

CJMV
Vertical condensate middle-pressure pumps

VERTICAL CONDENSATE MIDDLE-PRESURE PUMPS CJMV

APPLICATION

Middle-pressure condensate pumps CJMV are highly important auxiliary pumping equipment for power units designed for pumping of condensate from condenser space of steam turbines. Eventually, they may be used for pumping of clean non-corrosive water. The temperature of pumped liquid shall not exceed 180 °C with max. pH 10.

The pump features:

- advantageous monobloc design, enabling rigidity of the whole unit
- suction and discharge branches are designed in one axis above the ground
- possibility of adaptation for paralel service
- good suction performance
- high quality of material finish
- maximum operational reliability

DESIGN

Pumping unit consists of the following main parts:

- hydraulic parts (i.e. the pump itself in the lower part of the unit)
- bearing hanger
- vertical flanged electric motor
- condensate holding tank

Hydraulic part

The hydraulic part consist of centrifugal multi-stage pump. For improving of suction performance the first pump stage is made of two impellers, which are placed suction-sides to each other. The impellers are hydraulically lite in order to balance the axial force of the rotor. The rest of axial force is absorbed by the bearing located in the hanger. The shaft is laid in journal slide bearings, located in pump suction and discharge covers. The bearings are lubricated through pumped media.

Bearing hanger

The bearing hanger holds the weight of the whole unit (incl. electric motor) and absorbes the rest of rotor hydraulic force through spherical-roller

bearing (lubricated through oil bath). Within the hanger, the pump and electric motor shafts are connected through a flexible coupling. In the lower part of the hanger there is the pump casing with suction and discharge flange branches located in one axis („in-line“ design). The shaft is sealed through mechanic seal. As an option, it is possible to use soft seal with plugs for seal closure (pump in non-operation) or seal flushing for cooling (pump in operation). For seal closure or flushing, a cold condensate from external source is used.

Holding tank

Cylindric shaped holding tank is delivered with the pump. On the holding tank flange the bearing hanger and the pump itself are located. The whole set is laid on base washers for embedding in concrete to the floor (for an easier dismantling on two sides only). The holding tank may be equipped in the lower part with a hole enabling draining and flushing of settled dirt.

EXTRACTION STREAM

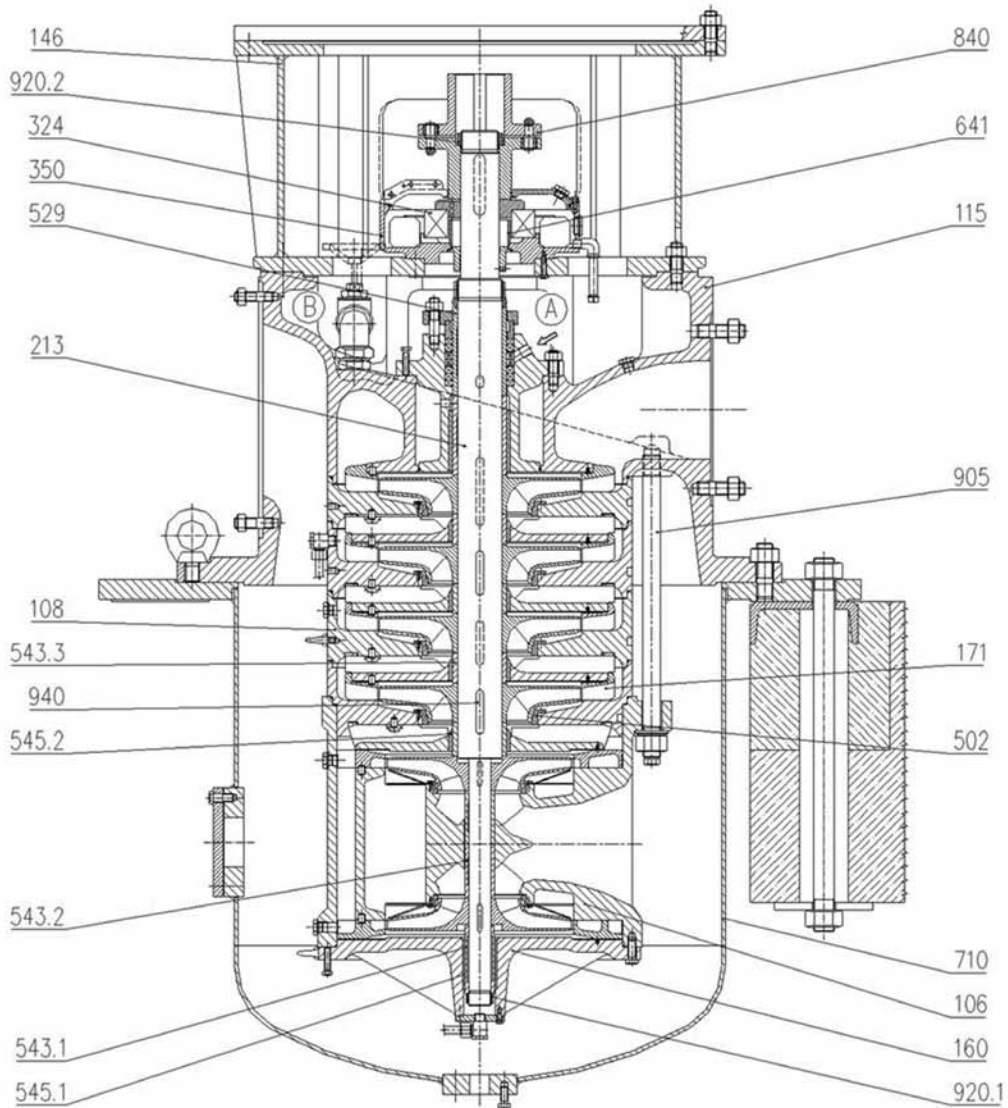
For an eventual extraction streams of pumped condensate for various reasons (for example valves flooding) a branch pipe may be added, leading in hanger casing (ended with DN 1 1/2“ valve for connection of drain piping).

