Prismet Inc

PUMPING EQUIPMENT CATALOGUE

- QUALITY
- RELIABILITY
- PROCESSABILITY

Prismet Inc.

Prismet Inc. USA is the international marketing partner of Nasosenergomash, Sumy, which is one the biggest enterprises specializing in the development and manufacture of pumping equipment for oil & gas industry, power generation, water industry, agriculture and housing and communal services:

- during the entire period of its existence, the Company has made over 550,000 pumps of more than 635 makes;
- geography of supplies: more than 50 countries on 5 continents;
- the pumping equipment is manufactured in compliance with Russian and international branch standards;
- pump units for petroleum industry are designed in compliance with the API Standard 610 and are included in Transneft's Register of Goods and Equipment (Major Products);
- pumps for nuclear power generation are entered in Uniform Specialized Nomenclature Catalog for Equipment and Materials Used During NPP Design, Construction and Operation (EOHKOM);
- Pumping equipment for high-hazard services is supplied under Licenses to Use issued by State Control Committee for Emergency Situations and Industrial Safety (Republic of Kazakhstan).

Design

A close cooperation of the Company with Research & Design Institute for Nuclear & Thermal Power Pump Engineering (VNIIAEN) ensures:

- high quality and reliability of products turned out;
- use of advanced state-of-the-art designs;
- application of up-to-date precision methods of analysis;
- Investigations and experimental development and refinement of all the design features of pump units.

Our specialists keep on improving serial products and raising their power efficiency and manufacturability. While developing new pumping equipment and updating the already mastered one, design decisions are made based on principles of economical operation and ecological compatibility

Technical Re-Equipment

A number of pieces of high-tech metal machining technique has been commissioned in recent years:
Schiess Vertimaster VMG 1.35 gantry machining center for a total machining of pump casings;
DOOSAN PUMA 5000 XLY high-precision turning center for finish turning and milling keyslots in the pump shafts using a single positioning; DMF-260 5-axis milling center for high-performance machining of sophisticated difficult-to-make diffusers and other parts of irregular (complex shaped) spatial configurations;
Danobat CNC vertical boring and turning centre VTC 1800 and some others;
a new foundry equipped with an up-to-date moulding line and induction furnaces capable of producing 4 thou. tonnes of castings per year has been built.

Quality Control

The Company maintains its Quality Management System certified for compliance with ISO Standard 9001:2008 running. Its laboratories provided with present-day equipment ensure high quality of pumps made.

One-of-a-kind complex of test stands enables a full-scale testing of both high pressure and high-capacity pump units:
outlet flow rate: up to 16,000 m3/h;
discharge pressure: up to 280 kgf/cm2;
nominal power of motor drives: maximum 14 MW.

Applications							Power generation		
Pump type and design features			Type of casing	Casing main joint	Other specific design features	API pump type classification code	Nuclear		Thermal
I CENTRIFUGAL PUMPS:									
1. Horizontal:									
1) with overhung impeller	single stage					OH1			KO, CN, KOSH / MKG
	multi-stage					OH1			2KO, 3KO, CN, 2KOSH
2) with impeller(s) between bearings	single stage	single entry impeller	segmental	radially split			Ks		Ks
		double entry impeller	volute	axially split		BB1	CNA, D / PD / CNR, CNA, CNSA		SE, PD, D, Ks
				radially split		BB2	PD, PTA		PD
	multi-stage		volute	axially split		BB3			
		single entry impeller	segmental	radially split	single casing	BB4	PEA, Ks		PE, CNSg, Ks, Ksg
					double casing	BB5	PEA, PTA	CNA	PE
		double entry impeller	volute	axially split		BB3	CE		SE
		double entry impeller (1st stage) + single entry impellers	volute	axially split		BB3	KsD		KsD
			combined	axially split		BB3			
				radially split					MSK
2. Vertical:									
1) for dry pit installation		single casing	with diffuser						
			volute casing		double entry impeller				DV
		double casing	with diffuser			VS6	KsVA		KsV
2) for wet pit installation (submersible / submerged)		with diffuser				VS4			MV
		volute casing							MKV
II TORQUE FLOW PUMPS:									
1. Horizontal:									
2. Vertical:		for wet pit installation							
III VACUUM PUMPS:									
1. Slide-valve controlled							AVZ, NVZ		
2. Plunger									

* Double entry impeller

- water, up to 85?C
- water (condensate), above 85?C
- acid solutions
- crude oil and refined products
- liquids containing foreign matter
- aqueous solutions of

Housing and communal services, water supply		Hydrocarbon production and transport			Industrial production					Other services		
Industrial and communal water supply / disposal, public power utilities		Oil pool waterflooding	Trunk pipeline pumping stations	Oil mixing tank farms, oil loading terminals, storage tanks	Oil refining and petrochemical industry	Chemical industry	Coal and ore mining	Ferrous and non-ferrous metallurgy	Woodworking and pulp & paper industry	Fire-fighting systems	Instrument engineering	Agricultural sector
K, KSH, KM	KO, KOSH						K, KM, KSH	K, KM, KSH	SKM	K, KSN		K, KM, KSN
SKM												SkM
2KO, 3KO, CN, 2KOSH							2KO, 3KO, CN, 2KOSH					
D	SE, D	NCl -E	NM, NGPN-M, 20NDsN, NCN-E	NGPN-M NCN-E, DN, 20NDsN	NGPN-M, 20NDsN, NG, DN, NCN-E	CNA, CNR	D	D	D	D		D
					NG							
14M8x4-1, CN	CN									CN		CN
PE, CNSg, Ks		CNS, CNSz, CNSp	NM, CNSn	CNSn	CNSn	NM, CNSn	CNS	PE, CNS, CN, CNSz				
						HBE-M						
			NM		NG, NMF	HB						
SE												
KsD												
						MSK						
CNS												
DV										DV		DV
KsV			NPV	NPV								
			NOU	NV, NOU	NV, NOU							
EPZ									EPZ			EPZ
SVN									SVN			SVN
EPZ									EPZ			EPZ
						AVZ, NVZ		AVZ, NVZ			AVZ, NVZ	
AVPI						AVPI		AVPI	AVPI		AVPI	AVPI

- turbine oils

- formation water

mono- and diethanol amines

- air and other chemically neutral vapours and gases

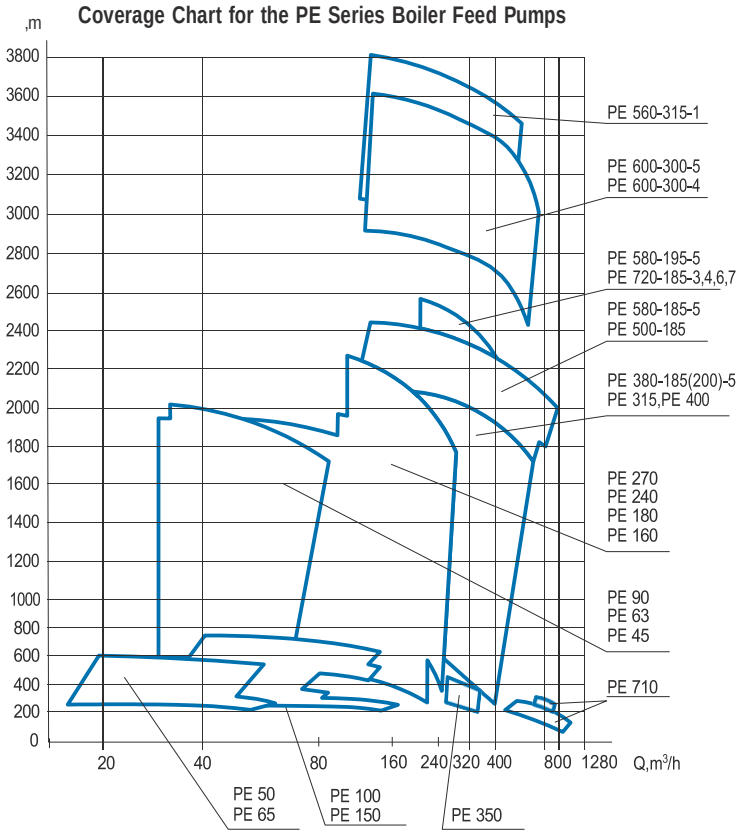
PE Series Multistage Segmental /Radially Split Barrel

PE 720

Designed for delivering treated water (feed water) into stationary steam boilers of the conventional (fossil-fueled) thermal power stations as well as to supply feedwater into waste-heat boilers at the power stations with combined-cycle and steam power plants.

Motor driven horizontal multistage diffuser centrifugal pumps of segmental or barrel type with a withdrawable cartridge of ring-section type. Single flow impeller arrangement, with all the impellers facing the same way.
May be operated both at the constant and variable speed of rotation.
The pump rotor is carried by the oil-ring or pressure lubricated plain bearings.
Shaft sealing: packed glands or mechanical seals.

Coverage Chart for the PE Series Boiler Feed Pumps



At the Customer's request, the following options can be provided:

- such a construction of studs for casing main joint that enables the use of hydraulic jacks (wrenches) for pre-tensioning the studs by making them only elongate before nuts screwing-on, thus avoiding torsional stresses arisen and ensuring their accurate and even tightening-up;
- equipping with a balance disc-from-seat separation device to ensure the guaranteed axial gap in the balancing device, thus holding pump rotor unbound both during standstill and at start-ups.

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	PE 20-16	20	172	3000	30
2	PE 50-70	35	530	3000	160
3	PE 63-90	60	930	3000	250
4	PE 65-28	65	290	2900	110
5	PE 65-40	65	440	3000	132
6	PE 65-40	25	480	3000	110
7	PE 65-40-1	51	425	3000	132
8	PE 65-40-1	65	580	3000	200
9	PE 65-40-1	70	501	3000	160
10	PE 65-40-1	80	580	3000	250
11	PE 65-53	65	580	3000	200
12	PE 65-53	54.14	617.83	3000	200
13	PE 65-53	51.7	615.4	3000	200
14	PE 65-53	80	500	3000	200
15	PE 90-110	90	1100	3000	500
16	PE 90-110	100	1100	3000	500
17	PE 90-180	90	1900	3000	1000
18	PE 100-32	100	330	3000	160
19	PE 100-53	80	580	3000	315
20	PE 145-30	145	293	3000	200
21	PE 150-53	150	580	3000	500
22	PE 150-63	150	700	3000	500
23	PE 160-140	160	1400	3000	1000
24	PE180-80	180	887	3000	630
25	PE 180-140	180	1450	2900	1000
26	PE 240-105	240	1140	3000	1250
27	PE 240-110	240	1210	3000	1250
28	APE 260-100	260	960	3000	1000
29	PE 250-190	250	1950	3000	2000
30	PE 270-150-3	270	1650	3000	2000
31	PE 270-150-4	250	1850	3000	2000
32	PE 270-150-4	248	1524	3000	1600
33	PE 275-100	275	1100	2970	1250
34	PE 310-100	310	1100	3000	2000
35	PE 310-110	310	1200	3000	2000
36	PE 310-140	310	1550	3000	2000
37	PE 310-160	310	1750	3000	2000
38	PE 315-130	315	1394	3000	1600
39	PE 315-140	315	1520	3000	2000
40	PE 315-150	315	1647	3000	2000
41	PE 315-175	315	1900	3000	2500
42	PE 350-45	350	460	3000	630
43	PE 380-185-5	380	2030	3000	3150

PE Series Multistage Segmental /Radially Split Barrel

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
44	PE 380-200-5	380	2190	3000	3150
45	PE 400-185	400	1900	3000	3150
46	PE 500-180-5	500	1950	3000	4000
47	PE 560-315-1	560	3500	6000	8000
48	PE 580-185-5	580	2030	3000	4000
49	PE 580-195-5	580	2150	3000	5000
50	PE 600-300-4	600	3290	6300	8000
51	PE 600-300-5	600	3290	6300	8000
52	PE 640-360	640	3670	6000	7000
53	PE 710-280	710	280	3000	800
54	PE 720-185-3	720	2030	3000	5000
55	PE 720-185-4	780	2030	4500	6300
56	PE 720-185-4	735	2030	3000	6300
57	PE 720-185-4	740	2250	3000	6300
58	PE 720-185-4	872	2052	3000	6300
59	PE 720-185-6	720	2030	3000	5000
60	PE 720-185-7	720	2030	3000	5000

PE 400

PE 150

PE 600

MG and MGL Fluid Couplings

Nos	Fluid coupling make	Output shaft speed range, rpm		Power transmitted by the coupling, kW
		from	t	
1	MG-600	2900	600	2000
2	MG-670	2900	600	5000
3	MGL- -710	6300	1900	7000
4	MG2-600	2900	600	5000
5	MG2L-650	2900	600	7000

Designed for controlling the rotational speed of electrically driven pumping sets in order to vary their head and capacity to meet the system requirements.

The scoop-controlled horizontal hydrodynamic couplings are made in single-chamber version with an integral gear (MGL-M-710) or without it (MG 600 and MG 670) and in double-chamber version (MG2-600 and MG2L-650).

MG 600

PD Series Double Flow Axially / Radially Split

The boiler feed booster pumps are installed upstream of boiler feed pumps to deliver feed water with the pumping temperature of max. 165°C at the power units in TPS's to ensure a cavitation-free operation of the main pumps.

PD 650-160: motor-driven horizontal single-stage axially split (radially split in case of PD 650-160-2) volute-casing centrifugal pumps with a double entry radial impeller. Pump nozzles oriented horizontally to the opposite sides. The pump rotor is carried by the oil-ring lubricated plain bearings. Shaft sealing: packed glands.

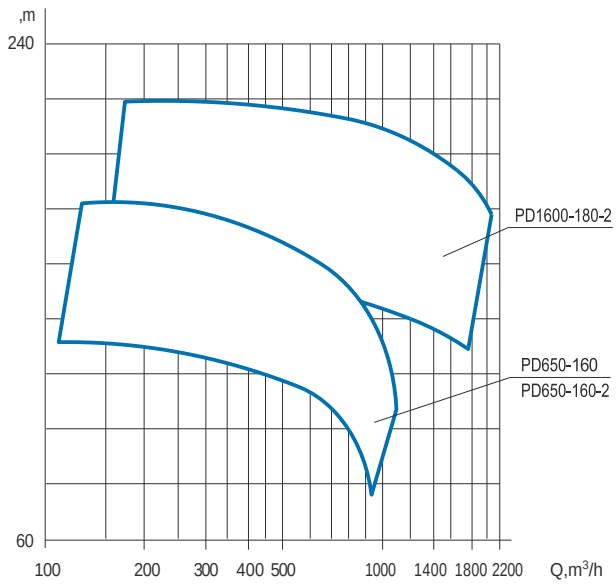
PD 1600-180-2: turbine-driven horizontal single-stage radially split volute-casing centrifugal pumps with a double entry radial impeller. The discharge nozzle horizontally sideward, the suction nozzle vertically to the bottom. The pump rotor is carried by the pressure lubricated plain bearings. Shaft sealing: mechanical seals.

PD

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed, rpm	Motor nominal power, kW
1	PD 650-160	650	158	3000 (synchr.)	324
2	PD 650-160-2	650	158	3000	303
3	PD 1600-180-2*	1660	194	2100	954
4	PD 1600-180-2 **	1050	184	2100	633
5	PD 1600-180-2 ***	1240	158	2000	618

* for TPS 800 MW power units
** for TPS 500 MW power units
*** for TPS 320 MW power units

Coverage Chart for the Boiler Feed Booster Pumps PD

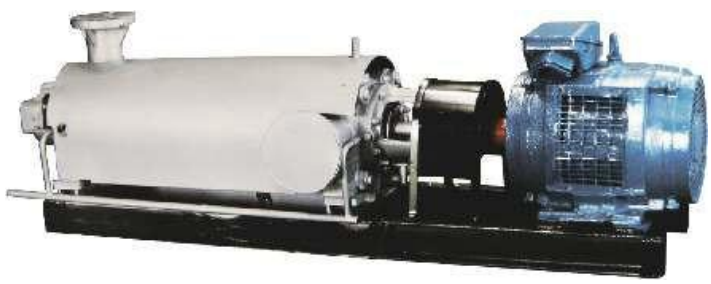


CNSg & CNSgM Series Multistage Segmental

Designed for handling water in hot water heating and water supply systems of industrial projects and public utilities (including the delivery of feedwater into the small-size boilers).

Electrically driven horizontal ring-section multistage centrifugal pumps. The pump rotor is carried by the grease-lubricated antifriction bearings. Shaft sealing: packed glands

CNSg



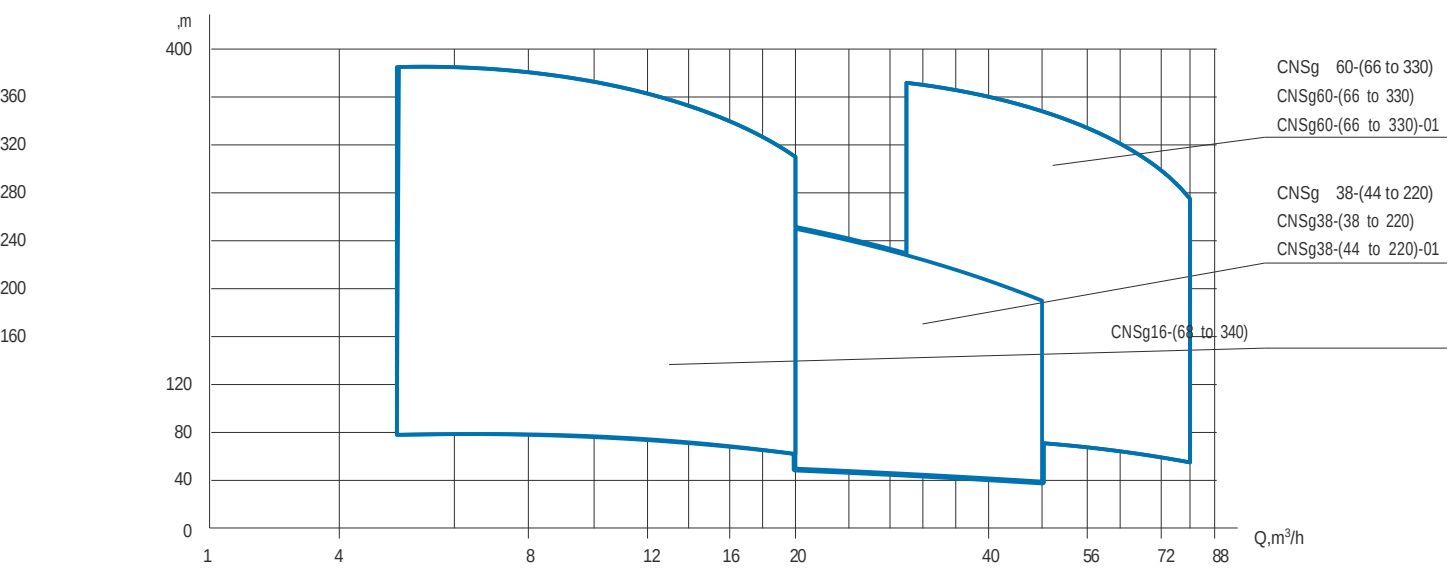
CNSgM

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	CNSg 16-68	16	68	3000	7.5 (11)
2	CNSg 16-102	16	102	3000	11
3	CNSg 16-136	16	136	3000	15
4	CNSg 16-170	16	170	3000	18,5
5	CNSg 16-204	16	204	3000	22
6	CNSg 16-238	16	238	3000	30
7	CNSg 16-272	16	272	3000	30
8	CNSg 16-306	16	306	3000	37
9	CNSg 16-340	16	340	3000	37
10	CNSgM 38-44	38	44	3000	11
11	CNSgÌ 38-66	38	66	3000	15
12	CNSgÌ 38-88	38	88	3000	22
13	CNSgÌ 38-110	38	110	3000	22
14	CNSgÌ 38-132	38	132	3000	22
15	CNSgÌ 38-154	38	154	3000	30
16	CNSgÌ 38-176	38	176	3000	30
17	CNSgÌ 38-198	38	198	3000	37 (55)
18	CNSgÌ 38-220	38	220	3000	37 (55)
19	CNSgÌ 60-66	60	66	3000	22
20	CNSg 60-99	60	99	3000	30
21	CNSg 60-132	60	132	3000	55
22	CNSg 60-165	60	165	3000	55
23	CNSg 60-198	60	198	3000	55
24	CNS 60-231	60	231	3000	75
25	CNSg 60-264	60	264	3000	75
26	CNSg 60-297	60	297	3000	110
27	CNSg 60-330	60	330	3000	110
28	CNSg 38-44	38	44	3000	11
29	CNSg 38-66	38	66	3000	15
30	CNSg 38-88	38	88	3000	18.5
31	CNSg 38-110	38	110	3000	22
32	CNSg 38-132	38	132	3000	30

