

Lifting Units & Tank Units

**Lifting Units
&
Tank Units**

Pumps

for Lifting Units & Tank Units

**All in this documentation described systems and components
are standard - units and standard - pumps**

**Environmental Systems is also designing and manufacturing flexible and
tailor made systems and components, according to customers requirements.**

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Bremerhaven, 12.01.2004

Part 1

Lifting Units

&

Tank Units

Advantages of the ES-Lifting Units & ES-Tank Units

for liquids and for temporary storage

- **Ready-To-Install-Units, internally wired**
- **Automatic operation**
- **Compact and robust design**
- **Units can be adapted to the local situation (flexible design)**
- **All pipe connections in position and size variable**
- **Equipped with high and low level sensor**
- **Easy dismountable pump**
- **Alarm in case of malfunction standard**
- **Operation from MCR possible**
- **Material: normal steel or stainless steel 1.4571**
- **For liquids like:**
 - **waste water**
 - **grey- and blackwater**
 - **oily water**
 - **etc.**

Characteristics of the ES-Lifting & Tank Units

General

- For liquids like
 - Waste Water
 - Grey-and Blackwater
 - Oily Water
 - Liquids with particles
 - etc.
- Material
 - Stainless Steel
 - Mild Steel
- Ready-To-Install-Units
- Compact and robust design
- Units can be adapted to local situation
(flexible design)

Tank- Unit

- All pipe connections in position and size variable
- Easy dismountable pump
- Material
 - Stainless Steel
 - Mild Steel, without inner coating
 - Mild Steel, with inner coating (type of coating will be adapted to type of fluid and customers requirements)
- Tank heating
Optional each Unit can be equipped with tank heating, alternative by:
 - steam
 - electric
 - thermal oil

Electric/ Control/ Operation

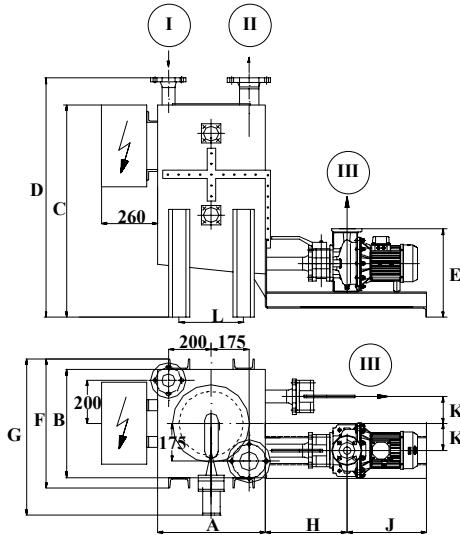
- Control Panel integrated and wired at Unit
- Equipped with automatic level control
 - high level
 - low level
- Control Panel
 - protection class IP54
 - operation by selection switch
 - manual operation
 - automatic operation
 - 1 signal lamp "green" = system in operation
 - 1 signal lamp "red" = system switched off
 - 1 signal lamp "yellow"= malfunction
 - with potential free contact for connection to ship system or MCR

Optional

- Acoustic alarm in case of malfunction
- Automatic operation from MCR
- Installation of electric control/ operation panel at separate location (not installed at unit)
- Unit with 2 pumps
(1 pump for stand by)
- Unit can be equipped with different types of pumps

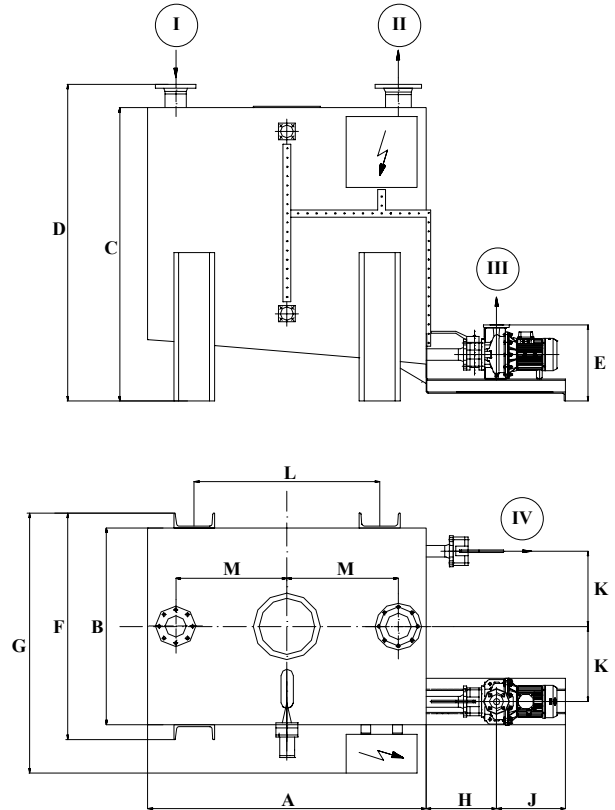
Technical Data:

Lifting Unit ES-LU-125



- I** Inlet
- II** Vent / Overflow
- III** Pump Outlet
- IV** Manual Drain

Lifting Unit ES-LU-250 up to 2500



Unit-Type	Volume	consumpti	Dimensions											Flange Connection				Weight	
			A	B	C	D	E	F	G	H	J	K	L	M	I	II	III		IV
	[liter]	[kW]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[DN]	[DN]	[DN]	[DN]	[kg]
ES-LU-125	125	1,5	500	500	985	1.110	410	600	725	380	370	125	300	/	50	80	32	50	230
ES-LU-250	250	1,5	1.000	500	983	1.108	410	600	810	380	370	125	700	350	65	80	32	50	290
ES-LU-500	500	1,5	1.000	750	1.153	1.278	410	850	1.060	380	370	250	700	350	80	100	32	50	371
ES-LU-750	750	1,5	1.000	750	1.483	1.608	410	860	1.065	380	370	250	700	350	100	125	32	50	449
ES-LU-1000	1.000	1,5	1.350	750	1.481	1.606	410	880	1.075	380	370	250	900	525	100	125	32	50	520
ES-LU-1250	1.250	1,5	1.500	830	1.481	1.606	410	970	1.160	380	370	290	1.200	600	100	125	32	50	584
ES-LU-1500	1.500	1,5	1.500	1.000	1.481	1.606	410	1.150	1.335	380	370	375	1.000	600	100	125	32	50	651
ES-LU-1750	1.750	1,5	1.500	1.060	1.581	1.706	410	1.220	1.400	380	370	405	1.000	600	100	125	32	50	716
ES-LU-2000	2.000	1,5	1.500	1.212	1.581	1.706	410	1.382	1.558	380	370	481	1.000	600	125	150	32	50	772
ES-LU-2250	2.250	1,5	1.500	1.212	1.718	1.843	410	1.392	1.562	380	370	481	1.000	600	125	150	32	50	847
ES-LU-2500	2.500	1,5	1.500	1.347	1.718	1.843	410	1.537	1.702	380	370	548,5	1.000	600	125	150	32	50	901

* **Dependent on type of Pump**

- **Drawing shows Lifting Unit with Pump ES-ED-F32-160/1,5**
- **Optional Units with 2 pumps possible**
- **Optional Units with other type of pump possible**
(in case of other pump, dimensions E, H and J will vary, see Part 2: "Pumps")

Part 2

Standard Pumps

for

Liquid Lifting Units

and

Tank Units

Different types of pumps are available.

The required type of pump depends on:

- Type of fluid
- Temperature of fluid
- Solids in the fluid
- Amount and sizes of solids
- Total required pumping head (loss of head + geodetic pumping head)
- Required emptying time of the tank

Types of standard pumps

1. Type of Pump: ES- ED (Torque- Flow- Pump)

For fluids such as:

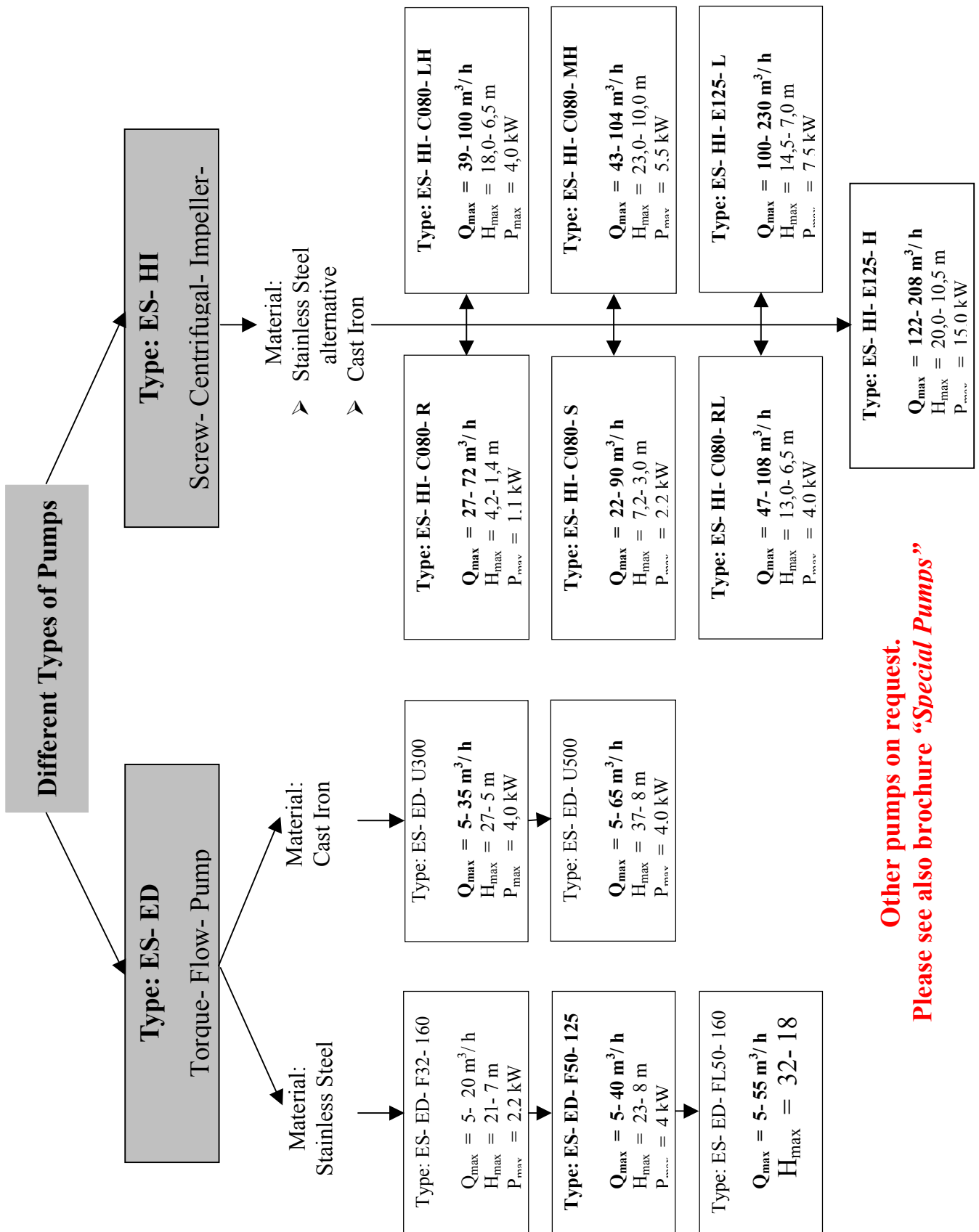
- Sewage with low amount of solids (about 10%)
- Macerated food waste/ water mixture
- Sewage with solids > 3 mm average
- Suspensions
- Cooling emulsions
- Lubricants
- Oils

2. Type of Pump: ES- HI (Screw- Centrifugal- Impeller- Pump)

For fluids such as:

- Sewage with high amount of solids (about 25%)
- Sewage with solids > 30 mm
- Macerated food waste/ water mixture
- Suspensions
- Cooling emulsions
- Sludge oil
- High viscosity fluids

Other pumps on request. Please see also brochure “Special Pumps”



**Other pumps on request.
Please see also brochure "Special Pumps"**

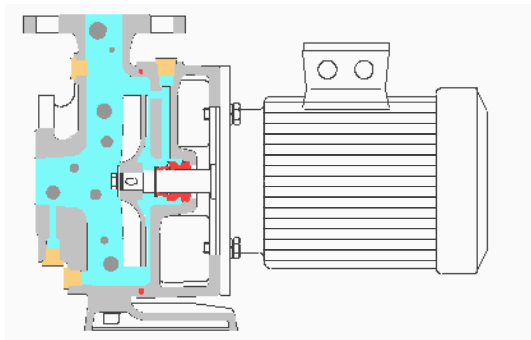
1. Type of Pump: ES- ED (Torque- Flow- Pump)



- For liquids with homogeneous solid content of max. 15%.
- special design of pump impeller being outside the main stream with the result of:
 - ◆ Low tear and wear of pump
 - ◆ Liquids will be treated with care
- Handling of abrasive and fibrous solids.
- Cavitation problems do not influence operation of pump.

