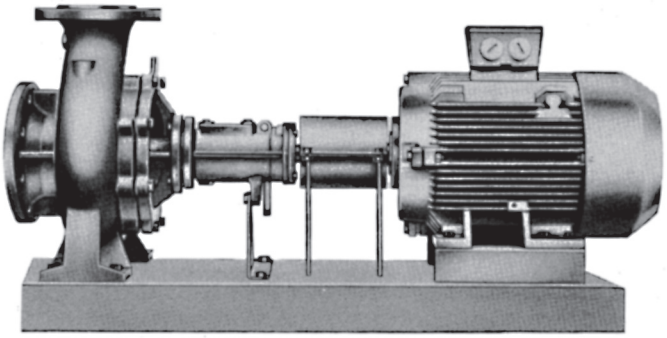
Volute Casing Centrifugal Pumps PN 16 for Heat-Transfer Oils up to 350°C, Series NTT



Sizes at bearing bracket sizes 360, 470, 530 and 630

Application
For handling organic heat-transfer oils in heat-transfer plants (DIN 4754). The fluids pumped must not contain any abrasive particles nor chemically attack the pump materials.

Main Fields of Application
Chemical and pharmaceutical industry:
Heating of drying plants, stirring apparatuses, autoclaves, reaction tanks, in plants for the production of synthetic fibres, plastics, lacquer raw materials, in mixing and storage facilities for viscous media.

Food industry:
Heating of baking and roasting ovens, plants for the production of fatty acids, edible oils, glycerine, dry pastes.

Textile, leather and paper industry:
Heating of calenders, drying chambers, rolls, drying cylinders.

Rubber and plastics industry:
Heating of presses, automatic injection moulding machines, calenders, fusion kettles.

Paint and lacquer industry:
Heating of agitators and mixing vessels.

Tar and bitumen-processing industry:
Heating of storage tanks, tankers, for heating up heavy oil, in asphalt processing and roofing-felt production.

Mineral-oil industry:
Heating of transportation means, pipes and storage installations, for pre-heating of oils, in the bitumen production.

Laundries:
Heating of dryers, hot mangles, automatic ironing machines.

Additionally, for the most varied fields of application in the metal-working industry, electrical-engineering industry, wood industry, building industry.

Type and Series Construction
Horizontal, single- and two-stage, single-flow volute casing centrifugal pumps with axial inlet.

Series design according to unit assembly system. Shaft bearing in a bearing bracket equipped with a support leg.

Volute casing with cast-on feet.

Sizes NTT 2/25–200/01, 2/32–200/01, 2/40–250/01 and 2/50–250/01 are double-stage, but in their outer dimensions, they correspond to the respective single-stage sizes. Owing to the two-stage design, relatively small delivery flows are achieved with great delivery heads, good efficiencies and low NPSH values.

Branch position/Flanges
Suction branch: axial
Delivery branch: radially upwards
Flanges: according to DIN 2533

Delivery
With the sizes according to DIN 24 255, the delivery considerably exceeds the standard nominal capacity.

With further sizes, the performance range was extended in both directions, viz. greater and smaller deliveries, for the economic operation of smaller heat-transfer plants.

Shaft Sealing
By means of uncooled, maintenance-free mechanical seal of the unbalanced type.

A safety stuffing box with a following throttling area is arranged in front of the mechanical seal.

Even in case of failure of the mechanical seal, these additional safety elements prevent seepage from emerging in a hazardous quantity and manner. The requirements according to DIN 4754 are thus exceeded.

It is ensured that any heat-transfer seepages emerging from the shaft sealing are safely drained through leakage outlet LO, and completely collected.

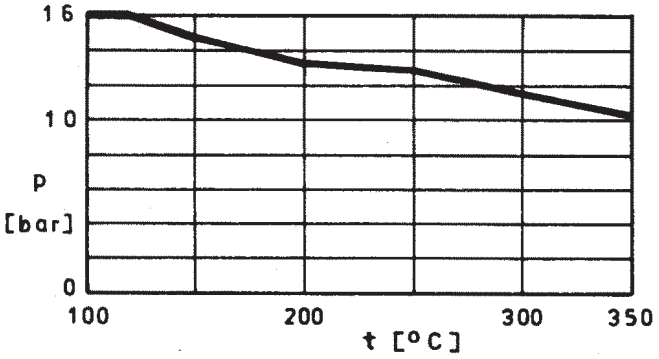
Owing to a special design of the built-in unit, the temperature is reduced to such an extent that proper functioning of the bearing and shaft sealing is ensured.

Shaft sealing

Abbreviation	Material design		Material key DIN 24960
U5A	Rotating seal ring	Special cast chrome steel	S
	Stationary seal ring	Hard carbon synthetic-resin-impregnated	B
	O-ring	Caoutchouc fluoride (Viton)	V
	Spring	CrNi steel	F
	Other construction parts	CrNi steel	F
	Safety stuffing box	Highly heat-resistant asbestos free special packing, outside graphite-treated, Diaplex-brading	–

Performance data
Q up to 1450 m^3/h, p_s up to 7 bar
H up to 155 m, p_d 16 bar ①
t up to 350°

① p_d depends on the temperature of the fluid pumped, for these purposes, please refer to the following diagram



Inlet pressure (p_s) plus maximum delivery head must not exceed the curve values for the final pump pressure (p_d).

Bearing and Lubrication
By means of two grooved ball bearings C4 DIN 625 with the one on the pump side being lubricated by the fluid to be pumped, the one on the driving side by grease.

