

## TOE-GN / GA / GI Series

*Heat transfer pumps*

*for heat transfer oils up to 350 °C and hot water up to 160 °C*

*with uncooled mechanical seals*

*volute casing PN 16*

*bearing brackets 360 and 470*

# Pumps for heat transfer technology

## Main applications

- » Tempering in plastics and die cast industry
- » Baking ovens, large frying units as well as in the production of edible oils and dry masses for the food and feedstuff industries
- » Heating calenders and melting pots in the leather and rubber industry
- » Heating stirring and mixing vessels in the production of paints and varnishes
- » Heating tank storage facilities on stationary and FPSE platforms as well as in tankers
- » Heating press lines in the wood and pulp industry
- » Flat glass production
- » Solar power stations and ORC processes

## Usage

These pumps are designed for circulating organic or synthetic heat transfer oils in heat transfer plants in acc. with DIN 4754, as well as hot water.

Suitable for media to be pumped with little non-abrasive contaminations

	Thermal oil versions	Hot water versions
Media	Heat transfer oil / thermal oil	Water
$T_{\min}$	- 40 °C	-
$T_{\max}$	+ 350 °C	+ 160 °C, + 180 °C on request
Casing	Spheroidal graphite cast iron	
Nominal pressure	PN 16	
$H_{\max}$ (2900 min <sup>-1</sup> )	100 m	
$Q_{\max}$ (2900 min <sup>-1</sup> )	550 m <sup>3</sup> /h	
ATEX	II 3G c TX	

## Denomination

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

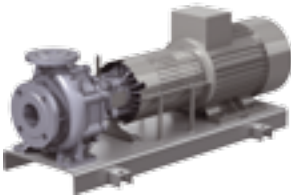
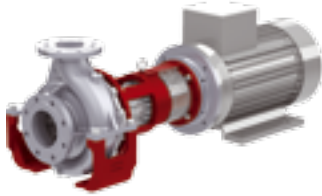
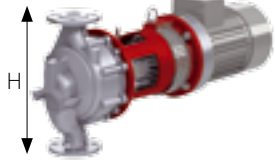

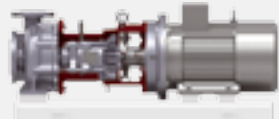
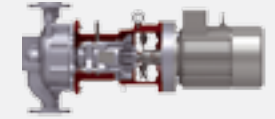
### Your contacts

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Systemtechnik GmbH**  
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91154 Roth  
Tel: +49 9171 809-0  
Fax: +49 9171 809-10  
info@speck.de  
www.speck.de

### International representatives

→ page 23

# TOE-GN / GA / GI Series

	TOE-GN	TOE-GA	TOE-GI
	 <p>Example: Casing with feet</p>	 <p>Example: Casing with centreline mounting</p>	 <p>H</p>
			
<b>Features</b>	<ul style="list-style-type: none"> <li>» Bearing bracket / process design</li> <li>» Base plate</li> <li>» Dismantling of the bearing bracket possible without moving the motor</li> <li>» Alignment / checking of the coupling required before start-up</li> <li>» Pump and aggregate dimensions in acc. with EN 733</li> </ul>	<ul style="list-style-type: none"> <li>» Bracket version</li> <li>» Base plate optional</li> <li>» No alignment of coupling required before start-up</li> <li>» Space for disassembling the cartridge insert required</li> <li>» Pump dimension in acc. with EN 733</li> </ul>	<ul style="list-style-type: none"> <li>» Bracket version with inline casing</li> <li>» No alignment of coupling required before start-up</li> <li>» Space for disassembling the cartridge insert required</li> </ul>
<b>Pump dimensions</b>	→ Pages 16 and 17	→ Pages 16 and 17	→ Page 18
<b>Hydraulics and casing</b>	<ul style="list-style-type: none"> <li>» Identical hydraulics for TOE-GN and TOE-GA</li> <li>» Characteristic curves → pages 12 and 13</li> <li>» Identical volute casing for each frame size</li> <li>» Large pumps with centreline mounting and double volute Description → page 5</li> </ul>		<ul style="list-style-type: none"> <li>» Characteristic curves → pages 14 and 15</li> <li>» Inline casings with two dimensions H available</li> </ul>
<b>Sizes</b>	<ul style="list-style-type: none"> <li>» Only two bearing brackets for all sizes</li> <li>» Bearing bracket 360 for 12 sizes - identical and interchangeable</li> <li>» Bearing brackets 470 for 7 sizes - identical and interchangeable</li> <li>» Only one bracket per size</li> </ul>		
<b>Description</b>	<ul style="list-style-type: none"> <li>» Thermal oil versions → page 6</li> <li>» Hot water versions → page 7</li> </ul>		
<b>Interchangeability of parts</b>	<ul style="list-style-type: none"> <li>» Within all series including the versions with magnetic coupling (→ see catalogue TOE-MN/MA/MI series) there is a high degree of interchangeability.</li> <li>» This means minimum spare parts stock and full flexibility as replacing pumps or components or retrofitting to a different design is very easy.</li> <li>» Table of interchangeable parts → page 19</li> </ul>		

# High operational safety, optimal design and service-friendly

## Robust design

### Torsion-resistant casing cover and ball bearings with lifetime lubrication

### Wear-resistant SiC sleeve bearings

Solid, hydrodynamically lubricated sleeve bearings made from SiC as tried-and-tested slide material - extremely wear-resistant and good resistance in corrosive media.

### Impellers with back vanes

The back vanes of the impellers significantly reduce the axial thrust and therefore remove strain from the mechanical seal and the ball bearings considerably. They also keep dirt particles away from the sleeve bearings.

## Optimised for synthetic heat transfer oils

### Dry-run safety function for the mechanical seal

Synthetic heat transfer oils are being used more and more frequently due to the benefits they offer. However, low-boilers develop in the synthetic oils over time in form of gas bubbles, can lead to dry-running on the mechanical seal.

This is ruled out completely in the generously designed mechanical seal casings from Speck. An anti-vortex rib reliably prevents gas bubbles from forming on the mechanical seal.

The vacuum generated by the back vanes also ensures that the low-boilers do not collect in the mechanical seal casing and are returned to the media circuit.

## Clever temperature management

### Optimised cooling of ball bearings, mechanical seal and sleeve bearings

The air flow generated by the fan blade on the coupling cools the mechanical seal and the ball bearing optimally in combination with coupling protection or bracket and several cooling fins. The additional cooling zone reduces the temperature on the sleeve bearings.

## Also suitable for critical applications

### Mechanical seal with quench

For media, which are prone to crack product formation on the sealing surfaces of the mechanical seal, versions with quench are available.

## Optimal design

### Energy efficiency

High energy efficiency secures a lasting competitive edge.

Speck offers the important criteria for energy-optimised design: Seamless range of sizes, highly efficient impellers, switching of impellers for the best design at the operating point and natural motors in accordance with IE2.

## Maintenance-friendly and flexible

### Simple installation

All series are extremely maintenance-friendly thanks to easy-to-remove bearing brackets.

### Minimum spare parts stock

The high level of interchangeability of identical parts guarantees minimal spare parts stock requirements and an extremely high level of flexibility.

The bearing bracket 360 alone is used with mechanical seal in all three series in up to twelve sizes.

Retrofitting to a different series is also no problem at all - the volute casing can even be left in the system.

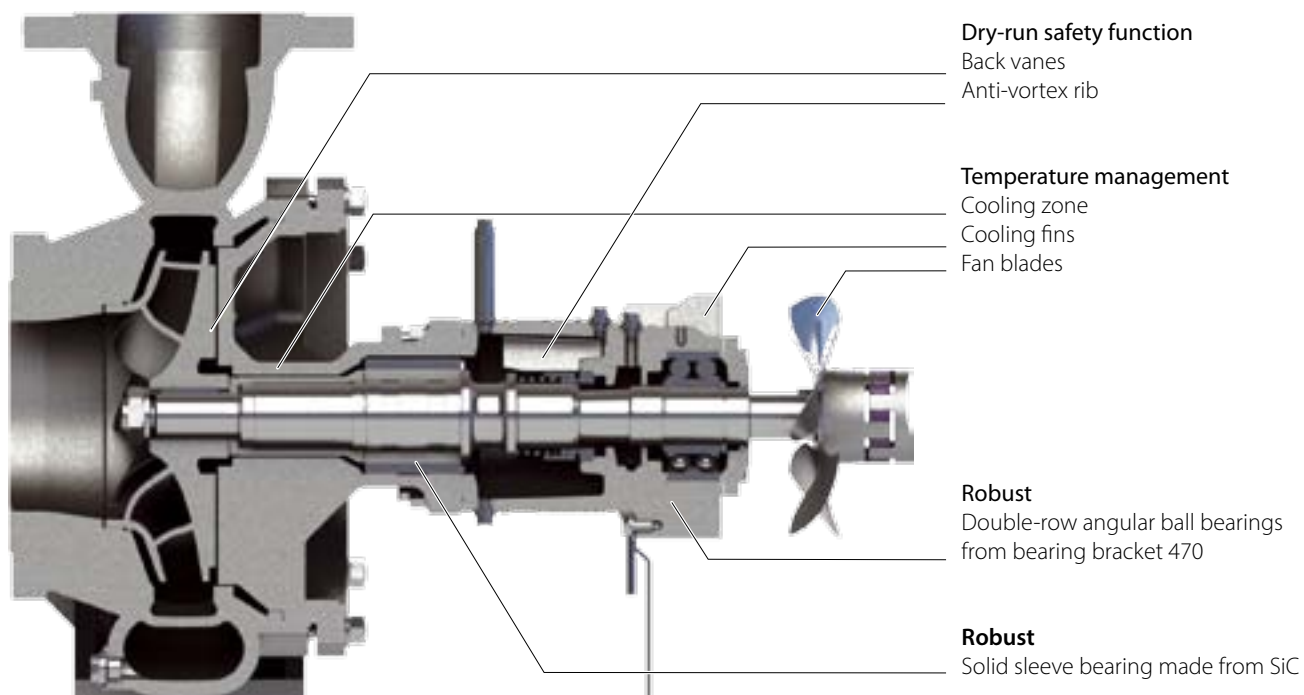


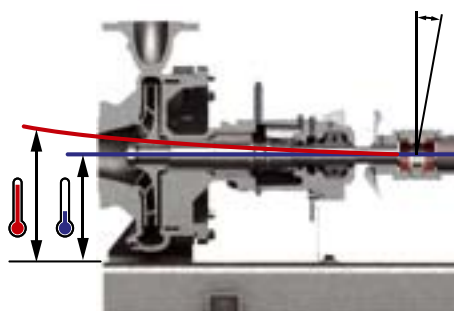
Fig.: TOE-GN, bearing bracket 470, casing with centreline mounting

# Longer lifetime

There are effects, which have little or no relevant impact on smaller designs, but lead to increased wear in larger pumps.

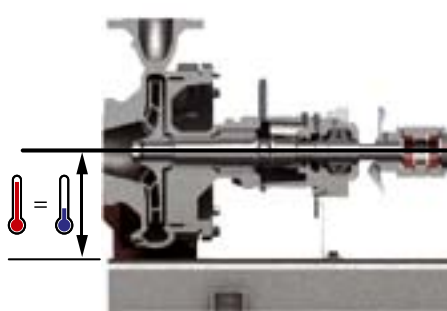
Speck offers larger pumps with special designs to guarantee a longer lifetime: Casing with centreline mounting and double volute.

## Centreline mounting relieves strain from the bearings and coupling



Casing with feet: The larger the pump, the more strain placed on the bearings and coupling by heat expansion

Casings with feet can only expand upwards in high temperatures, which causes the shaft to tilt and bend. This has an impact on the sleeve bearings and shaft coupling in particular. As the heat expansion increases with larger casing size, the sleeve bearings and couplings also wear faster on larger pumps.



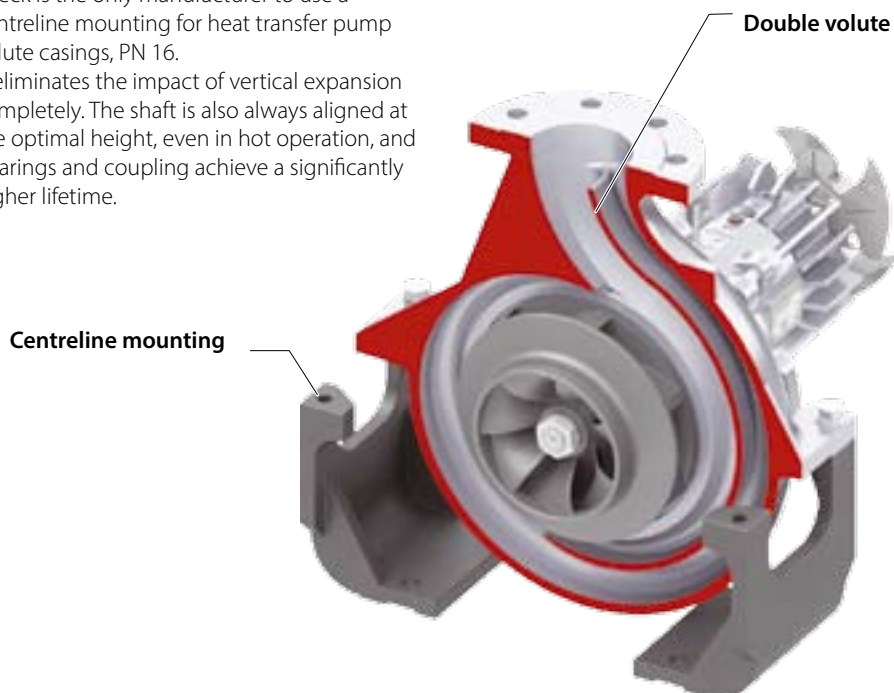
The centreline mounting eliminates the impact of the heat expansion completely

Speck is the only manufacturer to use a centreline mounting for heat transfer pump volute casings, PN 16. It eliminates the impact of vertical expansion completely. The shaft is also always aligned at the optimal height, even in hot operation, and bearings and coupling achieve a significantly higher lifetime.