Range of application:

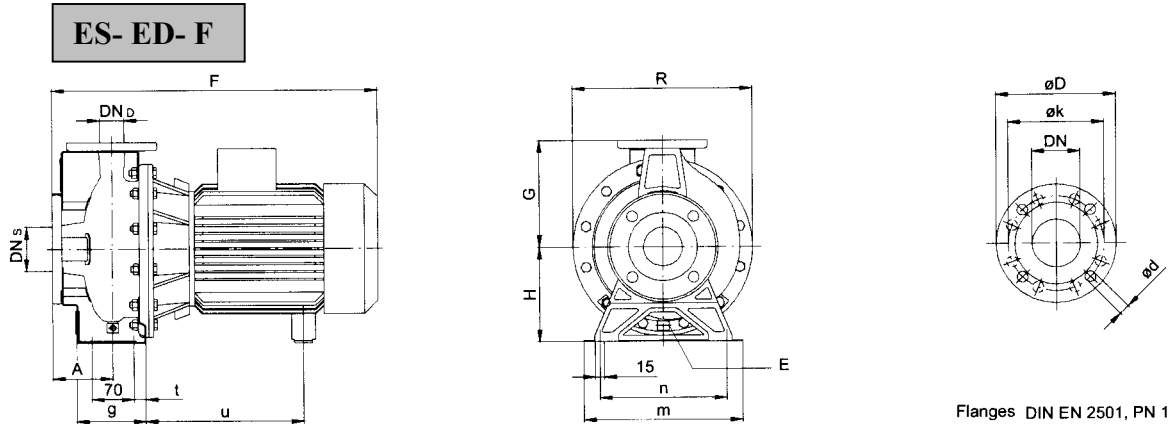
- Sewage Treatment Plants
- Sewage Collecting Plants
- Lifting Plants
- Cooling Lubricant Units
- Cooling Units
- Filter Units
- Tank Units



Application:

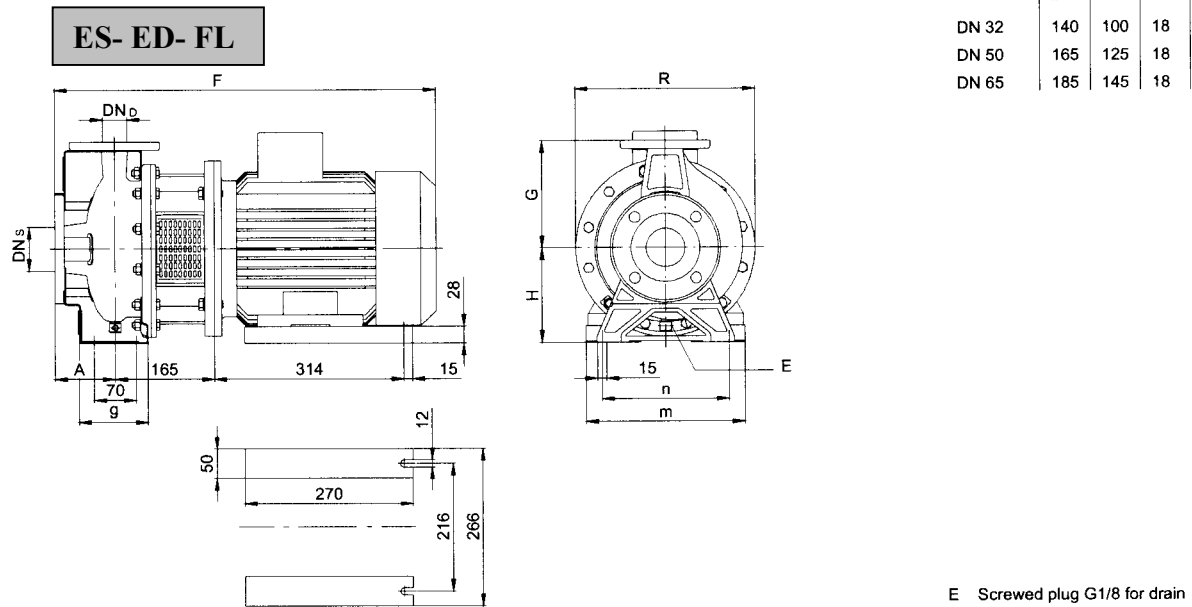
- Sewage
- Sewage with fibrous solids
- Liquids with granulates, sand or gravel
- Cooling emulsions
- Lubricants
- Oils
- Suspensions
- Milk of lime
- Grinded/pulped food waste - water - mixture

