

Boiler feed pumps

ES series

with mechanical seal or packing gland

PN 40 or PN 63

Research and development with recent test stands



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 m³/h are possible.



Thermal oil test stand with pump surveillance system on the premises of Speck in Roth.

Research of impacts of high temperatures up to 350 °C on the lifetime of the pumps.

Your contacts

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International representatives

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Boiler feed pumps made by Speck

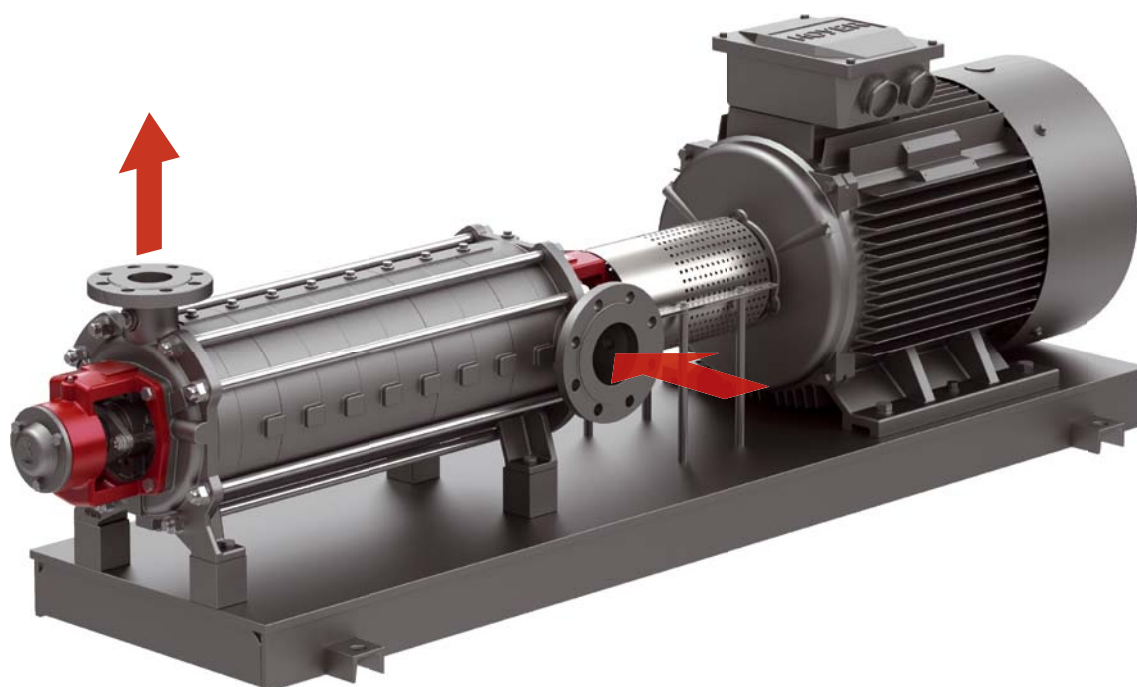
ES series

- » Horizontal multistage modular pumps
- » Designed for the delivery and circulation of clear or slightly contaminated liquids
- » Suitable for liquids without abrasive contaminants and without solid particles
- » Shaft bearing with two external rolling bearings
- » Hydraulically balanced impellers
- » Cast iron version and spheroidal graphite cast iron version

With mechanical seal

With packing gland

Nominal pressure	PN 40 or PN 63
50 Hz	H _{max.} 630 m / Q _{max.} 110 m ³ /h
60 Hz	H _{max.} 400 m / Q _{max.} 125 m ³ /h



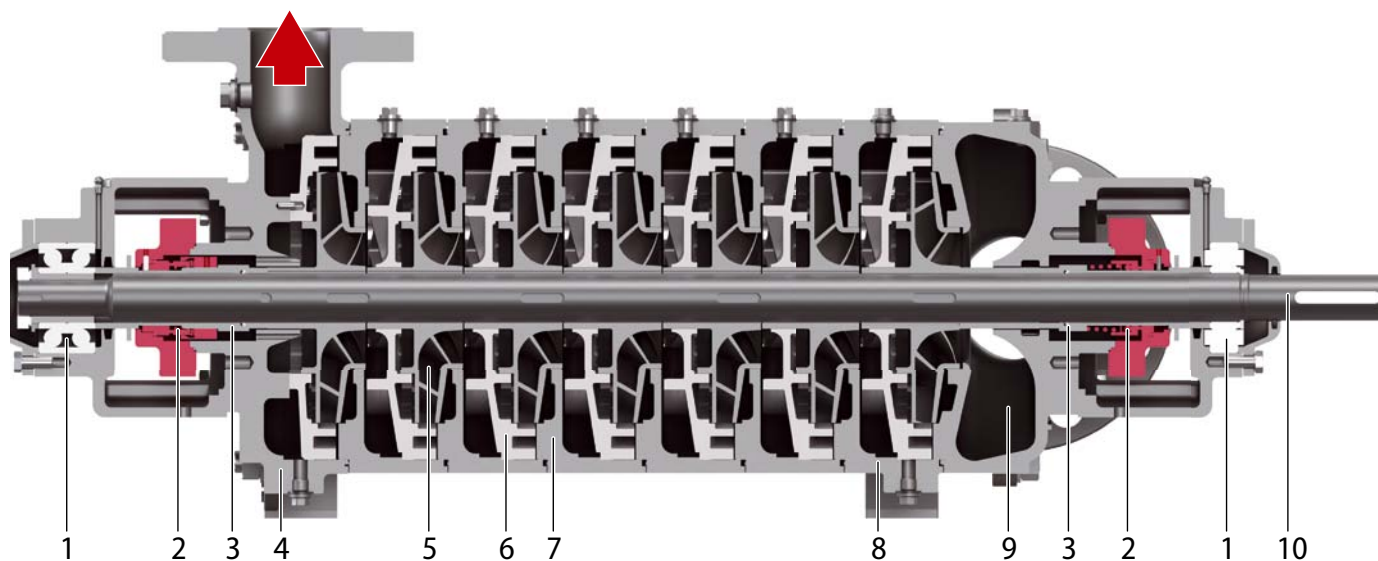
Proven boiler feed pumps for universal applications

