

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

→ page 15

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

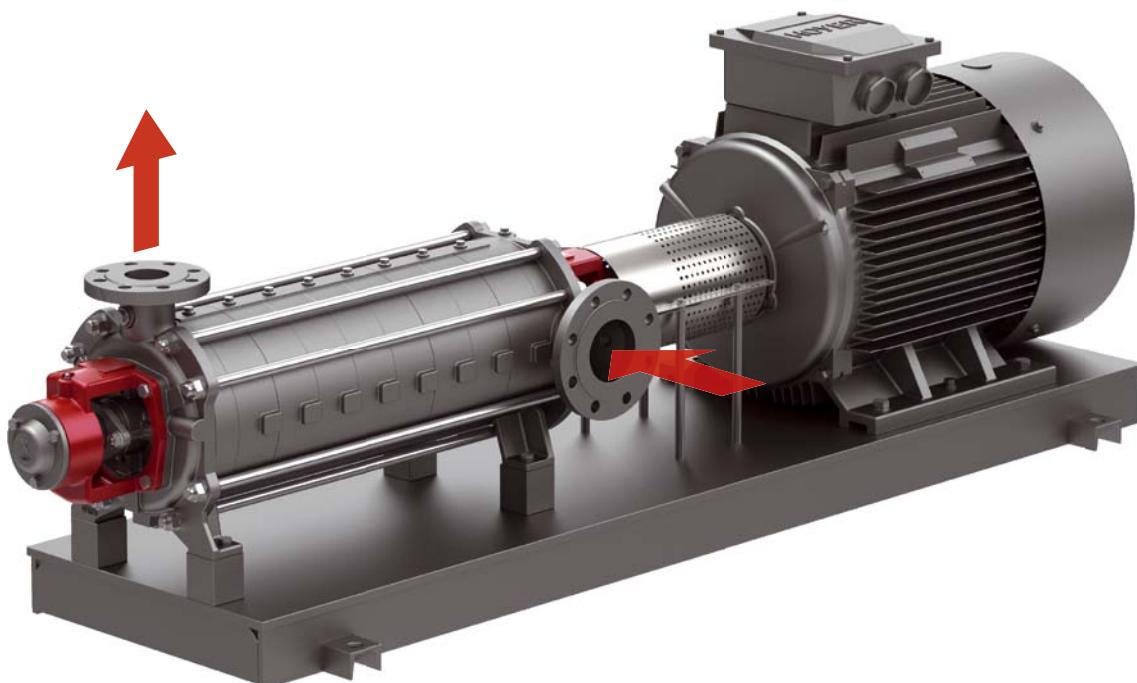
With mechanical seal

With packing gland

Nominal pressure	PN 40 or PN 63
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50 Hz	H _{max.} 630 m / Q _{max.} 110 m ³ /h
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60 Hz	H _{max.} 400 m / Q _{max.} 125 m ³ /h
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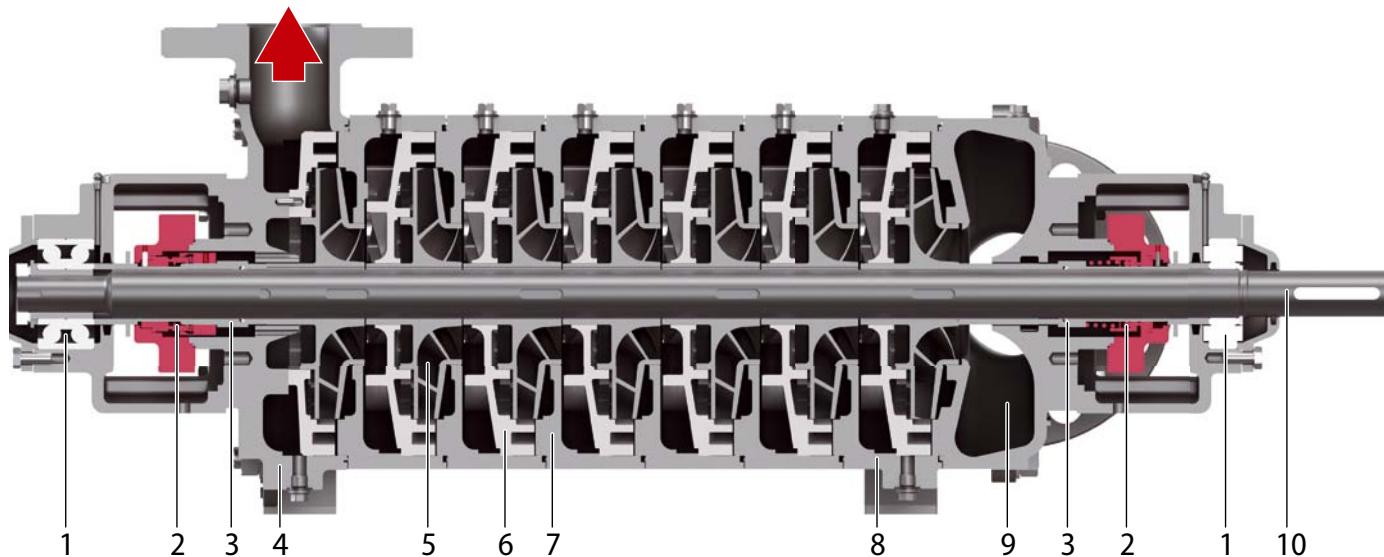
Proven boiler feed pumps for universal applications

