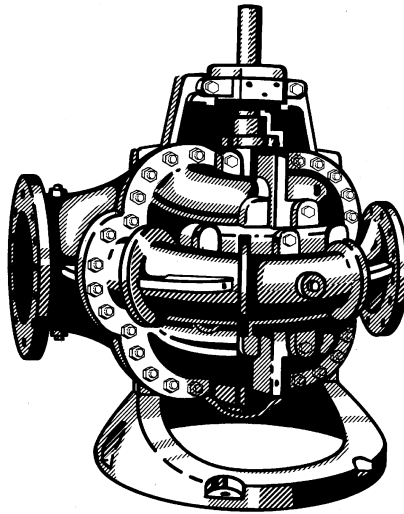


Axially split volute casing pumps



Applications

Waterworks, irrigation and drainage pumping stations, power stations, industrial water supply systems, fire fighting systems, marine applications as well as general applications in refineries

Operating data

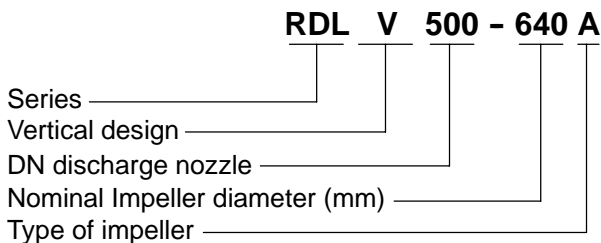
Pump sizes	DN 500	up to	800	
Capacities	Q	up to	3000	l/s
Total head	H	up to	150	m
Operating pressure	p	up to	25	bar
Operating temperature	t	up to	+80	°C

Design

Vertical single stage axially split volute casing pump with double entry radial impeller

Flanges acc. to ISO, DIN, BS or ANSI

Designation



Bearings

Upper bearing : Anti-friction bearing, grease lubricated.

Lower bearing : Plain bearing, medium lubricated

Shaft seal

Stuffing box packing or mechanical seal

Materials

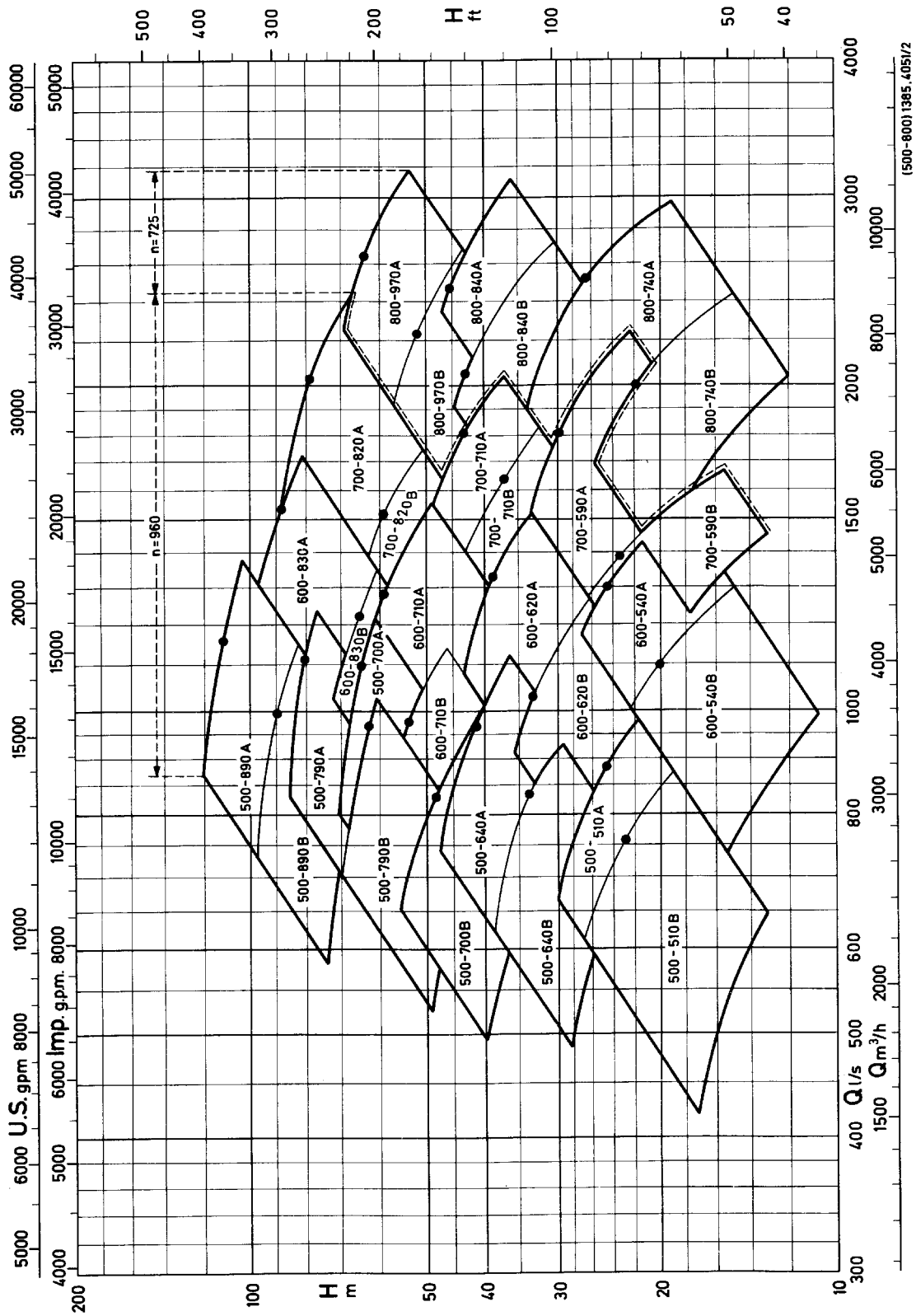
	ASTM	similar to DIN
Volute casing upper part	A48 class 35	GG-25
	A536 class 604018	GGG-40
Volute casing lower part	A48 class 30	GG-20
	A536 class 604018	GGG-40
Shaft	SAE 1045	C45N
	AISI 420	1.4021
Impeller	B 584-90500	G-CuSn10
	A743 CA6NM	1.4313.95
	A743CF8M	1.4408
Shaft protecting sleeve	AISI 420	1.4021
Casing wear ring	B584-90500	G-CuSn10
	A743CA6NM	1.4313.95
Impeller wear ring	B584-90500	G-CuSn10
	A743CA6NM	1.4313.95

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Technical data	page 9
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Coating	page 11
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Dimension table for installation with foundation block	page 16 + 17
Dimension table for installation with foundation ring	page 18 + 19
Installation plan for type of installation DJ	page 20 + 21
Spare parts	page 22 + 23
Accessories	page 24

