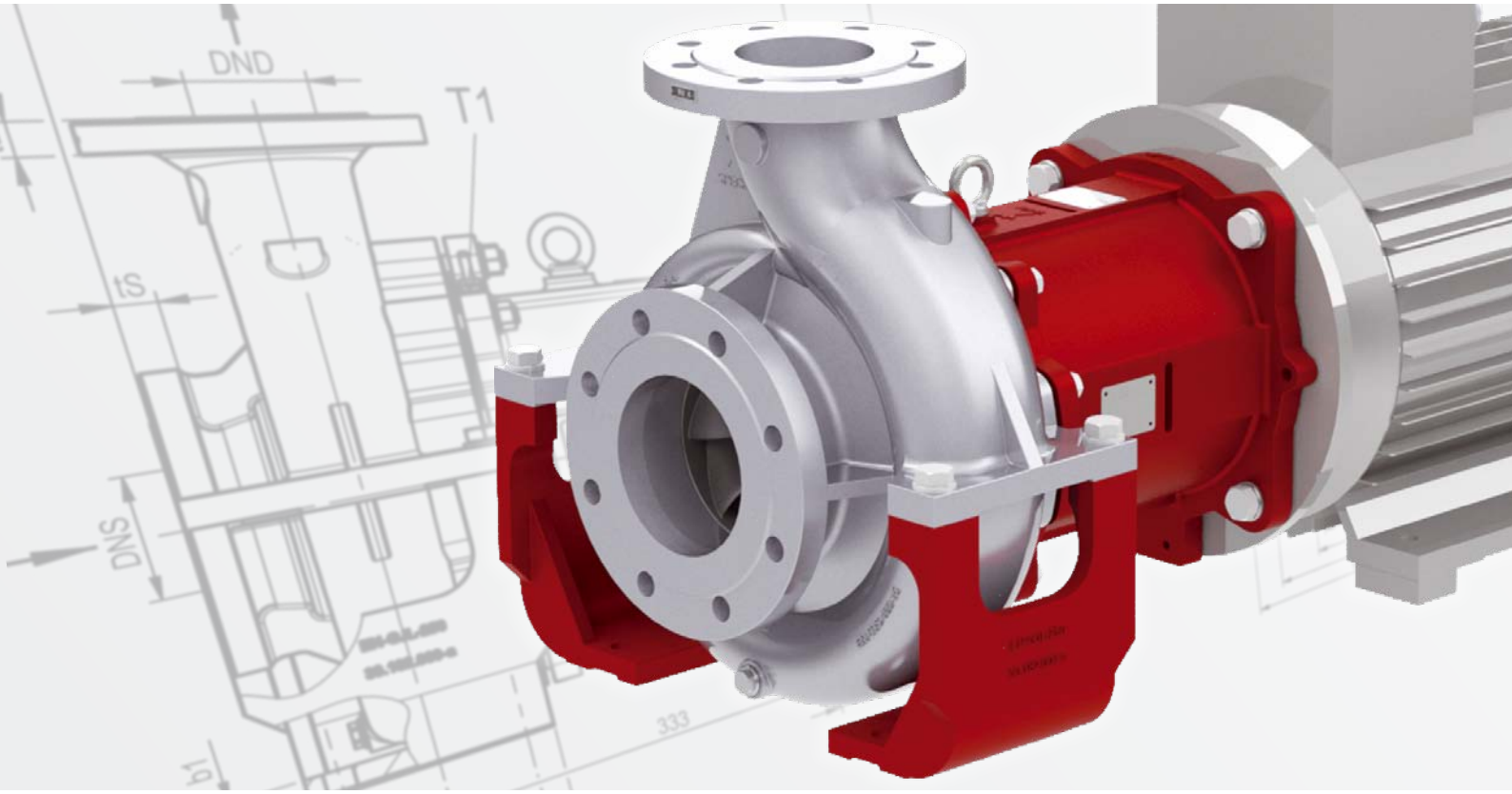


TOEM Series

Heat transfer pumps
for heat transfer oils from - 100 °C up to 400 °C

with magnetic coupling
bearing brackets 360 and 470

speck

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.

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

	Spheroidal graphite cast iron version	Stainless steel version
Media	Heat transfer oil / thermal oil	Heat transfer oil / thermal oil
T_{min}	- 40 °C	- 100 °C
T_{max}	+ 350 °C	+ 250 °C
Casing	Spheroidal graphite cast iron EN-GJS-400-15 (GGG-40)	Stainless steel 1.4581
Nominal pressure	PN 16	
H_{max} (2900 min^{-1})	100 m	60 m
Q_{max} (2900 min^{-1})	550 m^3/h	170 m^3/h
ATEX	II 2GD IIC cb TX	

Denomination

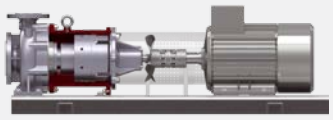
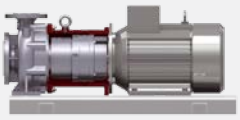
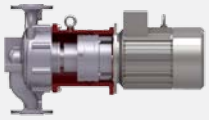
Type code | Example	**TOE**	**M**	**A**	**32**	**160**	**/150**
Denomination of series						
Magnetic coupling						
N = Version with bearing bracket, volute casing ax/top A = Close-coupled version with bracket, volute casing ax/top I = Close-coupled version with bracket, inline casing						
Nominal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

Your contacts

Speck Pumpen Systemtechnik GmbH
Regensburger Ring 6 -8
91154 Roth
Phone: +49 9171 809-0
Fax: +49 9171 809-10
info@speck.de
www.speck.de

International representatives
→ page 23

TOEM Series

	TOEMN	TOEMA	TOEMI
	 Example: Casing with feet	 Example: Casing with centreline mounting	
			
Features	» Bearing bracket / process design » Base plate » Dismantling of the bearing bracket without moving the motor is possible with optional spacer type coupling » Alignment / checking of the coupling required before start-up » Pump and aggregate dimensions in acc. with EN 733	» Bracket version » Base plate optional » No alignment of coupling required before start-up » Space for disassembling the cartridge insert required » Pump dimension in acc. with EN 733	» Bracket version with inline casing » No alignment of coupling required before start-up » Space for disassembling the cartridge insert required
Pump dimensions	→ Pages 16 and 17	→ Pages 16 and 17	→ Page 18
Hydraulics and casing	» Identlical hydraulics fo TOEMN and TOEMA Characteristic curves → pages 12 and 13 » Identical volute casing for each frame size » Large pumps with centreline mounting and double volute Description → page 5		» Characteristic curves → pages 12 and 13 » Inline casings with two dimensions H available
Sizes	Only two bearing brackets for all sizes » Bearing bracket 360 for 12 sizes - identical and interchangeable » Bearing brackets 470 for 7 sizes - identical and interchangeable » Only one bracket per size		
Description	Material versions and design → pages 6 and 7		
Interchangeability of parts	» Within all series including the versions with magnetic coupling (→ see catalogue TOEGN/GA/GI) there is a high degree of interchangeability. » This means minimum spare parts stock and full flexibliliy as replacing pumps or components or retrofitting to a different design is very easy. » Table of interchangeable parts → page 19		

New: TOEMH

For fluids up to + 400 °C
Available sizes and more information upon request.

High operational safety, optimal design and service-friendly

Robust design

Torsion-resistant casing cover and ball bearings with lifetime lubrication

Wearing-resistant SiC sleeve bearing
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 axial bearings considerably. They also keep dirt particles away from the sleeve bearings.

Clever temperature management

Optimised cooling of ball bearings and magnetic coupling
A fan blade on the coupling is also used for cooling in the TOEMN series. Here, the generated air flow, in combination with coupling protection, ventilation slots and cooling zone, reduces the temperature on the magnetic coupling and ball bearings extremely effectively.
On close-coupled pumps of the TOEMA and TOEMI series, the motor fan also cools the bearing shield and therefore also the ball bearings inside it.

Also suitable for critical applications

Pumps with magnetic couplings
100% free of leakage and lower maintenance requirements than pumps with mechanical seals.

Separating can protection guard
Two separating can protection guards on the inner and outer rotor avoid the destruction of the separating can if a sleeve or rolling bearing fails and they ensure that the pump remains hermetically sealed.

ATEX
All pumps of the TOEG and TOEM series are ATEX certified.

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, naturally, motors in accordance with IE3.

Optimal sizes of magnetic couplings
Magnetic couplings in staged sizes guarantee optimal design at the operating point with minimal viscosity and eddy current losses.

Maintenance-friendly and flexible

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

You can replace the sleeve bearing cartridge easily as a complete spare part. It is quick and ensures correct installation every time.

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

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

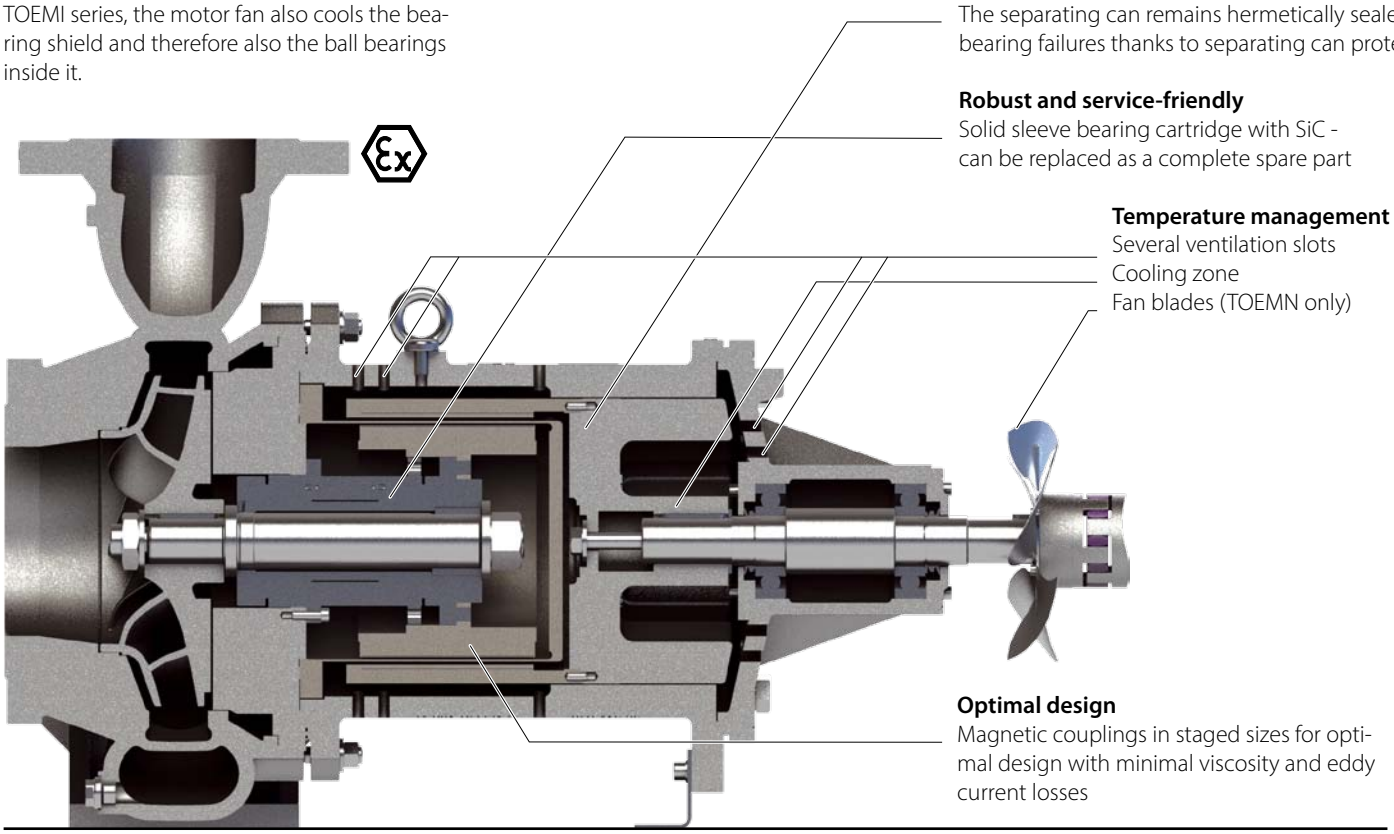


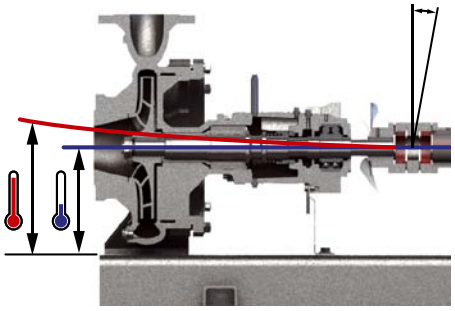
Figure: TOEMN, bearing bracket 470, casing with centreline mounting

Longer lifetime

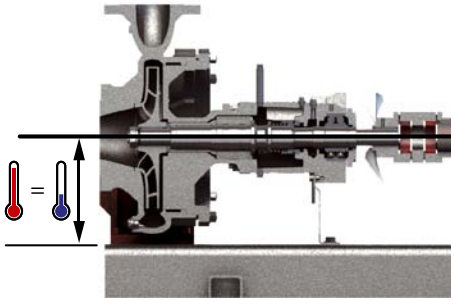
There are effects, which have little or no relevant impact on smaller designs, but lead to increased wear in larger pumps.

