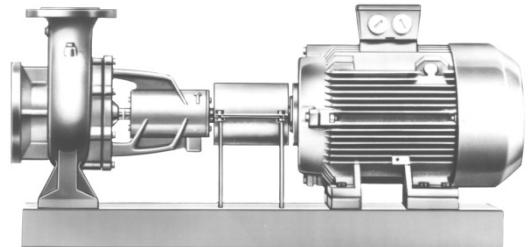


Norm-Centrifugal Pumps PN 10 SERIES NT

Pump dimensions acc. to DIN EN 733 with additional sizes
Technical requirements acc. to DIN ISO 9908



Application

For pumping pure water, industrial water, sea water, condensate, oils, brines, lyes, hot water. The liquids to be pumped must not contain any abrasive particles nor chemically attack the pump materials.

Main fields of application

In cooling and heating circuits in circulating, water supply, water treatment, irrigation, desalination, dedusting and spray painting installations as well as in air-conditioning, refrigerating, swimming pool and industrial engineering.

Design and series construction

Horizontal volute casing centrifugal pump with axial inlet, single-flow, single or two-stage, in process design.

Series construction according to the modular system. Shaft bearing in a bearing bracket which can be optionally provided with a support foot. With bearing bracket size 585 and 700 the foot belongs to serial equipment. Stable mounting with feet cast on volute casing.

The additional two-stage pump sizes correspond in their outer dimensions to the respective single-stage sizes. Due to the two-stage design good efficiencies and low NPSH values are achieved at high delivery heads.

Capacity

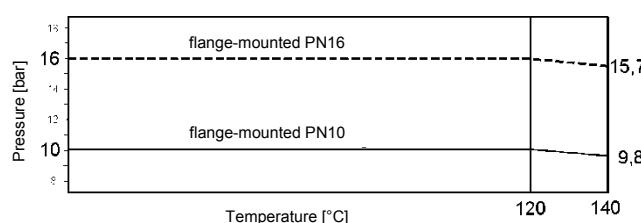
With the sizes according to DIN EN 733, the pump capacity exceeds the required rated power considerably. By additional sizes, the performance range acc. to DIN EN is increased.

Performance data

Flow	Q	up to	2,300 m ³ /h
Delivery head	H	up to	145 m
Temperature of the liquid pumped	t	-40 up to	140 °C
Inlet pressure	p_s	①	
Discharge pressure	p_d	up to	10/16 bar ②

① Inlet pressure plus maximum delivery head must not exceed the working pressure.

② Depends on flange version (PN stage, see diagram)



Branch positions and flanges

Suction branch: axial

Delivery branch: radially upwards

Flanges: acc. to DIN EN 1092-2

Shaft coupling and safety guarding

Safety guarding according to DIN EN 294 is supplied as soon as the scope of supply includes pump, base plate and shaft coupling (acc. to DIN 740 with or without spacer element). The safety standards acc. to DIN EN 809 are met.

Shaft sealing

By maintenance-free standard mechanical seal in unbalanced design in different materials (see page 2) or by gland packing.

Bearing and lubrication

By two groove ball bearings acc. to DIN 625, grease-lubricated for the whole service life, bearing clearance C3.

Dismantling of the insert unit

When using the spacer coupling the insert unit can because of the process design be dismantled towards the motor side, whereas the volute casing and the motor may remain on the base plate and the pipes on the volute casing.

Combination of structural components

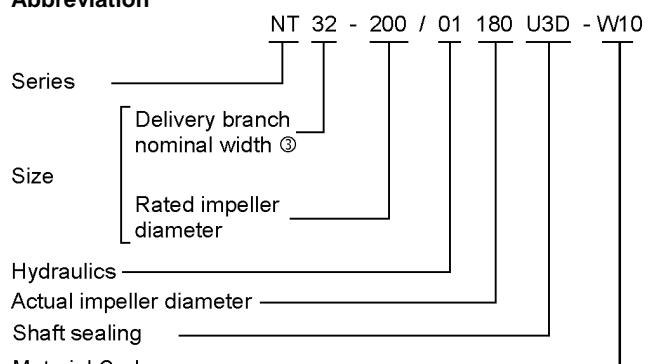
The table on page 3 shows the combination possibilities of structural components of all NT sizes. The modular system allows reduced stockkeeping of spare parts.

Drive

Standard: surface-cooled, three-phase squirrel-cage motors, IM B3 type of construction, degree of protection IP 55 according to IEC standard, class F insulation. Performances and main dimensions according to DIN 42 673.

Further drive options are possible.

Abbreviation



③ With the two-stage additional pump sizes, the number of stages is placed with a slash in front of the delivery branch nominal width, e.g. NT 2/32-200/01...

This abbreviation is entered on the nameplate. With the two-stage additional pump sizes, the actual impeller diameter relates to the second stage.

Connections

The following connections are provided:::

FD1	Draining
LO1	Leakage outlet
FV1	Venting (for automatic aspirator)

Optional:

FF1 ①	Filling (*)
PM1	Pressure gauge (Suction branch) (*)
PM2	Pressure gauge (Discharge branch) (*)
TM3	Temperature measurement connection
VM2	Vibration measurement connection

① Connection FF1 not provided in sizes 25-200 and 2/25-200

(*) Standard by material W133.

Base plates

Standard: channel steel base plate.

Shaft sealings with temperature and pressure limits

Valid for all materials of the pumps

Mechanical seal, uncooled		Unbalanced			
Flushing		Internal self flushing			
Abbreviation		U3.30D		U3.40D	
Rotating ring		hard carbon, resin impregnated		silicone carbide	
Stationary ring		silicone carbide		silicone carbide	
Metal parts		CrNiMo steel		CrNiMo steel	
O-rings		HNBR		EPDM	
Bellow				FPM	
Material code DIN EN 12 756		BQ1XGG		AQ1EGG	
Centrifugal pumps at all bearing housing sizes		Admissible temperature (° C) of pumped liquid and pump outlet pressure p _d (bar)			
		° C / bar		° C / bar	
single-stage		110 / 10		140 / 10	
two-stage		110 / 16 ③		140 / 16 ③	
		° C / bar			
		single-stage		125/10	

② max. 90 °C with water-based liquids

③ with an inlet pressure > 5 bar the use of the shaft sealing type U3.50D/U3.51D is absolutely essential!

Other mechanical seal designs upon request.

Gland packing		Uncooled			
Sealing		internal			external
Abbreviation		U1B			U1C
Packing rings		graphite-PTFE basis			
Centrifugal pumps at all bearing housing sizes		Admissible temperature (° C) of pumped liquid and pump outlet pressure p _d (bar)			
		° C / bar			
single-stage		125/10			

Materials

Denomination	Part-No.		Material code								
	1 st stage	2 nd stage	W 10	W 135	W 89	W 134	W 133	W 86	W 78	W 148	W 149
Volute casing	102...	102...	EN-GJS-400-15	EN-GJS-400-15	EN-GJS-400-15	EN-GJS-400-15	CC333G	EN-GJS-400-18-LT	EN-GJS-400-18-LT	EN-GJS-400-18-LT	EN-GJS-400-18-LT
Impeller (s)	230...	230...	EN-GJL-200	EN-GJL-200	CC333G	CC333G	CC333G	EN-GJL-200	EN-GJL-200	CC333G	CC333G
Diffuser	-	171...	EN-GJL-200	EN-GJL-200	CC333G	CC333G	CC333G	EN-GJL-200	EN-GJL-200	CC333G	CC333G
Stage casing	-	108...	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250	CC333G	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250
Casing cover	161...	161...	EN-GJS-400-15	EN-GJS-400-15	EN-GJS-400-15	EN-GJS-400-15	CC333G	EN-GJS-400-18-LT	EN-GJS-400-18-LT	EN-GJS-400-18-LT	EN-GJS-400-18-LT
Shaft ④	210...	210...	1.4021	1.4462	1.4021	1.4462	1.4462	1.4021	1.4462	1.4021	1.4462
Bearing bracket	330...	330...	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250

④ With bearing housing size 585 the pump side (liquid contact) in the material stated above and motor side in 1.7139

Combination of structural components

The table below shows the combination possibilities of structural components and parts of the standard sizes including additional sizes.

Within a vertical column, parts with identical numbers are interchangeable.

The modular system allows a reduced stockkeeping of spare parts.