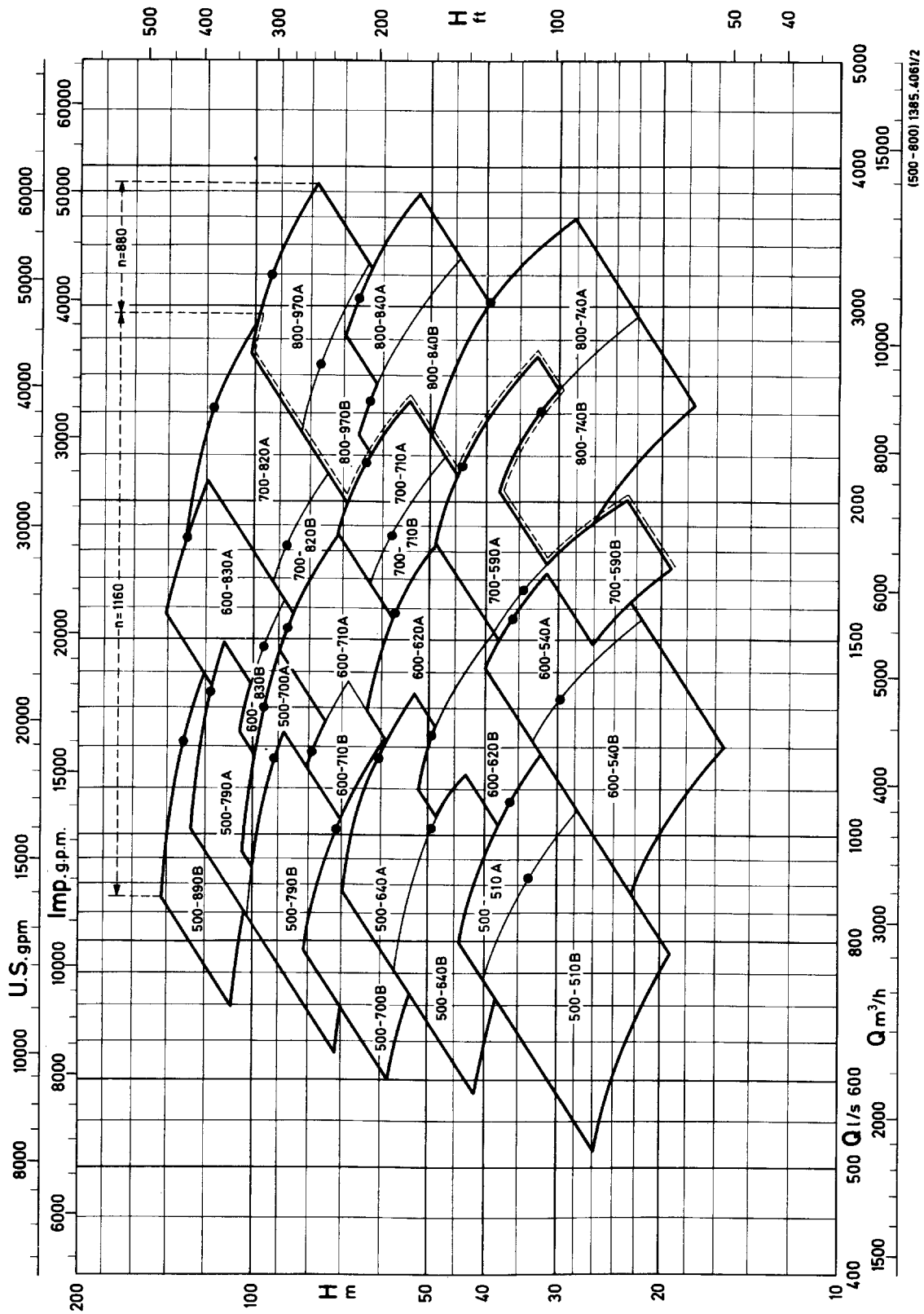


Selection chart 50 Hz





Selection chart 60 Hz



Scope of supply

Pump with bare shaft end, vertical design, with primer coating, soft packed stuffing box or mechanical seal.

- Extra charges for:
- potable water quality coating / top coat
 - material tests
- Available accessories:
(see page 23 for details)
- coupling and coupling guard,
 - vibration sensor SPM-Nippel,
 - set pressure gauges,
 - cyclone separator with piping,
 - venting valve,
 - temperature sensor for antifriction bearing (PT 100)
 - signal transmitter for PT 100
 - assembly device / lifting device

Guarantee, testing and quality control

Every pump undergoes a functional test and the operating data is guaranteed **without** acceptance test.

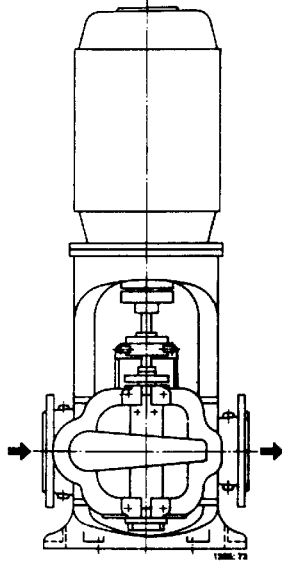
Acceptance tests can be performed in accordance with ISO 2548 C, DIN 1944/III or other comparable international testing standards.

The quality of the RDLV products is ensured by a tested and certified quality assurance system according to DIN ISO 9001 / EN 29001.

Order data

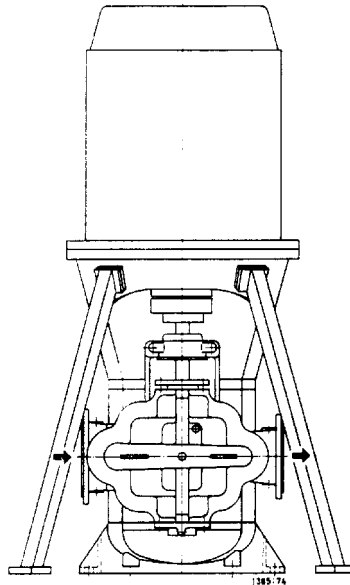
- **pump :**
 - description of the pump according to "Designation"
 - capacity Q
 - total head H (H_{geo} and plant losses)
 - material combination
 - flange design
 - shaft seal as soft packed stuffing box or mechanical seal
 - Anti-friction bearing grease lubricated / plain bearing medium lubricated
 - liquid handled and liquid temperature
 - direction of rotation / arrangement of the motor
 - accessories required
 - number and language of operating manual
- **motor :**
(choice by KSB)
 - type of construction
 - protection
 - voltage, frequency, method of starting
 - ambient temperature
 - insulation class
 - accessories required
- **motor :**
(motor provided by the client)
 - binding motor dimension table and data sheet with specification of the effective speed to be given with the order

Types of installation



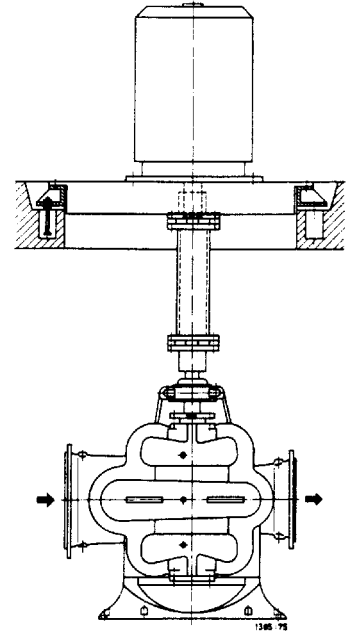
DB

Driver flanged on pump through drive stool



DK

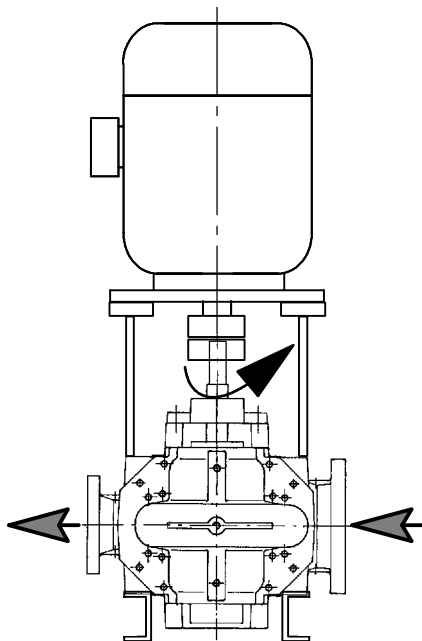
Driver flanged on pump through driver stool and additionally supported