Main applications

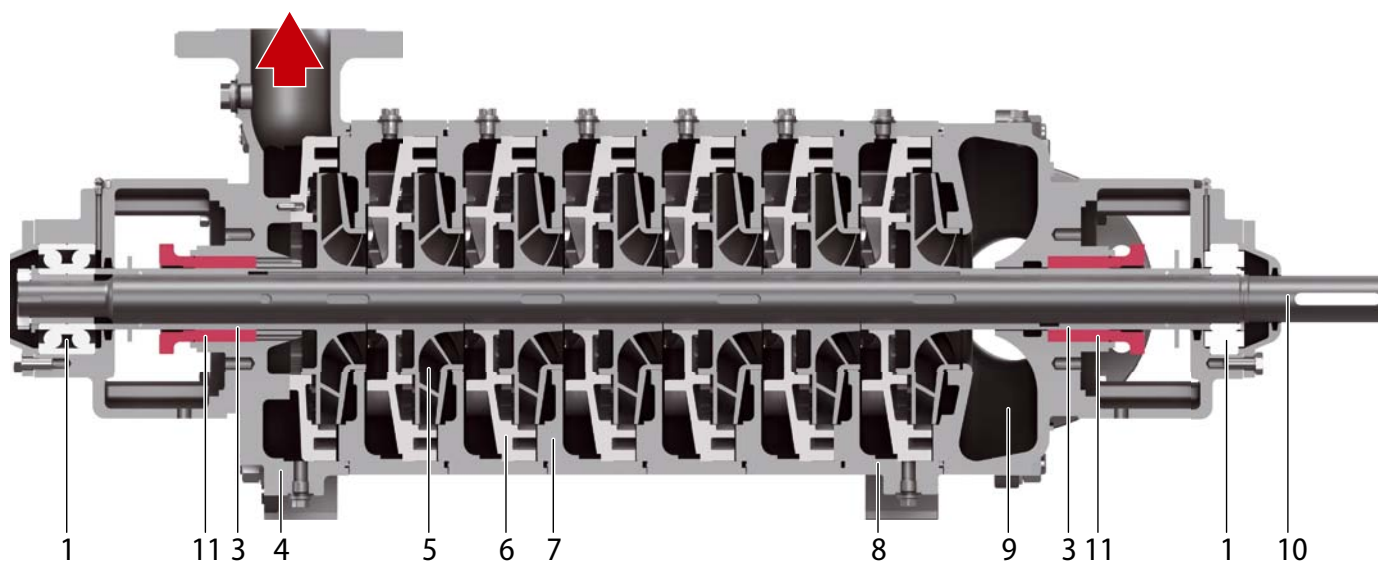
- » Delivery of hot water in boiler systems
- » Booster stations
- » Water supply units
- » Sprinkler units
- » Cleaning stations
- » Recovering of condensates (water)
- » Extracting palm oil

Modular system

Pumps with mechanical seal



Pumps with packing gland



No. Designation

- 1 Rolling bearing
- 2 Mechanical seal
- 3 Shaft protection sleeve
- 4 Discharge casing
- 5 Impeller
- 6 Diffuser insert

No. Designation

- 7 Stage casing
- 8 Stage casing with foot
- 9 Suction casing, from stage number 3: rotatable in steps of 90°
- 10 Shaft
- 11 Packing gland

Type code

Denomination

Type code Example	ES	40	07	LL	G4-	30	001
Denomination of series							
Pump size							
Number of stages							
Shaft bearing (table 1)							
Shaft sealing (table 2)							
Material design (table 3)							
Counting number							

Table 1 - Shaft bearing

Code	LL	LL	LL
Types / Sizes	ES32 / ES40	ES50	ES65 (PN 40) / ES65 (PN 63)
Design	1 roller bearing, 1 ball bearing	2 ball bearings	1 rolling bearing, 2 angle-seat ball bearings