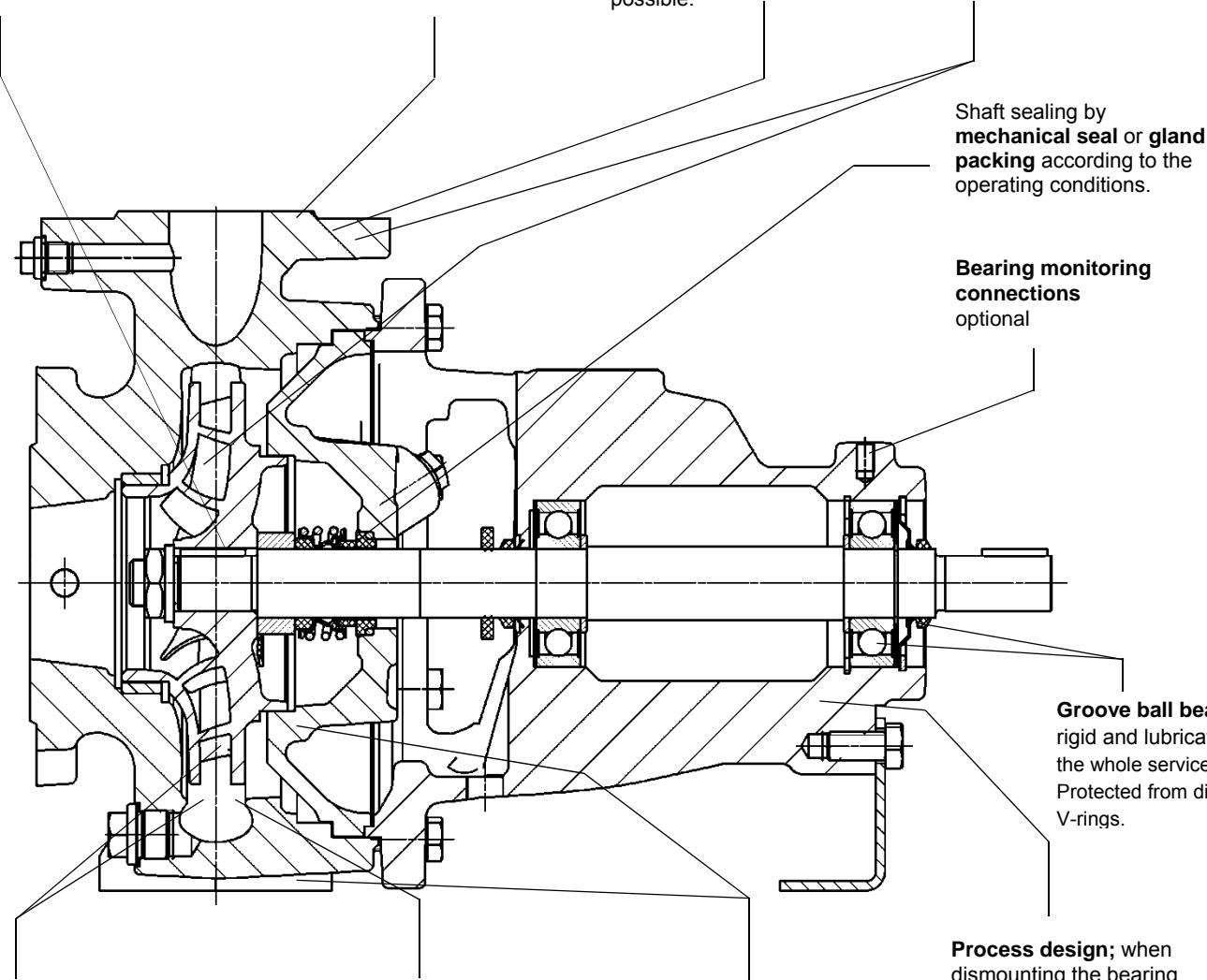
Bearing bracket size	Pump size		Volute casing	Impeller	Impeller		Diffuser	Stage-casing	Inter-mediating	Casing cover	Bear-ing-house	Shaft	Sup-port foot	Shaft sealing	
	acc. to DIN EN 733	Additional size			1 st stage	2 nd stage								Mech-a-nical seal	Gland packing
	NT	NT												Ø	
360	-	25-160	1	1	-	-	-	-	-	1	2	1	1	1	30
	-	25-200	2	2	-	1	1	1		3		2	2	2	-
	-	2/25-200	2	-	1	1	1	1		1		1	1	1	30
	32-160	-	3	3	-	-	-	-		3		2	2	2	-
	32-200	-	4	4	-	1	1	1		1		1	1	1	30
	-	2/32-200	4	-	1	1	1	1		3		2	2	2	-
	40-160	-	5	5	-	-	-	-		1		1	1	1	30
	40-200	-	6	6	-	-	-	-		1		1	1	1	30
	40-250	-	7	7	-	2	2	2		2		2	2	2	-
	-	2/40-250	7	-	2	2	2	2		4		2	2	2	-
	50-160	-	8	8	-	-	-	-		1		1	1	1	30
	50-200	-	9	9	-	-	-	-		2		2	2	2	-
	50-250	-	10	10	-	3	2	2		4		2	2	2	-
	-	2/50-250	10	-	3	2	2	2		1		1	1	1	30
	65-160	-	11	11	-	-	-	-		2		2	2	2	-
	65-200	-	12	12	-	-	-	-		1		1	1	1	30
	80-160	-	13	13	-	-	-	-		1		1	1	1	-
	-	100-160	14	14	-	-	-	-		1		1	1	1	30
470	65-250	-	15	15	-	-	-	-	-	5	3	3	40	40	
	65-315	-	16	16						6					
	-	65-400	17	17						1					
	80-200	-	18	18						5					
	80-250	-	19	19						6					
	80-315	-	20	20						5					
	100-200	-	21	21						6					
	100-250	-	22	22						5					
	100-315	-	23	23						6					
	125-200	-	24	24						5					
	125-250	-	25	25						7					
	150-200	-	26	26						8					
530	-	80-400	27	27	-	-	-	-	-	7	4	4	50	50	
	100-400	-	28	28						8					
	125-315	-	29	29						7					
	125-400	-	30	30						8					
	-	150-250	31	31						8					
	150-315	-	32	32						8					
	150-400	-	33	33						8					
585	-	200-250	34	34	-	-	-	-	-	9	5	5	65	65	
	-	200-315	35	35						9					
	-	200-400	36	36						10					
	-	250-315	37	37						9					
	-	250-400	38	38						10					
	-	300-315	39	39						11					
700	-	300-400	40	40	-	-	-	-	-	10	6	6	80	80	
	-	300-315	39	41						14					

Negligible axial thrust by fine adaptation of the relief bores.

Pressure safe casing parts designed for high reliability of operation.

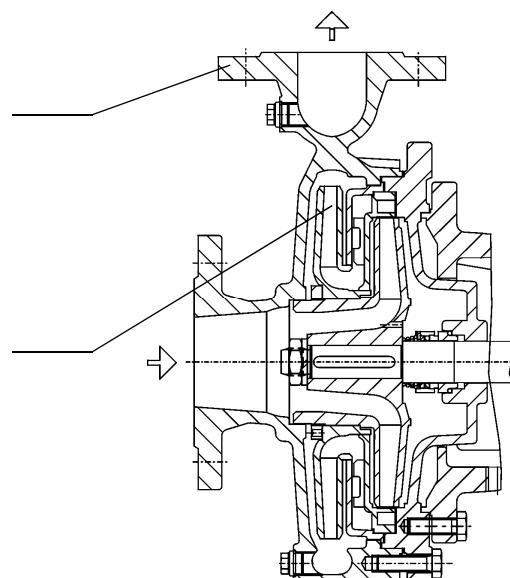
Flanges according to DIN EN 1092-2 PN 10/16, other flange designs possible.

Connection dimensions and capacities according to DIN EN 733.



Two-stage sizes with their outer dimensions correspond to the respective single-stage sizes.

Large delivery heads with two-stage sizes (2/25-200, 2/32-200, 2/40-250, 2/50-250). The connection dimensions correspond with the single stage design.

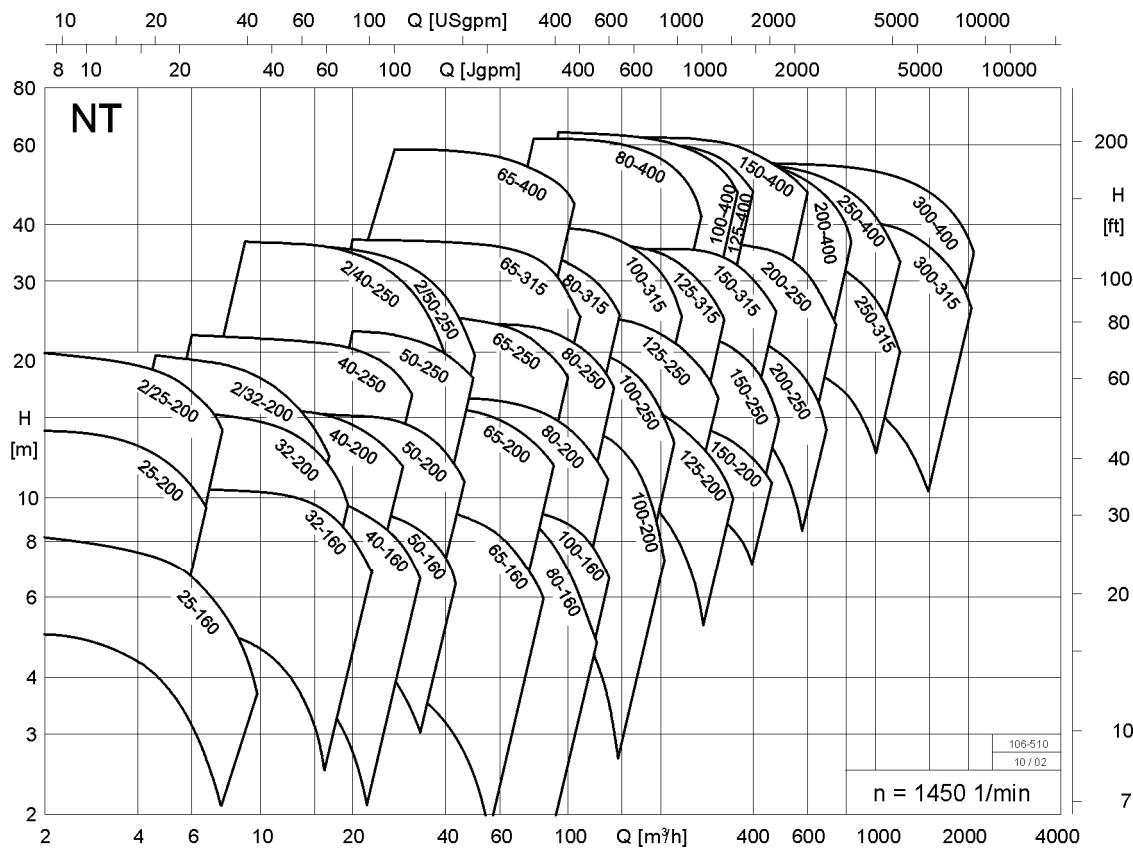


By additional pump sizes performance range according to DIN EN 733 is increased.