## A double volute remove strain from the sleeve bearings

Radial forces are applied directly on the sleeve bearings. The forces increase with higher impeller diameters and higher speeds. This is why the sleeve bearings on larger pumps with single volute casings wear faster.

Speck therefore uses casings with double volute for larger pumps, which significantly reduce the radial forces. The strain on the radial and axial bearings is considerably reduced, helping them achieve a much longer lifetime.

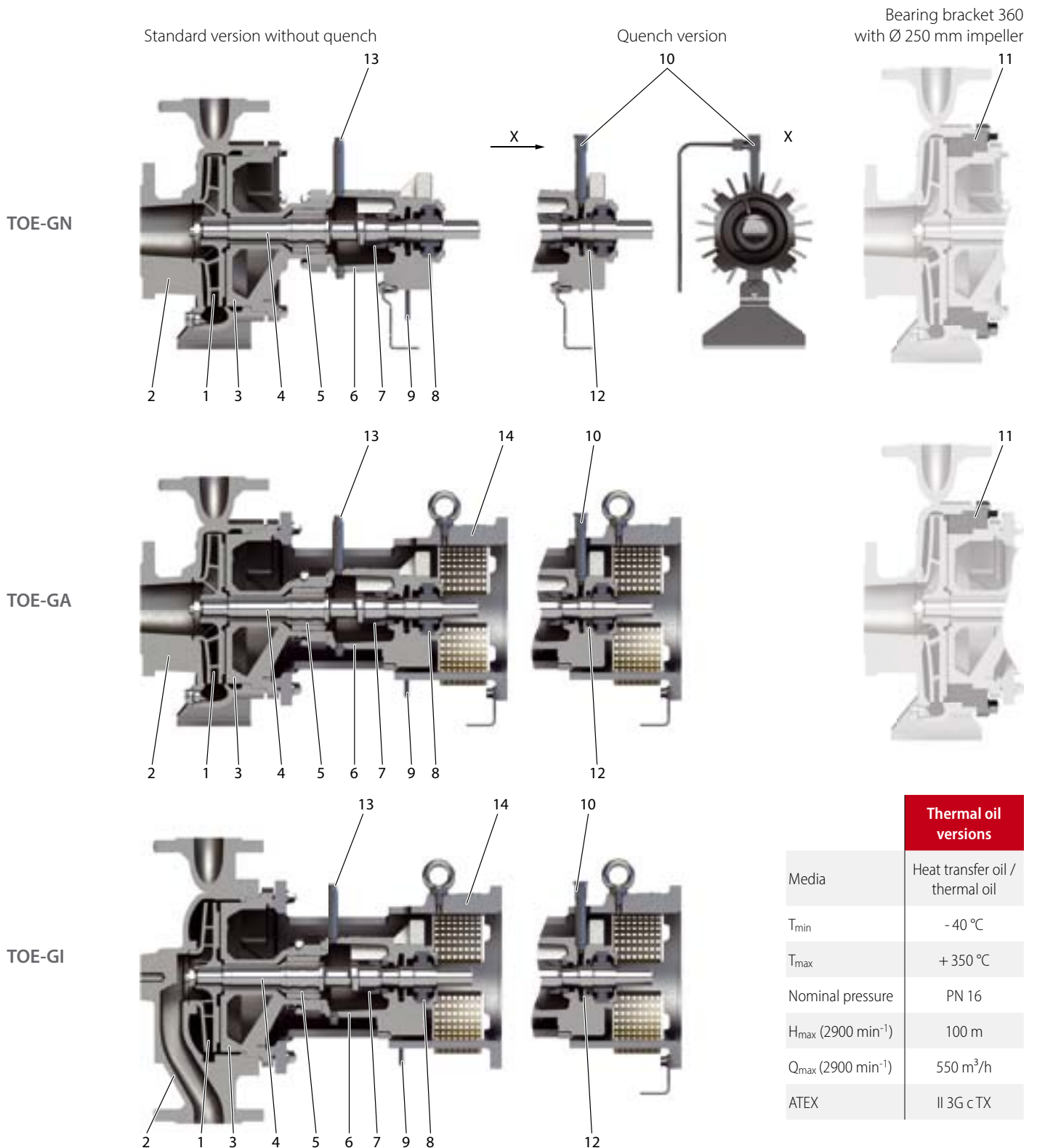


## TOE-GN / GA – Sizes and casing designs

32-160	40-160	50-160	65-160	80-160	100-160	–
32-200	40-200	50-200	65-200	80-200	100-200	125-200
32-250	40-250	50-250	65-250	80-250	100-250	–
<b>Bearing bracket 360</b>			<b>Bearing bracket 470</b>			

All casings with dimensions in accordance with EN 733 Casing with double volute Casing with centreline mounting

# Thermal oil versions



## Thermal oil versions

Media	Heat transfer oil / thermal oil
$T_{min}$	- 40 °C
$T_{max}$	+ 350 °C
Nominal pressure	PN 16
$H_{max}$ (2900 min <sup>-1</sup> )	100 m
$Q_{max}$ (2900 min <sup>-1</sup> )	550 m <sup>3</sup> /h
ATEX	II 3G c TX

No.	Description	Material / Remarks
1	Impeller	EN-GJL-250
2	Casing	EN-GJS-400-15
3	Casing cover	EN-GJS-400-15
4	Shaft	1.4122
5	Sleeve bearing	SiC
6	Mechanical seal casing	EN-GJS-400-15
7	Mechanical seal	AQ1VGG, unbalanced
8	Rolling bearing	High-quality brand

No.	Description	Material / Remarks
9	Leakage pipe	not applicable to quench version
10	Quench reservoir	optional
11	Counter flange	EN-GJS-400-15
12	Radial shaft sealing ring	only available with quench version
13	Ventilation	
14	Bracket	EN-GJS-400-15

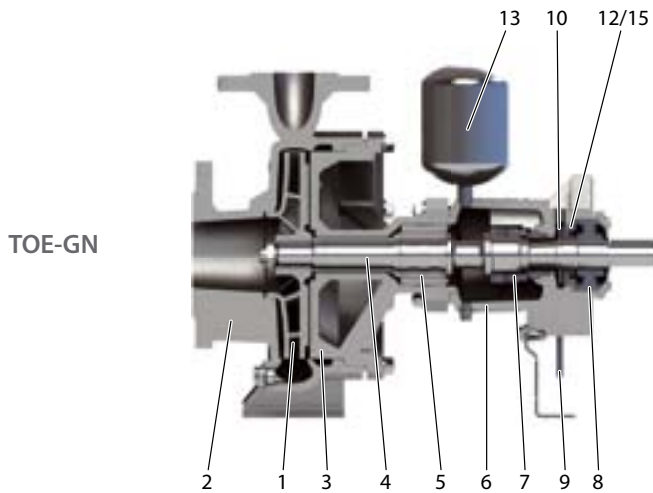
EN-GJL-250 = GG-25

EN-GJS-400-15 = GGG-40

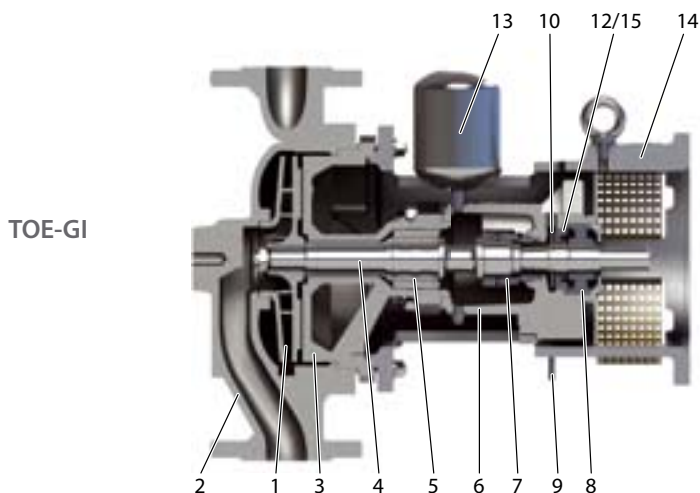
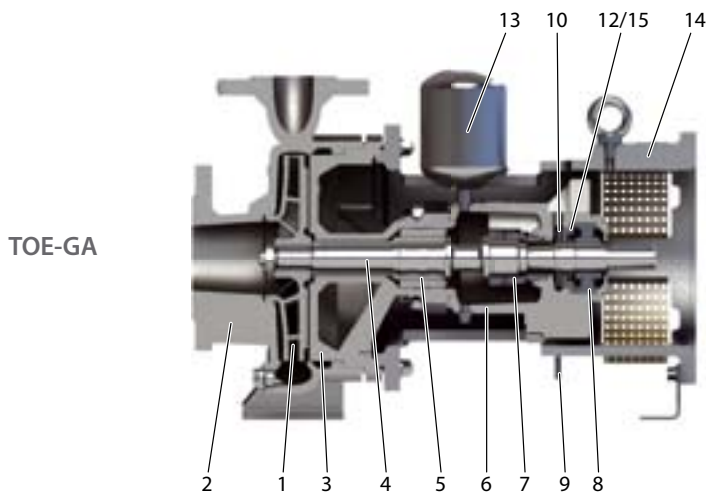


# Hot water versions

With degassing tank



Bearing bracket 360  
with  $\varnothing 250$  mm impeller



## Hot water versions

Media	Water
$T_{\min}$	-
$T_{\max}$	+ 160 °C, + 180 °C on request
Nominal pressure	PN 16
$H_{\max}$ (2900 min <sup>-1</sup> )	100 m
$Q_{\max}$ (2900 min <sup>-1</sup> )	550 m <sup>3</sup> /h
ATEX	II 3G c TX

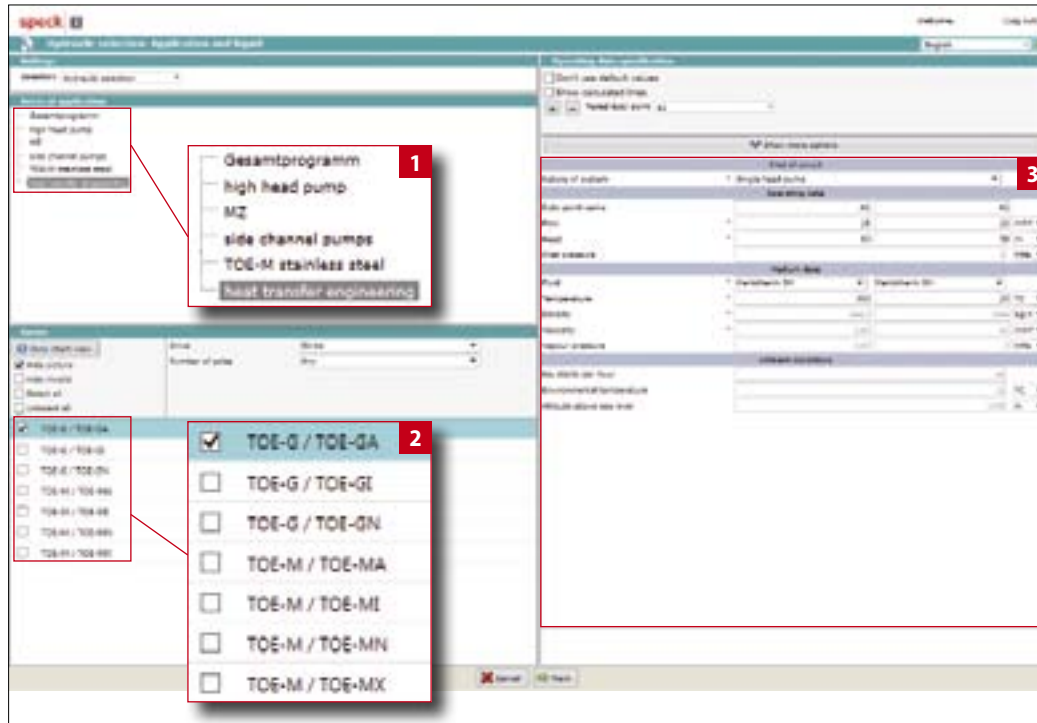
No.	Description	Material / Remarks
1	Impeller	EN-GJL-250
2	Casing	EN-GJS-400-15
3	Casing cover	EN-GJS-400-15
4	Shaft	1.4122
5	Sleeve bearing	SiC
6	Mechanical seal casing	EN-GJS-400-15
7	Mechanical seal	AQ;KGG, balanced
8	Rolling bearing	High-quality brand

No.	Description	Material / Remarks
9	Leakage pipe	
10	Splash ring	
11	Counter flange	EN-GJS-400-15
12	Radial shaft sealing ring	
13	Degassing tank	
14	Bracket	EN-GJS-400-15
15	Bush	

EN-GJL-250 = GG-25 | EN-GJS-400-15 = GGG-40

# Simple and optimal configuration software

## SPAIX selection program



The software allows you to configure heat transfer pumps, side channel pumps and boiler feed pumps via your Internet browser. As well as design details, the system will also request operating details and details about the medium to be pumped.