1.1 Type of Pump: ES- ED- F/ FL ➔ Material: Stainless Steel



Flanges DIN EN 2501, PN 10

	øD	øk	ød	number of holes
DN 32	140	100	18	4
DN 50	165	125	18	4
DN 65	185	145	18	4



E Screwed plug G1/8 for drain

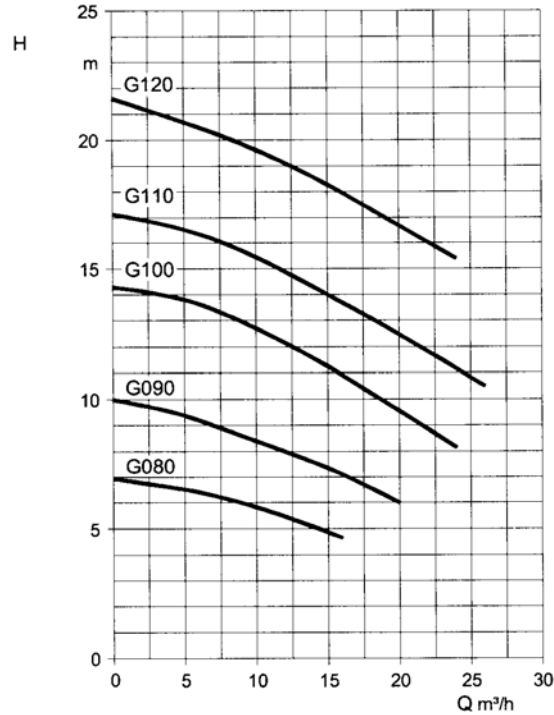
1.1.1 Dimensions for Types of Pumps: ES- ED- F/ FL

Model of Pump	Electric Power	Flanges		Dimensions									Weight	
		DN _{in}	DN _{out}	A	F	G	H	R	g	m	n	t		u
	[kW]	[-]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
ES- ED- F 32- 160	1,5	50	32	80	408	160	132	254	118	240	190	19	-	25
ES- ED- F 32- 160	2,2	50	32	80	408	160	132	254	118	240	190	19	-	26
ES- ED- F 50- 125	3,0	65	50	100	453	160	132	254	114	240	190	19	202	36
ES- ED- F 50- 125	4,0	65	50	100	478	160	132	254	114	240	190	19	202	40
ES- ED- FL 50- 160	5,5	65	50	100	640	180	160	300	115	265	212	20	-	72
ES- ED- FL 50- 160	7,5	65	50	100	640	180	160	300	115	265	212	20	-	75
ES- ED- FL 50- 160	9,2	65	50	100	640	180	160	300	115	265	212	20	-	87

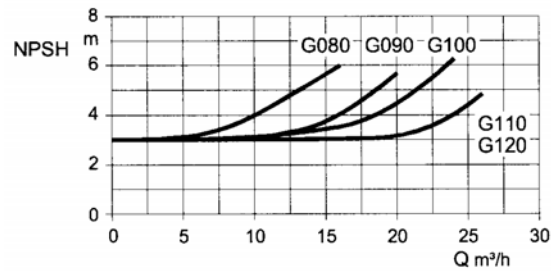
1.1.2 Diagrams for Type of Pump: ES- ED- F32- 160

for pumped media with a density of $\rho = 1 \text{ kg/dm}^3$ viscosity $\nu = 1 \text{ mm}^2/\text{s}$ temperature $t = 20^\circ\text{C}$

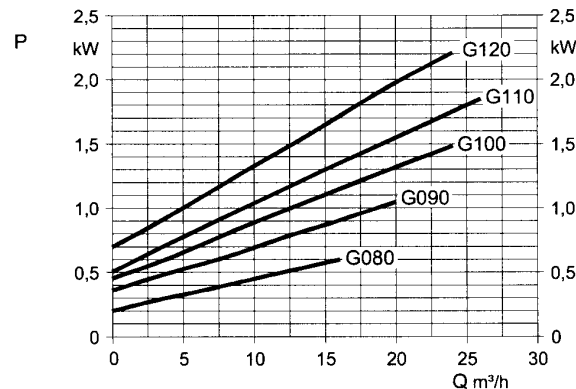
1.1.2.1 Q/ H- Diagram for Type of Pump: ES- ED- F32- 160