Dismantling of Built-In Unit
When using a shaft coupling with spacer, the built-in unit may be dismantled towards the motor side while the volute casing and motor may remain on the base plate and the pipe lines at the volute casing. The built-in unit consists of all components of the pump, except for the volute casing.

Combination of Components
The table on page 3 shows the combination possibilities of components of all NTT sizes.

The unit assembly system allows a simplified spare parts maintenance.

Connections
The following connections are always provided:

FD	Draining	LO	Leakage outlet*
FF	Filling	V	Venting

* According to DIN 4754 for the safe draining of the heat transfer seepage quantities emerging from the shaft sealing.

Shaft Coupling and Protection against accidental contact
Flexible shaft coupling according to DIN 740 without or with spacer. A coupling guard as protection against accidental contact according to DIN 24295/31001 is supplied as soon as the scope of supply includes pump, base plate and shaft coupling.

The pump sizes with bearing bracket size 470, nominal impeller diameter 315 and 400 and the pump sizes with bearing bracket sizes 530 and 650 will be equipped with couplings of special type.

Base plate
Using couplings without spacer:
Base plates of steel, U-beam see separate installation plans VM 500 E/3000-...
Base plates with drip channel of cast iron or fabricated steel (material depending on size) see separate installation plans VM 500 E/...3010-...

Using couplings with spacer:
Base plates of steel, U-beam, see separate installation plans VM 500 E/...3020-...
Base plates with drip channel of cast iron or fabricated steel (material depending on size) see separate installation plans VM 500 E/...3030-...

Drive
Surface-cooled, three-phase short-circuit motors, IM B3 type of construction, enclosure IP 44/IP 54 according to IEC Standard, class B insulation, capacities and main dimensions according to DIN 42673.

Materials

Description	Part No.		Material design
	single-stage	two-stage	W 4
Volute casing	102.01	102.01	GGG-40
Impeller	230.01	–	GG-20
Impeller 1st stage	–	230.02	GG-20
Impeller 2nd stage	–	230.03	GG-20
Diffuser	–	171.01	GG-20
Stage casing	–	108.01	GG-25
Casing cover	161.01	–	GGG-40
Casing cover	–	161.02	GGG-40
Shaft	210.01	210.02	1.7139
Bearing bracket	330.01	330.01	GG-25
Bearing cover	360.02	360.02	GG-25
Intermediate ring	509.01	–	GGG-40
Impeller nut	922.01	922.01	5
Spring washer	936.01	936.01	Spring steel
Spring disk	934.01	–	Spring steel
Key	940.01	940.03	St 50-1 K
Key	940.02	940.02	St 50-1 K

Abbreviation system of an NTT pump

NTT 32 - 200/01 / 180 U5A - W4

- NTT — Series
- 32 — Size ②: Nominal width suction and delivery branch
- 200/01 — Size ②: Rated impeller diameter
- 180 — Hydraulic no.
- U5A — Actual impeller diameter
- W4 — Shaft sealing
- Material design

This abbreviation is entered on the name plate.
With the two-stage sizes, the actual impeller diameter relates to the second stage.

② With the two-stage sizes, the number of stages is placed with an oblique stroke in front of the nominal width of the suction branch, e.g. 2/32-200/01/...