Table 2 - Shaft sealing

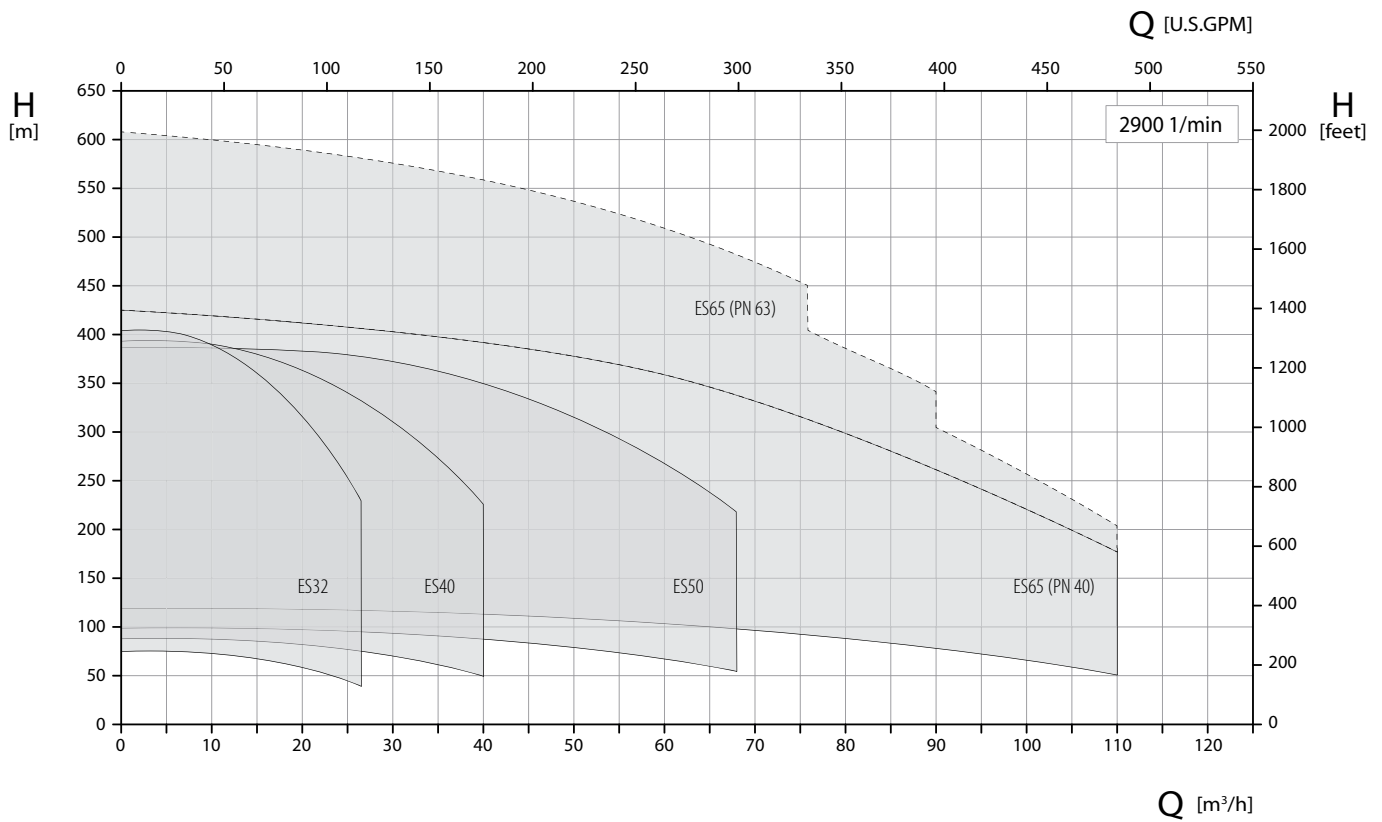
Code	G4	G6	X	SB
Types / Sizes	ES32 / ES40 / ES50 / ES65 (PN 40)	ES65 (PN 63)	ES32 / ES40 / ES50 / ES65 (PN 40)	
Shaft sealing	Mechanical seal			Packing gland
Material	SiC, carbon, FKM or SiC, carbon, EPDM			-
Max. operating pressure	suction side	12 bar 174 psi	16 bar 232 psi	16 bar 232 psi
	discharge side	40 bar 580 psi	63 bar 910 psi	40 bar 580 psi
Max. temperatures / media	SiC, carbon, FKM: Water max. 80 °C, other media max. 120 °C SiC, carbon, EPDM: Water without oil shares max. 120 °C			all media max. 105 °C

Table 3 - Material design

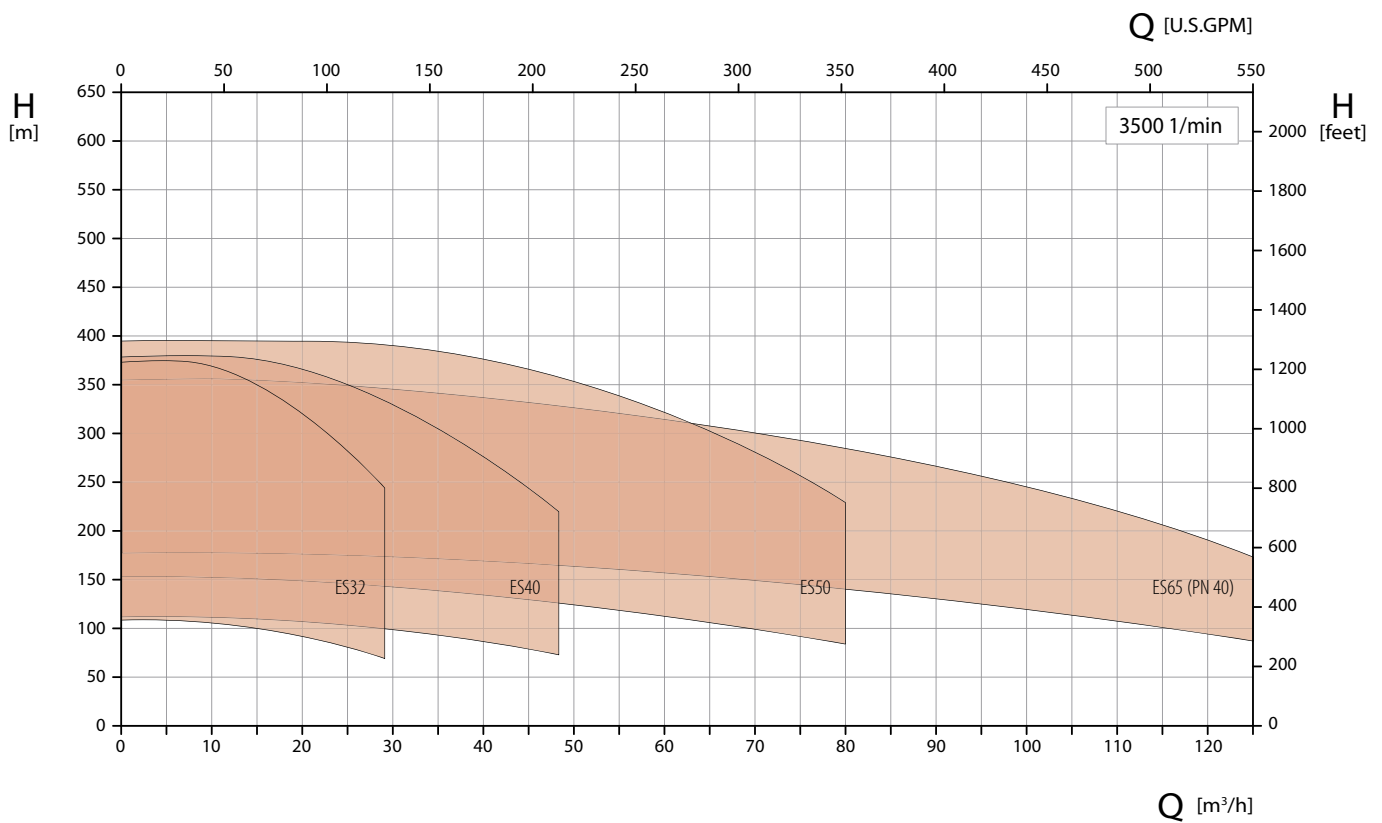
Code	30	30
Types / Sizes	ES32 / ES40 / ES50	ES65
Suction casing	EN-GJS-400-15	EN-GJS-400-15 Spheroidal graphite cast iron
Discharge casing	Spheroidal graphite cast iron	
Stage casing	EN-GJL-250 Cast iron	
Stage casing with foot		
Diffuser insert		
Impeller		
Shaft	1.4021 Cr-steel	1.4021 Cr-steel
Shaft protection sleeve	1.4122 CrMo-steel	1.4122 CrMo-steel