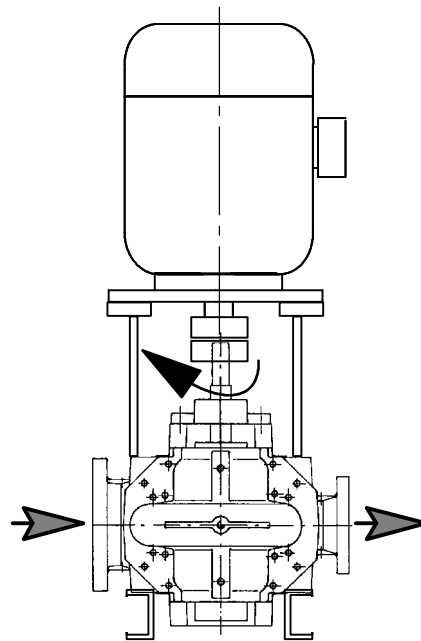
DJ

Driver on own foundation, driver direct or through intermediate shaft

Direction of rotation and flow direction



Direction of rotation, anticlockwise, viewed from the drive end



Direction of rotation, clockwise, viewed from the drive end



Material combinations

Part no.	Designation	ASTM - Materials / Similar to DIN					
		01	11	02	21	03	31
105.2	Volute casing, upper part	A 48 class 35 GG-25	A 536 class 604018 GGG-40	A 48 class 35 GG-25	A 536 class 604018 GGG-40	A 48 class 35 GG-25	A 536 class 604018 GGG-40
105.1	Volute casing, lower part	A 48 class 30 GG-20	A 536 class 604018 GGG-40	A 48 class 30 GG-20	A 536 class 604018 GGG-40	A 48 class 30 GG-20	A 536 class 604018 GGG-40
182	Pump foot	A48 class 30 GG-20					
211	Shaft	SAE 1045 or AISI 420 C 45 N or 1.4021					
234	Impeller	B 584-90500 G-CuSn10		A 743 CA 6 NM 1.4313.95			A 743 CF 8 M 1.4408
330	Bearing bracket	A 48 class 30 GG-20					
350	Bearing housing	A 48 class 30 GG-20					
360	Bearing cover	A 48 class 30 GG-20					
361	Bearing end plate	A 48 class 30 GG-20					
452	Gland	A 48 class 30 GG-20	A 536 class 604018 GGG-40	A 48 class 30 GG-20	A 536 class 604018 GGG-40	A 48 class 30 GG-20	A 536 class 604018 GGG-40
457	Neck ring	B 584-90500 G-CuSn10					
458	Lantern ring	A 48 class 30 GG-20					
471	Seal cover (mech. seal)	A 48 class 30 GG-20					
502	Casing wear ring	B 584-90500 G-CuSn10					
503	Impeller wear ring	A 743 CA 6 NM 1.4313.95					
524	Shaft protecting sleeve	AISI 420 1.4021					
525	Spacer sleeve	AISI 420 1.4021					
545	Bearing bush	AISI 420 1.4021					
921	Shaft nut	SAE 1020 8.8					AISI 316 A4



Casing test pressures, flange ratings, shaft details

Pump sizes	Casing test pressures and flange ratings				Shaft details		Moments of inertia J kgm ² (without coupling)		Casing with double volute
	Casing materials				Shaft material				
	A48 class 30 (GG-20)	A536 class 604018 (GGG-40)	A48 class 30 (GG-20)	A536 class 604018 (GGG-40)	SAE 1045 (C45N)	AISI 420 (1.4021)	without-water	with water	
	Max. test pressure (bar)		Max. flange rating to DIN (bar)		permissible shaft loading P / n kW / 1/min				
500-510	11	18	10	16	0,582	0,945	3,45	4,875	-
500-640	15	25	10	25	1,19	1,93	7,5	10,35	-
500-700	18	28	16	25	1,61	2,61	10,075	13,95	x
500-790	25	35	25	25	2,11	3,43	13,375	20,825	x
500-890	28	36	25	25	3,45	5,6	23,15	31,25	x
600-540	11	20	10	16	0,582	0,945	5,15	7,275	-
600-620	13,5	22	10	16	0,836	1,36	8,5	11,6	-
600-710	18	27	16	25	1,61	2,61	13,7	18,2	-
600-830	18	27	16	25	2,11	3,43	22,325	30,25	x
700-590	10	18	10	16	1,19	1,93	10,05	12,875	-
700-710	12	20	10	16	1,61	2,61	17,5	23,5	-
700-820	18	24	16	16	1,76	4,48	31,5	35,25	x
800-740	10	16	10	16	1,61	2,61	25,5	31,75	-
800-840	11	17	10	16	2,11	3,43	37,25	46,25	-
800-970	13	20	10	16	3,45	5,6	61,75	72,25	-

Fig. 5

Flanges

- When selecting casing flanges to DIN take the following into consideration:
Nominal pressure of flanges ² max. operating pressure. Minimum possible nominal pressure is 10 bar (PN 10), for max. nominal pressure see Fig. 5.
- If the suction and discharge flanges have different ratings then the difference must not exceed 1 rating stage (e.G. suction nozzle PN 16 and discharge nozzle PN 25).

Standard test pressure

1,2 · (Shut off head + suction pressure) or
1,5 · (Head at duty point + suction pressure)
The higher value to be used

Technical data

Impeller dimensions, Shaft diameter, stuffing box packing


Impeller outlet width Pump sizes	Impeller dimensions [mm]				Shaft diameter d_w [mm]			Stuffing box [mm]	
	A	B	A	B	in stuffing box housing	in mechanical seal (without shaft sleeve)	at coupling	Box dimensions D/d/l 	Packing ring section 5 rings
	Impeller rating b_2		Max. impeller-						
500-510	136	105	500/530	515/505	110	90	75	150/110/150	20x20
500-640	100	108	640	580	130	110	95	170/130/150	20x20
500-170	116	100	708	660	140	130	105	180/140/150	20x20
500-790	100	104	790	710	150	140	115	200/150/180	25x25
500-890	90	88	920	840	180	160	135	230/180/180	25x25
600-540	153	143	570	531/516	110	90	75	150/110/150	20x20
600-620	146	138	620	578/564	120	100	85	160/120/150	20x20
600-710	130	120	715	690	140	130	105	180/140/150	20x20
600-830	115	103	870	770	150	140	115	200/150/180	25x25
700-590	131	148	565	586/555	130	110	95	170/130/150	20x20
700-710	165	157	706/694	648/632	150	140	105	200/150/180	25x25
700-820	134	128	835	735	160	140	125	210/160/180	25x25
800-740	210	190	790/770	720/700	160	150	105	210/160/180	25x25
800-840	206	193	885	840	160	150	115	210/160/180	25x25
800-970	174	160	980	910	180	170	135	230/180/180	25x25

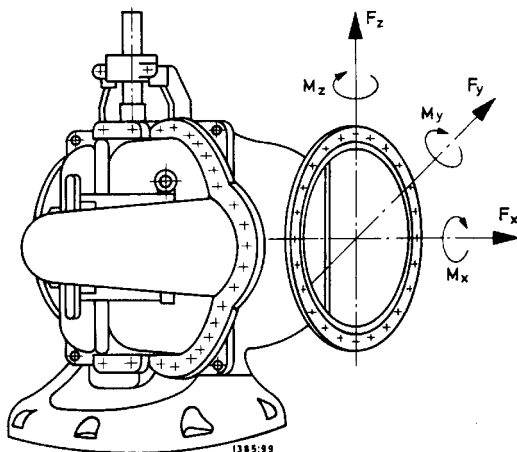
Fig. 4

Forces and moments

The forces and moments specified are mean values for simultaneous loading in 3 planes. Please contact the manufacturer if the forces and moments in one particular direction exceed the stipulated values. The figures in the table do not apply to reaction forces of unbraced expansion joints.

