

**TOE-GN / GA / GI Series**  
**Heat transfer pumps**  
**for heat transfer oils up to 350 °C and**  
**hot water up to approx. 160 °C**

**With mechanical seal**  
**Volute casing PN 16**  
**Bearing bracket 360 and 470**

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### Usage

Pumps of this series are designed for the transportation and recirculation of liquids on mineral oil or synthetic basis in heat transfer plants in acc. with DIN 4754 and of hot water.

They are suitable for pumped media with little non-abrasive contaminations and pumped media which do not chemically attack the pump materials used.

### Main applications

The pumps are mainly used in the following industrial sectors:

- Tempering in the plastics and die cast industry
- Baking ovens, large frying units as well as in the production of edible oil and dry mass for the food and feedstuff industries
- Heating of calenders and melting pots in the leather and rubber industry
- Heating of agitator and mixing tanks for the processing of colours, paints and lacquers
- Heating of tanks on stationary and FPSE platforms as well as in tank vessels
- Heating of press lines in the wood and pulp industry
- Flat glass production
- Solar Power Stations & ORC processes

## TOE-GN / GA / GI Series

Heat transfer pumps for heat transfer oils up to 350 °C and hot water up to approx. 160 °C

With mechanical seal

Volute casing in spheriodal graphite cast iron PN 16

Bearing bracket 360 and 470

The TOE Series is also available with magnetic coupling (see catalogue TOE-MN / MA / MI).

### Versions



Dimensions in acc. with EN 733	●
Casing dimensions in acc. with EN 733	●
Hydraulic power ratings in acc. w. EN 733	●
Base plate	●
Closed coupled version	–
Inline design	–
<b>Available sizes</b>	
bearing bracket 360	
bearing bracket 470	

	TOE-GN			TOE-GA			TOE-GI		
Dimensions in acc. with EN 733	●			–			–		
Casing dimensions in acc. with EN 733	●			●			–		
Hydraulic power ratings in acc. w. EN 733	●			●			–		
Base plate	●			optionally			–		
Closed coupled version	–			●			●		
Inline design	–			–			●		
<b>Available sizes</b>	32-160	32-200	32-250	32-160	32-200	32-250	–	–	–
bearing bracket 360	40-160	40-200	40-250	40-160	40-200	40-250	40-160	40-200	–
bearing bracket 470	50-160	50-200	50-250	50-160	50-200	50-250	–	50-200	–
	65-160	65-200	60-250	65-160	65-200	60-250	–	65-200	–
	80-160	80-200	80-250	80-160	80-200	80-250	–	–	–

### Denomination

The denomination of a centrifugal pump of the TOE-GN / GA / GI series is:

Example ▶	TOE	- G	A	32	- 160	/ 150
Denomination of series						
Mechanical seal						
N = Version with bearing bracket, volute casing ax/top A = Closed coupled version, volute casing ax/top I = Closed coupled version, inline design						
Nominal width of outlet nozzle						
Nominal impeller diameter in mm						
Actual impeller diameter in mm						

## Operating data

- Flow rate up to approx. 200 m<sup>3</sup>/h
- Total heads up to approx. 100 m
- Max. operating temperatures:  
heat transfer oils up to + 350 °C  
hot water up to + approx. 160 °C

### Standard conditions at site

- Relative humidity during continuous operation max. 55%
- Ambient temperature up to + 40 °C
- Permissible altitude up to 1000 m above sea level

Deviations from the site conditions specified herein must already be disclosed in the inquiry.

### Flow rate

The permissible operating range of centrifugal pumps depends on

- impeller shape
- speed
- type of liquid
- viscosity
- bearing load
- heat dissipation - particularly with regard to insulated volute casings
- clearance between the net positive suction head of the plant and the pump

The operating range applicable to the TOE-GN /GA / GI series is indicated in the individual characteristic curves and the pump data sheet.

### Pump outlet pressure

The pump outlet pressure at the outlet nozzle depends on

- the pump inlet pressure
- the maximum total head of the selected impeller diameter
- the density of the medium to be pumped

The maximum pump outlet pressure  $p_{2max\ op}$  is calculated using the formula:

$$p_{2max\ op} = p_{1max\ op} + \rho \cdot g \cdot H \cdot 10^{-5}$$

With:

$$p_{2max\ op} = \text{maximum pump outlet pressure [bar]}$$

$$p_{1max\ op} = \text{maximum pump inlet pressure [bar]}$$

$$\rho = \text{density of the medium to be pumped [kg/m}^3\text{]}$$

$$g = \text{gravitation constant [m/s}^2\text{]}$$

$$H = \text{maximum total head at zero flow or at the peak of the pump's characteristic curve at the selected impeller diameter [m]}$$

Pumps must be selected and operated in a way which ensures that the maximum pump outlet pressure does by no means exceed the maximum permissible operating pressure of the casing  $p_{all\ w\ c}$  at operating temperature.

This also applies to commissioning while the discharge valve is closed (refer to Fig. 1).

### Pressure and temperature limitations

The maximum casing operating pressure  $p_{all\ w\ c}$  of the volute casing and the casing cover depends on the operating temperature:

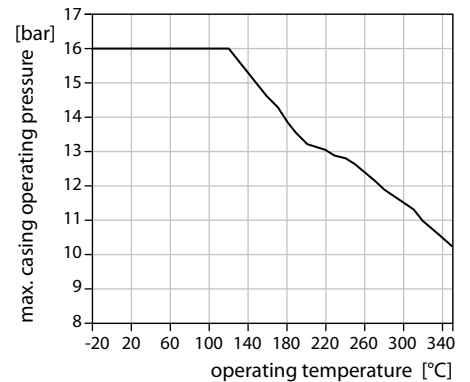


Fig. 1: Maximum permissible casing operating pressure  $p_{all\ w\ c}$

### Speeds

The operating speed of the pump shaft must not exceed the maximum permissible peripheral speed of the impeller, which corresponds to 48 m/s.

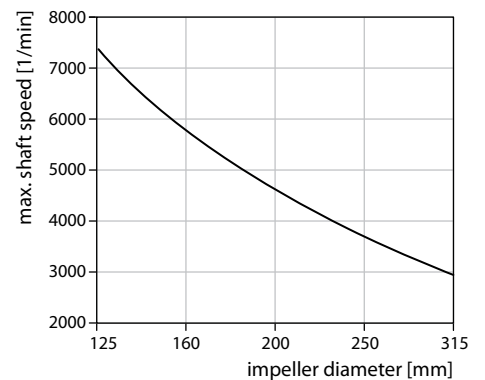


Fig. 2: Maximum permissible shaft speed

### Power transmission on bearing bracket

The maximum transmissible power of the pumps is

- on bearing bracket 360: 37 kW
- on bearing bracket 470: 75 kW

## Design details

Pumps of the TOE-GN / GA / GI series are single-stage, single-entry centrifugal pumps with volute casing in process design (disassembly of the cartridge insert while the volute casing remains in the conduit).

The tolerances of the mating dimensions are subject to the EN 735 standard.

### Allocation of components

Pumps of this series are part of a modular system, whose components can also be used for other pump series.

The complete bearing brackets including the impeller are used in the series with mechanical seal.

For the parts allocation, refer to page 40.

The TOE series is also available with magnetic coupling (see catalogue TOE-MN / MA / MI).

## Materials

Volute casing	EN-GJS-400-15 Spheroidal graphite cast iron	EN-GJS-400-18-LT** Spheroidal graphite cast iron**
Casing cover		
Impeller	EN-GJL-250 Cast iron	
Mechanical seal housing	EN-GJS-400-15 Spheroidal graphite cast iron	EN-GJS-400-18-LT** Spheroidal graphite cast iron**
Shaft	1.4122 CrMo-steel	
Bracket*	EN-GJS-400-15 Spheroidal graphite cast iron	EN-GJS-400-18-LT** Spheroidal graphite cast iron**
Plain bearing	S SiC	Carbon
Mechanical seal	AQ <sub>1</sub> VGG	

EN-GJS-400-15 = EN-JS1030 = GGG-40  
 EN-GJS-400-18LT = EN-JS-1025 = GGG-40.3

\*) TOE-GA / GI only

\*\*) on request

Tab. 1: Materials

### Volute casing

The nominal pressure of the volute casing is PN 16.

The outlet and inlet nozzles are fitted with bosses to allow for the subsequent connection of pressure gauges. These ports are only drilled upon request of the customer.

The volute casings are self-venting and provided with a plugged drain (G 3/8) as a standard.

### Casing cover

The casing cover is equipped with torsion-resistant reinforcing ribs, which are designed so that optionally prefabricated insulation segments can be installed.

## Shaft and bearing

The shaft is extremely rigid to minimise bending in the area of the plain bearing and the mechanical seal. The hydraulic forces generated during pump operation are compensated in different ways.

The radial reaction forces resulting from radial forces are mainly compensated by the plain bearing, which is positioned close to the impeller. The residual radial forces are transferred to the ball bearing on the atmospheric side.

The plain bearing is lubricated by the medium to be pumped and has been designed for hydrodynamic lubrication.

The hydraulic axial forces are mainly compensated by the back vanes on the impeller. Still available residual forces are balanced by the ball bearing on the coupling side.

The ball bearing is lifetime-lubricated with high-temperature grease and designed for a service life of 17,500 h. The bearing does not allow for re-lubrication and should be replaced before expiration of the indicated period of time.

### Shaft sealing

The shaft is sealed against the atmosphere by means of a single-acting mechanical seal in unbalanced design (materials refer to Tab. 1). The function of this sealing depends on the shaft's direction of rotation.

### Mechanical seal housing

The mechanical seal housing features a vent and drain and can be equipped with a quench reservoir (refer to chapter „Accessories“). If no quench reservoir is provided, a directed leakage evacuation tube is attached.

When the pump is filled for the first time, the vent screw has to be opened until oil escapes. During this process, the shaft should be continuously turned by hand to release trapped air bubbles.

### Cooling fan

The coupling half at the pump side is equipped with a cooling fan as a standard, which supports heat dissipation in the area of the ball bearing and the mechanical seal.

### Utility connections

For the exact positions and dimensions of the utility connections, refer to the dimension drawings of the pump on pages 12 et seq.

### Accessories

#### Quench reservoir

The task of the quench reservoir is to prevent oxygen from reacting with the seal leakage. This would result in sedimentation on the seal, which might impair its functioning in the long run.

The quench reservoir has to be filled with cold oil with low viscosity ( $< 10\text{mm}^2/\text{s}$ ).

The filling level has to be checked in regular intervals. The quench fluid is sealed against the atmosphere by means of a radial lip seal.

#### Base plate | TOE-GN / GA

Dimensions following the recommendations of DIN 24259

#### Drives

Surface-cooled three-phase asynchronous motors for low voltages with cage rotor

- designs IM B3, IM B5 or IM B35
- degree of protection IP 54
- insulation class F
- power ratings and dimensions in acc. with DIN 42677 / IEC 72
- make according to our choice

Other motor versions are available upon request.

If the motors are provided by the customer, a sufficient cooling power of the motor fan must be ensured ( $> 3\text{ m/s}$  flow rate measured at the motor's bearing shield at the pump side).

### Tests

If required, test certificates in acc. with DIN 55350-18 can be provided for the individual tests, which, however, has to be indicated in the order.

#### Material tests in acc. with EN 10204

The exact scope of the tests (which test for which parts) as well as the type of certificate (certificate of compliance with the order, factory certificate, inspection certificate) must be specified in the order.

Non-specific material tests do not have any impact on the delivery time of the pump.

If specific material tests are required, the delivery time of the pump depends on the availability of raw materials and will be checked on a case-to-case basis.

Tests certificates for specific material tests cannot be provided after the raw materials and/or semi-finished goods have been negotiated.

#### Gas pressure tests

All pressure bearing parts, e.g.

- volute casing
- casing cover
- mechanical seal housing

are subject to a gas pressure test (leakage test).

The gas pressure test is carried out by applying forming gas at 2 bar. The holding time is 15 minutes. By means of this test, the tightness of the parts is proven.

#### Hydrostatic pressure test

All pressure bearing parts are subject to a pressure test, during which the hydrostatic test pressure ( $p_{\text{test}}$ ) corresponds to 1.3 times the basic design pressure ( $p_N$ ) at 20 °C, following the recommendations of prEN 12162. The holding time is 10 minutes.

If pressure tests are to be carried out in acc. with other criteria, such criteria must be indicated in the inquiry.

By means of this test, the strength of the parts is proven.

**Hydraulic tests (performance curves)**

If required, hydraulic tests in acc. with ISO 9906, accuracy class II, can be implemented and the characteristic curves measured for the corresponding impeller diameter documented.

This option has to be indicated accordingly in the order. The purpose of this test is to verify that the duty point of the manufactured pump complies with the contractual duty point.

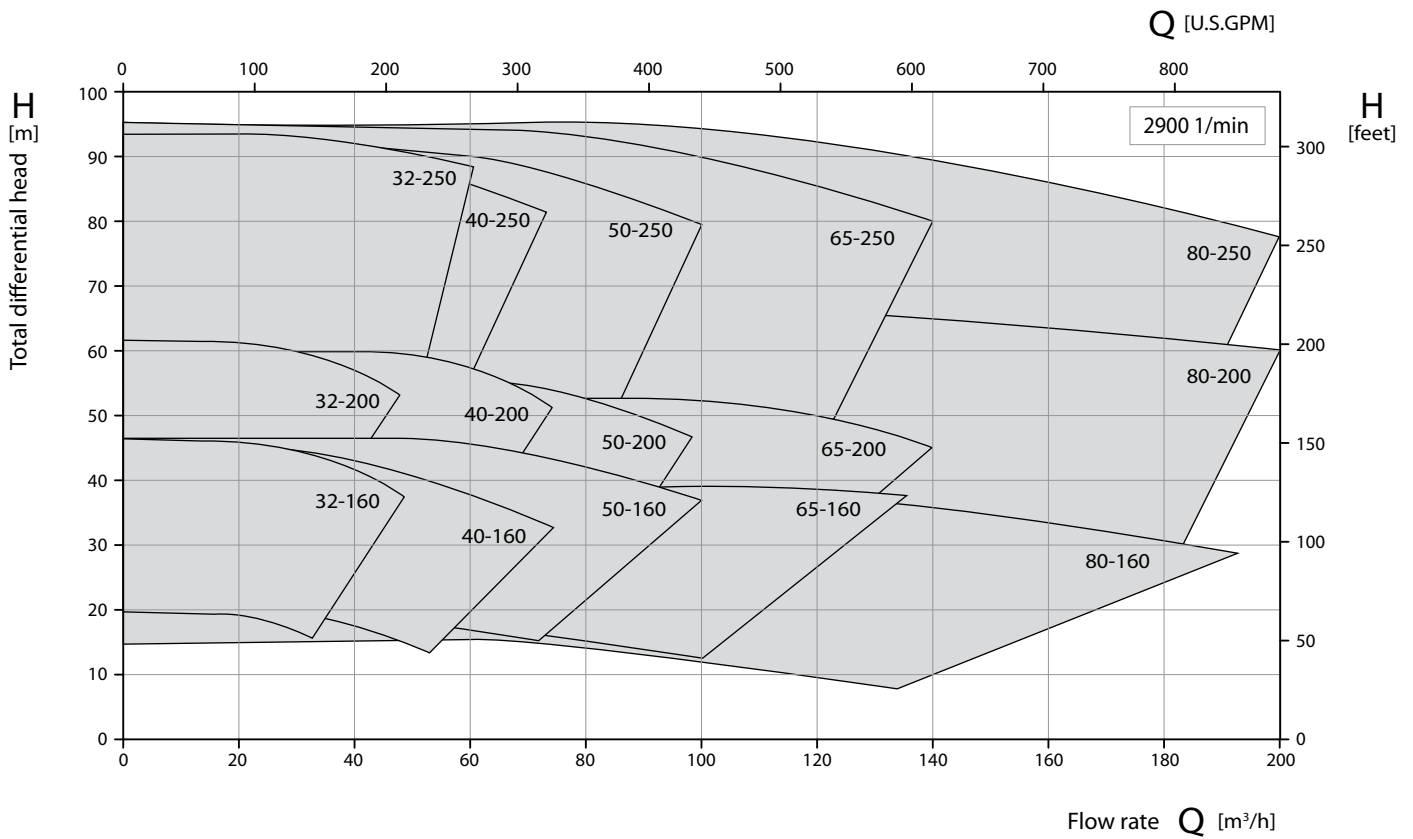
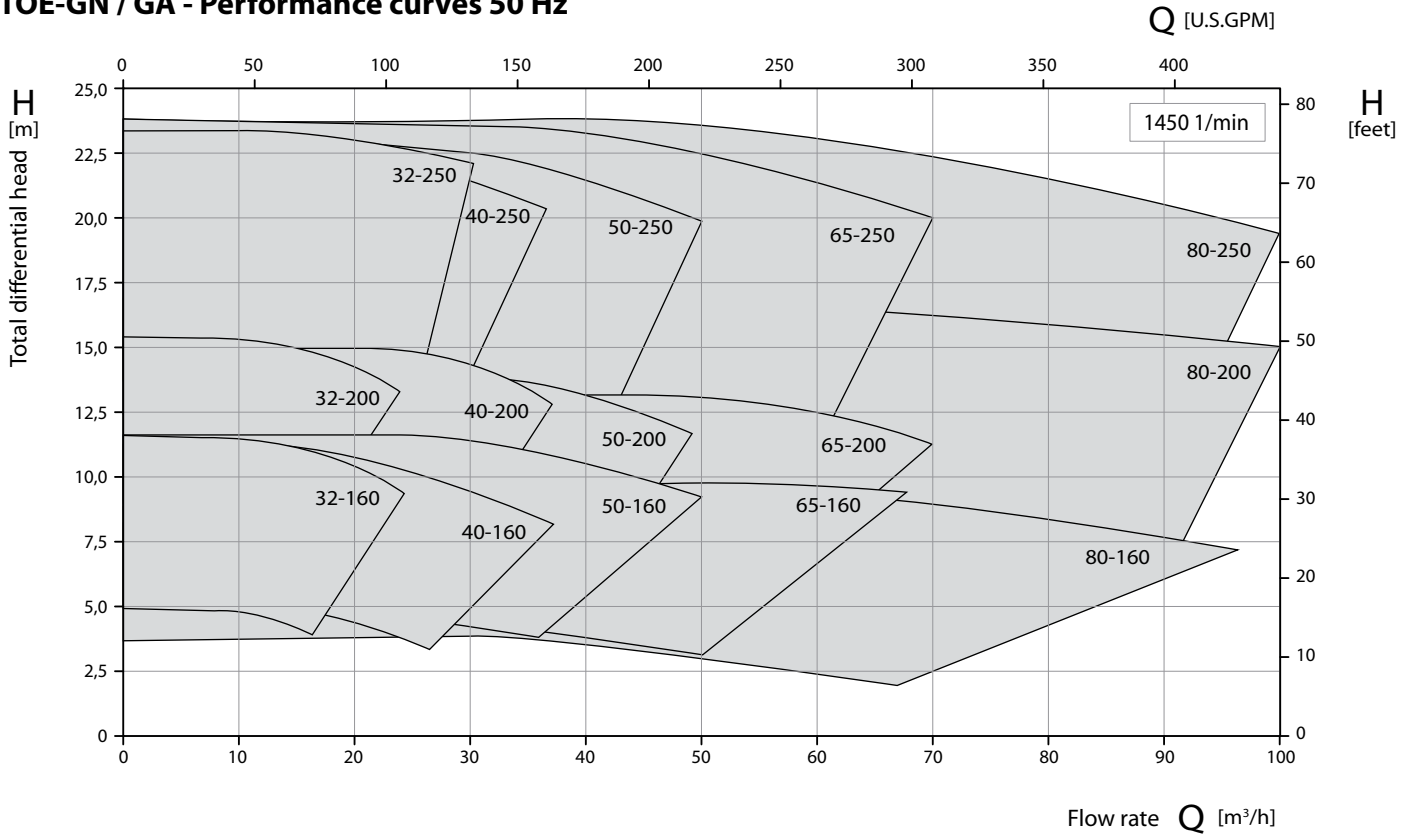
**Painting**

The pumps are coated with highly heat-resistant white aluminium paint, colour code RAL 9006.