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
33	CNSg 38-154	38	154	3000	30
34	CNSg 38-176	38	176	3000	30
35	CNSg 38-198	38	198	3000	37
36	CNSg 38-220	38	220	3000	45
37	CNSg 60-66	60	66	3000	22
38	CNSg 60-99	60	99	3000	30
39	CNSg 60-132	60	132	3000	45
40	CNSg 60-165	60	165	3000	55
41	CNSg 60-198	60	198	3000	55
42	CNSg 60-231	60	231	3000	75
43	CNSg 60-264	60	264	3000	75
44	CNSg 60-297	60	297	3000	90
45	CNSg 60-330	60	330	3000	110
46	CNSg 38-44-01*	38	44	3000	11
47	CNSg 38-66-01*	38	66	3000	15
48	CNSg 38-88-01*	38	88	3000	18.5
49	CNSg 38-110-01*	38	110	3000	22
50	CNSg 38-132-01*	38	132	3000	30
51	CNSg 38-154-01*	38	154	3000	30
52	CNSg 38-176-01*	38	176	3000	30
53	CNSg 38-198-01*	38	198	3000	37
54	CNSg 38-220-01*	38	220	3000	45
55	CNSg 60-66-01*	60	66	3000	22
56	CNSg 60-99/4	27	25	1500	4
57	CNSg 60-99-01*	60	99	3000	30
58	CNSg 60-132-01*	60	132	3000	45
59	CNSg 60-165-01*	60	165	3000	55
60	CNSg 60-198-01*	60	198	2940	55
61	CNSg 60-231-01*	60	231	3000	75
62	CNSg 60-264-01*	60	264	3000	75
63	CNSg 60-297-01*	60	297	3000	90
64	CNSg 60-330-01*	60	330	3000	110

* Explosion-proof version

Coverage Chart for the Boiler Feed Pumps CNSg and CNSgM



MSK Series Twin Suction, Radially Split

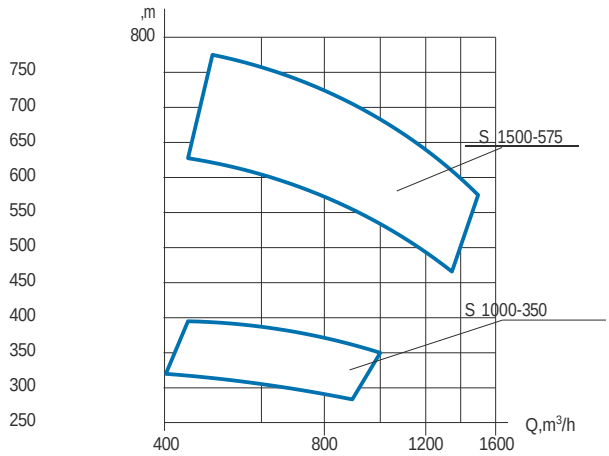
The boiler acid pickling pumps are designed for descaling TPS boilers by pumping an acid solution with the temperature of up to 120°C through them.

Motor driven horizontal near-centerline mounted, double-entry (with two suction nozzles) radially split volute-casing centrifugal pump of ring section type with single-flow impellers in back-to-back arrangement. The pump rotor is carried by the pressure-lubricated plain bearings. Shaft sealing: packed glands.

S

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	S 1000-350	1000	350	3000	1600
2	S 1500-575	1500	575	3000	3150

Coverage Chart of the Boiler Acid Pickling Pumps MSK



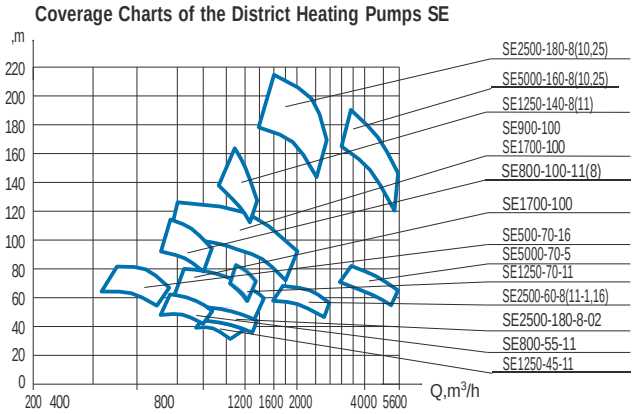
SE Series Double Flow Axially Split

Installed in main plants for hot water circulation in the heating circuit systems within a whole district

Electrically driven horizontal single stage or two-stage (with an interstage crossover for SE 800-100-11, SE 1250-140-11) axially split volute process centrifugal pumps between bearings, with one or two (in case of two-stage pumps) double entry radial impellers. Semicenterline casing support. The pump rotor is carried by the oil-ring or pressure lubricated plain or antifriction bearings. Shaft sealing: packed glands or mechanical seals.

SE

Coverage Charts of the District Heating Pumps SE



Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	SE 500-70-16	500	70	3000	160
2	SE 800-55-11	800	55	1500	200
3	SE 800-100-8	800	100	3000	315
4	SE 800-100-11	800	100	1500	315
5	SE 900-100	900	100	3000	250
6	SE 1250-45-11	1500	45	1500	200
7	SE 1250-70-11	1250	70	1500	315
8	SE 1250-140-8	1250	140	3000	800
9	SE 1250-140-11	1250	140	1500	630
11	SE 1700-100	1500	70	1500	600
10	SE 1700-100	1700	110	1500	600
12	SE 2500-60-8	2500	60	1500	630
13	SE 2500-60-11-1	2500	60	1500	630
14	SE 2500-60-16	2500	60	1500	630
15	SE 2500-160-8	2500	160	1500	1600
16	SE 2500-180-8	2500	180	3000	1600
17	SE 2500-180-8-02	1250	45	1500	250
18	SE 2500-180-10	2500	180	3000	1600
19	SE 2500-180-25	2500	180	3000	1600
20	SE 5000-70-5	5000	70	1500	1250
21	SE 5000-160-8	5000	160	3000	3150
22	SE 5000-160-10	5000	160	3000	3150
23	SE 5000-160-25	5000	160	3000	3150

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	Ks 32-150-2	32	150	3000	22
2	Ks 50-55-2	50	55	3000	15
3	Ks 50-110-2	50	110	3000	30
4	Ks 80-155-2	80	155	3000	55
5	KsV 90-155	90	155	3000	75
6	KsV 90-220	90	220	3000	110
7	KsV 120-85	120	85	3000	55
8	KsV 125-55-2	125	55	3000	30
9	KsV 125-55-2	125	45	3000	30
10	KsV 125-55-2	125	40	3000	30
11	KsV 125-55-2	125	70	3000	30
12	KsV 125-55-2.4	125	55	3000	30
13	KsV 125-55 -2.4	125	45	3000	30
14	KsV 125-55 -2.4	125	40	3000	30
15	KsV 125-140-1	125	140	3000	75
16	KsV 125-140-2	125	140	3000	75
17	KsV 125-140-2	125	125	3000	75
18	KsV 125-140-2	125	100	3000	55
19	KsV 125-140-2.4	125	140	3000	75
20	KsV 125-140 -2.4	125	125	3000	75
21	KsV 125-140 -2.4	125	100	3000	55
22	KsV 200-130	200	130	3000	110
23	KsV 200-130	200	115	3000	110
24	KsV 200-130	200	99	3000	110
25	KsV 200-220	200	220	1500	250
26	KsV 200-220	145	203.4	1500	132
27	KsV 200-220	200	180	1500	250
28	KsV 200-220	150	180	1500	132
29	KsV 200-220	180	220	1500	250
30	KsV 200-220	200	190	1500	160
31	KsV 200-220-1	200	220	1500	250
32	KsV 285-260	336	260	1500	400
33	KsV 285-260-1	335	238	1500	400
34	KsV 300-70	230	70	1000	75
35	KsV 320-85	320	85	1500	132
36	KsV 320-85	200	100	1500	132
37	KsV 320-125	320	125	1500	160
38	KsV 320-50/160	320	50/160	1500	315
39	KsV 320-160-2	320	160/100	1500	250
40	KsV 320-160-3	320	160/100	1500	250
41	KsV 320-160-4	320	160/100	1500	250
42	KsV 500-85-1	500	85	1000	200
43	KsV 500-85-1	475	115	1000	250
44	KsV 500-150-1	500	150	1500	315
45	KsV 500-220-1	500	220	1500	500
46	KsV 700-180	700	180	1500	500
47	KsV 700-210	700	210	1500	630
48	KsV 1000-95	1000	95	1000	400
49	KsV 1150-90	1150	90	1500	500
50	KsV 1150-90	925	90	1500	500
51	KsV 1250-45	1250	45	1500	250
52	KsV 1250-45	975	45	1500	250
53	KsV 1500-140	1500	140	1500	100
54	Ks 1500-240-2	1500	240	3000	1250
55	KsV 1600-90	1000	90	1000	630
56	Ksg 80-155-6	80	155	2940	55

Used for pumping condensate in the steam and water circuit systems of the thermal power stations that burn organic fuel and to transfer water in heating plants and water supply systems.

Ks /Ksg: Electrically driven horizontal single-stage (Ks 50-55-2) or multistage ring section centrifugal pumps between bearings, with inducer and single entry impeller or impellers arranged one behind the other. Rotor axial thrust balancing by drum. The pump rotor is carried by the antifriction bearings (medium-lubricated internal plain bearings in case of Ksg pump). Rotor axial thrust balancing by balance disc and balance disc seat. Shaft sealing: packed glands or mechanical seals

Ks 1500-240-2: horizontal centerline-mounted, single-stage axially split volute casing centrifugal pump with a double entry impeller and horizontal nozzles located opposite inline.

Radial forces and the residual rotor axial thrust are absorbed by forced oil lubricated plain bearings (one segmental thrust bearing and two radial bearings).

Shaft sealing: by single mechanical seals

KsV: Electrically driven vertically suspended can diffuser single-stage (KsV 125-55 and KsV 1250-45) or multistage inducer pumps with single flow impeller arrangement (except KsV 200-130, KsV 1150-90, KsV 1250-45 pumps equipped with a double suction first stage impeller). The inner casing (a withdrawable rotating assembly) of ring-section type comprises a bare rotor, casing parts, a shaft seal (packed gland or mechanical seal) and bearings.

S

sV

KO, 2KO & 3KO Series End Suction, with Overhung Impeller

Used for pumping condensate in the steam and water circuit systems of the thermal power stations that burn organic fuel and to transfer water in heating plants and water supply systems.

Flexibly coupled, electrically driven horizontal foot-mounted single-stage (KO), double-stage (2KO) or three-stage (3KO) end suction volute-casing centrifugal pumps with overhung impeller(s) and bearing bracket. The pump rotor is carried by grease-lubricated antifriction bearings. Shaft sealing: by a soft-packed gland or a mechanical seal.

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	50/56	50	56	3000	15
2	50/56	50	48	3000	15
3	50/56	50	41	3000	15
4	2 50/112	50	112	3000	30
5	2 50/112	50	97	3000	30
6	2 50/112	50	80	3000	30
7	3 32/150	32	150	3000	30

KOSH & 2KOSH Series Inducer End Suction, with Overhung Impeller

SH

Used for pumping condensate in the steam and water circuit systems of the thermal power stations that burn organic fuel and to transfer water in heating plants and water supply systems.

Flexibly coupled, electrically driven horizontal foot-mounted single-stage (KOSH) or double-stage (2KOSH) end suction volute-casing centrifugal pumps with an inducer, overhung impeller(s) and bearing bracket. The pump rotor is carried by grease-lubricated anti-friction bearings. Shaft sealing: by a soft-packed gland or a mechanical seal.

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	SH 80-200	125	55	3000	30
2	2 SH 80-250	125	140	3000	75

KsD Series Cross-Over Three-Stage, Axially Split, Double Entry 1st Stage

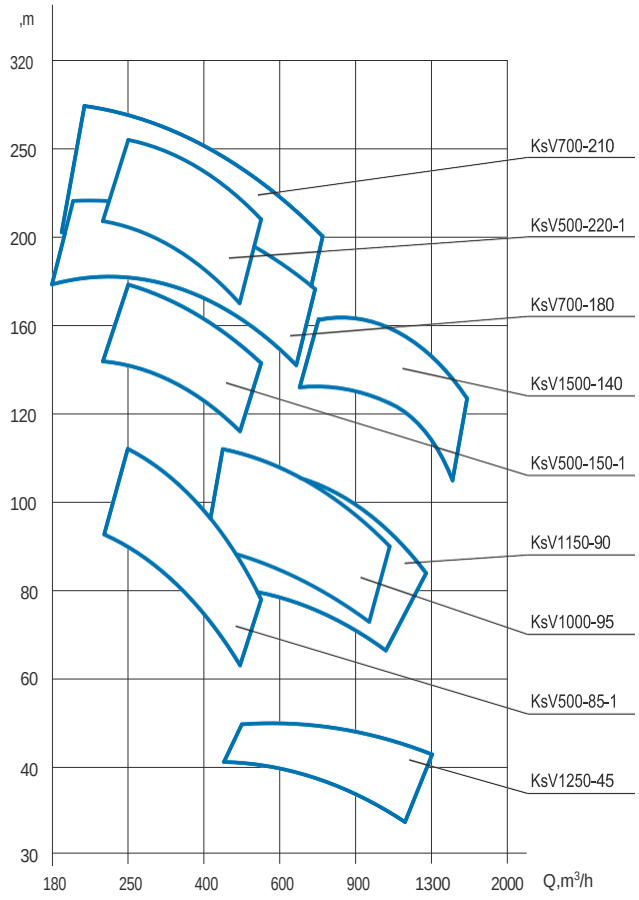
sD

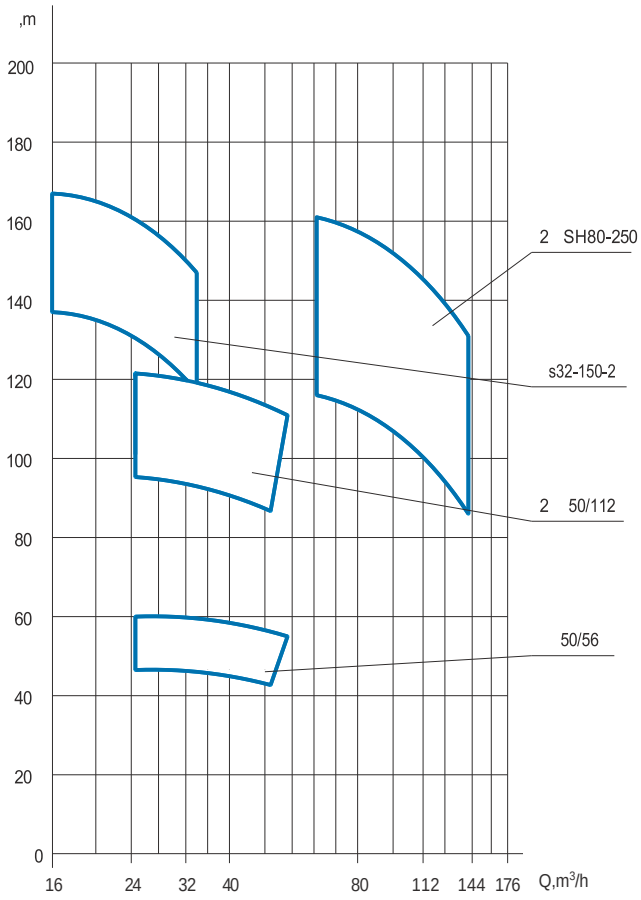
Designed for handling condensate in the steam and water circuit systems of the power stations that burn organic fuel, as well as liquids similar to condensate in viscosity, chemical activity and solid content.

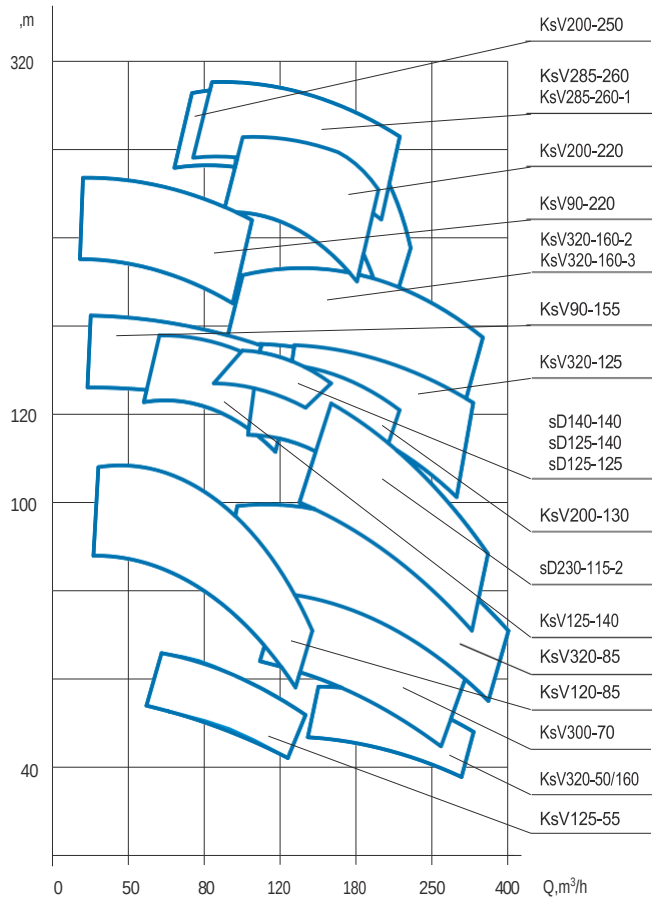
Electrically driven, horizontal three-stage, cross-over, axially split volute-casing centrifugal pumps between bearings, with the first-stage double-entry impeller and single-entry radial impellers in back-to-back arrangement. The pump rotor is carried by the anti-friction bearings. Shaft sealing: soft packed glands or mechanical seals.