Main applications

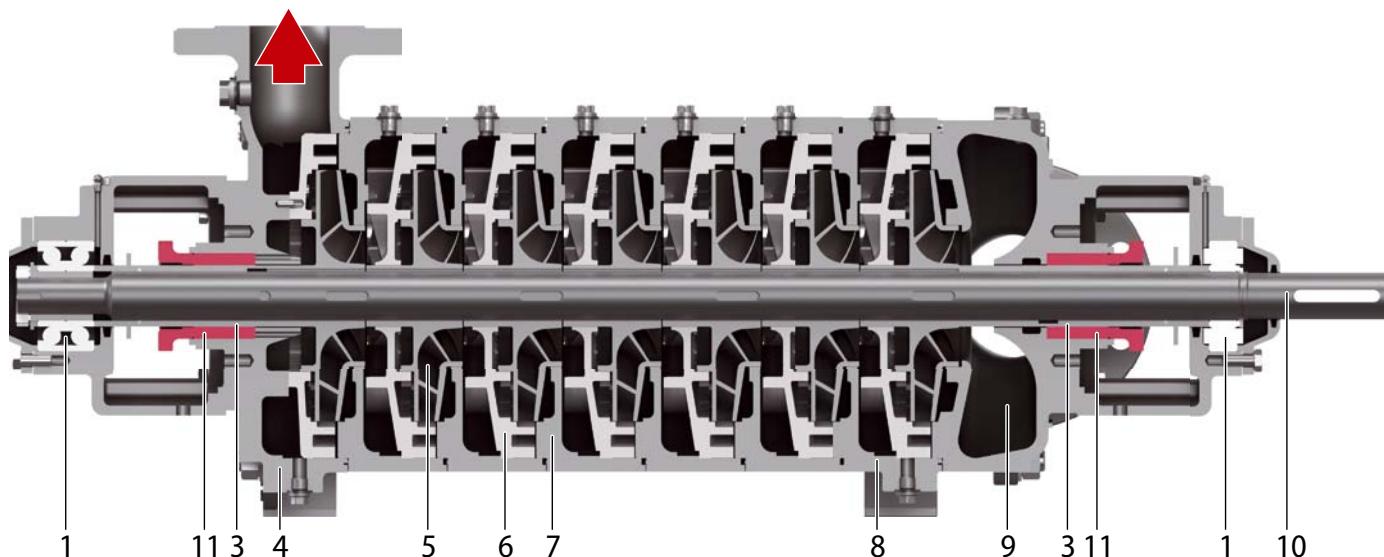
- » Delivery of hot water in boiler systems
- » Booster stations
- » Water supply units
- » Sprinkler units
- » Cleaning stations
- » Recovering of condensates (water)
- » Extracting palm oil

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

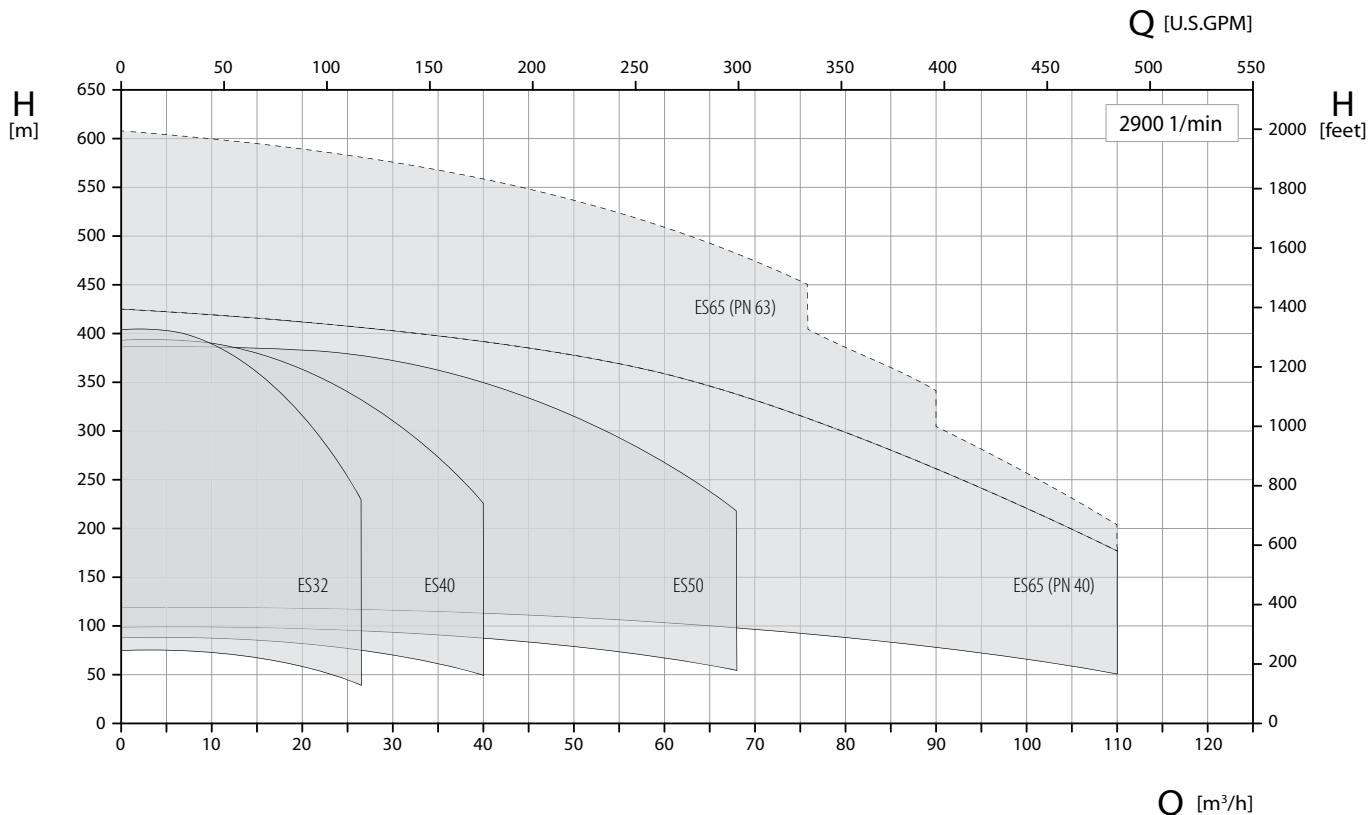
Code	G4	G6	X	SB
Types / Sizes	ES32 / ES40 / ES50 / ES65 (PN 40)	ES65 (PN 63)	ES32 / ES40 / ES50 / ES65 (PN 40)	
Shaft sealing	Mechanical seal			Packing gland
Material	SiC, carbon, FKM or SiC, carbon, EPDM			-
Max. operating pressure	suction side discharge side	12 bar 174 psi 40 bar 580 psi	16 bar 232 psi 63 bar 910 psi	Special version, on request
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

