

CVFV
Vertical multistage low-pressure pumps

VERTICAL MULTISTAGE LOW-PRESSURE PUMPS CVFV

APPLICATION

Vertical pumps CVFV are intended for pumping drinking and service water or even slightly polluted or turbid water containing 5 g sludge or further impurities a per litre, with max. grain size 0.5 mm. Max. temperature of pumped water 60 °C. Permissible pH values range of pumped water 6–11 pH.

Pumps may be applied to water management industry, water supply services and technological processes of various industrial plants requiring water supply.

DESIGN

According to their constructional arrangements those pumps are produced in following workmanships:

Wet sump version – basic version for direct pumping from a water supply, with arrangement of discharge branches **TEE** – under the machine room floor and/or **TEV** – above the machine room floor.

Wet sump version – with an intermediate floor – for buildings where it is necessary to consider increasing water level in a sump and flooding the space below the floor, there the pump is provided with a special intermediate floor closure for max. upward pressures up to 4 bar. **The closure is fixed, together with sealing it incorporates even the stator anchorage at the intermediate floor. On the closure there is the discharge branch TEE placed.**

Dry sump version – the pump may be supplied with a foot-type suction elbow. The suction elbow sits at the bottom of the pump sump on adjustable supports facilitating both dismantling and access to the pump-set hydraulic part in the sump. Arrangement of

discharge branches may be both **TEE** and **TEV**.

Pump-set consists of following main parts:

- Hydraulic part
- Column pipe
- Discharge elbow
- Bearing suspension assembly
- Electric motor

Hydraulic part is represented by centrifugal single or multistage pump with shrouded impellers being provided with replaceable wear ring on the suction side.

Shaft is supported on journal bearings, lubricated with a pumped water.

Column pipe connecting the hydraulic part with the discharge elbow and bearing suspension is of steel flanged pipes where the pump-set is carried in. Shaft is supported on guide bearings. Guide bearings in the piping wet parts are of rolling-contact type, grease-lubricated.

The seal is of gland packing placed in the discharge elbow.

Bearing suspension assembly bears the pump-set, inclusive of the electric motor and further, it may take up the rotor axial thrust through a rolling-contact bearing, that may be oil or grease lubricated.

MATERIAL OPTIONS

Pump main parts are of following materials:

Option „LN“

Suction and discharge cover	grey cast iron
Stage casing	grey cast iron
Discharge elbow	grey cast iron
Guide-vaned casing, diffusers	grey cast iron
Impellers, wear rings	grey cast iron
Shaft	carbon steel
Shaft sleeves	stainless steel
Journal guide bearings	steel and bearing rubber
Guide pipes	steel