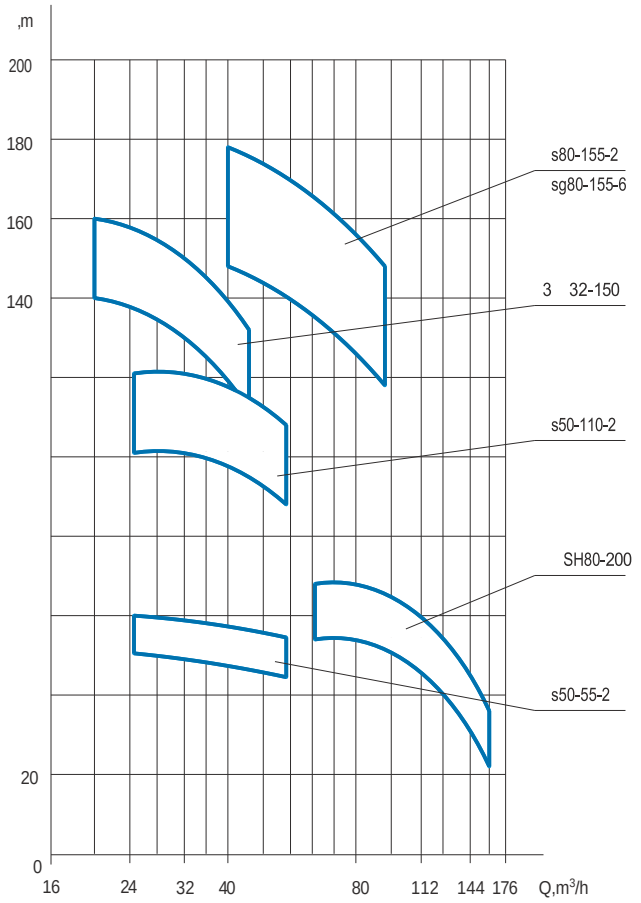
Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	sD 140-140	140	140	1500	110
2	sD 125-140	125	140	1500	110
3	sD 125-125	125	125	1500	90
4	sD 230-115-2	230	115	1000	160
5	sD 230-115 -2	210	95	1000	160

Coverage Charts of the Condensate Extraction & Heater Drain Pumps
Ks, KsV, KO, KOSH and KsD









CN Series End Suction, with Overhung Impeller

CN

The pumps CN 120, CN 150, CN 180 and CN 200 are designed for circulating boiler water at temperatures of up to 250?C (up to 315?C in case CN 200-40 make) through the steam-generating circuit of a waste-heat boiler.

The CN 100-9 pump make is designed for circulating slurry having pH ranging from 9.5 to 11.0 at the temperature of 5 to 95?C in the VTI type clarifier.

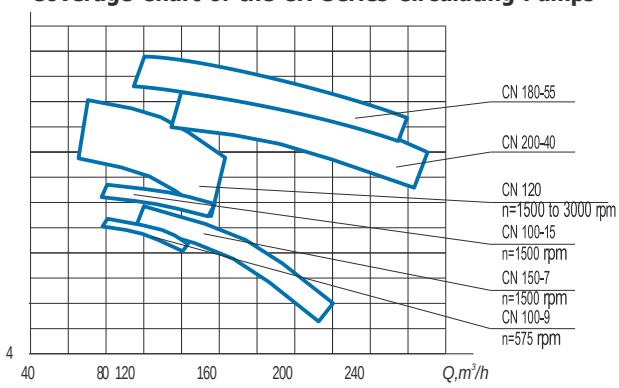
CN 150-7, CN 100-15, CN 120-15 and CN 200-40: Electrically driven, side-suction, barrel-insert inducer single stage centrifugal pumps between bearings. The rotor is carried by oil-ring lubricated ball bearings. Shaft sealing: mechanical seal. Casing mounting: either on the baseplate, or suspended with attachment at the nozzles, the driving torque being transmitted by means of a universal joint.

CN 120-35, CN 180-55 and CN 100-15: Electrically driven, horizontal foot-mounted single-stage end suction volute-casing centrifugal pumps with overhung impeller and bearing bracket. Discharge nozzle radially to the top. The pump rotor is carried by grease-lubricated antifriction bearings. Shaft sealing: by a mechanical seal.

CN 100-9 features a back pull-out design (which allows removal of the rotor assembly without separating the pump casing from the pipeline), an open impeller, a balanced soft-packed gland, oil- or grease-lubricated antifriction bearings. Axial thrust balancing by dynamic action of back blades. Steam inlet connection is provided for flushing the pump after its stopping.

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	CN 100-9	100	9	600	6
2	CN 100-15	100	15	1500	7.5
3	CN 150-7	150	7	1500	6
4	CN 120-15	120	15	1500	11
5	CN 120-35	120	35	3000	30
6	CN 180-55	180	55	3000	55
7	CN 200-40	200	40	3000	37

Coverage Chart of the CN Series Circulating Pumps



Pumps for Turbine Controlling Systems

Designed to deliver turbine oil into the oil supply and control systems for turbine plants. They can be also used in stationary installations for handling various lube oils similar to turbine oil in their physical and chemical properties.

MV Model Pump: a motor driven, vertically suspended, cantilever, diffuser three-stage ring-section wet sump (submerged) centrifugal pump with a separate discharge. Single entry radial impeller arrangement, with all the impellers facing the same way. The pump rotor is carried by the lower plain bearing and upper antifriction bearing. Shaft sealing: slit seal. The cover plate of an oil inlet sump serves as support plate for the pump.

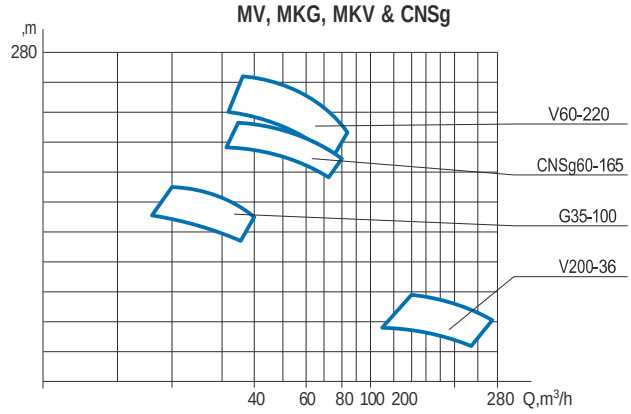
Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	Ì ÊG 35-100	35	100	3000	18.5
2	G 35-100à	35	85	3000	18.5
3	G 35-100D	35	112	3000	22
4	V 60-220	60	220	3000	75
5	V 200-36	200	36	1500	45
6	V 200-36	190	29	1500	30
7	V 200-36	180	25	1500	30
8	V 200-36	120	23	1500	16
9	CNSg 60-165	60	165	3000	55

MKG Series Pumps: motor driven, foot mounted, horizontal, end-suction two-stage volute-casing centrifugal pumps with overhung impellers and bearing bracket. Shaft sealing: mechanical seal. The pump rotor is carried by the grease lubricated antifriction bearings.

MKV Series Pumps: motor driven, vertically suspended, cantilever single-stage volute-casing wet sump centrifugal pump with a separate discharge and a single entry radial impeller. The pump rotor is carried by the lower plain bearing and upper anti-friction bearing. Shaft sealing: slit seal. The cover plate of an oil inlet sump serves as support plate for the pump.

CNSg 60-165: for design description, refer to page 8

Coverage Chart of the Pumps for Turbine Controlling Systems MV, MKG, MKV & CNSg



P 3750

P 3800

PEA 1840

PEA 250

KsV

CNS

Pumps For NPS Service

Product name & construction features	Pump make	Equipment applications	Technical data			Safety class	Seismic stability category	Climatic version, location category
			Capacity, m^3/h	Head, m	Type of drive & its parameters			
Boiler Feed Pumps: horizontal, centrifugal, with plain bearings and shaft sealing by means of mechanical seals (in case of **PEA 250-80-3:** horizontal, ring-section, centrifugal, with oil-bath lubricated plain bearings and shaft sealing by means of single mechanical seals; axial thrust compensation by balance disc; flanged nozzles)	**PEA 250-80-2**	Used as an auxiliary start and shut-down pumps for delivering feedwater from the deaerator to the steam generator during heating-up and cool-down conditions of the primary circuit of NPS power units equipped with VVER-91 pressurized water reactors	250	880	Electric motor: n = 3000 rpm; P_{nom} = 800 kW; U = 6000 V	3	II	M3
	PEA 250-80-3	Used for delivering feedwater to the steam generator at the NPS-2006 project equipped with the VVER-1200 pressurized water reactor	250	880	Electric motor: n = 3000 rpm; P_{nom} = 800 kW; U = 10,000 V	3	II	4
	PEA 1840-80	Designed as a boiler feed pump to deliver feed water from the deaerator to the steam generator at the NPS-2006 project equipped with the VVER-1200 pressurized water reactor. May be used for VVER-TOI design	1840	910	Electric motor: n = 3000 rpm ; P_{nom} = 6300 kW; U = 10,000 V	3	II	4
	P 3750-75-2	Designed as a boiler feed pump to deliver de-aerated water from gas-extractors (degasers) to steam generators in NPS power units equipped with a VVER-1000 PWR and turbine K-1000-60/3000-2	3400	635	Turbine: n = 3114 rpm; P_{nom} = 6285 kW	3	IIб	B3
	P 3750-75-3	Designed as a boiler feed pump to deliver de-aerated water from gas-extractors (degasers) to steam generators in NPS power units equipped with a VVER-1000 PWR and turbine K-12-1,0 -1 or -12 for Rostov NPP and -10-0,5 -1 in case of Kalinin NPP	3750	860	Turbine: n = 3409 rpm ; P_{nom} = 9603 kW	3	II	4
	P 3800-20-2	Used as a boiler feed booster pumps to deliver feed water from the de-aerator (gas extractor) to PTA 3750-75-2 and PTA 3750-75-3 BFPs respectively for providing a greater available NPSH to the main pumps for their cavitation-free operation	3450	134	Turbine: n = 1602 rpm; P_{nom} = 1280 kW	3	IIб	B3
	P 3800-20-3		3800	160	Turbine: n = 1753 rpm ; P_{nom} = 1680 kW		II	4
Condensate Pumps: vertically suspended multistage diffuser can, with an inner casing of ring section type, shaft sealing by means of a mechanical seal. The pump rotor is carried by the bottom medium lubricated plain bearing and the top thrust and radial antifriction bearing	**KsV 125-55-1**	Designed for condensate extraction from the condenser of TPN drive turbine to delivery either to the main turbine condenser or to the drainage tank	125	55	Electric motor: n = 3000 rpm; P_{nom} = 37 kW; U = 220/300 V	3	II	4
	KsV 200-220	Used for handling waste steam condensate of the stationary steam turbines of the secondary circuit at the NPP units	200	220	Electric motor: n = 1480 rpm; P_{nom} = 200 kW; U = 6000 V	3	-	4
	KsV 650-135-8	Used for pumping moisture separator drains and heating steam condensate from the moisture separator trap into the turbine condensate line downstream of the LP heater No. 4 to deliver the mixture into the deaerator for the turbo-installations -1200-6,8/50 forming part of 1200 MW PWR power unit at the Belarusian NPP-2006 project	663	141	Electric motor: n = 1500 rpm; P_{nom} = 400 kW; U = 10,000 V	4	II	4
	KsV 360-160-1	Designed as a heater drain pump for pumping heating steam condensate from the heat exchangers of the secondary circuit at the power units of nuclear power stations (NPS) and nuclear heat electropower stations	360	160	Electric motor: n = 1480 rpm; P_{nom} = 250 kW; U = 6000 V	3	-	4
	KsV 360-160-2	Used for drawing water from ECCS (emergency core cooling system) container to boost the inlet pressure of the auxiliary BFPs in case of loss-of-coolant accident at the NPS power units	360	160	Electric motor: n = 1485 rpm; P_{nom} = 250 kW; U = 6000 V	3	I	3
	KsV 360-160-3	Designed as a heater drain pump for pumping heating steam condensate from the LP heater No. 1 back into the main condensate line downstream of the LP heater No. 1 in the turbo-installations -1000-60/1500-2 at the NPS power units equipped with VVER-1000 PWR	360	160	Electric motor: n = 1480 rpm; P_{nom} = 250 kW; U = 6000 V	3	II	4

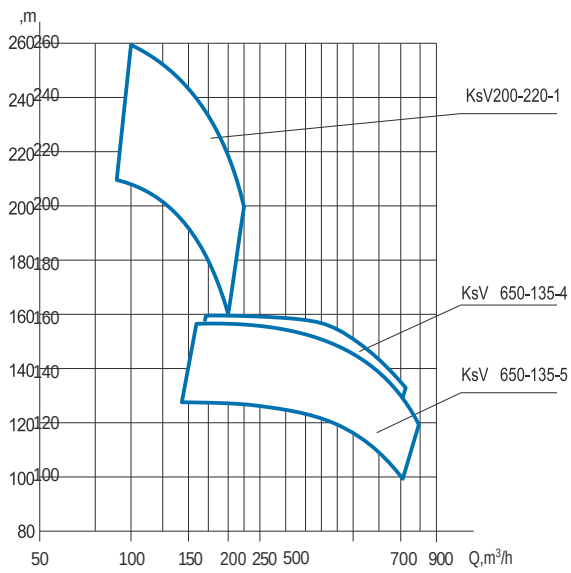
Product name & construction features	Pump make	Equipment applications	Technical data			Safety class	Seismic stability category	Climatic version, location category
			Capacity, m^3/h	Head, m	Type of drive & its parameters			
Condensate Pumps: vertically suspended multistage diffuser can, with an inner casing of ring section type, shaft sealing by means of a mechanical seal. The pump rotor is carried by the bottom medium lubricated plain bearing and the top thrust and radial antifriction bearing	**KsV 500-220**	Used for handling waste steam condensate of the stationary steam turbines of the secondary circuit at the NPP units	500	220	Electric motor: n = 1480 rpm; P_{nom} = 500 kW; U = 6000 V	3	-	4
	KsV 630-125-1	Designed as a heater drain pump for pumping heating steam condensate from the heat exchangers of the secondary circuit at the NPP units	630	125	Electric motor: n = 1480 rpm; P_{nom} = 315 kW; U = 6000 V	3	-	4
	KsV 630-125-2	Designed as a heater drain pump for pumping heating steam condensate from the LP heater No. 3 back into the main condensate line downstream of the LP heater No. 3 in the turbo-installations -1000-60/1500-2 at the NPS power units equipped with VVER-1000 PWR	630	125	Electric motor: n = 1480 rpm; P_{nom} = 315 kW; U = 6000 V	3	II	4
Condensate Pumps: vertically suspended multistage diffuser can, with an inner casing of ring section type, shaft sealing by means of a mechanical seal. The pump rotor is carried by the bottom medium lubricated plain bearing and the top oil-bath lubricated thrust and radial plain bearing	**KsV 650-135**	Used for pumping waste steam condensate of the stationary steam turbines and heating steam condensate from the heat exchangers at the power units of nuclear power stations (NPS) and nuclear heat electropower stations	582 to 663	135 to 146	Electric motor: n = 1480 rpm; P_{nom} = 500 kW; U = 6000 V	-	-	4
Pumps for Support Auxiliary Systems: horizontal, foot-mounted, between-bearings, single-stage, axially split volute casing centrifugal, with a double entry radial impeller, antifriction bearings and shaft sealing by means of mechanical seals	**N 1400-12**	Used to boost cooling water pressure at the inlet of the generator gas coolers	1400	12	Electric motor: n = 750 rpm; P_{nom} = 75 kW; U = 380 V	4	IIб	4
	CNA 1700-35	Designed for handling demineralized water in the intermediate loop	1700	35	Electric motor: n = 1500 rpm; P_{nom} = 250 kW; U = 6000 V	2	I	M4
	CNA 2000-40	Designed for handling demineralized water in the intermediate loop	2000	40	Electric motor: n = 1500 rpm; P_{nom} = 330 kW; U = 6000 V	2	I	M4
	CNA 4000-95/8	Used as a component cooling water pump for circulation of clean water through essential components to provide the requirements of critical using equipment / services in cooling water under all the operating conditions of the power unit, including emergency situation	3600	55	Electric motor: n = 750 rpm; P_{nom} = 630 kW; U = 6000 V	2	I	4
	CNA 1400-12					3		

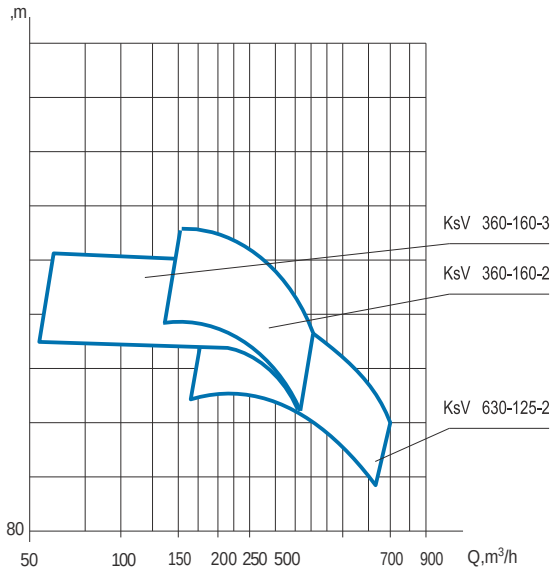
Pumps For NPS Service

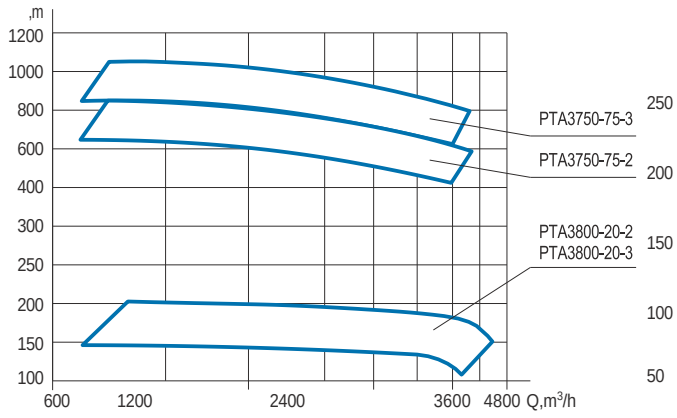
Product name & construction features	Pump make	Equipment applications	Technical data			Safety class	Seismic stability category	Climatic version, location category
			Capacity, m^3/h	Head, m	Type of drive & its parameters			
High Pressure Emergency Core Cooling System (ECCS) pumps: horizontal centreline mounted, multistage, barrel-casing centrifugal, with a withdrawable cartridge of ring-section type, plain bearings and shaft sealing by means of mechanical seals	**CNA 150-60**	Used as a charging pump for injection of boric acid ($_3$ $_3$) solution into the reactor coolant system (primary circuit) during a failure at the NPS units equipped with VVER-91 pressurized water reactor	150	650	Electric motor: n = 2973 rpm; P_{nom} = 630 kW; U = 6000 V	2,	I	4
	CN 150-60-1	**Designed for injection of boric acid solution into the reactor coolant system:** - to replenish liquid losses in the primary circuit (as a volume control pump) and to remove the fission product decay heat from the reactor core following a loss-of-coolant accident (as a result of rupture of small pipes of up to 100 mm inclusive in diameter) as a charging pump; - to make up the reactor coolant circuit in the emergency situation associated with a loss-of-coolant accident (leakage through rupture of pipes of more than 100 mm in diameter) as a safety injection pump; - to maintain the reactor core in the subcritical condition (as a RHR pump)	153	708	Electric motor: n = 2973 rpm; P_{nom} = 630 kW; U = 6000 V	2	I	4
	CNA 150-60-2	Designed for injection of boric acid solution into the primary circuit during predictable emergency operations, at which the safety injection system is to be automatically actuated	150	650	Electric motor: n = 2979 rpm; P_{nom} = 630 kW; U = 10,000 V	2	I	4
	CNA 150-60-3	Designed for injection of boric acid solution into the primary circuit during predictable emergency operations, at which the safety injection system is to be automatically actuated	150	650	Electric motor: n = 3000 rpm; P_{nom} = 630 kW; U = 10,000 V	2	I	4
	CNA 150-60-4	Designed for injection of boric acid solution into the primary circuit during predictable emergency operations, at which the safety injection system is to be automatically actuated	150	650	Electric motor: n = 3000 rpm; P_{nom} = 630 kW; U = 6000 V	2	I	4
	CNA 150-110-2	Designed for injection of boric acid solution from the emergency storage tank into the primary circuit of the NPS power units equipped with VVER-1000 PWR during cooldown of the reactor coolant system following a failure	150	980	Electric motor: n = 3000 rpm; P_{nom} = 800 kW; U = 6000 V	2	I	4
Low Pressure Emergency Core Cooling System (ECCS) Pumps: horizontal, centerline-supported, between-bearings, single-stage axially split volute casing centrifugal, with a double entry radial impeller, plain bearings and shaft sealing by means of mechanical seals. Unified with respect to each other and differ only in the impeller diameter	**CNR 800-230-1**	Used as a residual heat removal (RHR) pump for injection of boric acid solution into the reactor coolant circuit with the purpose of essential cooling service of the fuel core following a scheduled reactor shutdown and emergency cooldown in the event of failure	800	230	Electric motor: n = 3000 rpm; P_{nom} = 800 kW; U = 6000 V	2	I	4
	CNSA 700-140-1	Used as a sprinkler system supply pump (containment spray pump) taking suction from the emergency boron storage tank to supply boric acid solution for spray nozzles of a sprinkler system to cool the air space of the safety shell (containment) in case of a significant malfunction	700	140	Electric motor: n = 3000 rpm; P_{nom} = 500 kW; U = 6000 V	2	I	4