Performance range

50 Hz



60 Hz



Order-related tests and dimensioning

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 discharge casing and the suction casing, stages 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 1.3 x the nominal pressure (PN16) at 20 °C. The holding time is 30 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 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.

Standard conditions at site

- » Ambient temperature from - 20 °C 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.

Dimensioning

Assessment of the maximum pump outlet pressure

The pump outlet pressure at the pump outlet nozzle depends on

- » the pump inlet pressure
- » 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]
- 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 [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.

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.

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

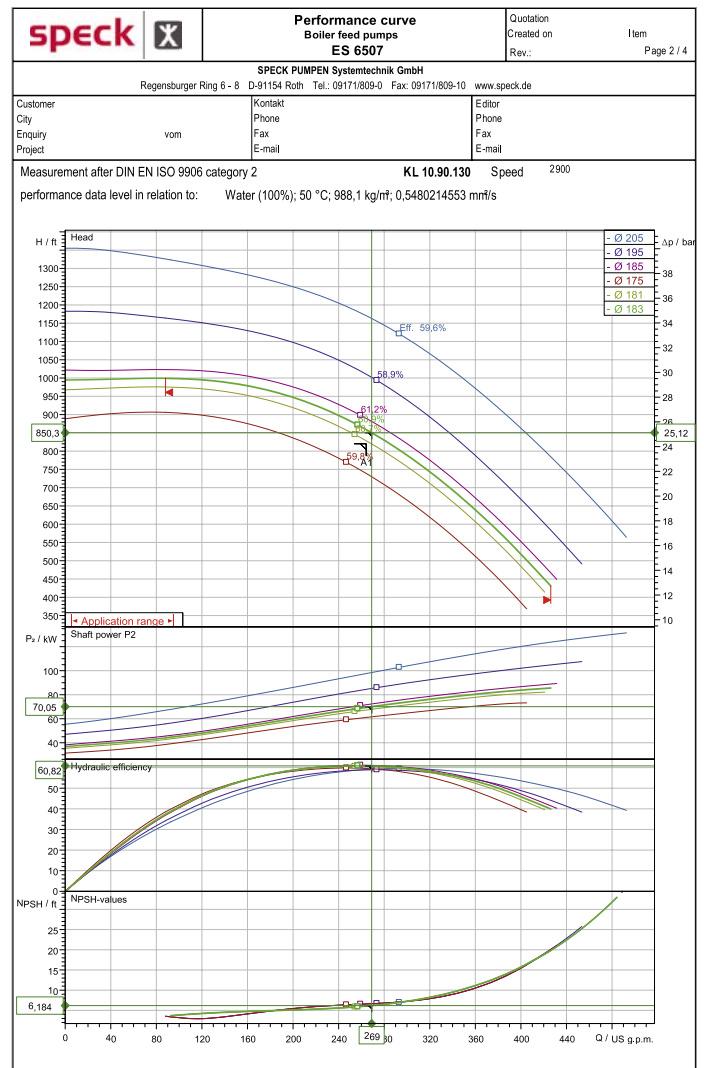


Characteristic curve depending on hydraulic selection

Documentation based on the selection program

speck X		Data Sheet Boiler feed pumps ES 6507		Quotation Created on Rev.: _____	Item Page 1 / 4
SPECK PUMPEN Systemtechnik GmbH Regensburg Ring 6 - 8 D-91154 Roth Tel.: 09171/809-0 Fax: 09171/809-10 www.speck.de					
Customer City Enquiry Project	vom		Kontakt Phone Fax E-mail	Editor Phone Fax E-mail	
Operating Data 1 Fluid Water 2 Corrosive matters keimel/hot 3 Abrasive matters keimel/hot 4 Solids 0 5 Oper. Temp. tW / tS 50 °C 6 Density at tW 988.1 kg/m³ 7 Kin. viscosity at tW / tS 0.548 mm²/s 8 Vapor press. at tA 0.1233 bar 9 PH value 7 Flow rate rated 269 US g.p.m. min / max 80.7 / 426.2 US g.p.m. Pressure Inlet 0 bar(u) Disch. 25.12 bar(u) Head 850.3 ft Pressure differential 25.12 bar(u) NPSH System required 9.08 ft 6.68 ft Speed 2900 1/min Hydr. efficiency 60.02 % hydr. power cons. 70.05 kW Max. operating pressure 29.4 bar(u) Start-up temp. °C Flow rate at cold start US g.p.m. Total abs. power at cold start kW					
Installation / Environment 10 Building / Outside Gebäude 11 under roof yes/no Ja / Yes Altitude < 3281 ft Amb. Temp. min 20 / 40 °C rel. Humidity < 55 %					
Pumps 12 No of stages Impeller-Ø mm 6 175 13 1 205 7 175 14 2 195 8 15 3 175 9 16 4 175 10 17 5 175 11 Impeller type direction of rotation right Suction port Pressure rating nom. diam. DN PN 16 Standard EN 1092-2 Delivery port Pressure rating nom. diam. DN PN 40 Standard EN 1092-2					