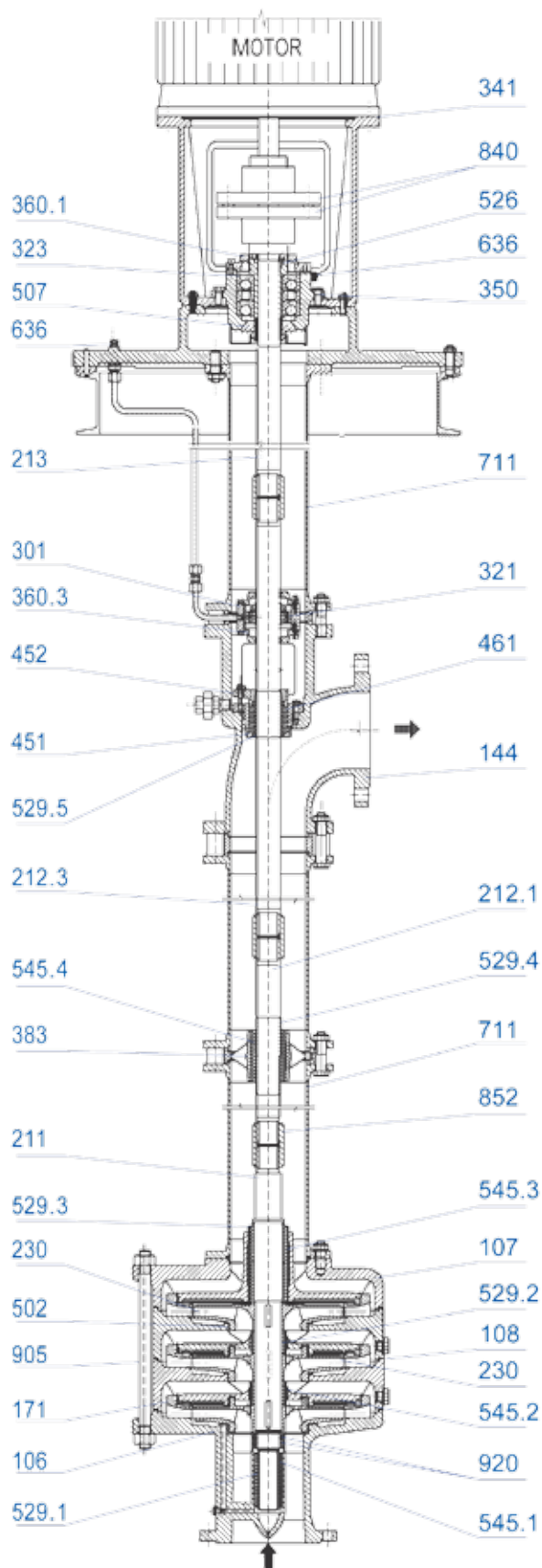
Material option „LU“

Impellers are of chrome steel, materials of further parts are the same as with the „LN“ option.

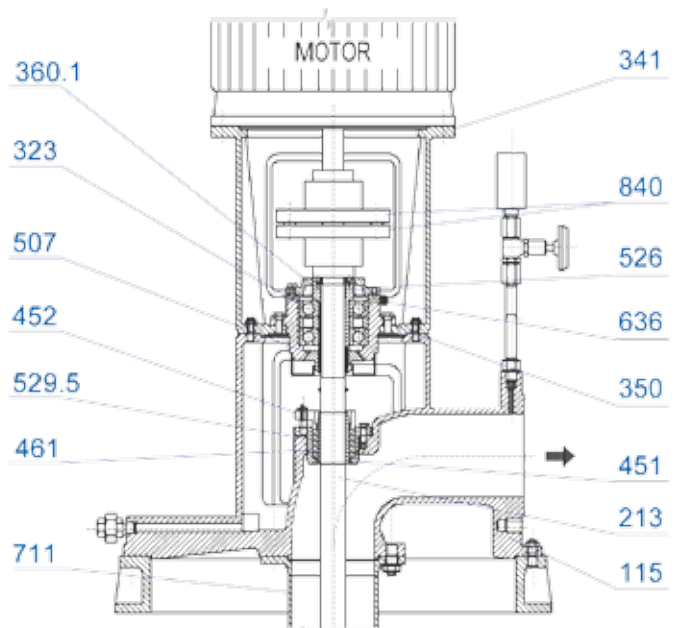
Special option

Special material and design version may be manufactured following characteristics of pumped media and whole environment. These versions may be manufactured from carbon steel, stainless steel and so on.