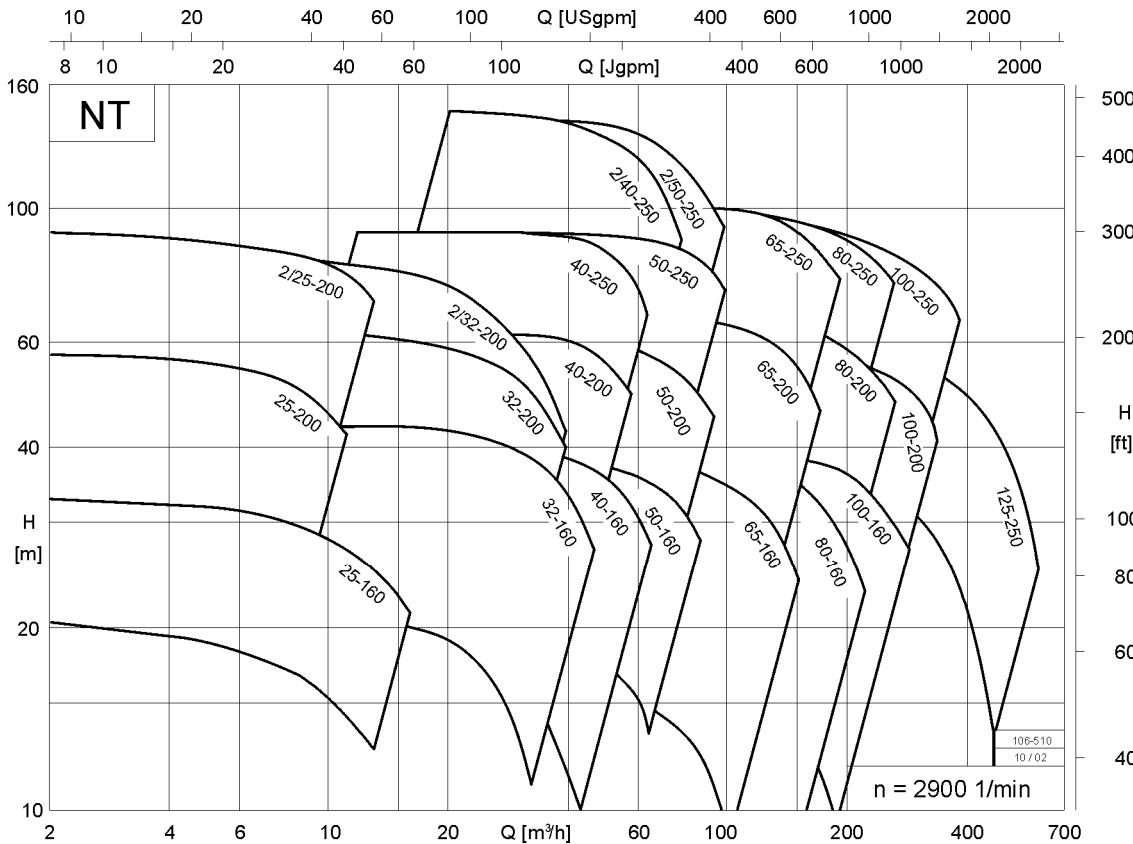
Reduced stockkeeping of spare parts due to use of as much non-variable parts as possible (modular system, see page 3).