Accessories 18 Motor Shaft seal Base plate 19 Make Type GRD NU045R0-INB045S1-AQ1VGG Description 20 Specific design Number of poles Max. 120 °C / 63 bar Specific design 21 Rated power kW Degree of prot. ±5% Coupling Length mm 22 Rated current A Frequency ±2% Hz Make Width mm 23 1-phase / 3-phs Voltage V Series 24 Sound pressure level dB(A) Mounting Frame size Coupling protection 25 Explosion protection Spacer length mm					
Materials 26 Suction casing EN-GJS-400-15 Discharge casing EN-GJS-400-15 27 Stage casing EN-GJS-400-15 Suction stage with foot EN-GJS-400-15 28 Diffuser insert EN-GJL-250 Impeller EN-GJL-250 29 Bearing support EN-GJL-250 Bearing cover EN-GJL-250 30 Shaft 1.4122 O-ring Viton					
Tests and Inspections 33 Material Tests Test Certificate Other Tests Tests and Inspections Certificate Qty 34 Suction casing keine kein Hydrost. Pressure Test Intern kein alle 35 Discharge casing keine kein Gas Pressure Test Intern kein alle 36 Stage casing keine kein Performance curve 4) keine kein alle 37 Suction stage with foot keine kein NPSH-Measurement keine kein alle 38 Diffuser insert keine kein Final check Intern kein alle 39 Vibration keine kein 40 temperature keine kein 41 Max. operating pressure 63 bar / 20 °C X 1 Factor 1.3 Test time 30 min					
Shipping data 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 Rp 8.30. xxx E 4022. xxx KL 10.90.130 DE 1096.0902					
Remarks 45 motor article					
46 1) Motor supplement corresponds to ISO 9906 2) According to EN 10204 3) Yoke casing & casing cover 4) Without NPSH test 5) Scope of deliv. to price sheet					

Technical data sheet (example)



Characteristic curve (example)

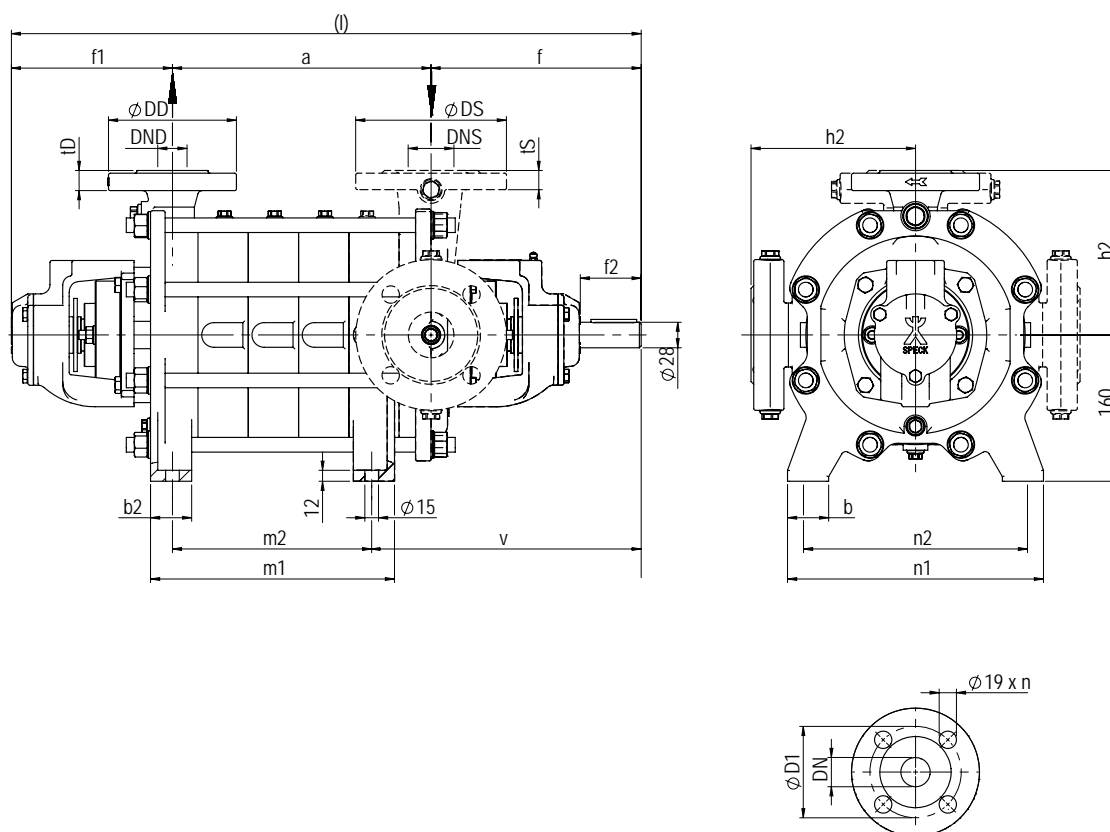
speck X		Dimension drawing Boiler feed pumps ES 6507		Customer City	Kontakt Phone Fax E-Mail	Editor Phone Fax E-Mail
Quotation		SPECK PUMPEN Systemtechnik GmbH Regensburg Ring 6 - 8 D-91154 Roth Tel.: 09171/809-0 Fax: 09171/809-10 www.speck.de		Created on 2015-07-09 Item Rev. 2015-07-09 Page 4 / 4		
Pumpe freie Welle		Motor		Anschlüsse Suction port EN 1092-2 DN 100 PN 16 Delivery port EN 1092-2 DN 65 PN 40 Ø D1 180 mm Ø D1 145 mm Ø D2 19 mm Ø D2 19 mm D2 x 8 D2 x 8		
		Dimensions in mm DNS 100 DS 226 IS 24 DND 6E DD 185 ID 24 a 51C m1 46E m2 38E l 102E				