CROSS-SECTION OF PUMP WITH DISCHARGE BRANCH UNDER FLOOR – TEE



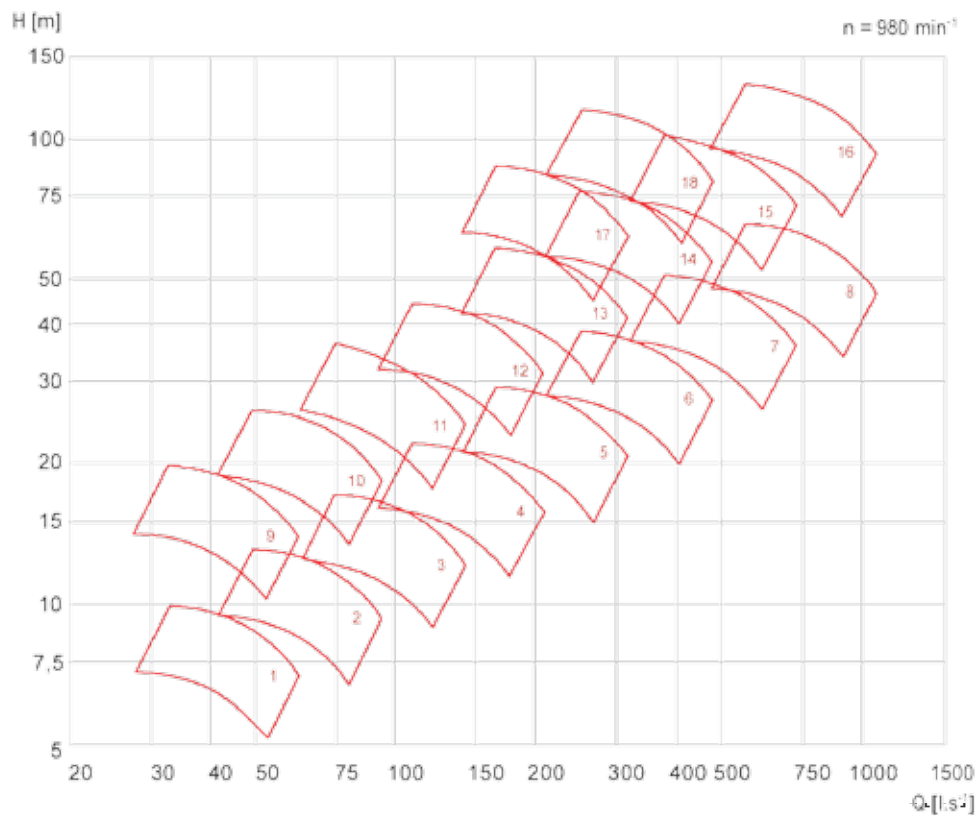
PARTIAL CROSS-SECTION OF PUMP WITH DISCHARGE BRANCH ABOVE FLOOR – TEV



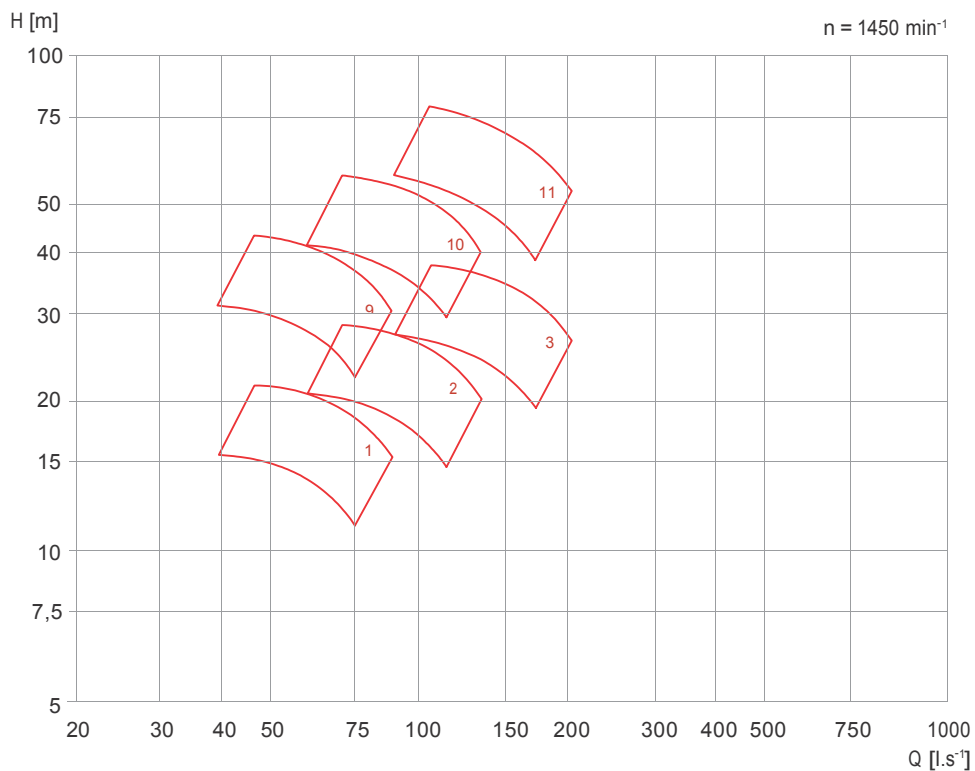
106	Suction cover
107	Discharge casing
108	Stage casing
115	Suspension body
144	Discharge elbow
171	Diffuser
211	Pump shaft
212.1	Shaft of column pipe
212.3	Shaft of discharge elbow
213	Suspension shaft
230	Impeller
301	Rolling-contact bearing housing
321	Radial ball bearing
323	Thrust ball bearing
341	Motor stool
350	Bearing housing
360.1	Thrust bearing cover
360.3	Radial/journal bearing cover
383	Sliding guide bearing
451	Stuffing box