MATERIAL VERSION

The pumps are delivered in standard material version „UY“ where main parts are made, from the following materials:

Pump part	Material
Suction casing, bottom cover	Gray cast iron
Stage casing	Cast carbide steel
Discharge cover, discharge casing	Cast manganese steel
Impellers, diffusers	Cast carbide-nickel steel
Shaft	Carbon steel
Protective bushings	Carbide steel

PUMP INFORMATIVE CROSS-SECTION



106	Suction casing
108	Stage casing
115	Discharge casing
146	Lantern
160	Bottom cover
171	Diffuser ring

213	Pump shaft
324	Bearing
350	Bearing pan
502	Lantern
529	Sealing bushing
543.1	Shaft bushing

543.2	Shaft bushing
543.3	Distance bushing
545.1	Bearing bushing
545.2	Stage bushing
641	Oil overflow
710	Pump reservoir

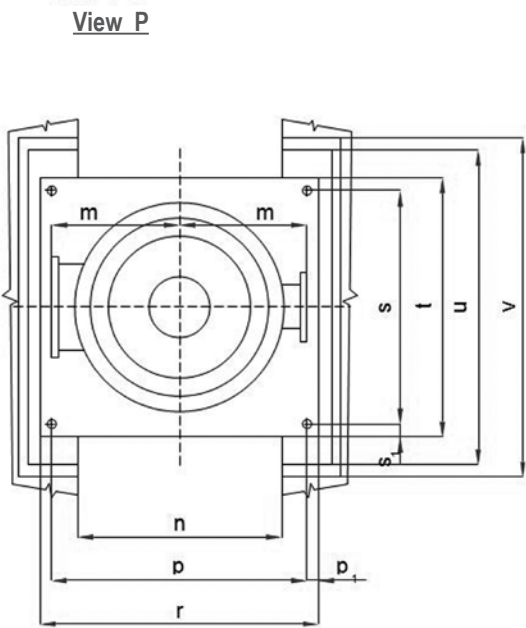
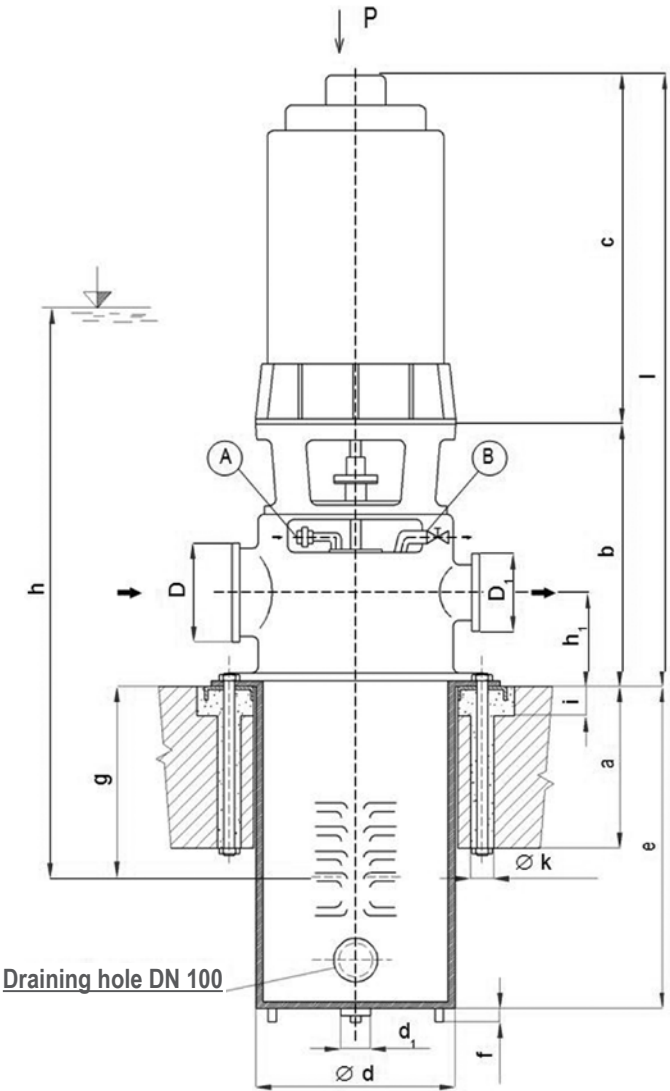
840	Coupling
905	Hydraulic screw
920.1	Nut
920.2	Nut
940	Spring