**TOE-GN / GA / GI**

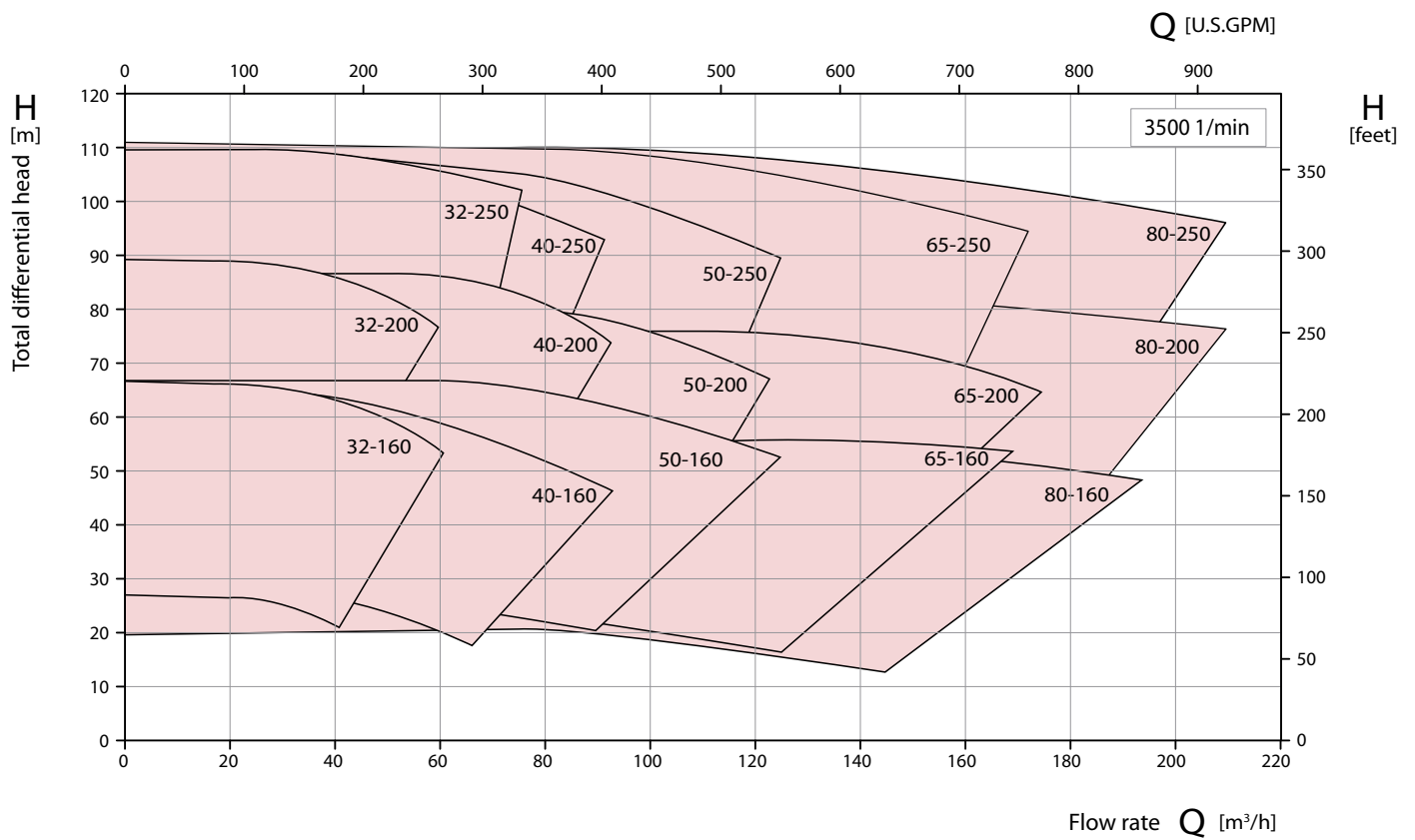
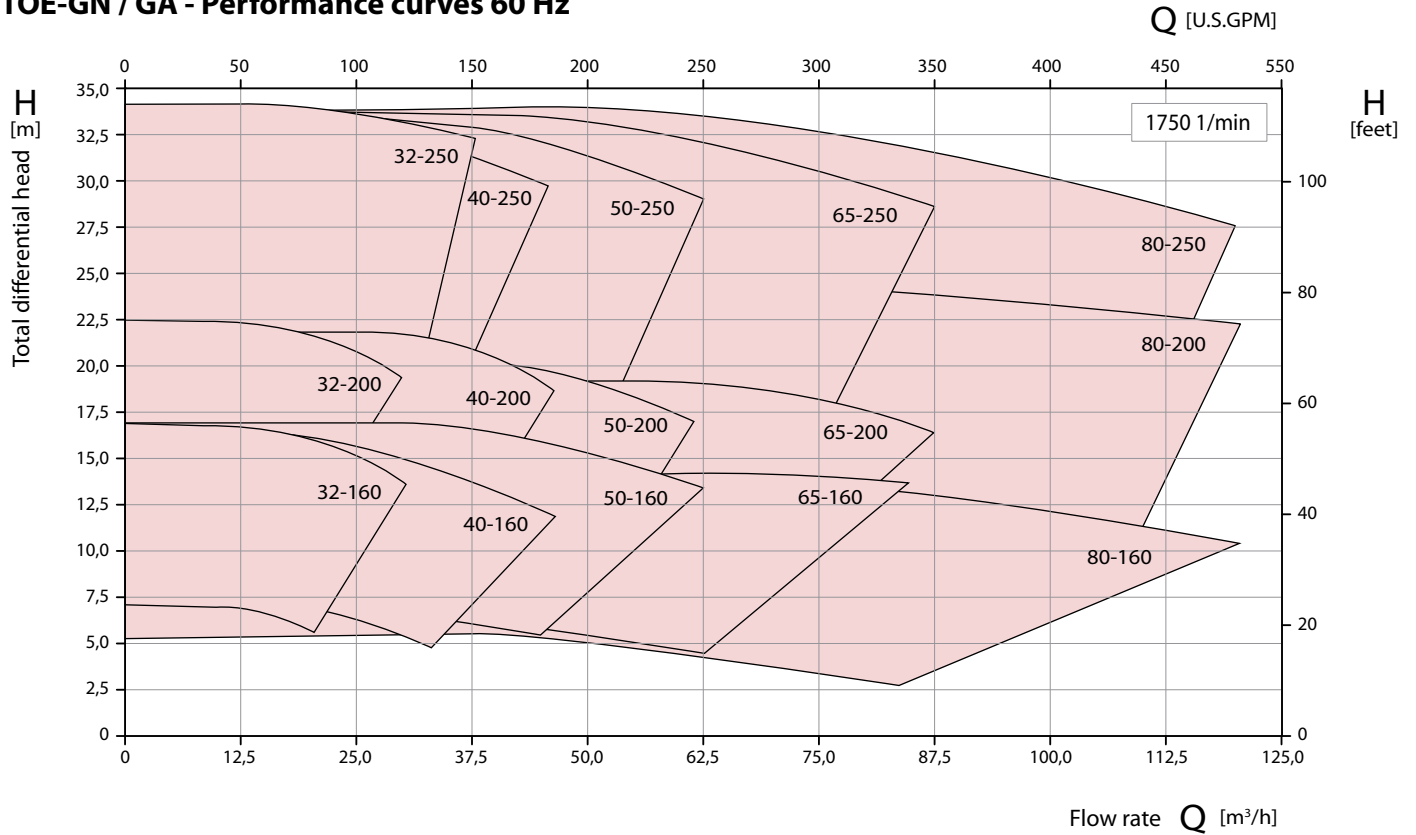
Heat transfer pumps with mechanical seal

**TOE-GN / GA - Performance curves 50 Hz**

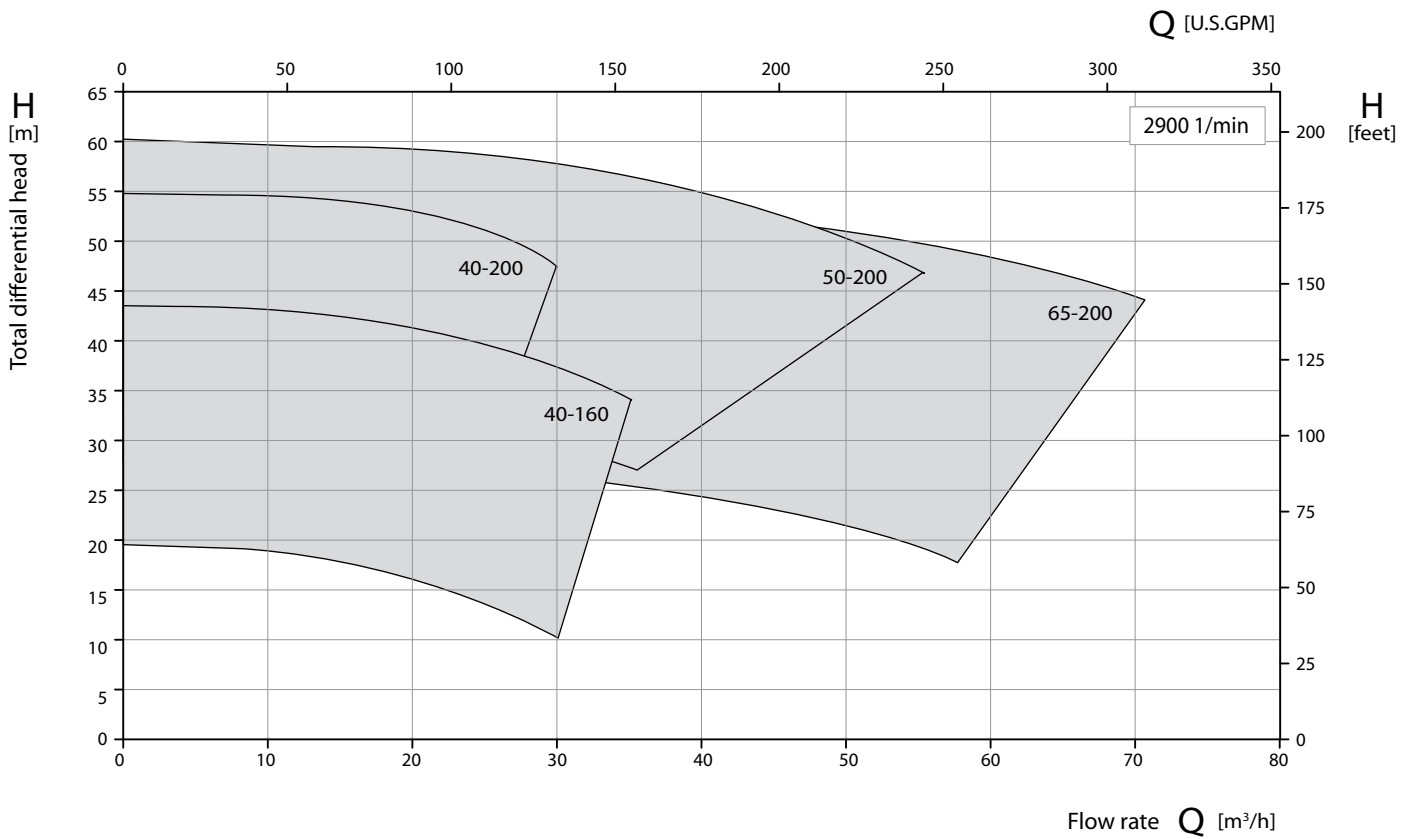
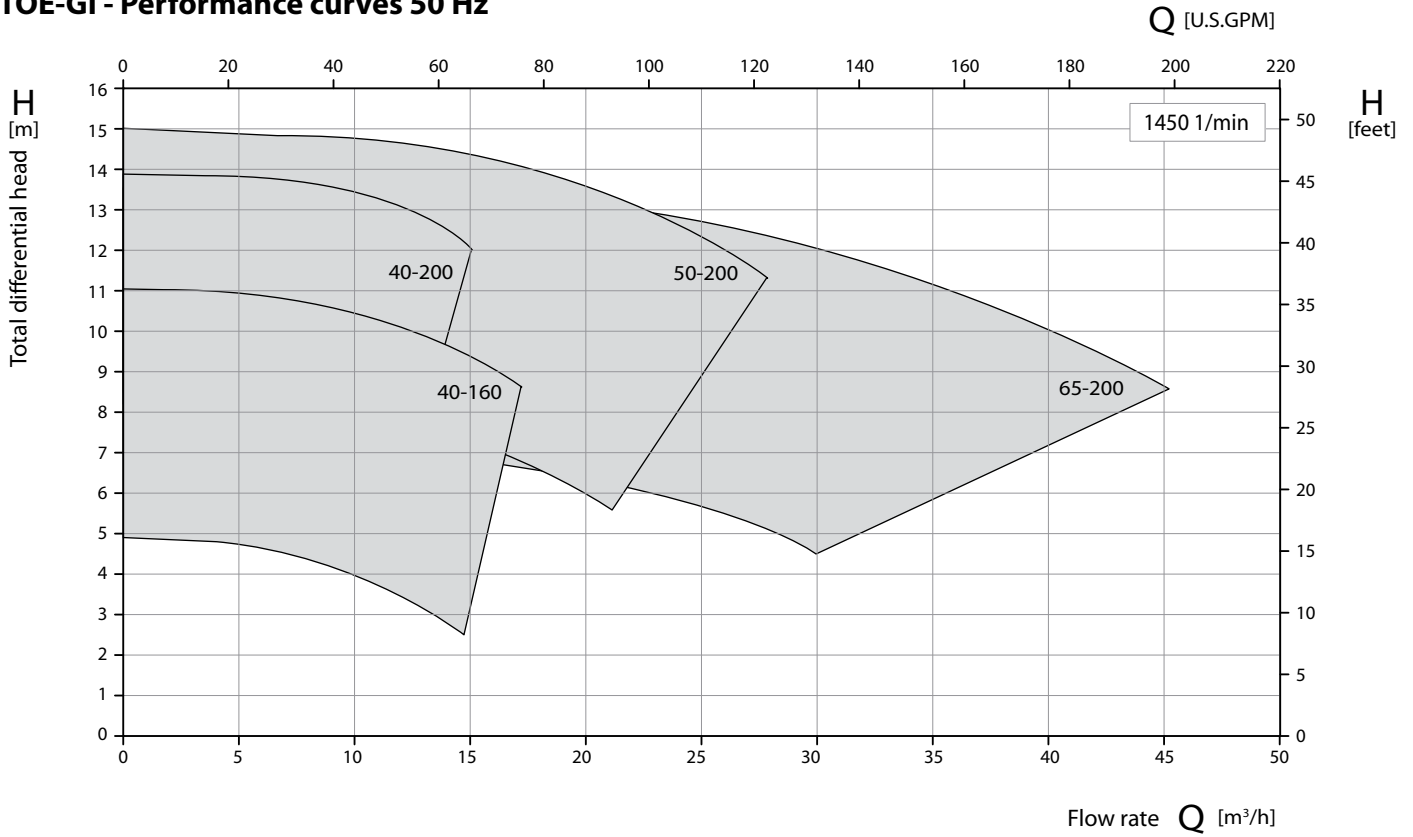




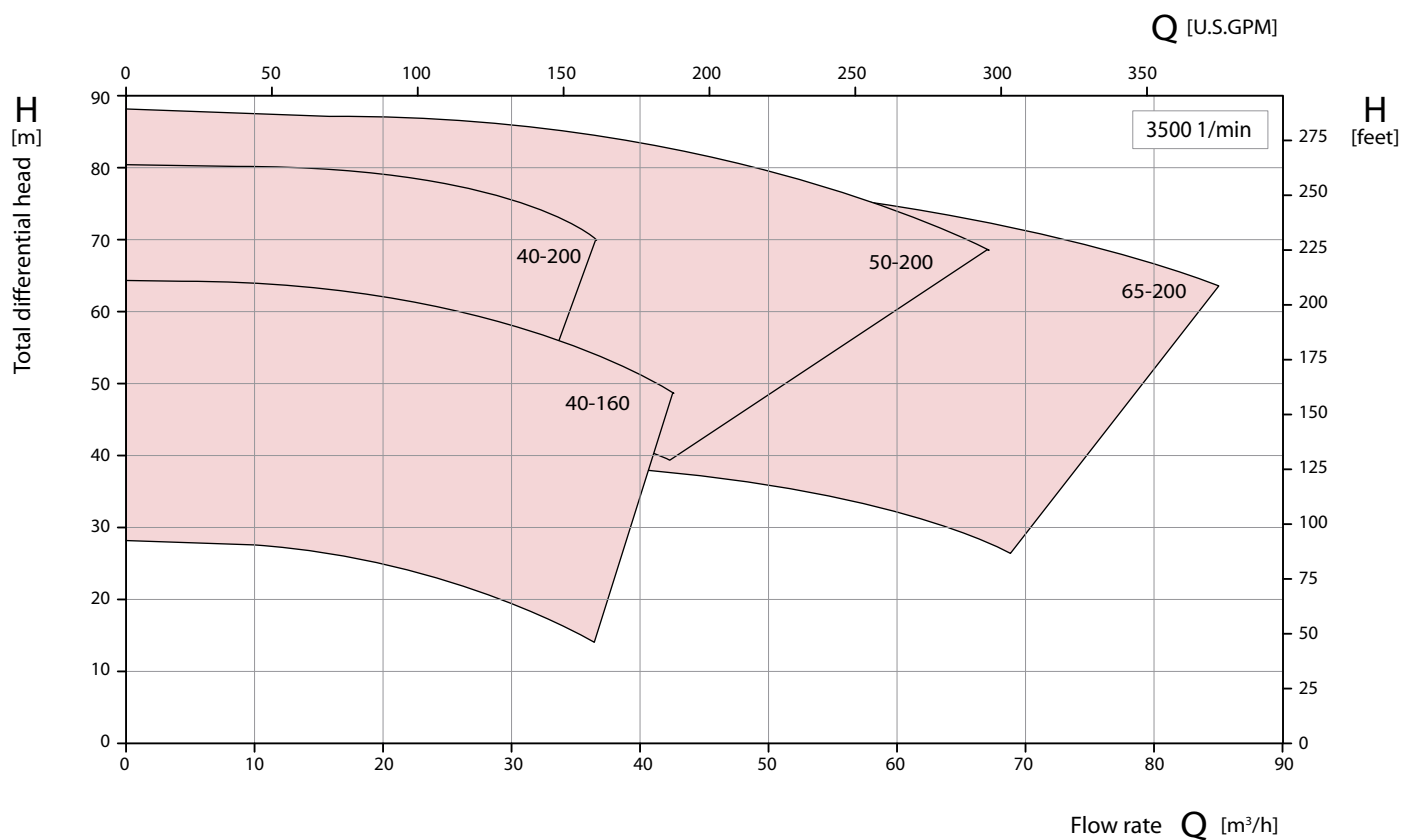
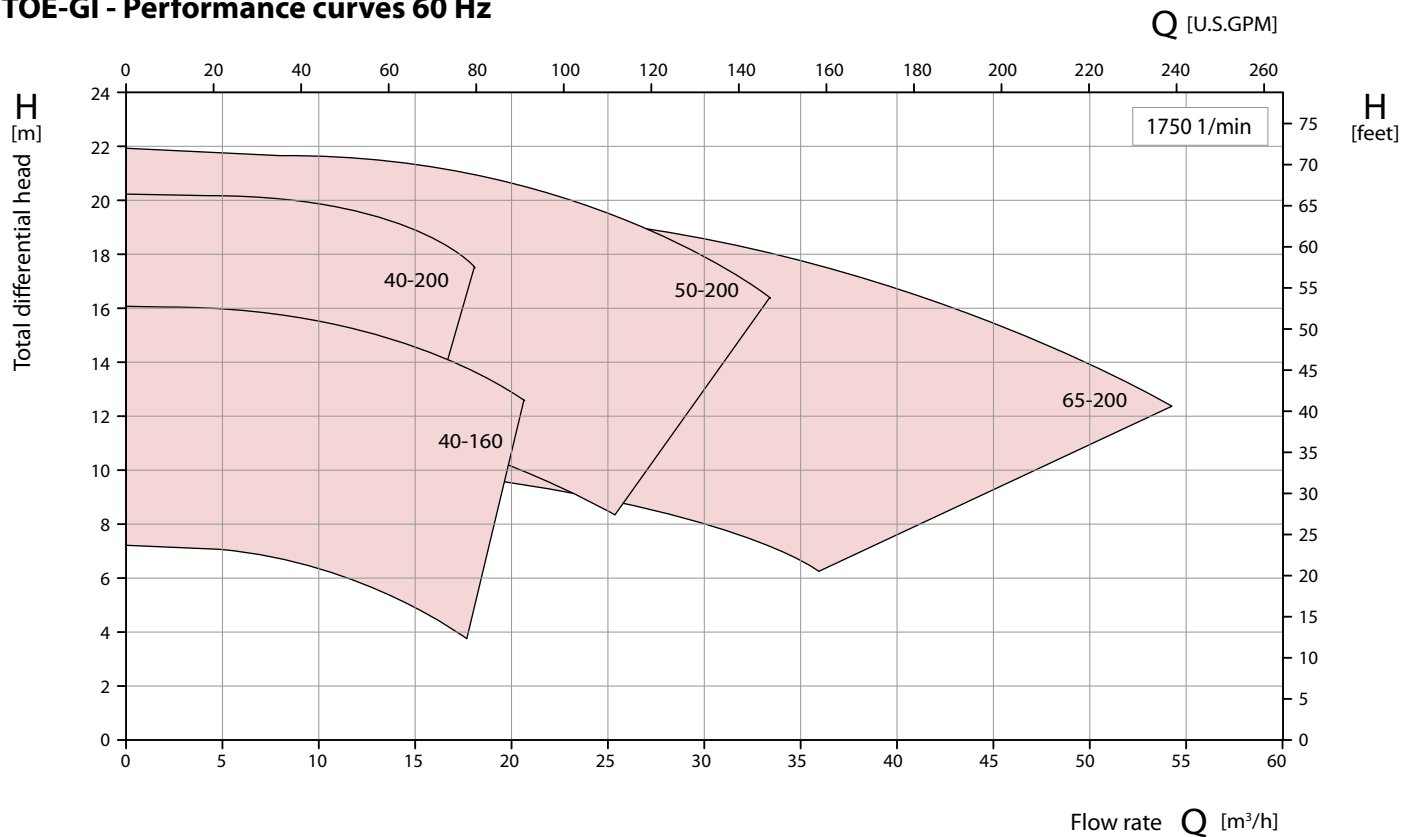
TOE-GN / GA - Performance curves 60 Hz