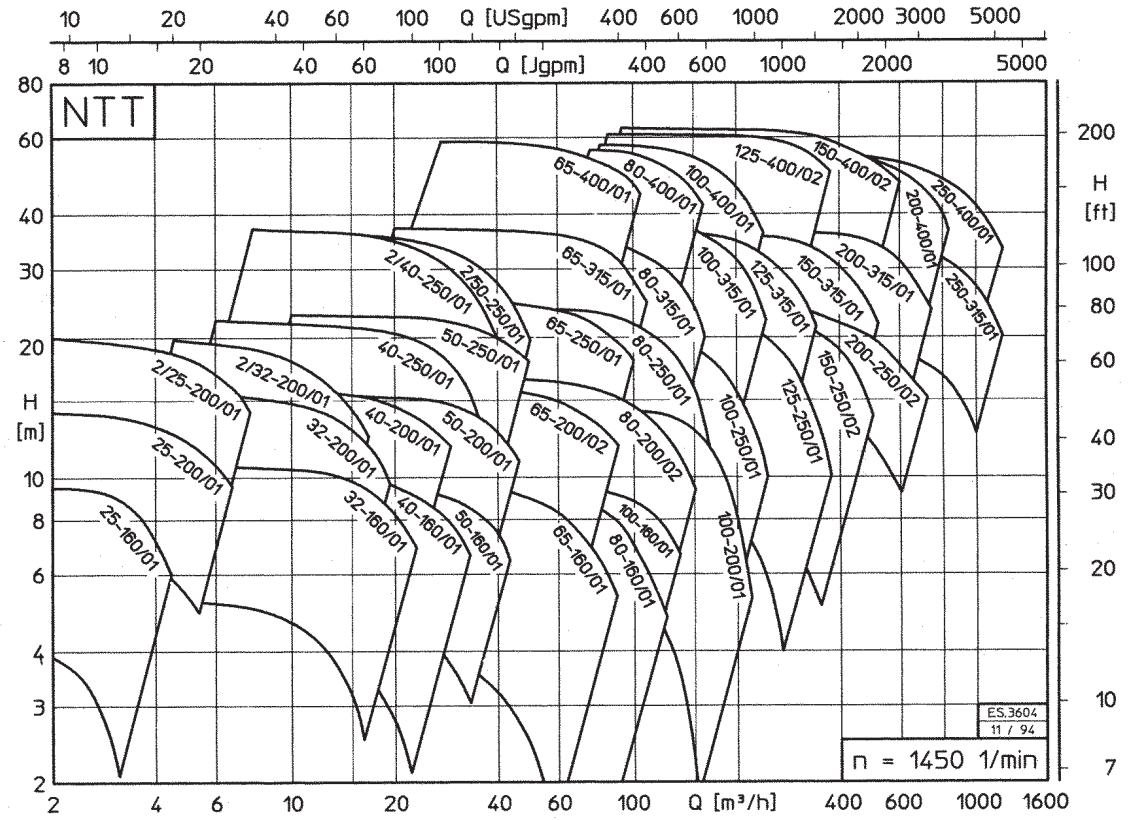
Table Combination of components

The table below shows the combination possibilities of components or spare parts of the NTT sizes.

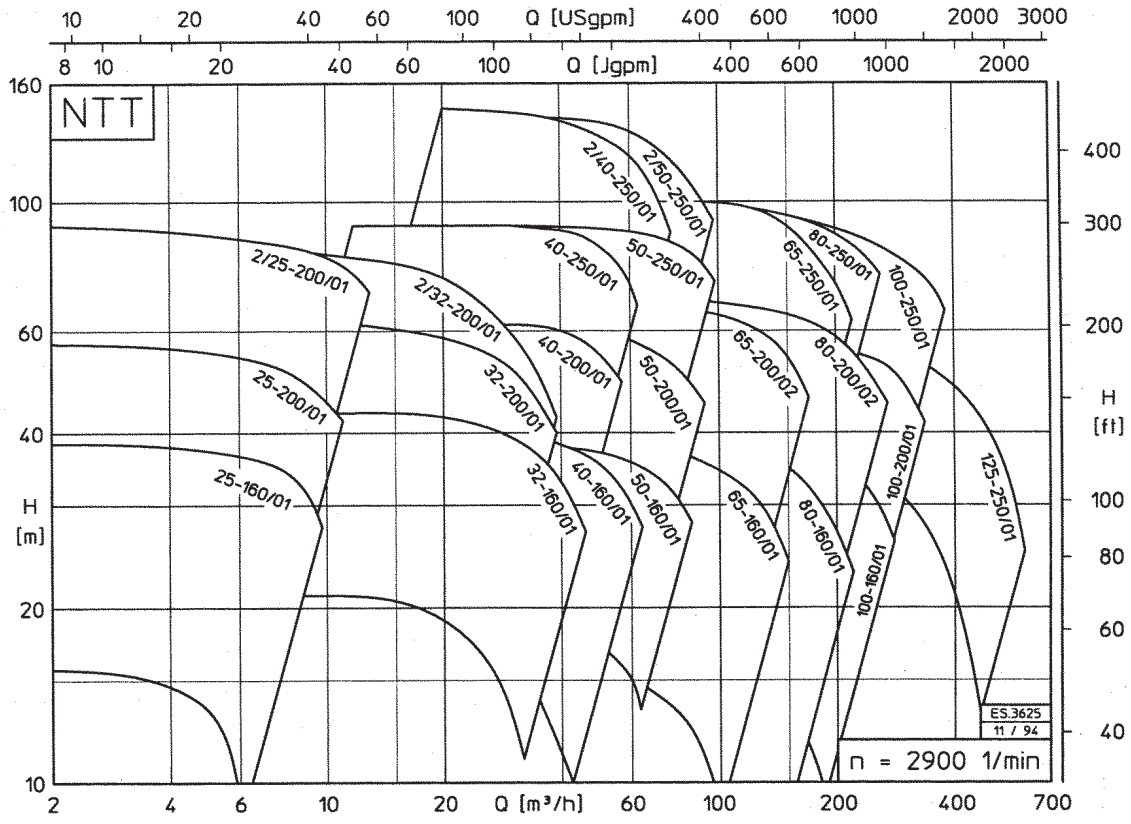
Bearing bracket size	Pump size	Volute casing	Im-peller	Impeller		Diffuser	Stage casing	Inter-mediate ring	Casing cover	Bearing bracket	Shaft	Support foot	Shaft coupling	
				1st stage	2nd stage								K...	L...
360	25-160/01	1	1	–	–	–	–	–	1	1	1	1	x	–
	25-200/01	2	2									2	x	–
	2/25-200/01		–	1	1	1	1		2		2		x	–
	32-160/01	3	3	–	–	–	–	–	1	1	1	1	x	–
	32-200/01	4	4									2	x	–
	2/32-200/01		–	1	1	1	1		2		2		x	–
	40-160/01	5	5	–	–	–	–		1	1	1	1	x	–
	40-200/01	6	6									2	x	–
	40-250/01	7	7					1				3	x	–
	2/40-250/01		–	2	2	2	2	–	3		2		x	–
	50-160/01	8	8	–	–	–	–		1	1	1	2	x	–
	50-200/01	9	9										x	–
	50-250/01	10	10					1				3	x	–
	2/50-250/01		–	3	2	2	2	–	3		2		x	–
	65-160/01	11	11	–	–	–	–		1		1	2	x	–
	65-200/02	12	12					1				3	x	–
	80-160/01	13	13					–					x	–
	100-160/01	14	14									4	x	–
470	65-250/01	15	15	–	–	–	–	–	4	2	3	5	x	–
	65-315/01	16	16					2				6	–	x
	65-400/01	17	17					3				7	–	x
	80-200/02	18	18					–				8	x	–
	80-250/01	19	19									5	x	–
	80-315/01	20	20					2				7	–	x
	100-200/01	21	21					–				5	x	–
	100-250/01	22	22									6	x	–
	100-315/01	23	23					2				7	–	x
	125-250/01	24	24					–					x	–
530	80-400/01	25	25	–	–	–	–	4	5	3	4	9	–	x
	100-400/01	26	26										–	x
	125-315/01	27	27					–					–	x
	125-400/02	28	28					5				10	–	x
	150-250/02	29	29					–	6			9	–	x
	150-315/01	30	30						5				–	x
	150-400/02	31	31					5				10	–	x
	200-250/02	32	32					–	6			11	–	x
650	200-315/01	33	33	–	–	–	–	–	7	4	5	12	–	x
	200-400/01	34	34										–	x
	250-315/01	35	35									13	–	x
	250-400/01	36	36										–	x