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



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



The centreline mounting eliminates the impact of the heat expansion completely.

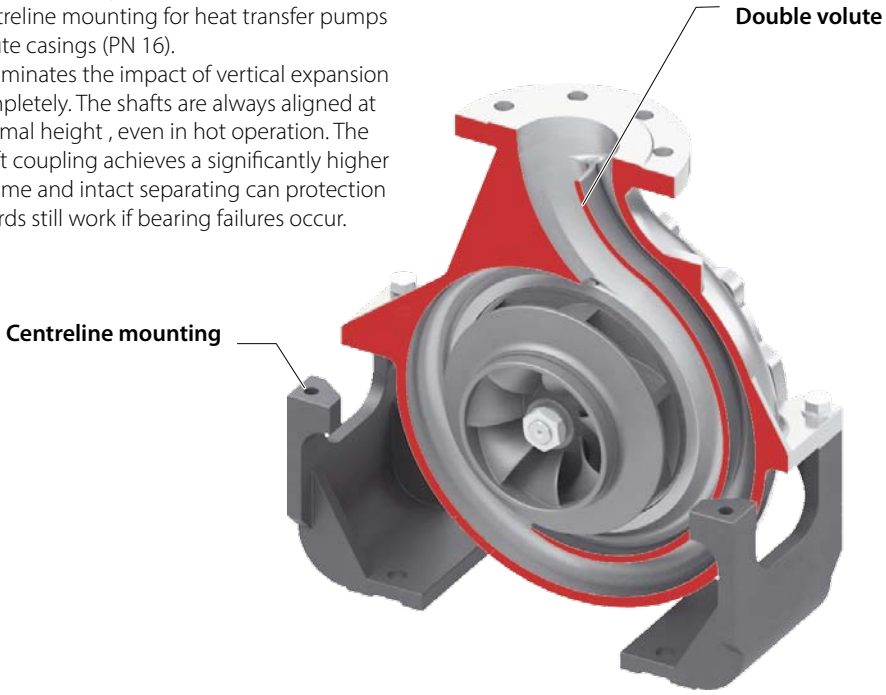
Casings with feet can only expand upwards in high temperatures, which causes the pump to tilt and bend. This has an impact on the magnetic coupling and the shaft coupling in particular. As the heat expansion increases with larger casing sizes, the shaft couplings and, eventually the separating can protection guards, wear faster on larger pumps.

Speck is the only manufacturer to use a centreline mounting for heat transfer pumps volute casings (PN 16).
It eliminates the impact of vertical expansion completely. The shafts are always aligned at optimal height , even in hot operation. The shaft coupling achieves a significantly higher lifetime and intact separating can protection guards still work if bearing failures occur.

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.



TOEMN / TOEMA – Sizes and casing designs

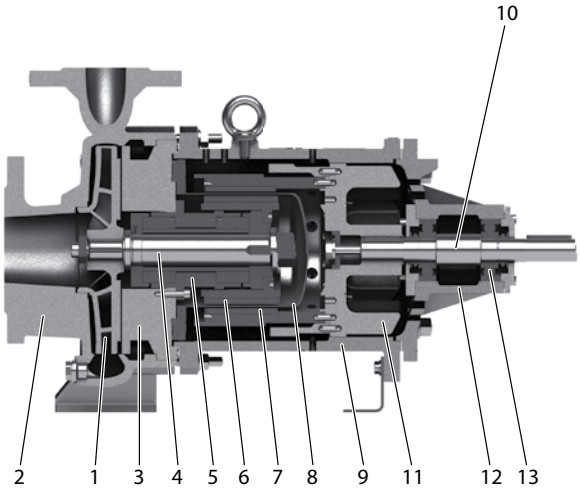
32-160*	40-160	50-160	65-160	80-160	100-160	–
32-200*	40-200*	50-200*	65-200*	80-200	100-200	125-200
32-250	40-250	50-250	65-250	80-250	100-250	–
Bearing bracket 360			**Bearing bracket 470**			

* also available in stainless steel version

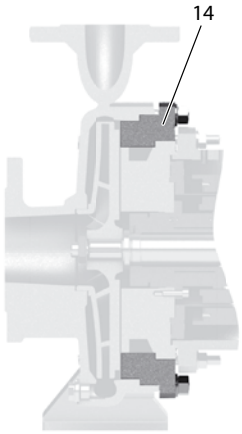
All casings with dimensions in accordance with EN 733 Casing with double volute Casing with centreline mounting

Material designs

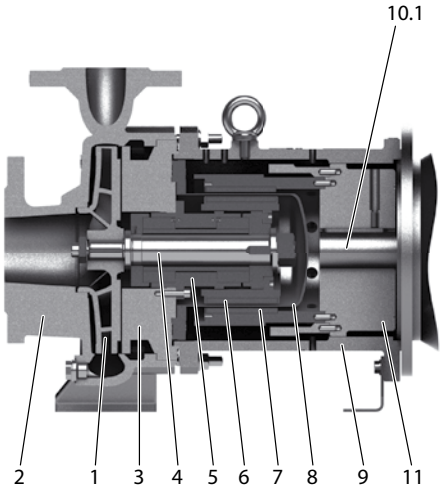
TOEMN



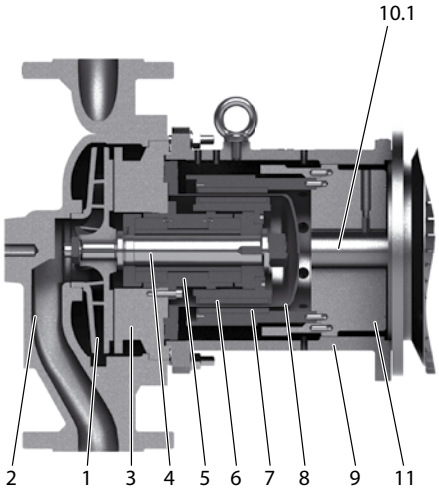
Bearing bracket 360
with Ø 250 mm impeller



TOEMA



TOEMI



	Spheroidal graphite cast iron version	Stainless steel version
Media	Heat transfer oil / thermal oil	Heat transfer oil / thermal oil
T_{min}	- 40 °C	- 100 °C
T_{max}	+ 350 °C	+ 250 °C
Nominal pressure	PN 16	
ATEX	II 2GD IIC cb TX	
Series	All series	TOEMN, TOEMA series
Sizes	All sizes	32-160 32-200 40-200 50-200 65-200
H_{max} (2900 min^{-1})	100 m	60 m
Q_{max} (2900 min^{-1})	550 m^3/h	170 m^3/h

No.	Designation	Spheroidal graphite cast iron version	Stainless steel version
1	Impeller	EN-GJL-250	1.4581
2	Casing	EN-GJS-400-15	1.4581
3	Casing cover	EN-GJS-400-15	1.4581
4	Shaft	1.4122	1.4571
5	Sleeve bearing	SiC	SiC
6	Inner magnet	Sm_2Co_{17}	Sm_2Co_{17}
7	Outer magnet	Sm_2Co_{17}	Sm_2Co_{17}
8	Separating can	2.4610	2.4610

No.	Designation	Spheroidal graphite cast iron version	Stainless steel version
9	Bracket	EN-GJS-400-15	EN-GJS-400-15
10/.1	Drive shaft / motor shaft	1.4122	1.4122
11	Coupling insert	EN-GJL-250	EN-GJL-250
12	Bearing casing	EN-GJL-250	EN-GJL-250
13	Rolling bearing	High-quality brand	High-quality brand
14	Counter flange	EN-GJS-400-15	EN-GJS-400-15

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

Design

Magnetic couplings

The magnetic coupling consist of inner magnetic rotor, separating can and outer magnetic rotor.
The large numer of staged sizes and a modern design software guarantee the best design at the operating point. The transmissible torques of the magnetic couplings range between 10 and 500 Nm.

Type code

Type code | Example	**135-**	**70**
Nominal diameter DN		
Magnetic length [mm]		

Magnetic coupling sizes

		Magnetic coupling diameter				
		DN 60	DN 75	DN 110	DN 135	DN 165
Magnetic length [mm]	40	x	x	x		
	50		x	x	x	
	60	x	x	x	x	
	70			x	x	
	80			x	x	x
	90				x	x
	100					x
	110					x
	120					x
		360	360	360, 470	360, 470	470
		Bearing bracket				

Maintenance-friendly and safe design

Assemblies are easy-to-replace spare parts

The cartridge insert (TOEMN) or assembly unit (TOEMA, TOEMI) are the parts of the pump getting in touch with the medium to be pumped. They can be removed easily from the volute casing without dismantling the pipes. Both are available as a single spare part and the best choice for quick and falseless repair. We recommend to put at least one cartridge insert/assembly unit into stock.

Further subassemblies are designed in the same way. In the event of servicing, they can be ordered and replaced as a single spare part.

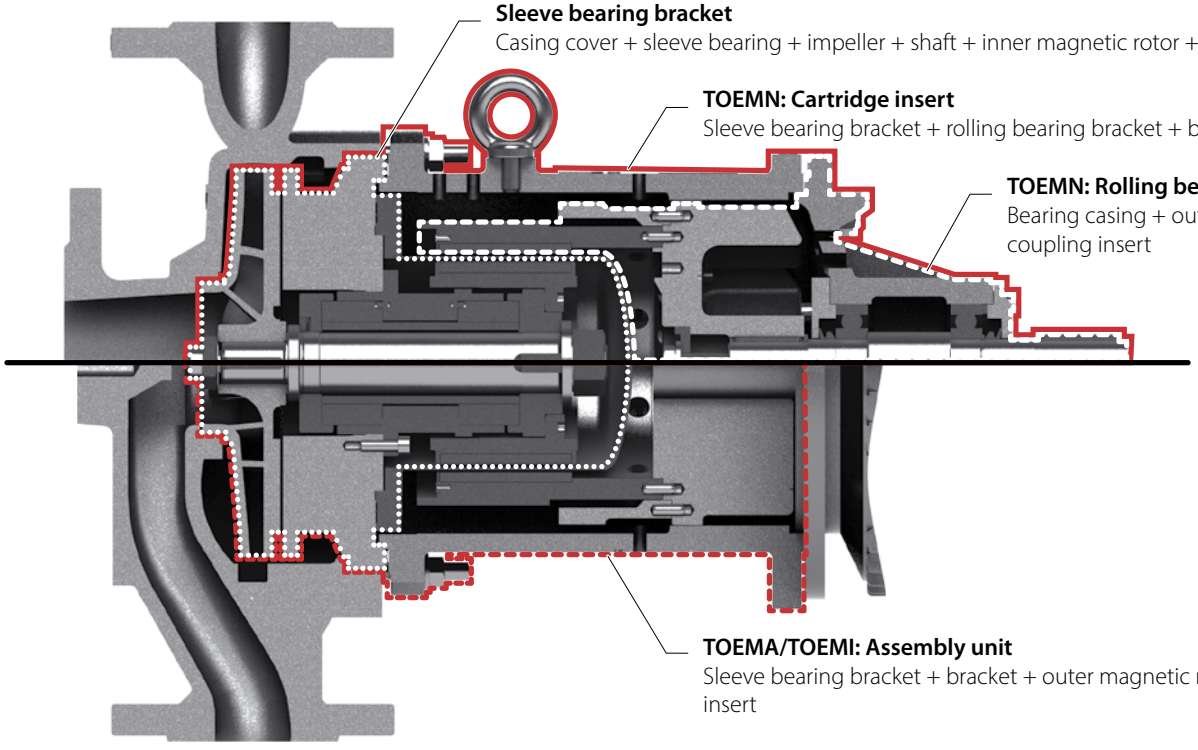
Flushing bore holes

Current eddy, viscosity and bearing friction losses lead to higher temperatures within the pump and have to be added to the media temperature. Flushing bore holes in the inner rotor and the casing ensure that these critical places are cooled by the medium to be pumped.
In addition, light ends are discharged from the inner rotor.