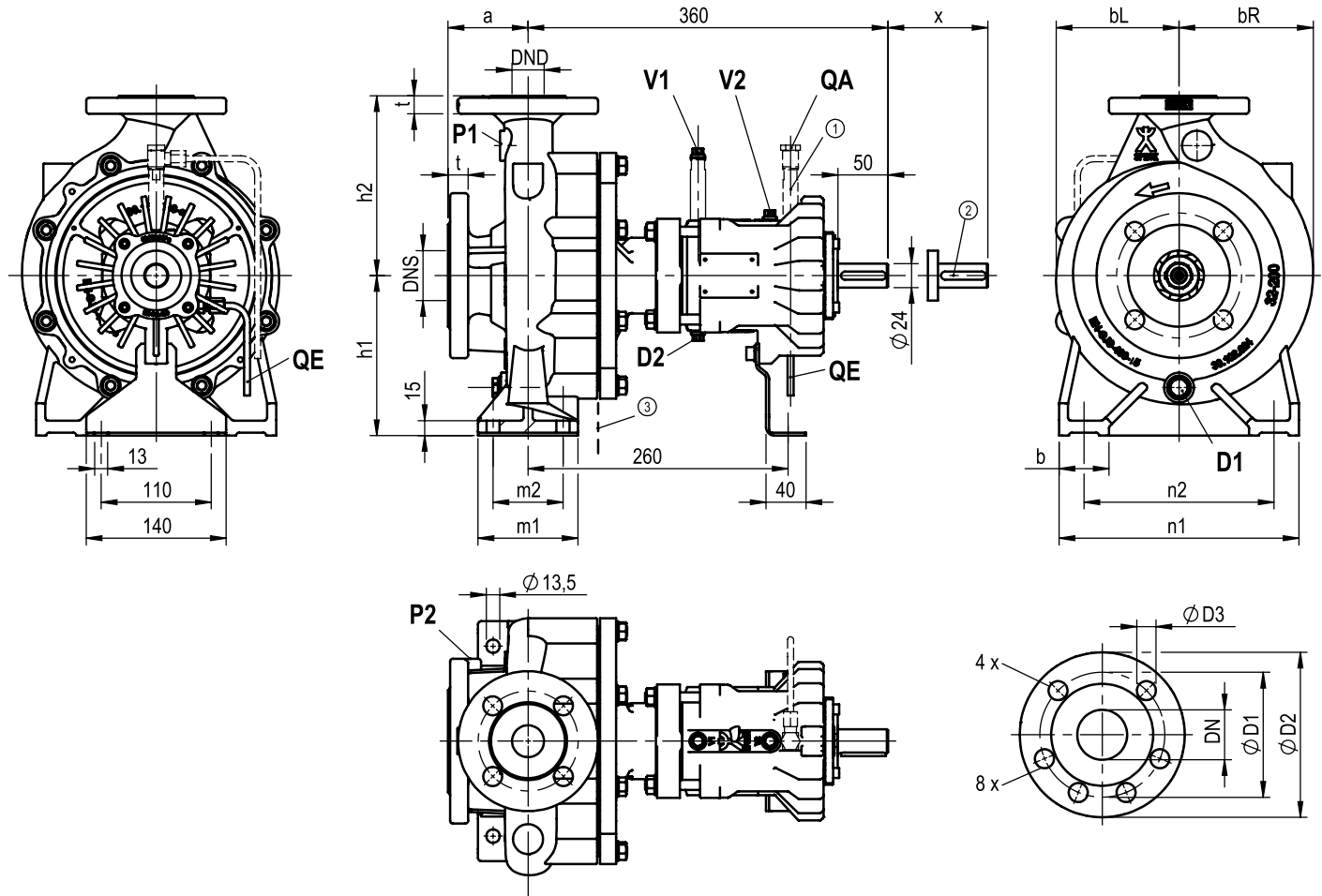
TOE-GI - Performance curves 50 Hz



TOE-GI - Performance curves 60 Hz



TOE-GN, bearing bracket 360 - Pump dimensions



Pump	Pump dimensions							Foot dimensions					P-out
Size	DNS	DND	a	bL	bR	h1	h2	b	m1	m2	n1	n2	x
32-160				123	132	160							
32-200	50	32	80	135	160	180		50	100	70	240	190	
32-250			100	163	180	225		65	125	95	320	250	
40-160			80	123	129	132	160				240	190	
40-200		40		127	141	160	180	50	100	70	265	212	
40-250				151	160	180	225	65	125	95	320	250	110
50-160	65			123	136	180	180				265	212	
50-200		50	100	130	148	160	200	50	100	70	265	212	
50-250				157	170	180	225				320	250	
65-160				124	151	160	200				280	212	
65-200	80	65		136	164	180	225	65	125	95	320	250	
80-160				139	174	180	225				320	250	

Flanges in acc. with DIN EN 1092-2

DN	øD2	øD1	t	øD3	Holes
32	140	100	18	19	4
40	150	110	18		
50	165	125	20		
65	185	145	20		
80	200	160	22	19	8
100	220	180	24		

Flanges in acc. with ANSI 150 lbs

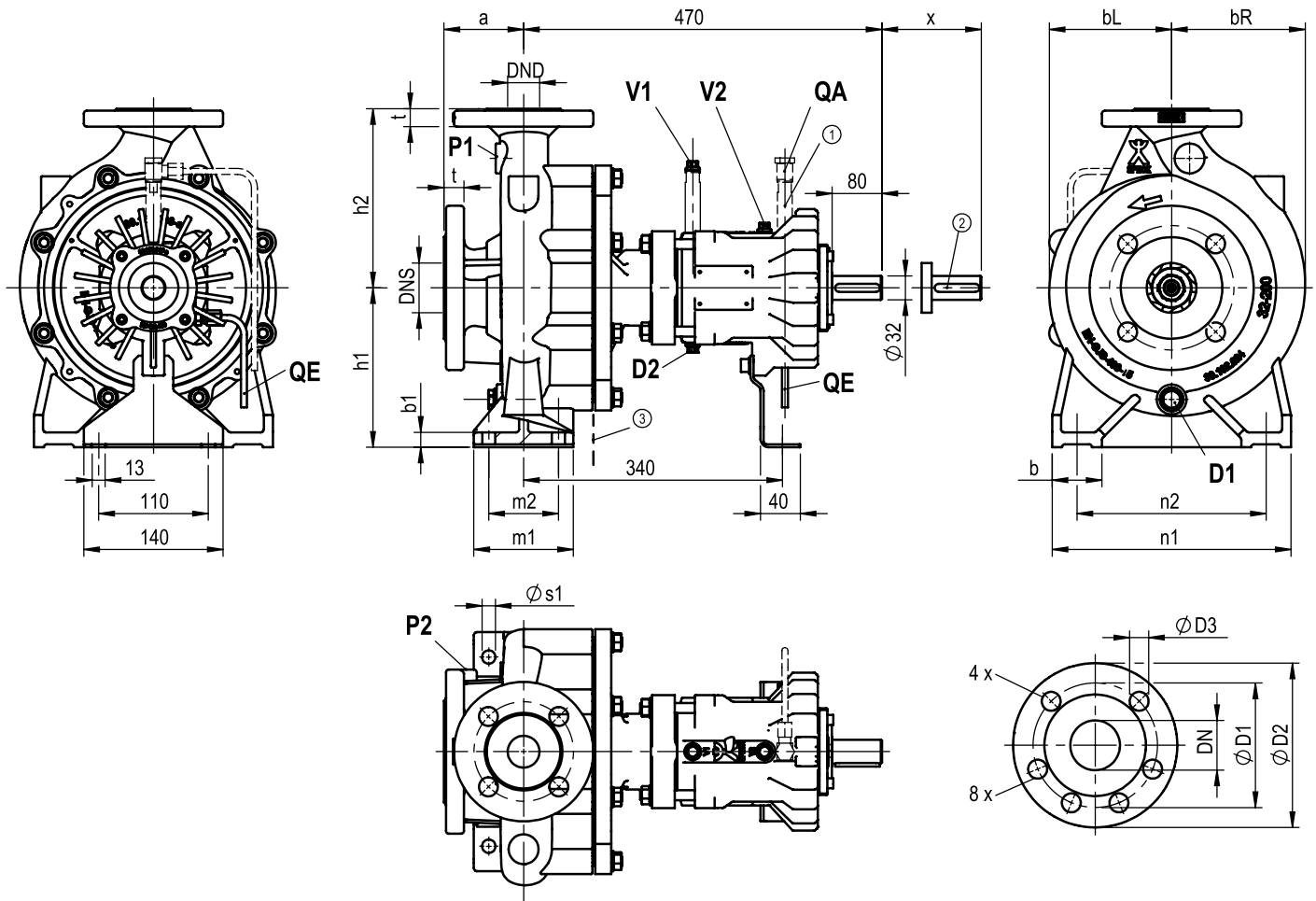
DN	øD2	øD1	t	øD3	Holes
32	140	88,9	18	16	4
40	150	98,6	18	16	
50	165	120,7	20	19	
65	185	139,7	20	19	
80	200	152,4	22	19	8
100	220	190,5	24	19	

Utility connections

P1	G 1/4	Outlet pressure indicator connection (not drilled)
P2	G 1/8	Inlet pressure indicator connection (not drilled)
V1	G 1/8	Mechanical seal housing vent (at horizontal installations)
V2	G 1/8	Mechanical seal housing vent (at vertical installations)
D1	G 3/8	Volute casing drain
D2	G 1/8	Mechanical seal housing drain
QE	G 1/8	Mechanical seal leakage tube
QA	G 1/8	Quench

- ① Quench optionally
  - ② Keyway DIN 6885
  - ③ Volute casing (102) insulation only to this line
- P-out. = Pull out

TOE-GN, bearing bracket 470 - Pump dimensions



Pump	Pump dimensions								Foot dimensions						P-out
Size	DNS	DND	a	bL	bR	h1	h2	b	b1	m1	m2	n1	n2	ø s1	x
65-250	80	65	100	172	190	200	250	80	18	160	120	360	280	18	140
80-200	100	80	125	162,5	191	180	280	65	15	125	95	345	315	13,5	18
80-250			181	206,5	200	80		18	160	120	400	18			

Flanges in acc. with DIN EN 1092-2

DN	øD2	øD1	t	øD3	Holes
65	185	145	20	19	4
80	200	160	22		8
100	220	180	24		

Flanges in acc. with ANSI 150 lbs

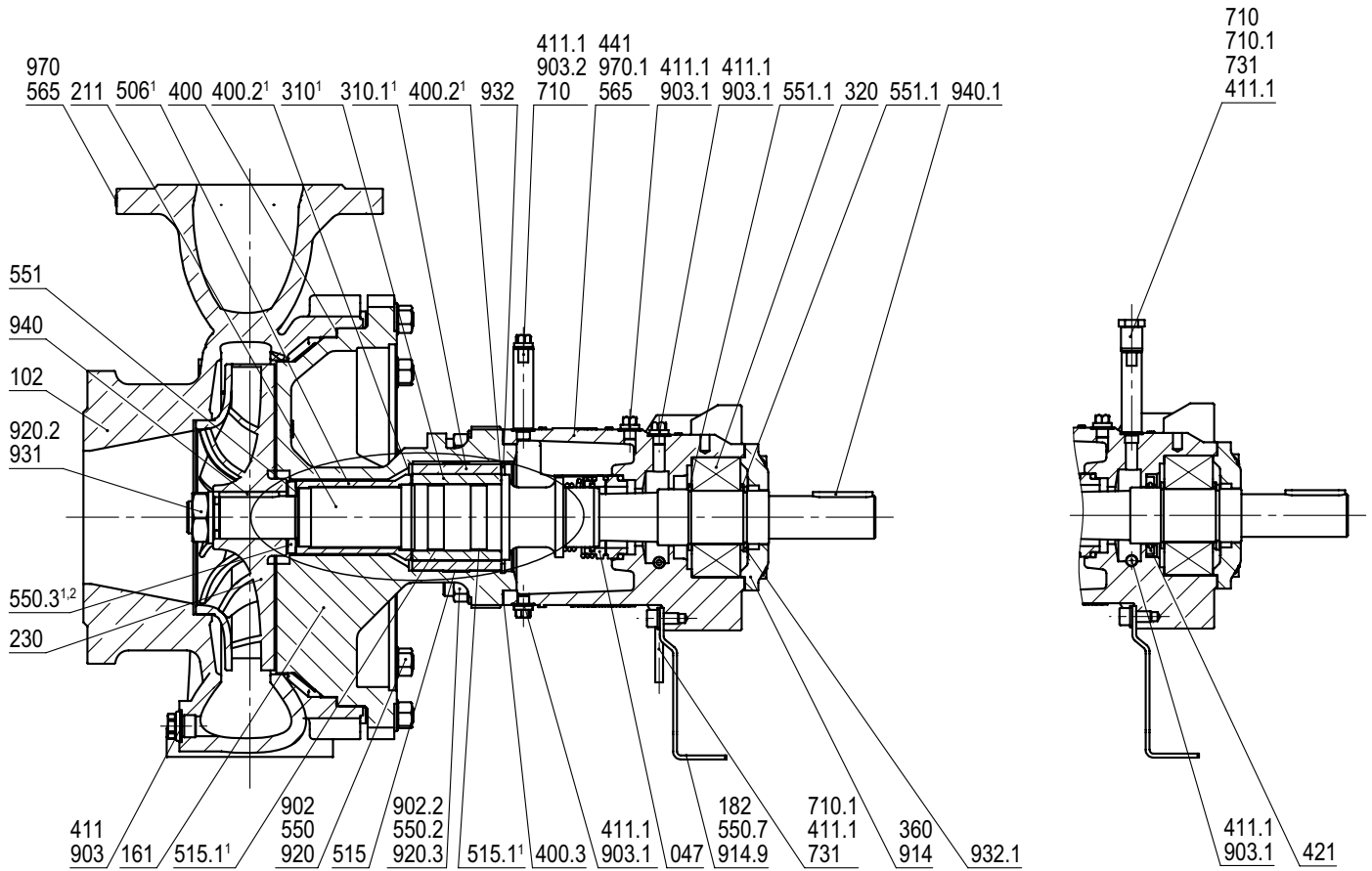
DN	øD2	øD1	t	øD3	Holes
65	185	139,7	20	19	4
80	200	152,4	22		8
100	220	190,5	24		

Utility connections

P1	G 1/4	Outlet pressure indicator connection (not drilled)
P2	G 1/8	Inlet pressure indicator connection (not drilled)
V1	G 1/8	Mechanical seal housing vent (at horizontal installations)
V2	G 1/8	Mechanical seal housing vent (at vertical installations)
D1	G 3/8	Volute casing drain
D2	G 1/8	Mechanical seal housing drain
QE	G 1/8	Mechanical seal leakage tube
QA	G 1/8	Quench

- ① Quench optionally
  - ② Keyway DIN 6885
  - ③ Volute casing (102) insulation only to this line
- P-out. = Pull out

TOE-GN, bearing bracket 360 and 470 - Cross-sectional drawing and part list



Version with nom. impeller ø 160 and 200 mm

047	Mechanical seal
102	Volute casing
161	Casing cover
182	Foot
211	Shaft
230	Impeller
310 <sup>1</sup> -310.1 <sup>1</sup>	Bearing, complete
320	Kugellager
360	Bearing cover
400, 400.2 <sup>1</sup> -400.3	Flat gasket
411-411.1	Ring gasket
441	Shaft seal housing
506 <sup>1</sup>	Retaining ring
515-515.1 <sup>1</sup>	Tolerance ring
550, 550.2-550.3 <sup>1,2</sup> , 550.7	Washer
551-551.1	Shim washer
565	Rivet
710 - 710.1	Tube
731	Screw joint
902, 902.2	Stud
903-903.1	Screwed plug
903.2	Vent screw
914, 914.9	Socket head cap screw
920, 920.2-920.3	Hexagon nut
931	Lock washer
932-932.1	Lock ring
940-940.1	Key
970-970.1	Plate

Version with nom. impeller ø 250 mm

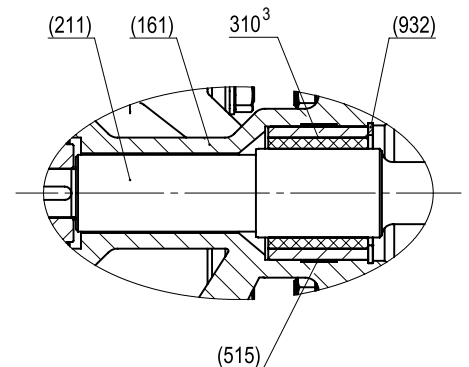
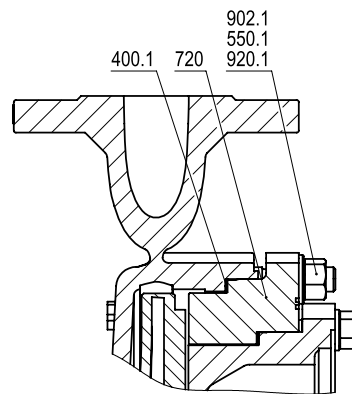
400.1	Flat gasket
550.1	Disk
720	Counter flange
902.1	Stud
920.1	Hexagon nut

Version with quench

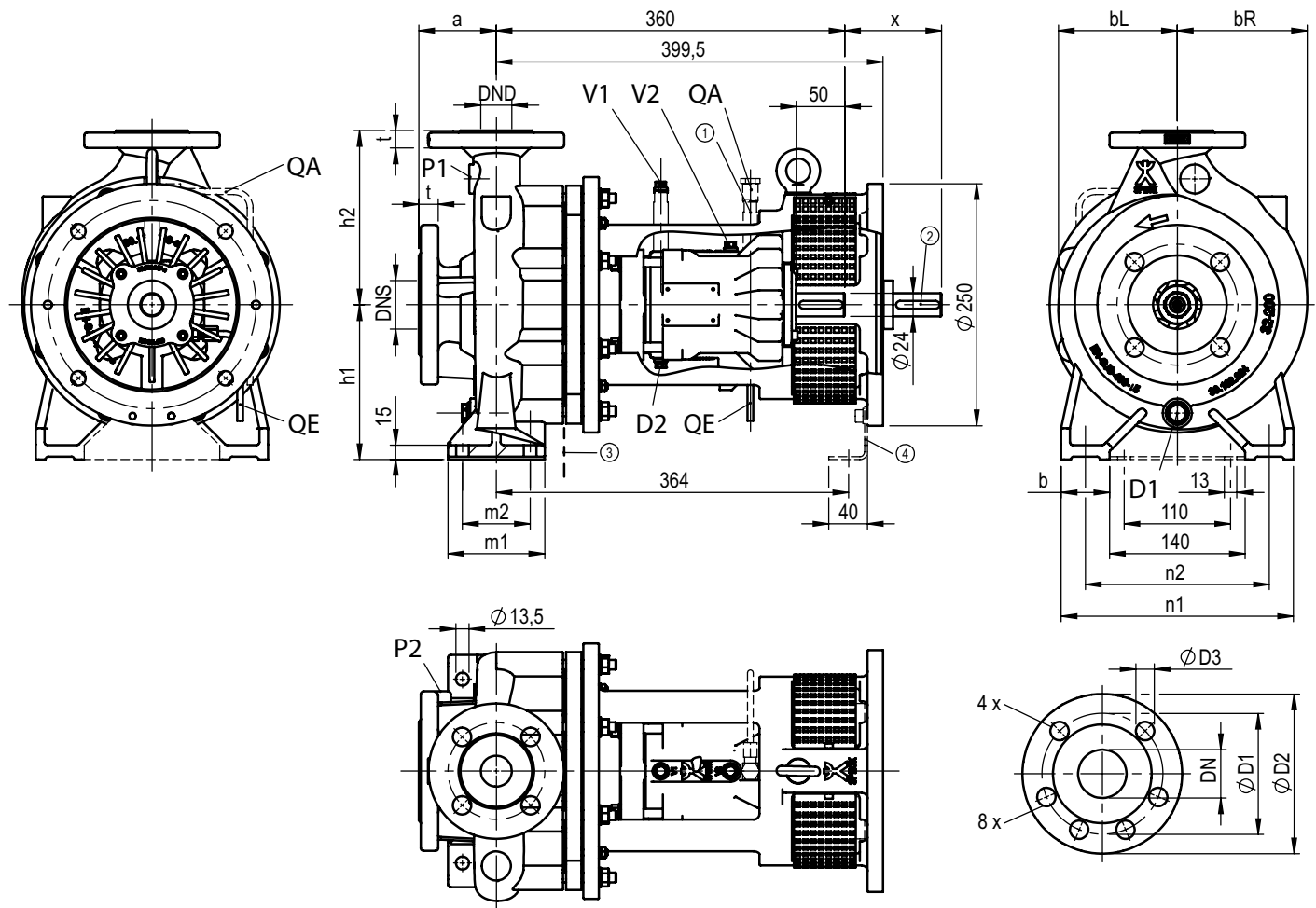
411.1	Ring gasket
421	Radial shaft seal
710-710.1	Tube
731	Screw joint
903.1	Screwed plug

Version with plain bearing in carbon

310 <sup>3</sup>	Plain bearing (carbon)
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<sup>1</sup> Plain bearing (SiC) only  
<sup>2</sup> Bearing bracket 470 only  
<sup>3</sup> Plain bearing (carbon) only

**TOE-GA, bearing bracket 360 - Pump dimensions**


Pump	Pump dimensions						Foot dimensions						P-out	
Size	DNS	DND	a	bL	bR	h1	h2	b	m1	m2	n1	n2	x	
32-160			80	123	123	132	160							
32-200	50	32			135	160	180	50	100	70	240	190		
32-250			100	152	163	180	225	65	125	95	320	250		
40-160			80	123	129	132	160				240	190		
40-200		40		127	141	160	180	50	100	70	265	212		
40-250				151	160	180	225	65	125	95	320	250	110	
50-160	65			123	136		180							
50-200		50	100	130	148	160	200	50	100	70	265	212		
50-250				157	170	180	225				320	250		
65-160	80	65		124	151	160	200	65	125	95	280	212		
65-200				136	164		180				320	250		
80-160	100	80	125	139	174	180	225							