452	Gland
461	Gland packing
502	Wear ring
507	Thrower
526	Bearing hub
529.1	Shaft sleeve, suction side
529.2	Spacer sleeve
529.3	Shaft sleeve, discharge side
529.4	Shaft sleeve
529.5	Stuffing box sleeve
545.1	Stuffing box sleeve
545.2	Stage bush
545.3	Bearing of discharge casing
545.4	Column pipe bearing
636	Lubricating nipple
711	Column
840	Coupling
852	Screwed coupling
905	Connection bolt
920	Shaft nut

INFORMATIVE SELECTION CHART OF CVFV PUMPS



1	150-CVFV-265/1	6	400-CVFV-530/1	11	250-CVFV-350/2	16	600-CVFV-700/2
2	200-CVFV-305/1	7	500-CVFV-600/1	12	300-CVFV-400/2	17	350-CVFV-460/3
3	250-CVFV-350/1	8	600-CVFV-700/1	13	350-CVFV-460/2	18	400-CVFV-530/3
4	300-CVFV-400/1	9	150-CVFV-265/2	14	400-CVFV-530/2		
5	350-CVFV-460/1	10	200-CVFV-305/2	15	500-CVFV-600/2		



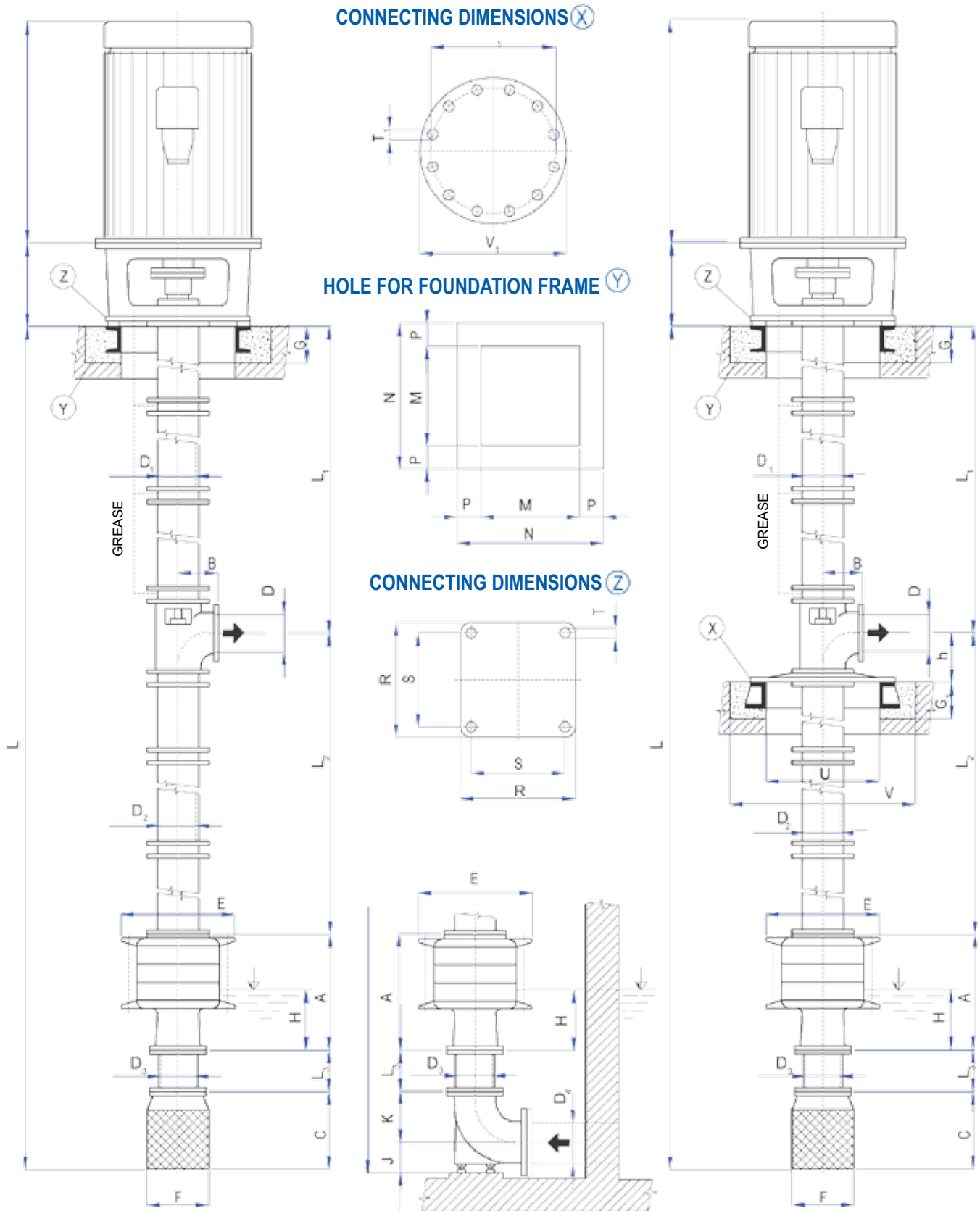
TECHNICAL AND DESIGN DATA

Pump type	Speed min ⁻¹	Number of stages	Discharge branch DN/PN	Max. stavební délka L (m)		Moment of inertia (kg/m ²) versions TEE, TEV		Weight (kg)					
				Version TEE	Version TEV	Pump + suspension assembly	1 m of pipe column shaft	Pump	Suspension UV	Suspension UP	1m of pipe column (shaft + pipe)	Suction strainer	1 m of suction pipe
150-CVfV-265-35	980	1	150/10	21	21	0,145	0,0010	166	217	256	27	72	56
		2	150/10	21	21	0,312	0,0010	282	224	253	27		