Temperature control

If required (e.g. in potentially explosive areas), temperature sensors can be installed in the bracket to control the surface temperature of the separating can.

Assemblies



Sleeve bearing bracket
Casing cover + sleeve bearing + impeller + shaft + inner magnetic rotor + separating can

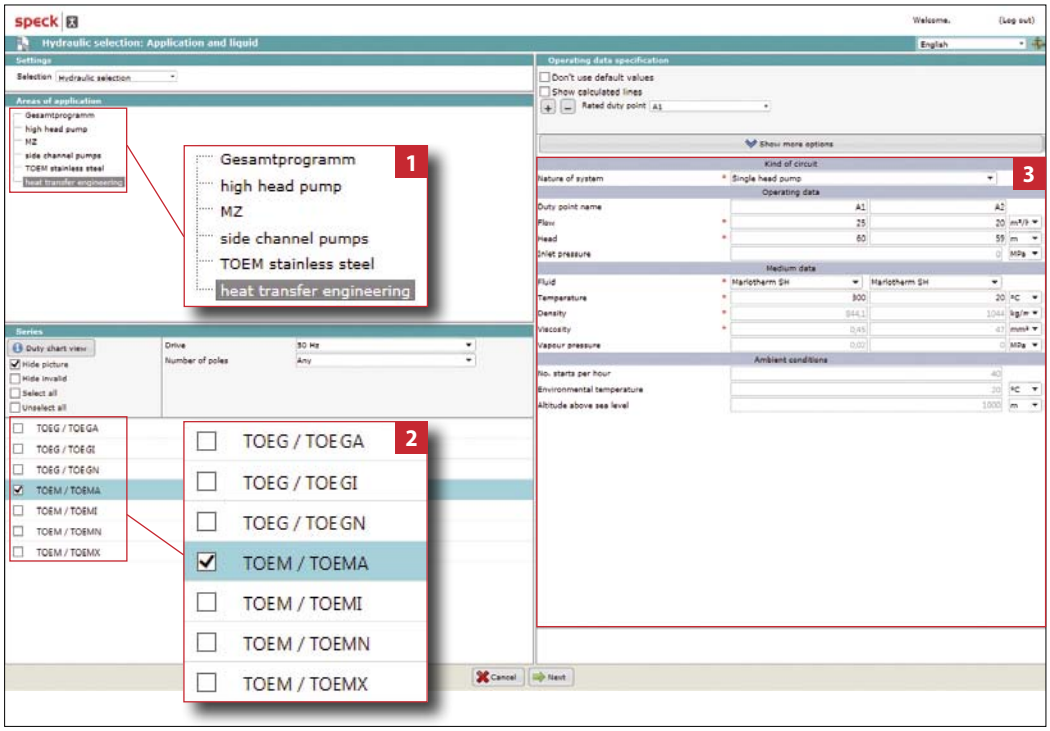
TOEMN: Cartridge insert
Sleeve bearing bracket + rolling bearing bracket + bracket

TOEMN: Rolling bearing bracket
Bearing casing + outer magnetic rotor + coupling insert

TOEMA/TOEMI: Assembly unit
Sleeve bearing bracket + bracket + outer magnetic rotor + coupling insert

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.

Characteristic curve depending on hydraulic selection

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.

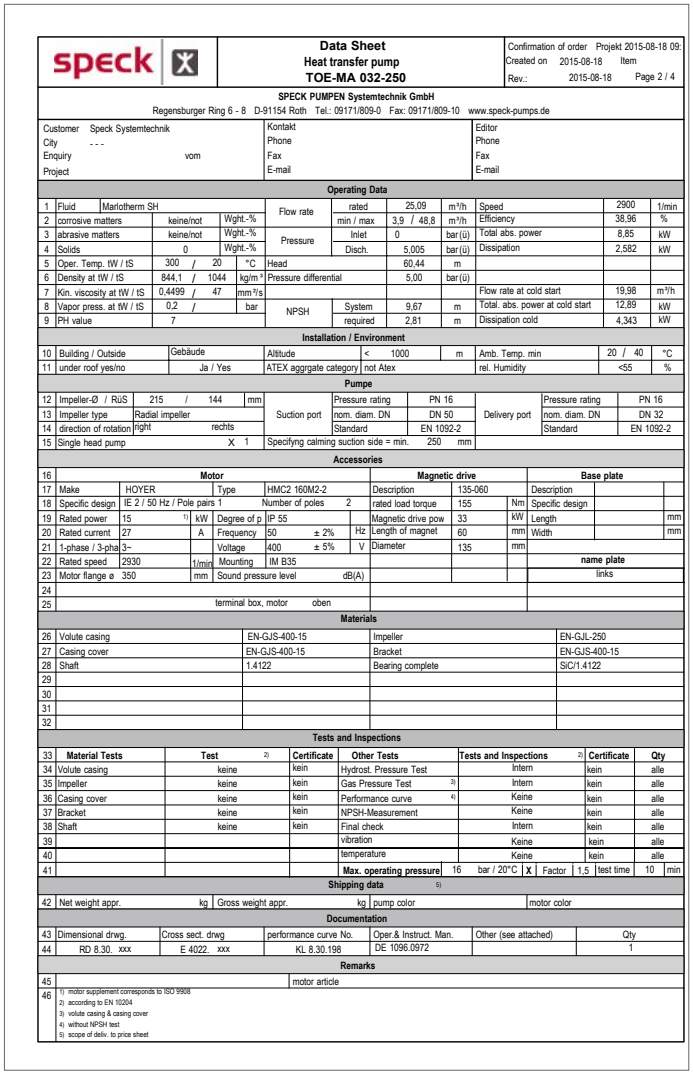
Checking the pre-selection

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

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



Data Sheet
Heat transfer pump
TOE-MA 032-250

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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	Kontakt	Editor
City - - -	Phone	Phone
Enquiry vom	Fax	Fax
Project	E-mail	E-mail

Operating Data

1	Fluid	Marlotherm SH	Flow rate	rated	25,09	m³/h	Speed	2900	1/min
2	corrosive matters	keine/not	Wght.-%	min / max	3,9 / 48,8	m³/h	Efficiency	38,96	%
3	abrasive matters	keine/not	Wght.-%	Pressure Inlet	0	bar (ü)	Total abs. power	8,85	kW
4	Solids	0	Wght.-%	Pressure Disch.	5,005	bar (ü)	Dissipation	2,582	kW
5	Oper. Temp. tW / tS	300 / 20	°C	Head	60,44	m			
6	Density at tW / tS	844,1 / 1044	kg/m³	Pressure differential	5,00	bar (ü)			
7	Kin. viscosity at tW / tS	0,4499 / 47	mm²/s				Flow rate at cold start	19,98	m³/h
8	Vapor press. at tW / tS	0,2 /	bar	NPSH System	9,67	m	Total. abs. power at cold start	12,89	kW
9	PH value	7		NPSH required	2,81	m	Dissipation cold	4,343	kW

Installation / Environment

10	Building / Outside	Gebäude	Altitude	< 1000	m	Amb. Temp. min	20 / 40 °C
11	under roof yes/no	Ja / Yes	ATEX aggrgate category	not Atex		rel. Humidity	<55 %

Pumpe

12	Impeller-Ø / RüS	215 / 144 mm	Suction port	Pressure rating	PN 16	Delivery port	Pressure rating	PN 16
13	Impeller type	Radial impeller		nom. diam. DN	DN 50		nom. diam. DN	DN 32
14	direction of rotation	right rechts		Standard	EN 1092-2		Standard	EN 1092-2
15	Single head pump	X 1	Specifyng calming suction side = min.	250 mm				

Accessories

16	Motor				Magnetic drive				Base plate			
17	Make	HOYER	Type	HMC2 160M2-2	Description	135-060			Description			
18	Specific design	IE 2 / 50 Hz / Pole pairs 1		Number of poles 2	rated load torque	155	Nm		Specific design			
19	Rated power	15 [1]	kW	Degree of p IP 55	Magnetic drive pow	33	kW		Length			mm
20	Rated current	27	A	Frequency 50 ± 2%	Hz Length of magnet	60	mm		Width			mm
21	1-phase / 3-pha	3~		Voltage 400 ± 5%	V Diameter	135	mm					
22	Rated speed	2930	1/min	Mounting IM B35					name plate			
23	Motor flange ø	350	mm	Sound pressure level	dB(A)				links			
24												
25	terminal box, motor oben											

Materials

26	Volute casing	EN-GJS-400-15	Impeller	EN-GJL-250
27	Casing cover	EN-GJS-400-15	Bracket	EN-GJS-400-15
28	Shaft	1.4122	Bearing complete	SiC/1.4122
29				
30				
31				
32				

Tests and Inspections

	Material Tests	Test [2]	Certificate	Other Tests	Tests and Inspections [2]	Certificate	Qty
33							
34	Volute casing	keine	kein	Hydrost. Pressure Test	Intern	kein	alle
35	Impeller	keine	kein	Gas Pressure Test [3]	Intern	kein	alle
36	Casing cover	keine	kein	Performance curve [4]	Keine	kein	alle
37	Bracket	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 10 min			

Shipping data [5]

42	Net weight appr. kg	Gross weight appr. kg	pump color	motor color	

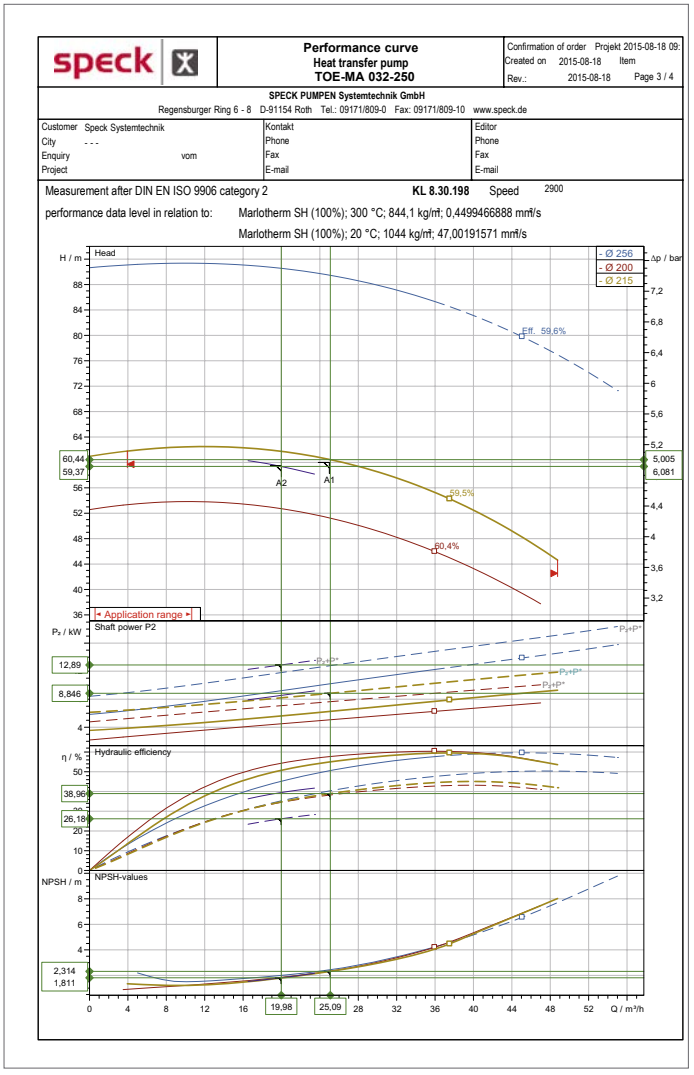
Documentation

43	Dimensional drwg.	Cross sect. drwg	performance curve No.	Oper.& Instruct. Man.	Other (see attached)	Qty
44	RD 8.30. xxx	E 4022. xxx	KL 8.30.198	DE 1096.0972		1