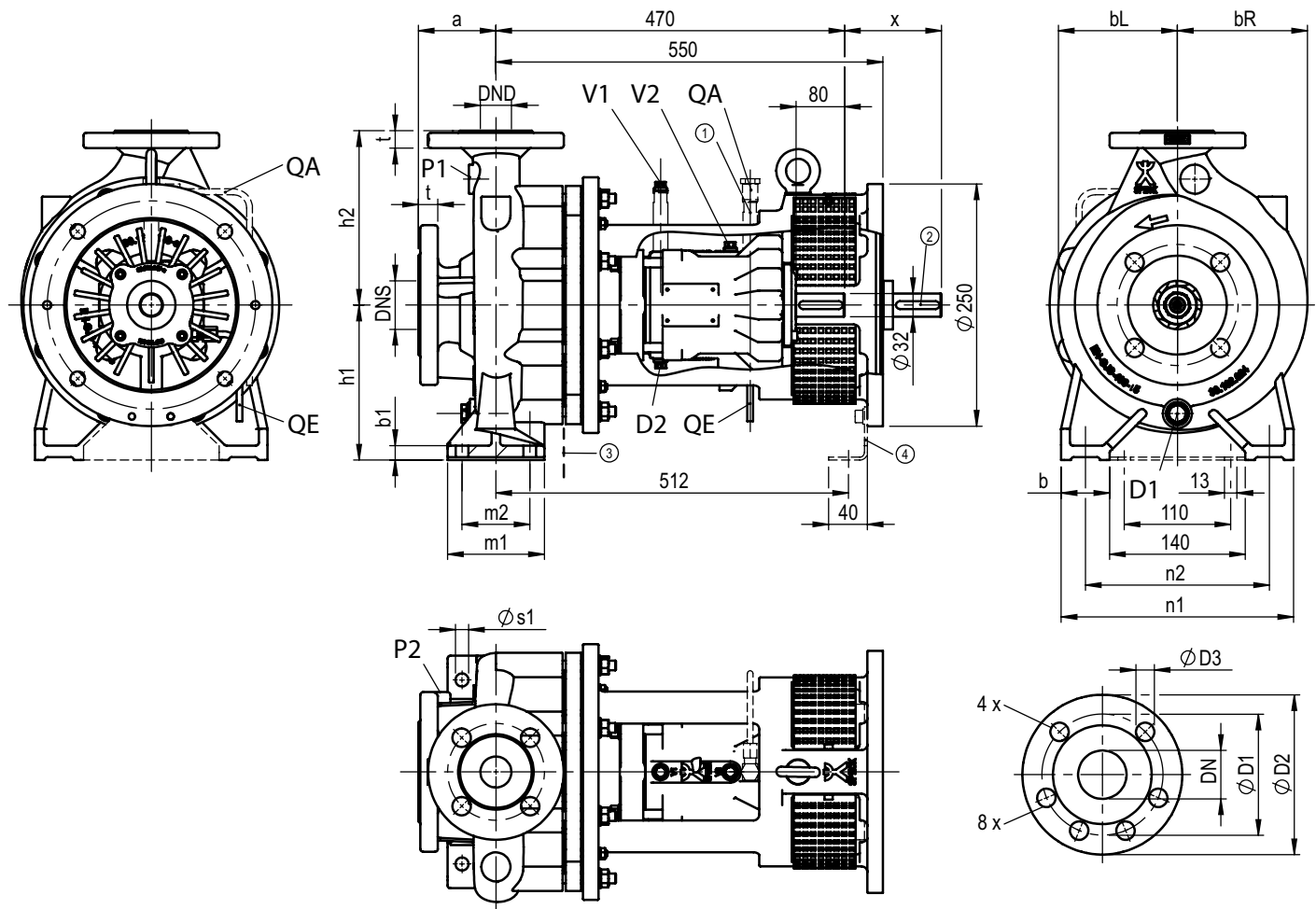
Flanges in acc. with DIN EN 1092-2					
DN	øD2	øD1	t	øD3	Holes
32	140	100	18	19	4
40	150	110			
50	165	125			
65	185	145			
80	200	160	22		8
100	220	180			

Flanges in acc. with ANSI 150 lbs						
DN	øD2	øD1	t	øD3	Holes	
32	140	88,9	18	16	4	
40	150	98,6				
50	165	120,7				
65	185	139,7				
80	200	152,4	22		19	8
100	220	190,5				

Utility connections		
P1	G 1/4	Outlet pressure indicator connection (not drilled)
P2	G 1/8	Inlet pressure indicator connection (not drilled)
V1	G 1/8	Mechanical seal housing vent (at horizontal installations)
V2	G 1/8	Mechanical seal housing vent (at vertical installations)
D1	G 3/8	Volute casing drain
D2	G 1/8	Mechanical seal housing drain
QE	G 1/8	Mechanical seal leakage tube
QA	G 1/8	Quench

- ① Quench optionally
  - ② Keyway DIN 6885
  - ③ Volute casing (102) insulation only to this line
  - ④ Foot optionally
- P.-out. = Pull out

TOE-GA, bearing bracket 470 - Pump dimensions



Pump	Pump dimensions							Foot dimensions						P-out	
Size	DNS	DND	a	bL	bR	h1	h2	b	b1	m1	m2	n1	n2	Øs1	x
65-250	80	65	100	172	190	200	250	80	18	160	120	360	280	18	140
80-200	100	80	125	162,5	191	180		65	15	125	95	345		13,5	
80-250			181	206,5	200	280	80	18	160	120	400	315	18		

Flanges in acc. with DIN EN 1092-2

DN	ØD2	ØD1	t	ØD3	Holes
65	185	145	20	19	4
80	200	160	22		8
100	220	180	24		

Flanges in acc. with ANSI 150 lbs

DN	ØD2	ØD1	t	ØD3	Holes
65	185	139,7	20	19	4
80	200	152,4	22		8
100	220	190,5	24		

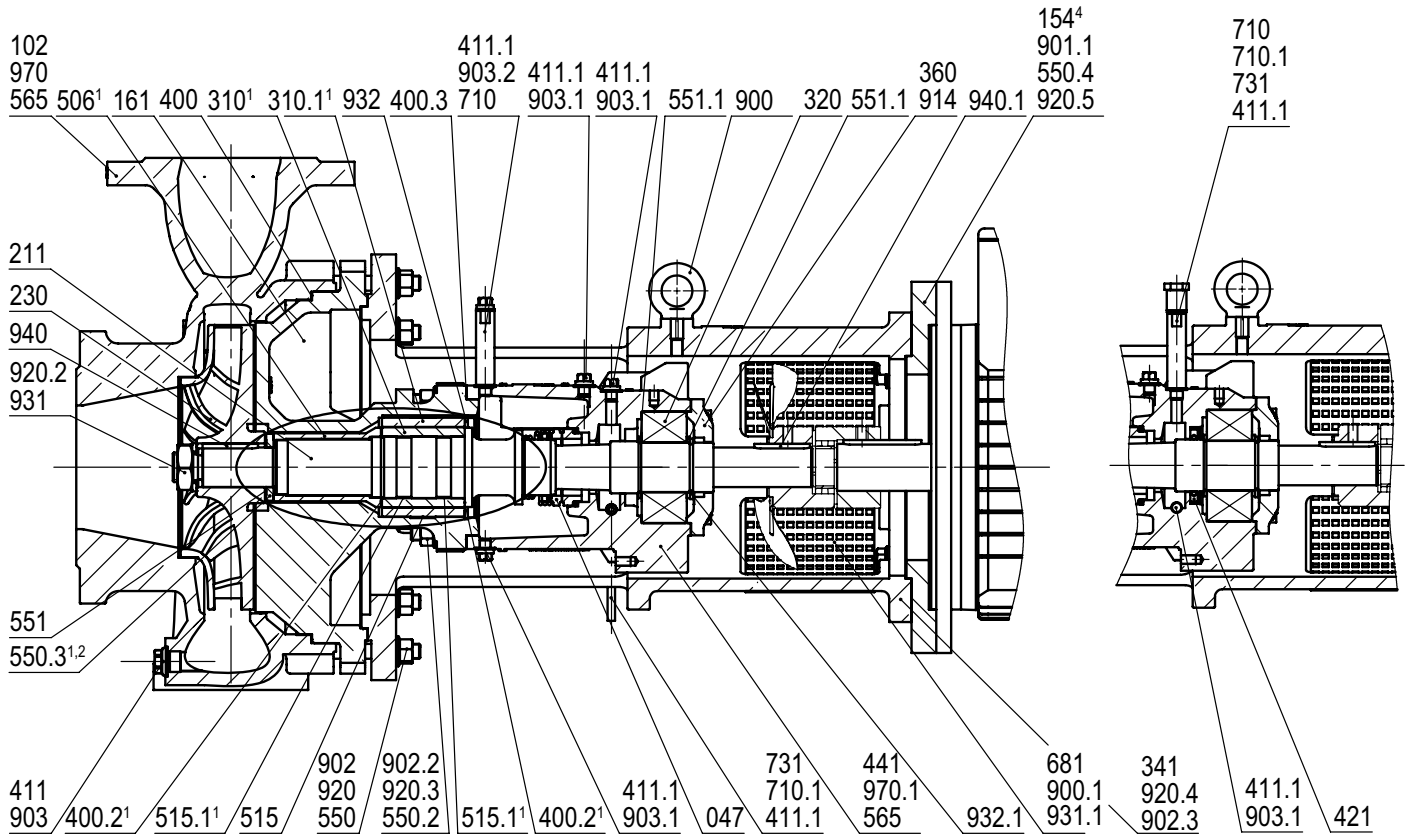
Utility connections

P1	G 1/4	Outlet pressure indicator connection (not drilled)
P2	G 1/8	Inlet pressure indicator connection (not drilled)
V1	G 1/8	Mechanical seal housing vent (at horizontal installations)
V2	G 1/8	Mechanical seal housing vent (at vertical installations)
D1	G 3/8	Volute casing drain
D2	G 1/8	Mechanical seal housing drain
QE	G 1/8	Mechanical seal leakage tube
QA	G 1/8	Quench

- ① Quench optionally
  - ② Keyway DIN 6885
  - ③ Volute casing (102) insulation only to this line
  - ④ Foot (Motor design B5)
- P-out. = Pull out



TOE-GA, bearing bracket 360 and 470 - Cross-sectional drawing and part list

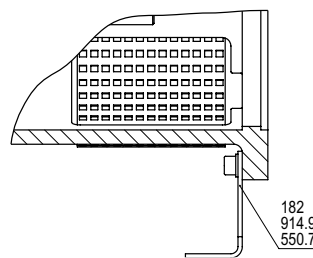


Version with nom. impeller ø 160 and 200 mm

047	Mechanical seal
102	Volute casing
154 <sup>4</sup>	Intermediate flange
161	Casing cover
211	Shaft
230	impeller
310 <sup>1</sup> -310.1 <sup>1</sup>	Plain bearing
320	Ball bearing
341	Bracket
360	Bearing cover
400, 400.2 <sup>1</sup> , 400.3	Flat gasket
411-411.1	Ring gasket
441	Mechanical seal housing
506 <sup>1</sup>	Retaining ring
515-515.1 <sup>1</sup>	Tolerance ring
550, 550.2, 550.3 <sup>1,2</sup> , 550.4	Washer
551-551.1	Shim washer
565	Rivet
681	Coupling protection
710 - 710.1	Tube
731	Screw joint
900-900.1	Ring bolt
901.1	Hexagon head cap screw
902, 902.2-902.3	Stud
903-903.1	Screwed plug
903.2	Vent screw
914	Socket head cap screw
920, 920.2-920.5	Hexagon nut
931	Lock washer
932-932.1	Lock ring
940-940.1	Key
970-970.1	Plate

Version with foot<sup>5</sup>

182	Pump foot
550.7	Disk
914.9	Hexagon socket head cap screw

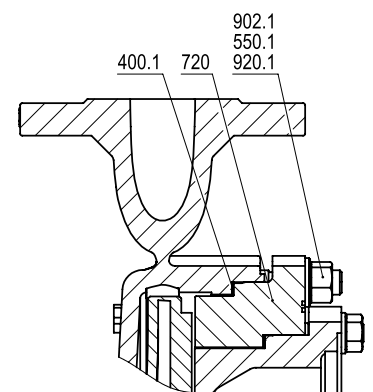


Version with quench

411.1	Ring gasket
421	Radial shaft seal
710-710.1	Tube
731	Screw joint
903.1	Screwed plug

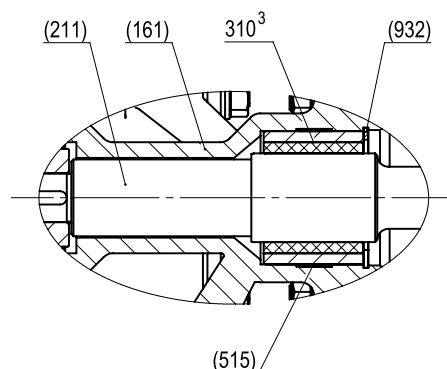
Execution with nom. impeller ø 250 mm

400.1	Flat gasket
550.1	Disk
720	Counter flange
902.1	Stud
920.1	Hexagon nut



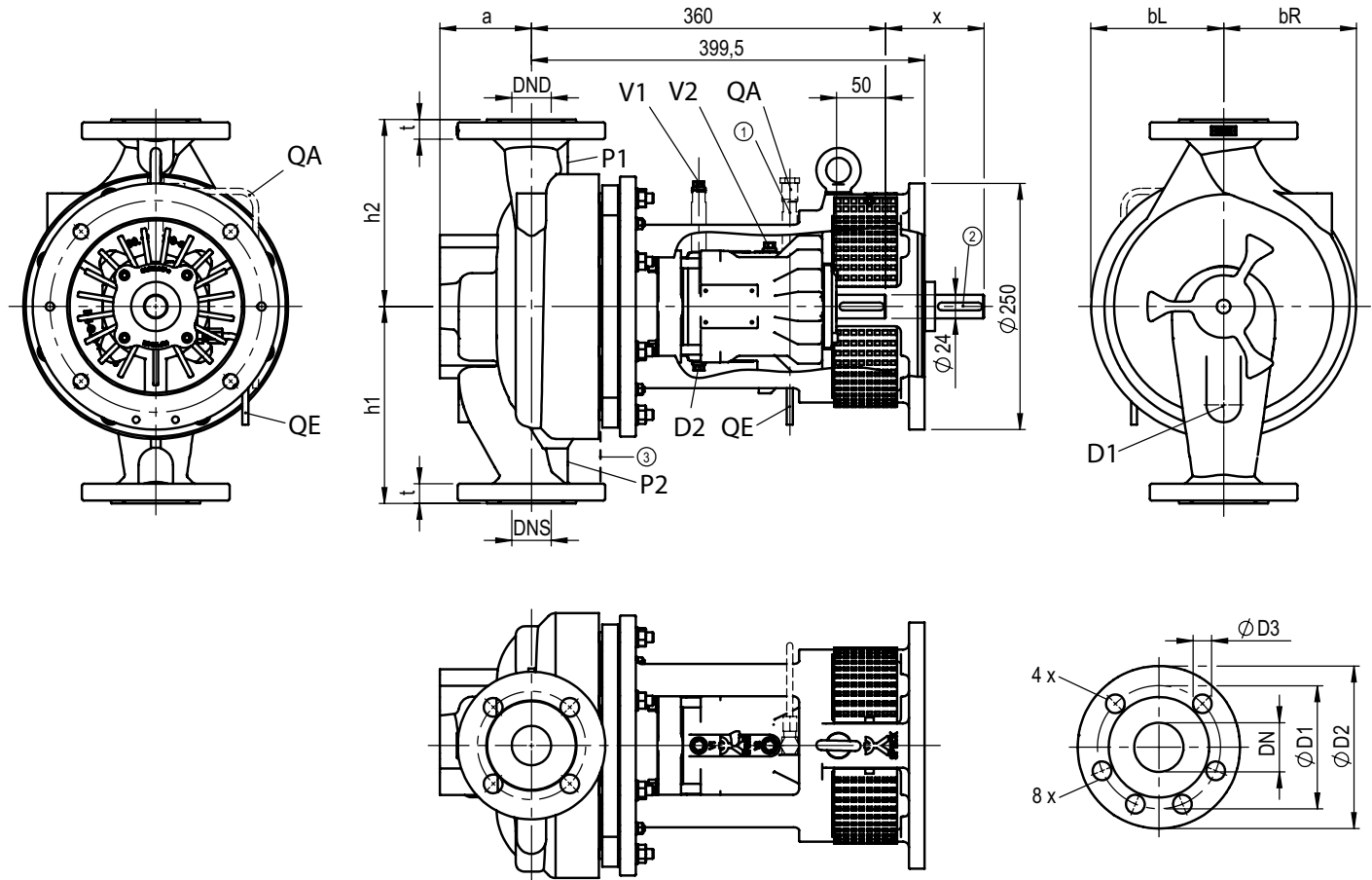
Version with plain bearing in carbon

310 <sup>3</sup>	Plain bearing (carbon)
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<sup>1</sup> Plain bearing (SiC) only  
<sup>2</sup> Bearing bracket 470 only  
<sup>3</sup> Plain bearing (carbon) only  
<sup>4</sup> Depending on Ø motor flange  
<sup>5</sup> Motor design B5 only

TOE-GI, bearing bracket 360 - Pump dimensions



Pump	Pump dimensions							Pull out
Size	DNS	DND	a	bL	bR	h1	h2	x
40-160			97	116	116	200	190	
40-200	40	40	93	135	135			110
50-200	50	50	102	126	139	220	205	
65-200	65	65	112	131	151	240	225	

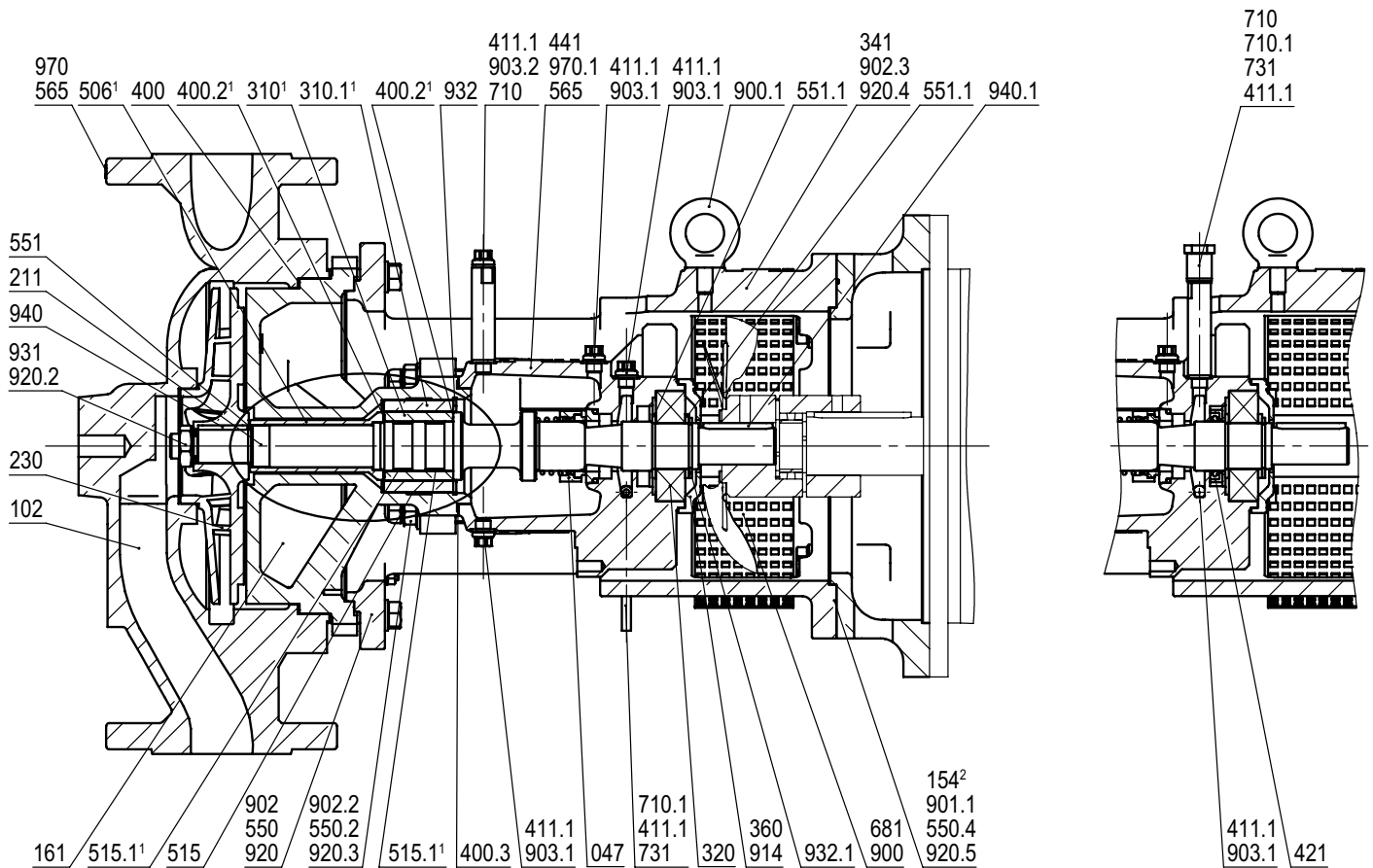
Pump	Flanges in acc. with DIN EN 1092-2					
Size	DN	øD2	øD1	t	øD3	Holes
40-160	40	150	110	17		
40-200	40	150	110		19	4
50-200	50	165	125	20		
65-200	65	185	145			