Material: A48 class 30

GG-20



Pump sizes	Nozzle in N			Moments in Nm		
	F _x	F _y	F _z	M _x	M _y	M _z
500-510	6000	6000	6000	4000	4000	4000
500-640						
500-700						
500-790						
500-890						
600-540	8000	8000	8000	5000	5000	5000
600-620						
600-710	10000	10000	10000	8000	8000	8000
600-830						
700-590						
700-710						
700-820	11000	11000	11000	9000	9000	9000
800-740						
800-840	12000	12000	12000	9000	9000	9000
800-970						

Speeds

For higher speeds consult KSB also stipulating the pump operating range as per selection chart.

Vibrations

Vibration values of the pump according to VDI-Rules 2056, Group G, "good" up to "acceptable", ($V_{eff} < 4,5$ mm/s), in the operating range from 0,8 up to $1,2 \times Q_{Opt}$



Coating

**A) Standard coating for material combination 01 up to 031:
non-potable water coating (potable water approval not available!)**

without extra charge		Inside	Outside
	Pretreatment	Derusting St 2 DIN 55928 T4	
	Primer	1-Component antirust primer red	
	Top coat	-without-	1-component-coat, thickness 0,06 mm RAL 5002 ultramarinblau (blue)

**B) Special coating for material combination 01 up to 031:
approved for potable water**

against extra charge see on list top coat inside+outside		Inside	Outside
	Pretreatment	Derusting St 2 DIN 55928 T4	
	Primer	1-Component antirust primer red	
	Top coat	2-component-epoxy resin based coat, thickness 0,125 mm, black RAL 9005, approved for potable water	1-component-coat, thickness 0,06 mm RAL 5002 ultramarinblau (blue)

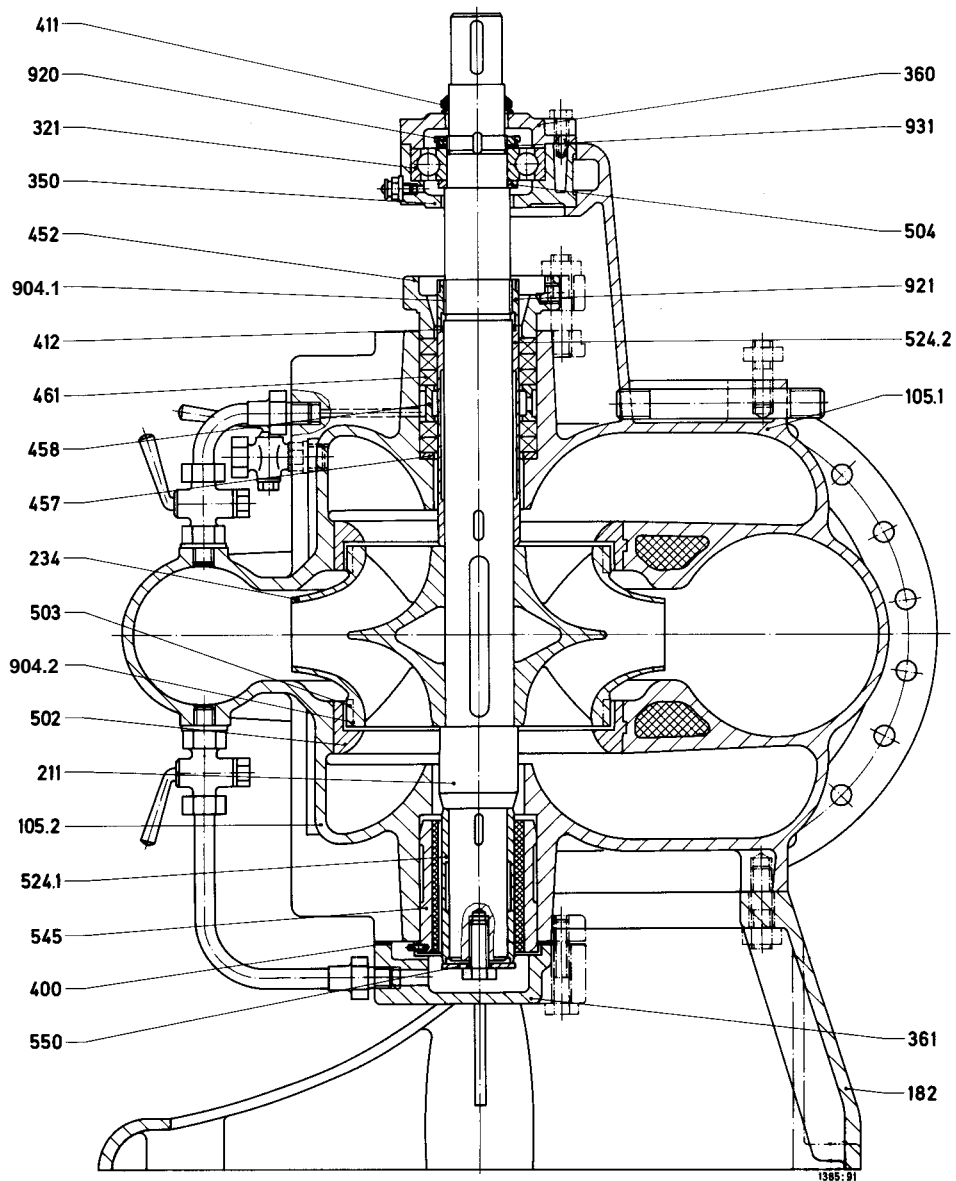
**C) Special coating for material combination 01 up to 031:
approved for potable water**

against extra charge dependent on individual project		Inside	Outside
	Pretreatment	Blasting SA 2 1/2, DIN 55928 T4	
	Primer	2-Component epoxy resin based zinc dust paint, grey, thickness 0,04 mm ¹⁾	
	Top coat	2-component-epoxy resin based coat, thickness 0,125 mm, black RAL 9005, approved for potable water	coating according to customer's specification or by customer itself