BASIC TECHNICAL DATA

Pump size	Branches suction/discharge [mm]	Q [l.s ⁻¹]	Δh_{dov} [m]	H [m] P [kW]	Number of stages						Speed (min ⁻¹)
					2	3	4	5	6	7	
200-CJMV-410-23	350/200	55	2,5	H P	101 80	155 12	209 166	263 212	316 251	370 294	1485
		8	2,6	H P	87,5 99	136 154	184 208	232 262	280 317	328 371	
		105	4,0	H P	70 108	110 169	150 231	190 292	230 354	269 414	
		Pump weight incl. frame and reservoir [kg] Pump unit weight [kg]				3030 4130	3260 4410	3490 5770	3720 6000	3950 8150	
300-CJMV-460-38	500/300	150	2,7	H P	128 270	200 405	275 550	353 705			1485
		196	3,6	H P	112 300	174 450	246 620	328 810			
		240	–	H P	94 320	147 490	209 700	280 950			
		Pump weight incl. frame and reservoir [kg] Pump unit weight [kg]				3600 6700	4200 8400	4800 9000	5400 10900		

Q	<i>Pump flow</i>
H	<i>Pump head</i>
P	<i>Pump shaft input, pumped media density 1000 kg.m⁻³</i>
Δh_{dov}	<i>Permitted cavitation depression</i>

EXTERNAL PUMP JUNCTIONS



A	Seal flushing – screwing DN 1/2"
B	Extraction stream of pumped condensate – valve DN 1 1/2"

DIMENSIONS

Pump type	Number of stages	a	b	c	∅ d	d ₁	e	f	g	h	h ₁	i	∅ k
200-CJMV-410-23	2	600 1000	1150	1000	1000	DN 40	580–1280	80	do 780	to be set individually	395	150	100
			1150	1000			720–1420		40–740				
	4	600	1150	1550			860–1560		180–880				
	5		1150	1550			1000–1700		320–1020				
	6	1000	1280	2200			1140–1840		460–1160				
	7	1000	1280	2200			1280–1980		600–1300				
300-CJMV-460-38	2	600	1580	1720	1200	DN 40	950–1650	80	250–950	to be set individually	600	150	100
			1630	2200			1150–1850		425–1125				
	4	1000	1630	2200			1300–2000		600–1300				
	5	1000	1630	2300			1500–2200		775–1475				

Pump type	Number of stages	l	m	n	p	p ₁	r	s	s ₁	t	u	v	D	D ₁
200-CJMV-410-23	2	2150	450	1100	1400	75	1550	1250	75	1400	1800	1900	DN 350 PN 10	DN 200 PN40
		2150												
	4	2600												
	5	2600												
	6	3480												
	7	3480												
300-CJMV-460-38	2	3300	800	1300	1600	75	1750	1450	75	1600	2000	2100	DN 500 PN 6	DN 300
	3	3830												
	4	3830												
	5	3930												

All dimensions given in mm.

Sense of rotation clock-wise, view from the drive above.

Missing data upon request.



SIGMA GROUP a. s.
Jana Sigmunda 79
783 49 Lutín, Česká republika
+420 585 652 011, +420 585 652 060
+420 585 652 051, +420 585 944 294
info@sigma.cz
2014

www.sigma.cz