Pump	Flanges in acc. with ANSI 150 lbs					
Size	DN	øD2	øD1	t	øD3	Holes
40-160	40	150	98,6	17		
40-200	40	150	98,6		16	4
50-200	50	165	120,7	20		
65-200	65	185	139,7		19	

Utility connections		
P1	G 1/4	Outlet pressure indicator connection (not drilled)
P2	G 1/8	Inlet pressure indicator connection (not drilled)
V1	G 1/8	Mechanical seal housing vent (at horizontal installations)
V2	G 1/8	Mechanical seal housing vent (at vertical installations)
D1	G 3/8	Volute casing drain
D2	G 1/8	Mechanical seal housing drain
QE	G 1/8	Mechanical seal leakage tube
QA	G 1/8	Quench

- ① Quench optionally
- ② Keyway DIN 6885
- ③ Volute casing (102) insulation only to this line

TOE-GI, bearing bracket 360 - Cross-sectional drawing and part list



Standard version

047	Mechanical seal
102	Volute casing
154 <sup>3</sup>	Intermediate flange
161	Casing cover
211	Shaft
230	Impeller
310 <sup>1</sup> -310.1 <sup>1</sup>	Plain bearing
320	Ball bearing
341	Bracket
360	Bearing cover
400, 400.2 <sup>1</sup> , 400.3	Flat gasket
411.1	Ring gasket
441	Mechanical seal housing
506 <sup>1</sup>	Retaining ring
515-515.1 <sup>1</sup>	Tolerance ring
550, 550.2, 550.4	Washer

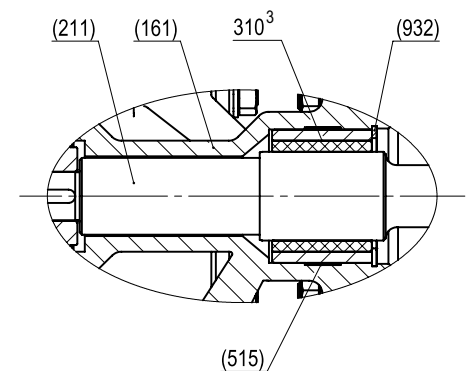
551-551.1	Shim washer
565	Rivet
681	Coupling protection
710 - 710.1	Tube
731	Screw Joint
900-900.1	Screw
901.1	Hexagon head cap screw
902, 902.2-902.3	Stud
903.1-903.1	Screwed plug
903.2	Vent Screw
914	Socket head cap screw
920, 920.2-920.5	Hexagon nut
931	Lock washer
932-932.1	Lock ring
940-940.1	Key
970-970.1	Plate

Version with quench

411.1-411.2	Ring gasket
421	Radial shaft seal
710-710.1	Tube
731	Screw joint
903.1	Screwed plug

Version with plain bearing in carbon

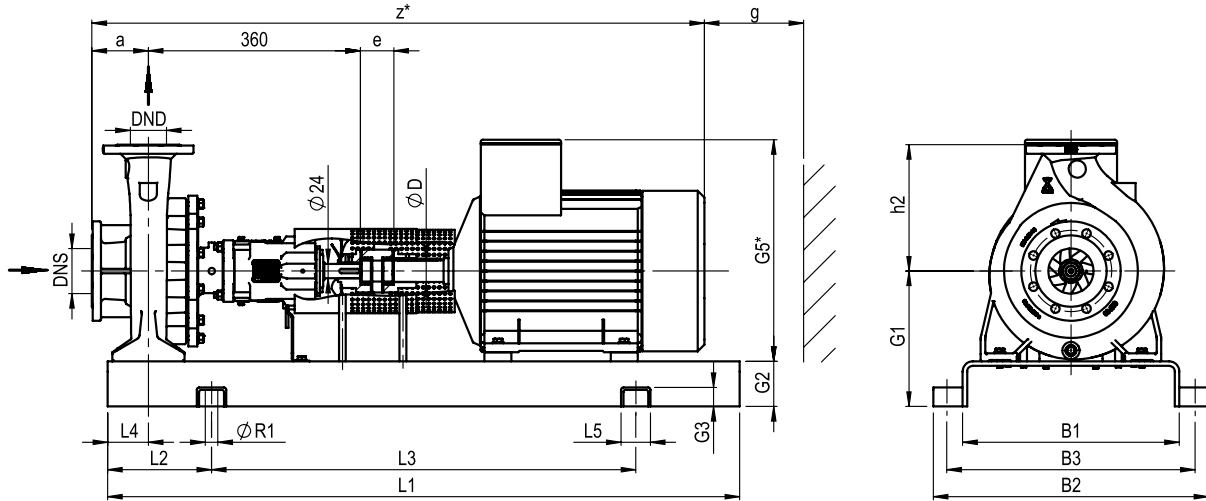
310 <sup>2</sup>	Plain bearing (carbon)
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<sup>1</sup> Plain bearing (SiC) only  
<sup>2</sup> Plain bearing (carbon) only  
<sup>3</sup> Depending on Ø motor flange

TOE-GN - Dimensional drawing 32-160 up to 32-250

(Shaft coupling without spacer)

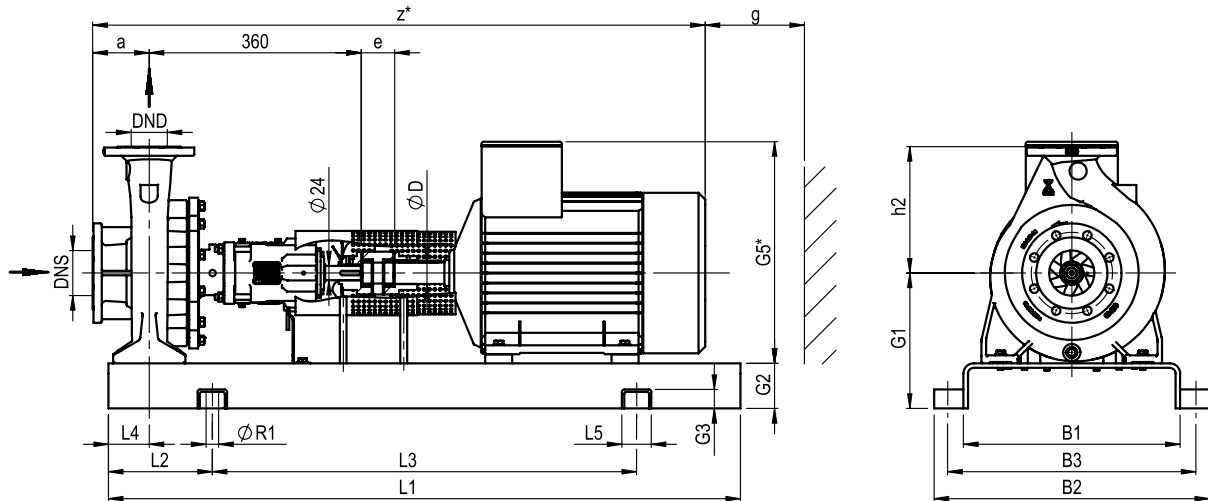


Pump Size	Motor Frame size	Power kW		Pump dimensions				Pump set dimensions																
		4-pole	2-pole	DNS	DND	a	h2	z*	e	g	G1	G2	G3	G5*	L1	L2	L3	L4	L5	B1	B2	B3	øR1	øD
32-160	80	0,55 / 0,75	0,75 / 1,1					777		30				261	710	115	480							19
	90 S	1,1	1,5					776	42	35				280									24	
	90L	1,5	2,2					801												270	360	320		
	100L	2,2 / 3	3					855	52	50	197	65	38	287	800	130	540						19	
	112M	4	4	50	32	80	160	872						300			60						28	
	132 S	5,5	5,5 / 7,5					983	58					320	900	150	600				300	390	350	38
	132M	7,5	-							100														
	160 M	11	11 / 15					1135	68		240	80	42	410	1120	190	740		65		380	490	440	24
160 L	15	18,5																						
32-200	80	0,55 / 0,75	0,75 / 1,1					777		30				289	710	115	480						19	
	90 S	1,1	1,5					776	42	35				308									24	
	90L	1,5	2,2					801												270	360	320		
	100L	2,2 / 3	3					855	52	50	197	65	38	315	800	130	540		50				19	
	112M	4	4					872						328			60						28	
	132 S	5,5	5,5 / 7,5	50	32	80	180	983	58					348	900	150	600				300	390	350	38
	132M	7,5	-							100														
	160 M	11	11 / 15					1135	68		240			410							380	490	440	24
160 L	15	18,5												1120	190	740		65		430	540	490		48
180 M	18,5	22					1202	74	110	260			471											
180L	22	-																						
32-250	90 S	1,1	1,5					796	42	35				328	800	130	540						24	
	90L	1,5	2,2					821																
	100L	2,2 / 3	3					875	52	50				335									28	
	112M	4	4					892						348	900	150	600						38	
	132 S	5,5	5,5 / 7,5					1003	58		260	80	42	368				70	65				24	38
	132M	7,5	-	50	32	100	225			100														
	160 M	11	11 / 15					1155	68					430										42
	160 L	15	18,5												1120	190	740							
180 M	18,5	22					1222	74	110				471							430	540	490		48
180L	22	-																						
200 L	30	30 / 37					1272			300	100		491	1250	205	840				480	610	550	28	55

\*Dimensions can differ depending on the motor supplier.

**TOE-GN - Dimensional drawing 40-160 up to 40-250**

(Shaft coupling without spacer)

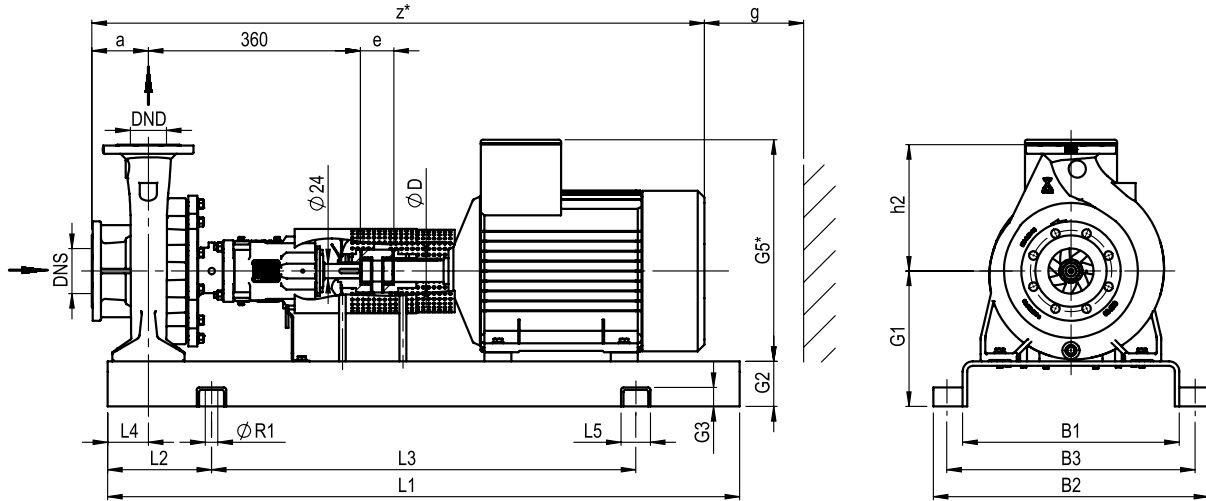


Pump Size	Motor Frame size	Power kW		Pump dimensions					Pump set dimensions															
		4-pole 1450 / 1750	2-pole 2900 / 3500	DNS	DND	a	h2	z*	e	g	G1	G2	G3	G5*	L1	L2	L3	L4	L5	B1	B2	B3	ØR1	ØD
40-160	80	0,55 / 0,75	0,75 / 1,1					777	30				261	710	115	480								19
	90 S	1,1	1,5					776	42	35			280										24	
	90L	1,5	2,2					801															28	
	100L	2,2 / 3	3					855	52	50	197	65	38	287	800	130	540		50		270	360	320	19
	112M	4	4					872						300									28	
	132 S	5,5	5,5 / 7,5	65	40	80	160	983	58					320	900	150	600	60			300	390	350	38
	132M	7,5	-							100														38
	160 M	11	11 / 15					1135	68		240			410							380	490	440	24
	160 L	15	18,5								80	42		1120	190	740		65			430	540	490	24
180 M	18,5	22					1202	74	110	260			471							430	540	490	48	
180L	22	-																					48	
40-200	80	0,55 / 0,75	0,75 / 1,1					797	30				289										19	
	90 S	1,1	1,5					796	42	35			308	710	115	480							24	
	90L	1,5	2,2					821															24	
	100L	2,2 / 3	3					875	52	50	225	65	38	315	800	130	540		50	300	390	350	19	
	112M	4	4					892						328									28	
	132 S	5,5	5,5 / 7,5	65	40	100	180	1003	58					348	900	150	600	60					38	
	132M	7,5	-							100				348									38	
	160 M	11	11 / 15					1155	68		240			410							380	490	440	24
	160 L	15	18,5								80	42		1120	190	740		65			430	540	490	24
180 M	18,5	22					1222	74	110	260			471							430	540	490	48	
180L	22	-																		430	540	490	48	
200 L	30	30 / 37					1272			300	100		491	1250	205	840				480	610	550	28	
40-250	90 S	1,1	1,5					796	42	35			328	800	130	540							24	
	90L	1,5	2,2					821															24	
	100L	2,2 / 3	3					875	52	50			335										28	
	112M	4	4					892					348										28	
	132 S	5,5	5,5 / 7,5	65	40	100	225	1003	58		260	80	42	368	900	150	600		70	65	380	490	440	24
	132M	7,5	-							100				368									38	
	160 M	11	11 / 15					1155	68				430										42	
	160 L	15	18,5											1120	190	740							42	
	180 M	18,5	22					1222	74	110				471							430	540	490	48
180L	22	-																		430	540	490	48	
200 L	30	30 / 37					1272			300	100		491	1250	205	840				480	610	550	28	

\*Dimensions can differ depending on the motor supplier.

TOE-GN - Dimensional drawing 50-160 up to 50-250

(Shaft coupling without spacer)

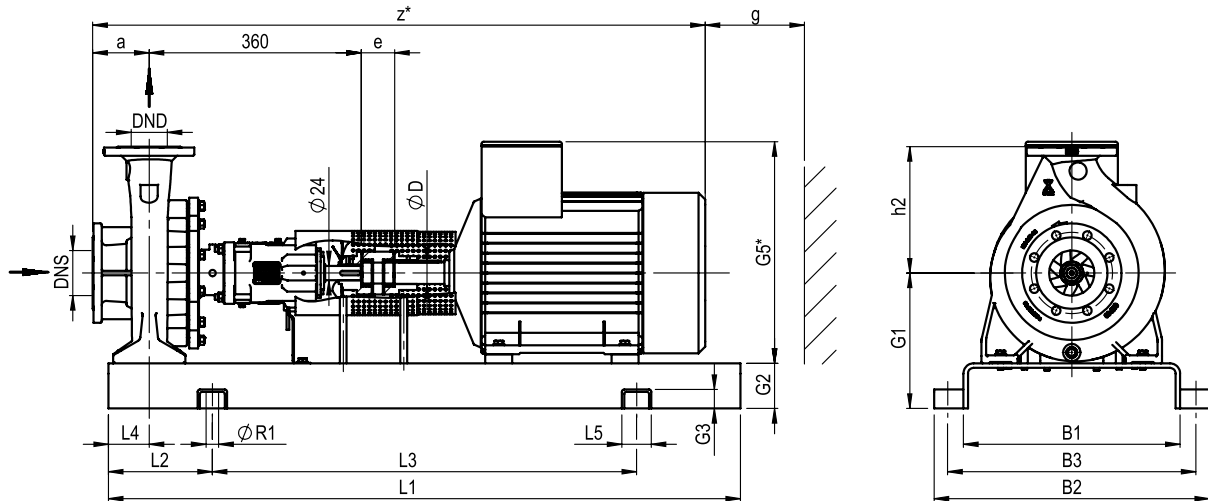


Pump Size	Motor Frame size	Power kW		Pump dimensions				Pump set dimensions																		
		4-pole	2-pole	DNS	DND	a	h2	z*	e	g	G1	G2	G3	G5*	L1	L2	L3	L4	L5	B1	B2	B3	ØR1	ØD		
50-160	80	0,55 / 0,75	0,75 / 1,1					797		30				289											19	
	90 S	1,1	1,5					796	42	35				308	710	115	480								24	
	90L	1,5	2,2					821																		
	100L	2,2 / 3	3					875	52	50	225	65	38	315	800	130	540		50	300	390	350	19		28	
	112M	4	4					892						328												
	132 S	5,5	5,5 / 7,5	65	50	100	180	1003	58					348	900	150	600	60								38
	132M	7,5	-							100																
	160 M	11	11 / 15					1155	68		240			410								380	490	440		42
	160 L	15	18,5									80	42		1120	190	740		65			430	540	490	24	48
	180 M	18,5	22					1222	74	110	260			471								480	610	550	28	55
200 L	30	30 / 37					1272			300	100		491	1250	205	840					480	610	550	28	55	
50-200	80	0,55 / 0,75	0,75 / 1,1					797		30				289											19	
	90 S	1,1	1,5					796	42	35				308	710	115	480								24	
	90L	1,5	2,2					821																		
	100L	2,2 / 3	3					875	52	50	225	65	38	315	800	130	540		50	300	390	350	19		28	
	112M	4	4					892						328												
	132 S	5,5	5,5 / 7,5	65	50	100	200	1003	58					348	900	150	600	60							38	
	132M	7,5	-						100																	
	160 M	11	11 / 15					1155	68		240			410								380	490	440		42
	160 L	15	18,5									80	42		1120	190	740		65			430	540	490	24	48
	180 M	18,5	22					1222	74	110	260			471								480	610	550	28	55
200 L	30	30 / 37					1272			300	100		491	1250	205	840					480	610	550	28	55	
50-250	90 S	1,1	1,5					796	42	35				328	800	130	540								24	
	90L	1,5	2,2					821																		
	100L	2,2 / 3	3					875	52	50				335											28	
	112M	4	4					892						348	900	150	600					380	490	440		38
	132 S	5,5	5,5 / 7,5	65	50	100	225	1003	58		260	80	42	368				70	65					24	38	
	132M	7,5	-					1003		100																
	160 M	11	11 / 15					1155	68					430											42	
	160 L	15	18,5					1155							1120	190	740									
	180 M	18,5	22					1222						471								430	540	490		48
	180L	22	-					1222	74	110																
200 L	30	30 / 37					1272			300	100		491	1250	205	840					480	610	550	28	55	

\*Dimensions can differ depending on the motor supplier.

**TOE-GN - Dimensional drawing 65-160 up to 80-160**

(Shaft coupling without spacer)

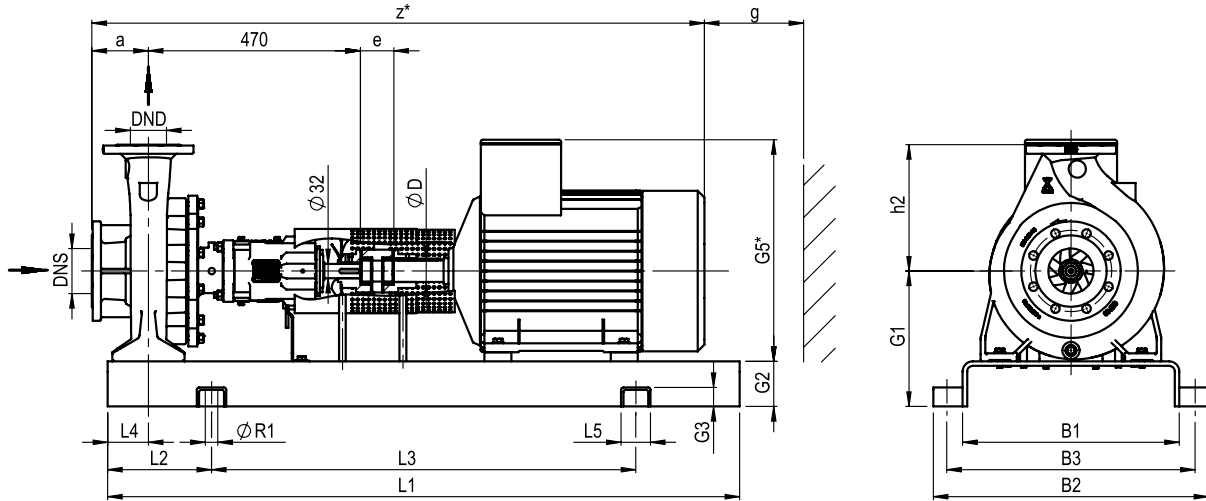


Pump Size	Motor Frame size	Power kW		Pump dimensions					Pump set dimensions																
		4-pole 1450 / 1750	2-pole 2900 / 3500	DNS	DND	a	h2	z*	e	g	G1	G2	G3	G5*	L1	L2	L3	L4	L5	B1	B2	B3	ØR1	ØD	
65-160	80	0,55 / 0,75	0,75 / 1,1					797	30				289	710	115	480								19	
	90 S	1,1	1,5					796	42	35			308										24		
	90L	1,5	2,2					821																	
	100L	2,2 / 3	3					875	52	50	225		315	800	130	540					340	450	400	28	
	112M	4	4					892					328												
	132 S	5,5	5,5 / 7,5	80	65	100	200	1003	58			80	42	348	900	150	600	70	65				24	38	
	132M	7,5	-							100															
	160 M	11	11 / 15					1155	68		240			410							380	490	440	42	
	160 L	15	18,5												1120	190	740								
	180 M	18,5	22					1222	74	110	260			471							430	540	490	48	
180L	22	-																							
200 L	30	30 / 37					1272			300	100		491	1250	205	840				480	610	550	28	55	
65-200	90 S	1,1	1,5					796	42	35			328	800	130	540							24		
	90L	1,5	2,2					821																	
	100L	2,2 / 3	3					875	52	50			335										28		
	112M	4	4					892					348												
	132 S	5,5	5,5 / 7,5	80	65	100	225	1003	58		260	80	42	368	900	150	600	70	65		380	490	440	24	38
	132M	7,5	-							100															
	160 M	11	11 / 15					1155	68					430										42	
	160 L	15	18,5												1120	190	740								
	180 M	18,5	22					1222	74	110				471							430	540	490	48	
	180L	22	-																						
200 L	30	30 / 37					1272			300	100		491	1250	205	840				480	610	550	28	55	
80-160	90 S	1,1	1,5					821	42	35			328	800	130	540							24		
	90L	1,5	2,2					846																	
	100L	2,2 / 3	3					900	52	50			335										28		
	112M	4	4					917					348												
	132 S	5,5	5,5 / 7,5	100	80	125	225	1028	58		260	80	42	368	900	150	600	70	65		380	490	440	24	38
	132M	7,5	-							100															
	160 M	11	11 / 15					1180	68					430										42	
	160 L	15	18,5												1120	190	740								
	180 M	18,5	22					1247	74	110				471							430	540	490	48	
	180L	22	-																						
200 L	30	30 / 37					1297			300	100		491	1250	205	840				480	610	550	28	55	

\*Dimensions can differ depending on the motor supplier.