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.

ES32 / ES40 / ES50 – Dimensions



ES32 | PN 40

Size	a	m1	m2	(l)	b2	Ød	f1	f	v	h2
ES3202	118	103	53	522	45	28	174	230	295	180
ES3203	173	158	108	577						
ES3204	228	213	163	632						
ES3205	283	268	218	687						
ES3206	338	323	273	742						
ES3207	393	378	328	797						
ES3208	448	433	383	852						
ES3209	503	488	438	907						
ES3210	558	543	492	962						
ES3211	613	598	548	1017						

Discharge flange PN 40				
DND	DD	D1	n	tD
DN 32	140	100	4	22

Suction flange PN 16				
DNS	DS	D1	n	tS
DN 50	165	125	4	21

ES40 | PN 40

Size	a	m1	m2	(l)	b2	Ød	f1	f	v	h2
ES4002	135	115	55	597	50	32	197	265	345	180
ES4003	195	175	115	657						
ES4004	255	235	175	717						
ES4005	315	295	235	777						
ES4006	375	355	295	837						
ES4007	435	415	355	897						
ES4008	495	475	415	957						
ES4009	555	535	475	1017						

Discharge flange PN 40				
DND	DD	D1	n	tD
DN 40	150	110	4	19

Suction flange PN 16				
DNS	DS	D1	n	tS
DN 65	185	145	4	21

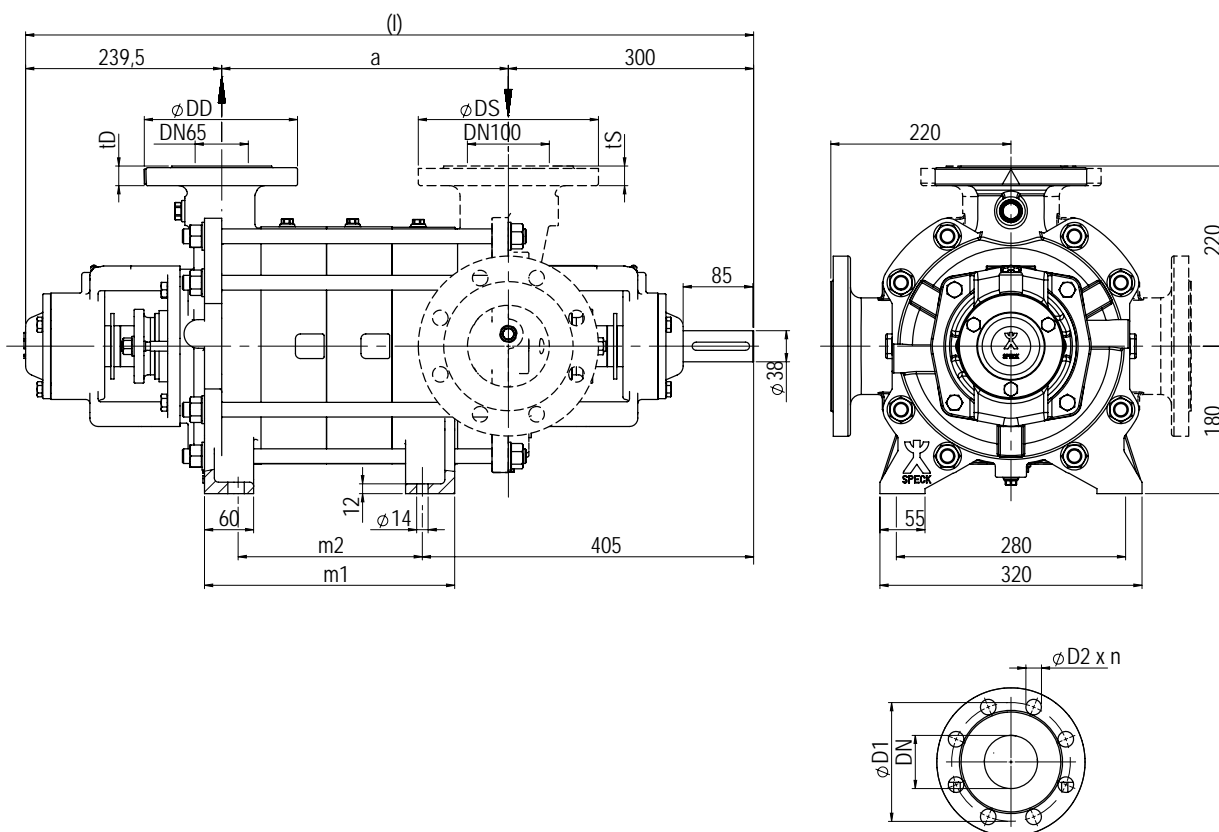
ES50 | PN 40

Size	a	m1	m2	(l)	b2	Ød	f1	f	v	h2
ES5002	153	133	63	625	55	32	197	275	365	200
ES5003	218	198	128	690						
ES5004	283	263	193	755						
ES5005	348	328	258	820						
ES5006	413	393	323	885						