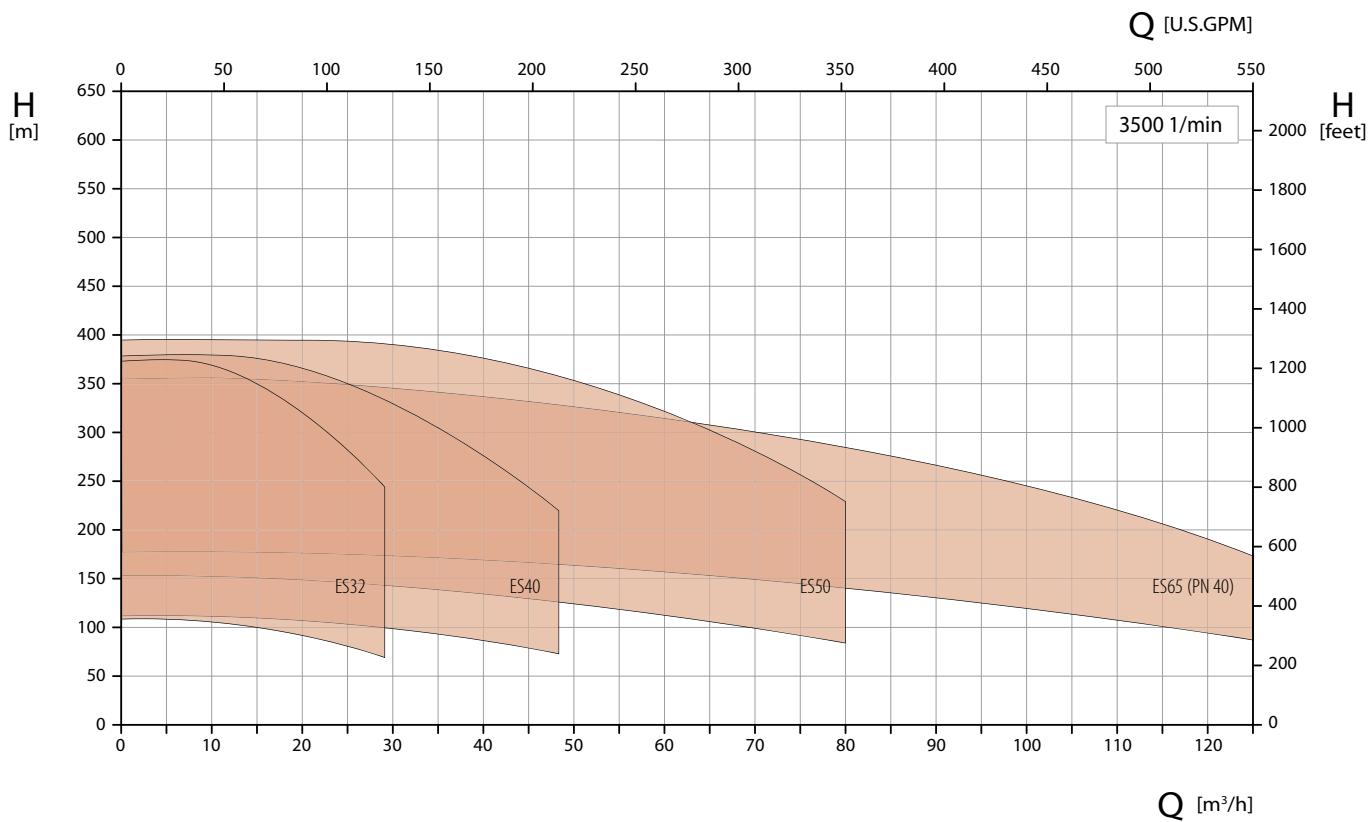
Code	30	30
Types / Sizes	ES32 / ES40 / ES50	ES65
Suction casing	EN-GJS-400-15	
Discharge casing	Spheroidal graphite cast iron	
Stage casing		EN-GJS-400-15 Spheroidal graphite cast iron
Stage casing with foot	EN-GJL-250	
Diffuser insert	Cast iron	
Impeller		EN-GJL-250 Cast iron
Shaft	1.4021 Cr-steel	1.4021 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 $p_{2\max op}$ is calculated using the formula:

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

With:

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

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

ρ = density of the medium to be pumped [kg/m^3]

g = gravitation constant [m/s^2]

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 $p_{all w c}$ at operating pressure.