TOE-GN - Dimensional drawing 65-250 up to 80-250

(Shaft coupling without spacer)



Pump Size	Motor Frame size	Power kW		Pump dimensions				Pump set dimensions																
		4-pole	2-pole	DNS	DND	a	h2	B1	B2	B3	G1	G2	G3	G5*	ØR1	L1	L2	L3	L4	L5	ØD	e	z*	g
65-250	100L	2,2 / 3	3										355		1000	170	660				28	991	50	
	112M	4	4									368									58	1008		
	132 S	5,5	5,5 / 7,5										388		1120	190	740				38	1129		
	132M	7,5	-					430	540	490	280	80		24							42	68	1271	100
	160 M	11	11 / 15										450		1250	205	840							
	160 L	15	18,5															90	65		48	1332		
	180 M	18,5	22	80	65	100	250						42								74	1382		
	180L	22	-										491								55	1421	110	
	200L	30	30 / 37					480	610	550	300				28	1400	230	940			60	1456		
	225M	-	45						530	660	600	325	100								65	1540		
225M	45	-																		88	1548			
225S	37	-																			80	1432		
250M	-	55						600	730	670	350				1600	270	1060					1540	140	
250M	55	-																		65	88	1548		
80-200	100L	2,2 / 3	3										335		1000	170	660				28	1016	50	
	112M	4	4										348								58	1033		
	132 S	5,5	5,5 / 7,5					380	490	440				24	1120	190	740				38	1154		
	132M	7,5	-										368											
	160 M	11	11 / 15								260	80									42	68	1296	100
	160 L	15	18,5										430		1250	205	840							
	180 M	18,5	22	100	80	125	250	430	540	490			42	471				70	65		48	1357		
	180L	22	-																		74	1407		
	200L	30	30 / 37					480	610	550	300			491		1400	230	940			55	1446	110	
	225M	-	45						530	660	600	325	100		28						60	1481		
225M	45	-																		80	1457			
225S	37	-																						
250M	-	55						600	730	670	350				1600	270	1060					1565	140	
250M	55	-																		65	88	1573		

\*Dimensions can differ depending on the motor supplier.



Pump Size	Motor Frame size	Power kW		Pump dimensions				Pump set dimensions																
		4-pole 1450 / 1750	2-pole 2900 / 3500	DNS	DND	a	h2	B1	B2	B3	G1	G2	G3	G5*	øR1	L1	L2	L3	L4	L5	øD	e	z*	g
80-250	132 S	5,5	5,5 / 7,5																					
	132M	7,5	-											388	1120	190	740				38	58	1154	100
	160 M	11	11 / 15											450	1250	205	840				42	68	1296	
	160 L	15	18,5							300														
	180 M	18,5	22						480	610	550													110
	180L	22	-											491										
	200L	30	30 / 37	100	80	125	280						100	42	28	1400	230	940	90	65	55			1446
	225M	-	45																					1481
	225M	45	-										325											1457
	225S	37	-																					1565
	250M	-	55																					1573
	250M	55	-										350			1600	270 205	1060						1727
	280S	-	75						600	730	670													1741
	280S	75	-										380			1800	300 205	1200						1741

\*Dimensions can differ depending on the motor supplier.

### TOE-GN - Allocation of coupling and base plate

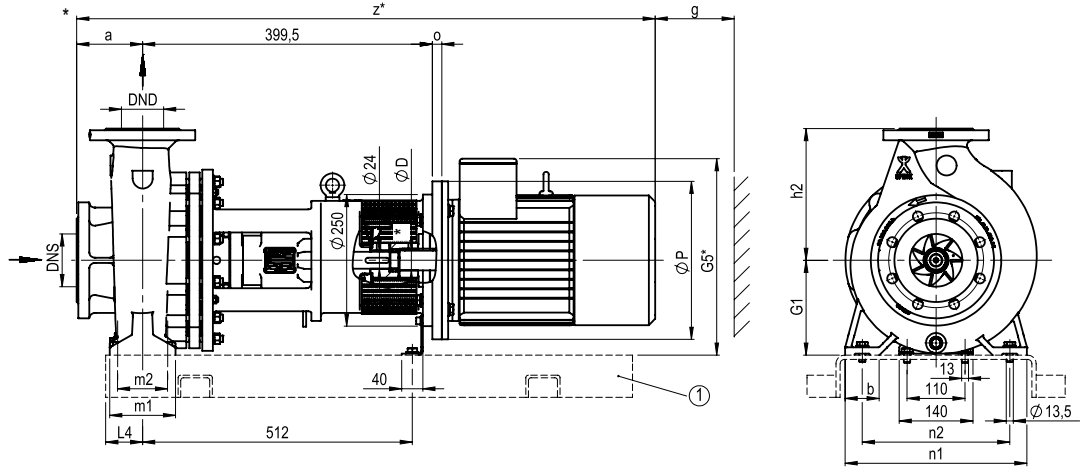
Pump size	Motor size ▶	80	90S	90L	100L	112M	132S	132M	160M	160L	180M	180L	200L	225M 2-pole	225M 4-pole	225S	250M 2-pole	250M 4-pole	280S 2-pole	280S 4-pole	
32-160	Coupling Base plate										-	-	-	-	-	-	-	-	-	-	
32-200	Coupling Base plate	019 1-270			024 2-270									-	-	-	-	-	-	-	
40-160	Coupling Base plate													-	-	-	-	-	-	-	
40-200	Coupling Base plate						028 3-300							-	-	-	-	-	-	-	
50-160	Coupling Base plate	019 1-300			024 2-300									-	-	-	-	-	-	-	
50-200	Coupling Base plate								038 5-380					-	-	-	-	-	-	-	
65-160	Coupling Base plate	019 1-340			024 2-340		028 3-340				042 5-430			-	-	-	-	-	-	-	
65-200	Coupling Base plate	-										042 6-430		-	-	-	-	-	-	-	
80-160	Coupling Base plate	-												-	-	-	-	-	-	-	
32-250	Coupling Base plate	-	019 2-380	024 2-380	024 3-380		028 3-380							-	-	-	-	-	-	-	
40-250	Coupling Base plate	-												-	-	-	-	-	-	-	
50-250	Coupling Base plate	-												-	-	-	-	-	-	-	
65-250	Coupling Base plate	-	-	-	028 4-430		028 5-430		038 6-430		042 7-430										
80-200	Coupling Base plate	-	-	-	028 4-380		028 5-380		038 6-380			042 7-480	042 7-530	048 7-530	048 8-600	055 8-600					
80-250	Coupling Base plate	-	-	-	-	-	028 5-480		038 6-480		042 7-480									055 9-600	065 9-600

# TOE-GN / GA / GI

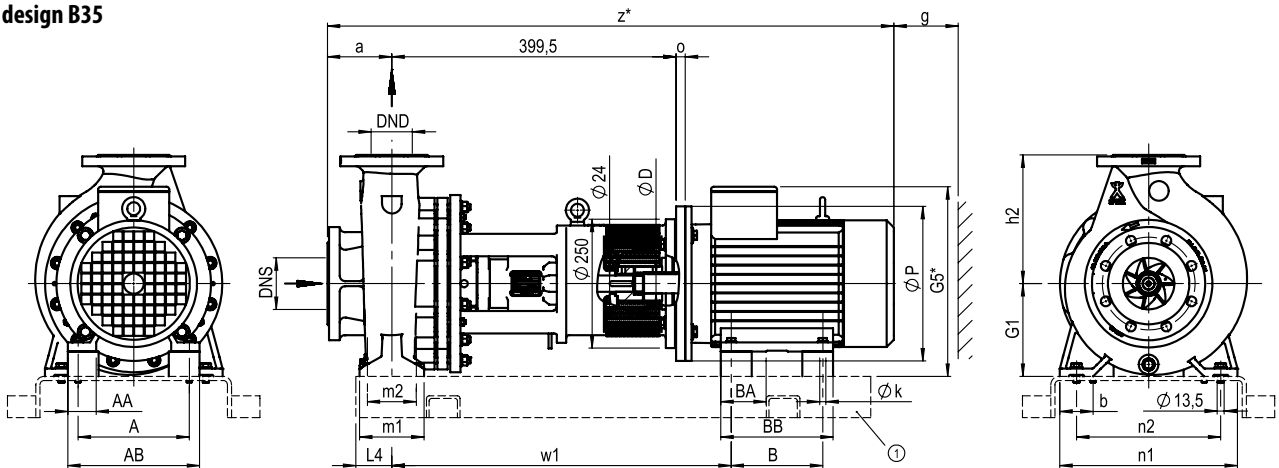
Heat transfer pumps with mechanical seal

## TOE-GA - Dimensional drawing 32-160 up to 32-250

Motor design B5



Motor design B35



Pump Size	Motor Frame size	Motor De-sign	ø P	Power kW		Pump dimensions							Pump set dimensions																						
				4-pole 1450 / 1750	2-pole 2900 / 3500	DNS	DND	a	h2	b	n1	n2	m1	m2	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	øK	øD	o	z*	g						
32-160	80	B5	200	0,55 / 0,75	0,75 / 1,1											261										19	16,5	751	30						
			250																												752				
	90 S	B5	200	1,1	1,5																					24	28,5			35					
			250																												777				
	90L	B5	200	1,5	2,2																														
			250																																
	100L	B5	250	2,2 / 3	3																														
			250	4	4	50	32	80	160	50	240	190	100	70			287																		
	112M	B5	250																																
			250	2,2 / 3	3																														
	132 S	B35	250	5,5	5,5 / 7,5																														
			300																																
	132M	B35	250	7,5	-																														
			300																																
160 M	B35	300	11	11 / 15																															
		350																																	
160 L	B35	300	15	18,5																															
		350																																	

\*Dimensions can differ depending on the motor supplier.

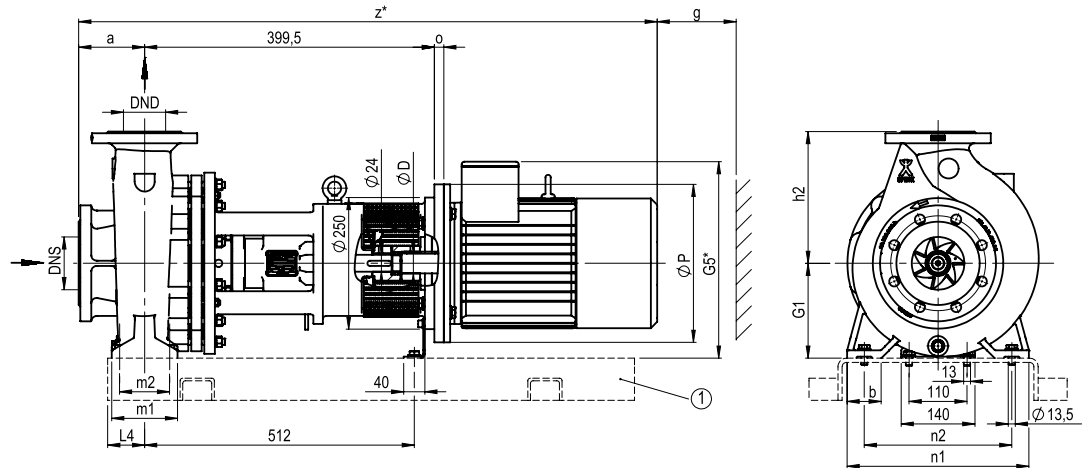
① Base plate optionally, dimensions see page 36.

Pump Size	Motor Frame size	De-sign	ø P	Power kW		Pump dimensions											Pump set dimensions																	
				4-pole	2-pole	DNS	DND	a	h2	b	n1	n2	m1	m2	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	øK	øD	o	z*	g					
				1450 / 1750	2900 / 3500																													
32-200	80	B5	200	0,55 / 0,75	0,75 / 1,1																							19	16,5	751	30			
			250																															
	90 S	B5	200	1,1	1,5																										752			
			250																															
	90L	B5	200	1,5	2,2																											777		
			250																															
	100L			2,2 / 3	3											160	315														821			
	112M			4	4												328														838			
	132 S	B35	250	5,5	5,5 / 7,5	50	32	80	180	50	240	190	100	70					140															
			300																															
	132M	B35	250	7,5	-														178															
			300																															
160 M	B35	300	11	11 / 15													410																	
		350																																
160 L	B35	300	15	18,5														604																
		350																																
180 M	B35	300	18,5	22																														
		350																																
180L	B35	300	22	-														617																
		350																																
32-250	90 S	B5	200	1,1	1,5																											772		
			250																															
	90L	B5	200	1,5	2,2																													
			250																															
	100L			2,2 / 3	3																													
	112M			4	4																													
	132 S	B35	250	5,5	5,5 / 7,5	50	32	100	225	65	320	250	125	95																				
			300																															
	132M	B35	250	7,5	-																													
			300																															
	160 M	B35	300	11	11 / 15																													
			350																															
160 L	B35	300	15	18,5																														
		350																																
180 M	B35	300	18,5	22																														
		350																																
180L	B35	300	22	-																														
		350																																
200 L			30	30 / 37																														
			400																															

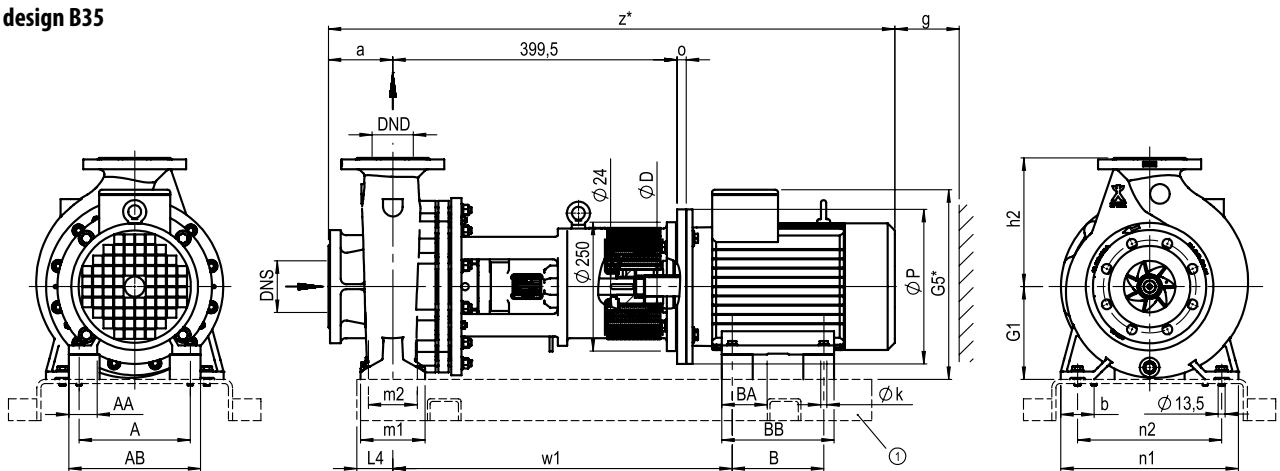
\*Dimensions can differ depending on the motor supplier. Ⓢ Base plate optionally, dimensions see page 36.

**TOE-GA - Dimensional drawing 40-160 up to 40-250**

**Motor design B5**



**Motor design B35**



Pump Size	Motor Frame size	De-sign	Power kW		Pump dimensions										Pump set dimensions															
			ø P	4-pole	2-pole	DNS	DND	a	h2	b	n1	n2	m1	m2	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	øK	øD	o	z*	g	
				1450 / 1750	2900 / 3500																									
40-160	80	B5	200	0,55 / 0,75	0,75 / 1,1										261											19	16,5	751	30	
			250																											752
	90 S	B5	200	1,1	1,5																					24	28,5		35	
			250																											777
	90L	B5	200	1,5	2,2										132	280														
			250																											
	100L			2,2 / 3	3										287															821
	112M			4	4										300											28	38,5		838	
	132 S	B35		250	5,5	5,5 / 7,5	65	40	80	160	50	240	190	100	70	320	60	549	140	218	88	216	55	256	12	38	60,5	945		
				300	160	348																								
	132M	B35		250	7,5	-										132														
				300													160													
	160 M	B35		300	11	11 / 15										160														
				350													180													
	160 L	B35		300	15	18,5										160														
				350													180													
	180 M	B35		300	18,5	22										160														
350																180														
180L	B35		300	22	-										180															
			350													471														

\*Dimensions can differ depending on the motor supplier.

① Base plate optionally, dimensions see page 36.

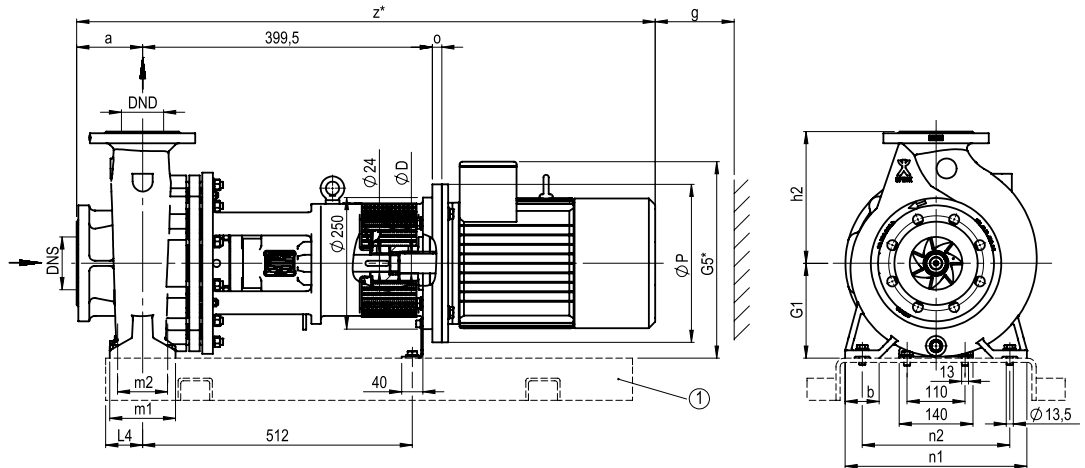
Pump		Motor		Power kW		Pump dimensions								Pump set dimensions																					
Size	Frame size	De-sign	ø P	4-pole	2-pole	DNS	DND	a	h2	b	n1	n2	m1	m2	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	øK	øD	o	z*	g						
				1450 / 1750	2900 / 3500																														
40-200	80	B5	200	0,55 / 0,75	0,75 / 1,1											289													19	16,5	771	30			
			250																																
	90 S	B5	200	1,1	1,5												308	-	-	-	-	-	-	-	-	-	-	-	-	24	28,5	772	35		
			250																																
	90 L	B5	200	1,5	2,2												308																		
			250																																
	100 L	B35	250	2,2 / 3	3												160	315													28	38,5	841	50	
			250	4	4													328																	
	132 S	B35	250	5,5	5,5 / 7,5														140																
			300															348	549	218	88	216	55	256	12	38	60,5	965							
	132 M	B35	250	7,5	-	65	40	100	180	50	265	212	100	70					60																
			300															410																	
	160 M	B35	300	11	11 / 15												180	430																	
			350															160	410	604	210	260													
160 L	B35	300	15	18,5												160	410																		
		350															180	430																	
180 M	B35	300	18,5	22															241	300															
		350															180	471	617																
180 L	B35	300	22	-															279	340															
		350																																	
200 L	B35	350	30	30 / 37												200	491																		
		400																	629	305	380	95	318	99,5	403	18	55	96,5	1224	110					
40-250	90 S	B5	200	1,1	1,5											328																			
			250																																
	90 L	B5	200	1,5	2,2											328																			
			250																																
	100 L	B35	250	2,2 / 3	3											335																			
			250	4	4												348																		
	132 S	B35	250	5,5	5,5 / 7,5													140																	
			300														368	549	218	88	216	55	256	12	38	60,5	965								
	132 M	B35	250	7,5	-	65	40	100	225	65	320	250	125	95			180		70																
			300															430	604	210	260														
	160 M	B35	300	11	11 / 15															241	300														
			350														471	617																	
	160 L	B35	300	15	18,5															279	340														
			350																																
180 M	B35	300	18,5	22																															
		350														471	617																		
180 L	B35	300	22	-															279	340															
		350																																	
200 L	B35	350	30	30 / 37												200	491																		
		400																629	305	380	95	318	99,5	403	18	55	96,5	1224	110						

\*Dimensions can differ depending on the motor supplier. ① Base plate optionally, dimensions see page 36.

