement and is displaced into the high-pressure outlet during upward movement. A patented sealing system is located between the high-pressure chamber and the eccentric chamber, which prevents the exchange of the pumping and lubricating medium.

1.2 Line Materials

The liquid conveyed with the HPP can come into contact with the following sealing and pipe materials:

- Stainless steels: 1.4305, 1.4310, 1.4404, 1.4021
- Coatings: anodized layer, nickel layer
- Plastics: PTFE-Compound, Polyurethane (PUR)
- Options for sealing material: FKM oder NBR

When ordering, please specify the required sealing material:
(examples: P2-25 HPP 200 – **FKM** oder P2-25 HPP 200 – **NBR**)

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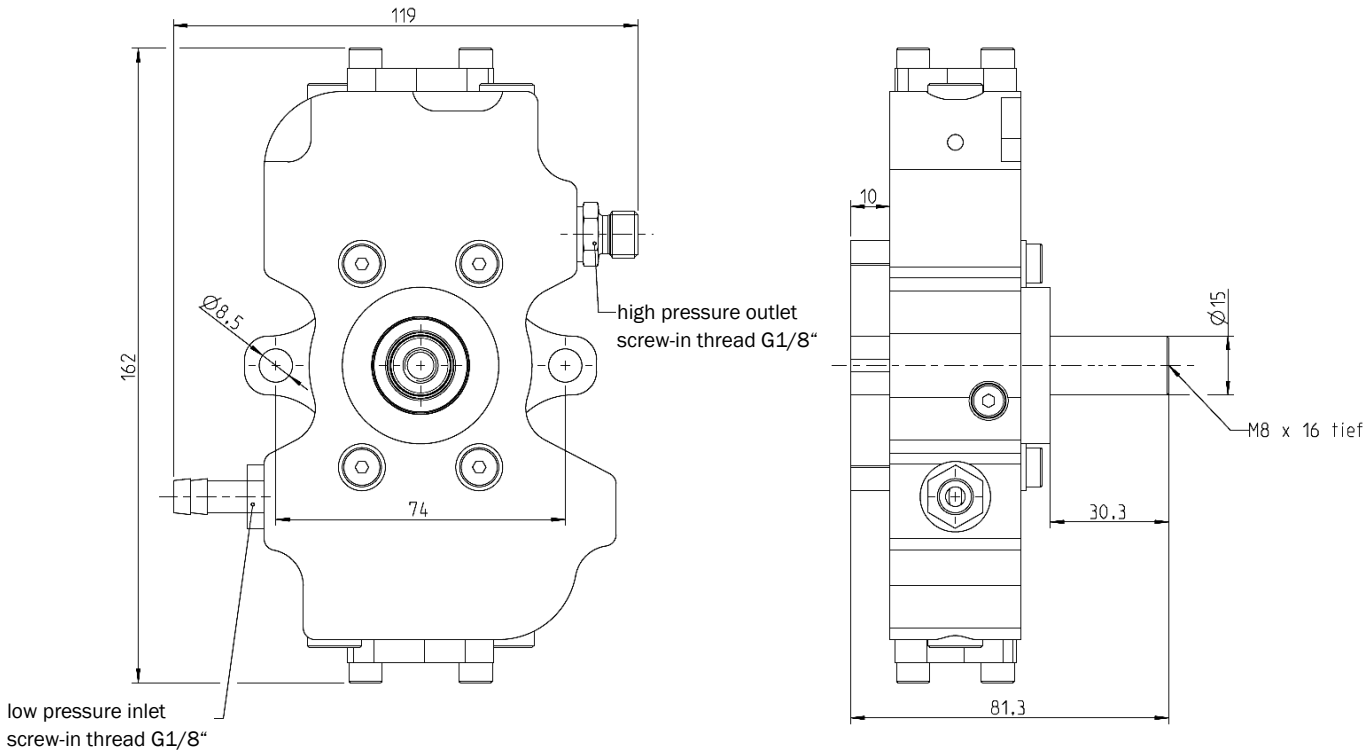
1.3 Technical Data HPP 200

rotational speed range		rev/min	up to 3.750	
operating pressure	Inlet	bar	2 to 4	
	Outlet	bar	200	
number of pistons			2	
geometric displacement volume		cm³/U	0,429	
volumetric efficiency		L/min	siehe Tabelle 1	
required drive power		kW	siehe Tabelle 2	
flow medium range of viscosity		mm²/s	0,5 to 65	
direction of rotation			rotating to the right and the left does not impact the direction of flow	
installation position			Discretionary / no specification	
line connection			screw-in thread G1/8“	
operation temperature		°C	-30 bis +90	
storage temperature		°C	-10 bis +70	
admissible flow fluid temperature:		°C	+80, temporarily up to +130	
weight		kg	1,45	
version options			**FKM**	sealing material fluorocarbon rubber
			NBR	sealing material nitrile butadiene rubber

1.4 Dimensions in mm



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1.5 Performance parameters

The actual effective values depend on the overall system design. The following two tables are an approximation based on the hydraulic design.