This also applies to commissioning while the discharge valve is closed.

Simple and optimal configuration software

SPAIX selection program

The screenshot shows the SPAIX selection program interface. On the left, there's a sidebar with 'Areas of application' (Complete range, high head pump, MZ, side channel pumps, TOE-M stainless steel, heat transfer engineering) and a 'Series' section with checkboxes for 'ES / PN 40' and 'ES / PN 63'. A red box labeled '1' highlights the 'high head pump' category under 'Areas of application'. A red box labeled '2' highlights the selected series 'ES / PN 40' and 'ES / PN 63'. The main panel shows 'Operating data specification' and 'Medium data' sections, with a red box labeled '3' highlighting the operating data input fields.

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.

1 List of all pump designs that can be configured in the software

2 List of all series within the pump designs

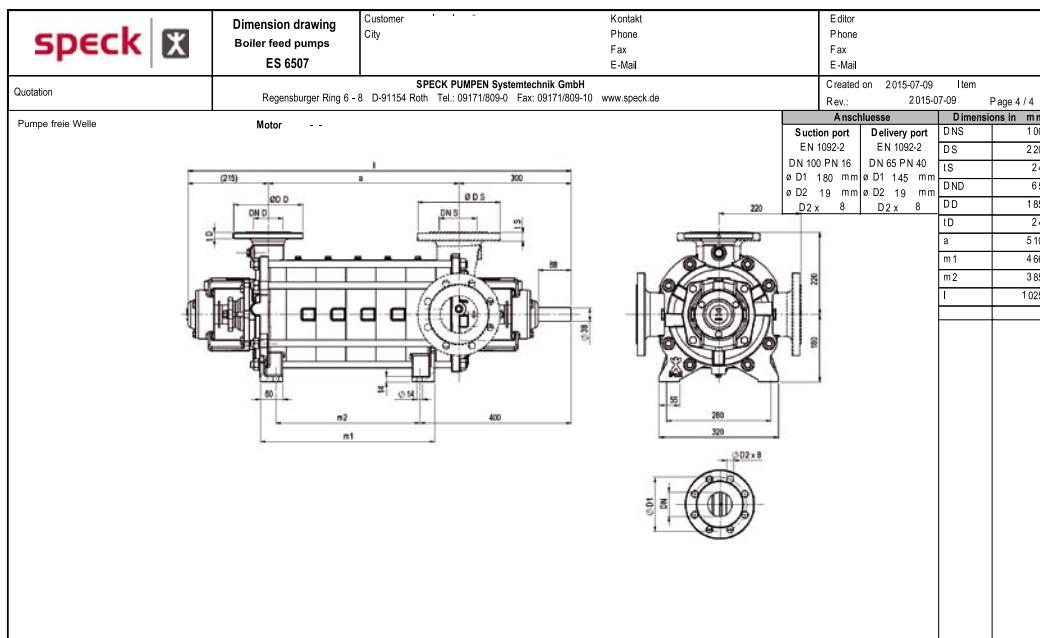
3 Selection parameters operating parameters and medium data in the first instance

4 Characteristic curve depending on hydraulic selection generated

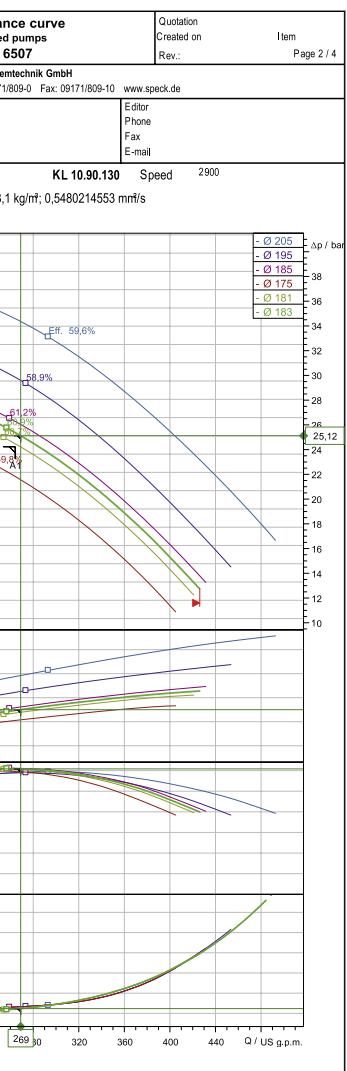
Documentation based on the selection program