	1450	1	150/10	21	21	0,158	0,0010	166	217	246	27	72	56
		2	150/10	21	21	0,322	0,0010	282	224	253	27		
200-CVfV-305-40	980	1	200/10	19,5	19,5	0,178	0,0010	193	222	345	60	75	52
		2	200/10	20	20	0,363	0,0010	325	240	360	60		
	1450	1	200/10	19,5	19,5	0,192	0,0010	193	250	360	60	75	52
		2	200/10	20	20	0,376	0,0020	235	265	375	62		
250-CVfV-350-46	680	1	250/10	21	19	0,473	0,0016	265	390	615	71	83	67
		2	250/10	21	19,5	0,773	0,0016	457	390	615	71		
	1450	1	250/10	21	19	0,488	0,0016	265	390	615	71	83	67
		2	250/10	21	19,5	0,843	0,0048	457	435	670	79,5		
300-CVfV-400-52	980	1	300/10	21	20	0,731	0,0020	390	440	695	94,5	83	87
		2	300/10	21,5	20	1,304	0,0034	669	505	870	97		
350-CVfV-460-59	980	1	350/10	21	20,5	1,360	0,0026	576	630	885	122	110	122
		2	350/10	21,5	21	2,830	0,0100	1019	840	1185	131		
		3	350/10	22	21	3,950	0,0100	1463	840	1185	131		
400-CVfV-530-68	980	1	400/10	22	20	2,840	0,0086	811	850	1123	126	155	109
		2	400/10	22,5	20,5	5,010	0,0150	1428	980	1325	126		
		3	400/16	23	21	7,270	0,0250	1921	996	1678	126		
500-CVfV-600-78	980	1	500/10	21,5	21	5,520	0,0150	1215	900	1260	165	155	111
		2	500/16	22	21,5	10,790	0,0390	2138	1080	1460	177		
600-CVfV-700-90	980	1	600/10	22	20,5	10,490	0,0300	1539	1827	2123	298	190	229
		2	600/16	22,5	21	18,430	0,0550	2758	1857	2144	298		