### Ideal for system planners

Speck now also offers the latest version 4 of the renowned SPAIX design software.

We make the program available to authorised customers who can pre-select the pumps within their system.

The web-based software always accesses an up-to-date database.

### Easy pre-selection

The configuration system avoids a wide range of selection parameters with regard to design, sealing systems, hydraulics, operating conditions and media.

The software has language options for German and English.

### Checking the pre-selection

When the order is submitted, the customer's choices are double-checked to ensure that your project requirements are met.



Characteristic curve depending on hydraulic selection

### Key

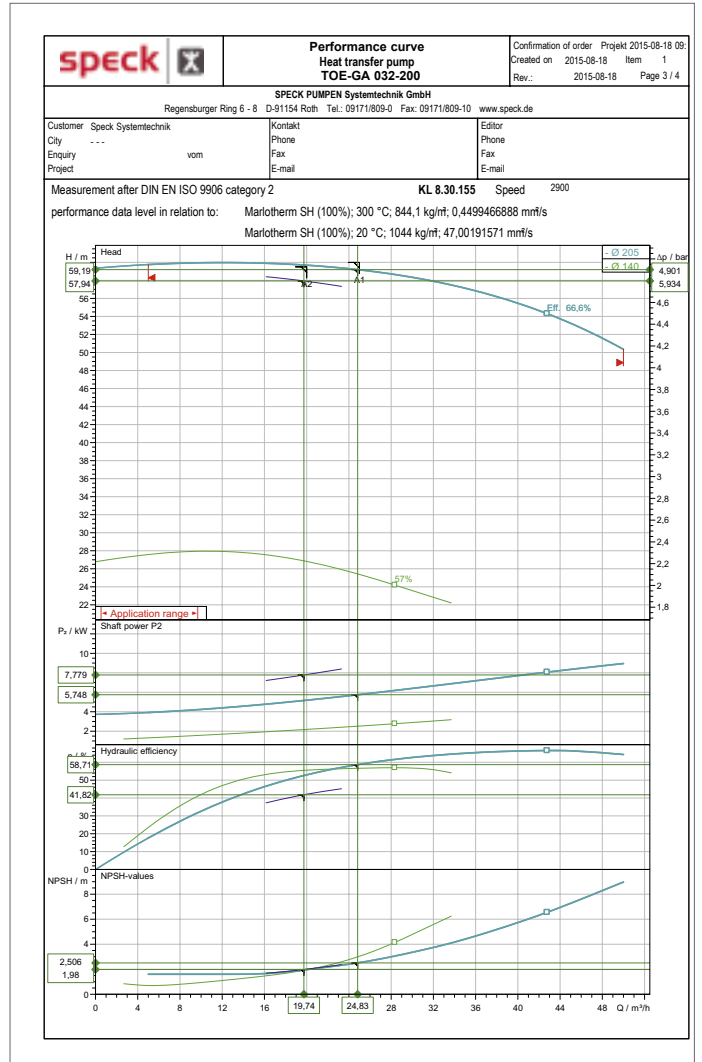
- 1 List of all pump designs that can be configured in the software
- 2 List of all series within the pump designs
- 3 Selection parameters operating parameters and medium data in the first instance
- 4 Characteristic curve depending on hydraulic selection generated



# Documentation based on the selection program

speck		Data Sheet Heat transfer pump TOE-GA 032-200		Confirmation of order Projekt 2015-08-18 09 Created on 2015-08-18 Item 1 Rev.: 2015-08-18 Page 2 / 4	
SPECK PUMPEN Systemtechnik GmbH Regensburger Ring 6-8 D-91154 Roth Tel.: 09171/809-0 Fax: 09171/809-10 www.speck-pumps.de					
Customer Speck Systemtechnik City ... Enquiry vom Project		Kontakt Phone Fax E-mail		Editor Phone Fax E-mail	
<b>Operating Data</b>					
1 Fluid	Marlotherm SH	Flow rate	rated 24.83 m <sup>3</sup> /h min / max 5 / 50 m <sup>3</sup> /h	Speed	2900 1/min
2 Corrosive matters	keine/none	Wght.-%		Hydr. efficiency	58.71 %
3 Abrasive matters	keine/none	Wght.-%		Hydr. power const.	5.75 kW
4 Solids	0	Wght.-%		Max. operating pressure	4.91 bar (a)
5 Oper. Temp. / W / IS	300 / 20 °C	Head	59.19 m	Flow rate at cold start	20 m <sup>3</sup> /h
6 Density at 20 °C	844.1 / 1044 kg/m <sup>3</sup>	Pressure different	4.90 bar (a)	Start-up temp.	20 °C
7 Kin. viscosity at 20 °C	0.4499 / 47 mm <sup>2</sup> /s	NPSH	System required 3.01 m	Total abs. power at cold start	7.78 kW
8 Vapor press. at 20 °C	0.2 / bar				
9 PH value	7				
<b>Installation / Environment</b>					
10 Building / Outside	Gebäude	Altitude	< 1000 m	Amb. Temp. min	20 / 40 °C
11 under roof yes/no	Ja / Yes	ATEX aggregate category	not ATEX	rel. Humidity	<55 %
<b>Pumpe</b>					
12 Impeller-Ø / RUS	205 / 148 mm	Pressure rating	PN 16	Delivery port	Pressure rating PN 16 nom. diam. DN DN 50
13 Impeller type	Radial	Impeller	Standard	Delivery port	Pressure rating PN 16 nom. diam. DN DN 32
14 direction of rotation	right	Standard	EN 1092-2		Standard EN 1092-2
15 Single head pump	X 1	Specifying calving suction side = min.	250 mm		
<b>Accessories</b>					
16 Motor		Shaft seal		Base plate	
17 Make	HOYER	Type	HMC2 160M1-2	Mechanical seal	
18 Specific design	IE 2 / 50 Hz / Pole pairs 1	Number of poles	2	AQ1VGG	
19 Rated power	11 kW	Degree of prot.	IP 55		
20 Rated current	20 A	Frequency	50 ±2% Hz		
21 1-phase / 3-ph	3-	Voltage	400 ±5% V		
22 Rated speed	2930 1/min	Mounting	IM B35		
23 Motor flange ø	350 mm	Sound pressure level	dB(A)	name plate	links
24		terminal box, motor	coben	Quench yes/no	Nein / not
25					
<b>Materials</b>					
26 Volute casing	EN-GJS-400-15	Impeller	EN-GJL-250		
27 Casing cover	EN-GJS-400-15	Mechanical seal housing	EN-GJS-400-15		
28 Shaft	1.4122	Bracket	EN-GJS-400-15		
29 Bearing cover	EN-GJS-400-15	Mechanical seal	AQ1VGG		
30 Sleeve bearing	SIC				
31					
32					
<b>Tests and Inspections</b>					
33 Material Tests	Test	Certificate	Other Tests	Tests and Inspections	Certificate Qty
34 Volute casing	keine	kein	Hydrost. Pressure Test	Intern	kein alle
35 Impeller	keine	kein	Gas Pressure Test	Intern	kein alle
36 Casing cover	keine	kein	Performance curve	Keine	kein alle
37 Mechanical seal housing	keine	kein	NPSH-Measurement	Keine	kein alle
38 Shaft	keine	kein	Final check	Intern	kein alle
39			vibration	Keine	kein alle
40			temperature	Keine	kein alle
41			Max. operating pressure	16 bar / 20°C [X] Factor 1.5	test time min
<b>Shipping data</b>					
42 Net weight appr.	kg	Gross weight appr.	kg	motor color	
<b>Documentation</b>					
43 Dimensional dwg.	Cross sect. dwg.	performance curve No.	Oper. & Instruct. Man.	Other (see attached)	Qty
44 RD 8.30. xxx	E 4022. xxx	KL 8.30.155	DE 1096.0966		1
<b>Remarks</b>					
45	motor article				
46	1) motor supplement corresponds to ISO 9908				
	2) according to EN 10204				
	3) volute casing & casing cover				
	4) without NPSH test				
	5) scope of deliv. to press sheet				

Technical data sheet (example)



Characteristic curve (example)

speck		Dimension drawing Heat transfer pump TOE-GA 032-200		Confirmation of order Projekt 2015-08-18 09 Created on 2015-08-18 Item 1 Rev.: 2015-08-18 Page 4 / 4																																																																																																																																	
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		<table border="1"> <thead> <tr> <th colspan="2">Anschlüsse</th> <th colspan="2">Dimensionen in mm</th> </tr> </thead> <tbody> <tr><td>Suction port</td><td>EN 1092-2</td><td>P</td><td>350</td></tr> <tr><td>Delivery port</td><td>EN 1092-2</td><td>B</td><td>210</td></tr> <tr><td>DN 50 PN 16</td><td>DN 52 PN 16</td><td>BB</td><td>260</td></tr> <tr><td>ø D1 125 mm</td><td>ø D1 100 mm</td><td>A</td><td>254</td></tr> <tr><td>ø D2 19 mm</td><td>ø D2 19 mm</td><td>AA</td><td>85</td></tr> <tr><td>D2 x 4</td><td>D2 x 4</td><td>AB</td><td>320</td></tr> <tr><td></td><td></td><td>K</td><td>14,5</td></tr> <tr><td></td><td></td><td>D</td><td>42</td></tr> <tr><td></td><td></td><td>DNS</td><td>50</td></tr> <tr><td></td><td></td><td>DS</td><td>165</td></tr> <tr><td></td><td></td><td>IS</td><td>20</td></tr> <tr><td></td><td></td><td>DND</td><td>32</td></tr> <tr><td></td><td></td><td>ED</td><td>146</td></tr> <tr><td></td><td></td><td>ED</td><td>16</td></tr> <tr><td></td><td></td><td>S</td><td>80</td></tr> <tr><td></td><td></td><td>D1</td><td>190</td></tr> <tr><td></td><td></td><td>D2</td><td>190</td></tr> <tr><td></td><td></td><td>G1</td><td>180</td></tr> <tr><td></td><td></td><td>b</td><td>50</td></tr> <tr><td></td><td></td><td>m1</td><td>100</td></tr> <tr><td></td><td></td><td>m2</td><td>76</td></tr> <tr><td></td><td></td><td>B1</td><td>15</td></tr> <tr><td></td><td></td><td>m1</td><td>240</td></tr> <tr><td></td><td></td><td>G2</td><td>190</td></tr> <tr><td></td><td></td><td>w1</td><td>694</td></tr> <tr><td></td><td></td><td>ø</td><td>95,5</td></tr> <tr><td></td><td></td><td>e</td><td>24</td></tr> <tr><td></td><td></td><td>z</td><td>1681</td></tr> <tr><td></td><td></td><td>B1</td><td>13,5</td></tr> <tr><td></td><td></td><td>AD</td><td>277</td></tr> <tr><td></td><td></td><td>H</td><td>160</td></tr> </tbody> </table>		Anschlüsse		Dimensionen in mm		Suction port	EN 1092-2	P	350	Delivery port	EN 1092-2	B	210	DN 50 PN 16	DN 52 PN 16	BB	260	ø D1 125 mm	ø D1 100 mm	A	254	ø D2 19 mm	ø D2 19 mm	AA	85	D2 x 4	D2 x 4	AB	320			K	14,5			D	42			DNS	50			DS	165			IS	20			DND	32			ED	146			ED	16			S	80			D1	190			D2	190			G1	180			b	50			m1	100			m2	76			B1	15			m1	240			G2	190			w1	694			ø	95,5			e	24			z	1681			B1	13,5			AD	277			H	160	<p>1) The application drawing is to be used as the basis for the design of the piping system.</p> <p>2) The drawing does not show the motor.</p>	
Anschlüsse		Dimensionen in mm																																																																																																																																			
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		b	50																																																																																																																																		
		m1	100																																																																																																																																		
		m2	76																																																																																																																																		
		B1	15																																																																																																																																		
		m1	240																																																																																																																																		
		G2	190																																																																																																																																		
		w1	694																																																																																																																																		
		ø	95,5																																																																																																																																		
		e	24																																																																																																																																		
		z	1681																																																																																																																																		
		B1	13,5																																																																																																																																		
		AD	277																																																																																																																																		
		H	160																																																																																																																																		

Dimensional drawing (example)

## Save projects

Interim configuration results such as characteristic curves, scale drawings or technical data sheets can be saved as a project and generated as a pdf file.