Data Sheet Boiler feed pumps ES 6507			Quotation Created on	Item
			Rev.: Page 1 / 4	
SPECK PUMPEN Systemtechnik GmbH Regensburger Ring 6 - 8 D-91154 Roth Tel.: 09171/809-0 Fax: 09171/809-10 www.speck.de				
Customer	Kontakt	Editor		
City	Phone	Phone		
Enquiry	vom	Fax	Fax	
Project	E-mail	E-mail	E-mail	
Operating Data				
1 Fluid	Water	Flow rate	t _{rated} 269 US g.p.m	Speed 2900 1/min
2 corrosive matters	keine/nicht	Wight-%	min / max 80,7 / 426,2 US g.p.m	Hydr. efficiency 60,82 %
3 abrasive matters	keine/nicht	Wight-%	Pressure Inlet 0 bar (0)	70,05 kW
4 Solids	0	Wight-%	Disch. 25,12 bar (0)	Max. operating pressure 29,4 bar (0)
5 Oper. Temp. tW / tS	50 °C	Head 850,3 ft		
6 Density at tW	988,1 kg/m ³	Pressure differential 25,12 bar (0)	Start-up temp. °C	
7 Kin. viscosity at tW / tS	0,548 mm ² /s		Flow rate at cold start US g.p.m	
8 Vapor press. at tA	0,1233 bar	NPSH System 9,08 ft	Total. abs. power at cold start kW	
9 PH value	7	required 6,68 ft		
Installation / Environment				
10 Building / Outside	Gebäude	Altitude < 3281 ft	Amb. Temp. min 20 / 40 °C	
11 under roof yes/no	Ja / Yes	Hazardous area	rel. Humidity <55 %	
Pumpe				
12 No. of stages	Impeller-Ø mm	6 175	Impeller type direction of rotation right	Suction port Pressure rating PN 16 nom. diam. DN 100 Standard EN 1092-2
13 1	205	7 175		Delivery port Pressure rating PN 40 nom. diam. DN 65 Standard EN 1092-2
14 2	195	8		
15 3	175	9		
16 4	175	10		
17 5	175	11		
Accessories				
18	Motor	Shaft seal	Base plate	
19 Make	1) Type	GRD NU045R0-NB0145S1-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	±2%	Hz	Make
23 1-phase / 3-ph	Voltage	v	Series	Width mm
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	14122	O-ring	Viton	
31				
32				
Tests and Inspections				
33 Material Tests	Test 2)	Certificate	Other Tests	Tests and Inspections 3) Certificate Qty
34 Suction casing	keine	kein	Hydrest. Pressure Test	Intern kein alle
35 Discharge casing	keine	kein	Gas Pressure Test 3)	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 alle
40			Temperature	Keine kein alle
41			Max. operating pressure 63 bar / 20°C X Factor 1,3 Test time 30 min	
Shipping data 5)				
42 Net weight appr.	kg	Gross weight appr.	kg	Pump color motor color
Documentation				
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 10.90.130	DE 1096.0902	1
45				
46				

Technical data sheet (example)



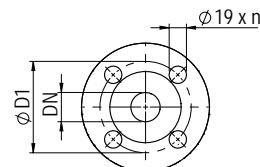
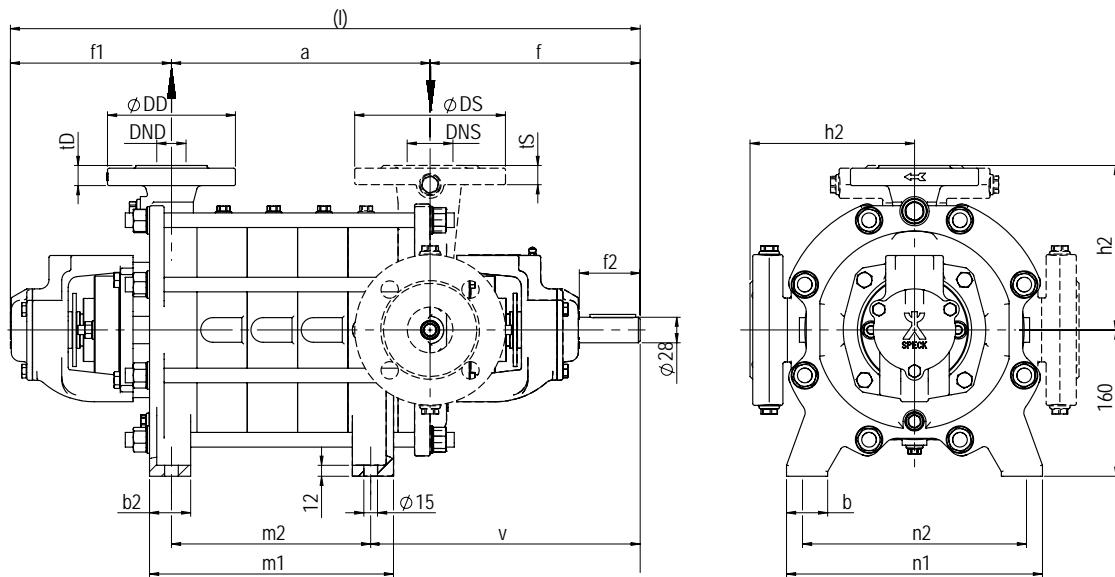
Dimensional drawing (example)



Characteristic curve (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	Discharge flange PN 40	Suction flange PN 16
ES3202	118	103	53	522							DND DD D1 n tD	
ES3203	173	158	108	577							DN 32 140 100 4 22	
ES3204	228	213	163	632								
ES3205	283	268	218	687								
ES3206	338	323	273	742								
ES3207	393	378	328	797	45	28	174	230	295	180		
ES3208	448	433	383	852								
ES3209	503	488	438	907								
ES3210	558	543	492	962								
ES3211	613	598	548	1017								