1.1.2.2 NPSH/ Q- Diagram for Type of Pump: ES- ED- F32- 160



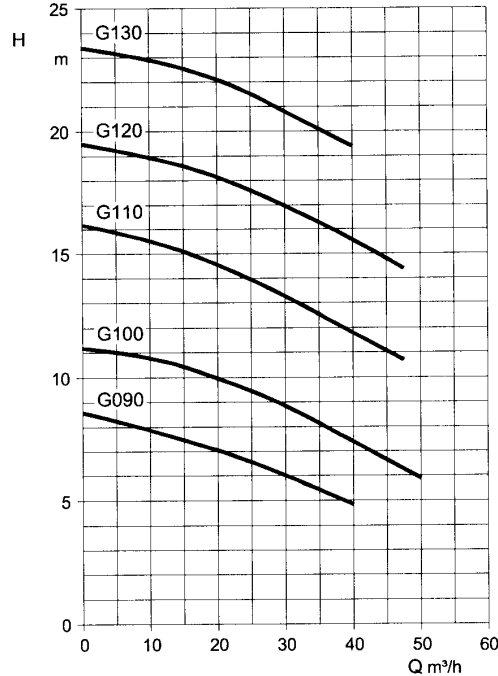
1.1.2.3 P/ Q- Diagram for Type of Pump: ES- ED- F32- 160



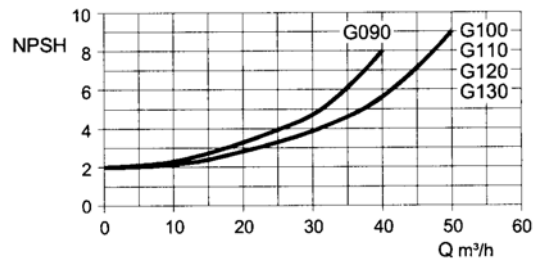
1.1.3 Diagrams for Type of Pump: ES- ED- F50- 125

for pumped media with a density of $\rho = 1 \text{ kg/dm}^3$ viscosity $\nu = 1 \text{ mm}^2/\text{s}$ temperature $t = 20^\circ\text{C}$

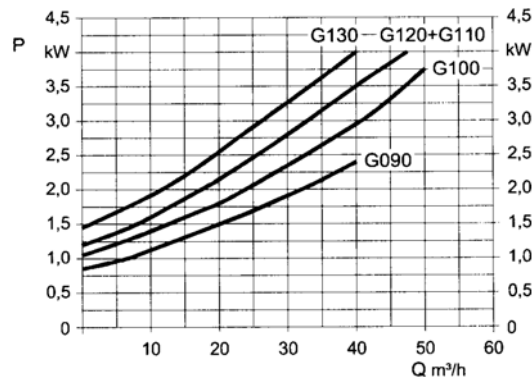
1.1.3.1 Q/ H- Diagram for Type of Pump: ES- ED- F50- 125



1.1.3.2 NPSH/ Q- Diagram for Type of Pump: ES- ED- F50- 125



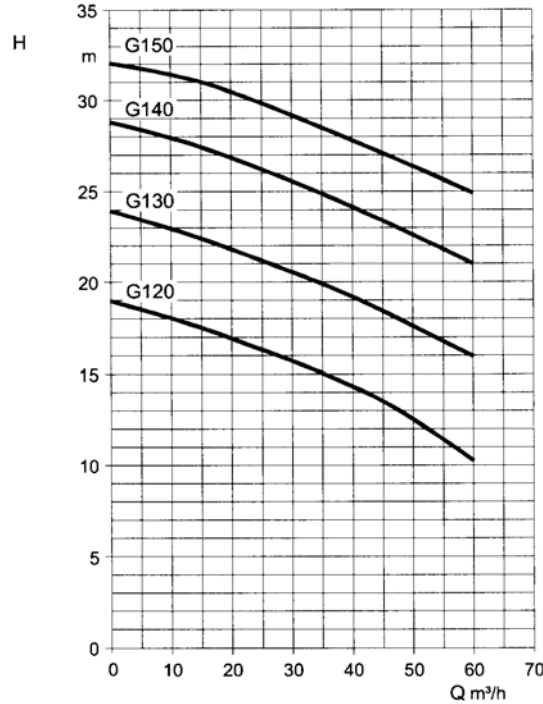
1.1.3.3 P/ Q- Diagram for Type of Pump: ES- ED- F50- 125