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

Performance graph
1450 1/min

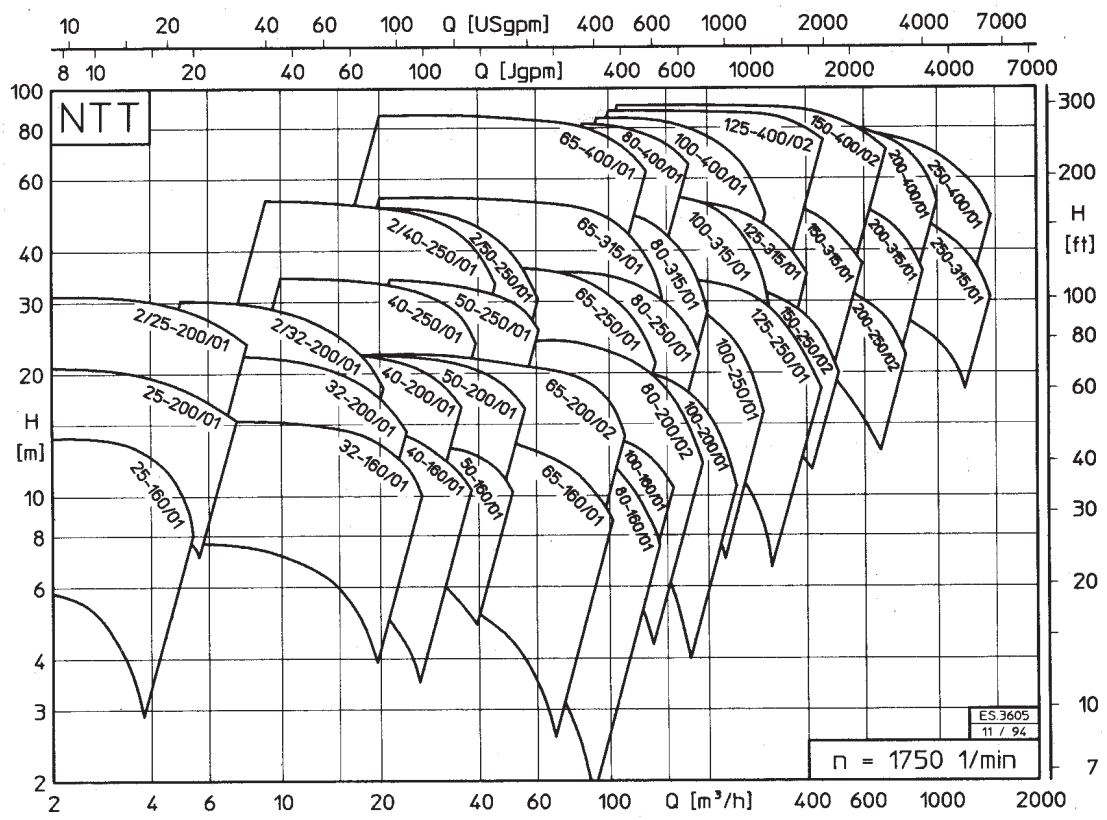


Performance graph
2900 1/min

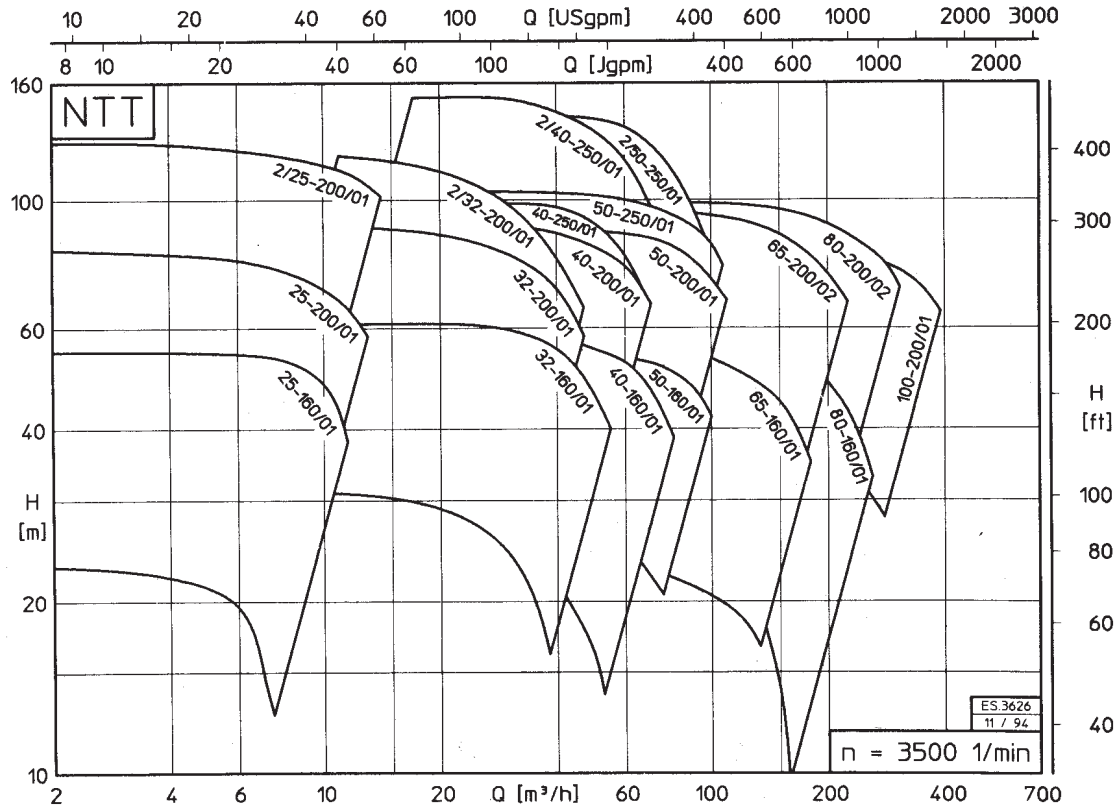


For exact performance data, please refer to the individual characteristics.

Performance graph
1750 1/min