¹⁾ Primer suitable for various top coats

Sectional drawing

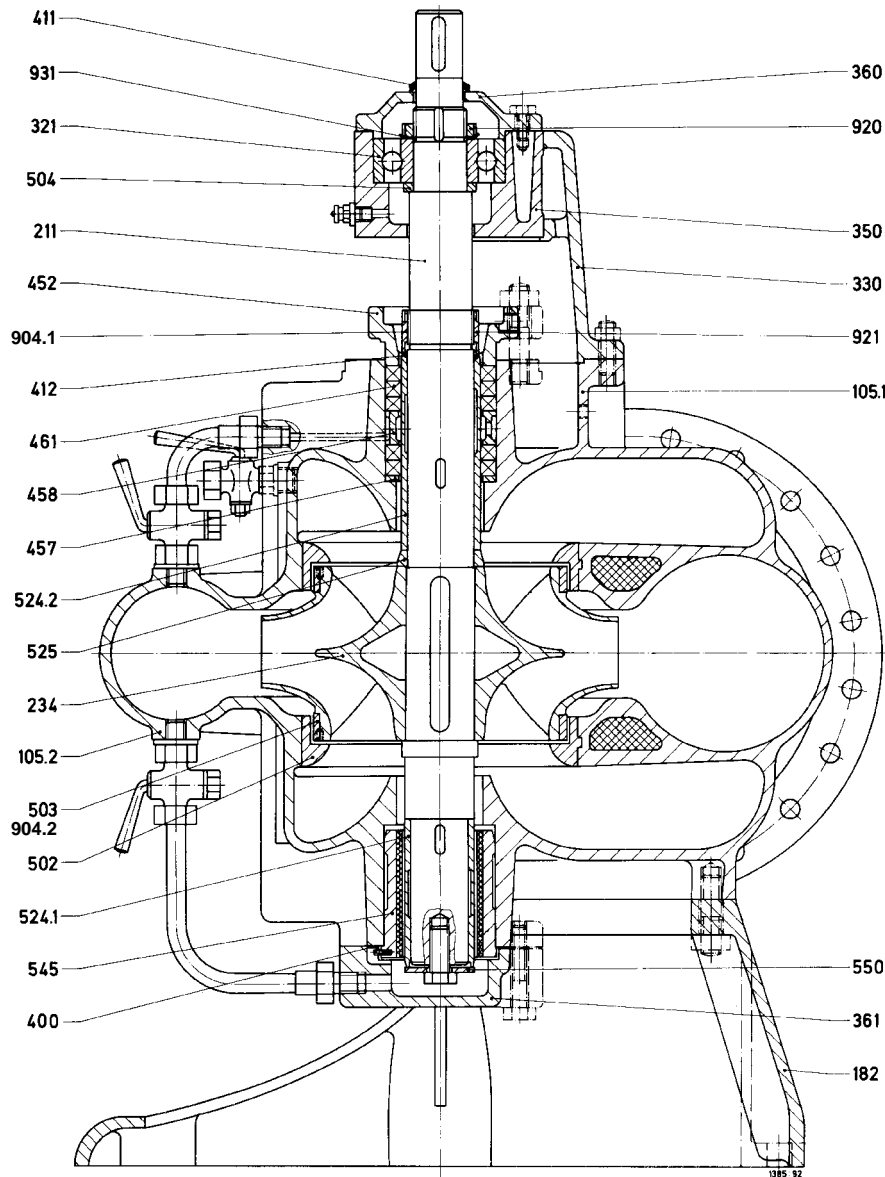
Pumpe sizes 500-510 up to 500-890



Part no.	Part designation	Part no.	Part designation
105.1-.2	Casing half	458	Lantern ring
182	Pump foot	461	Gland packing
211	Pump shaft	502	Casing wear ring
234	Double entry impeller	503	Impeller wear ring
321	Radial ball bearing	504	Spacer ring
350	Bearing housing	524.1-.2	Shaft protecting sleeve
360	Bearing cover	545	Bearing bush
361	Bearing end cover	550	Disc
400	Flat gasket	904.1-.2	Grub screw
411	V-ring	920	Nut
412	O-ring	921	Shaft nut
452	Gland	931	Lock washer
457	Neck ring		

Sectional drawing

Pump sizes 600-540 up to 800-970



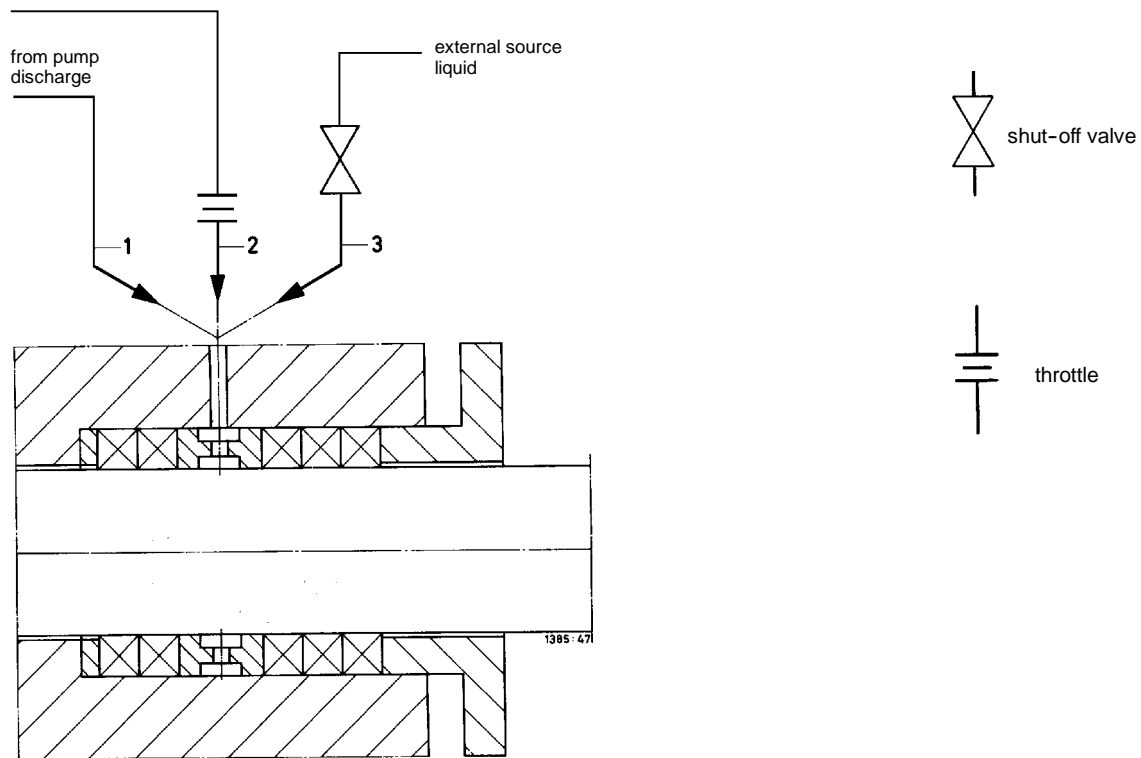
Part no.	Part designation	Part no.	Part designation
105.1-.2	Casing half	457	Neck ring
182	Pump foot	458	Lantern ring
211	Pump shaft	461	Gland packing
234	Double entry impeller	502	Casing wear ring
321	Radial ball bearing	503	Impeller wear ring
330	Bearing bracket	504	Spacer ring
350	Bearing housing	524.1-.2	Shaft protecting sleeve
360	Bearing cover	545	Bearing bush
361	Bearing end cover	550	Disc
400	Flat gasket	904.1-.2	Grub screw
411	V-ring	920	Nut
412	O-ring	921	Shaft nut
452	Gland	931	Lock washer

Shaft seal

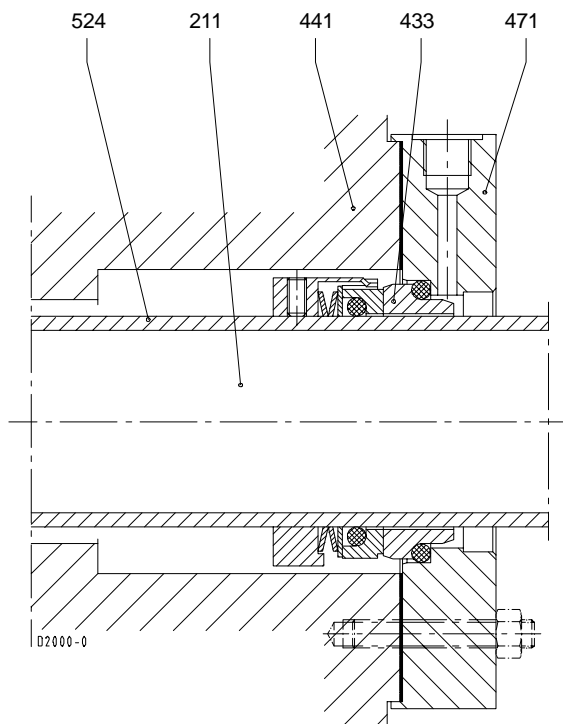
Uncooled soft-packed stuffing box or uncooled single acting, unbalanced mechanical seal, acc. to DIN 24960, independent of direction of rotation.

For operating pressure > 16 bar: balanced mechanical seal.