Remarks

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 price sheet

Technical data sheet (example)



Performance curve
Heat transfer pump
TOE-MA 032-250

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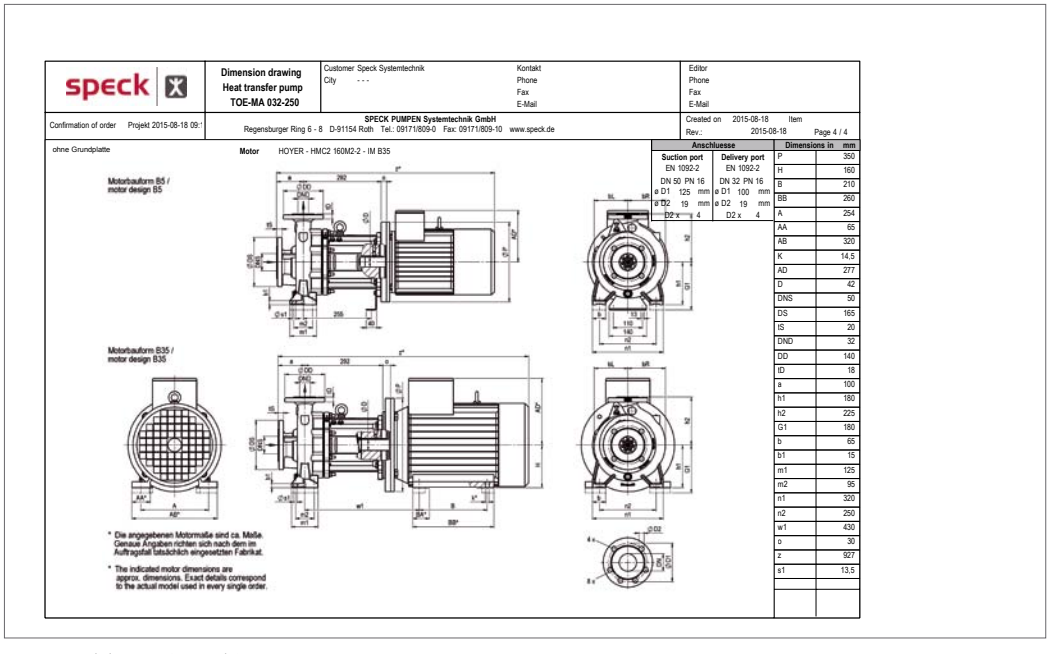
SPECK PUMPEN Systemtechnik GmbH
Regensburger Ring 6 - 8 D-91154 Roth Tel.: 09171/809-0 Fax: 09171/809-10 www.speck.de

Customer Speck Systemtechnik	Kontakt	Editor
City - - -	Phone	Phone
Enquiry vom	Fax	Fax
Project	E-mail	E-mail

Measurement after DIN EN ISO 9906 category 2 **KL 8.30.198** Speed 2900

performance data level in relation to: Marlotherm SH (100%); 300 °C; 844,1 kg/m³; 0,4499466888 mm²/s
Marlotherm SH (100%); 20 °C; 1044 kg/m³; 47,00191571 mm²/s

Characteristic curve (example)



Dimension drawing
Heat transfer pump
TOE-MA 032-250

Customer Speck Systemtechnik City - - - Kontakt Phone Fax E-Mail
Editor Phone Fax E-Mail

Confirmation of order Projekt 2015-08-18 09:

SPECK PUMPEN Systemtechnik GmbH
Regensburger Ring 6 - 8 D-91154 Roth Tel.: 09171/809-0 Fax: 09171/809-10 www.speck.de

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ohne Grundplatte

Motor HOYER - HMC2 160M2-2 - IM B35

Motorbauform B5 / motor design B5

Motorbauform B35 / motor design B35

* Die angegebenen Motormaße sind ca. Maße. Genaue Angaben richten sich nach dem im Auftragsfall tatsächlich eingesetzten Fabrikat.

* The indicated motor dimensions are approx. dimensions. Exact details correspond to the actual model used in every single order.

Anschluesse		Dimensions in mm	
Suction port EN 1092-2	Delivery port EN 1092-2	P	350
DN 50 PN 16	DN 32 PN 16	H	160
ø D1 125 mm	ø D1 100 mm	B	210
ø D2 19 mm	ø D2 19 mm	BB	260
D2 x 4	D2 x 4	A	254
		AA	65
		AB	320
		K	14,5
		AD	277
		D	42
		DNS	50
		DS	165
		IS	20
		DND	32
		DD	140
		ID	18
		a	100
		h1	180
		h2	225
		G1	180
		b	65
		b1	15
		m1	125
		m2	95
		n1	320
		n2	250
		w1	430
		o	30
		z	927
		s1	13,5

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 mesurement

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^3/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 out let pressure $p_{2max\ op}$ is calculated using the formula:

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

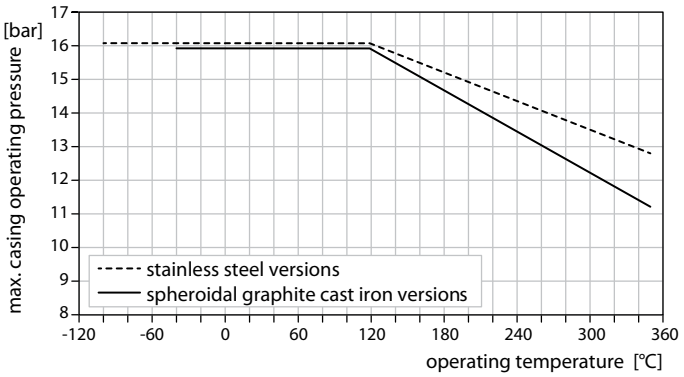
With:

$p_{2max\ op}$	=	maximum pump outlet pressure [bar]
$p_{1max\ op}$	=	maximum pump inlet pressure [bar]
ρ	=	density of the medium to be pumped [kg/m³]
g	=	gravitation constant [m/s²]
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 $p_{all\ w\ c}$ at operating pressure.
This also applies to commissioning while the discharge valve is closed (refer to diagram).

Pressure and temperature limitations

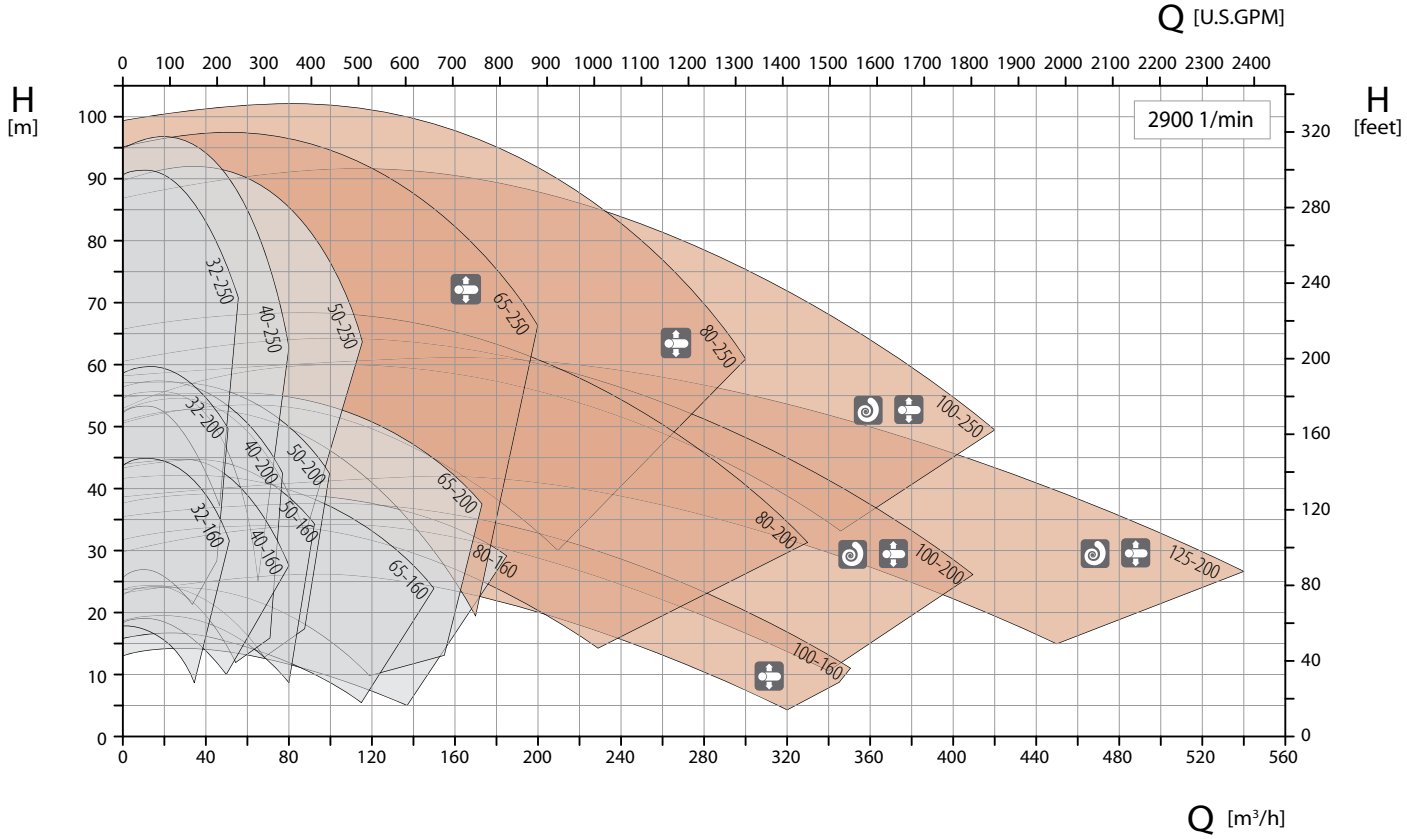
The maximum casing operating pressure $p_{all\ w\ c}$ of the pressure retaining parts depends on the operating temperature:

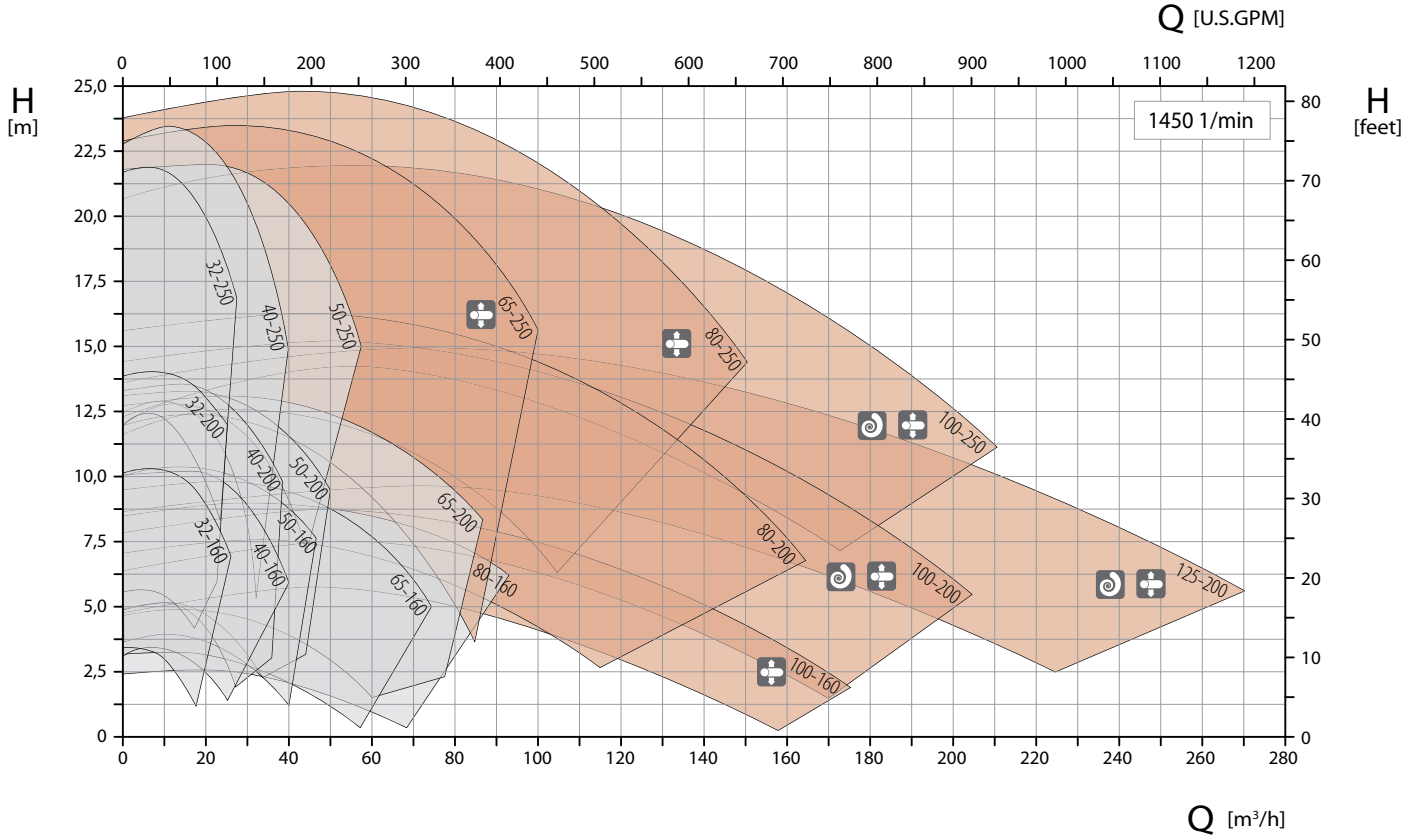


Maximum permissible casing operating pressure $p_{all\ w\ c}$

TOEMN / TOEMA – Characteristic curves

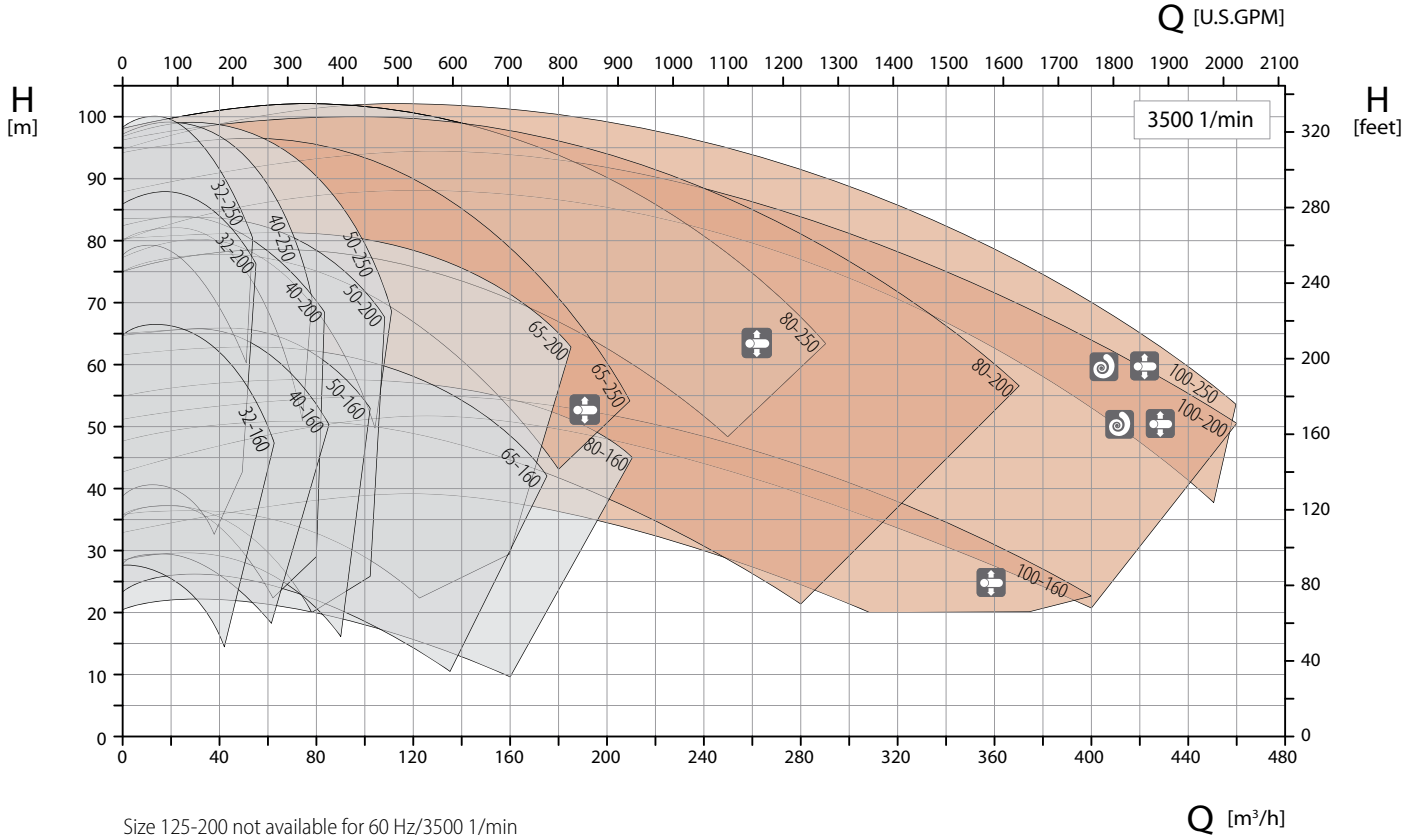
50 Hz



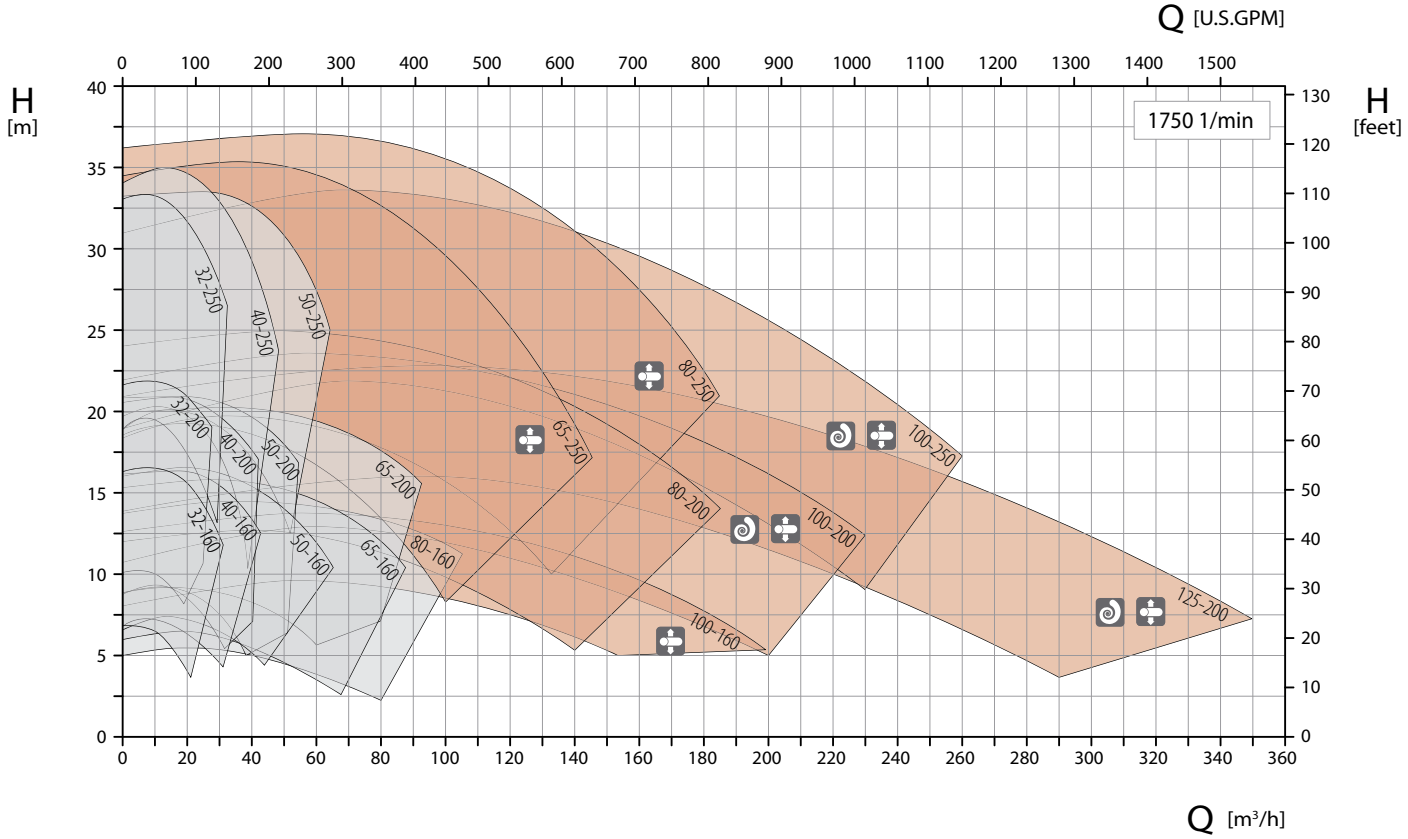


Bearing bracket 360 **Bearing bracket 470** Casing with double volute Casing with centreline mounting