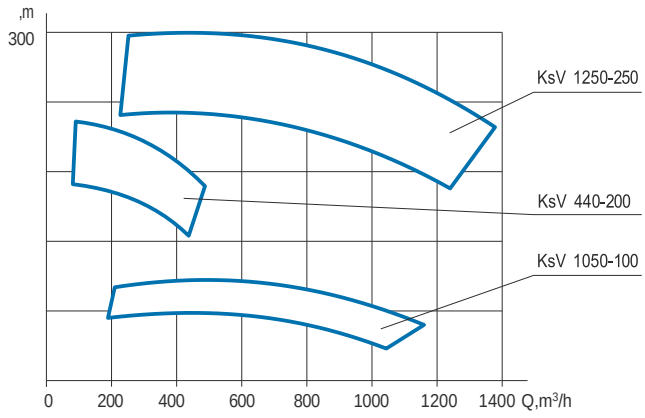
Product name & construction features	Pump make	Equipment applications	Technical data: Capacity, m³/h	Technical data: Head, m	Technical data: Type of drive & its parameters	Safety class	Seismic stability category	Climatic version, location category
Residual Heat Removal Pumps: horizontal centreline mounted, inducer multistage, barrel-casing centrifugal, with a withdrawable cartridge of ring-section type, plain bearings and shaft sealing by means of mechanical seals	**CNSA 750-140**	Designed for injection of boric acid solution into the reactor coolant circuit during predictable emergency operations, at which the safety injection system is to be automatically actuated, and to cool down the fuel core following a scheduled reactor shutdown	750	140	Electric motor: n = 1500 rpm; P_{nom} = 500 kW; U = 6000 V	2	1	4
	CNSA 750-140-1							4
	CNSA 750-140-2							4
	CNSA 750-140	Designed for injection of boric acid solution into the reactor coolant circuit during predictable emergency operations, at which the safety injection system is to be automatically actuated, and to cool down the fuel core following a scheduled reactor shutdown	800	150	Electric motor: n = 1500 rpm; P_{nom} = 630 kW; U = 6000 V	2	1	4
	CNSA 750-140 -1							4
	CNSA 750-140 -2				Electric motor: n = 1500 rpm; P_{nom} = 630 kW; U = 10,000 V			4
	CNSA 750-140 -3							
	CNSA 750-140 -4				Electric motor: n = 1500 rpm; P_{nom} = 630 kW; U = 6000 V			4

Coverage Charts of the Pumps for NPS Service

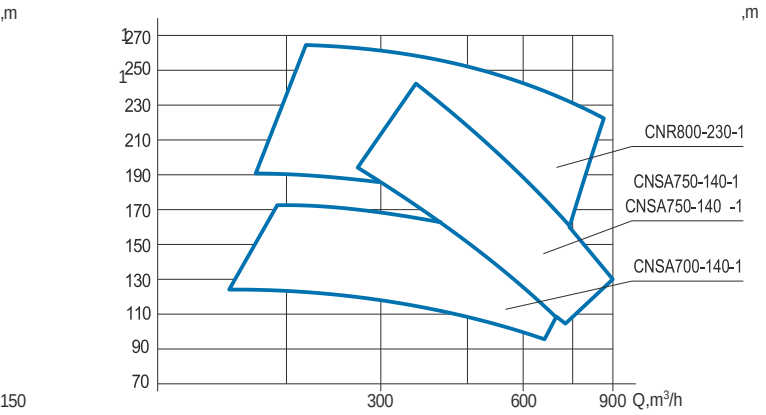


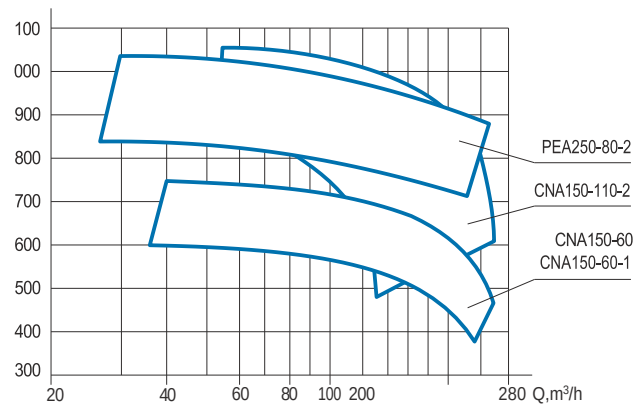


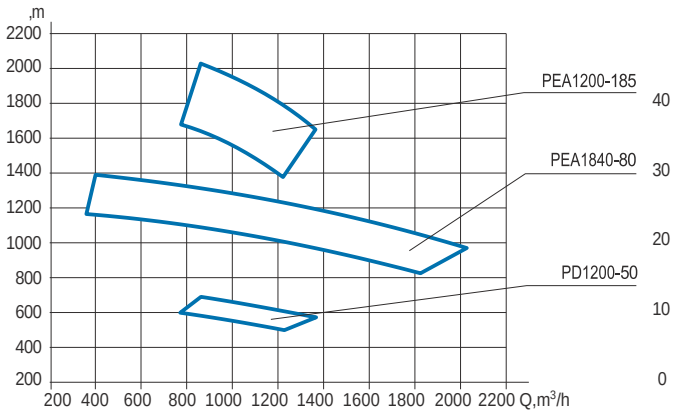


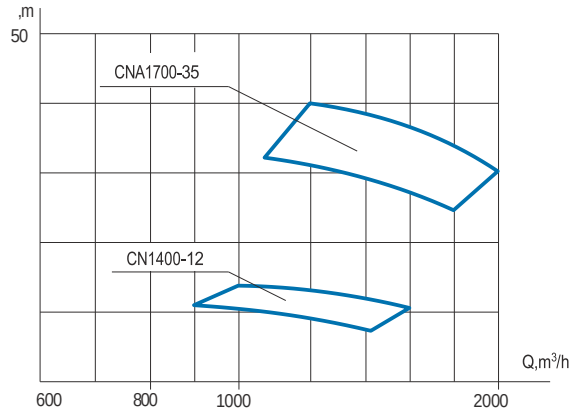


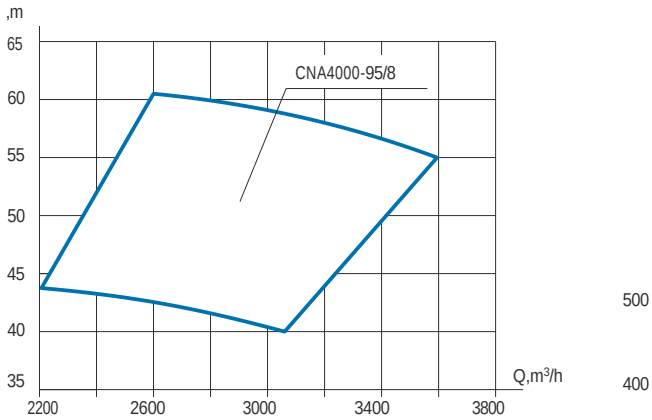
Coverage Charts of the Pumps for NPS Service

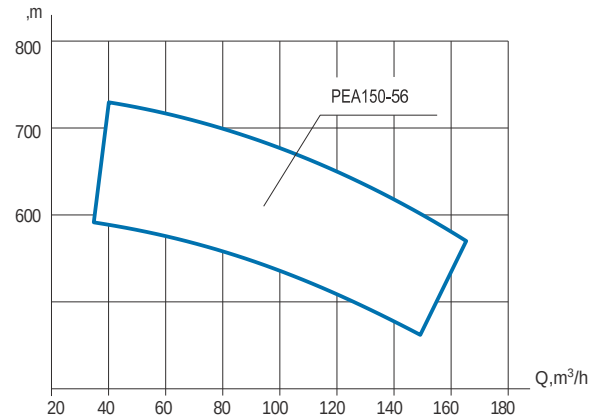












PEA 1840-80

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	CN 400-105	400	105	1500	200
2	CN 400-105	380	96	1500	160(200)
3	CN 400-105	360	83	1500	132(200)
4	CN 400-210	400	210	1500	400
5	CN 400-210	380	192	1500	315
6	CN 400-210	360	166	1500	250
7	CN 1000-180-3	1000	180	1500	630
8	CN 1000-180 -3	900	157	1500	500
9	14 -8 4-1	600	380	1500	1000

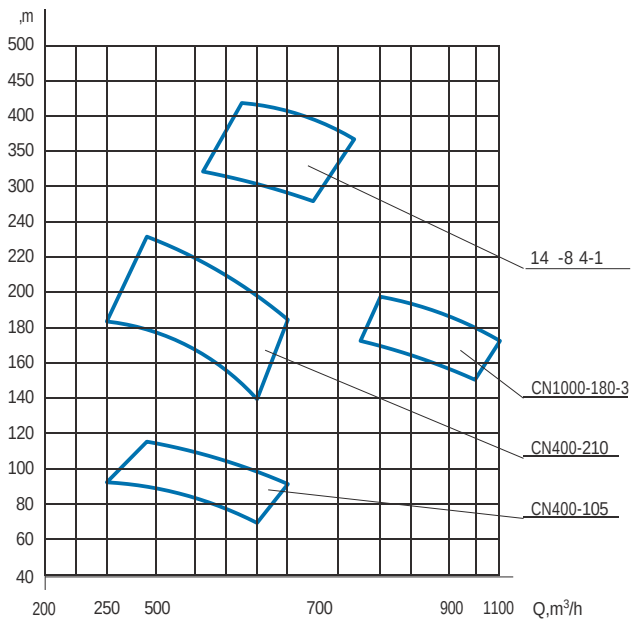
CN: Designed for the water supply to industrial plants and communities. Applied also for agricultural land irrigation and drainage

Horizontal foot-mounted, cross-over, two-stage or four-stage (CN 400-210), axially split volute casing centrifugal pumps between-bearings, with single entry radial impellers mounted back-to-back. Driven by an electric motor or a diesel engine (in case of CN 400-105). The rotor is carried by grease-lubricated antifriction bearings. Shaft sealing: packed glands

14M-8 4-1: Designed for the water supply to industrial plants and communities

Electrically driven, horizontal foot-mounted, cross-over, four-stage, axially split volute casing centrifugal pumps between-bearings, with single entry radial impellers mounted back-to-back. The rotor is carried by grease-lubricated antifriction bearings. Shaft sealing: packed glands

Coverage Charts of the Water-Works Pumps CN and 14M-8x4-1



14 -8 4-

CN

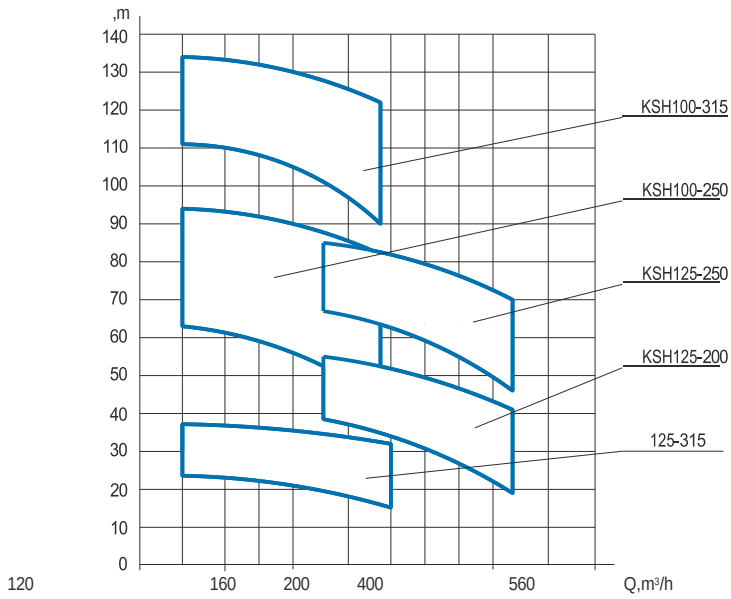
Pump CN 400-105 (Diesel-driven)

K & KSH Series End Suction, with Overhung Impeller

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	125-315	200	32	1500	30
2	125-315	200	26	1500	30
3	125-315	200	21	1500	22
4	125-315D	200	35.5	1500	37
5	KSH 100-250	200	80	3000	75
6	KSH 100-250	200	71	3000	75
7	KSH 100-250	200	56	3000	55
8	KSH 100-250D	200	90	3000	90
9	KSH 100-315	200	125	3000	132
10	KSH 100-315	200	105	3000	110
11	KSH 100-315D	250	125	3000	132
12	KSH 125-200	315	50	3000	75
13	KSH 125-200	315	42	3000	55
14	KSH 125-200	315	31.5	3000	45
15	KSH 125-250	315	80	3000	110
16	KSH 125-250	315	71	3000	90
17	KSH 125-250	315	60	3000	75

KSH

Coverage Charts of the Water-Works Pumps K and KSH



Designed for handling water in water supply systems of industrial projects and public utilities. Used also for agricultural land irrigation and drainage.

Electrically driven horizontal end-suction single-stage volute casing centrifugal pumps with overhung impeller and bearing bracket. KSH series pumps have an optimized-NPSH impeller design with blades extending well into the suction chamber. The rotor is carried by grease-lubricated or oil-ring lubricated (in case of KSH series pumps) antifriction bearings. Shaft sealing: packed gland

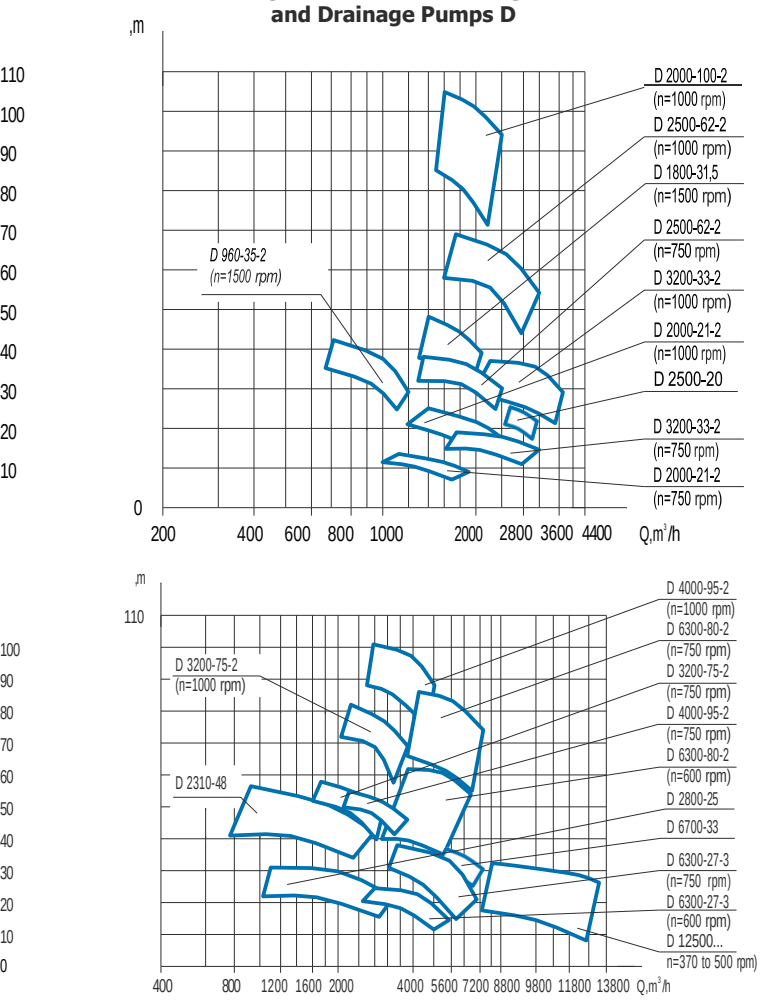
D Series Double Flow Axially Split

Designed for agricultural land irrigation and drainage as well as for handling water in water supply systems of industrial projects and public utilities.