# Order-related tests

## Pressure tests

Speck carries out the tests below as standard:

### Gas pressure test

The gas pressure test is used to prove that the components are leak-proof. All components that bear pressure are tested, such as the volute casing, casing cover and mechanical seal casing. The test is carried out with forming gas at 2 bar. The holding time is 15 minutes.

### Hydrostatic pressure test

The hydrostatic pressure test is used to prove strength of the components and that the pump is leak-proof. The fully assembled pump is tested. The test is carried out with a hydrostatic test pressure based on prEN 12162; the hydrostatic test pressure corresponds to 1.5 x the nominal pressure (PN16) at 20 °C. The holding time is 10 minutes.

If you want to use pressure tests according to different criteria, please enter them in the request.

## Testing the performance

At the customer's request, Speck offers the following tests:

### Hydraulic tests

Measurement according to DIN EN ISO 9906, Class II, Acceptance Class 2B, Edition March 2013

### NPSH test

In this test, the suction-side pressure is gradually reduced until the decrease in the delivered head reaches 3 % at a constant flow rate. At least four flows are evaluated that are spread appropriately over the admissible operating range. The NPSH value is not a guarantee point.

### Vibration test

Vibration test according to EN ISO 5199, Edition 2002

The vibration values are measured radially and vertically at every operating point on the bearing casing at the nominal speed and with the corresponding flow rate.

### Temperature measurement

The measurement is taken on the motor-side bearing at operating temperature. The operating temperature and the ambient temperature at every operating point measured are documented.



Computer-controlled and fully automated test stands on the premises of Speck in Roth.

Measuring of hydraulics, power requirements, axial thrust, vibrations and NPSH values. Heads of up to 400 m and flow rates of up to 750 m<sup>3</sup>/h are possible.

# Further data and notes

## Standard conditions at site

- » Ambient temperature from -20 °C to +40 °C
- » Permissible altitude up to 1000 m above seal level

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

## Painting

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

## Dimensioning

### Assessment of the maximum pump outlet pressure

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

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

With:

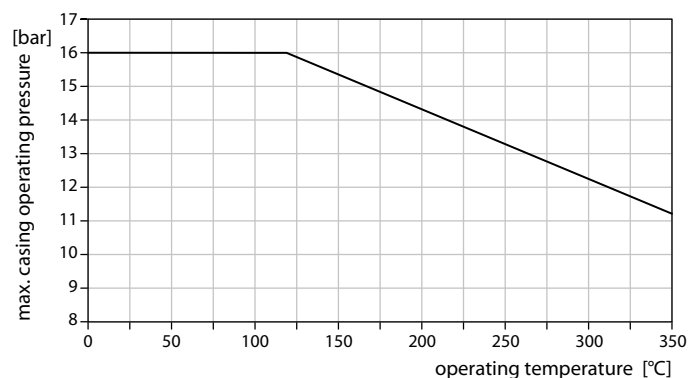
- $p_{2\max\text{ op}}$  = maximum pump outlet pressure [bar]
- $p_{1\max\text{ op}}$  = maximum pump inlet pressure [bar]
- $\rho$  = density of the medium to be pumped [ $\text{kg}/\text{m}^3$ ]
- $g$  = gravitation constant [ $\text{m}/\text{s}^2$ ]
- $H$  = maximum total head at zero flow or at the 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  $p_{\text{all w c}}$  at operating pressure.

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

### Pressure and temperature limitations

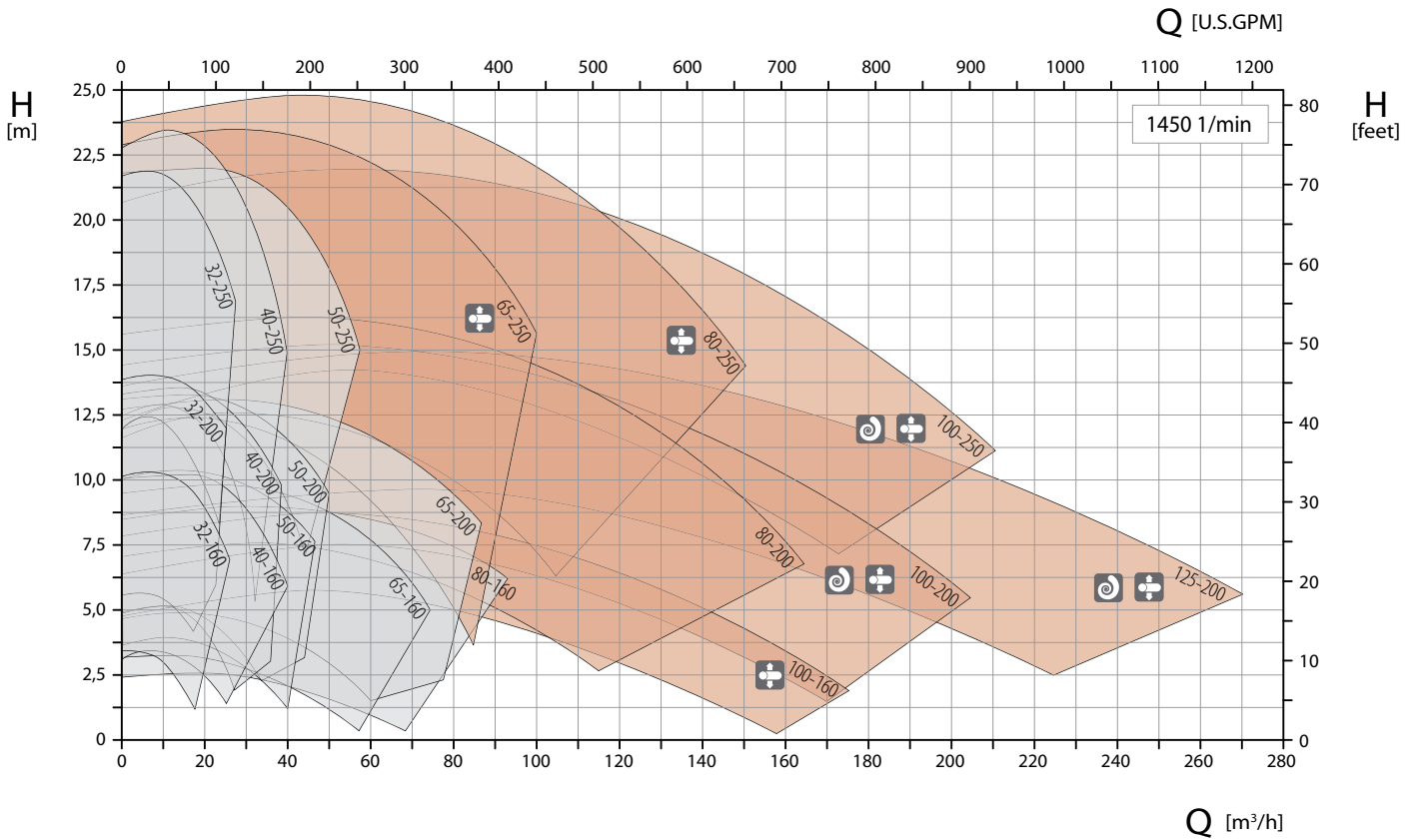
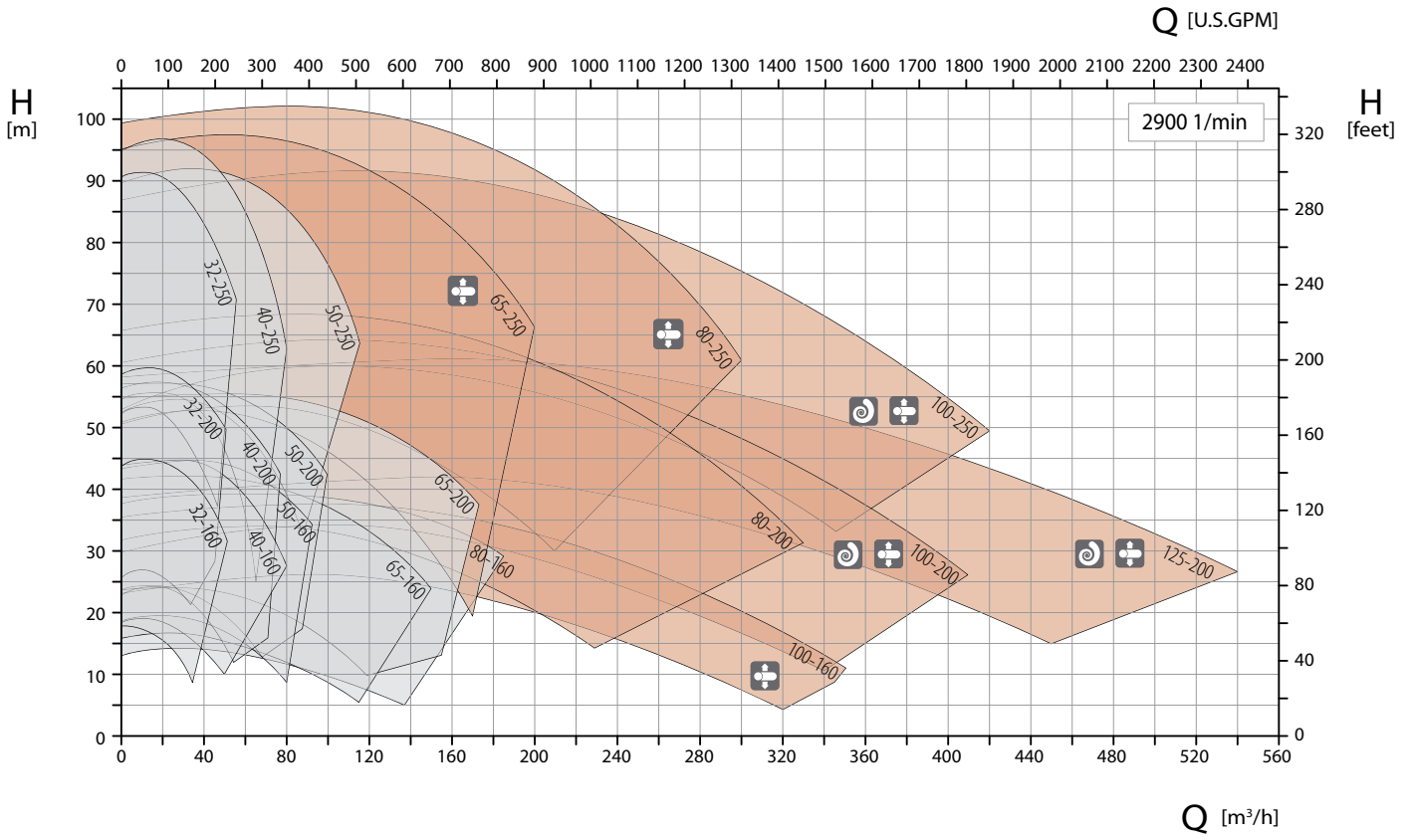
The maximum casing operating pressure  $p_{\text{all w c}}$  of the pressure retaining parts depends on the operating temperature:



Maximum permissible casing operating pressure  $p_{\text{all w c}}$

# TOE-GN / GA – Characteristic curves

50 Hz



**Bearing bracket 360**

**Bearing bracket 470**

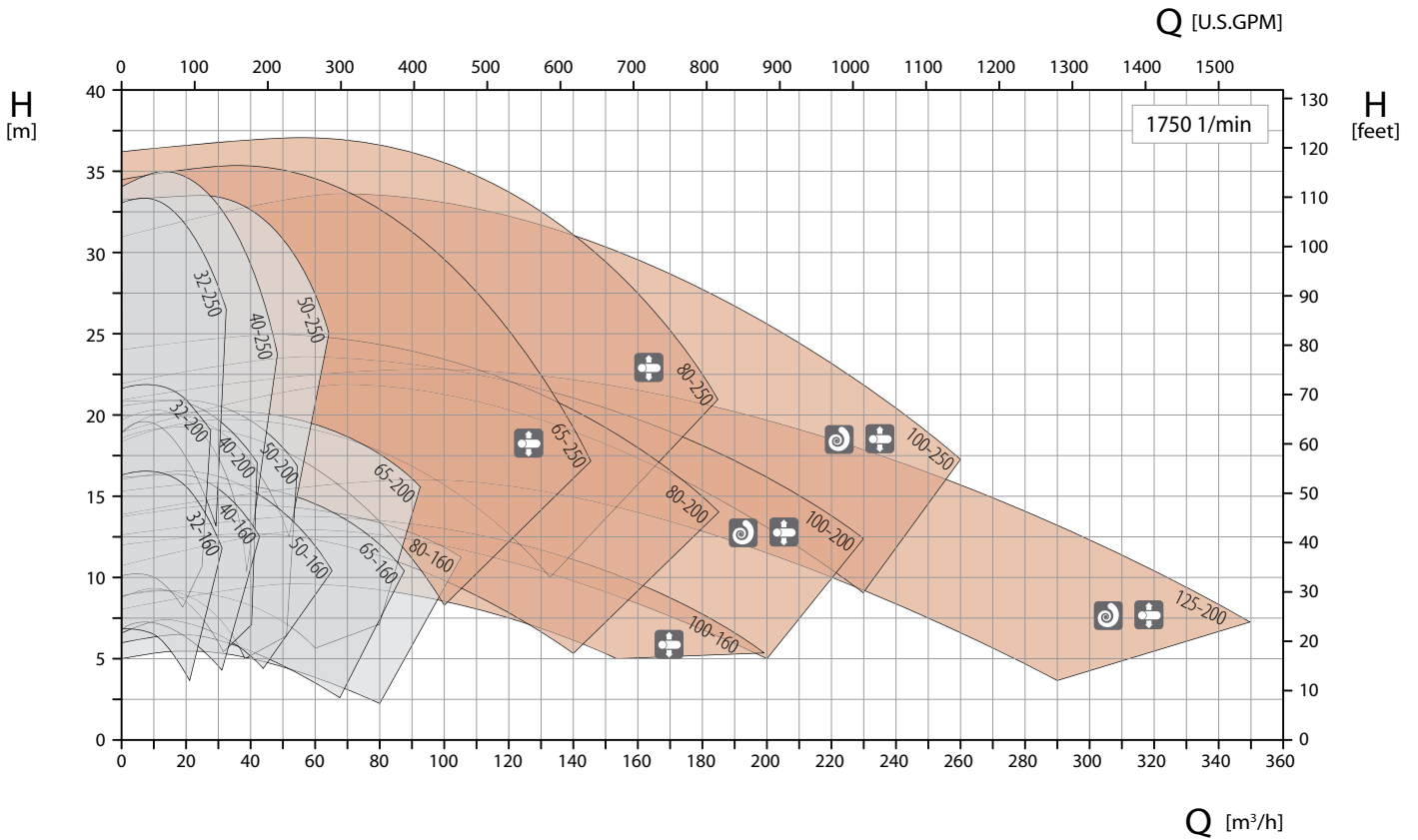
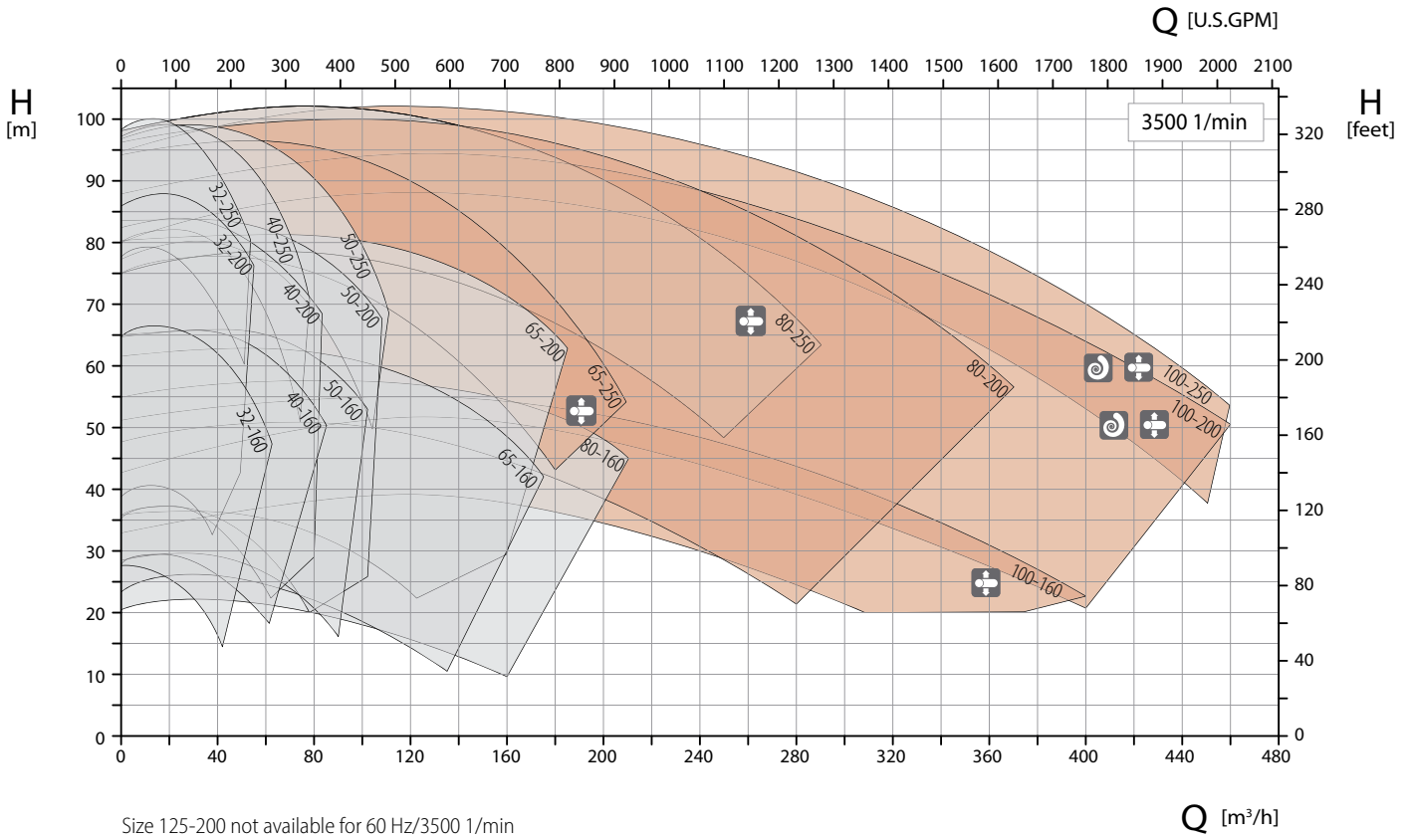


Casing with double volute



Casing with centreline mounting

60 Hz

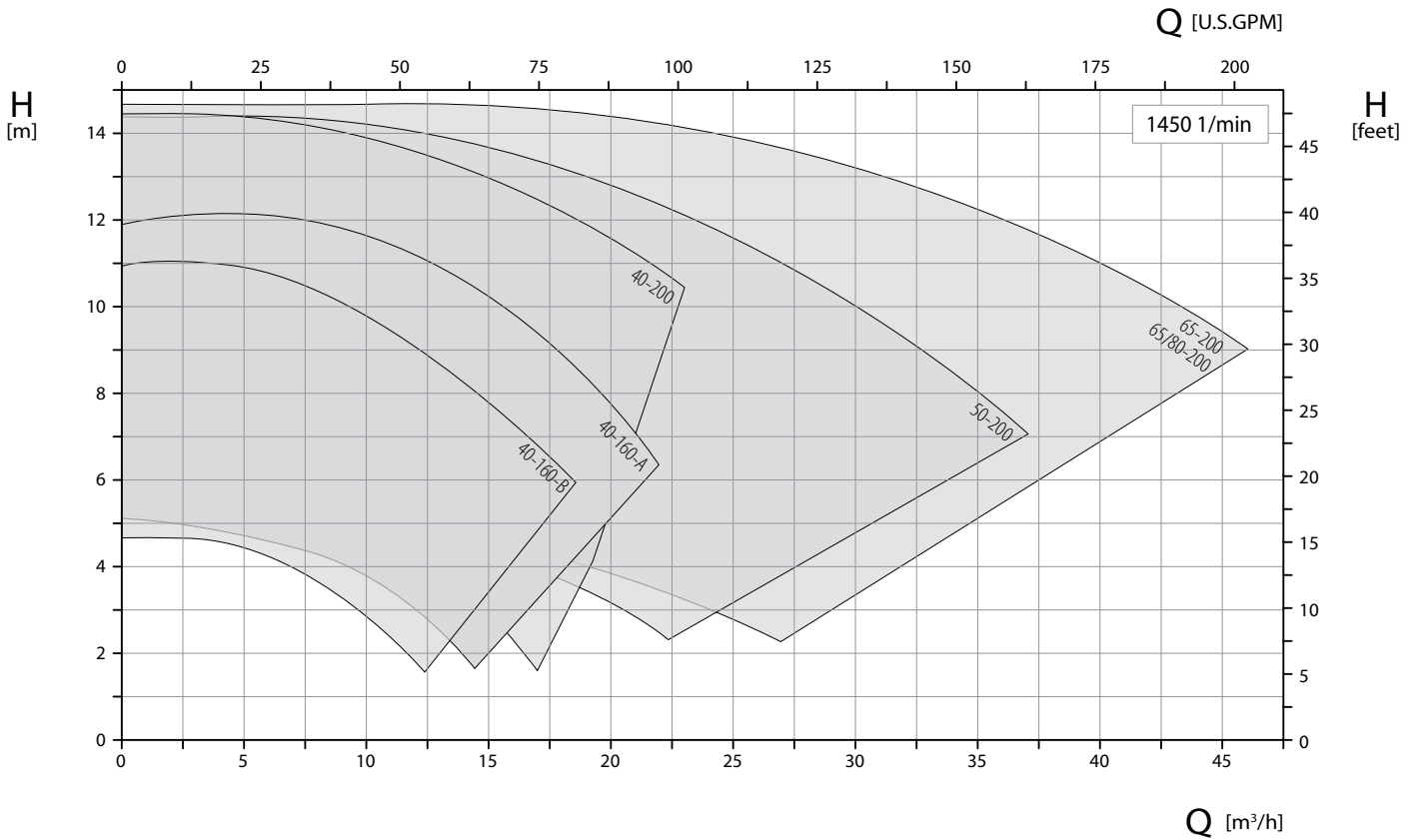
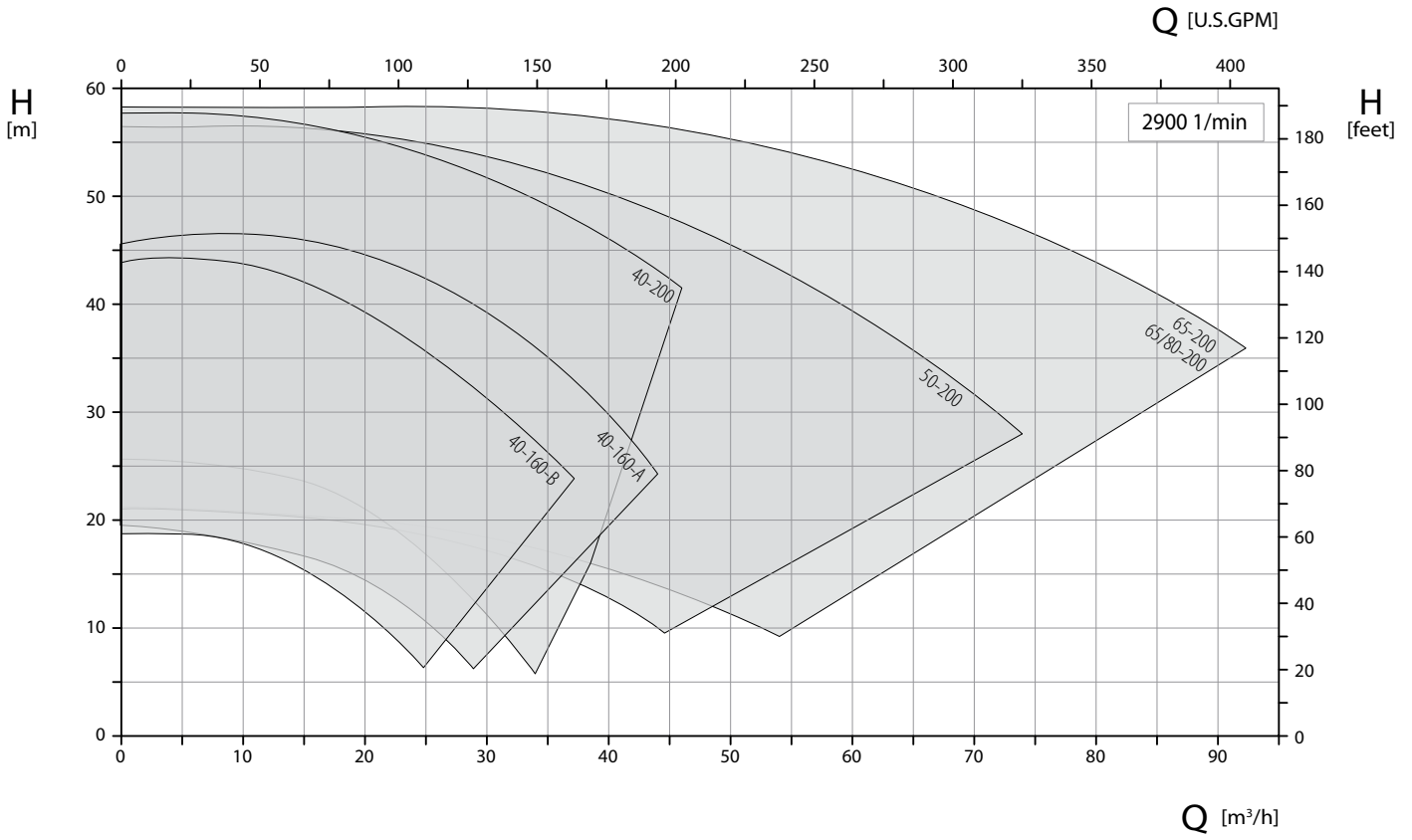