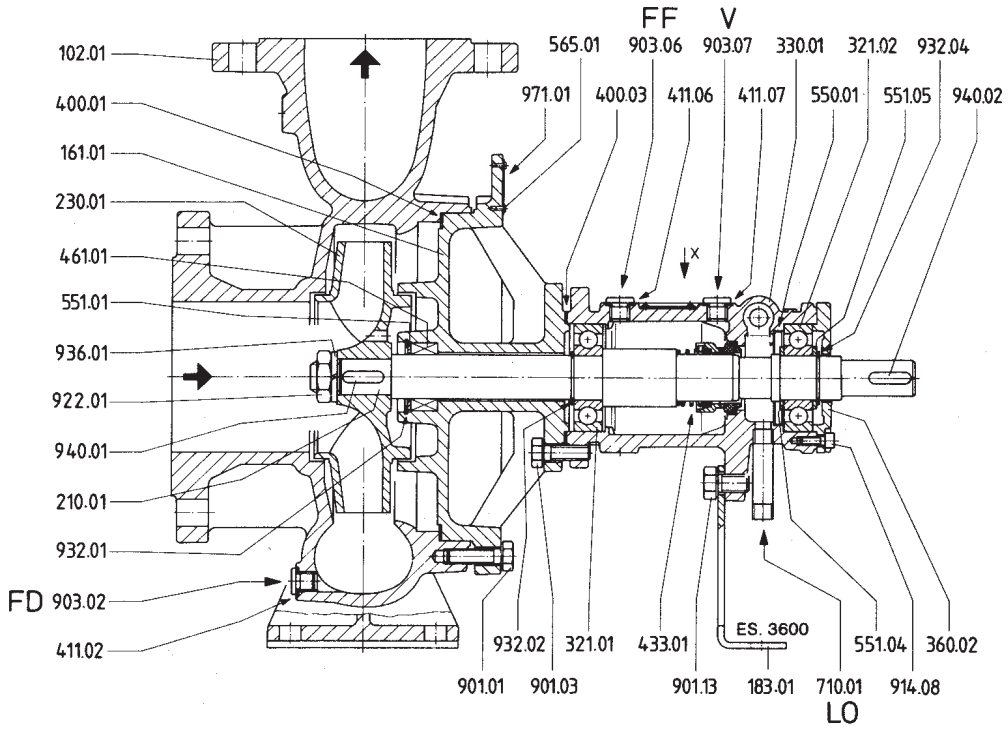


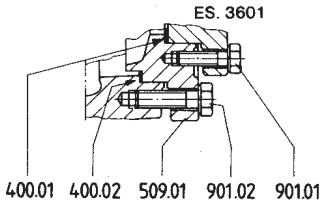
Performance graph
3500 1/min



For exact performance data, please refer to the individual characteristics.

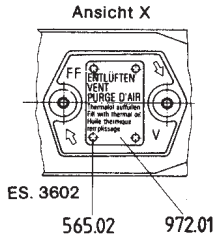
Sectional drawing for single-stage sizes
Sizes at bearing bracket sizes 360 and 470