Electrically driven, horizontal foot-mounted, between-bearings, single-stage, axially split volute casing centrifugal pumps with a double entry radial impeller. The rotor is carried by grease-lubricated or oil-ring lubricated (in case of D 6300-80-2 model pump) antifriction bearings. Shaft sealing: packed glands

D12500

Coverage Chart of the Land Irrigation and Drainage Pumps D



Nos	Pump make	Capacity, m³/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	D 960-35	960	36	1500	132
2	D 1800-31,5	1800	31.5	1500	315
3	D 2000-21-2	2000	21	1000	160
4	D 2000-21-2	1600	11	800	75
5	D 2000-21 -2	1850	19	1000	132
6	D 2000-21 -2	1500	10	800	55
7	D 2000-21 -2	1700	17	1000	110
8	D 2000-21 -2	1400	9	800	55
9	D 2000-100-2	2000	100	1000	800
10	D 2000-100 -2	1900	88	1000	630
11	D 2000-100 -2	1800	80	1000	630
12	D 2310-48 3*	2310	48	100	500
13	D 2500-62-2	2500	62	1000	630
14	D 2500-62-2	2000	34	800	250
15	D 2500-62 -2	2300	52	1000	500
16	D 2500-62 -2	1900	29	800	250
17	D 2800-25 3*	2800	25	1000	315
18	D 3200-33-2	3200	33	1000	400
19	D 3200-33-2	2500	17	800	160
20	D 3200-33 -2	3000	29	1000	315
21	D 3200-33 -2	2400	15	800	132
22	D 3200-33 -2	2800	25	1000	315
23	D 3200-33 -2	2300	13	800	110
24	D 3200-75-2	3200	75	1000	1000
25	D 3200-75-2	2500	42	800	400
26	D 3200-75 -2	3000	65	1000	800
27	D 3200-75 -2	2300	35	800	400
28	D 4000-95-2	4000	95	1000	1600
29	D 4000-95-2	3200	50	800	630
30	D 4000-95 -2	3700	82	1000	1250
31	D 4000-95 -2	3000	45	800	630
32	D 6300-27-3	6300	27	800	630
33	D 6300-27-3	5000	17	600	315
34	D 6300-27-3-1	5000	32	800	630
35	D 6300-27-3-1	4000	20	600	315
36	D 6300-27 -3	5800	24	800	500
37	D 6300-27 -3	4620	15	600	250
38	D 6300-27 -3	5450	22	800	400
39	D 6300-27 -3	4350	14	600	200
40	D 6300-80-2	6300	80	800	2000
41	D 6300-80-2	5000	50	600	1000
42	D 6300-80 -2	5900	70	800	1600
43	D 6300-80 -2	4700	45	600	800
44	D 6300-80 -2	5500	60	800	1250
45	D 6300-80 -2	4400	38	600	630
46	D 6700-33	6700	33	800	800
47	D 12500-10	12500	10	400	500
48	D 12500-24	9300	32	500	1250
49	D 12500-24	12500	24	500	1250

* – Tropicalized version

D Series Double Flow Axially Split

New Generation of D Series Pumps

Electrically driven, foot-mounted, between-bearings, in-line, single-stage, double-suction, axially split volute casing, heavy-duty industrial pumps with a basically horizontal shaft. Available with optional vertical mounting (DV-configurations).

Accurate positioning of the upper-to-lower casing halves with pins for ease of assembly.

The rotor is carried by grease-lubricated or oil-bath lubricated antifriction bearings (in the latter case a cooling system is provided). Shaft sealing: packed glands or API 682 single / double mechanical seals.

The pump is designed to be capable of remaining functional in the areas of seismic hazard of magnitude up to 9 (MSK-64 scale).

Nozzle flanges are made according to DIN / ANSI /ISO.

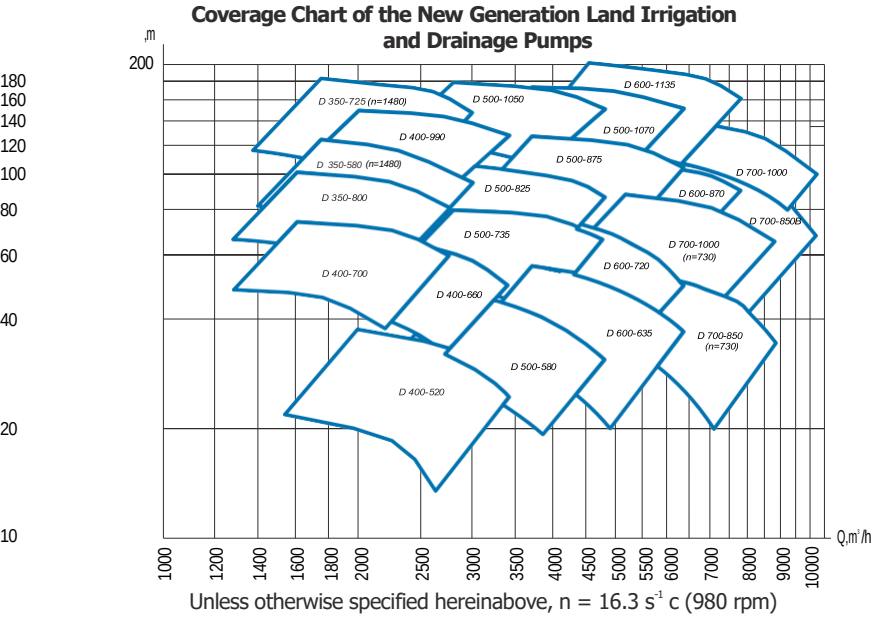
The pump shaft is completely protected against handled medium.

Impeller material options: cast iron, steel, bronze.

The pump casing is basically made of high-strength cast iron.

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm
1	D(DV) 350-580	2500	102	1500
2	D(DV) 350-800	2300	88	1000
3	D(DV) 350-725	2500	160	1500
4	D(DV) 400-700	2300	64	1000
5	D(DV) 400-520	2850	29	1000
6	D(DV) 400-660	2850	56	1000
7	D(DV) 400-990	2850	132	1000
8	D(DV) 500-580	4000	37	1000
9	D(DV) 500-735	4000	70	1000
10	D(DV) 500-825	4000	92	1000
11	D(DV) 500-1050	4000	158	1000
12	D(DV) 600-635	5300	44	1000
13	D(DV) 600-720	5300	62	1000
14	D(DV) 500-875	5300	110	1000
15	D(DV) 500-875	4000	110	1000
16	D(DV) 500-1070	5300	155	1000
17	D(DV) 600-870	6500	97	1000
18	D(DV) 600-1135	6500	174	1000
19	D(DV) 700-1000	8500	116	1000
20	D(DV)) 700-1000	7400	72	1000
21	D(DV) 700-850	8500	84	1000
22	D(DV) 700-850	7400	44	1000

Coverage Chart of the New Generation Land Irrigation and Drainage Pumps



Unless otherwise specified hereinabove, n = 16.3 s^{-1} c (980 rpm)

NOU Series Vertical Sump Diffuser

Designed for pumping out crude oil and oil products that leak out of pipeline pumps and for their injection into the suction pipeline of an oil pumping station.

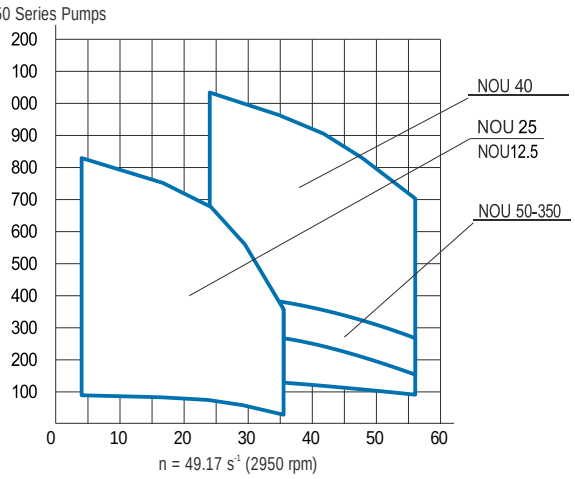
Electrically driven, vertically suspended, wet-pit end-suction diffuser multistage segmental centrifugal pumps in cantilever design, with single flow radial impellers, a separate discharge pipe, a motor stool and a can (outer casing). The inner casing (a withdrawable rotating assembly) of ring-section design may be installed in an existing vessel or a sump* to be submerged in the medium pumped. The rotor is carried by medium-lubricated radial plain bearing at the balance drum and intermediate bearing and a grease-lubricated top thrust and radial antifriction bearing (of two ball bearings). No shaft sealing is required.

NOTE: *Overall and mounting dimensions of the withdrawable element mounting plate (pump cover plate) are made specific after the Customer's submittal of data on fitting dimensions of a tank mouth flange.

Made in compliance with Transneft's General and Specific Engineering Requirements (OTT and STT resp.).

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), rpm	Motor nominal power, kW
1	NOU 12.5-80	0.0035 (12.5)	80	3000	To be determined by the manufacturer according to kinematic viscosity of handled medium
2	NOU 12.5-120		120		
3	NOU 12.5-160		160		
4	NOU 12.5-200		200		
5	NOU 12.5-240		240		
6	NOU 12.5-280		280		
7	NOU 12.5-320		320		
8	NOU 12.5-360		360		
9	NOU 12.5-400		400		
10	NOU 12.5-440		440		
11	NOU 12.5-480		480		
12	NOU 12.5-520		520		
13	NOU 12.5-560		560		
14	NOU 12.5-600		600		
15	NOU 12.5-640		640		
16	NOU 12.5-680		680		
17	NOU 12.5-720		720		
18	NOU 12.5-760		760		
19	NOU 12.5-800		800		
20	NOU 25-60	0.007 (25)	60	3000	To be determined by the manufacturer acc. to kinematic viscosity of handled medium
21	NOU 25-90		90		
22	NOU 25-120		120		
23	NOU 25-150		150		
24	NOU 25-180		180		
25	NOU 25-210		210		
26	NOU 25-240		240		
27	NOU 25-270		270		
28	NOU 25-300		300		
29	NOU 25-330		330		
30	NOU 25-360	0.007 (25)	360	3000	To be determined by the manufacturer acc. to kinematic viscosity of handled medium
31	NOU 25-390		390		
32	NOU 25-420		420		
33	NOU 25-450		450		
34	NOU 25-480		480		
35	NOU 25-510		510		
36	NOU 25-540		540		
37	NOU 25-570		570		
38	NOU 25-600		600		
39	NOU 40-120	0.011 (40)	120	3000	To be determined by the manufacturer acc. to kinematic viscosity of handled medium
40	NOU 40-180		180		
41	NOU 40-240		240		
42	NOU 40-300		300		
43	NOU 40-380		380		
44	NOU 40-420		420		
45	NOU 40-460		460		
46	NOU 40-540		540		
47	NOU 40-600		600		
48	NOU 40-660		660		
49	NOU 40-730		730		
50	NOU 40-780		780		
51	NOU 40-840		840		
52	NOU 40-900		900		
53	NOU 50-350	0.014 (50)	350		

Coverage Chart of the Oil Leakage Drain Pumps NOU



DN Series Double Flow Axially Split

DN

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	DN 1250-65	1250	65	1500	315
2	DN 600-80	600	80	1500	315

NGPN-M Series
Inducer Double Flow Axially Split

NGPN-

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW	NPSHR
1	NGPN-M 1250-160	1250	160	1500	1000	1.8
2	NGPN-M 1250/0,5-160	750	160	1500	800	1.9
3	NGPN-M 1250-160	1500	160	1500	1250	2.0
4	NGPN-M 2500-160	2500	160	1500	1800	2.5
5	NGPN-M 2500-160	3000	160	1500	2000	2.7
6	NGPN-M 3600-120	3600	110	1000	1600	2.5
7	NGPN-M 3600-120	3600	120	1000	1600	2.5
8	NGPN-M 3600-120	4000	125	1000	2000	3.0
9	NGPN-M 3600-120	2500	60	1000	1000	2.5
10	NGPN-M 3600-78	3600	78	1000	1000	2.5
11	NGPN-M 3600-78	3600	90	1000	1250	2.5

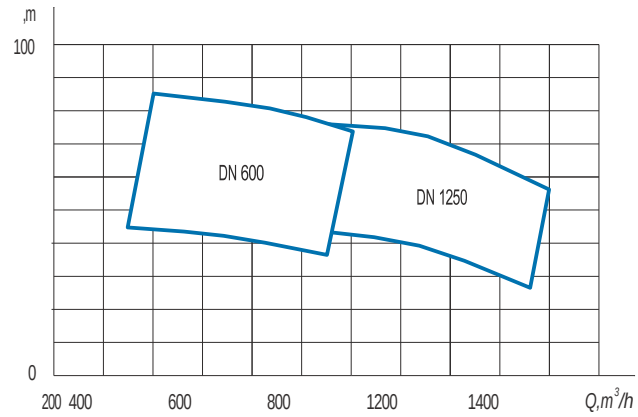
Used as booster pumps for main pipeline pumps that transport crude oil or oil products (mazout, motor gasoline, kerosene and diesel fuel), as transfer pumps in tank farms and as loading pumps for filling of rail tank wagons at the oil refineries or tank ships at the sea terminals.

Electrically driven, horizontal foot-mounted, between-bearings, single-stage, double-suction, axially split double-volute casing centrifugal pumps. Pump nozzles integrally cast with the lower casing half are oriented horizontally to the opposite sides that makes its rotor accessible for maintenance without piping detachment.

The rotor is carried by the grease or oil-bath lubricated antifriction bearings. Shaft sealing: mechanical seals.

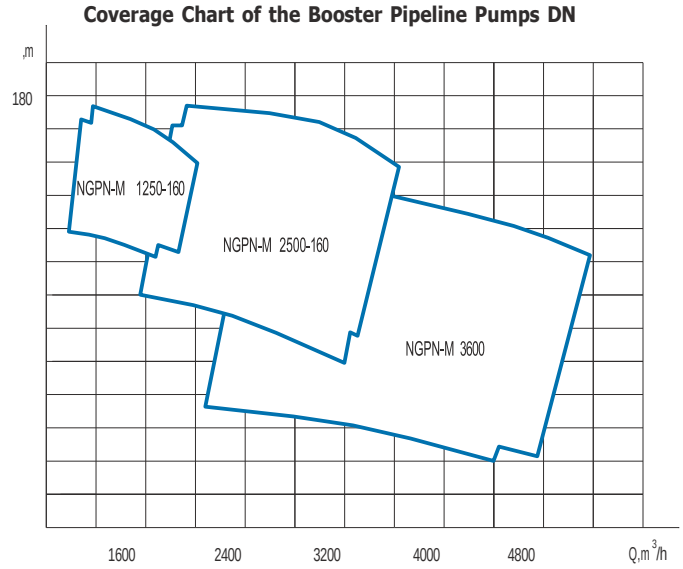
The pump and motor are mounted on a common rigid base plate. The driving torque is transmitted by means of a diaphragm flexible coupling.

Coverage Chart of the Booster Pipeline Pumps DN



Designed to ensure the necessary suction head (a greater NPSH available) for the main pipeline pumps. May used also for pumping crude oil in other process systems at the pump stations or at other industrial projects.
Electrically driven, horizontal foot-mounted, between-bearings, single-stage, axially split volute casing centrifugal pumps with a double entry radial impeller and an inducer on each side to reduce the NPSH value. Rotor radial forces are taken up by the radial antifriction bearings with self-contained oil-ring lubrication. The residual axial thrust of the rotor is absorbed by two single row angular-contact antifriction bearings mounted back to back.
Shaft sealing: by single mechanical seals, each provided with an auxiliary (safety) seal on the atmosphere side. Cyclone separators are employed to clean handled oil extracted at the top connection from contaminants and solids and to supply cleaned liquid for sealing the mechanical seals.
Made in compliance with Transneft's General and Specific Engineering Requirements (OTT and STT resp.).

Coverage Chart of the Booster Pipeline Pumps DN



NPV Series Vertical Can, Diffuser

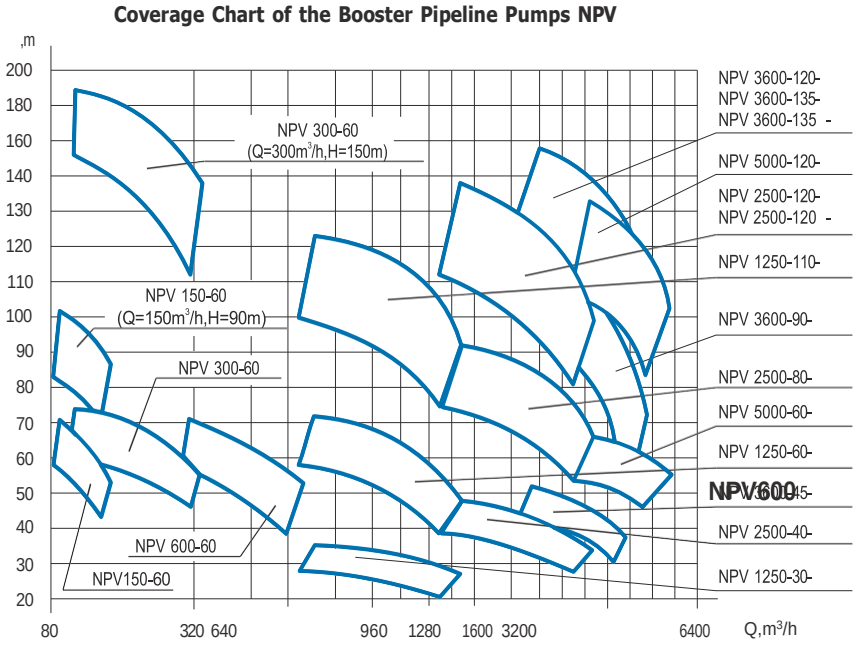
Designed for delivering crude oil or oil products to the main pipeline pumps to ensure their satisfactory suction performance (cavitation-free operation). Suitable also as mixing pumps to transfer oil in tank farms and as loading pumps to fill end products into tank wagons at the oil refineries.

Electrically driven vertically suspended, end-suction single- or multistage (according to the required head) diffuser centrifugal pumps equipped with an inducer. The major pump components are a can (outer casing) and a withdrawable rotating assembly with a motor stool. Upgraded versions (identified with "M") feature a bowl-shaped delivery casing. The pump rotor is carried by the top thrust and radial bearing (comprising two ball bearings) and the bottom medium lubricated plain bearing. Shaft sealing: by mechanical seal

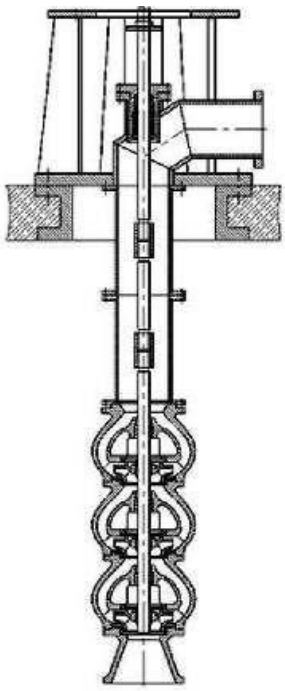
Made in compliance with Transneft's General and Specific Engineering Requirements (OTT and STT resp.).