**Bearing bracket 360**   **Bearing bracket 470**   Casing with double volute   Casing with centreline mounting



# TOE-GI – Characteristic curves

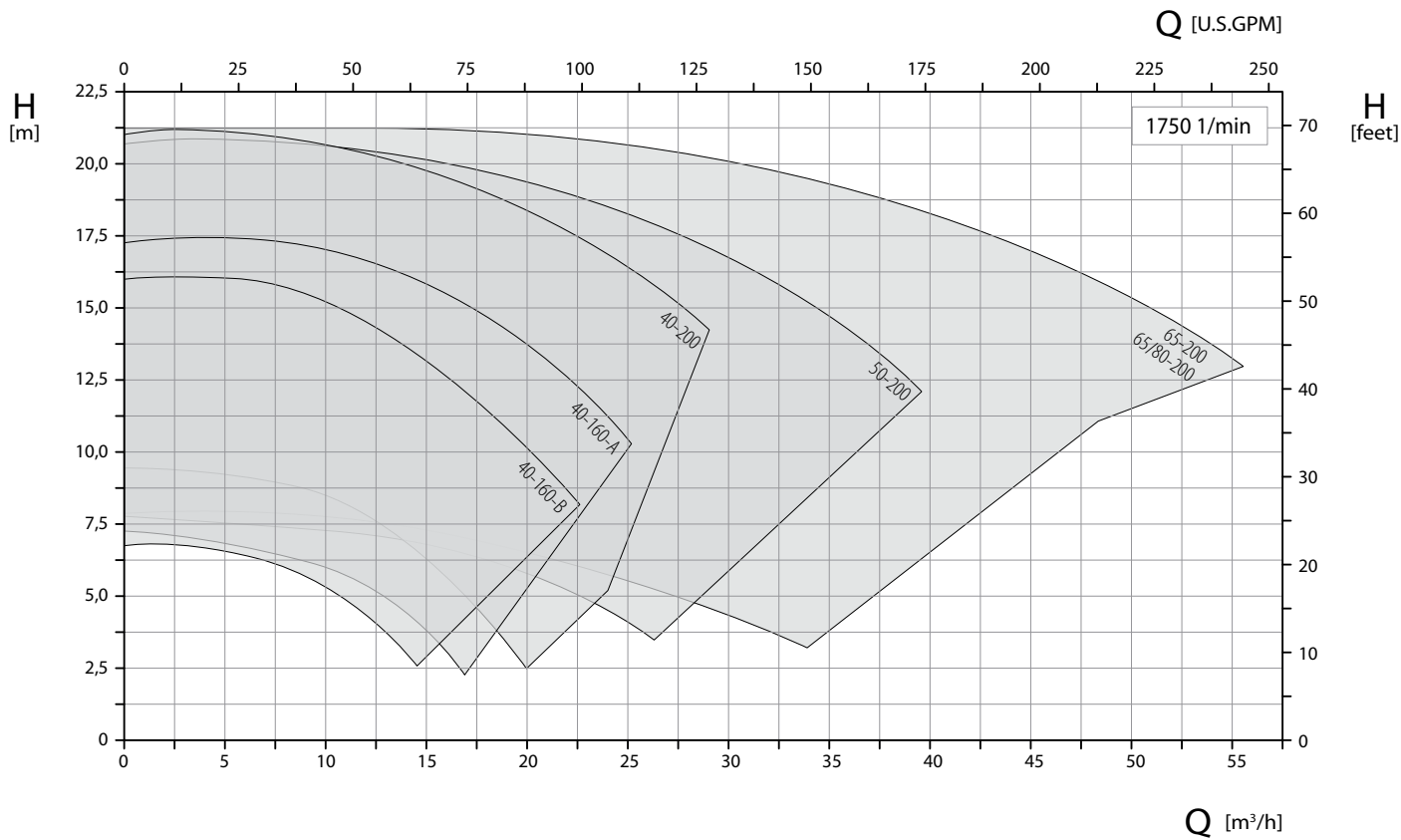
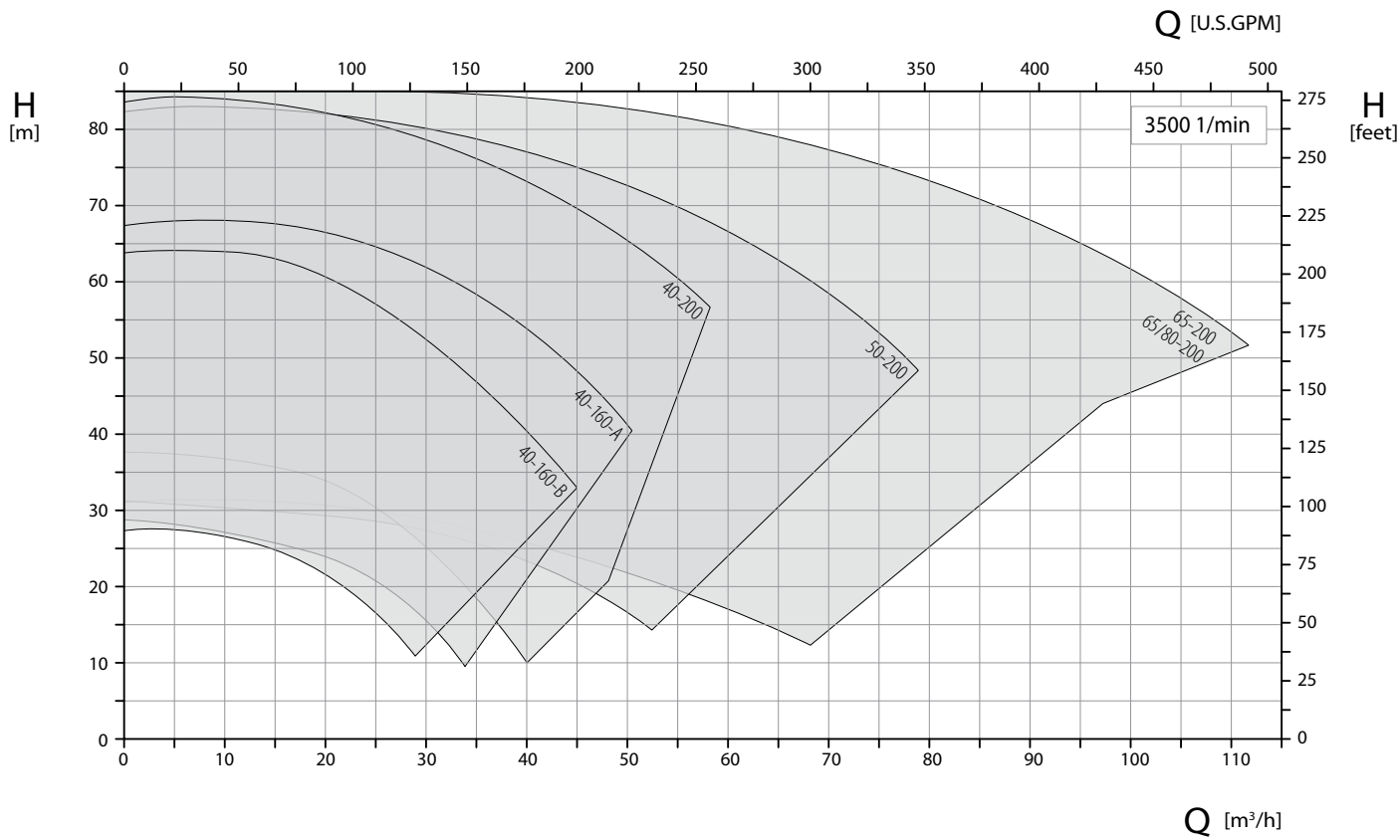
50 Hz



**Bearing bracket 360**

Size 40-160 with hydraulics A or B available

60 Hz



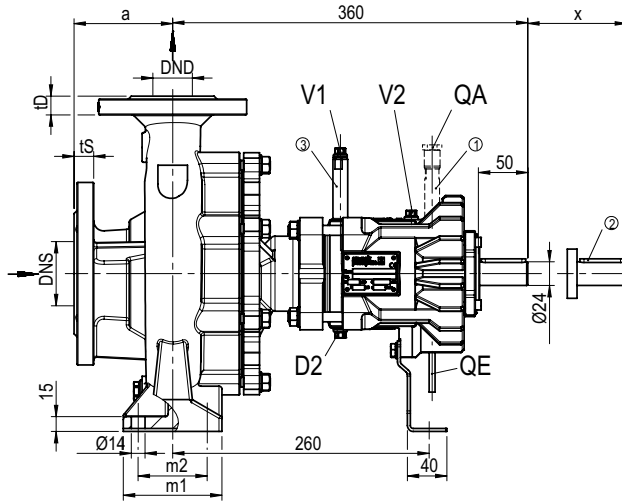
**Bearing bracket 360**

Size 40-160 with hydraulics A or B available

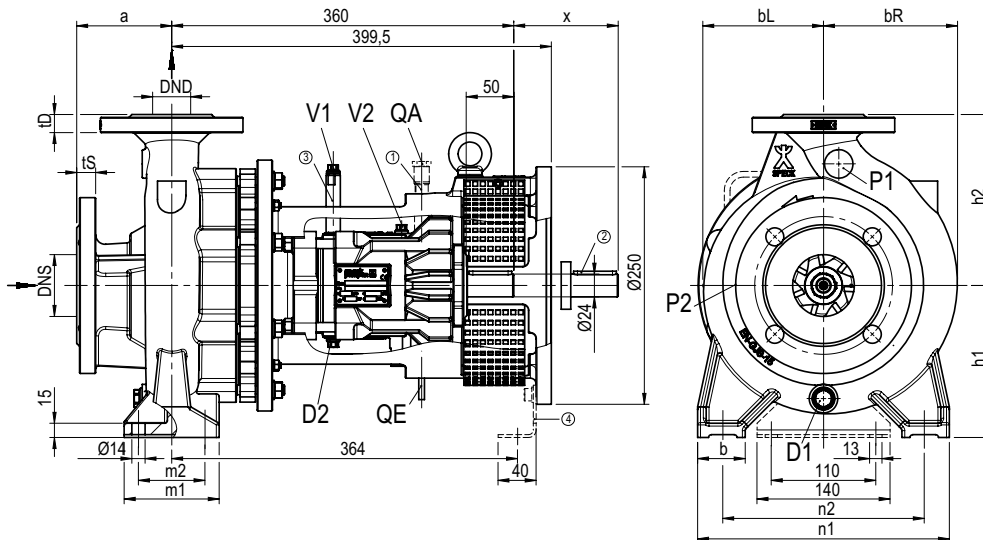
# TOE-GN / GA – Dimensions and connections

## Bearing bracket 360

TOE-GN



TOE-GA



Size	DNS	DS	tS	DND	DD	tD	a	bL	bR	h1	h2	b	m1	m2	n1	n2	x
32-160	50	165	20	32	140	15	80	116	121	132	160	50	100	70	240	190	110
32-200	50	165	20	32	140	18	80	123	135	160	180	50	100	70	240	190	110
32-250	50	165	20	32	140	18	100	152	163	180	225	65	125	95	320	250	110
40-160	65	185	20	40	150	18	80	123	129	132	160	50	100	70	240	190	110
40-200	65	185	20	40	150	18	100	127	141	160	180	50	100	70	265	212	110
40-250	65	185	20	40	150	18	100	151	160	180	225	65	125	95	320	250	110
50-160	65	185	20	50	165	20	100	123	136	160	180	50	100	70	265	212	110
50-200	65	185	20	50	165	20	100	130	148	160	200	50	100	70	265	212	110
50-250	65	185	20	50	165	20	100	157	170	180	225	65	125	95	320	250	110
65-160	80	200	22	65	185	20	100	124	151	160	200	65	125	95	280	212	110
65-200	80	200	22	65	185	20	100	136	164	180	225	65	125	95	320	250	110
80-160	100	220	24	80	200	22	125	139	174	180	225	65	125	95	320	250	110