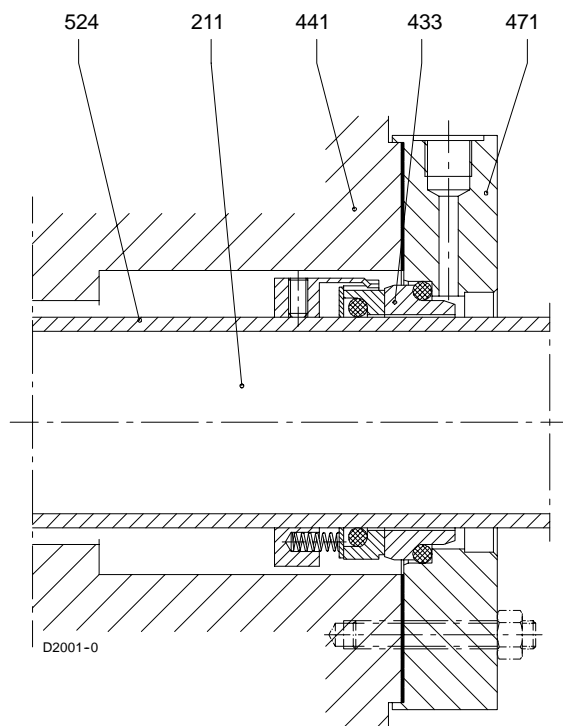
Stuffing box packing



**Standard mechanical seal acc. to DIN 24960
for shaft seal diameter up to 100 mm
(Pump sizes 500-510 and 600-540)**

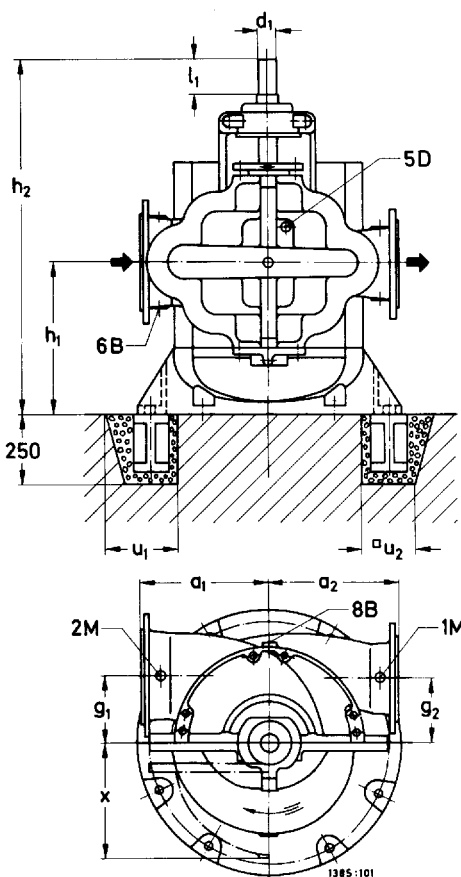


**Mechanical seal
Shaft seal for shaft seal diameter from 110 mm**



Part no.	Part designation
211	Shaft
433	Mechanical seal
441	Shaft seal housing
471	Seal cover
524	Shaft protecting sleeve

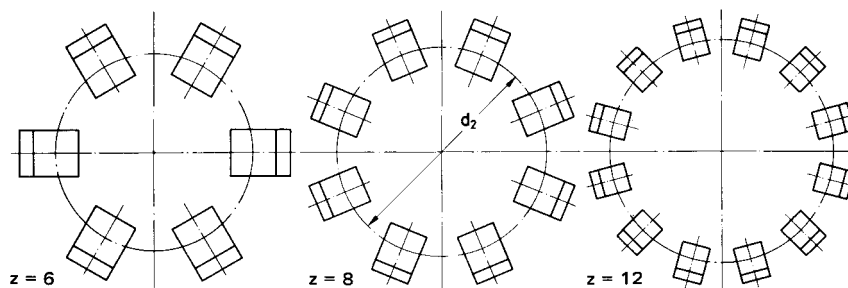
Dimension table for installation with foundation blocks



- Permissible deviations of dimensions for:**
- Height of centre DIN 747
 - Dimensions without indication of tolerances average to DIN 7168
 - Cast iron parts DIN 1686 GTB 18
 - Spheroidal graphite cast iron parts DIN 1685 GTB 18
 - Cast steel parts DIN 1683 GTB 18

R = B.S.P.
 Key and keyway to DIN 6885
 Shaft diameter: fit h₆ to DIN 7155

Holes for foundation blocks
 Number of holes = z



Connections

1 M	Pressure gauge	R 1/2
2 M	Vacuum gauge	R 1/2
5 D	Venting	R 3/4
6 B	Drain	R 3/4
8 B	Drain drip	R 1/2



Pump sizes	Flanges		Pump dimensions						Stub shaft		Weight of pump [kg]
	suction DN ₁	discharge DN ₂	a ₁	a ₂	h ₁	h ₂	g ₁	g ₂	d ₁	l ₁	
500-510	600	500	850	550	805	1830	475	475	75	180	2330
500-640	600	500	850	800	895	2010	495	495	95	210	2644
500-700	600	500	1050	850	865	1950	550	620	105	230	3060
500-790	600	500	1000	900	820	1995	600	600	115	250	3547
500-890	600	500	1050	950	830	2040	650	650	135	280	4361
600-540	700	600	1100	900	930	2010	610	610	75	180	3164
600-620	700	600	1000	1000	845	1905	545	545	85	200	3452
600-710	700	600	1000	1100	890	2050	545	545	105	230	3780
600-830	700	600	1100	1200	1000	2275	580	580	115	250	4702
700-590	800	700	1300	800	1055	2355	600	600	95	200	4014
700-710	800	700	1200	1150	1160	2520	620	620	105	230	5168
700-820	800	700	1250	1250	1220	2660	650	650	125	280	6488
800-740	900	800	1400	950	1280	2690	770	770	105	230	6490
800-840	900	800	1400	1125	1245	2745	770	770	115	290	7194
800-970	900	800	1400	1300	1305	2885	760	760	135	290	7652

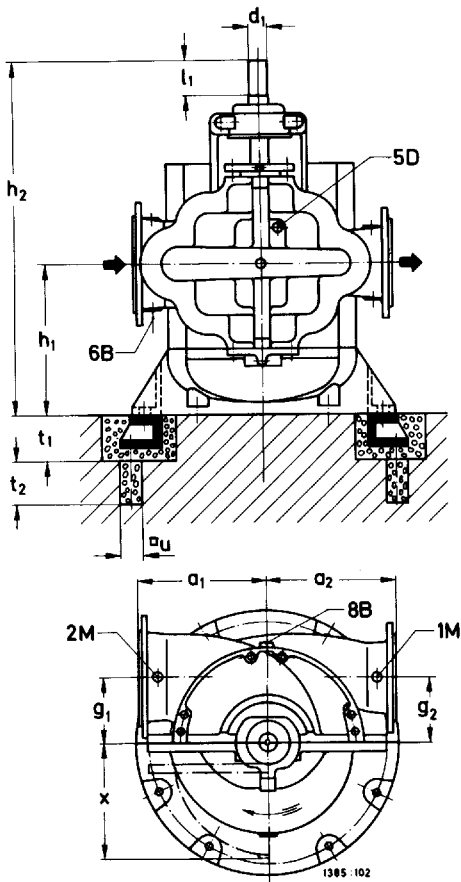
Pump sizes	Dismantling dimensions	Foundation dimensions				Max. flange rating to DIN [bar] Casing material	
		d ₂	u ₁	u ₂	z	GG-20 A48 class 30	GGG-40 A536 class 604018
500-510	950	1130	200	150	8	10	16
500-640	950	1130	200	150	8	10	25
500-700	1000	1130	200	150	8	16	25
500-790	1150	1330	200	150	8	25	25
500-890	1250	1330	200	150	8	25	25
600-540	1100	1330	200	150	8	10	16
600-620	1050	1130	200	150	8	10	16
600-710	1100	1130	200	150	8	16	25
600-830	1300	1510	200	150	8	16	25
700-590	1100	1330	200	150	8	10	16
700-710	1200	1510	200	150	8	10	16
700-820	1300	1900	270	200	12	16	16
800-740	1450	1900	270	200	12	10	16
800-840	1450	1900	270	200	12	10	16
800-970	1500	1900	270	200	12	10	16