Performance graphs

n = 1450 1/min

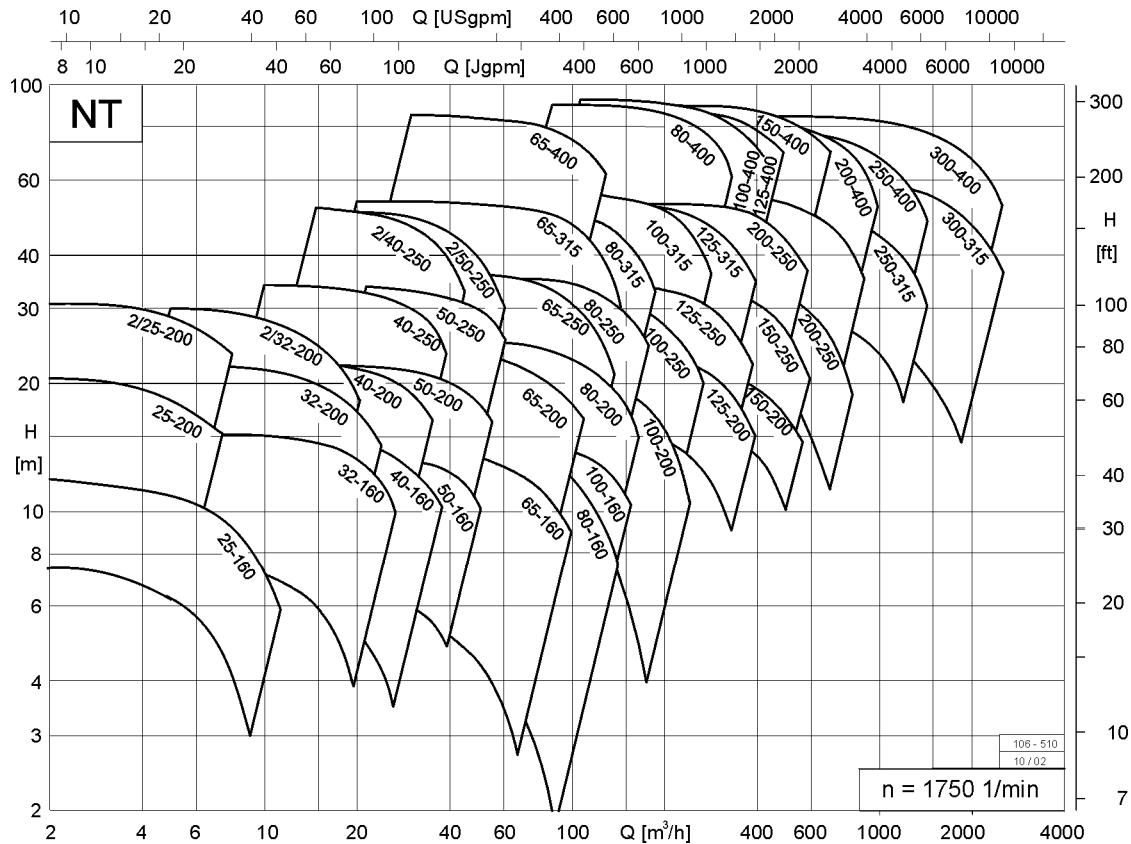


n = 2900 1/min

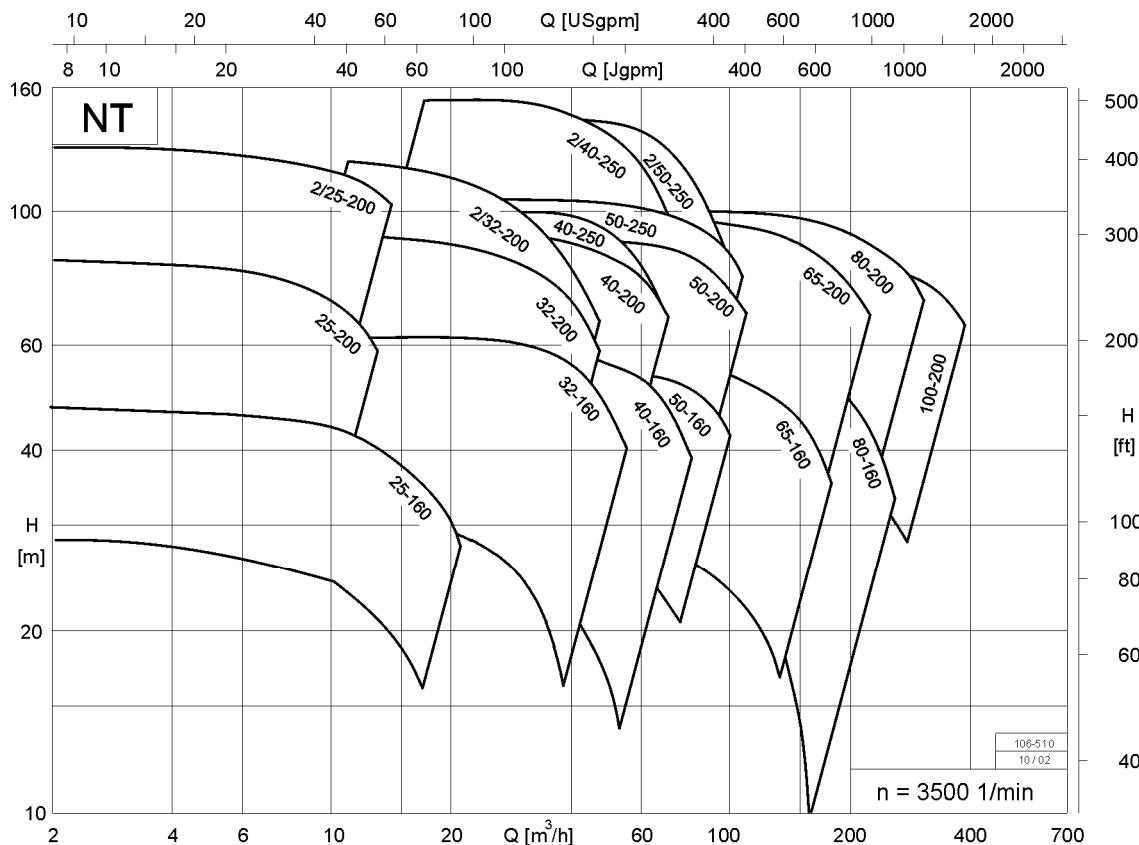
Valid for $\rho = 1 \text{ kg/dm}^3$ and $V = 1 \text{ mm}^2/\text{s}$.

Exact performance data to be taken from the individual characteristics.

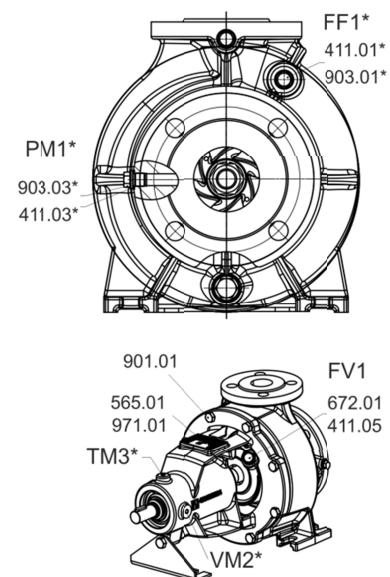
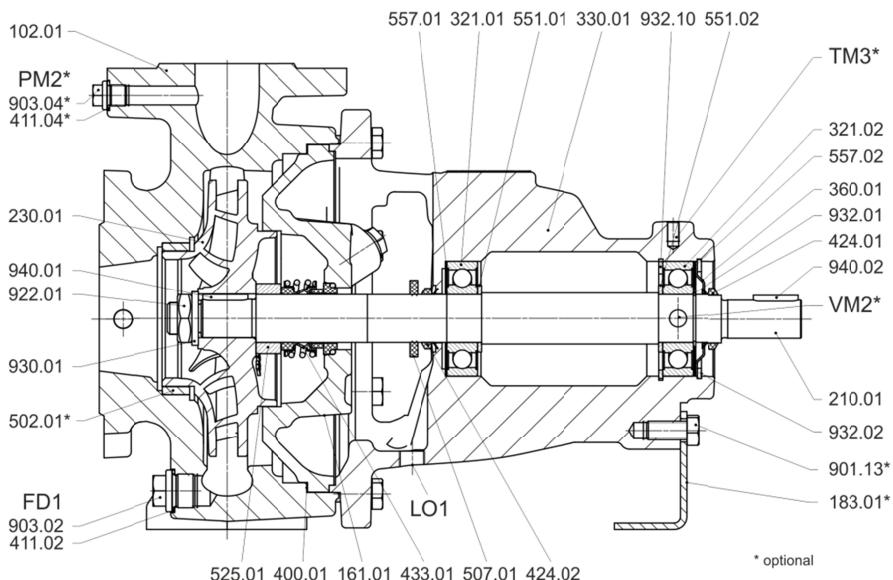
n = 1750 1/min



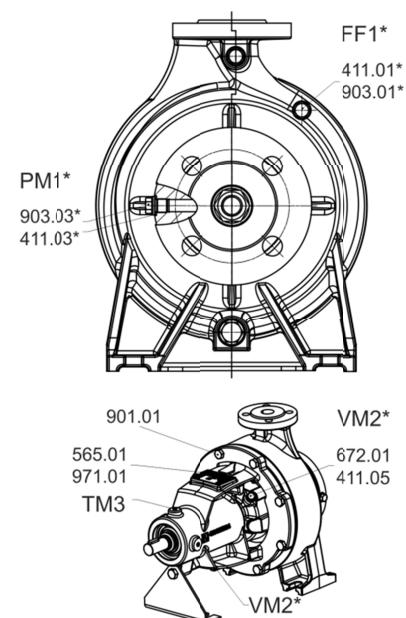
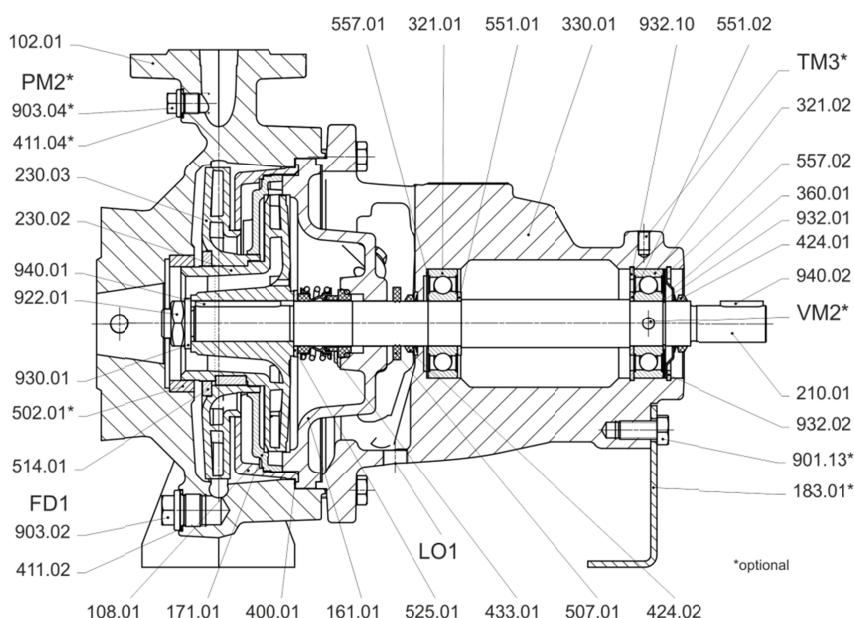
n = 3500 1/min

Valid for $\rho = 1 \text{ kg/dm}^3$ and $v = 1 \text{ mm}^2/\text{s}$.

Exact performance data to be taken from the individual characteristics.

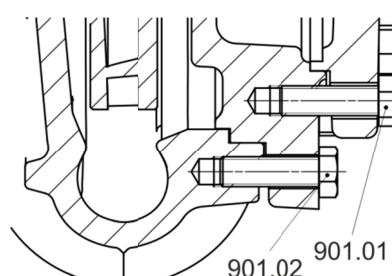
Sectional drawings**Sizes on bearing bracket size 360**