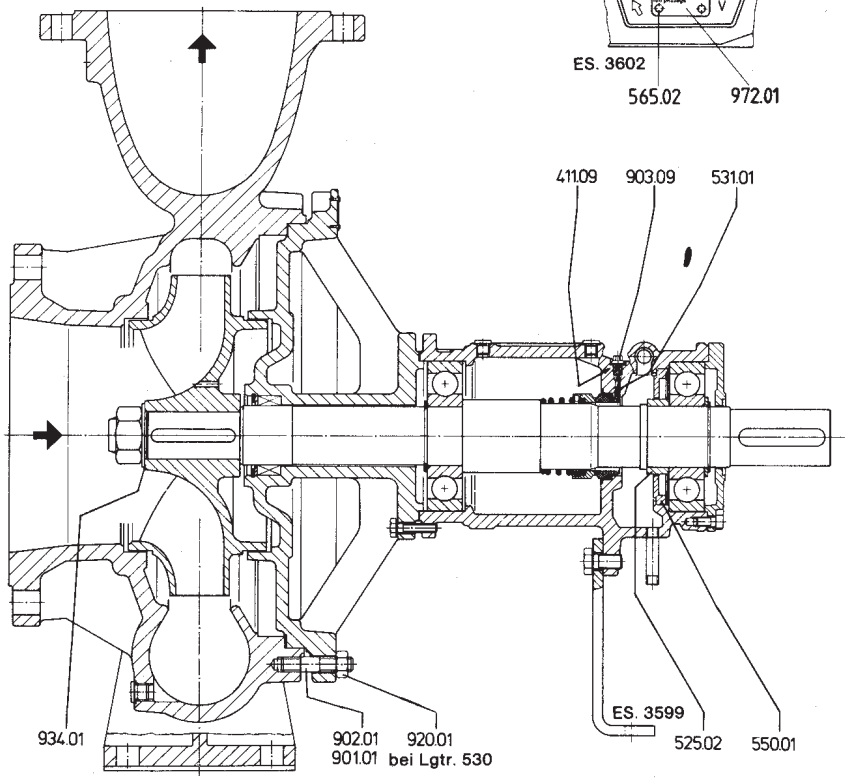




Design with intermediate ring with sizes

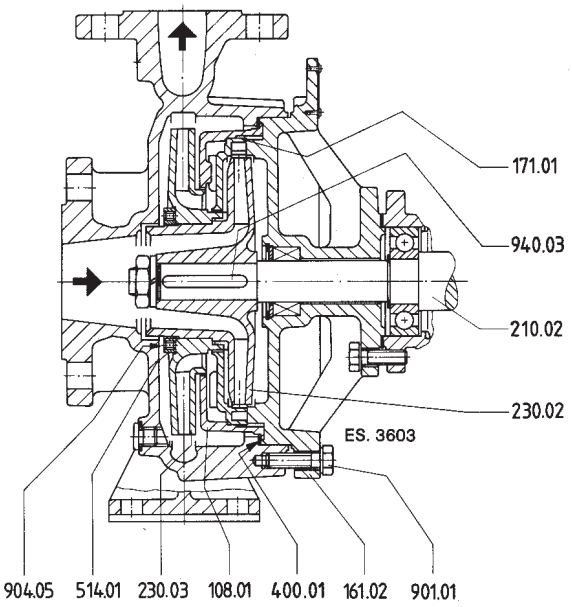
Sizes at bearing bracket sizes 530 and 650





Shaft sealing: uncooled, unbalanced mechanical seal with safety stuffing box arranged in front
Abbreviation: **U5A**

Sectional drawing for two-stage sizes
Sizes at bearing bracket size 360



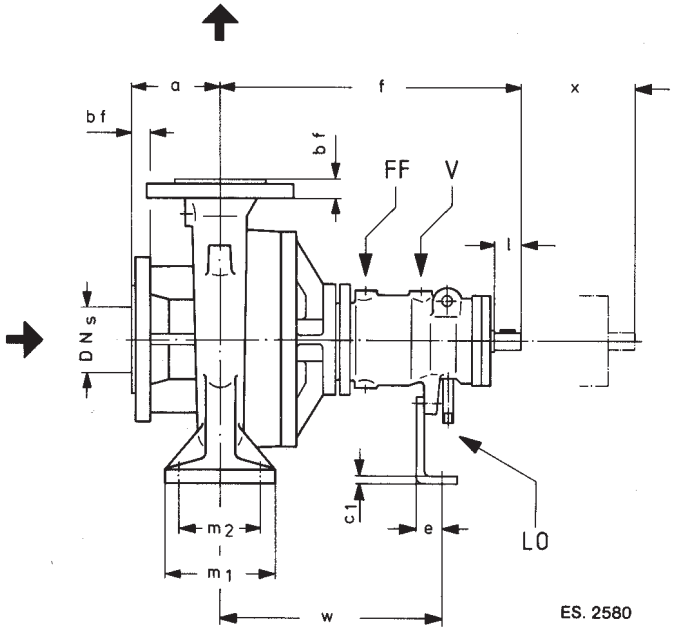
Shaft sealing: Uncooled, unbalanced mechanical seal with safety stuffing box arranged in front
Abbreviation: **U5A**

Description	Part No.
Volute casing	102.01
Stage casing	108.01
Casing cover	161.01
Casing cover	161.02
Diffuser	171.01
Support leg	183.01
Shaft	210.01
Shaft	210.02
Impeller	230.01
Impeller 1st stage	230.02
Impeller 2nd stage	230.03
Grooved ball bearing	321.01
Grooved ball bearing	321.02
Bearing bracket	330.01
Bearing cover	360.02
Gasket	400.01
Gasket	400.02
Gasket	400.13
Joint ring	411.02
Joint ring	411.06
Joint ring	411.07
Joint ring	411.09
Mechanical seal complete	433.01
Gland packing	461.01
Intermediate ring	509.01
Screwed ring	514.01
Spacer sleeve	525.02
Spring sleeve	531.01
Disk	550.01