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	NPV 150-60	150	60	3000	90
2	NPV 150-60	150	90	3000	90
3	NPV 300-60-	300	40	3000	90
4	NPV 300-60	300	60	3000	90
5	NPV 300-60	300	150	3000	200
6	NPV 600-60	600	60	1500	200
7	NPV 1250-30-	1250	30	1000	160
8	NPV 1250-60-	1250	60	1000	315
9	NPV 1250-110-	1250	110	1000	630
10	NPV 2500-40-	2500	40	1000	400
11	NPV 2500-80-	2500	80	1000	800
12	NPV 2500-120-	2400	103	1000	800
13	NPV 2500-120-	2500	120	1000	1250
14	NPV 2500-120 -	2500	110	1000	1000
15	NPV 3600-45-	3600	45	1000	630
16	NPV 3600-90-	3600	90	1000	1250
17	NPV 3600-90-	4500	80	1000	1600
18	NPV 3600-120-	3600	120	1000	1600
19	NPV 3600-135-	3600	135	1000	2000
20	NPV 3600-135 -	3600	120	1000	1600
21	NPV 5000-60-	5000	60	1000	1250
22	NPV 5000-120-	5000	120	1000	2000
23	NPV 5000-120- 1	5000	120	1000	2000
24	NPV 5000-120- 2	5000	120	1000	2000

Coverage Chart of the Booster Pipeline Pumps NPV



20 NV Series Vertical Line-Shaft, Multistage Wet-Pit

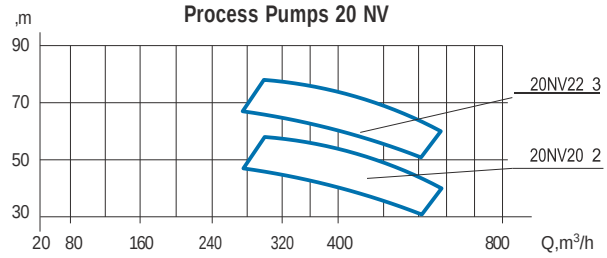


Designed for transferring and pumping crude oil and refined products with temperatures ranging from minus 15°C to +80°C as well as water out of underground storage tanks. USTs of the standard line have various capacity and various burial depth without exceeding 15 m. The pumps can be applied for any such USTs, the required pump submergence (distance from the pump mounting surface to the lowest point of its suction nozzle) being obtained by changing the number of rising main (column pipe) elements.

Vertically suspended, wet-pit submerged multistage ring-section centrifugal pumps with bowl-type vaned casings. Back wear rings balance the axial hydraulic forces. Bottom intake with open line shaft design. Driven by a motor from the ground level with shaft extending below ground to the pump. In case of the pump 24 NV 18x1 its rotor is carried by the oil-lubricated top thrust and radial antifriction bearing and the medium lubricated bottom and intermediate hydrodynamic plain bearings. Shaft sealing: by mechanical seal. Made in compliance with Transneft's General and Specific Engineering Requirements (OTT and STT resp.).

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	20 NV 22 3	600	65	1500	160
2	20 NV 22 2	600	43	1500	160
3	24 NV 18 1	1200	40	1500	250

Coverage Chart of the Vertical Submerged Process Pumps 20 NV



NM Series Multistage Segmental/ Radially Split Barrel

Designed for transporting crude oil and refined oil products through long-distance pipelines.

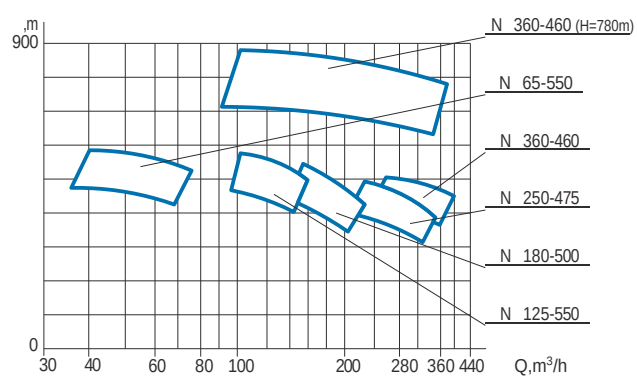
Electrically driven, horizontal, between-bearings, multistage diffuser centrifugal pumps of segmental or barrel (in case of NM 500-800 and NM1250-400) type with a withdrawable cartridge of ring-section type. Single flow impeller arrangement, with all the impellers facing the same way. The pump rotor is carried by the plain bearings with forced oil lubrication. Shaft sealing: by mechanical seals.

The pumps can be arranged both in series and in parallel. Made in compliance with Transneft's General and Specific Engineering Requirements (OTT and STT resp.).

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	N 65-550	65	550	3000	200
2	NM 125-550	125	185	3000	110
3	NM 125-550	125	183.6	3000	200
4	NM 125-550	125	550	3000	315, 400
5	NM 125-550	149	218	3000	200
6	NM 180-500	163.9	256.6	3000	315
7	NM 180-500	180	500	3000	400, 500
8	NM 180-500-	180	500	3000	400
9	NM 250-475	250	475	3000	500, 630
10	NM 300-500	250	550	3000	630,800,1000
11	NM 360-460	360	780	3000	1000
12	NM 360-460	360	460	3000	630, 800
13	NM 360-460	360	405	3000	500
14	NM 500-300	500	300	3000	630, 800
15	NM 500-300	500	260	3000	500
16	NM 500-800	500	800	3000	1600
17	NM 500-800	500	670	3000	1250
18	NM 710-280	710	280	3000	800, 1000
19	NM 1250-400	1250	400	3000	1600

NM

Coverage Chart of the Pipeline Pumps NM



Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
20	N 1250-260	900	255	3000	800
21	NM 1250-260	1250	260	3000	1250
22	NM 1250-260	1565	250	3000	1600
23	NM 1700-300	1700	300	3000	1600
24	NM 2500-230	1250	220	3000	1250
25	NM 2500-230	1800	225	3000	1600
26	NM 2500-230	2500	230	3000	2000
27	NM 2500-230	3150	220	3000	2500
28	NM 3600-230	1800	225	3000	1600
29	NM 3600-230	2500	225	3000	2000
30	NM 3600-230	3600	230	3000	2500
31	NM 3600-230	4500	220	3000	3150
32	NM 7000-210	3500	205	3000	2500
33	NM 7000-210	5000	210	3000	3150
34	NM 7000-210	6300	195	3000	5000
35	NM 7000-210	7000	210	3000	5000
36	NM 7000-210	8750	205	3000	6300
37	NM 10000-210	5000	205	3000	4000
38	NM 10000-210	7000	200	3000	5000
39	NM 10000-210	10000	177	3000	5000
40	NM 10000-210	10000	210	3000	6300
41	NM 10000-210	12500	210	3000	8000
42	NM 1250-260-2.1	1250	260	3000	1250
43	NM 1250-260 -2.1	1135	215	3000	1250
44	NM 1250-260 -2.1	1070	192	3000	1250
45	NM 1250/0.7-260-2.1	900	265	3000	1250
46	NM 1250/1.25-260-2.1	1565	270	3000	1600
47	NM 2500-230-2.1	2500	230	3000	2000
48	NM 2500-230 -2.1	2300	195	3000	2000
49	NM 2500-230 -2.1	2190	176	3000	2000
50	NM 2500/0.5-230-2.1	1250	220	3000	1250
51	NM 2500/0.7-230-2.1	1800	225	3000	1600
52	NM 2500/1.25-230-2.1	3150	225	3000	2500
53	NM 3600-230-2.1	3600	230	3000	2500
54	NM 3600-230 -2.1	3325	196	3000	2500
55	NM 3600-230 -2.1	3230	185	3000	2500
56	NM 3600/0.5-230-2.1	1800	230	3000	1600
57	NM 3600/0.7-230-2.1	2500	230	3000	2000
58	NM 3600/1.25-230-2.1	4500	220	3000	3150
59	NM 7000-210-2.1	7000	210	3000	5000
60	NM 7000-210 -2.1	6630	188	3000	5000
61	NM 7000-210 -2.1	6340	172	3000	5000
62	NM 7000/0.5-210-2.1	3500	205	3000	2500
63	NM 7000/0.7-210-2.1	5000	210	3000	4000
64	NM 7000/1.25-210-2.1	8750	210	3000	6300
65	NM 10000-210-2.1	10000	210	3000	6300
66	NM 10000-210 -2.1	9600	194	3000	6300
67	NM 10000-210 -2.1	9300	182	3000	6300
68	NM 10000/0.5-210-2.1	5000	210	3000	4000
69	NM 10000/0.7-210-2.1	7000	210	3000	5000
70	NM 10000/1.25-210-2.1	12500	210	3000	8000
71	NM 10000/1.2-380-2	12000	380	3000	14000
72	N 10000-380 -2	9600	380	3000	14000
73	N 10000/0.5-380-2	4500	350	3000	14000
74	NM 10000/0.7-380 -2	7003/11654*	207	3000	12000
75	NM 10000/0.7-380 -2	7003/11654*	224	3000	12000
76	NM 10000/0.7-380 -2	7003/11654*	250	3000	12000
77	NM 10000/0.7-380 -2-	7003/11654*	283	3000	12000
78	NM 10000/0.7-380 -2-	7003/11654*	233	3000	12000
79	NM 10000-250-3-	9150	245	3000	8000
80	NM 10000/0.6-250-3-	5250	251	3000	8000
81	NM 10000/0.5-250 -3-	5250	223	3000	8000
82	NM 7000/1.1-250-3-	7500	249	3000	6300
83	NM 7000/0.7-250-3-	5250	247	3000	6300
84	NM 7000/0.6-250-3-	4500	247	3000	6300
85	NM 7000/0.5-250 -3.1	3660	202	3000	6300
86	NM 7000/0.4-250 -3.1	2786	238	3000	6300
87	NM 7000/0.85-250-3.2	1800	250	3000	5500
88	NM 7000/0.85-250-3.2	6000	250	3000	5500
89	NM 7000/0.85-250-3.2	3300	250	3000	5500
90	NM 2500/1.25-250-3.2	2900	240	3000	2500
91	NM 2500/1.25-250-3.2	1250	240	3000	2500

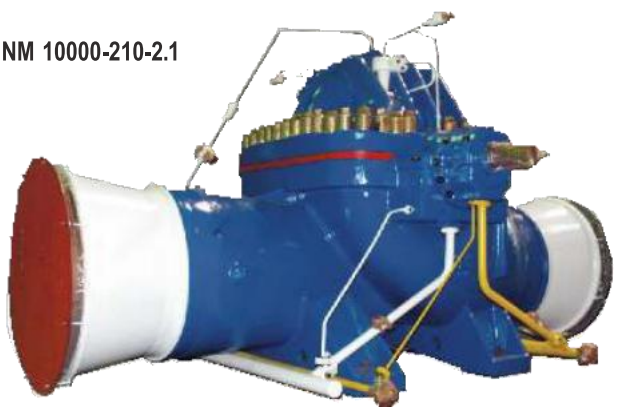
*- obtainable with an interchangeable replacement rotor for the maximum capacity to meet the requirements of the full development of pipeline projects

Designed for transporting crude oil through long-distance pipelines.

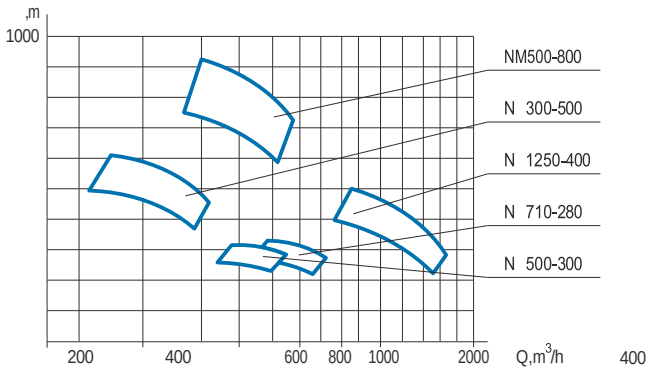
Electrically driven, horizontal foot-mounted, between-bearings, single-stage, axially split volute casing centrifugal pumps with a double entry radial impeller. The rotor is carried by the pressure oil lubricated plain bearings. The residual rotor axial thrust is absorbed by an angular-contact ball bearing (optional hydrodynamic axial plain bearing). Shaft sealing: basically by single mechanical seals, each provided with an auxiliary (safety) seal (a floating throttle bushing) on the atmosphere side; optional dual mechanical seals with a barrier fluid sealing system.

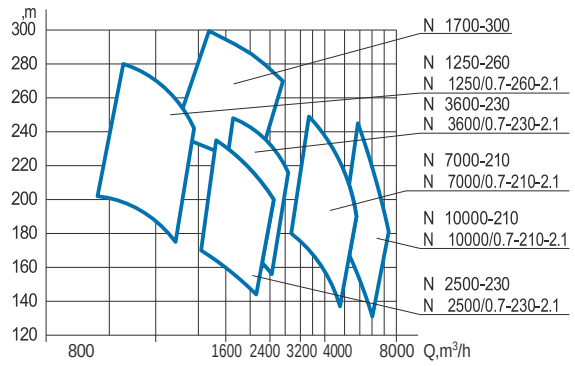
Made in compliance with Transneft's General and Specific Engineering Requirements (OTT and STT resp.).

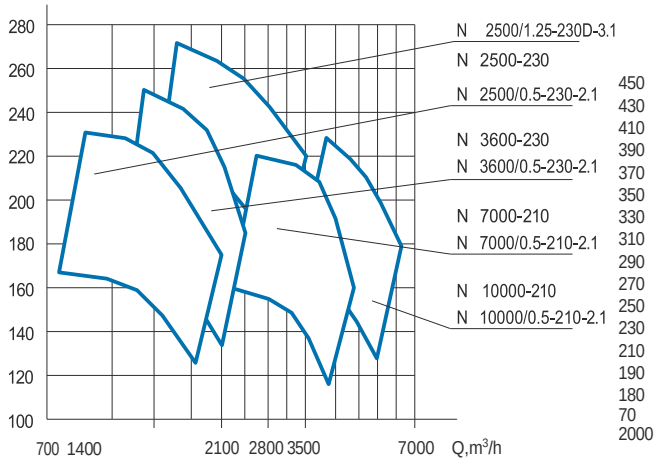
NM 10000-210-2.1

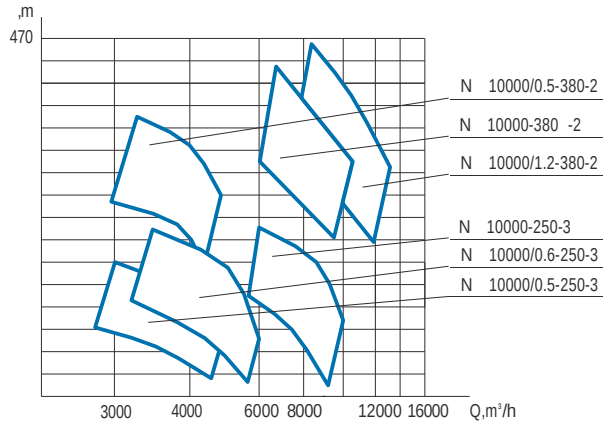


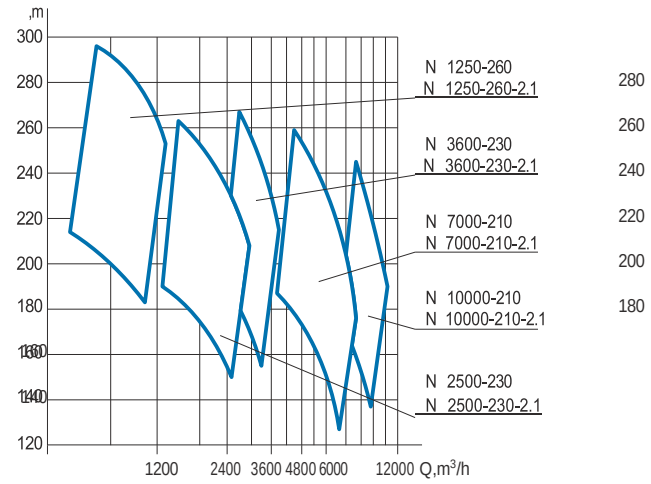
Coverage Chart of the Pipeline Pumps NM

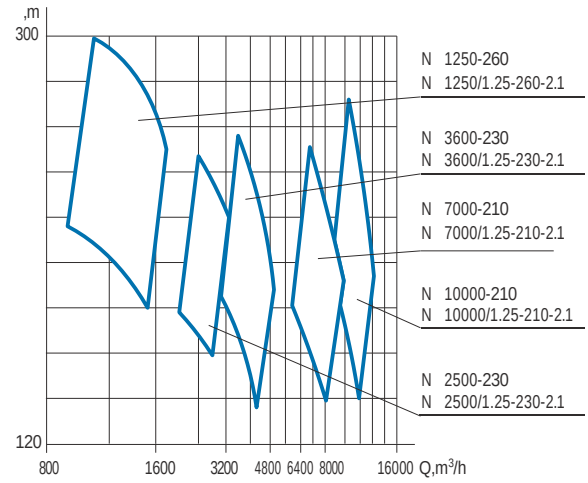


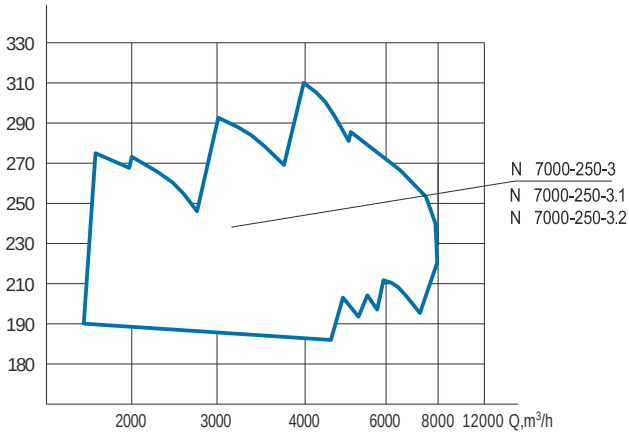










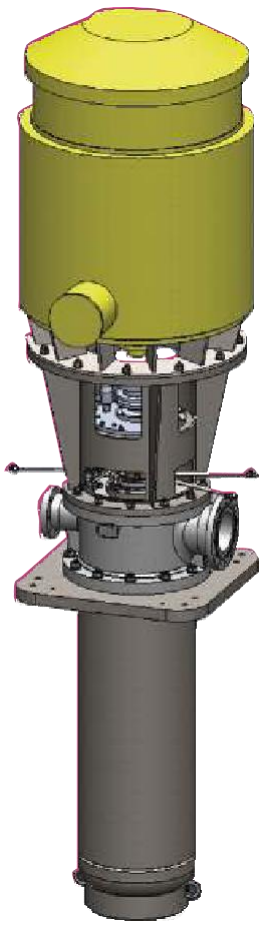


NMV Series In-Line Vertical Multistage Can

Designed for transporting crude oil through long-distance pipelines and end products (diesel fuel, motor petrol, jet engine fuel) through product pipelines.

Vertically suspended, in-line, can, end-suction multistage diffuser centrifugal pumps with the first stage double flow impeller, provided with inducers. Driven by induction motors by means of a spacer-type diaphragm flexible coupling. The pump rotor is carried by the top thrust and radial antifriction bearing and the bottom medium lubricated hydrodynamic plain bearing. Shaft sealing: by mechanical seal

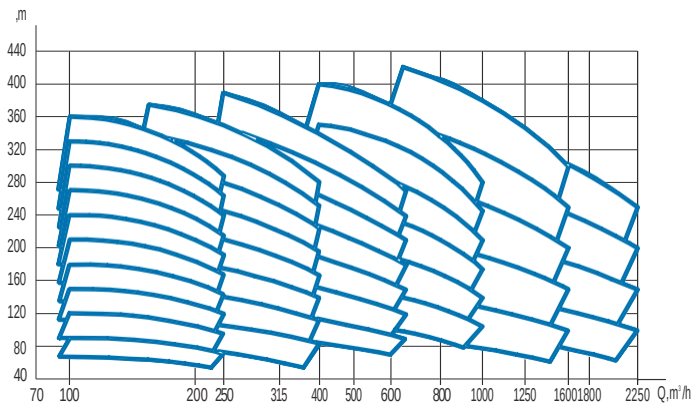
Designed in compliance with API Standard 610 requirements.