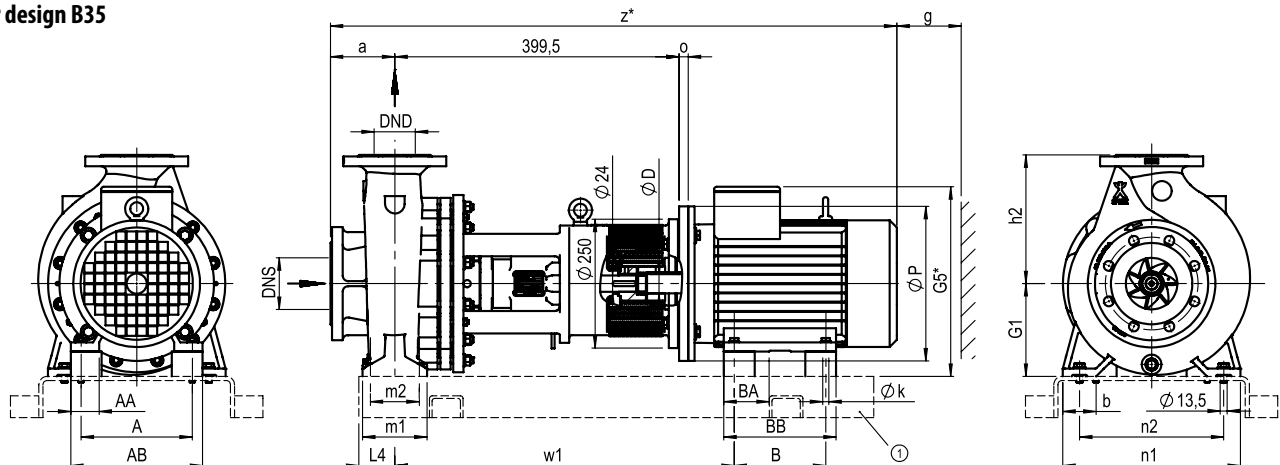
Heat transfer pumps with mechanical seal

TOE-GA - Dimensional drawing 50-160 up to 50-250

Motor design B5



Motor design B35



Pump Size	Motor Frame size	De-sign	ø P	Power kW		Pump dimensions								Pump set dimensions																			
				4-pole	2-pole	DNS	DND	a	h2	b	n1	n2	m1	m2	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	øK	øD	o	z*	g				
				1450 / 1750	2900 / 3500																												
50-160	80	B5	200	0,55 / 0,75	0,75 / 1,1										289												19	16,5	771	30			
			250																												772		
	90 S	B5	200	1,1	1,5										308												24	28,5		35			
			250																												797		
	90L	B5	200	1,5	2,2																												
			250																														
	100L			250	2,2 / 3	3									160	315															841		
	112M			250	4	4										328											28	38,5		858			
	132 S	B35	B5	250	5,5	5,5 / 7,5														140													
				300													348	549	218	88	216	55	256	12	38	60,5	965						
	132M	B35	B5	250	7,5	-	65	50	100	180	50	265	212	100	70																	100	
				300													410																
	160 M	B35	B5	300	11	11 / 15										180	430																
350																160	410	604									62	254	69	320	14	42	96,5
160 L	B35	B5	300	15	18,5										180	430																	
			350																														
180 M	B35	B5	300	18,5	22																												
			350													180	471	617										75	279	74	352	14	48
180L	B35	B5	300	22	-																												
			350																														
200 L	B35	B5	350	30	30 / 37																												
			400													200	491	629	305	380	95	318	99,5	403	18	55	96,5	1224	110				

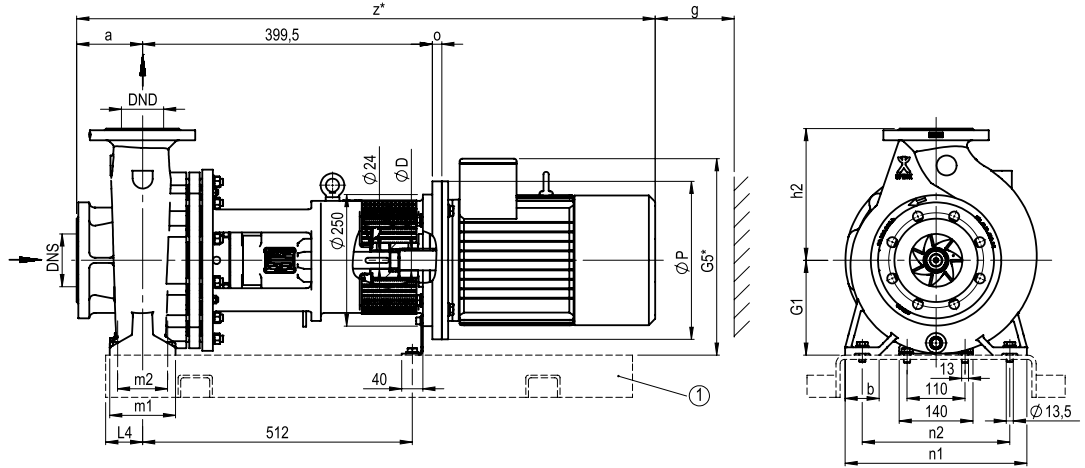
\*Dimensions can differ depending on the motor supplier. Ⓛ Base plate optionally, dimensions see page 36.

Pump	Motor		Power kW		Pump dimensions								Pump set dimensions																		
	Size	Frame size	De-sign	ø P	4-pole 1450 / 1750	2-pole 2900 / 3500	DNS	DND	a	h2	b	n1	n2	m1	m2	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	øK	øD	o	z*	g	
	80			200 250	0,55 / 0,75	0,75 / 1,1											289										19	16,5	771	30	
	90 S		B5	200 250	1,1	1,5											308		-	-	-	-	-	-	-	-	24	28,5	772 797	35	
	90L			200 250	1,5	2,2																									
	100L			250	2,2 / 3	3										160	315										28	38,5	841 858	50	
	112M			250	4	4										328															
	132 S			250 300	5,5	5,5 / 7,5													140												
50-200	132M			250 300	7,5	-	65	50	100	200	50	265	212	100	70		348		60	549	218	88	216	55	256	12	38	60,5	965		
	160 M			300 350	11	11 / 15											410														
	160 L	B35		300 350	15	18,5											180 430 160 410 180 430		604	210	260										
	180 M			300 350	18,5	22																									
	180L			300 350	22	-											180 471			617											
	200 L			350 400	30	30 / 37																									
	90 S		B5	200 250	1,1	1,5											328										24	28,5	772 797	35	
	90L			200 250	1,5	2,2																									
	100L			250	2,2 / 3	3											335										28	38,5	841 858	50	
	112M			250	4	4											348														
	132 S			250 300	5,5	5,5 / 7,5														140											
50-250	132M			250 300	7,5	-	65	50	100	225	65	320	250	125	95		368		70	549	218	88	216	55	256	12	38	60,5	965		
	160 M			300 350	11	11 / 15											430														
	160 L	B35		300 350	15	18,5											180 430 160 410 180 430		604	210	260										
	180 M			300 350	18,5	22																									
	180L			300 350	22	-											471			617											
	200 L			350 400	30	30 / 37																									

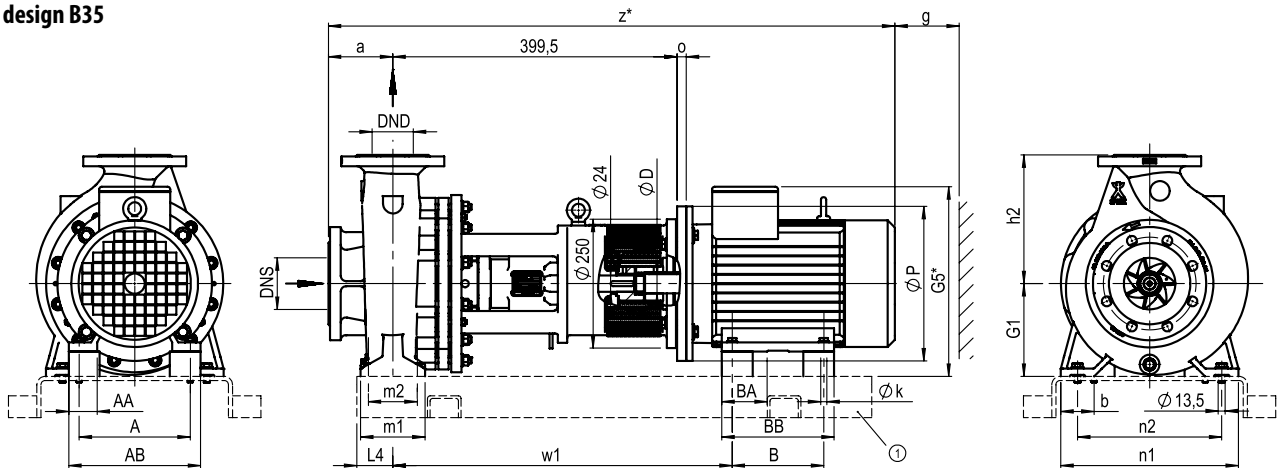
\*Dimensions can differ depending on the motor supplier. (1) Base plate optionally, dimensions see page 36.

TOE-GA - Dimensional drawing 65-160 up to 80-160

Motor design B5



Motor design B35



Pump Size	Motor Frame size	De-sign	ø P	Power kW		Pump dimensions								Pump set dimensions																	
				4-pole 1450 / 1750	2-pole 2900 / 3500	DNS	DND	a	h2	b	n1	n2	m1	m2	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	øK	øD	o	z*	g		
65-160	80	B5	200	0,55 / 0,75	0,75 / 1,1																					19	16,5	771	30		
			250																												
	90 S	B5	200	1,1	1,5																										772
			250																												
	90 L	B5	200	1,5	2,2																										797
			250																												
	100 L			250	2,2 / 3	3									160	315															
	112 M			250	4	4										328															
	132 S	B35	B35	250	5,5	5,5 / 7,5																									
				300																											
	132 M	B35	B35	250	7,5	-	80	65	100	200	65	280	212	125	95																
				300																											
160 M	B35	B35	300	11	11 / 15																										100
			350																												
160 L	B35	B35	300	15	18,5																										
			350																												
180 M	B35	B35	300	18,5	22																										
			350																												
180 L	B35	B35	300	22	-																										
			350																												
200 L	B35	B35	350	30	30 / 37																										
			400																												

\*Dimensions can differ depending on the motor supplier.

① Base plate optionally, dimensions see page 36.



Pump Size	Motor Frame size	De-sign	ø P	Power kW		Pump dimensions											Pump set dimensions													
				4-pole	2-pole	DNS	DND	a	h2	b	n1	n2	m1	m2	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	øK	øD	o	z*	g	
				1450 / 1750	2900 / 3500																									
<b>65-200</b>	90 S	B5	200	1,1	1,5																									
			250																								24	28,5	772	35
	90L	B5	200	1,5	2,2																									
			250													328														
	100L			2,2 / 3	3																									
				250																										
	112M			250	4	4																								
				250																										
	132 S			250	5,5	5,5 / 7,5																								
				300															140											
	132M			250	7,5	-													549	218	88	216	55	256	12	38	60,5	965		
				300											180				178											
160 M			300	11	11 / 15	80	65	100	225	65	320	250	125	95																
			350																											
160 L	B35		300	15	18,5																									
			350																											
180 M			300	18,5	22																									
			350																											
180L			300	22	-																									
			350																											
200 L			350	30	30 / 37																									
			400																											
200 L			400	30	30 / 37																									
			400																											
<b>80-160</b>	90 S	B5	200	1,1	1,5																									
			250																											
	90L	B5	200	1,5	2,2																									
			250																											
	100L			2,2 / 3	3																									
	112M			250	4	4																								
				250																										
	132 S			250	5,5	5,5 / 7,5																								
				300																										
	132M			250	7,5	-																								
				300																										
	160 M			300	11	11 / 15	100	80	125	225	65	320	250	125	95															
			350																											
160 L	B35		300	15	18,5																									
			350																											
180 M			300	18,5	22																									
			350																											
180L			300	22	-																									
			350																											
200 L			350	30	30 / 37																									
			400																											

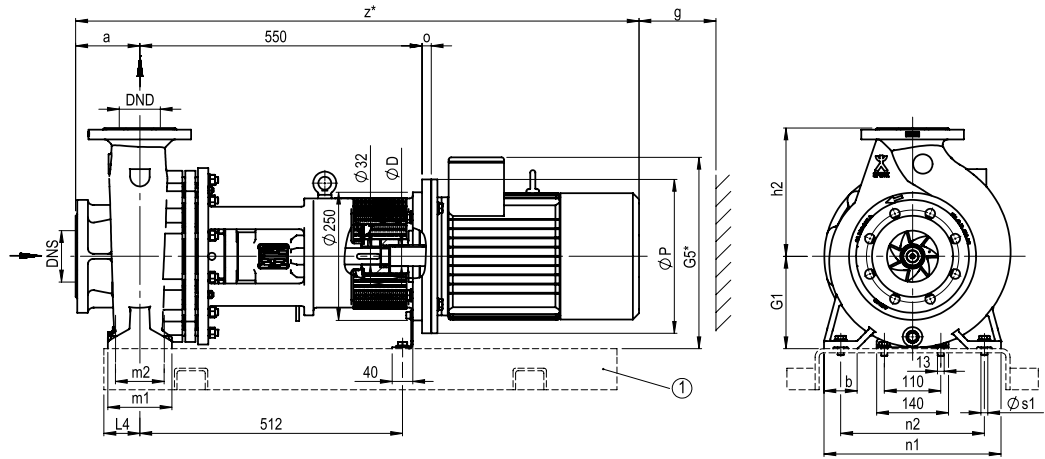
\*Dimensions can differ depending on the motor supplier. Ⓞ Base plate optionally, dimensions see page 36.

**TOE-GN / GA / GI**

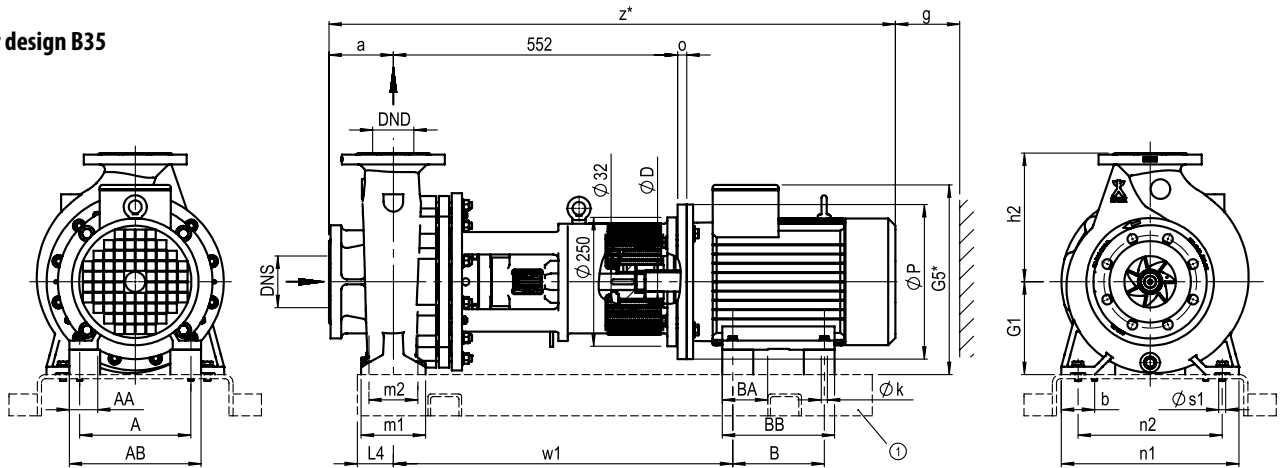
Heat transfer pumps with mechanical seal

**TOE-GA - Dimensional drawing 80-200 up to 80-250**

Motor design B5



Motor design B35



Pump Size	Motor Frame size	Motor De-sign	P, Ø	Power kW		Pump dimensions											Pump set dimensions																							
				4-pole	2-pole	DNS	DND	a	h2	b	n1	n2	m1	m2	s1	G1	G5*	L4	w1	B	BB	BA	A	AA	AB	ØK	ØD	o	z*	g										
				1450 / 1750	2900 / 3500																																			
65-250	100L	B5	250	2,2 / 3	3																																			
	112M		250	4	4																																			
	132S		250	5,5	5,5 / 7,5																																			
			300																																					
	132M		250	7,5	-																																			
			300																																					
	160M		300	11	11 / 15																																			
			350																																					
	160L	B35	300	15	18,5	80	65	100	250	80	360	280	160	120	18																									
			350																																					
			300																																					
			350																																					
			300																																					
			350																																					
180M		300	18,5	22																																				
		350																																						
180L		300	22	-																																				
		350																																						
200L		350	30	30 / 37																																				
		400																																						
225M			450	-	45																																			
225M			450	45	-																																			
225S			450	55	-																																			

\*Dimensions can differ depending on the motor supplier.

① Base plate optionally, dimensions see page 36.



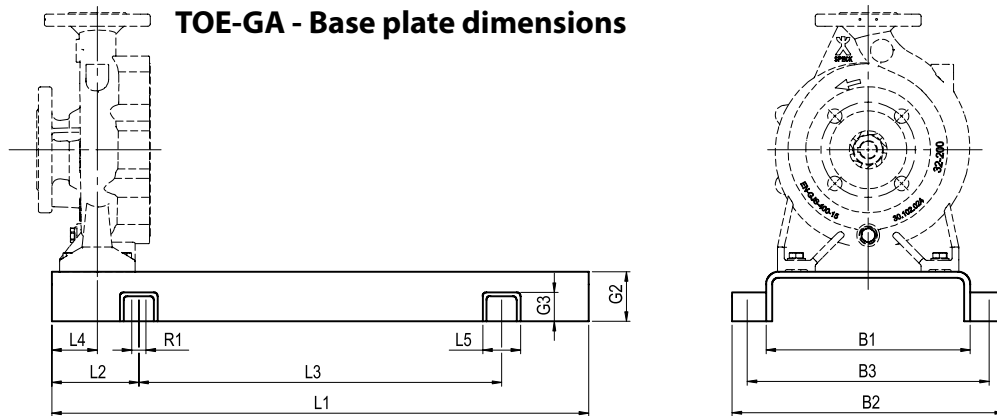
**TOE-GN / GA / GI**

Heat transfer pumps with mechanical seal

**TOE-GA - Allocation of coupling and base plate**

Motor size ▶		80	90S	90L	100L	112M	132S	132M	160M	160L	180M	180L	200L	225M 2-pole	225M 4-pole	225S
32-160	Coupling Base plate										-	-	-	-	-	-
32-200	Coupling Base plate	019 1-270		024 1-270	024 2-270								-	-	-	-
40-160	Coupling Base plate							028 3-300					-	-	-	-
40-200	Coupling Base plate													-	-	-
50-160	Coupling Base plate	019 1-300			024 2-300									-	-	-
50-200	Coupling Base plate								038 5-380					-	-	-
65-160	Coupling Base plate	019 1-340			024 2-340		028 3-340			042 5-430				-	-	-
65-200	Coupling Base plate	-										042 6-480		-	-	-
80-160	Coupling Base plate	-												-	-	-
32-250	Coupling Base plate	-	019 2-380		024 2-380		028 3-380							-	-	-
40-250	Coupling Base plate	-												-	-	-
50-250	Coupling Base plate	-												-	-	-
65-250	Coupling Base plate	-	-	-	028 3-430		028 5-430		038 6-430		042 6-430					
80-200	Coupling Base plate	-	-	-	028 2-380		028 4-380		038 6-380		042 6-430		042 7-480	042 7-530	048 7-530	
80-250	Coupling Base plate	-	-	-	-	-	028 5-480		038 6-480		042 6-480					