ES5007	478	458	388	950						
ES5008	543	523	453	1015						

Discharge flange PN 40				
DND	DD	D1	n	tD
DN 50	165	125	4	25

Suction flange PN 16				
DNS	DS	D1	n	tS
DN 80	200	160	8	25

ES65 – Dimensions



ES65 | PN 40

Size	a	m1	m2	(l)
ES6502	190	146	65	730
ES6503	270	226	145	810
ES6504	350	306	225	890
ES6505	430	386	305	970
ES6506	510	466	385	1050
ES6507	590	546	465	1130

Discharge flange PN 40					
DND	DD	D1	n	tD	D2
DN 65	185	145	8	24	19

Suction flange PN 16					
DNS	DS	D1	n	tS	D2
DN 100	220	180	8	24	19

ES65 | PN 63

Size	a	m1	m2	(l)
ES6505	430	386	305	970
ES6506	510	466	385	1050
ES6507	590	546	465	1130
ES6508	670	626	545	1210
ES6509	750	706	625	1290
ES6510	830	786	705	1370

Discharge flange PN 63					
DND	DD	D1	n	tD	D2
DN 65	205	160	8	28	23

Suction flange PN 63					
DNS	DS	D1	n	tS	D2
DN 100	253	200	8	33	23

Flanges

Flanges in acc. with EN 1092 PN 40.

Flanges in acc. with EN 1092-2, drilled in acc. with ANSI 150 lbs or 300 lbs on request.

Direction of rotation

Direction of rotation is clockwise with view towards pump shaft

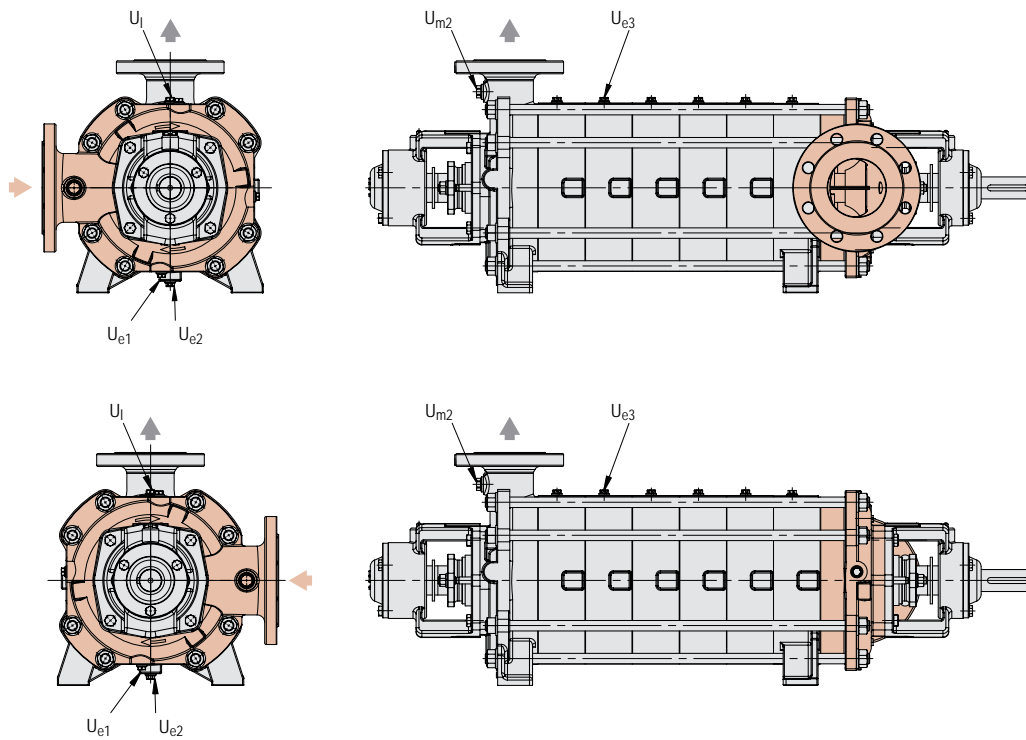
Connections

Position of inlet and outlet nozzle

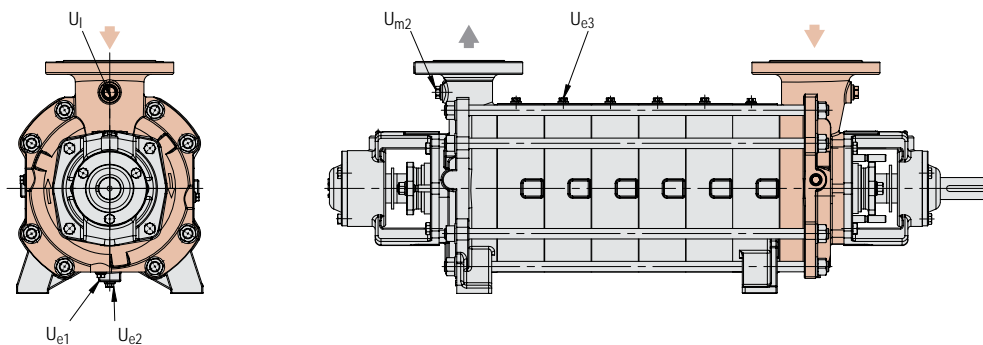
The outlet nozzle is always on the top. The inlet nozzle can be rotated 90°.