U...D mechanical seal unbalanced

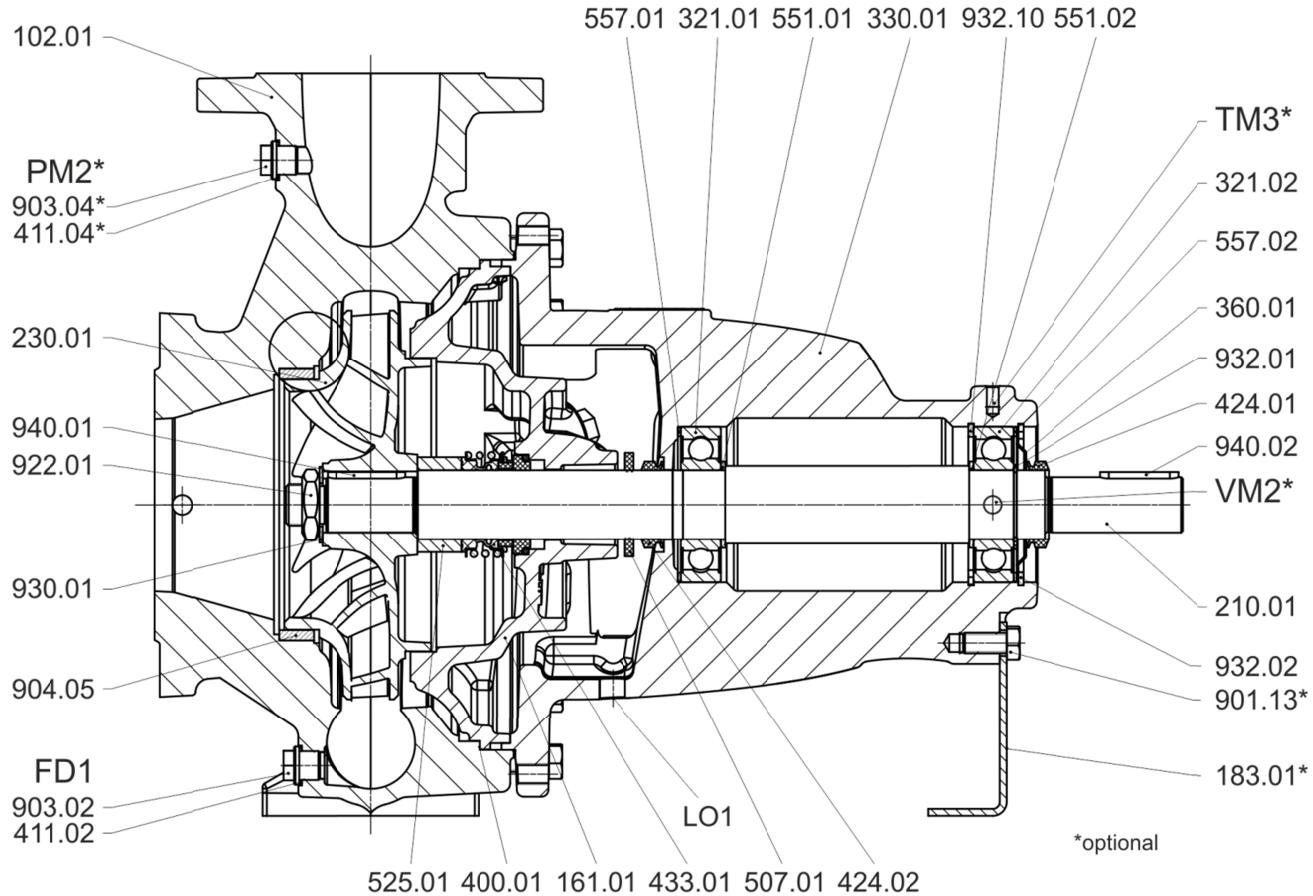


Bearing bracket size 360, two-stage, U...D - mechanical seal unbalanced

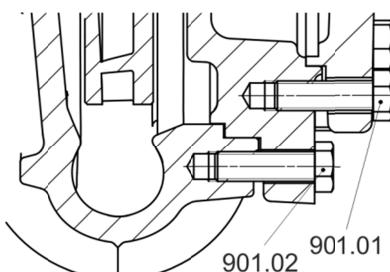
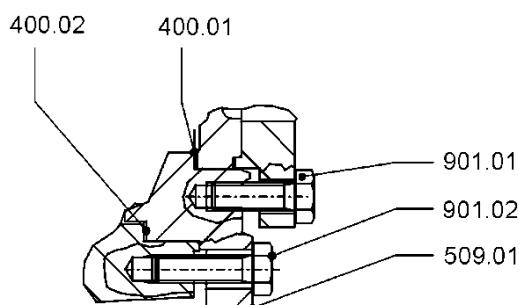
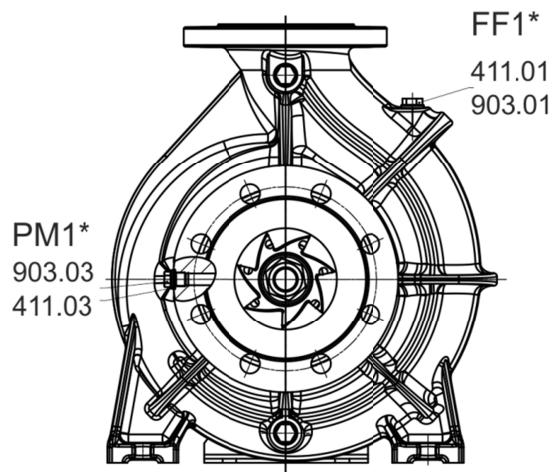
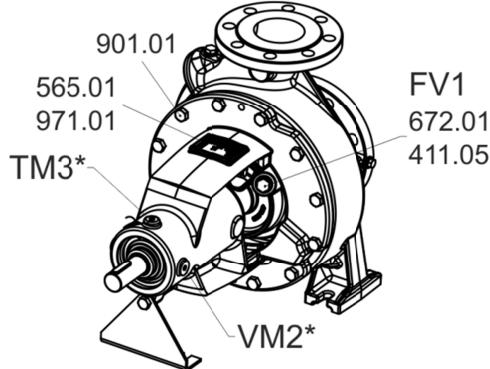
Design by size 2/40-250 + 2/50-250



Sizes on bearing bracket size 470



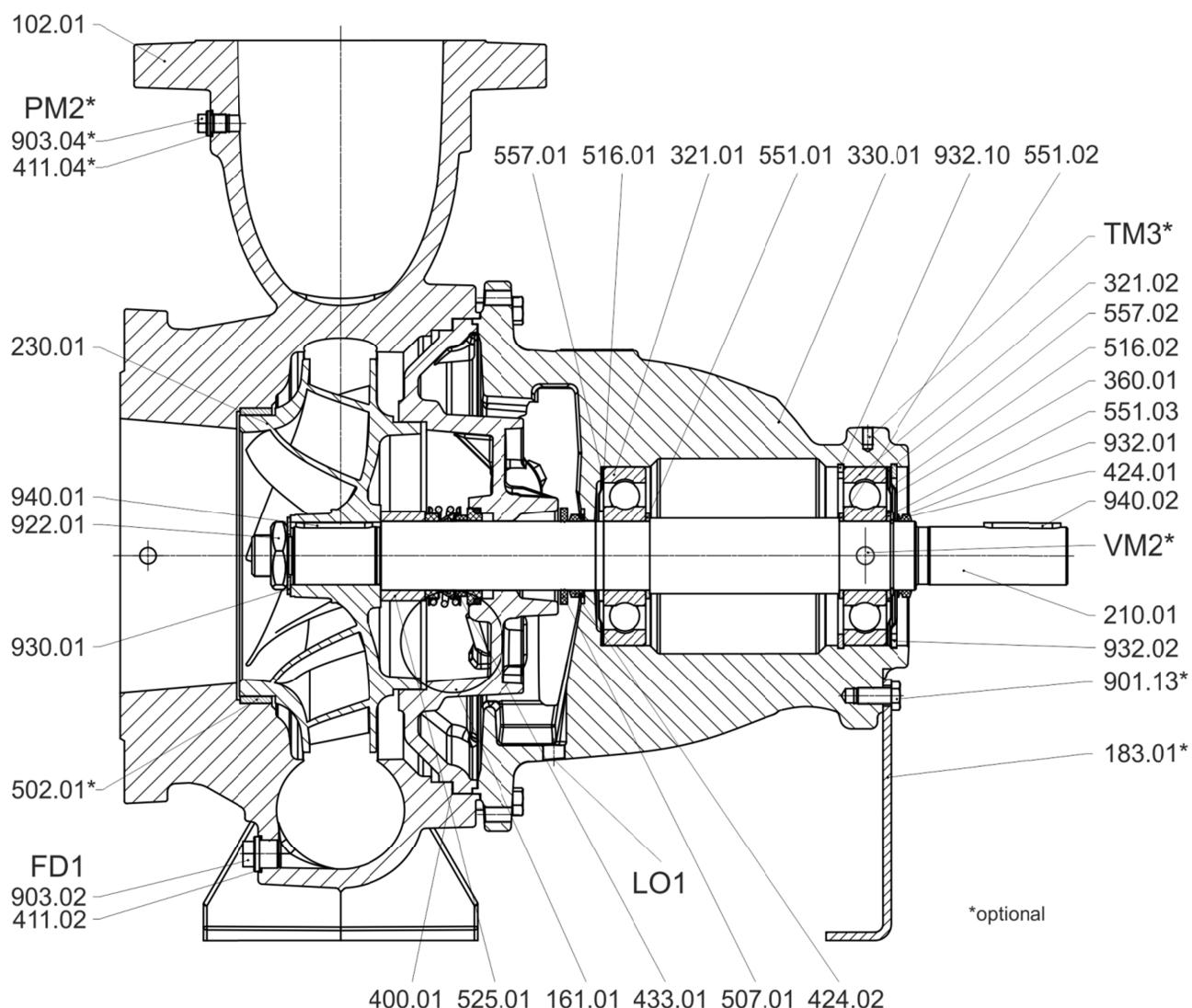
U...D - mechanical seal unbalanced



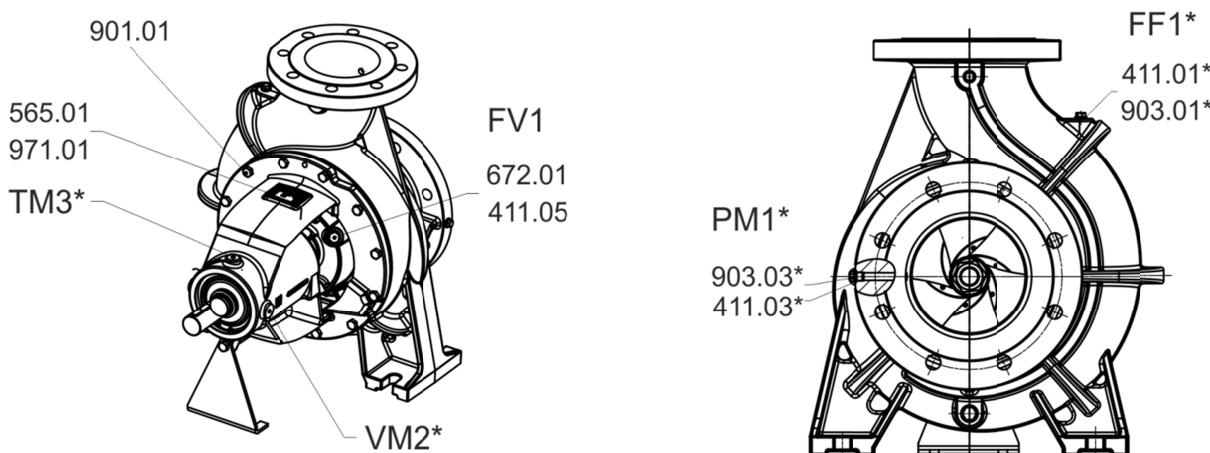
Design with intermediate ring by bearing bracket size 470-400