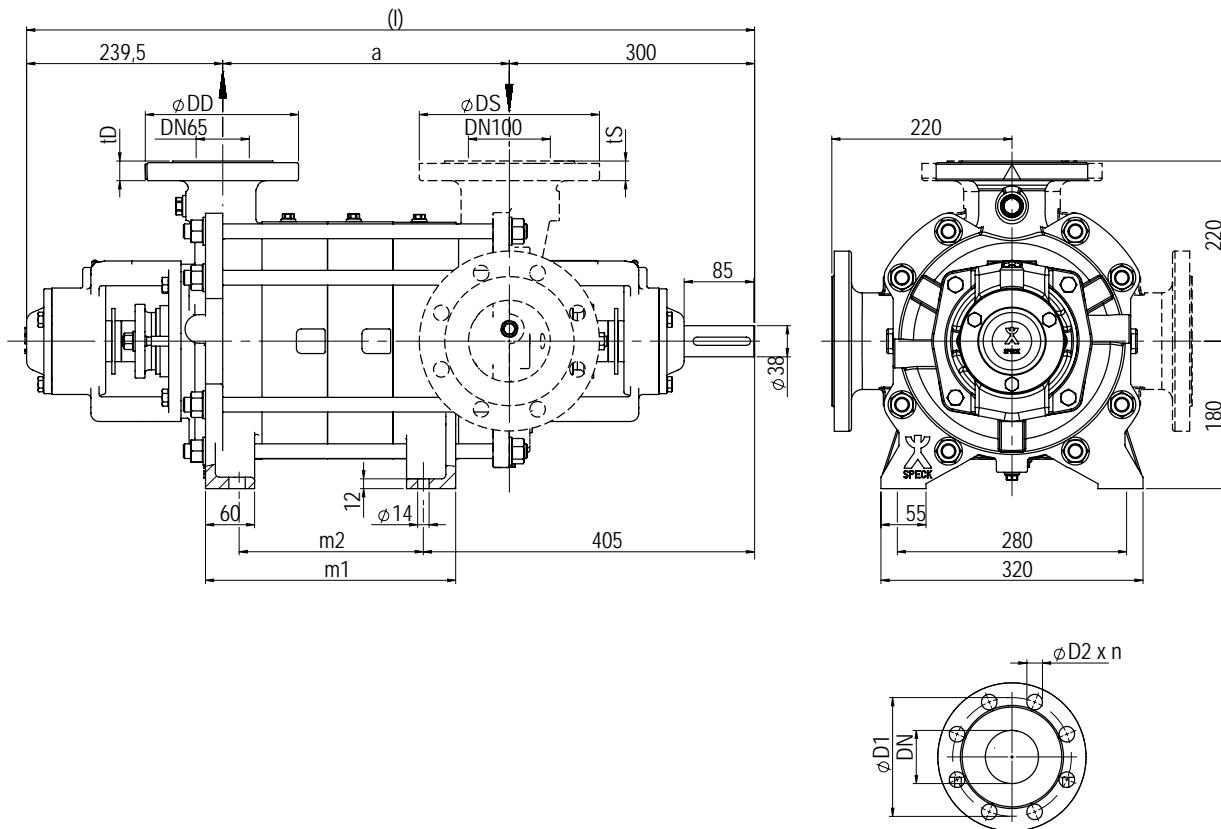
ES40 | PN 40

Size	a	m1	m2	(l)	b2	Ød	f1	f	v	h2	Discharge flange PN 40	Suction flange PN 16
ES4002	135	115	55	597							DND DD D1 n tD	
ES4003	195	175	115	657							DN 40 150 110 4 19	
ES4004	255	235	175	717								
ES4005	315	295	235	777	50	32	197	265	345	180		
ES4006	375	355	295	837								
ES4007	435	415	355	897								
ES4008	495	475	415	957								
ES4009	555	535	475	1017								

ES50 | PN 40

Size	a	m1	m2	(l)	b2	Ød	f1	f	v	h2	Discharge flange PN 40	Suction flange PN 16
ES5002	153	133	63	625							DND DD D1 n tD	
ES5003	218	198	128	690							DN 50 165 125 4 25	
ES5004	283	263	193	755								
ES5005	348	328	258	820	55	32	197	275	365	200		
ES5006	413	393	323	885								
ES5007	478	458	388	950								
ES5008	543	523	453	1015								

ES65 – Dimensions



ES65 | PN 40

Size	a	m1	m2	(l)	Discharge flange PN 40					
					DND	DD	D1	n	tD	D2
ES6502	190	146	65	730	DN 65	185	145	8	24	19
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						

Suction flange PN 16			
DNS	DS	D1	n
DN 100	220	180	8

ES65 | PN 63

Size	a	m1	m2	(l)	Discharge flange PN 63					
					DND	DD	D1	n	tD	D2
ES6505	430	386	305	970	DN 65	205	160	8	28	23
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						