NMV

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm
1	NMV 200-75	200	75	1500
2	NMV 200-100	200	100	1500
3	NMV 200-125	200	125	1500
4	NMV 200-150	200	150	1500
5	NMV 200-175	200	175	1500
6	NMV 200-200	200	200	1500
7	NMV 200-225	200	225	1500
8	NMV 200-250	200	250	1500
9	NMV 200-275	200	275	1500
10	NMV 200-300	200	300	1500
11	NMV 315-90	315	90	1500
12	NMV 315-120	315	120	1500
13	NMV 315-150	315	150	1500
14	NMV 315-180	315	180	1500
15	NMV 315-210	315	210	1500
16	NMV 315-240	315	240	1500
17	NMV 315-270	315	270	1500
18	NMV 315-300	315	300	1500
19	NMV 500-105	500	105	1500
20	NMV 500-140	500	140	1500
21	NMV 500-175	500	175	1500
22	NMV 500-210	500	210	1500
23	NMV 500-245	500	245	1500
24	NMV 500-280	500	280	1500
25	NMV 500-315	500	315	1500
26	NMV 800-120	800	120	1500
27	NMV 800-160	800	160	1500
28	NMV 800-200	800	200	1500
29	NMV 800-240	800	240	1500
30	NMV 800-280	800	280	1500
31	NMV 800-320	800	320	1500
32	NMV 1250-110	1250	110	1500
33	NMV 1250-165	1250	165	1500
34	NMV 1250-220	1250	220	1500
35	NMV 1250-275	1250	275	1500
36	NMV 1250-330	1250	330	1500
37	NMV 1800-110	1800	110	1500
38	NMV 1800-165	1800	165	1500
39	NMV 1800-220	1800	220	1500
40	NMV 1800-275	1800	275	1500

Coverage Chart of the Vertical Process Pumps NMV



CNSn Series Horizontal Multistage Segmental

Designed for transporting crude oil and end products through long-distance, process and auxiliary pipelines.
Electrically driven horizontal multistage segmental centrifugal pumps, with all impellers facing the same way and automatic balancing of the rotor axial thrust by balance disc and balance disc seat. The suction nozzle horizontally sideward, the discharge nozzle vertically to the top. Radial forces and unbalanced axial thrust load of the pump rotor are taken up by the grease-lubricated antifriction bearings.
Shaft sealing: by dual mechanical seals or single mechanical seals, each provided with an auxiliary (safety) seal on the atmosphere side. Cartridge type design of the mechanical seals allows their installation and removal as an assembly unit.

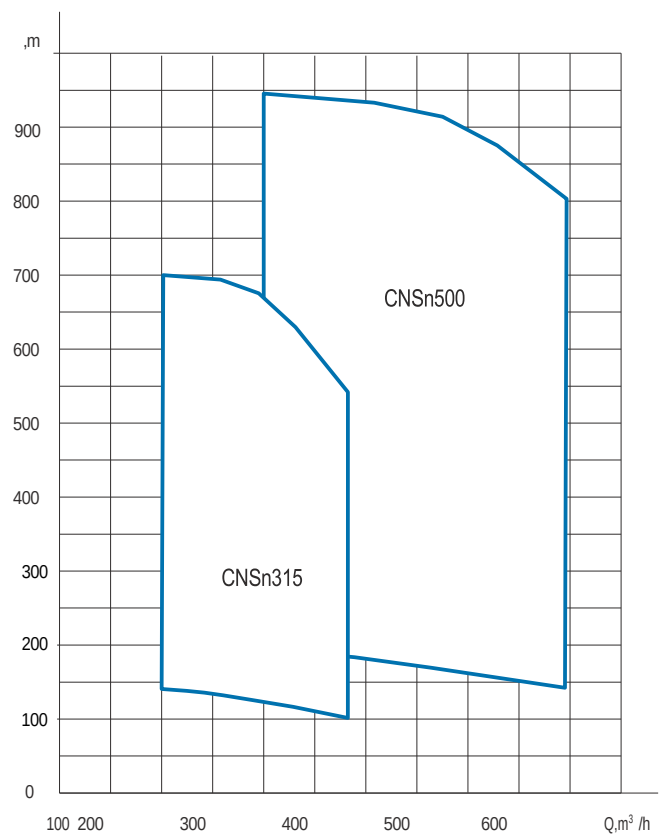
Cyclone separators for cleaning liquid supplied to the mechanical seal chambers can be mounted on the pumps for their reliability improvement.
For applications with low NPSH available existing at the installation, the CNSn 500 model pumps can be equipped with an inducer to ensure NPSH required equal to 3 m.

Made in compliance with Transneft's General and Specific Engineering Requirements (OTT and STT resp.).

CNSn500

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	CNSn 315-126	315	126	1500	200
2	CNSn 315-189	315	189	1500	250
3	CNSn 315-252	315	252	1500	315
4	CNSn 315-315	315	315	1500	400
5	CNSn 315-378	315	378	1500	450
6	CNSn 315-441	315	441	1500	630
7	CNSn 315-504	315	504	1500	630
8	CNSn 315-567	315	567	1500	800
9	CNSn 315-630	315	630	1500	800
10	CNSn 500-160	500	160	1500	400
11	CNSn 500-240	500	240	1500	630
12	CNSn 500-320	500	320	1500	800
13	CNSn 500-400	500	400	1500	1000
14	CNSn 500-480	500	480	1500	1000
15	CNSn 500-560	500	560	1500	1250
16	CNSn 500-640	500	640	1500	1600
17	CNSn 500-720	500	720	1500	1600
18	CNSn 500-800	500	800	1500	2000
19	CNSn 500-880	500	880	1500	2000

Coverage Chart of the Pipeline Pumps CNSn



20 NDsN-M Model Double Flow Axially Split

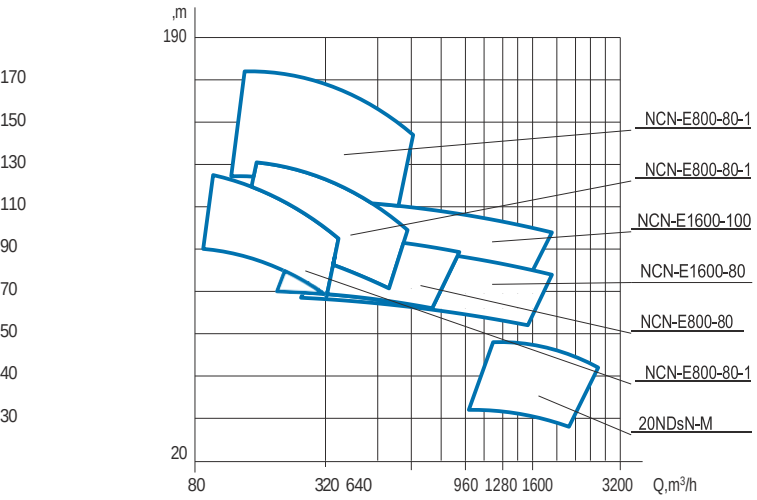
20 NDsN-M

Designed for delivering crude oil to the main pipeline pumps as booster pumps to ensure their cavitation-free operation. Suitable also as a loading pump for filling light products into tank wagons at the refineries and as an oil transfer pump in the tank farms.

Electrically driven, horizontal foot-mounted, between-bearings, single-stage, axially split volute casing centrifugal pump with a double entry radial impeller. The rotor is carried by grease-lubricated spherical roller bearings. Shaft sealing: mechanical seals with organized leakage drain

	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	20NDsN-M	2200	45	750	315

Coverage Chart of the Loading / Booster Pipeline Pumps NCN-E and 20 NDsN-M



NCN-E Series Double Flow Axially Split

Applications (see Table below):

- Items 1 to 3: for boosting the pressure of oil-field produced (formation) water to be injected into the petroliferous pools (for secondary oil recovery) as booster waterflood pumps;

- Item 4: for handling triethylene glycol;

- Items 5, 7 to 9: for loading mazout (fuel oil) and light oil (motor gasoline, kerosene and diesel fuel) into tank wagons at the oil refinery terminals. May be used as booster pipeline pumps for NM series pipeline pumps used for handling crude oil;

- Item 10: for drawing off crude oil from the flow tanks (oil treating vessels) of the central process facility.

Electrically driven, horizontal foot- or semicentreline-mounted, between-bearings, single-stage, axially split volute casing centrifugal pumps with a double entry radial impeller. The rotor is carried by the grease-lubricated or oil-bath lubricated antifriction bearings. Shaft sealing: by mechanical seals.

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	NCN-E 800/0,6-80-1	341	101.6	3000	160
2	NCN-E 800-80 -1	567	106	3000	315
3	NCN-E 800-80-1	571	150.4	3000	400
4	NCN-E 800-80 -1	618	136.5	3000	400
5	NCN-E 800-80	800	80	1500	315
6	NCN-E 800-80	808	90.4	1500	315
7	NCN-E 1600-80	1600	80	1500	630
8	NCN-E 1600-80	1800	70	1500	630
9	NCN-E 1600-100	1600	100	1500	630
10	NCN-E 1600-100	1487	111	1500	800

NCN-E

NG Model Double Flow Axially Split / Radially Split Barrel

The fuel oil charge pump **NG 800-250** is designed for delivering fuel oil (a heavy pyrolysis tar) into the high-pressure polyethylene production plants.

Electrically driven horizontal single-stage axially split volute casing centrifugal pump with a double entry impeller. The pump rotor is carried by the plain bearings with forced oil lubrication. Shaft sealing: by mechanical seals

The tower bottoms pump **NG 200-510** is designed for handling tar (asphalt flux removal) in the slow coking process units at the petroleum refineries.

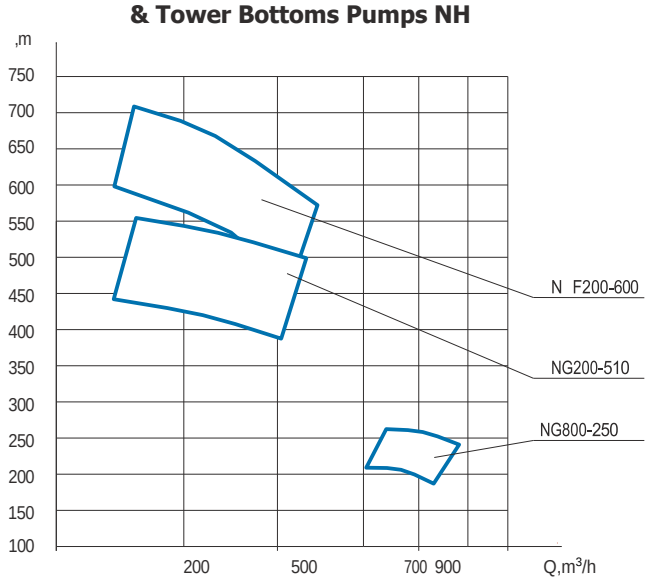
Electrically driven horizontal multistage ring-section barrel-insert centrifugal pump. The pump rotor is carried by the pressure oil lubricated plain bearings. Shaft sealing: by mechanical seals

The pumps **NG 200-510** and **NMF 200-600** are designed for handling tar (asphalt flux removal) in the slow coking process units and other oil products at the temperature of 400°C.

NG

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	NG 200-510	182	410	3000	400
2	NG 200-510	200	510	3000	400
3	NG 800-250	800	250	3000	1000
4	N F 200-600	200	600	3000	500

Coverage Chart of the Fuel Oil Charge & Tower Bottoms Pumps NH

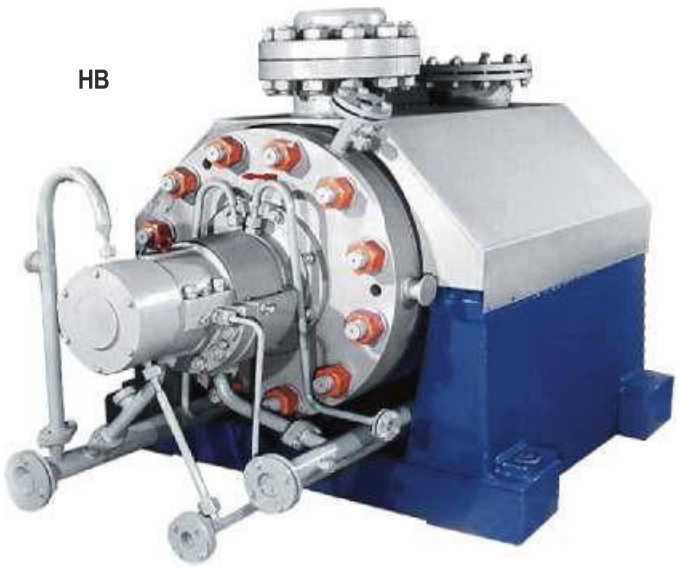


HB Series Radially Split Barrel

Designed for handling aqueous solutions of mono- or diethanolamines in the plants for cleaning of natural gas from hydrogen sulphide and carbon dioxide.

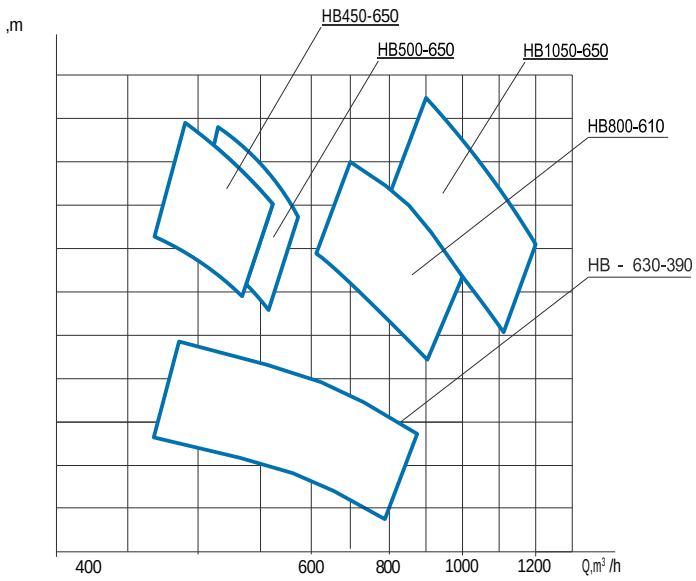
Electrically driven, horizontal, between-bearings, barrel-insert centrifugal pump with single entry radial impellers. The pump rotor is carried by the pressure lubricated plain bearings. Shaft sealing: mechanical seals

HB



Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	HB 450-650	450	650	3000	1250
2	HB 500-650	500	650	3000	1250
3	HB 800-610	800	610	3000	2000
4	HB 1050-650	1050	650	3000	2500
5	HB - 630-390	630	390	1500	1250

Coverage Chart of the Chemical Pumps HB



Designed for injection of water into the oil-bearing formations to boost the oil yield (to maintain the seam pressure after the natural field pressure is reduced and insufficient to bring the oil to the surface) on the oil fields.

Also could be used for hydraulic scale removal with water sprayed by high-pressure nozzles in the rolling mills at metallurgical (integrated) works.

Electrically driven horizontal, between-bearings, multistage segmental centrifugal pumps, with automatic balancing of the rotor axial thrust by balance disc and balance disc seat.

CNS …-2 (2nd upgrading) models: CNS 45, CNS 63, CNS 90, CNS 120, CNS 180, CNS 240 and CNS 315

The pump rotor is carried by the oil-bath or pressure oil lubricated plain bearings.

Shaft sealing: soft packed glands (C) or mechanical seals (T).

The suction nozzle horizontally sideward, the discharge nozzle vertically to the top.

As regards the mounting dimensions of their nozzles and base plate, these pumps are interchangeable with the pumps for a duty of 180 m^3/h in the same service, for the replacement of which the former have been designed.

CNSz …-2 (2nd upgrading) models:

In order to enhance a cumulative reliability and entire life of the pumps if frequently started and stopped, their design features a **balance disc-from-seat separation device.** It is intended for ensuring the guaranteed axial gap between the balance disc and balance disc seat.

CNSp …- models:

With back-to-back impeller arrangement that makes an axial thrust balancing device unnecessary in the pump design and significantly improves the reliability of pump operation. The residual axial thrust is absorbed by a thrust bearing.

CNS …-3 (3rd upgrading) models: CNS 45, CNS 63, CNS 90, CNS 120, CNS 180, CNS 240 and CNS 315

The pump rotor is carried by the medium-lubricated plain bearings.
Shaft sealing: soft packed glands (C) or mechanical seals (T).
The suction nozzle horizontally sideward, the discharge nozzle vertically to the top.

CNS …-2 (2nd upgrading) models: CNS 300, CNS 360, CNS 500, CNS 720

The pump rotor is carried by the oil-bath or pressure oil lubricated plain bearings.

Shaft sealing: soft packed glands (C) or mechanical seals (T).

The suction and discharge nozzles vertically to the top.

At the Customer's request, pumps to deliver 500, 630 and 720 m^3/h can be equipped with a balance disc-from-seat separation device (supplied in the CNSz configuration).

CNS Series Multistage Segmental

Ordinary (general service) version
Handled media: clean water and oil-field produced waters free from hydrogen sulfide

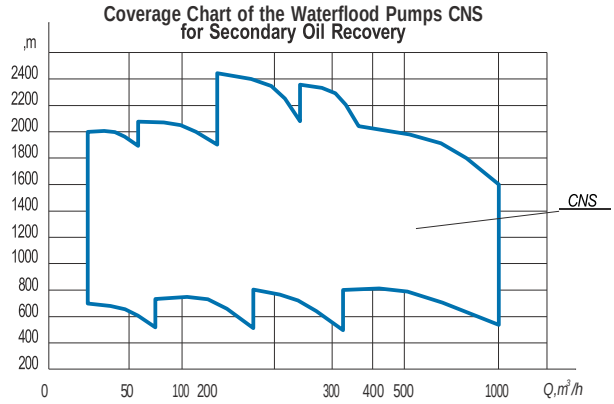
Corrosion-resistant material construction
Handled media in case of corrosion-resisting and wear- and corrosion-resisting constructions: aggressive sewage and formation oil-field produced waters including those that contain hydrogen sulfide

Duplex steel construction
Handled media in case of duplex steel construction: aggressive sewage and formation and cenomanian oil-field produced waters including those that contain hydrogen sulfide (H_2S up to 400mg/l)

The Manufacturer shall select appropriate material construction according to handled medium characteristics specified by the Purchaser.