Tabelle 1 volumetric flow HPP 200 vs. discharge pressure/speed pump shaft (water)

Q [L/min]		p_Soll [bar]								
		10	25	50	75	100	125	150	175	200
n_PW [rev/min]	120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	250	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	500	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	750	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	1000	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	1250	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	1500	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	1750	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	2000	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	2250	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	2500	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2750	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	3000	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	3250	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
	3500	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	3750	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4

Tabelle 2 required drive power HPP 200 vs. discharge pressure/speed pump shaft (water)

P [W]		p_Soll [bar]								
		10	25	50	75	100	125	150	175	200
n_PW [rev/min]	120	21	30	32	35	38	41	45	49	53
	250	28	39	43	47	51	55	60	65	71
	500	33	47	51	55	60	65	71	77	83
	750	39	55	60	65	71	77	83	91	98
	1000	46	65	71	77	83	91	98	107	116
	1250	54	77	83	91	98	107	116	126	137
	1500	64	91	98	107	116	126	137	149	162
	1750	76	107	116	126	137	149	162	176	191
	2000	90	126	137	149	162	176	191	208	226
	2250	106	149	162	176	191	208	226	246	267
	2500	125	176	191	208	226	246	267	290	315
	2750	147	208	226	246	267	290	315	342	372
	3000	174	246	267	290	315	342	372	404	439
	3250	267	290	315	342	372	404	439	477	519
	3500	315	342	372	404	439	477	519	564	613
	3750	372	404	439	477	519	564	613	666	723

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1.6 Flow Rate Curve

From the kinematic parameters of the pump, the change in volume flow can be calculated over a working cycle of the pump (one revolution at the pump shaft) as follows:

$$\dot{Q}(\varphi) = |6{,}75 \cdot 10^{-4} \cdot n \cdot \cos 2\varphi| \; \frac{L}{min} \qquad \text{Gl. 1}$$

by $175 \leq n \leq 3.750 \; \frac{rev}{min}$ und $0 \leq \varphi \leq 360\,°$

Abbildung 1 shows the flow rate $\dot{Q}(\varphi)$ at the high-pressure outlet over one revolution of the pump shaft. Two strokes of the radial pistons are executed over an angle of rotation of 360°. As a result, there is a swelling flow rate curve with maxima. Depending on the pump speed n, different maximum flow rates occur. The resulting pressure pulsations can be eliminated by suitable damping in the high-pressure line.

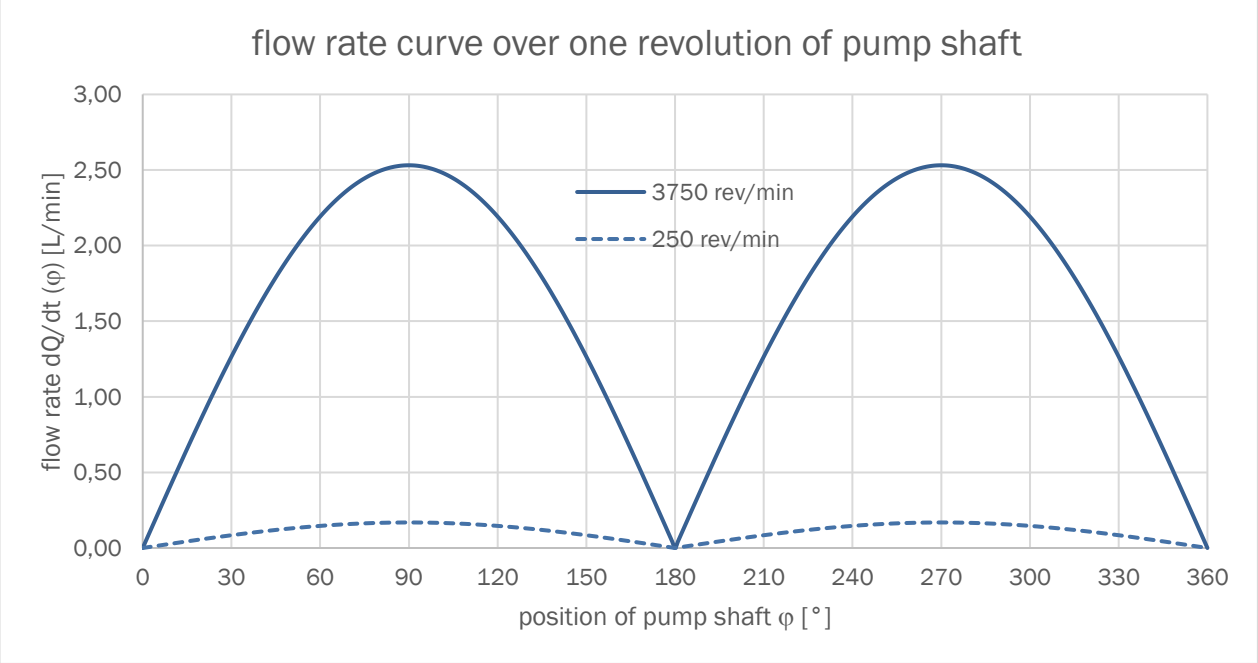

Abbildung 1 flow rate curve at the high-pressure outlet of the HPP 200