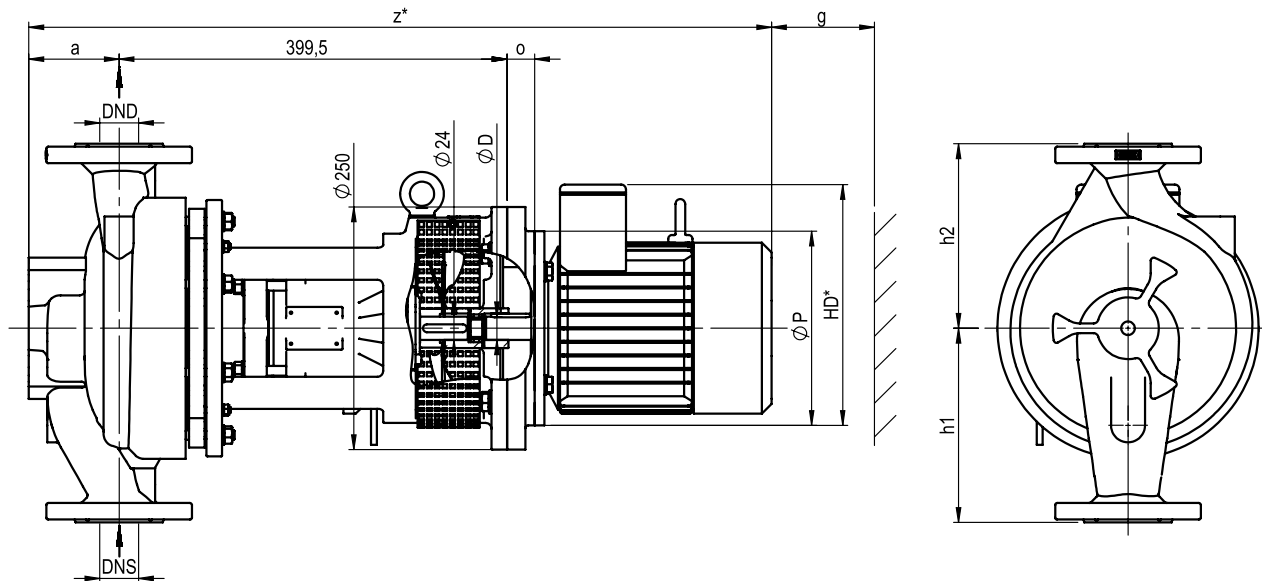
**TOE-GA - Base plate dimensions**



Base plate	B1	B2	B3	G2	G3	R1	L5	L1	L2	L3
1-270	270	360	320	65	38	19	50	710	115	480
2-270	270	360	320	65	38	19	50	800	130	540
1-300	300	390	350	65	38	19	50	710	115	480
2-300	300	390	350	65	38	19	50	800	130	540
3-300	300	390	350	65	38	19	50	900	150	600
1-340	340	450	400	80	42	24	65	710	115	480
2-340	340	450	400	80	42	24	65	800	130	540
3-340	340	450	400	80	42	24	65	900	150	600
2-380	380	490	440	80	42	24	65	800	130	540
3-380	380	490	440	80	42	24	65	900	150	600
4-380	380	490	440	80	42	24	65	1000	170	660
5-380	380	490	440	80	42	24	65	1120	190	740
6-380	380	490	440	80	42	24	65	1250	205	840
3-430	430	540	490	80	42	24	65	900	150	600
5-430	430	540	490	80	42	24	65	1120	190	740
6-430	430	540	490	80	42	24	65	1250	205	840
5-480	480	610	550	100	42	28	65	1120	190	740
6-480	480	610	550	100	42	28	65	1250	205	840
7-480	480	610	550	100	42	28	65	1400	230	940
7-530	530	660	485	100	42	24	65	1400	230	940

Pump size	L4
32-160	60
32-200	60
32-250	70
40-160	60
40-200	60
40-250	70
50-160	60
50-200	60
50-250	70
65-160	70
65-200	70
65-250	70
80-160	70
65-250	90
80-200	70
80-250	90

TOE-GI - Dimensional drawing 40-160 up to 65-200



Pump Size	Motor		Power kW		Pump dimensions					Pump set dimensions								
	Frame size	De-sign	P,φ	4-pole	2-pole	DNS	DND	a	h1	h2	z*	o	øD	HD*	g			
				1450 / 1450	2900 / 3500													
40-160	80	B5	200	0,55 / 0,75	0,75 / 1,1	40	40	97	200	190	768	16,5	19	229	30			
			250													254		
	90 S	200	1,1	1,5	769											28,5	24	248
		250																
	90L	200	1,5	2,2	794											28,5	24	248
	250	273																
	100L	250	2,2 / 3	3	838											38,5	28	280
112M	250	293																
132 S	250	5,5	5,5 / 7,5	983	60,5	38	313											
	300							343										
132M	250	7,5	-	983	60,5	38	313											
	300							343										
40-200	80	B5	200	0,55 / 0,75	0,75 / 1,1	40	40	93	200	190	764	16,5	19	229	30			
			250													254		
	90 S	200	1,1	1,5	765											28,5	24	248
		250																
	90L	200	1,5	2,2	790											28,5	24	248
	250	273																
	100L	250	2,2 / 3	3	834											38,5	28	280
112M	250	293																
132 S	250	5,5	5,5 / 7,5	979	60,5	38	313											
	300							343										
132M	250	7,5	-	979	60,5	38	313											
	300							343										
50-200	80	B5	200	0,55 / 0,75	0,75 / 1,1	50	50	102	220	205	773	16,5	19	229	30			
			250													254		
	90 S	200	1,1	1,5	774											28,5	24	248
		250																
	90L	200	1,5	2,2	799											28,5	24	248
	250	273																
	100L	250	2,2 / 3	3	843											38,5	28	280
112M	250	293																
132 S	250	5,5	5,5 / 7,5	988	60,5	38	313											
	300							343										
132M	250	7,5	-	988	60,5	38	313											
	300							343										
65-200	90 S	B5	200	1,1	1,5	65	65	112	240	225	784	28,5	24	248	35			
			250													273		
	90L	200	1,5	2,2	809											28,5	24	248
	250	273																
	100L	250	2,2 / 3	3	853											38,5	28	280
	112M	250																
	132 S	250	5,5	5,5 / 7,5	998											60,5	38	313
300		343																
132M	250	7,5	-	998	60,5	38	313											
	300							343										

\*Dimensions can differ depending on the motor supplier.

### TOE-GN / GA / GI - Interchangeability of parts

Part	Position	Pump type			Pump size															
		GN	GA	GI	32-160	32-200	32-250	40-160	40-200	40-250	50-160	50-200	50-250	65-160	65-200	80-160	65-250	80-200	80-250	
					Bearing bracket 360												Bearing bracket 470			
Mechanical seal	047	●	●	●	1												2			
Volute casing	102	●	●	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		-	-	●	-			16	17	-		18	-		19	-				
Casing cover	161	●	●	●	1	2		1	2		1	2		1	2	1	3	4	3	
Shaft	211	●	●	●	1												2			
Impeller	230	●	●	●	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		-	-	●	-			1	16	-		5	-		8	-				
Plain bearing	310 310.1	●	●	●	1												2			
Ball bearing	320	●	●	●	1												2			
Bracket	341	-	●	●	1												2			
Flat gasket	400	●	●	●	1												2			
	400.1	●	●	●	-	1	-	1	-	1	-									
	400.2 400.3	●	●	●	1												2			
Mechanical seal housing	441	●	●	●	1												2			
Counter flange	720	●	●	-	-	1	-	1	-	1	-									
Other parts	-	●	●	●	1												2			

**Pump data sheet**

		<b>Heat Transfer Pump Technical Data Sheet Pump Model</b>			Quotation Date Item	
SPECK PUMPEN Systemtechnik GmbH Regensburger Ring 6 - 8 D-91154 Roth Tel.: 09171/809-0 Fax: 09171/809-10 www.speck-pumps.de						
1	Pump Model:		Quantity:			
2	Customer	Location		Page:      of:      pages		
3	Phone	Fax		Iss. / Dpt.:		
4	Contact	E-Mail		Phone:		
5	PO	dated		Fax:		
6	Project	Pump No.		E-Mail		
<b>Installation / Environment</b>						
7	Building / Outside	Altitude	m	Amb. temp	Start-up temp.	rel. Humidity
8	under roof yes/no	Hazardous area	-	min.:      max:	min.:      °C	%
<b>Operating (Contractual) Data</b>						
9	Fluid		Flow rate	rated	m <sup>3</sup> /h	Reference Speed
10	corrosive matters	Wght.-%	min / max		m <sup>3</sup> /h	direction of rotation 1)
11	abrasive matters	Wght.-%	Pressure	Inlet	bar (ü)	Hydr. efficiency
12	Solid content	Wght.-%		Disch.	bar (ü)	hydr. power cons.
13	Oper. Temp. tA	°C	Tot. Diff. Head rated		m	power loss
14	Density @ tA	kg/m <sup>3</sup>	pressure differential		bar	Total abs. power
15	Kin. viscosity @tA	mm <sup>2</sup> /s	NPSH	available	m	abs. power at cold start
16	Vapor press. @ tA	bar (a)		required	m	Duty point data to
<b>Pump design</b>						
17	Impeller-Ø	mm	Inlet-nozzle	nom. diam. DN		Bearings
18	No of stages	-		location		
19	nom. pressure PN	bar		machined to		Type
20	max. all. Cas. press. @ tA	bar	Outlet-nozzle	nom. diam. DN		Lubrication
21	Cooling 'C' / Heating 'H'			location		
22	Volute casing	Casing cover	Bearing bracket	machined to		Mechanical seal
23	-	-	-	Sound pressure level 2)	-	dB(A)
<b>Accessories</b>						
24	AC Electric Motor	Power	kW	Frame		Ex-protection
25		Frequency	Hz	Enclos.		Make
26		Voltage	V	Construct.		Delivered by
27		Nom. Speed	1/min	Current		mounted by
						Coupling
						Size/Spacer /      mm
						Make
						Type
						Baseplate
<b>Materials</b>						
28	Volute casing		bearing bracket			containm. shell
29	Casing cover		motor lantern			sleeve bearing
30	Impeller		cas. wear ring			coupl.+guard
31	Shaft		imp. wear ring			Baseplate
<b>Tests and Inspections</b>						
32	1. Material Tests:	Kind of Test	Test Certificate 3)	4. Other Tests Tests:	Witnessed by:	Test Certif.
33	1.1 volute casing			4.1 Hydrost. Pressure Test 4)		
34	1.2 Cas. Cover			4.2 Gas Pressure Test		
35	1.3 Bearing frame			4.3 Performance curve 5)		
36	1.4 Impeller			4.4 Final check		
37	1.5 Shaft			4.5		
38	1.6			4.6		
<b>Shipping data 6)</b>						
39	Total net weight appr.	kg	/	Total gross weight appr.	kg	
<b>Documentation</b>						
40	Dimensional drwg.	Cross sect. drwg	Performance curve	Oper. & Instruct. Man.	Other (see attached)	Qty each
41						Language
<b>Remarks</b>						
42	▣ = min. information required for quotation					
43	1) = seen from driver to pump      2) = calcul. to EUROPUMP					
44	3) = acc. to EN 10204      4) = volute casing & casing cover					
45	5) = without NPSH-Test      6) = scope of supply see price sheet					
46	Revision:	Issued:			Date:	

**Substance data of heat transfer media**

Temperature	Water			Therminol VP			Therminol 66			Marlotherm SH		
	Density	Viscosity (kin)	Vapour pressure	Density	Viscosity (kin)	Vapour pressure	Density	Viscosity (kin)	Vapour pressure	Density	Viscosity (kin)	Vapour pressure
t	$\rho$	$\nu$	$p_v$ (or $p_D$ )	$\rho$	$\nu$	$p_v$ (or $p_D$ )	$\rho$	$\nu$	$p_v$ (or $p_D$ )	$\rho$	$\nu$	$p_v$ (or $p_D$ )
[°C]	[kg/m <sup>3</sup> ]	[mm <sup>2</sup> /s]	[bar]	[kg/m <sup>3</sup> ]	[mm <sup>2</sup> /s]	[bar]	[kg/m <sup>3</sup> ]	[mm <sup>2</sup> /s]	[bar]	[kg/m <sup>3</sup> ]	[mm <sup>2</sup> /s]	[bar]
0	1000						1022	1297,01		1058	290,11	
20	998	1,01	0,023	1064	4,03		1008	122,45		1044	61,20	
40	992	0,64	0,074	1048	2,48		995	29,64		1030	20,97	
60	983	0,47	0,199	1032	1,71		982	11,74		1016	9,59	
80	972	0,37	0,474	1015	1,27		969	6,12		1001	5,28	
100	958	0,29	1,013	999	0,99	0,0050	955	3,77	0,0010	987	3,30	
120	943	0,22	1,985	982	0,8	0,0100	941	2,58	0,0010	973	2,26	
140	926	0,19	3,614	965	0,67	0,0300	928	1,89	0,0030	958	1,65	
160	907	0,18	6,181	948	0,57	0,0700	914	1,46	0,0060	944	1,27	0,0003
180	884	0,17	10,027	931	0,49	0,1300	900	1,17	0,0120	930	1,02	0,0013
200	864	0,16	15,549	913	0,43	0,2400	885	0,97	0,0220	915	0,84	0,0041
220	840	0,14	23,198	895	0,39	0,4200	870	0,82	0,0410	901	0,71	0,0110
240	814	0,14	33,478	877	0,35	0,6800	856	0,71	0,0710	887	0,61	0,0261
260				857	0,32	1,0800	840	0,63	0,1200	873	0,54	0,0556
280				838	0,29	1,6300	825	0,56	0,1950	858	0,48	0,1089
300				817	0,27	2,3900	809	0,51	0,3070	844	0,43	0,1983
320				796	0,25	3,4000	792	0,47	0,4720	830	0,39	0,3398
340				773	0,24	4,7000	775	0,43	0,7070	815	0,36	0,5528
360				749	0,23	6,3500	757	0,41	1,0340	801	0,33	0,8596
380				723	0,22	8,4000	738	0,38	1,4810			
400				694	0,21	10,9000						

**Formula for calculation of operating point**

Motor efficiency		$\eta_N$	$\eta_N = P_N \cdot 1000 / (\sqrt{3} \cdot U_N \cdot I_N \cdot \cos\phi_N)$
Motor power	[kW]	$P_M$	$P_M = \sqrt{3} \cdot U \cdot I \cdot \cos\phi \cdot \eta / 1000$
Total head	[m]	H	$H = \Delta p \cdot 100000 / (\rho \cdot g)$
Corr. flow rate	[m <sup>3</sup> /h]	Q	$Q = Q_0 \cdot (n / n_0)$
Corr. total head	[m]	H	$H = H_0 \cdot (n^2 / n_0^2)$
Corr. power	[kW]	P	$P = P_0 \cdot (n^3 / n_0^3)$
Power for actual density	[kW]	$P_p$	$P_p = P_M \cdot (\rho / \rho_0)$

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Production Program**
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**Peripheral Impeller Pumps**

- Small Centrifugal Pumps
- Heat Transfer Pumps
- Submersible Pumps

**Radial Impeller Pumps**

- Small Centrifugal Pumps
- Heat Transfer Pumps
- Boiler Feed Pumps

**Side Channel Pumps**

- Pumps - Standard EN 734
- With NPSH-Stage
- Small Pumps

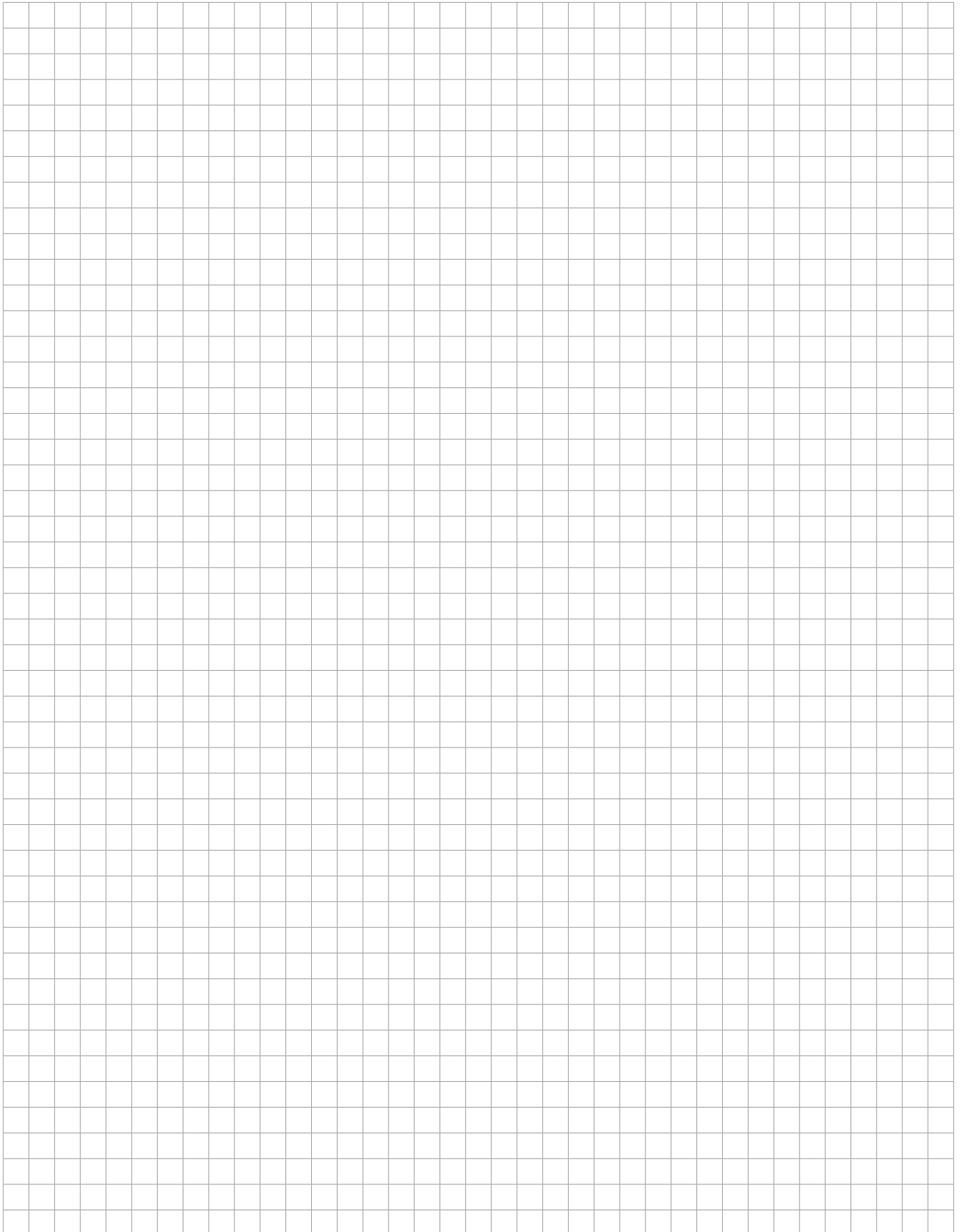
**Displacement Pumps**

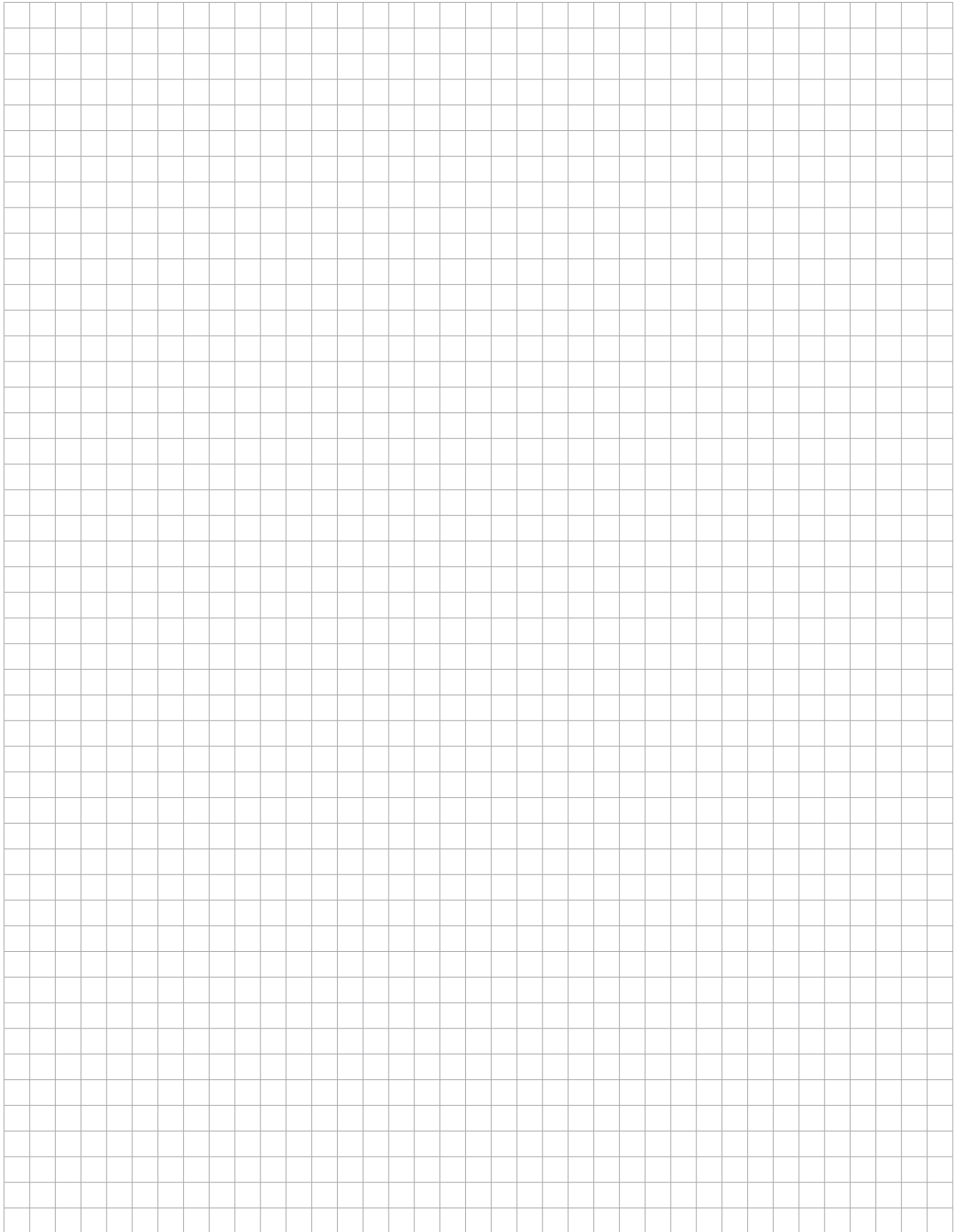
- Roller Vane Pumps
- Gear Pumps
- Oscillating Piston Pump

**Liquid Ring Vacuum Pumps**

- Closed coupled Version
- Base Plate Version











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