### Utility connections

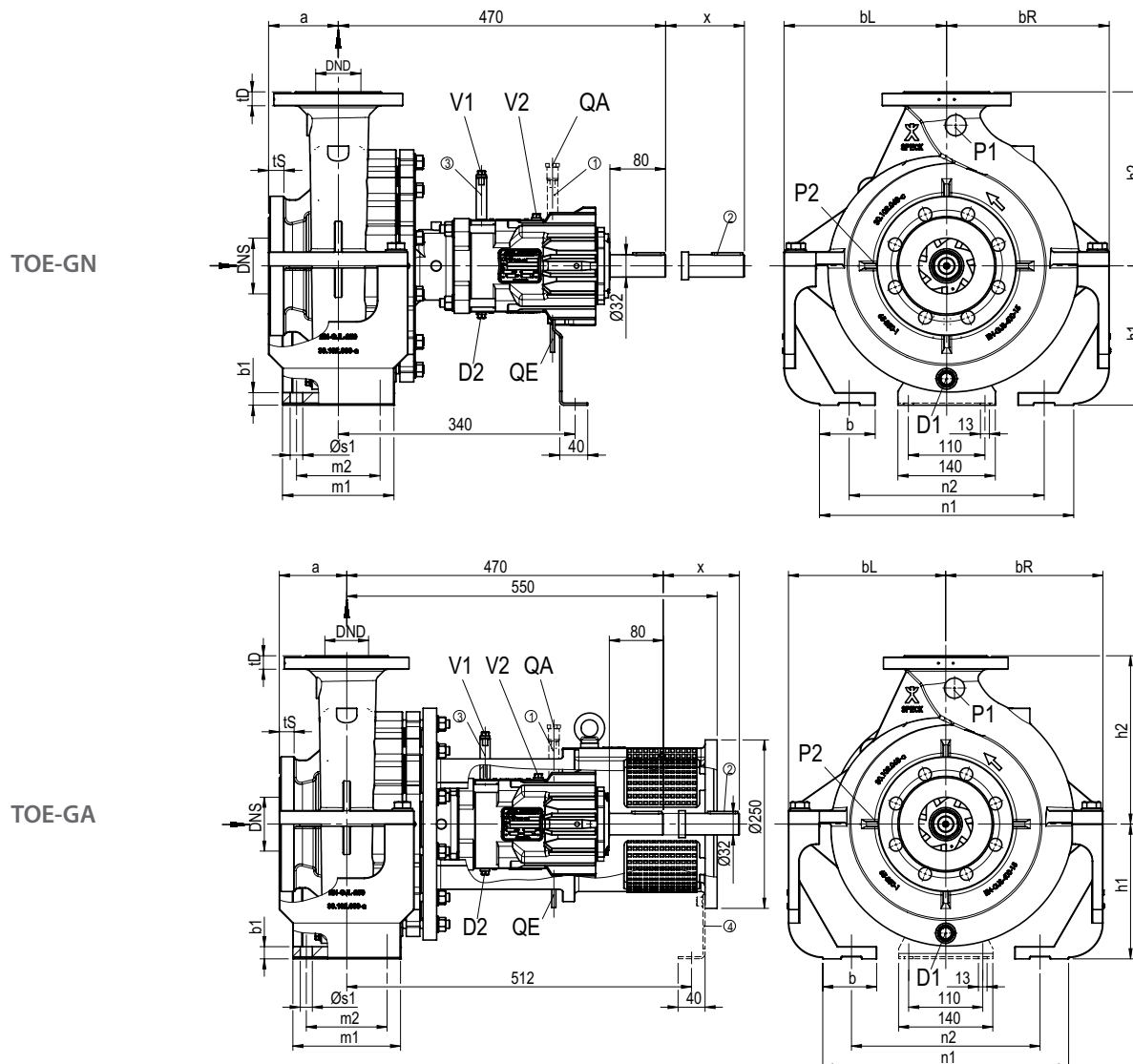
P1	G 1/4	Manometer connection pressure-side (without bore)
P2	G 1/8	Manometer connection suction-side (without bore)
V1	G 1/8	Ventilation mechanical seal casing (horizontal set-up), not applicable for hot water version
V2	G 1/8	Ventilation mechanical seal casing (vertical set-up), not applicable for hot water version
D1	G 3/8	Drainage volute casing
D2	G 1/8	Drainage mechanical seal casing
QE	G 1/8	Leakage evacuation mechanical seal
QA	G 1/8	Quench (optional)

- ① Quench optionally
- ② Fitting key DIN 6885
- ③ Venting pipe
- ④ Feet applicable for motor design B5 only

Flange dimensions → page 16

# TOE-GN / GA – Dimensions and connections

## Bearing bracket 470



Size	DNS	DS	tS	DND	DD	tD	a	bL	bR	h1	h2	b	b1	m1	m2	n1	n2	øS1	x
65-250	80	200	22	65	185	20	100	233,5	233,5	200	250	80	18	160	120	360	280	18	140
80-200 <sup>1</sup>	100	220	24	80	200	22	125	162,5	191	180	250	65	15	125	95	345	280	14	140
80-250 <sup>2</sup>	100	220	24	80	200	22	125	181	206,5	200	280	80	18	160	120	400	315	18	140
100-160	125	254	26	100	230	25	125	233,5	233,5	200	280	80	18	160	120	360	280	18	140
100-200 <sup>3</sup>	125	254	26	100	230	25	125	233,5	233,5	200	280	80	18	160	120	360	280	18	140
100-250 <sup>3</sup>	125	254	26	100	230	25	140	230	230	225	280	80	18	160	120	400	315	18	140
125-200 <sup>3</sup>	150	285	26	125	254	26	140	262	262	250	315	80	18	160	120	400	315	18	140

<sup>1</sup> Casing with feet resp. without centreline mounting

<sup>2</sup> Casing with feet – as of 2015 with centreline mounting

<sup>3</sup> Casing with double volute

### Utility connections

P1	G 1/4	Manometer connection pressure-side (without bore)
P2	G 1/8	Manometer connection suction-side (without bore)
V1	G 1/8	Ventilation mechanical seal casing (horizontal set-up), not applicable for hot water version
V2	G 1/8	Ventilation mechanical seal casing (vertical set-up), not applicable for hot water version
D1	G 3/8	Drainage volute casing
D2	G 1/8	Drainage mechanical seal casing
QE	G 1/8	Leakage evacuation mechanical seal
QA	G 1/8	Quench (optionally)

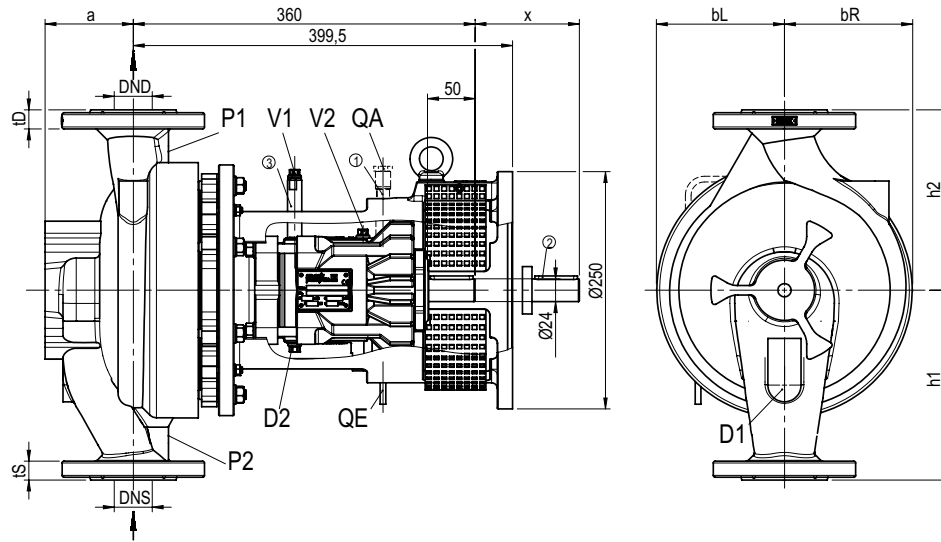
- ① Quench optionally
- ② Fitting key DIN 6885
- ③ Venting pipe
- ④ Feet applicable for motor design B5 only

Flange dimensions → page 16

# TOE-GI – Dimensions and connections

## Bearing bracket 360

TOE-GI



Size	Casing	DNS	DND	a	DD	DS	tD	tS	bL	bR	h1	h2	x
40-160	INA	40	40	97	150	150	20	20	116	116	200	190	110
40-160	INB	40	40	97	150	150	20	20	116	116	180	160	110
40-200	INA	40	40	93	150	150	20	20	135	135	200	190	110
50-200	INA	50	50	102	165	165	21	21	126	139	220	205	110
50-200	INB	50	50	92	165	165	21	21	126	139	200	180	110
65-200	INA	65	65	112	185	185	23	23	131	151	240	225	110
65/80-200	INB	80	80	112	200	200	23	23	131	151	255	225	110

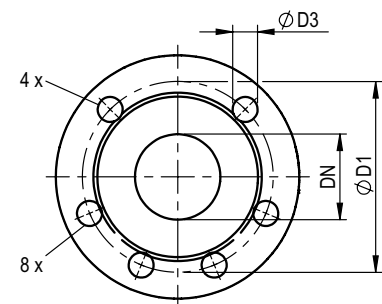
### Anschlüsse

P1	G 1/4	Manometer connection pressure-side (without bore)
P2	G 1/8	Manometer connection suction-side (without bore)
V1	G 1/8	Ventilation mechanical seal casing (horizontal set-up), not applicable for hot water version
V2	G 1/8	Ventilation mechanical seal casing (vertical set-up), not applicable for hot water version
D1	G 3/8	Drainage volute casing
D2	G 1/8	Drainage mechanical seal casing
QE	G 1/8	Leakage evacuation mechanical seal
QA	G 1/8	Quench (optionally)

- ① Quench optionally
- ② Fitting key DIN 6885
- ③ Venting pipe

## Flange dimensions

Flanges in acc. with DIN EN 1092-2				Flanges in acc. with DIN EN 1092-2, drilled in acc. with ANSI 150 lbs			
DN	øD1	øD3	Holes	DN	øD1	øD3	Holes
32	100	19	4	32	88,9	16	4
40	110	19	4	40	98,6	16	4
50	125	19	4	50	120,7	19	4
65	145	19	4	65	139,7	19	4
80	160	19	8	80	152,4	19	4
100	180	19	8	100	190,5	19	8
125	210	19	8	125	215,9	22	8
150	240	23	8	150	241,3	22	8





# Interchangeability of parts

All series including the versions with magnetic coupling (→ brochure TOE-MN/MA/MI series) offer a high degree of interchangeability.

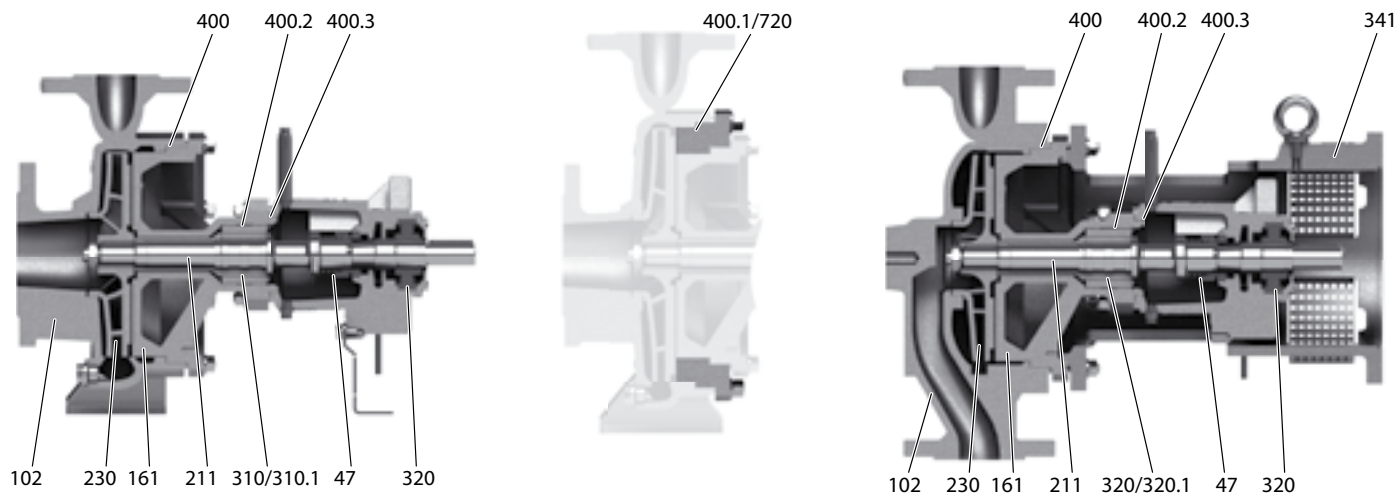
## Same components within TOE-GN/GA/GI series

Compare only numbers within one **row**:

- 1 and 1 = same number means same component
- 1 and 2 and ... = different numbers mean different components