Design by bearing bracket size 360-250 + 470-315

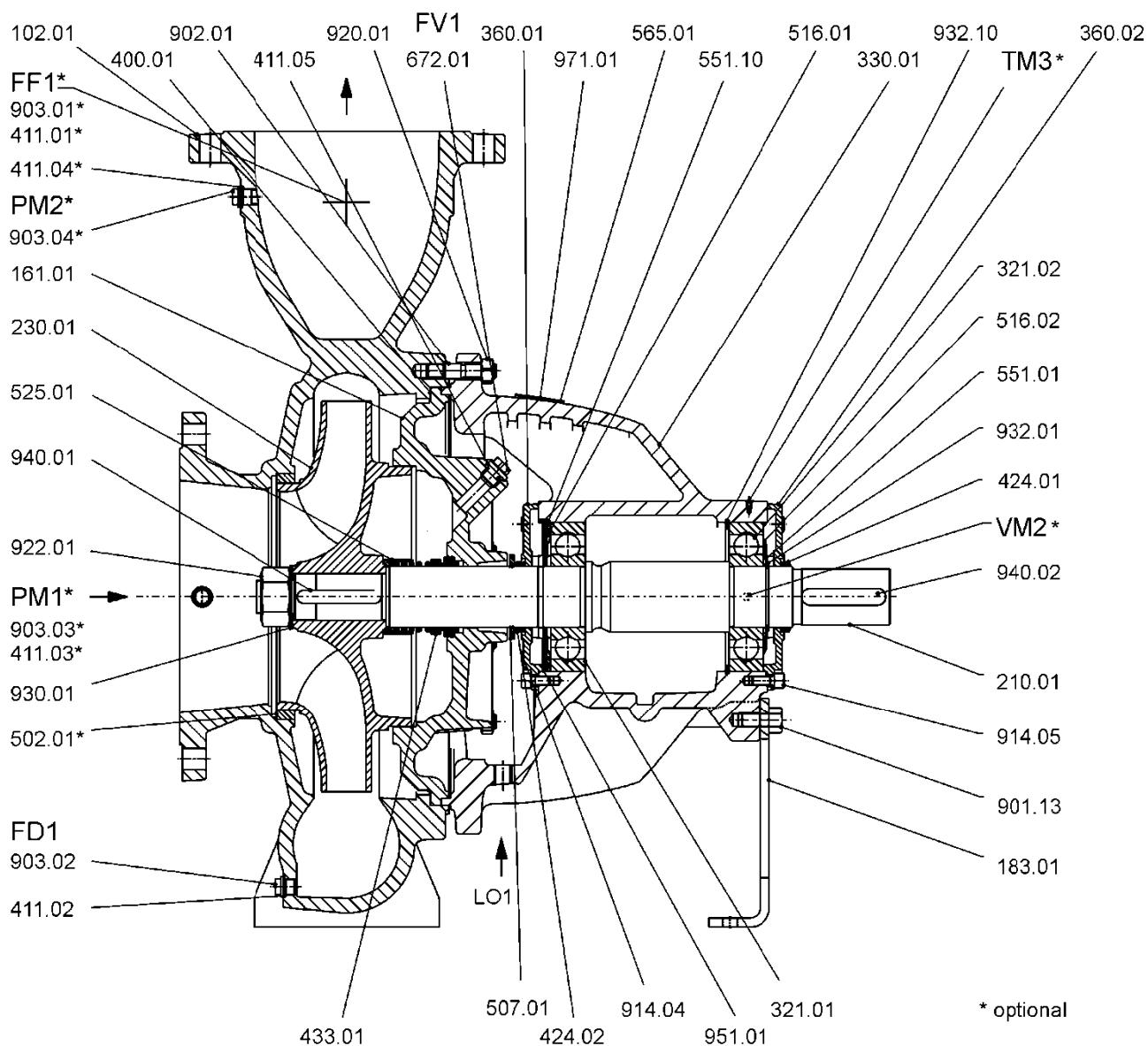
Sizes on bearing bracket size 530



U...D - mechanical seal unbalanced

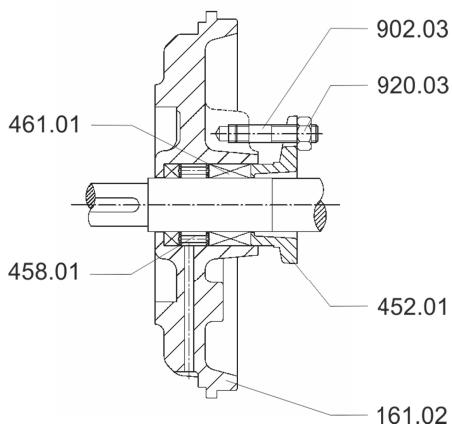


Sizes on bearing bracket size 585

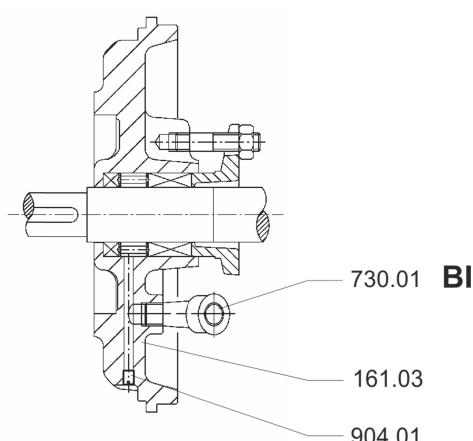


U...D - mechanical seal unbalanced

Shaft seal variants

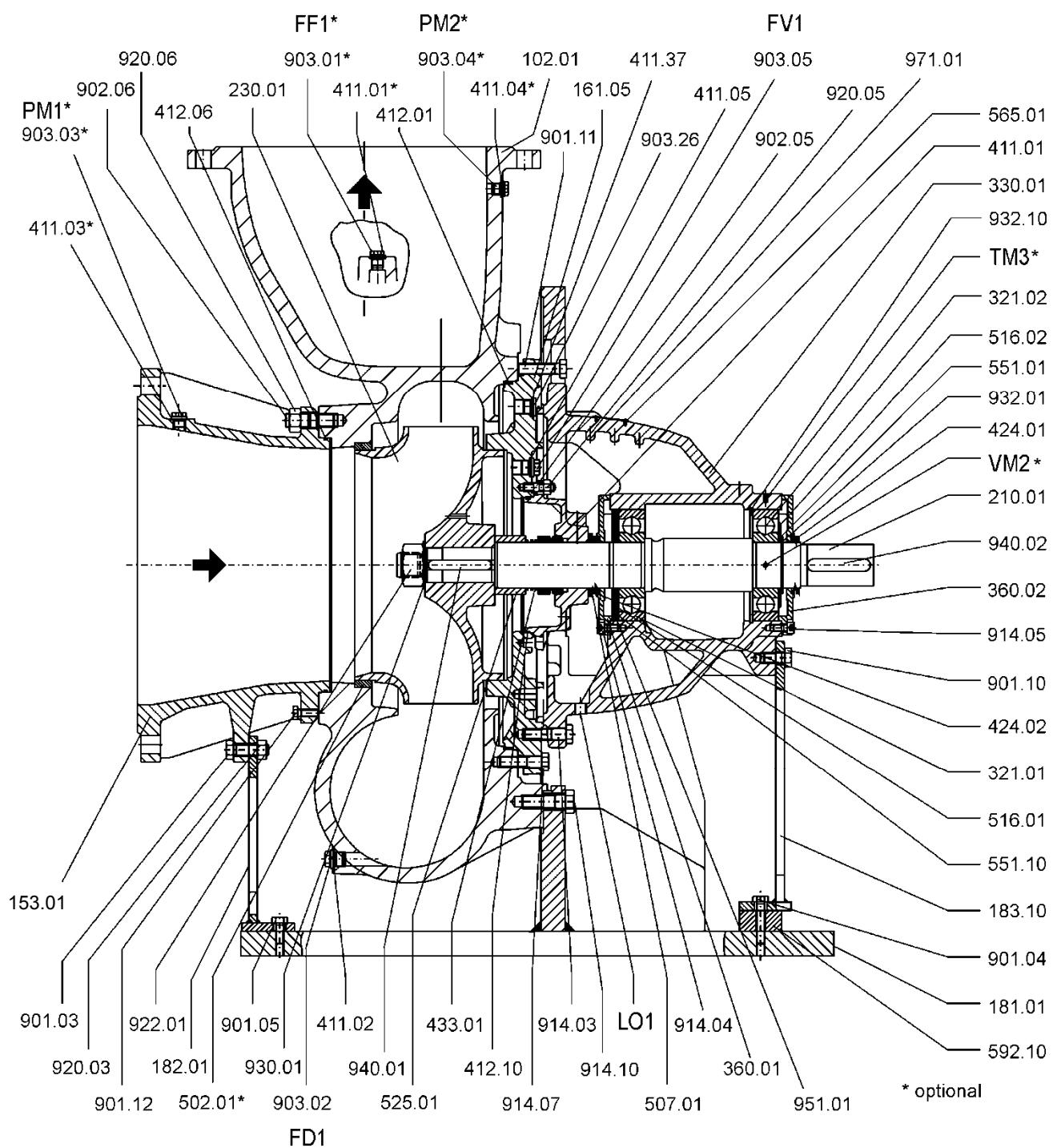