Unless otherwise specified, applicable to all the constructions:

* – only the CNSp models;
** – to all the pump models except CNSp;
*** – only the CNS …-2 (2nd upgrading) models



	Nos	Pump make	Capacity, m³/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
	1	CNS 10-200	10	200	3000	22
	2	CNS 10-480	10	480	3000	55
	3	CNS 10-700	10	700	3000	90
	4	CNS 30-800	30	800	3000	315
	5	CNS 30-1050	30	1050	3000	315
	6	CNS 30-1422	30	1250	3000	315
	7	CNS 40-800	40	800	3000	315
	8	CNS 40-1050	40	1050	3000	315
	9	CNS 40-1422	40	1250	3000	315
	10	CNS 45-700	45	700	3000	315
	11	CNS 45-900	45	900	3000	315
	12	CNS 45-1050	45	1050	3000	500
	13	CNS 45-1150	45	1150	3000	500
	14	CNS 45-1275	45	1275	3000	500
	15	CNS 45-1422	45	1422	3000	630
	16	CNS 45-1525	45	1525	3000	630
	17	CNS 45-1650	45	1650	3000	630
	18	CNS 45-1775	45	1775	3000	800
	19	CNS 45-1900	45	1900	3000	800
	20	CNS 45-2100*	45	2100	3000	800
	21	CNS 63-700**	63	700	3000	500
	22	CNS 63-900	63	900	3000	500
	23	CNS 63-1050	63	1050	3000	500
	24	CNS 63-1150	63	1150	3000	500
	25	CNS 63-1275	63	1275	3000	630
	26	CNS 63-1422	63	1422	3000	630
	27	CNS 63-1525	63	1525	3000	630
	28	CNS 63-1650	63	1650	3000	800
	29	CNS 63-1775	63	1775	3000	1000
	30	CNS 63-1900	63	1900	3000	1000
	31	CNS 63-2100*	63	2100	3000	800
	32	CNS 90-700**	90	700	3000	500
	33	CNS 90-900	90	900	3000	500
	34	CNS 90-1050	90	1050	3000	630
	35	CNS 90-1150	90	1150	3000	630
	36	CNS 90-1275	90	1275	3000	630
	37	CNS 90-1422	90	1422	3000	800
	38	CNS 90-1525	90	1525	3000	800
	39	CNS 90-1650	90	1650	3000	800
	40	CNS 90-1775	90	1775	3000	1000
	41	CNS 90-1900	90	1900	3000	1000
	42	CNS 90-2100*	90	2100	3000	1000
	43	CNS 120-750**	120	700	3000	800
	44	CNS 120-900	120	900	3000	1000
	45	CNS 120-1050	120	1050	3000	1000
	46	CNS 120-1150	120	1150	3000	1000
	47	CNS 120-1275	120	1275	3000	1000
	48	CNS 120-1422	120	1422	3000	1250
	49	CNS 120-1525	120	1525	3000	1250
	50	CNS 120-1650	120	1650	3000	1600
	51	CNS 120-1775	120	1775	3000	1600
	52	CNS 120-1900	120	1900	3000	1600
	53	CNS 120-2100*	120	2100	3000	1250
	54	CNS 180-700**	180	700	3000	800
	55	CNS 180-900	180	900	3000	800
	56	CNS 180-1050	180	1050	3000	100
	57	CNS 180-1150	180	1150	3000	1000
	58	CNS 180-1275	180	1275	3000	1000
	59	CNS 180-1422	180	1422	3000	1250
	60	CNS 180-1525	180	1525	3000	1250
	61	CNS 180-1650	180	1650	3000	1600
	62	CNS 180-1775	180	1775	3000	1600
	63	CNS 180-1900	180	1900	3000	1600
	64	CNS 180-2100*	180	2100	3000	1600
	65	CNS 200-2050**	200	2050	3000	1600
	66	CNS 200-2200**	200	2200	3000	2000
	67	CNS 240-700**	240	700	3000	800
	68	CNS 240-900	240	900	3000	1000
	69	CNS 240-1050	240	1050	3000	1000
	70	CNS 240-1150	240	1150	3000	1250
	71	CNS 240-1275	240	1275	3000	1250
	72	CNS 240-1422	240	1422	3000	1250
	73	CNS 240-1525	240	1525	3000	1600
	74	CNS 240-1650	240	1650	3000	1600
	75	CNS 240-1775	240	1775	3000	1600
	76	CNS 240-1900	240	1900	3000	2000
	77	CNS 240-2100*	240	2100	3000	2000
	78	CNS 315-1050	315	1050	3000	1600
	79	CNS 315-1422	315	1422	3000	2000
	80	CNS 315-1900	315	1900	3000	2500

CNS Series Multistage Segmental

	81	CNS 500-1050	500	1050	3000	2500
	82	CNS 500-1422	500	1422	3000	3150
	83	CNS 500-1900	500	1900	3000	4000
	84	CNS 630-1050	630	1050	3000	2500
	85	CNS 630-1422	630	1422	3000	3150
	86	CNS 630-1900	630	1900	3000	4000
	87	CNS 720-1050	720	1050	3000	2500
	88	CNS 720-1422	720	1422	3000	3150
	89	CNS 720-1900	720	1900	3000	4000
	90	CNS 300-1800***	300	1575	3000	3150
	91	CNS 300-1800***	300	1800	3000	3150
	92	CNS 360-2000***	360	2000	3000	3150
	93	CNS 360-2000***	250	2370	3000	2500
	94	CNS 360-2000***	341	1891	3000	3150
	95	CNS 500-1900***	500	1900	3000	5000
	96	CNS 500-1900***	567	2000	3000	5000
	97	CNS 500-1900-1***	800	1390	3000	5000
	98	CNS 630-1700***	630	1700	3000	4000

CNSDp 240-1422 Radially Split Barrel

Designed for injection of water into the petroliferous pools to maintain the seam pressure for the intensification of production of oil, gas and condensate.
Due to its super duplex steel hydraulic parts suitable to handle highly-corrosive seawater, aggressive sewage and formation (oil-field produced) waters including those that contain hydrogen sulfide (H_2S up to 400 mg/l) with pH value of 4 to 9, density up to 1180 kg/m^3 and maximum grain size of 0.2 mm at pumping temperatures ranging from 0 to +90 °C.
The pump can be also used in the high pressure oil refining processes and petrochemical industry applications.

Motor driven, horizontal centerline-mounted, radially spit multistage double-casing centrifugal pump with a withdrawable cartridge of ring-section type (BB5 type according to ANSI/API Standard 610 (ISO 13709:2009). Two groups of single suction impellers rotating in opposite directions are arranged back-to-back with a cross-over to balance the rotor axial thrust.

The pump rotor is carried by two forced oil lubricated tilting-segment radial plain bearings.

The residual axial thrust of the rotor is taken up by the double(-acting) thrust plain bearing with tilting pads.
Shaft sealing: by single or dual mechanical seals of cartridge type. In the latter case: equipped with a life-support system.
Nozzles vertically to the top

Development and mastering the production of ACNSDp series pumps is underway for covering models (duties) to deliver respectively 45, 63, 90, 120, 180, 240, 315, 630 and 720 m^3/h.

EPZ Series Close-Coupled Single-Stage End-Suction

Designed for handling crude municipal and household sewage, factory waste waters, storm water and other polluted effluents with a temperature up to 40°C.
They can be used both for a stationary installation at the sewerage pumping stations and in the mobile installations for disaster control (versions I1 and I4 respectively).

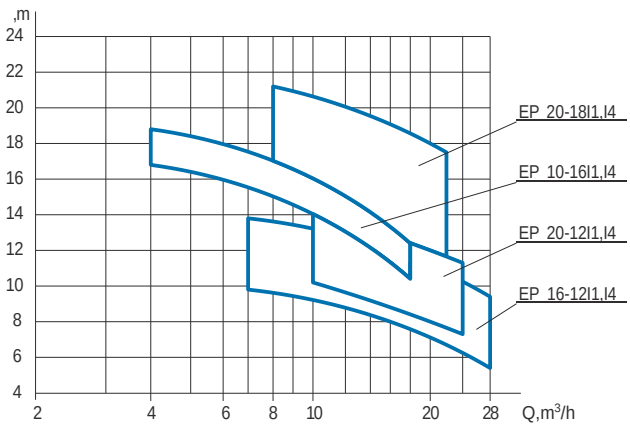
Vertical close-coupled non-clog single-stage volute-casing centrifugal or torque flow (according to the impeller type employed) pumps driven by built-in hermetically sealed air-filled electric motors, which are protected against overheating and ingress of moisture. Shaft sealing: by two mechanical seals arranged in series.

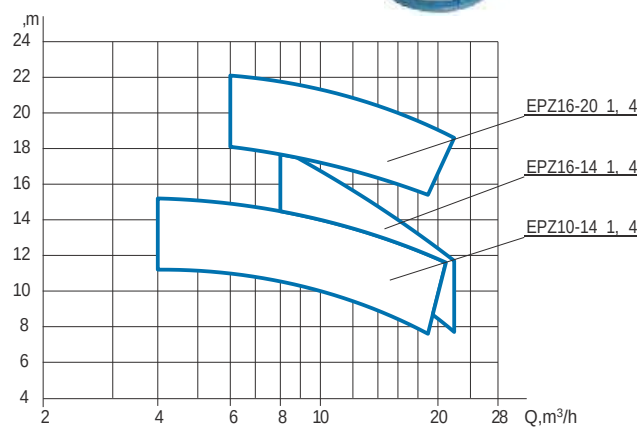
I1: Stationary vertically suspended wet-pit installation with slide rails and location/sealing delivery flange (pressure-tight automatic connection between pump and support bend)
I4: Transportable vertically suspended free-standing installation on a pump stool with suction strainer, for mobile disaster control plants

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	EPZ 10-14 1, 4	10	12 to 17	3000	1.6
2	EPZ 10-16 1, 4	10	12 to 19	3000	1.6
3	EPZ 16-12 1, 4	16	9 to 14	3000	1.8
4	EPZ 16-14 1, 4	16	12 to 17	3000	1.9
5	EPZ 16-20 1, 4	16	19 to 22	3000	2.0
6	EPZ 20-12 1, 4	20	10 to 24	3000	1.8
7	EPZ 20-18 1, 4	20	8 to 22	3000	2.0

EPZ

Coverage Charts of the Sewage Submersible Pumps EPZ





SVN Series Torque Flow

Designed for handling crude household and industrial effluents in the municipal services, chemically non-aggressive slurries and sludge, viscous and gassy liquids, various suspended solids as well as liquids charged with fibrous materials and solids, containing abrasive matter. Used for water transport of various raw materials, intermediate products and products without damaging them.

Electrically driven horizontal end suction torque flow pumps with an overhung impeller and a bearing bracket. The pump rotor is carried by the grease-lubricated antifriction bearings. Shaft sealing: packed gland

SVN

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	SVN 20/10	20	10	1500	2.2
2	SVN 40/40	40	40	3000	15
3	SVN 50/20	50	20	1500	7.5
4	SVN 50/20-1	50	20	1500	11
5	SVN 50/32	50	32	1500	18.5
6	SVN 80/20	80	20	1500	11
7	SVN 80/32	80	32	1500	22
8	SVN 100/50	100	50	3000	37
9	SVN 100/50	100	40	3000	30
10	SVN 160/40	160	40	3000	55
11	SVN 200/32	200	32	1500	55
12	SVN 200/32	200	27	1500	45
13	SVN 200/32	200	23	1500	37
14	SVN 200/50	200	50	1500	75
15	SVN 200/50	200	44	1500	55
16	SVN 200/50	200	38	1500	55
17	SVN 25/20	25	20	1500	4
18	SVN 125/50	125	50	1500	45
19	SVN 125/50	100	45	1500	37
20	SVN 125/50	80	40	1500	30
21	SVN 125/32	125	32	1500	30

S

SKM Series Single-Stage Process

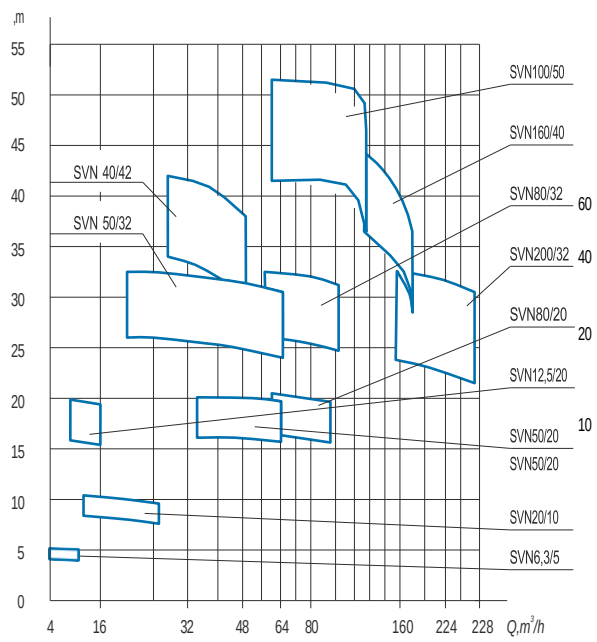
Designed for handling juices, syrups and other process liquids used in beet sugar industry services.

Flexibly-coupled, horizontal, foot-mounted end suction single stage volute casing pumps with overhung impeller and bearing bracket. Discharge nozzle radially to the top. When handling crystalline media, after the shutdown it is necessary to flush the pump with steam without its dismantling.

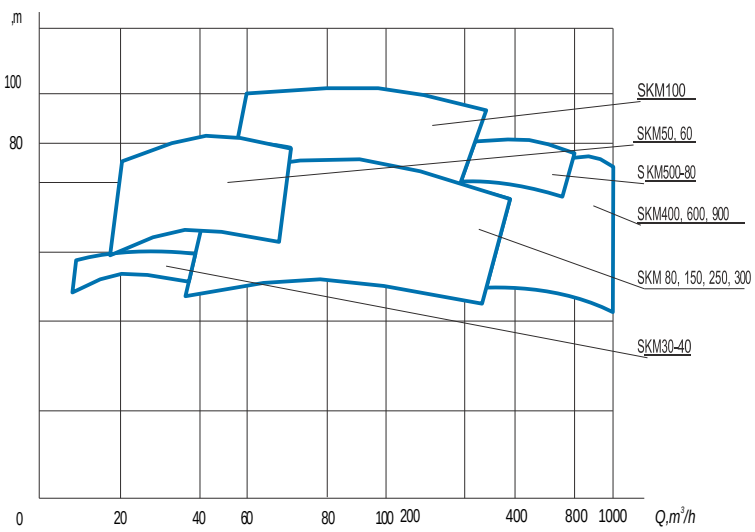
Pump rotor is carried by grease-lubricated antifriction bearings.

Nos	Pump make	Capacity, m^3/h	Head, m	Rotational speed (synchr.), pm	Motor nominal power, kW
1	S 30-40	30	40	1500	15
2	SKM 50-25	50	25	1500	15
3	SKM 50-60	50	60	1500	18,5
4	SKM 50-65	50	65	3000	18,5
5	SKM 50-80	50	80	3000	22
6	SKM 60-63	60	63	1500	22
7	SKM 80-25	80	25	1500	15
8	SKM 80-50	80	50	1500	37
9	SKM 80-63	80	63	1000	37
10	SKM 100-25	100	25	1500	22
11	SKM 100-32	100	32	1500	37
12	SKM 100-45	100	45	1500	37
13	SKM 100-50	100	50	1500	45
14	SKM 100-57	100	57	1500	55
15	SKM 100-63	100	63	1500	55
16	SKM 100-100	100	100	3000	75
17	SKM 150-25	150	25	1500	37
18	SKM 150-32	150	32	1500	37
19	SKM 150-45	150	45	1500	37
20	SKM 150-60	150	60	1500	55
21	SKM 200-25	200	25	1500	37
22	SKM 200-32	200	32	1500	37
23	SKM 200-45	200	45	1500	45
24	SKM 200-60	200	60	1500	75
25	SKM 250-32	250	32	1500	55
26	SKM 250-45	250	45	1500	55
27	SKM 250-60	250	60	1500	75
28	SKM 300-45	300	45	1500	90
29	SKM 300-60	300	60	1500	110
30	SKM 400-40	400	40	1500	90
31	SKM 400-80	400	80	1500	200
32	SKM 500-80	500	80	1500	250
33	SKM 600-70	600	70	1500	250
34	SKM 700-70	700	70	1500	315
35	SKM 800-70	800	70	1500	315
36	SKM 900-70	900	70	1500	400

Coverage Chart of the Pulp Torque Flow Pumps SVN



Coverage Chart of the Pumps SKM for Sugar Industry



AVZ, NVZ & AVPl Series
Oil-Sealed Plunger Vacuum

Slide-valve controlled vacuum pumps NVZ and pumping sets AVZ as well as plunger vacuum pumping sets AVPl are designed for evacuation of air, non-corrosive vapors and gas-vapor mixtures out of the closed hermetically sealed vacuum systems.

The pump units are economical and are widely used in various industries: machine-building, metallurgy, electrical engineering, electronic industry, for the production of foodstuffs, microbiologic specimens, medicines and in other branches of industry. Suitable as backing pumps for high vacuum plants

The **AVPl** series vacuum pumping sets are mostly efficient: for drying electrical engineering products, for the use in the production of building materials, in the drying and evaporator systems.

The **NVZ** pumps and **AVZ** series pumping sets can run at the ambient temperatures within plus 10°C to 35°C.

The pumping sets **AVPl-25, 2AVPl-30, AVPl-90T and AVPl-180T** may be operated under roof at the ambient temperatures within minus 5°C to plus 35°C.

AVZ-20D, AVPl-25, 2AVPl-30 are air-cooled, the rest of pumping sets are water-cooled.
Oil tank of **2AVPl-30, AVPl-90T** and **AVPl-180T** has a built-in filter for cleaning exhaust gases from oil mist.
The pumping set **2AVPl-30** features a lubrication system that enables its operation in a wide range of inlet pressures.
The pumping set **AVPl-380** has a lubrication system that rules out the possibility of ingress of dirty working oil inside the bearings.
AVPl-380 has been designed for the replacement of NVZ-300.
AVPl-25 and **2AVPl-30** have been designed for the replacement of **AVZ-20D** in the production facilities where the development of high vacuum is not required.

Nos	Pump unit / pump make	Pumping speed, l/s	Ultimate residual pressure, kPa (mm Hg), not more	Nominal power of the motor, kW
1	VZ-20D	20	$1.1\ 10^{-3}(8\ 10^{-3})$	2.2
2	VPl-25	25	$6.7\ 10^{-3}(5\ 10^{-2})$	3
3	2 VPl-30	25	$6.7\ 10^{-3}(5\ 10^{-2})$	3
4	VZ-63D	63	$6.7\ 10^{-4}(5\ 10^{-3})$	7.5
5	VZ-90	90	$6.7\ 10^{-3}(5\ 10^{-2})$	11
6	VPl-90	90	$6.7\ 10^{-3}(5\ 10^{-2})$	11
7	VZ-125D	125	$6.7\ 10^{-4}(5\ 10^{-3})$	15
8	VZ-180	180	$6.7\ 10^{-3}(5\ 10^{-2})$	15
9	VZ-180	180	$6.7\ 10^{-3}(5\ 10^{-2})$	18.5
10	VPl-180	180	$6.7\ 10^{-3}(5\ 10^{-2})$	15
11	VPl-380	380	$6.7\ 10^{-3}(5\ 10^{-2})$	37
12	NVZ-500	560	$6.7\ 10^{-3}(5\ 10^{-2})$	55

AVZ-20D

AVZ-180

NVZ-500

Oil Mist Separator Filters

The oil mist filter FV-650 is designed for cleaning exhausted gas medium (air) from oil mist at the outlet of vacuum pumps with maximum pumping speed of 650 m^3/h (180 l/s).

Nos	Filter make	Applied in (pump makes)	Maximum filter capacity, m^3/h (l/s)	Filter fineness, %, not less
1	FV-650	VZ-125D, AVZ-180	650 (180)	80

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