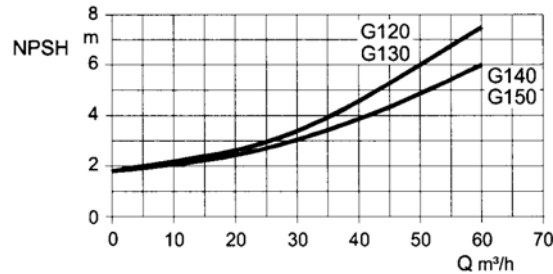
1.1.4 Diagrams for Type of Pump: ES- ED- FL50- 160

for pumped media with a density of $\rho = 1 \text{ kg/dm}^3$ viscosity $\nu = 1 \text{ mm}^2/\text{s}$ temperature $t = 20^\circ\text{C}$

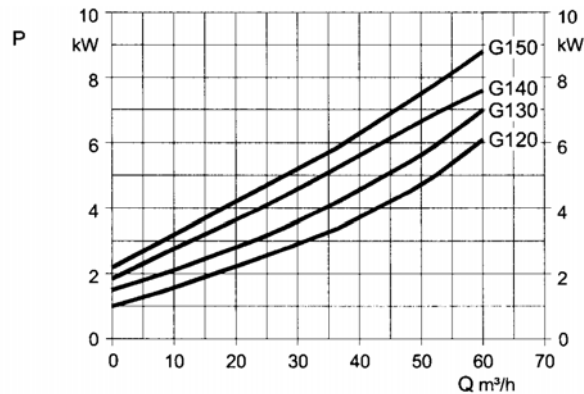
1.1.4.1 Q/ H- Diagram for Type of Pump: ES- ED- FL50- 160



1.1.4.2 NPSH/ Q- Diagram for Type of Pump: ES- ED- FL50- 160

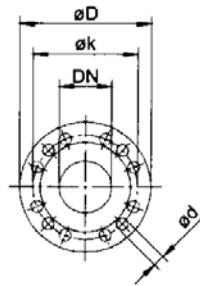
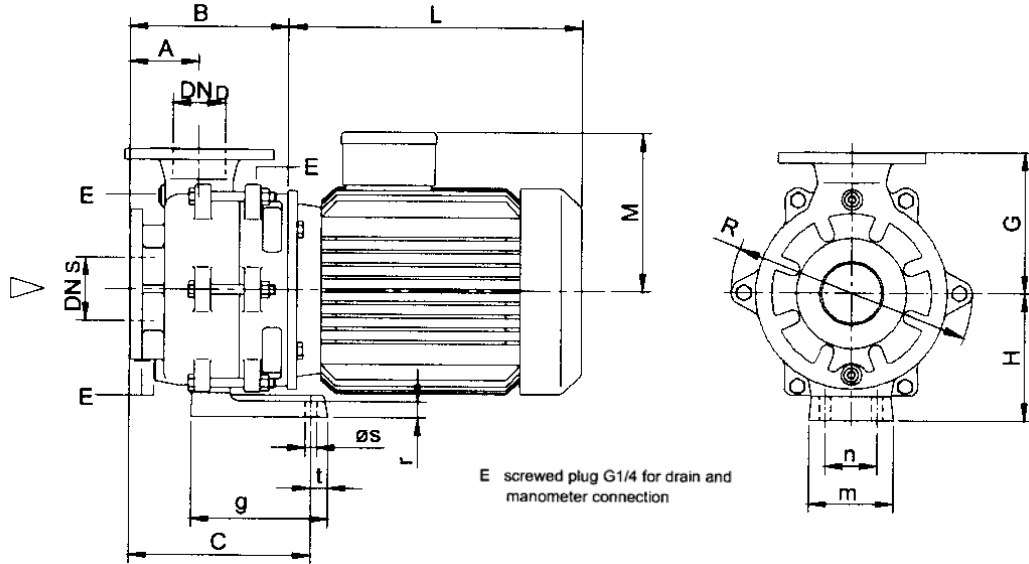