60 Hz



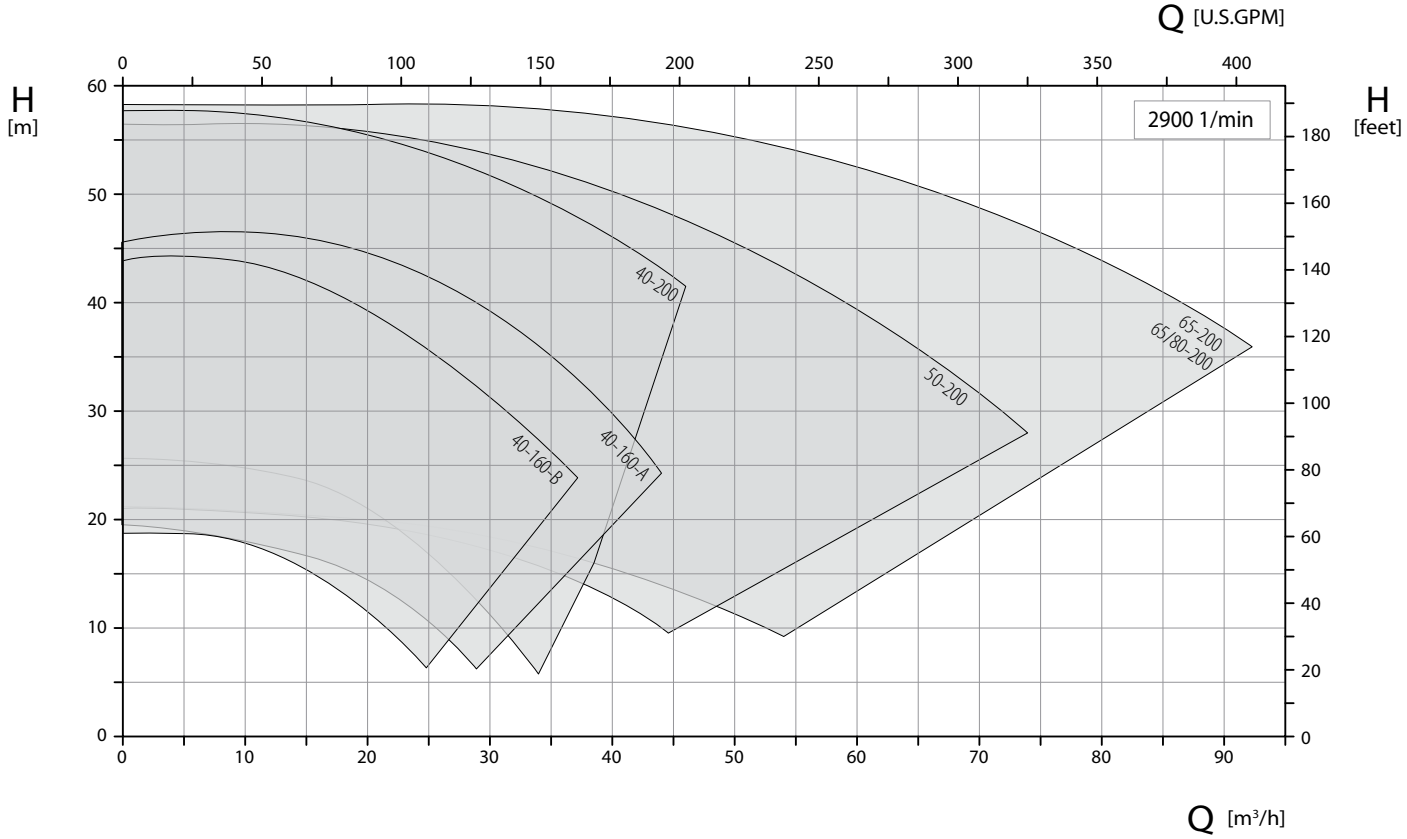
Size 125-200 not available for 60 Hz/3500 1/min

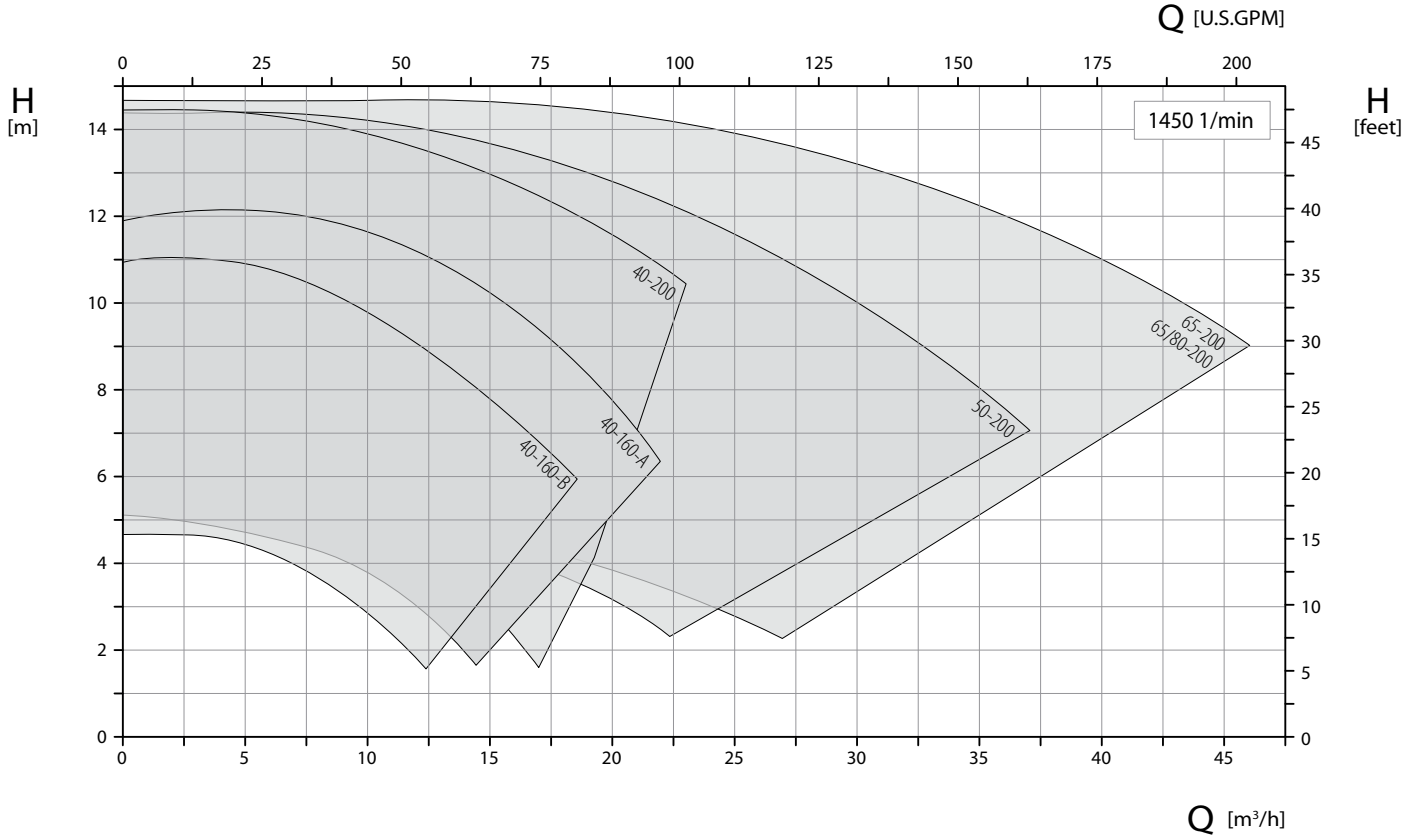


Bearing bracket 360 **Bearing bracket 470** Casing with double volute Casing with centreline mounting