BASIC VERSION- WET SUMP

DRY SUMP VERSION

WET SUMP WITH INTERMEDIATE FLOOR VERSION



DIMENSIONS OF PUMPS WITH DISCHARGE BRANCH TEE

Pump type		150-CVFFV	200-CVFFV	250-CVFFV	300-CVFFV	350-CVFFV	400-CVFFV	500-CVFFV	600-CVFFV							
A	Number of stages	1	376	418	458	543	640	735	830	860						
		2	553	622	691	808	945	1085	1230	1313						
		3	-	-	-	-	1250	1435	-	-						
B		200	280	300	350	400	500	650	700							
C		450	450	500	670	670	754	754	870							
D	DN 150	DN 200	DN 250	DN 300	DN 350	DN 400	DN 500	DN 600								
D ₁	DN 150	DN 200	DN 250	DN 300	DN 350	DN 400	DN 500	DN 600								
D ₂	DN 150	DN 200	DN 250	DN 300	DN 350	DN 400	DN 500	DN 600								
D ₃	DN 200	DN 200	DN 250	DN 300	DN 350	DN 400	DN 400	DN 500								
D ₄	DN 200	DN 200	DN 250	DN 400	DN 400	DN 500	DN 500	DN 700								
∅E	554	635	714	790	930	1030	1200	1380								
∅F	440	440	520	504	504	605	605	775								
G	180	180	200	220	250	250	250	280								
G ₁	160	180	200	220	230	230	230	280								
H	290	320	340	410	480	540	610	780								
h	250	290	340	400	400	460	500	640								
I	300	300	350	500	500	600	600	800								
J	220	220	250	370	350	450	450	580								
K	300	300	350	500	500	600	600	800								
L	L ₁ + L ₂ + A + L ₃ + C Basic version and version with intermediate floor L ₁ + L ₂ + A + L ₃ + K + J Dry sump version															
L	1185	3185	1235	3235	1285	3285	1280	3280	1310	3310	1420	3420				
	1685	3685	1735	3735	1785	3785	1780	3780	1810	3810	1920	3920				
	2185	4185	2235	4235	2285	4285	2280	4280	2310	4310	2420	4420				
	2685	4685	2735	4735	2785	4785	2780	4780	2810	4810	2920	4920				
L ₂	1220	5720	1255	5755	1300	5800	1355	5855	1350	5850	1400	5900	1440	5940	1560	6060
	1720	6220	1755	6255	1800	6300	1855	6355	1850	6350	1900	6400	1940	6440	2060	6560
	2220	7220	2255	7255	2300	7300	2355	7355	2350	7350	2400	7400	2440	7440	2560	7560
	2720	8220	2755	8255	2800	8300	2855	8355	2850	8350	2900	8400	2940	8440	3060	8560
	3220	9220	3255	9255	3300	9300	3355	9355	3350	9350	3400	9400	3440	9440	3560	9560
	3720	10220	3755	10255	3800	10300	3855	10355	3850	10350	3900	10400	3940	10440	4060	10560
	4220	11220	4255	11255	4300	11300	4355	11355	4350	11350	4400	11400	4440	11440	4560	11560
	4720	12220	4755	12255	4800	12300	4855	12355	4850	12350	4900	12400	4940	12440	5060	12560
5220	13220	5255	13255	5300	13300	5355	13355	5350	13350	5400	13400	5440	13440	5560	13560	
L ₃	250	1250	250	1250	250	1250	250	1250	250	1250	250	1250	250	1250		
	500	1500	500	1500	500	1500	500	1500	500	1500	500	1500	500	1500		
	750	2000	750	-	750	2000	750	2000	750	2000	750	2000	750	2000		
	1000	-	1000	-	1000	-	1000	-	1000	-	1000	-	1000	-		
M	650 × 650	700 × 700	800 × 800	900 × 900	1000 × 1000	1300 × 1300	1300 × 1300	1650 × 1650	1300 × 1300	1650 × 1650	1450 × 1450					
N	900 × 900	1000 × 1000	1150 × 1150	1300 × 1300	1300 × 1300	1650 × 1650	1650 × 1650	2000 × 2000	1650 × 1650	2000 × 2000	2000 × 2000					
P	125	150	175	200	150	175	175	275	175	275	275					
R	760 × 760	810 × 810	920 × 920	1040 × 1040	1140 × 1140	1440 × 1440	1440 × 1440	1600 × 1600	1440 × 1440	1600 × 1600	1600 × 1600					
S	710 × 710	760 × 760	850 × 850	960 × 960	1080 × 1080	1360 × 1360	1360 × 1360	1530 × 1530	1360 × 1360	1530 × 1530	1530 × 1530					
∅T	8 × ∅18	8 × ∅23	8 × ∅23	8 × ∅23	8 × ∅23	8 × ∅27	8 × ∅30	8 × ∅32	8 × ∅30	8 × ∅32	8 × ∅32					
∅T ₁	12 × ∅18	12 × ∅23	12 × ∅23	12 × ∅23	12 × ∅23	12 × ∅27	12 × ∅30	12 × ∅30	12 × ∅30	12 × ∅30	12 × ∅30					
∅U	650	700	800	900	1000	1300	1300	1520	1300	1520	1520					
∅V	900	1000	1150	1130	1400	1650	1650	2000	1650	2000	2000					
∅U ₁	710	770	900	960	1080	1370	1360	1620	1360	1620	1620					
∅V ₁	740	810	960	1040	1150	1440	1450	1700	1450	1700	1700					