Dimensions in mm, non-certified

We reserve the right to make technical changes

				Pos.-no.	Enclosure	
				Dimension Table RDLV -		
				Project-no. / Works-no.	No.	
Date	Name	Change				

Dimension table for intallation with foundation ring



Permissible deviations of dimensions for:

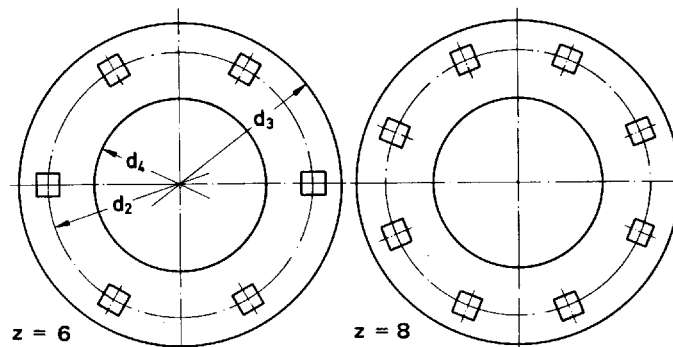
Height of centre	DIN 747
Dimensions without indication of tolerances average to	DIN 7168
Cast iron parts	DIN 1686 GTB 18
Spheroidal graphite cast iron parts	DIN 1685 GTB 18
Cast steel parts	DIN 1683 GTB 18

R = B.S.P.

Key and keyway to DIN 6885

Shaft diameter: fit h_6 to DIN 7155

Holes for foundation blocks
Number of holes = z



Connections

1 M	Pressure gauge	R 1/2
2 M	Vacuum gauge	R 1/2
5 D	Venting	R 3/4
6 B	Drain	R 3/4
8 B	Drain drip	R 1/2



Pump sizes	Flanges		Pump dimensions						Stub shaft		Weight of pump [kg]
	suction DN ₁	discharge DN ₂	a ₁	a ₂	h ₁	h ₂	g ₁	g ₂	d ₁	l ₁	
500-510	600	500	850	550	805	1830	475	475	75	180	2330
500-640	600	500	850	800	895	2010	495	495	95	210	2644
500-700	600	500	1050	850	865	1950	550	620	105	230	3060
500-790	600	500	1000	900	820	1995	600	600	115	250	3547
500-890	600	500	1050	950	830	2040	650	650	135	280	4361
600-540	700	600	1100	900	930	2010	610	610	75	180	3164
600-620	700	600	1000	1000	845	1905	545	545	85	200	3452
600-710	700	600	1000	1100	890	2050	545	545	105	230	3780
600-830	700	600	1100	1200	1000	2275	580	580	115	250	4702
700-590	800	700	1300	800	1055	2355	600	600	95	200	4014
700-710	800	700	1200	1150	1160	2520	620	620	105	230	5168
700-820	800	700	1250	1250	1220	2660	650	650	125	280	6488
800-740	900	800	1400	950	1280	2690	770	770	105	230	6490
800-840	900	800	1400	1125	1245	2745	770	770	115	290	7194
800-970	900	800	1400	1300	1305	2885	760	760	135	290	7652

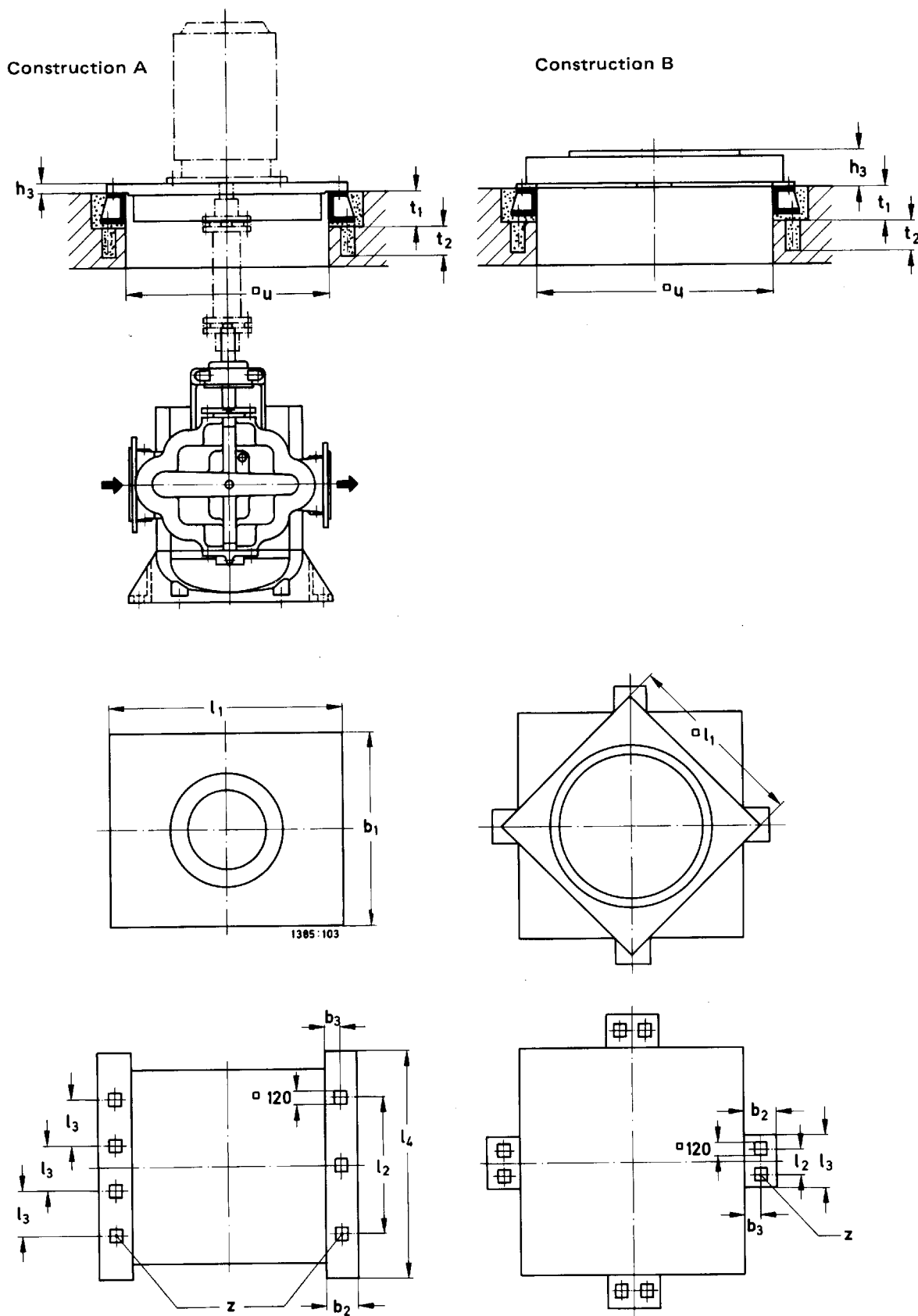
Pump sizes	Dismantling dimensions	Foundation dimensions							Max. flange rating to DIN [bar] Casing material	
		d ₂	d ₃	d ₄	t ₁	t ₁	u	z	GG-20 A48 class 30	GGG-40 A536 class 604018
500-510	950	1270	1550	950	200	200	100	8	10	16
500-640	950	1270	1550	950	200	200	100	8	10	25
500-700	1000	1270	1550	950	200	200	100	8	16	25
500-790	1150	1470	1750	1150	200	200	100	8	25	25
500-890	1250	1470	1750	1150	200	200	100	8	25	25
600-540	1100	1470	1750	1150	200	200	100	8	10	16
600-620	1050	1270	1550	950	200	200	100	8	10	16
600-710	1100	1270	1550	950	200	200	100	8	16	25
600-830	1300	1620	1900	1300	200	200	100	8	16	25
700-590	1100	1470	1750	1150	200	200	100	8	10	16
700-710	1200	1620	1900	1300	200	200	100	8	10	16
700-820	1300	1900	2200	1500	200	300	150	8	16	16
800-740	1450	1900	2200	1500	200	300	150	8	10	16
800-840	1450	1900	2200	1500	200	300	150	8	10	16
800-970	1500	1900	2200	1500	200	300	150	8	10	16