TOEMI – Characteristic curves

50 Hz

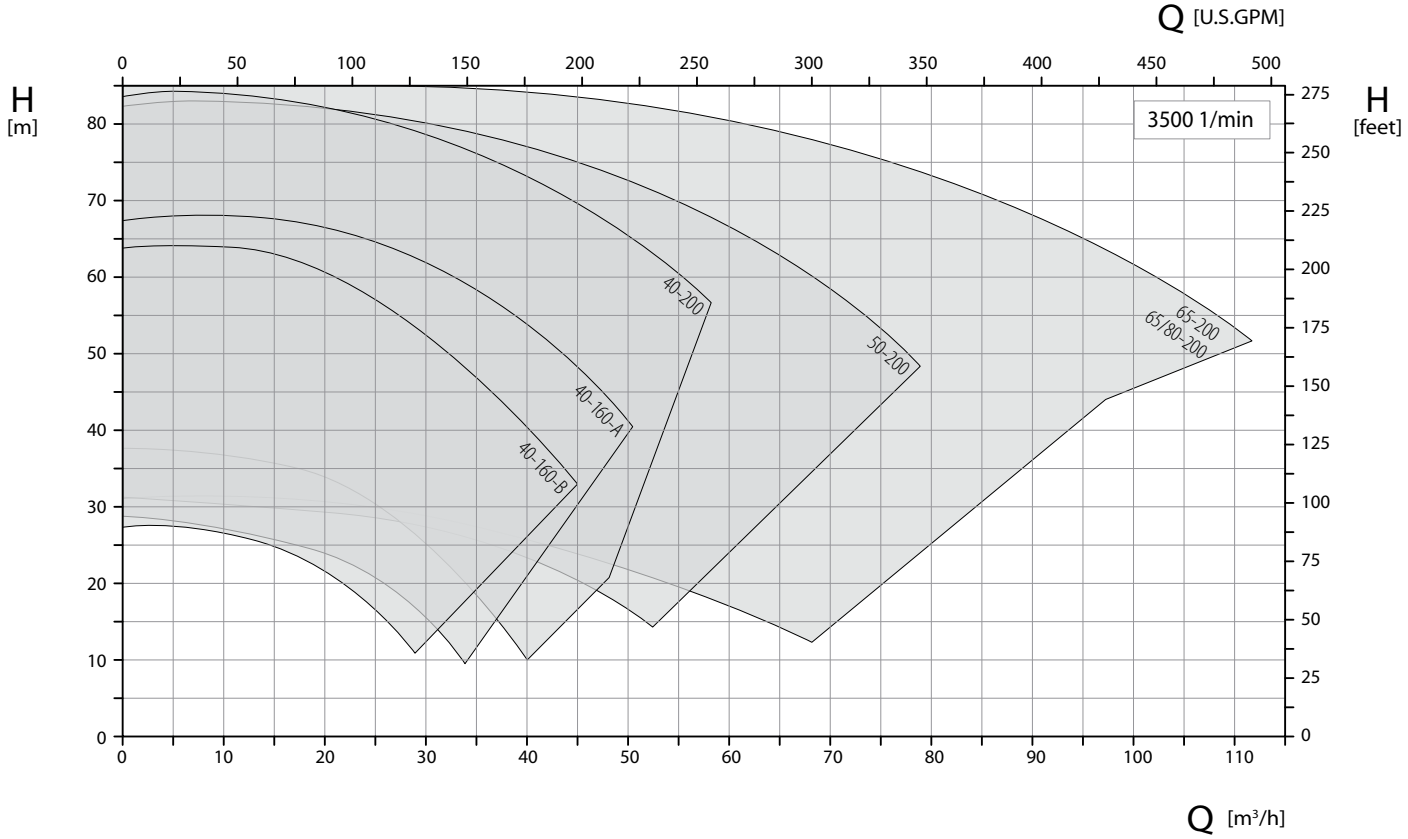


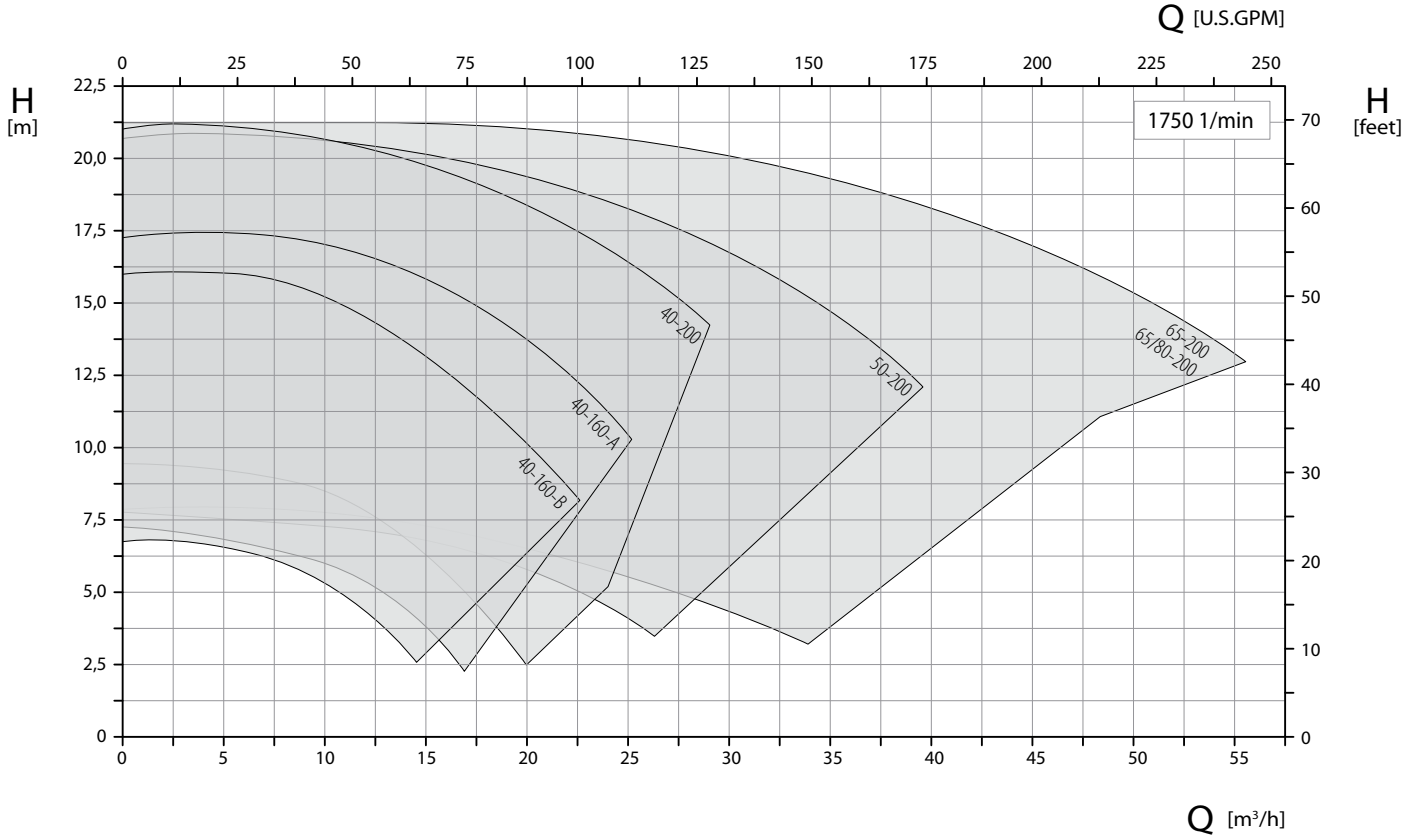


Bearing bracket 360

Size 40-160 with hydraulics A or B available

60 Hz





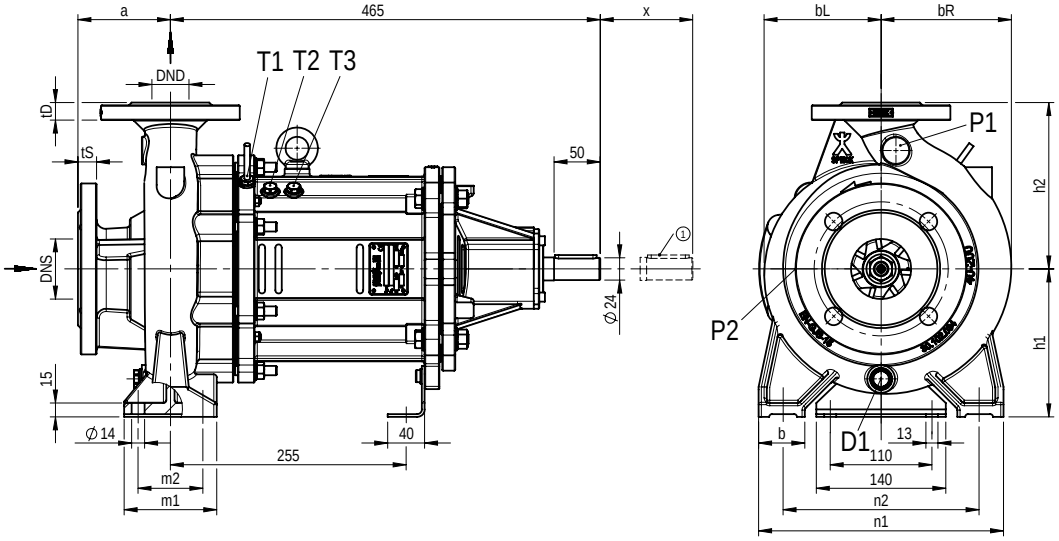
Bearing bracket 360

Size 40-160 with hydraulics A or B available

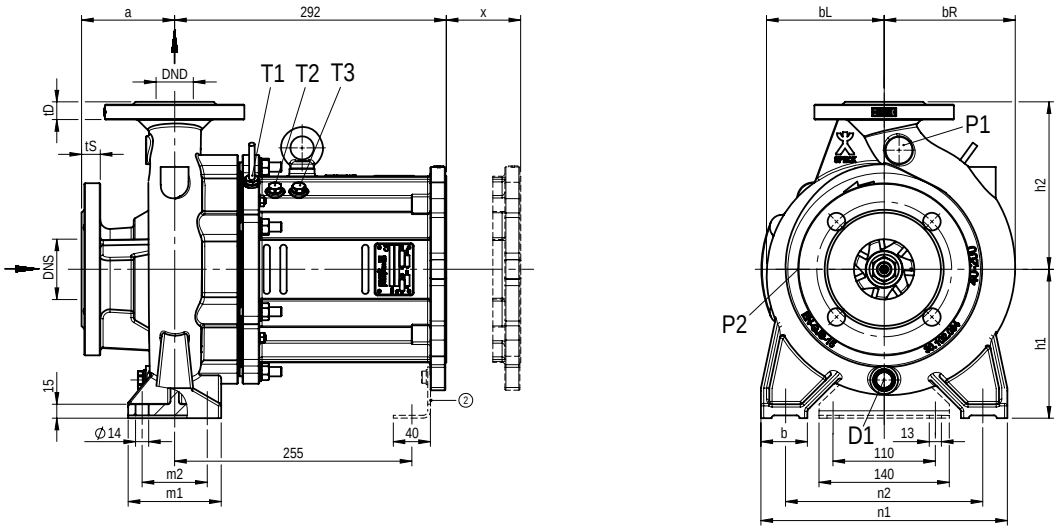
TOEMN / TOEMA – Dimensions and connections

Bearing bracket 360

TOEMN



TOEMA



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

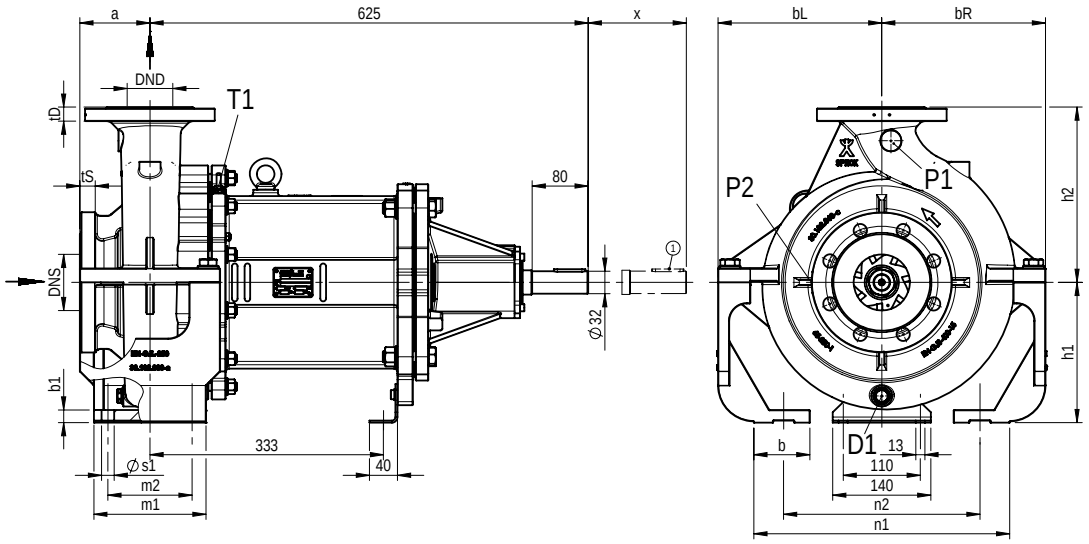
Utility connections		
P1	G 1/4	Manometer connection pressure-side (without bore)
P2	G 1/8	Manometer connection suction-side (without bore)
D1	G 3/8	Drainage volute casing
T1	G 1/4	Temperature sensor PT 100 (magnetic coupling 110 / 135 / 165)
T2	G 1/4	Temperature sensor PT 100 (magnetic coupling 75)
T3	G 1/4	Temperature sensor PT 100 (magnetic coupling 60)

① Fiitting key DIN 6885
② Feet applicable for motor design B5 only
x = Dismantling dimension
Flange dimensions → page 16

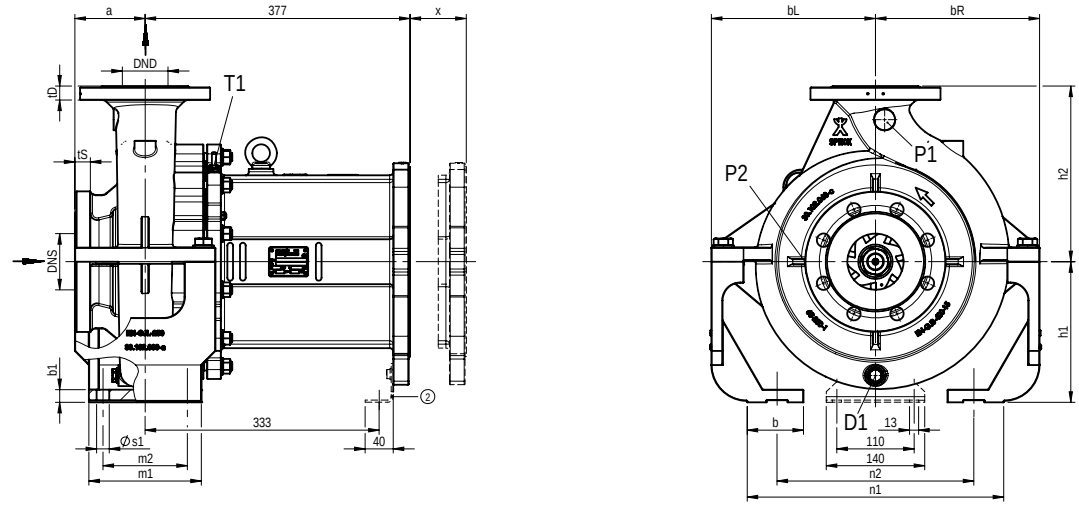
TOEMN / TOEMA – Dimensions and connections

Bearing bracket 470

TOEMN



TOEMA



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[1]	100	220	24	80	200	22	125	162,5	191	180	250	65	15	125	95	345	280	14	140
80-250[2]	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[3]	125	254	26	100	230	25	125	233,5	233,5	200	280	80	18	160	120	360	280	18	140
100-250[3]	125	254	26	100	230	25	140	230	230	225	280	80	18	160	120	400	315	18	140
125-200[3]	150	285	26	125	254	26	140	262	262	250	315	80	18	160	120	400	315	18	140

[1] Casing with feet resp. without centreline mounting

[2] Casing with feet – as of 2015 casing with centreline mounting

[3] 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)
D1	G 3/8	Drainage volute casing
T1	G 1/4	Temperature sensor PT 100 (magnetic coupling 110 / 135 / 165)