Dimensions given in mm.

Dimensions pre-sized but not given there are variable as they depend on an electric motor type and size. They may be given on request within contract. Connecting dimensions of the pump suction branch flange are intended for PN 10.

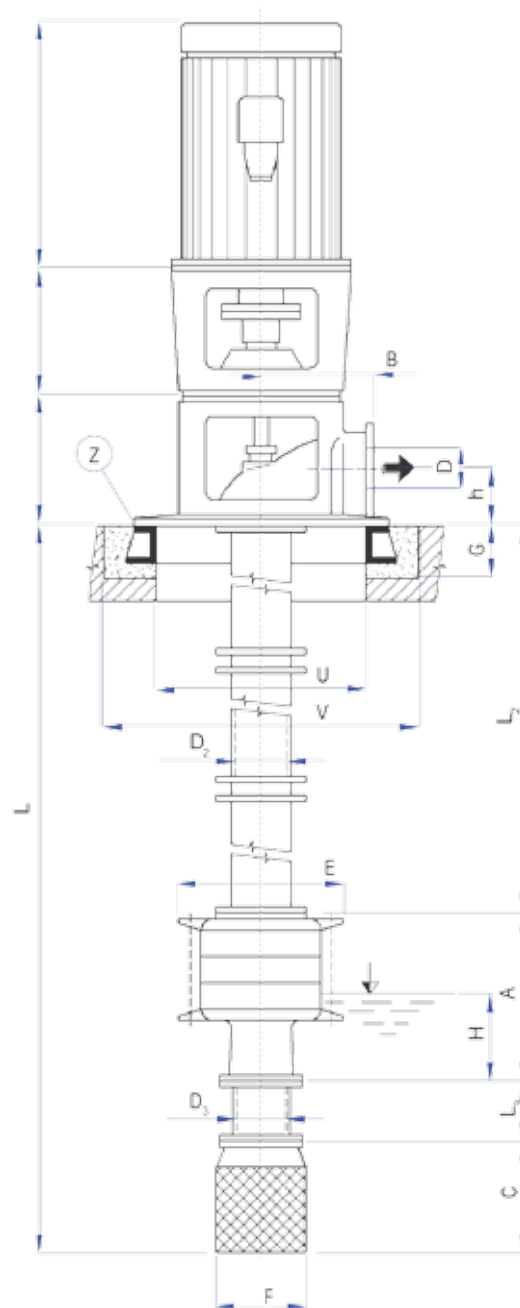
Connecting dimensions of the discharge elbow flange are intended for PN – given in the Table „TECHNICAL AND DESIGN DATA“.

L₃ using a suction pipe individually, for extension the pump total face-to-face dimension.

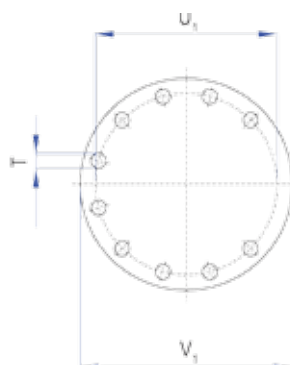
H minimal „on“ level necessary within the pump starting-up for its thorough flooding and reliable operation.