Gland packing with internal sealing U1B



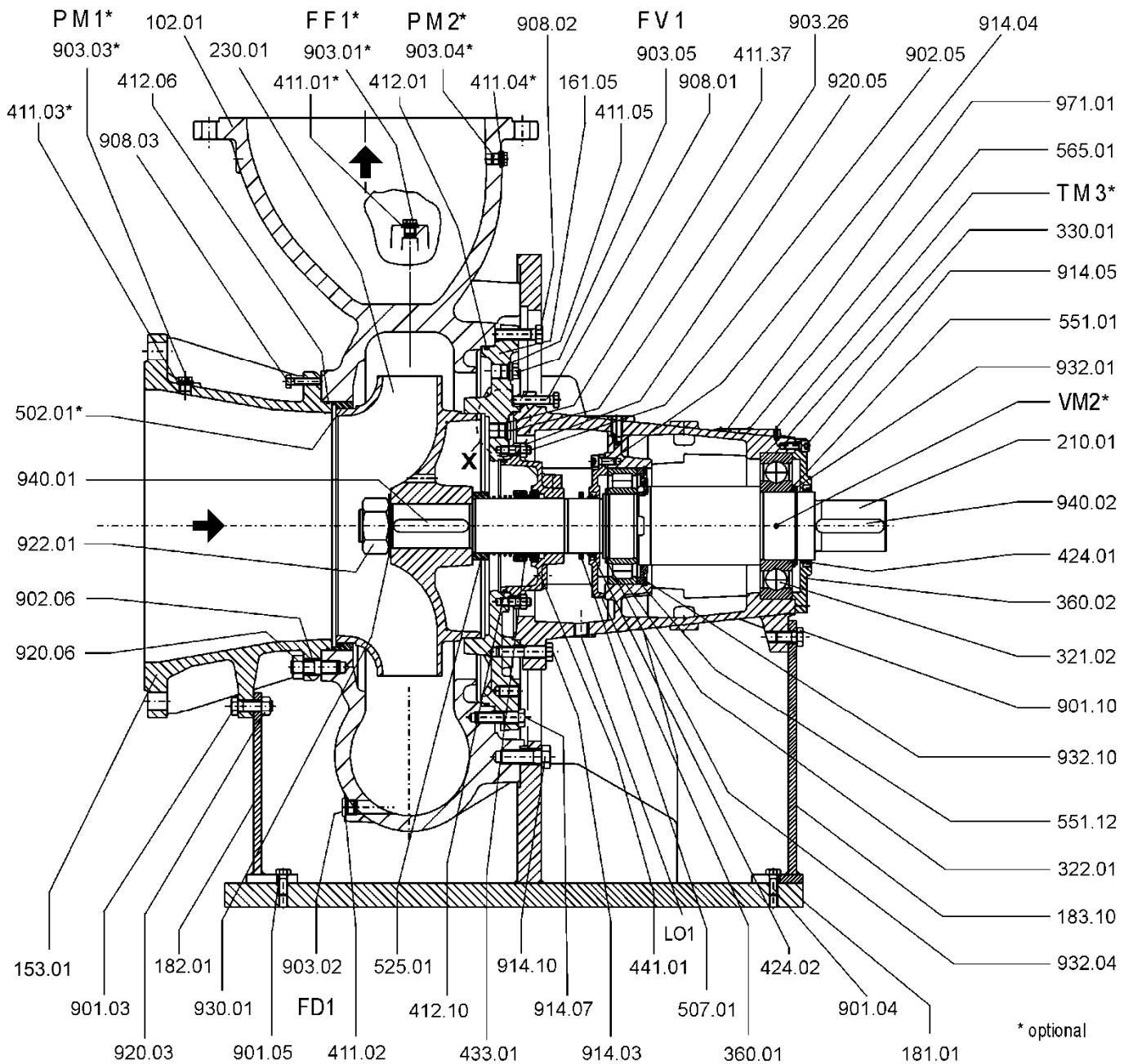
Gland packing with external sealing U1C

Sizes 300-315 and 300-400 on bearing bracket sizes 585

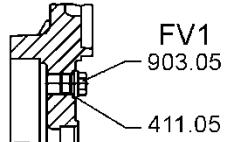
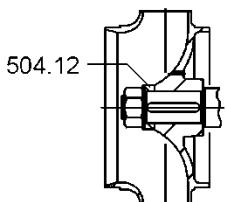
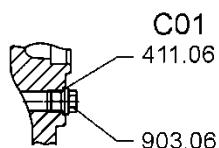
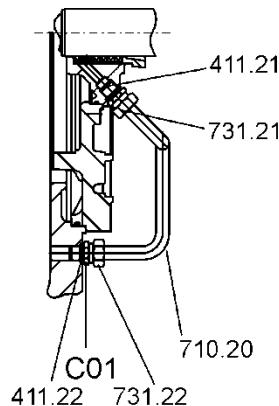