Suction flange PN 63			
DNS	DS	D1	n
DN 100	253	200	8

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

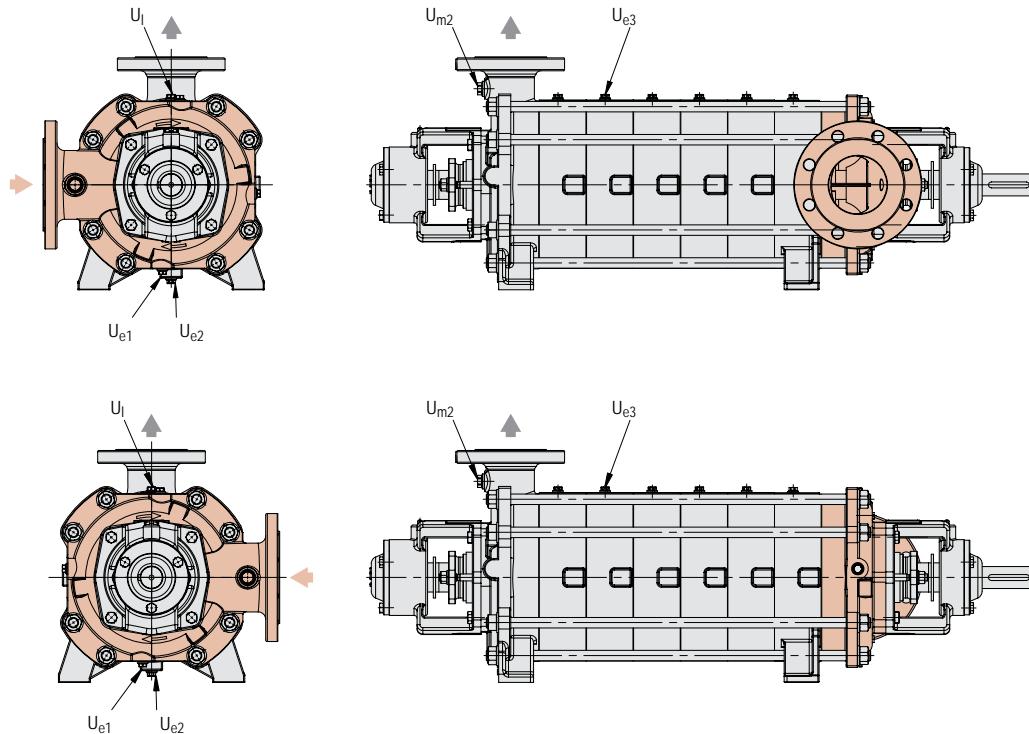
Connections

Position of inlet and outlet nozzle

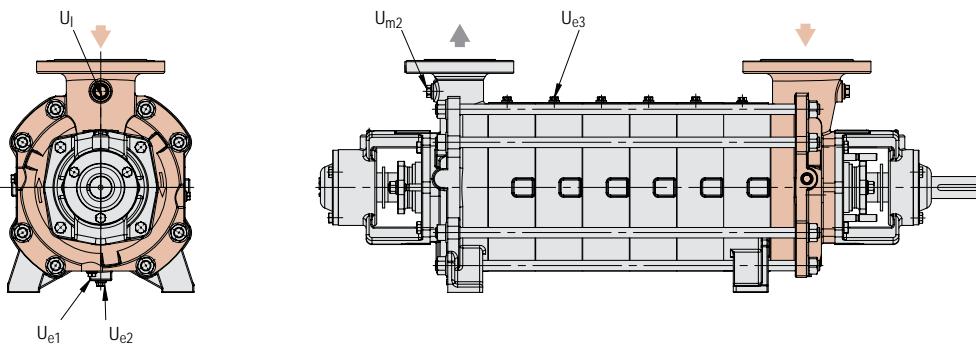
The outlet nozzle is always on the top. The inlet nozzle can be rotated 90°.