C and F according to individual version.

WET SUMP VERSION WITH BRANCH TEV



CONNECTING DIMENSIONS Z



DIMENSIONS OF PUMPS WITH DISCHARGE BRANCH TEV

Pump type			150-CVfV	200-CVfV	250-CVfV	300-CVfV	350-CVfV	400-CVfV	500-CVfV	600-CVfV								
A	Number of stages	1	376	418	458	543	640	735	830	860								
		2	553	622	691	808	945	1085	1230	1313								
		3	-	-	-	-	1250	1435	-	-								
B			340	350	420	450	500	650	650	710								
C			450	450	500	670	670	754	754	870								
D			DN 150	DN 200	DN 250	DN 300	DN 350	DN 400	DN 500	DN 600								
D1			DN 150	DN 200	DN 250	DN 300	DN 350	DN 400	DN 500	DN 600								
D3			DN 200	DN 200	DN 250	DN 300	DN 350	DN 400	DN 400	DN 500								
ØE			554	635	714	790	930	1030	1200	1380								
ØF			440	440	520	504	504	605	605	775								
G			160	180	200	220	230	250	230	280								
H			290	320	340	410	480	540	610	780								
h			180	210	240	280	300	340	420	540								
L			$L_2 + A + L_3 + C$															
L ₂			970	6970	965	6965	960	6960	955	6955	950	6950	940	6940	940	6940	930	6930
			1470	7970	1465	7965	1460	7960	1455	7955	1450	7950	1440	7940	1440	7940	1430	7930
			1970	8970	1965	8965	1960	8960	1955	8955	1950	8950	1940	8940	1940	8940	1930	8930
			2470	9970	2465	9965	2460	9960	2455	9955	2450	9950	2440	9940	2440	9940	2430	9930
			2970	10970	2965	10965	2960	10960	2955	10955	2950	10950	2940	10940	2940	10940	2930	10930
			3470	11970	3465	11965	3460	11960	3455	11955	3450	11950	3440	11940	3440	11940	3430	11930
			3970	12970	3965	12965	3960	12960	3955	12955	3950	12950	3940	12940	3940	12940	3930	12930
			4470	13970	4465	13965	4460	13960	4455	13955	4450	13950	4440	13940	4440	13940	4430	13930
			4970	14970	4965	14965	4960	14960	4955	14955	4950	14950	4940	14940	4940	14940	4930	14930
			5470	15970	5465	15965	5460	15960	5455	15955	5450	15950	5440	15940	5440	15940	5430	15930
5970	16970	5965	16965	5960	16960	5955	16955	5950	16950	5940	16940	5940	16940	5930	16930			
L ₃			250	1250	250	1250	250	1250	250	1250	250	1250	250	1250	250	1250		
			500	1500	500	1500	500	1500	500	1500	500	1500	500	1500	500	1500		
			750	2000	750	-	750	2000	750	2000	750	2000	750	2000	750	2000		
			1000	-	1000	-	1000	-	1000	-	1000	-	1000	-	1000	-		
ØT ₁			10 × Ø18	10 × Ø23	10 × Ø23	10 × Ø23	10 × Ø27	10 × Ø30	10 × Ø30	10 × Ø30	14 × Ø30							
ØU			650	700	800	900	1000	1300	1300	1520								
ØV			900	1000	1150	1130	1400	1650	1650	2000								
ØU ₁			710	770	900	960	1080	1370	1360	1620								
ØV ₁			740	810	960	1040	1150	1440	1450	1700								

Dimensions are given in mm.

Dimensions pre-sized but not given there are variable as they depend on an electric motor type and size. They may be given on request within contract. Connecting dimensions of the discharge branch elbow flange are intended for PN – given in the Table „TECHNICAL AND DESIGN DATA“.

L₃ using a suction pipe individually, for lengthening the pump total face-to-face dimension.

H minimal „on“ level necessary within the pump starting-up for its thorough flooding and reliable operation.

C and F..... according to individual version



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