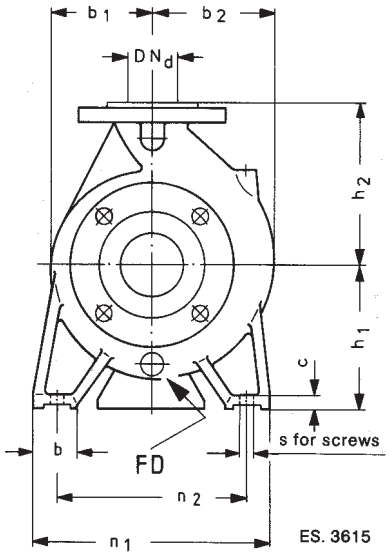
Description	Part No.
Distance washer	551.01
Distance washer	551.04
Distance washer	551.05
Blind rivet	565.01
Blind rivet	565.02
Nipple joint	710.01
Hexagonal screw	901.01
Hexagonal screw	901.02
Hexagonal screw	901.03
Hexagonal screw	901.13
Stud bolt	902.01
Screwed plug	903.02
Screwed plug	903.06
Screwed plug	903.07
Screwed plug	903.09
Set screw	904.05
Socket-head cap screw	914.08
Hexagonal nut	920.01
Impeller nut	922.01
Circlip	932.01
Circlip	932.02
Circlip	932.04
Spring disk	934.01
Spring washer	936.01
Key	940.01
Key	940.02
Key	940.03
Name plate	970.01
Information plate	972.01

Connections	
FD	Draining
FF	Filling
LO	Leakage outlet
V	Venting

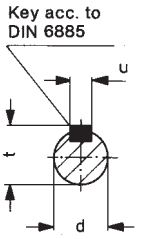
Pump dimensions
Size at bearing bracket sizes 360, 470, 530 and 650



ES. 2580



ES. 3615

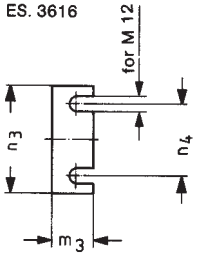


ES. 1656

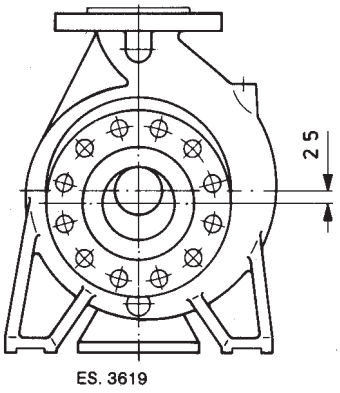
Tolerances of companion dimensions acc. to VDMA 24275

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

Dimensions in mm without commitment



ES. 3616

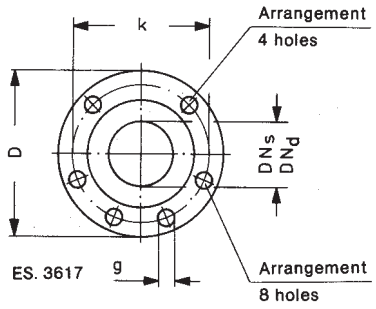


ES. 3619

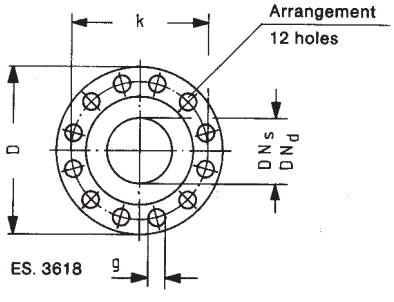
With size 250–400/01 only

Bearing bracket size	Connections			
	Draining	Filling	Leakage outlet	Venting
	FD ①	FF	LO	V
360	G 1/4	G 1/4		
470	G 3/8			
530				
650				

① Connection FD in sizes 25–160/01, 25–200/01 and 2/25–200/01 each G 1/2



ES. 3617



ES. 3618

Flanges acc. to DIN 2533					
DNs DNd	D	bf	k	g	No. of holes
25	115	16	85	14	4
32	140	18	100	18	4
40	150	18	110	18	4
50	165	20	125	18	4
65	185	20	145	18	4
80	200	22	160	18	8
100	220	24	180	18	8
125	250	26	210	18	8
150	285	26	240	22	8
200	340	30	295	22	12
250	405	32	355	26	12
300	460	32	410	26	12