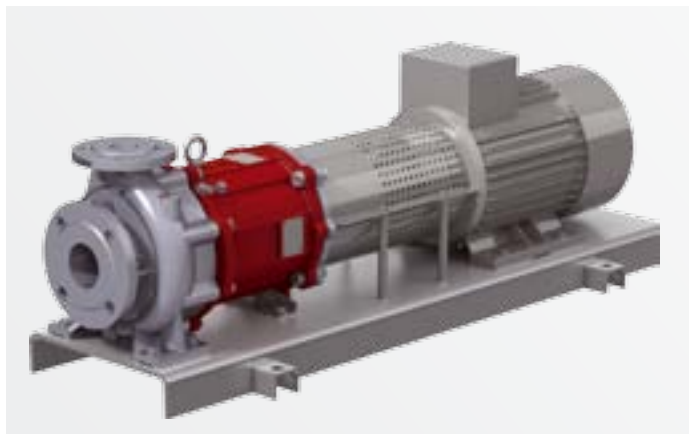
Component	No.	Series	Pump size																		
			32-160	32-200	32-250	40-160	40-200	40-250	50-160	50-200	50-250	65-160	65-200	80-160	65-250	80-200	80-250	100-160	100-200	100-250	125-200
Bearing bracket complete	–	GN GA GI	1	2	1	2	1	2	1	2	1	2	1	3	4	3	5	4	3	4	
Mechanical seal	47	GN GA GI	1												2						
Volute casing	102	GN GA –	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		– – GI					20	21	22			23									
Casing cover	161	GN GA GI	1	2	1	2	1	2	1	2	1	2	1	3	4	3	5	4	3	4	
Shaft	211	GN GA GI	1												2						
Impeller	230	GN GA –	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		– – GI					1	20	5			8									
Sleeve bearing	310 / 310.1	GN GA GI	1												2						
Ball bearing	320	GN GA GI	1												2						
Bracket	341	– GA GI	1												2						
Flat gasket	400	GN GA GI	1												2						
Flat gasket	400.1	GN GA –					1	1			1										
Flat gasket	400.2 / 400.3	GN GA GI	1												2						
Mechanical seal casing <sup>1</sup>	441	GN GA GI	1												2						
Counter flange	720	GN GA –					1	1			1										
further parts	–	GN GA GI	1												2						

<sup>1</sup> Thermal oil version and hot water version deviating



# Pumps for heat transfer technology

## Centrifugal pumps with magnetic coupling



### Modular system

TOE-MN/MA/MI and TOE-GN/GA/GI series mean a consistent designed modular system. Hydraulics and the main part of the used components are identical and interchangeable.

### TOE-MN/MA/MI Series

Developed for circulating organic or synthetic heat transfer oils in heat transfer systems in accordance with DIN 4754

Suitable for pumped media with low amounts of non-abrasive impurities

	Spheroidal graphite cast iron versions	Stainless steel versions
Media	Heat transfer oil / thermal oil	Heat transfer oil / thermal oil
T <sub>min</sub>	-40 °C	- 100 °C
T <sub>max</sub>	+ 350 °C	+ 250 °C
Casing	Spheroidal graphite cast iron	Stainless steel
Nominal pressure	PN 16	
H <sub>max</sub> (2900 min <sup>-1</sup> )	100 m	60 m
Q <sub>max</sub> (2900 min <sup>-1</sup> )	550 m <sup>3</sup> /h	170 m <sup>3</sup> /h
ATEX	II 2G c b TX	

Description in full length → see brochure TOE-MN/MA/MI series

## Regenerative turbine pumps with magnetic coupling



### NPY-MK and CY-MK Series

Tried and tested and compact close-coupled pumps with top/top casings and magnetic coupling. Developed for transporting and circulating organic or synthetic heat transfer oils and hot water. Suitable for pumped media with low amounts of non-abrasive impurities. Suitable for the delivery of gas shares due to the principle of delivery.

	Thermal oil versions	Hot water versions
Media	Heat transfer oil / thermal oil	Water
T <sub>min</sub>	- 100 °C	-
T <sub>max</sub>	+ 350 °C + 400 °C on request	+ 220 °C higher temp. on request
Casing	Spheroidal graphite cast iron or stainless steel	
Nominal pressure	PN 25 higher pressures on request	
H <sub>max</sub> (2900 min <sup>-1</sup> )	90 m	
Q <sub>max</sub> (2900 min <sup>-1</sup> )	12 m <sup>3</sup> /h (200 l/min) 24 m <sup>3</sup> /h (400 l/min) on request	
ATEX	II 2G c b TX	

### Compact, robust, durable and safe

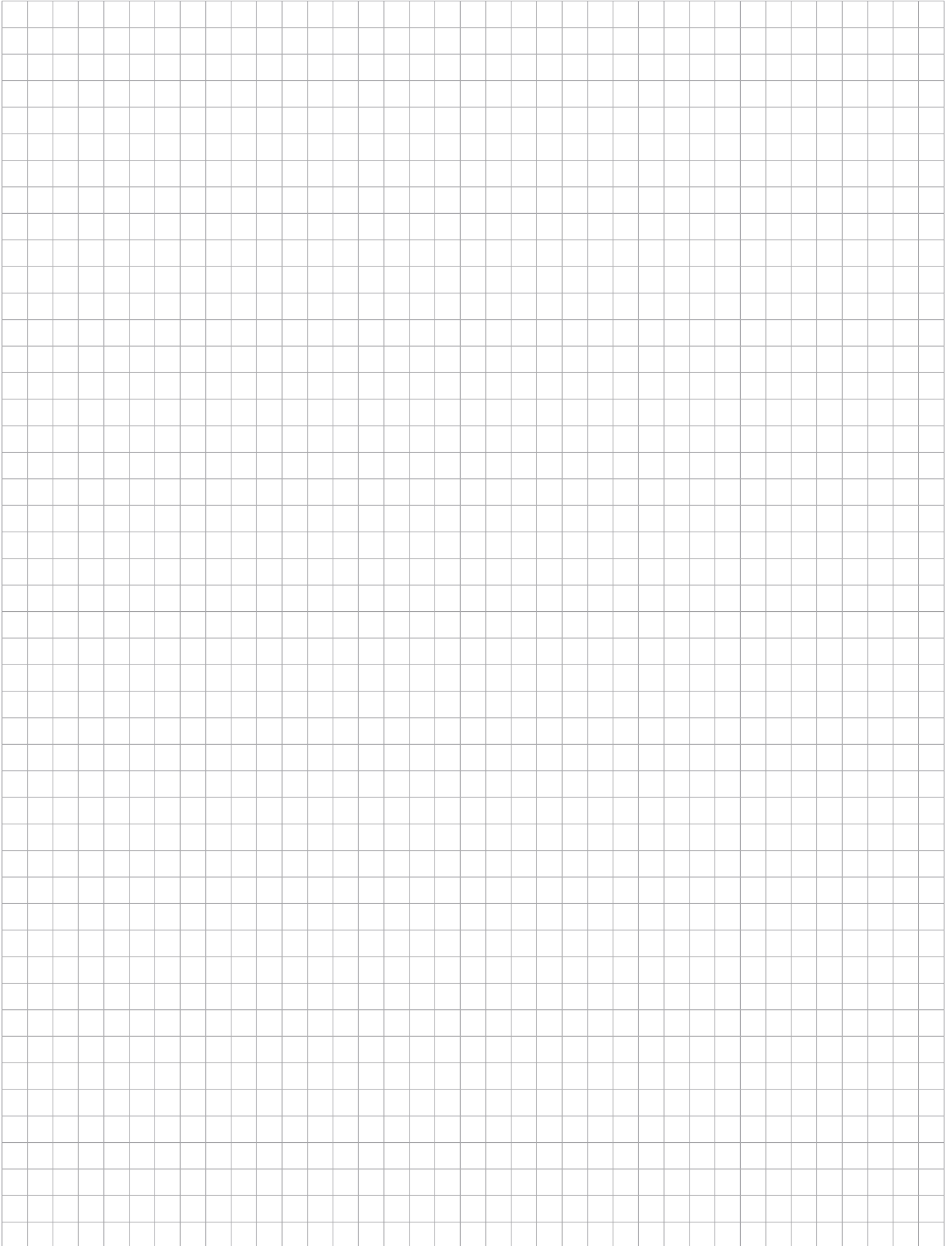
Regenerative turbine pumps with magnetic coupling from Speck have been used in a wide range of systems and assemblies successfully for many years. The compact design requires minimal installation space and reduces the weight. The perfected pumps also impress with the small number of extremely high-quality parts.

Robust sleeve bearings made from SiC and ceramic shafts guarantee a long lifetime and are free from leakage and maintenance-free thanks to magnetic couplings.

On request, Speck can also develop special designs for special media or with different hydraulics. Please contact us.



# Your notes



# Representatives

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mike@pumpsolutions.com.au  
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*Centrifugal pumps / Pompe centrifughe*  
Speck Industries S.r.l.  
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Mobile: +39 339 16 59 440  
info@speckindustries.it  
www.speckindustries.it

*Vacuum pumps / Pompe per vuoto*  
Rio Nanta S.r.l.  
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Fax: +39 028 323 913  
Mobile: +39 339 658 781 6  
rionanta@rionanta.it  
www.rionanta.it

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Tel.: +972 976 775 00  
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Arie.Weiss@PWeiss.d2g.com  
www.pweiss.co.il

*Small pumps / Heat transfer pumps:*  
Ringel Brothers (1973) Ltd.  
134 Hertzelt St.  
P.O. Box 5148  
Tel-Aviv 66555  
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Fax: +972 368 220 41  
Mobile: +972 544 623 095  
mringel@ringel-bros.co.il  
www.ringel-bros.co.il

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Near Prabhat Printing Press  
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*Vacuum pumps / Vacuümpompen*  
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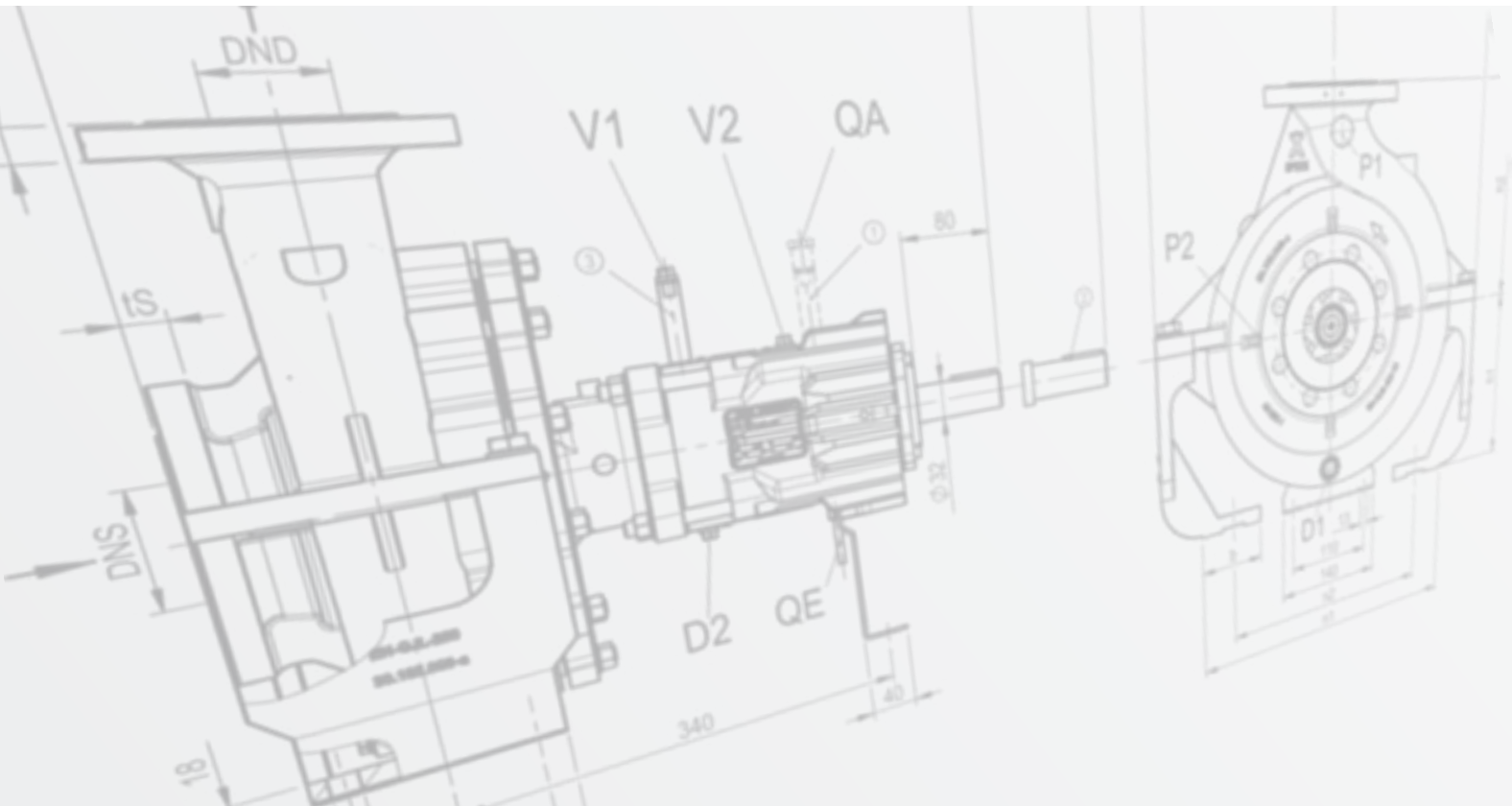
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