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

Inlet nozzle at the side

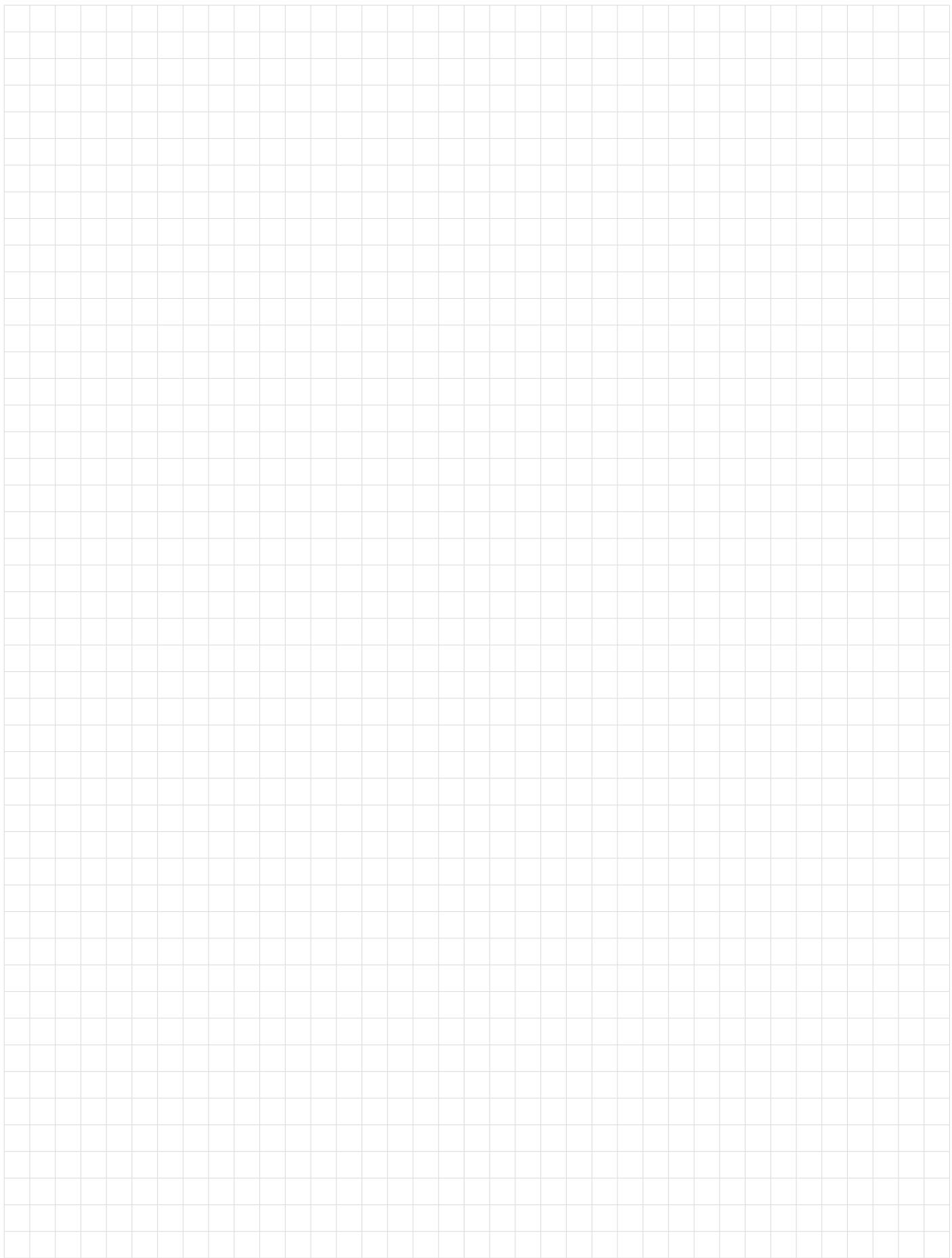


Inlet nozzle on top



Designation	Connection	ES32	Sizes	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

Your notes



Your notes

A large grid of squares, approximately 20 columns by 25 rows, designed for handwritten notes.

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■ Vertrieb / Sales
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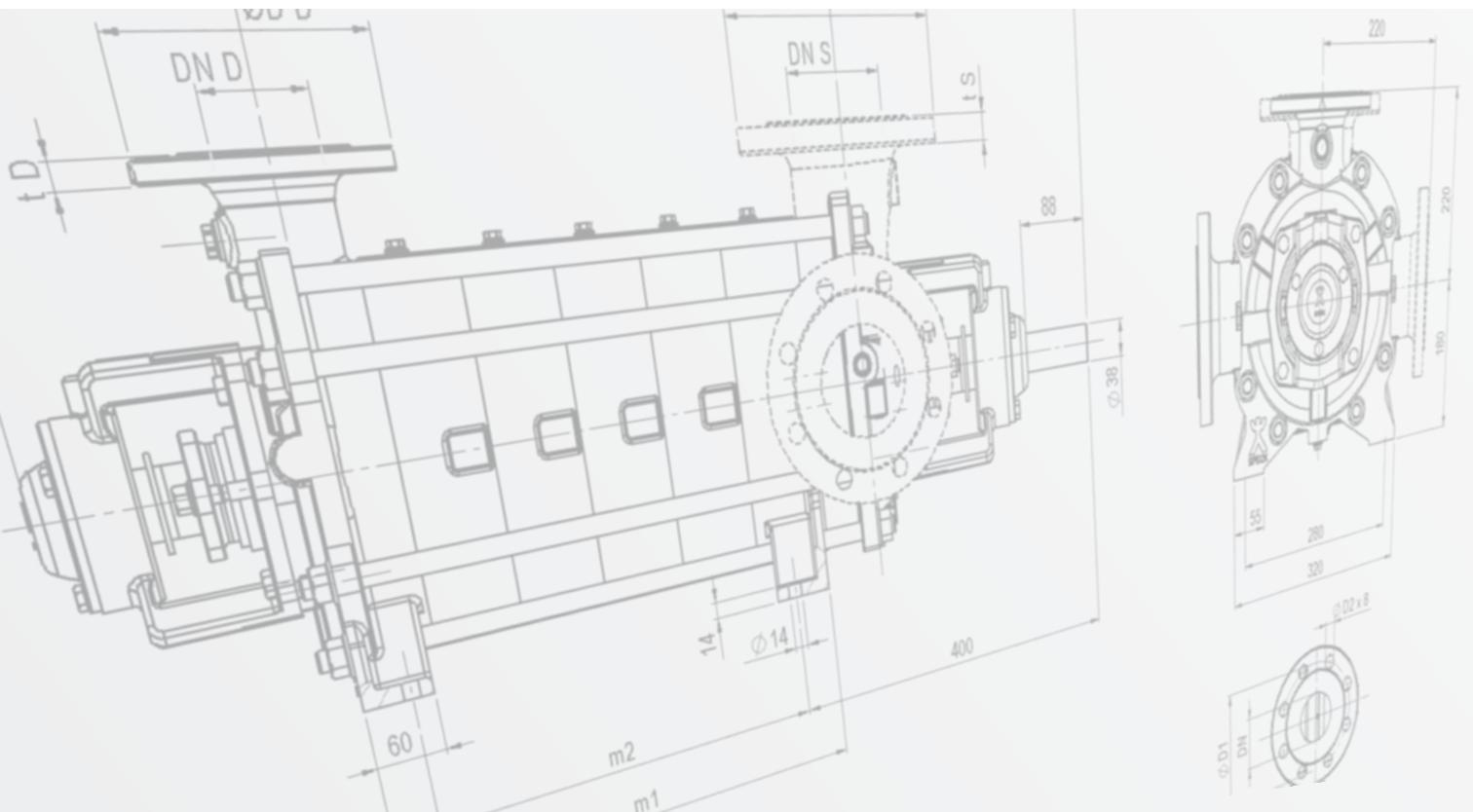
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