Tolerances of companion dimensions
acc. to VDMA 24275

Dimensions in mm without commitment

Bearing bracket size	Pump size	Suction flange	Delivery flange	Pump dimensions						Feet dimensions												for screw	Extension dimension	Shaft end acc. to DIN 748			
		DN_s	DN_d	a	f	b_1	b_2	h_1	h_2	b	c	c_1	e	m_1	m_2	m_3	n_1	n_2	n_3	n_4	w	s	x	d	l	t	u
360	25-160/01	40	25	80	360	125	125	132	160	50	15	4	28	100	70	45	240	190	160	110	260	M 12	80	24	50	27	8
	25-200/01	40	25	80	360	132	132	160	180	50	15	4	28	100	70	45	240	190	160	110	260	M 12	80	24	50	27	8
	2/25-200/01	40	25	80	360	132	132	160	180	50	15	4	28	100	70	45	240	190	160	110	260	M 12	80	24	50	27	8
	32-160/01	50	32	80	360	130	130	132	160	50	15	4	28	100	70	45	240	190	160	110	260	M 12	80	24	50	27	8
	32-200/01	50	32	80	360	124	130	160	180	50	15	4	28	100	70	45	240	190	160	110	260	M 12	80	24	50	27	8
	2/32-200/01	50	32	80	360	124	130	160	180	50	15	4	28	100	70	45	240	190	160	110	260	M 12	80	24	50	27	8
	40-160/01	65	40	80	360	130	130	132	160	50	15	4	28	100	70	45	240	190	160	110	260	M 12	80	24	50	27	8
	40-200/01	65	40	100	360	125	135	160	180	50	15	4	28	100	70	45	265	212	160	110	260	M 12	80	24	50	27	8
	40-250/01	65	40	100	360	150	156	180	225	65	15	4	28	125	95	45	320	250	160	110	260	M 12	80	24	50	27	8
	2/40-250/01	65	40	100	360	150	156	180	225	65	15	4	28	125	95	45	320	250	160	110	260	M 12	80	24	50	27	8
	50-160/01	65	50	100	360	125	130	160	180	50	15	4	28	100	70	45	265	212	160	110	260	M 12	80	24	50	27	8
	50-200/01	65	50	100	360	133	145	160	200	50	15	4	28	100	70	45	265	212	160	110	260	M 12	80	24	50	27	8
	50-250/01	65	50	100	360	156	169	180	225	65	15	4	28	125	95	45	320	250	160	110	260	M 12	80	24	50	27	8
	2/50-250/01	65	50	100	360	156	169	180	225	65	15	4	28	125	95	45	320	250	160	110	260	M 12	80	24	50	27	8
	65-160/01	80	65	100	360	133	162	160	200	65	15	4	28	125	95	45	280	212	160	110	260	M 12	80	24	50	27	8
	65-200/02	80	65	100	360	150	170	180	225	65	15	4	28	125	95	45	320	250	160	110	260	M 12	100	24	50	27	8
	80-160/01	100	80	125	360	136	170	180	225	65	15	4	28	125	95	45	320	250	160	110	260	M 12	100	24	50	27	8
	100-160/01	125	100	125	360	165	200	200	280	65	15	4	28	125	95	45	320	250	160	110	260	M 12	100	24	50	27	8
470	65-250/01	80	65	100	470	164	184	200	250	80	18	4	28	160	120	45	360	280	160	110	340	M 16	100	32	80	35	10
	65-315/01	80	65	125	470	202	219	225	280	80	25	6	30	160	120	47	400	315	160	110	340	M 16	100	32	80	35	10
	65-400/01	80	65	125	470	239	255	250	355	80	25	6	30	160	120	47	420	335	160	110	340	M 16	100	32	80	35	10
	80-200/02	100	80	125	470	172	190	180	250	65	18	4	28	125	95	45	345	280	160	110	340	M 16	100	32	80	35	10
	80-250/01	100	80	125	470	182	208	200	280	80	18	4	28	160	120	45	400	315	160	110	340	M 16	100	32	80	35	10
	80-315/01	100	80	125	470	210	231	250	315	80	25	6	30	160	120	47	400	315	160	110	340	M 16	100	32	80	35	10
	100-200/01	125	100	125	470	165	203	200	280	80	18	4	28	160	120	45	360	280	160	110	340	M 16	120	32	80	35	10
	100-250/01	125	100	140	470	189	224	225	280	80	18	6	30	160	120	47	400	315	160	110	340	M 16	120	32	80	35	10
	100-315/01	125	100	140	470	220	250	250	315	80	25	6	30	160	120	47	400	315	160	110	340	M 16	120	32	80	35	10
	125-250/01	150	125	140	470	212	255	250	355	80	18	6	30	160	120	47	400	315	160	110	340	M 16	120	32	80	35	10
530	80-400/01	100	80	125	530	246	265	280	355	80	25	6	31	160	120	47	435	355	160	110	370	M 16	140	42	85	45	12
	100-400/01	125	100	140	530	256	272	280	355	100	27	6	31	200	150	47	500	400	160	110	370	M 20	140	42	85	45	12
	125-315/01	150	125	140	530	226	252	280	355	100	27	6	31	200	150	47	500	400	160	110	370	M 20	140	42	85	45	12
	125-400/02	150	125	140	530	264	283	315	400	100	27	6	31	200	150	47	500	400	160	110	370	M 20	140	42	85	45	12
	150-250/02	200	150	160	530	231	283	280	375	100	27	6	31	200	150	47	500	400	160	110	370	M 20	140	42	85	45	12
	150-315/01	200	150	160	530	239	271	280	400	100	27	6	31	200	150	47	550	450	160	110	370	M 20	140	42	85	45	12
	150-400/02	200	150	160	530	277	305	315	450	100	27	6	31	200	150	47	550	450	160	110	370	M 20	140	42	85	45	12
	200-250/02	200	200	180	530	262	330	355	425	100	27	6	31	200	150	47	550	450	160	110	370	M 20	140	42	85	45	12
650	200-315/01	250	200	200	650	270	335	355	450	110	27	10	42	200	150	65	550	450	250	200	455	M 20	180	60	105	64	18
	200-400/01	250	200	180	650	315	374	355	500	110	30	10	42	200	150	65	550	450	250	200	455	M 20	180	60	105	64	18
	250-315/01	300	250	250	650	325	408	400	560	130	30	10	42	260	190	65	690	560	250	200	455	M 24	180	60	105	64	18
	250-400/01	300	250	225	650	350	440	400	600	120	30	10	42	280	200	65	630	500	250	250	455	M 27	180	60	105	64	18

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Quality Management System

BROCHURE: VM500 REV 08-03 5-16-2006