Dimensions in mm, non-certified

We reserve the right to make technical changes

				Pos.-no.	Enclosure	
				Dimension Table RDLV -		
				Project-no. / Works-no.	No.	
Date	Name	Change				

Installation plan for type of installation DJ



z = Number of holes



Pump sizes	Support frame				Foundation dimensions								
	Constr.	b ₁	h ₃	l ₁	b ₂	b ₃	l ₂	l ₃	l ₄	t ₁	t ₂	u	z
500-510	B	-	255	1340	360	130	125	-	400	220	300	1650	2
500-640	B	-	300	1480	380	210	180	-	450	210	300	1800	2
500-700	B	-	360	1620	380	210	180	-	450	210	300	2000	2
500-790	A	2000	35	2200	300	125	-	-	2200	250	300	2000	4
500-890	B	-	410	1800	420	195	200	-	500	250	300	2200	2
600-540	B	-	340	1800	420	195	200	-	500	250	300	2200	2
600-620	B	-	360	1800	420	195	200	-	500	250	300	2200	2
600-710	B	-	380	1800	420	195	200	-	500	250	300	2200	2
600-830	B	-	410	1940	420	195	200	-	500	250	300	2400	2
700-590	B	-	360	1800	420	195	-	-	500	250	300	2200	2
700-710	B	-	460	2120	450	225	250	-	550	250	300	2600	2
700-820	B	-	460	2120	450	225	250	-	550	250	300	2600	2
800-740	B	-	340	2120	450	225	250	-	550	250	300	2600	2
800-840	B	-	340	2120	450	225	250	-	550	250	300	2600	2
800-970	B	-	440	2260	450	225	250	-	550	250	300	2800	2

Dimensions in mm, non-certified

We reserve the right to make technical changes

				Pos.-no.	Enclosure
				Installation Plan RDLV -	
				Project-no. / Works-no.	No.
Date	Name	Change			



Spare parts

Proposals for Spare Parts for 2 - Years Operation (8000 hours per year)

Pump with soft packed Stuffing Box

Part No.	Part Designation	No. of Pumps including Stand-By Pumps							
		1	2	3	4	5	6	8	10 and more
		No. of Spare Parts							
211 520 920 932 940	Shaft, with Sleeve Nut Circlip Key	-	-	-	1	1	1	2	3
234	Impeller	-	-	-	1	1	1	2	3
321 550	Deep groove ball bearings Disc	1	1	1	2	2	3	4	5
452	Gland	-	-	-	1	1	1	2	3
411 412 421	V-Ring O-Ring Radial shaft seal ring	1	2	3	4	5	6	8	10
461	Set Gland packing	4	8	12	16	20	24	32	40
457	Neck ring	-	-	-	1	1	1	2	3
458	Lantern ring	-	-	-	1	1	1	2	3
502	Set casing wear rings	1	1	1	2	2	3	4	5
503 904.2	Set impeller wear rings Grub screw	1	1	1	2	2	3	4	5
524.1	Shaft protec. sleeve	1	1	1	2	2	3	4	5
524.2 545	Residur bearing Shaft protec. sleeve Bearing bush	1	1	1	2	2	3	4	5

Pump with Mechanical Seal

Part No.	Part Designation	No. of Pumps including Stand-By Pumps							
		1	2	3	4	5	6	8	10 and more
		No. of Spare Parts							
211 412 550 920 932 940 950	Shaft, with O-Ring Disc Nut Circlip Key Spring	-	-	-	1	1	1	2	3
234	Impeller	-	-	-	1	1	1	2	3
321 550	Deep groove ball bearing Disc	1	1	1	2	2	3	4	5
411 412 421	V-Ring O-Ring Radial shaft seal ring	1	2	3	4	5	6	8	10
433	Mechanical seal	1	1	1	2	2	3	4	5
502	Set casing wear rings	1	1	1	2	2	3	4	5
503 904.2	Set impeller wear rings Grub screw	1	1	1	2	2	3	4	5
524.1	Shaft protec. sleeve	1	1	1	2	2	3	4	5
524.2 545	Residur bearing Shaft protec. sleeve Bearing bush	1	1	1	2	2	3	4	5



Proposals for Spare Parts for 5 - Years Operation (8000 hours per year)

Pump with soft packed Stuffing Box

Part No.	Part Designation	No. of Pumps including Stand-By Pumps							
		1	2	3	4	5	6	8	10 and more
		No. of Spare Parts							
211 520 920 932 940	Shaft, with Sleeve Nut Circlip Key	1	1	1	2	2	2	4	6
234	Impeller	1	1	1	2	2	2	4	6
321 550	Deep groove ball bearings Disc	2	2	2	4	4	6	8	10
452	Gland	1	1	1	2	2	2	4	6
411 412 421	V-Ring O-Ring Radial shaft seal ring	2	2	6	8	8	12	16	20
461	Set Gland packing	10	20	30	40	50	60	80	100
457	Neck ring	1	1	1	2	2	2	4	6
458	Lantern ring	1	1	1	2	2	2	4	6
502	Set casing wear rings	2	2	2	4	4	6	8	10
503 904.2	Set impeller wear rings Grub screw	2	2	2	4	4	6	8	10
524.1	Shaft protec. sleeve	2	2	2	4	4	6	8	10
524.2 545	Residur bearing Shaft protec. sleeve Bearing bush	2	2	2	4	4	6	8	10

Pump with Mechanical Seal

Part No.	Part Designation	No. of Pumps including Stand-By Pumps							
		1	2	3	4	5	6	8	10 and more
		No. of Spare Parts							
211 412 550 920 932 940 950	Shaft, with O-Ring Disc Nut Circlip Key Spring	1	1	1	2	2	2	4	6
234	Impeller	1	1	1	2	2	2	4	6
321 550	Deep groove ball bearing Disc	2	2	2	4	4	6	8	10
411 412 421	V-Ring O-Ring Radial shaft seal ring	2	2	6	8	8	12	16	20
433	Mechanical seal	2	2	2	4	4	6	8	10
502	Set casing wear rings	2	2	2	4	4	6	8	10
503 904.2	Set impeller wear rings Grub screw	2	2	2	4	4	6	8	10
524.1	Shaft protec. sleeve	2	2	2	4	4	6	8	10
524.2 545	Residur bearing Shaft protec. sleeve Bearing bush	2	2	2	4	4	6	8	10

Accessories

- 1 shock pulse monitoring stud
- 1 set seal pipe with 1 cyclone separator (for handling contaminated fluids)
including:
 - cyclone separator plastic
 - flow indicator of stainless steel
 - shut-off valve of stainless steel
 - connectors + piping of stainless steel
- 1 vent valve, manually operated of stainless steel
including:
 - connectors
- 1 temperature monitoring devise for antifriction bearings
for each bearing consisting of:
 - 1 resistance thermometer PT 100,
2-wire system, with 2m connection cable
 - 1 adaptor of stainless steel
- 1 signal transmitter for PT 100 control room mounting
 - output signal 0-20 mA, voltage optional AC 110 V or 220 V
- 1 set pressure gauges acc. to DIN 16064
consisting of:
 - 1 pressure gauge BSP 1/2, 100 mm, grade of quality 1,0
 - 1 pressure-vacuum gauge BSP 1/2, 100 mm, grade of quality 1,0
 - 2 pressure gauge cocks BSP 1/2 incl. brackets