	Number of stages	
	2	≥ 3
Position of inlet nozzle	Nozzle at the side	Nozzle at the side / on top
Position of outlet nozzle	on top	on top

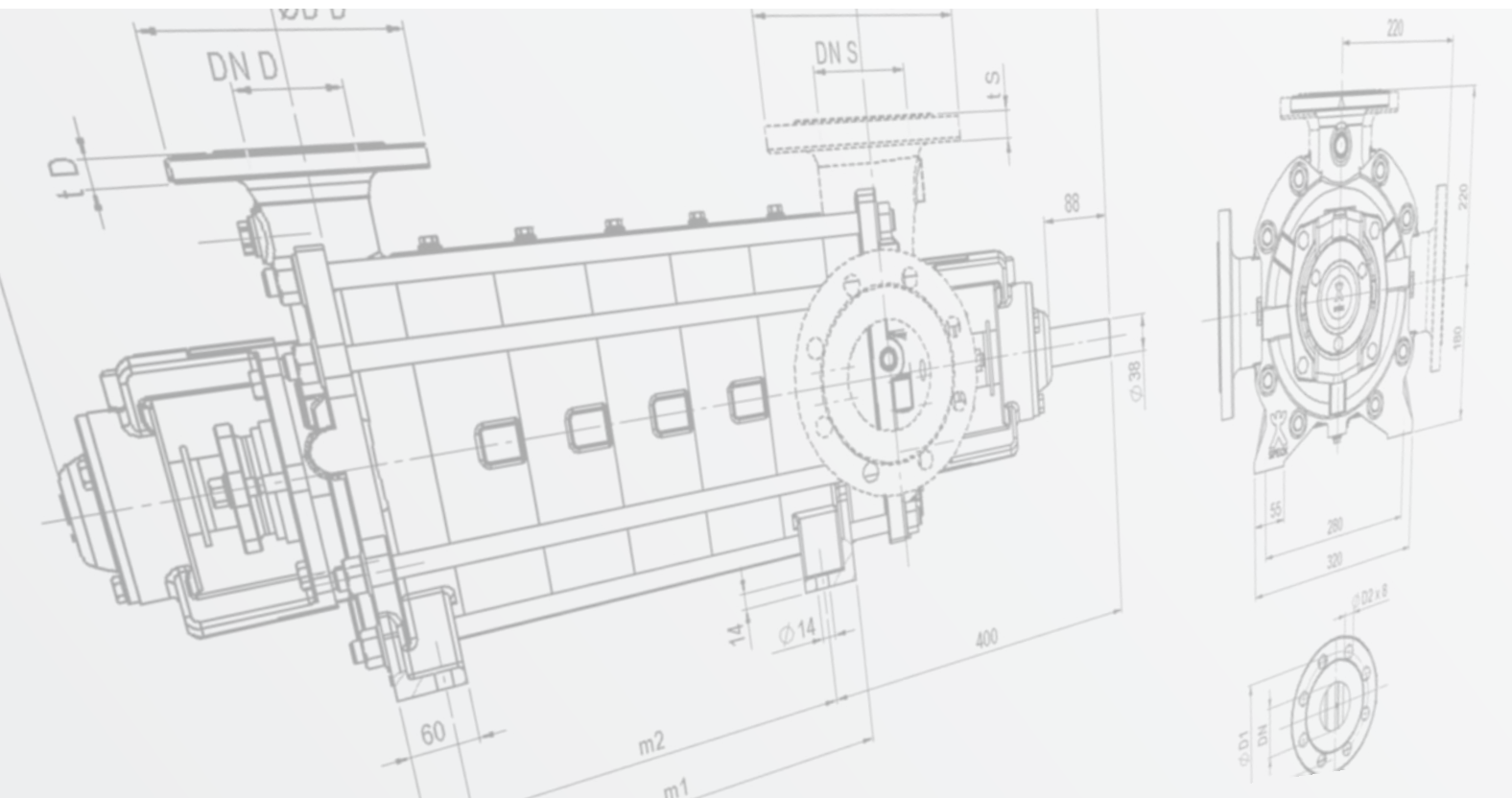
Inlet nozzle at the side



Inlet nozzle on top



Designation	Connection	Sizes		
		ES32	ES40/ ES50	ES65
U_{e1}	Drainage (screw plug)	G 1/4	G 1/4	G 1/4
U_{e2}	Drainage (screw plug)	-	G 1/4	G 1/4
U_{e3}	Drainage (screw plug)	G 1/4	G 1/4	G 1/4
U_i	Vent (screw plug)	G 1/4	G 1/4	G 1/4
U_{m1}	Pressure gauge connection	G 3/8	G 3/8	G 1/2
U_{m2}	Pressure gauge connection	G 1/2	G 1/2	G 1/2



Representation

SPECK 
pumps

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