① Fitting key DIN 6885

② Feet applicable for motor design B5 only

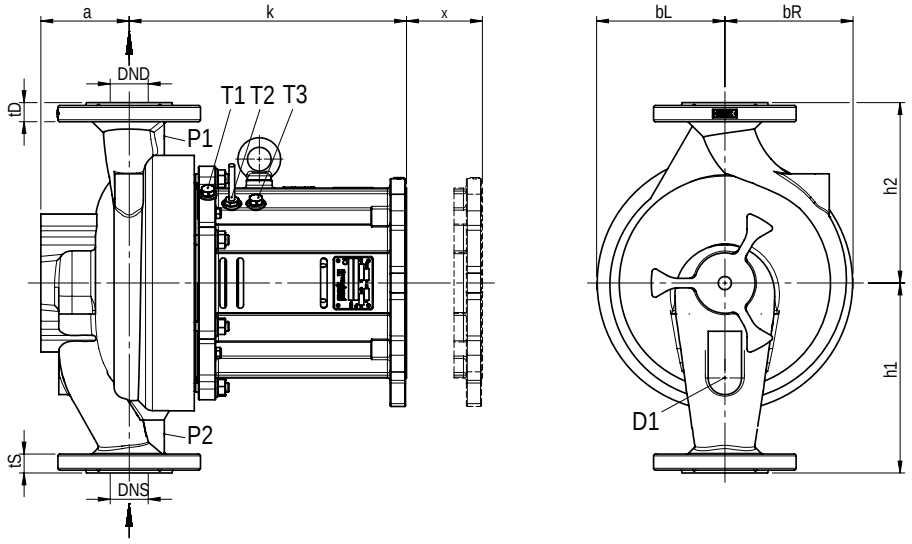
x = Dismantling dimension

Flange dimensions → page 16

TOEMI – Dimensions and connections

Bearing bracket 360

TOEMI



Size	Casing	DNS	DND	a	DD	DS	tD	tS	bL	bR	h1	h2	k	x
40-160	INA	40	40	97	150	150	20	20	116	116	200	190	395,5	110
40-160	INB	40	40	97	150	150	20	20	116	116	180	160	395,5	110
40-200	INA	40	40	93	150	150	20	20	135	135	200	190	399,5	110
50-200	INA	50	50	102	165	165	21	21	126	139	220	205	399,5	110
50-200	INB	50	50	92	165	165	21	21	126	139	200	180	409,5	110
65-200	INA	65	65	112	185	185	23	23	131	151	240	225	400,5	110
65/80-200	INB	80	80	112	200	200	23	23	131	151	255	225	400,5	110

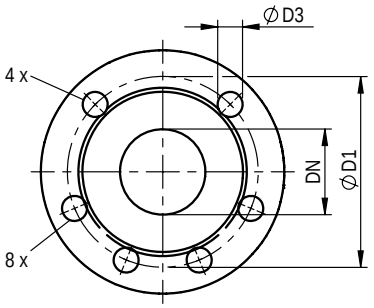
Utility connections		
P1	G 1/4	Manometer connection pressure-side (without bore)
P2	G 1/8	Manometer connection suction-side (without bore)
D1	G 3/8	Drainage volute casing
T1	G 1/4	Temperature sensor PT 100 (magnetic coupling 110 / 135 / 165)
T2	G 1/4	Temperature sensor PT 100 (magnetic coupling 75)
T3	G 1/4	Temperature sensor PT 100 (magnetic coupling 60)

x = Dismantling dimension

Flange dimensions

Flanges in acc. with DIN EN 1092-2			
DN	øD1	øD3	Holes
32	100	19	4
40	110	19	4
50	125	19	4
65	145	19	4
80	160	19	8
100	180	19	8
125	210	19	8
150	240	23	8

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



Interchangeability of parts

All series including the versions with mechanical seal (→ brochure TOEGN/GA/GI series) offer a high degree of interchangeability.

Same components within TOEMN/MA/MI series

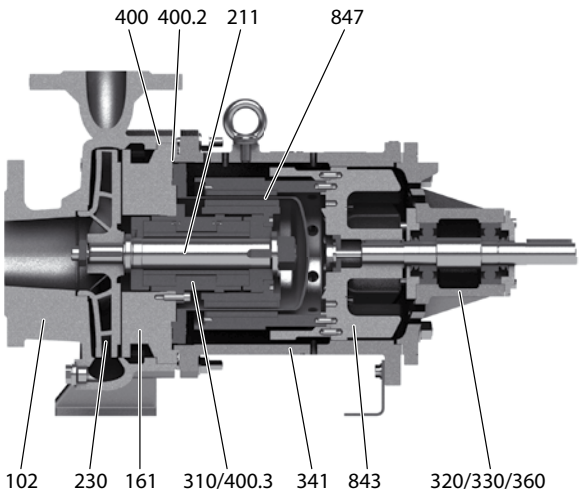
Compare only numbers within one **row**:

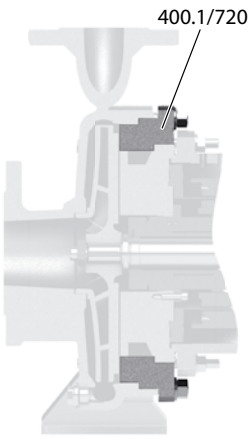
1 and 1 = same number means same component

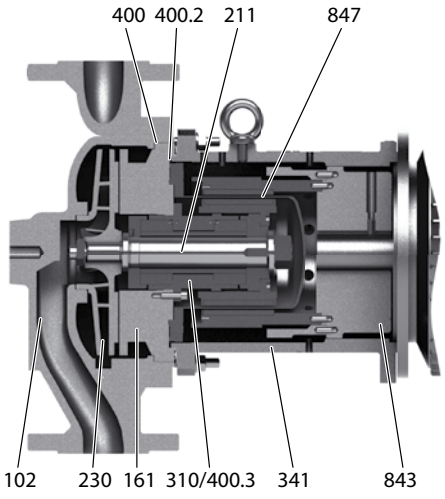
1 and 2 and ... = different numbers mean different components

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[1]	–	MN	MA	MI	1	2		1	2		1	2		1	2	1	3	4	3	5	4	3	4
Volute casing	102	MN	MA	–	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		–	–	MI				20	21			22			23								
Casing cover	161	MN	MA	MI	1	2		1	2		1	2		1	2	1	3	4	3	5	4	3	4
Shaft	211	MN	MA	MI	1												2						
Impeller	230	MN	MA	–	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		–	–	MI				1	20			5			8								
Sleeve bearing[1]	310	MN	MA	MI	1[1]												2[1]						
Bearing casing / rolling bearing / bearing cover	330 / 320 / 360	MN	–	–	1												2						
Bracket	341	MN	MA	MI	1												2						
Flat gasket	400	MN	MA	MI	1												2						
Flat gasket	400.1	MN	MA	–			1			1			1										
Flat gasket	400.2 / 400.3	MN	MA	MI	1[1]												2[1]						
Counter flange	720	MN	MA	–			1			1			1										
Coupling insert[1]	843	MN	MA	MI	1[1]												2[1]						
Magnetic coupling complete[1]	847	MN	MA	MI	1[1]												2[1]						
further parts	–	MN	MA	MI	1												2						

[1] Interchangeable with identical sizes of magnetic coupling only.

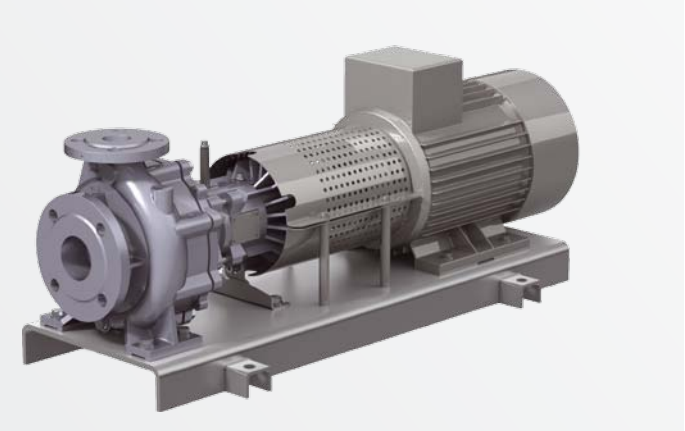






Pumps for heat transfer technology

Centrifugal pumps with mechanical seal



Modular system

TOEG and TOEM series mean a consistent designed modular system. Hydraulics and the main part of the used components are identical and interchangeable.

TOEG Series

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}	- 30 °C	–
T_{max}	+ 350 °C	+ 160 °C, + 180 °C on request
Casing	Spheroidal graphite cast iron	
Nominal pressure	PN 16	
H_{max} (2900 min^{-1})	100 m	
Q_{max} (2900 min^{-1})	550 m^3/h	
ATEX	II 2GD IIC cb TX	

Description in full length → see brochure TOEG 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_{min}	- 100 °C	–
T_{max}	+ 350 °C + 400 °C on request	+ 200 °C higher temp. on request
Casing	Spheroidal graphite cast iron or stainless steel	
Nominal pressure	PN 25 higher pressures on request	
H_{max} (2900 min^{-1})	90 m	
Q_{max} (2900 min^{-1})	12 m^3/h (200 l/min) 24 m^3/h (400 l/min) on request	
ATEX	II 2GD IIC cb 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

Your notes

Representatives

■ Produktion / Production
◘ Vertrieb / Sales
O Service / Service

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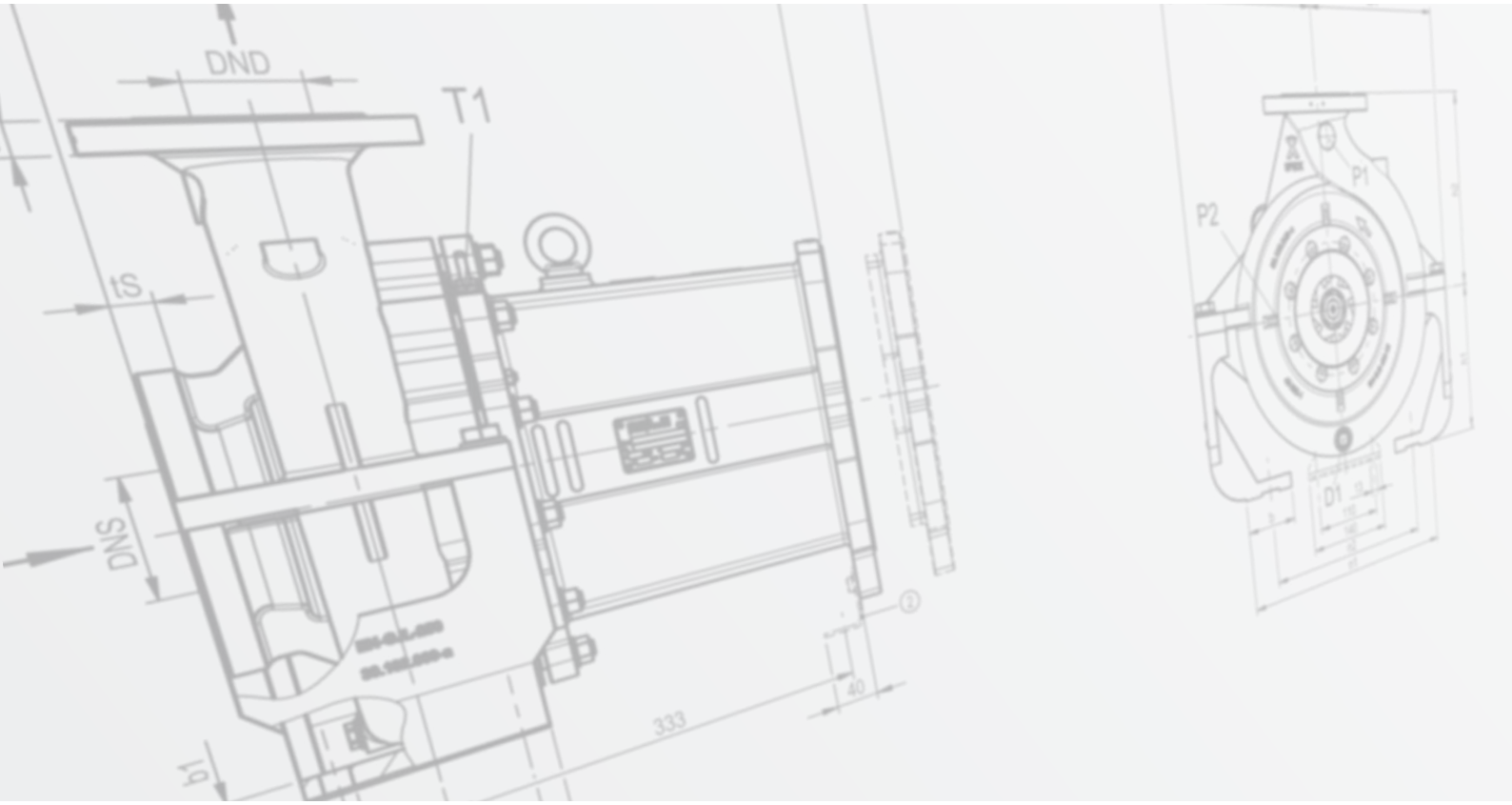

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