U...D - mechanical seal unbalanced

Sizes 300-315 and 300-400 on bearing bracket 700



U...D - mechanical seal unbalanced

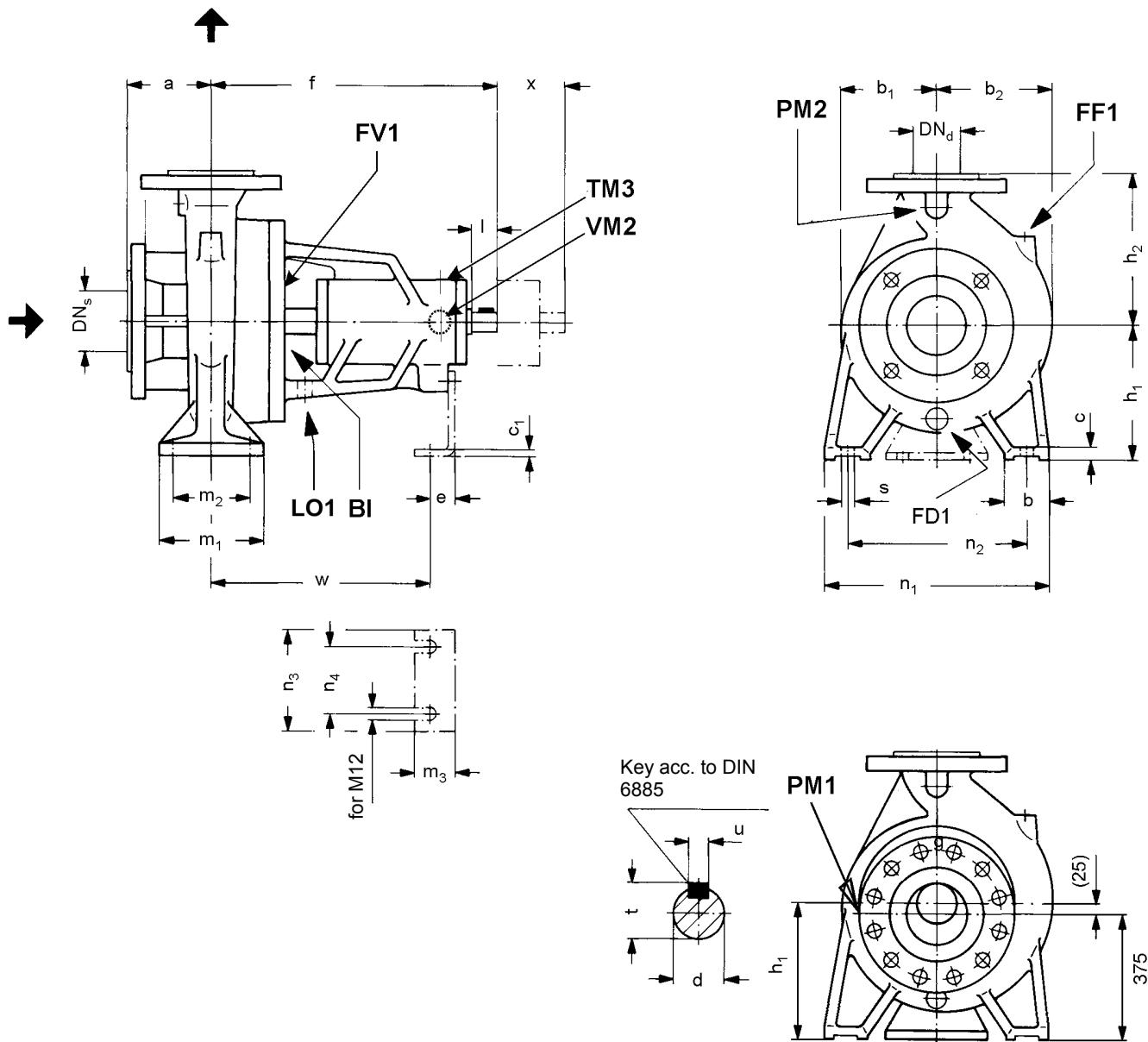


List of components

Denomination	Part-No.	Denomination	Part-No.
Volute casing	102.01	Pipe fitting	731.22
Stage casing	108.01	Hexagon head bolt	901.01
Suction branch	153.01	Hexagon head bolt	901.02
Casing cover	161.01	Hexagon head bolt	901.03
Casing cover	161.02	Hexagon head bolt	901.04
Casing cover	161.03	Hexagon head bolt	901.05
Casing cover	161.05	Hexagon head bolt	901.10
Diffuser	171.01	Hexagon head bolt	901.11
Pump frame	181.01	Hexagon head bolt	901.12
Foot	182.01	Hexagon head bolt	901.13
Support foot	183.01	Stud bolt	902.01
Support foot	183.10	Stud bolt	902.03
Shaft	210.01	Stud bolt	902.05
Impeller	230.01	Stud bolt	902.06
Impeller 1 st stage	230.02	Screw plug	903.01
Impeller 2 nd stage	230.03	Screw plug	903.02
Radial ball bearing	321.01	Screw plug	903.03
Radial ball bearing	321.02	Screw plug	903.04
Cylindrical roller bearing	322.01	Screw plug	903.05
Bearing housing	330.01	Screw plug	903.06
Bearing cover	360.01	Screw plug	903.26
Bearing cover	360.02	Setscrew	904.01
Gasket	400.01	Setscrew	904.05
Gasket	400.02	Jacking screw	908.01
Seal ring	411.01	Jacking screw	908.02
Seal ring	411.02	Jacking screw	908.03
Seal ring	411.03	Socket head cap screw	914.03
Seal ring	411.04	Socket head cap screw	914.04
Seal ring	411.05	Socket head cap screw	914.05
Seal ring	411.06	Socket head cap screw	914.07
Seal ring	411.21	Socket head cap screw	914.10
Seal ring	411.22	Hexagon nut	920.01
Seal ring	411.37	Hexagon nut	920.03
O-ring	412.01	Hexagon nut	920.05
O-ring	412.06	Hexagon nut	920.06
O-ring	412.10	Impeller nut	922.01
V-ring	424.01	Spring ring	930.01
V-ring	424.02	Circlip	932.01
Mechanical seal	433.01	Circlip	932.02
Shaft seal housing	441.01	Circlip	932.04
Stuffing box gland	452.01	Circlip	932.10
Lantern ring	458.01	Key	940.01
Gland packing	461.01	Key	940.02
Wear ring	502.01	Key	940.03
Spacer ring	504.12	Cup spring	951.01
Thrower	507.01	Nameplate	971.01
Intermediate ring	509.01		
Threaded ring	514.01		
Nilos ring	516.01	Connections	for:
Nilos ring	516.02	BI	External sealing
Spacer sleeve	525.01	FD1	Draining
Spacer disc	551.01	FF1	Filling
Spacer disc	551.03	FV1	Venting (for automatic aspirator)
Spacer disc	551.10	LO1	Leakage outlet
Spacer disc	551.10	PM1	Pressure gauge
Spacer disc	551.12	PM2	Pressure gauge
Compensating disc	557.01	VM2	Vibration measurement connection
Compensating disc	557.02	TM3	Temperature measurement connection
Rivet	565.01		
Shim plate	592.10		
Venting	672.01		
Pipe	710.20		
Pipe fitting	730.01		
Pipe fitting	731.21		

Main dimensions

Sizes on bearing bracket sizes 360, 470, 530 and 585



Only size 250-400

Dimensions in mm.

Sense of rotation: clockwise, as seen from the driving side.

Bearing bracket size	External sealing	Draining ①	Filling ②	Venting	Leakage-outlet	Pressure gauge	Pressure gauge	Vibration gauge	Temperature gauge
	BI	FD1	FF1	FV1	LO1	PM1	PM2	VM2	TM3
360	G 1/4	G 1/4	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	M8	M8
470	G 1/4	G 3/8	G 3/8	G 3/8	G 3/8	G 1/4	G 3/8	M8	M8
530	G 3/8	G 3/8	G 3/8	G 1/2	G 3/8	G 1/4	G 3/8	M8	M8
585	G 3/8	G 3/8	G 3/8	G 1/2	G 3/8	G 3/8	G 3/8	M8	M8
2-stage sizes	-	G 1/4	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	M8	M8

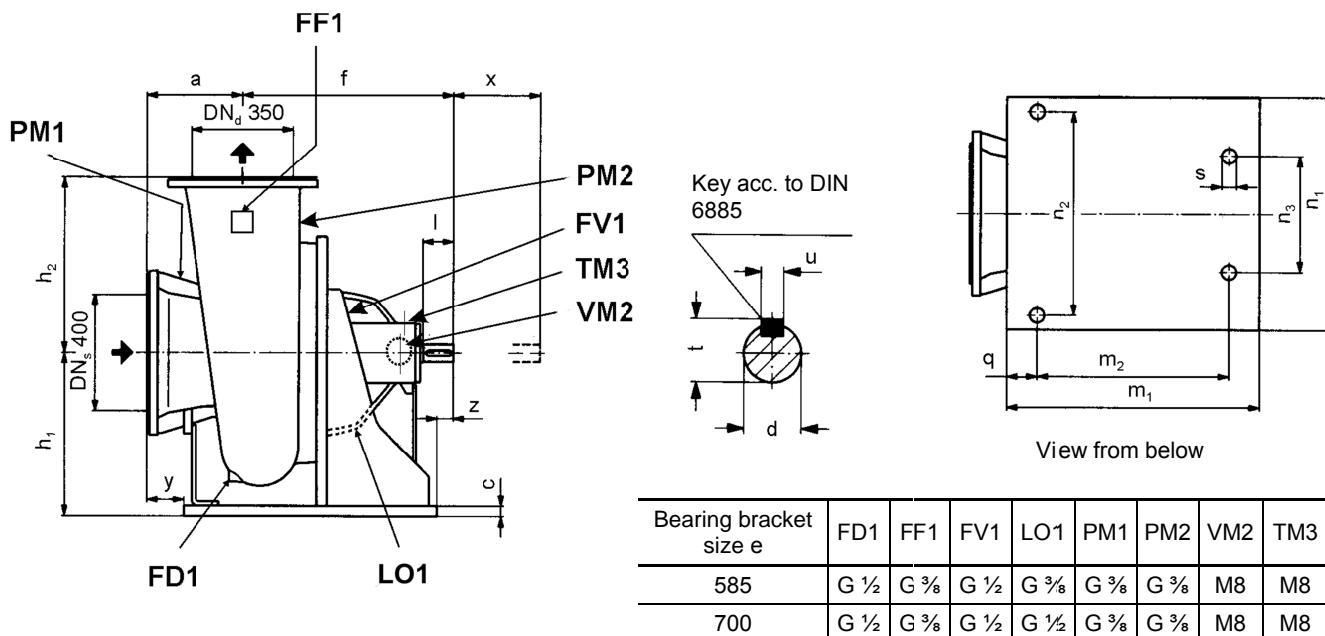
① connection FD1 in sizes 25-200 and 2/25-200 = G 1/4

② connection FF1 in sizes 25-200 and 2/25-200 not provides.

Flanges acc.to DIN EN 1092-2 PN 10 / PN 16 (The outside diameter and thickness of the flange may be larger than specified in the standard)

Main dimensions

Size 300-315 and 300-400 on bearing bracket 585 ① and 700



Flanges acc. to DIN EN 1092-2 PN 10 / PN 16 (The outside diameter and thickness of the flange may be larger than specified in the standard).

Dimensions in mm.

Sense of rotation: clockwise, as seen from the driving side.

Pump size	Bearing bracket size	Pump dimensions				Foot dimensions						Extensi- on dimen- sion x	Shaft end acc. to DIN 748				Others		
		a	f	h ₁	h ₂	c	m ₁	m ₂	n ₁	n ₂	n ₃	q	s	d	l	t	u	y	z
300-315	585	325	730	560	600	35	850	720	800	700	400	50	M30	250	60	105	64	18	57
	700		795												75		79,5	20	148
300-400	585	325	700	765									M30	250	60	105	64	18	57
	700		765												75		79,5	20	118

Installation dimensions are available in ALLWEILER drawing archive ALL2CAD.

Allocation of the bearing bracket sizes to the speeds

Pump size	Speed [min ⁻¹]			
	950		1.180	
	Bearing bracket size			
300-315	585 ①			700
300-400				

① up to the max. power 200 kW; above 200 kW bearing housing size 700 has to be used

Subject for technical alterations.