1.1.4.3 P/ Q- Diagram for Type of Pump: ES- ED- FL50- 160



1.2 Type of Pump: ES- ED- U ➔ Material: Cast Iron

1.2.1 Type of Pump: ES- ED- U300



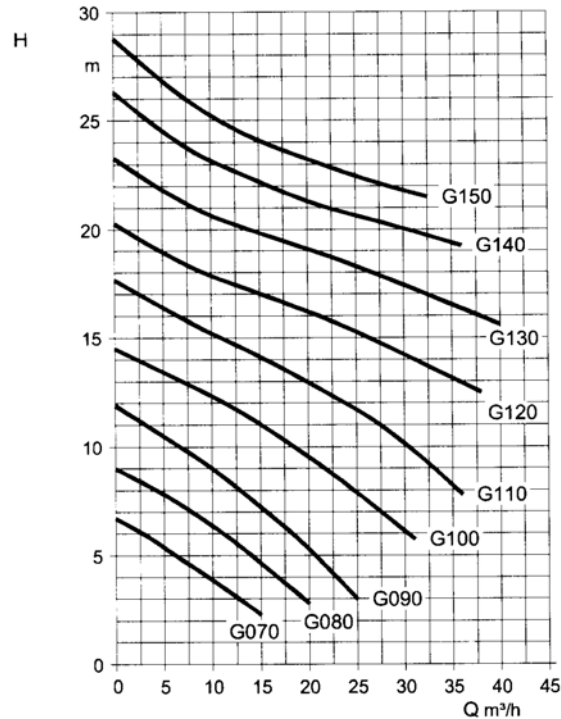
Flanges DIN EN 1092-2, PN 16		number of	
DN _D	DN _S	ød	holes
DN _D 32	140	100	19
DN _S 40	150	110	19
DN _D 50	165	125	19
DN _S 65	185	145	19
DN _D 65	185	145	19
DN _S 80	200	160	19
DN _D 100	220	180	19
DN _S 125	250	210	19

1.2.1.1 Dimensions for Type of Pump: ES- ED- U300

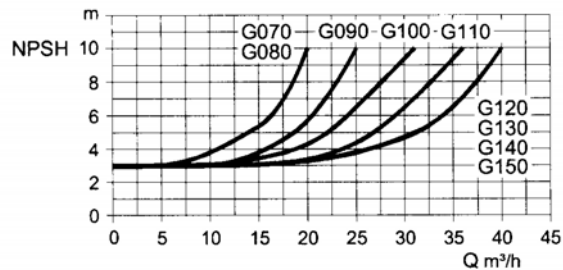
Model of Pump	Electric power	Flanges		Dimensions														Weight
		DN _{in}	DN _{out}	A	B	C	G	H	L	M	R	g	m	n	r	t	s	
	[kW]	[-]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
ES- ED- U300	0,75	40	32	60	161	153	145	130	234	120	253	133	106	65	15	23	14	26
ES- ED- U300	1,1	40	32	60	161	153	145	130	234	120	253	133	106	65	15	23	14	28
ES- ED- U300	1,5	40	32	60	161	153	145	130	282	128	253	133	106	65	15	23	14	31
ES- ED- U300	2,2	40	32	60	161	153	145	130	261	150	253	133	106	65	15	23	14	34
ES- ED- U300	3,0	40	32	60	161	187	145	136	309	130	253	170	106	65	20	21	14	41
ES- ED- U300	4,0	40	32	60	226	187	145	136	334	175	253	170	106	65	20	21	14	53

1.2.1.2 Q/ H- Diagram for Type of Pump: ES- ED- U300

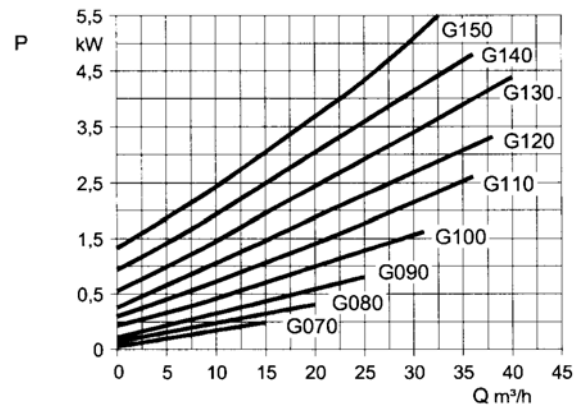
for pumped media with a density of $\rho = 1 \text{ kg/dm}^3$ viscosity $\nu = 1 \text{ mm}^2/\text{s}$ temperature $t = 20^\circ\text{C}$



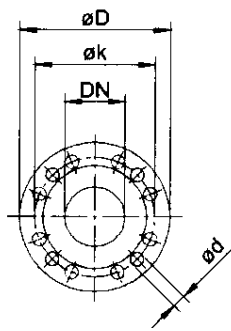
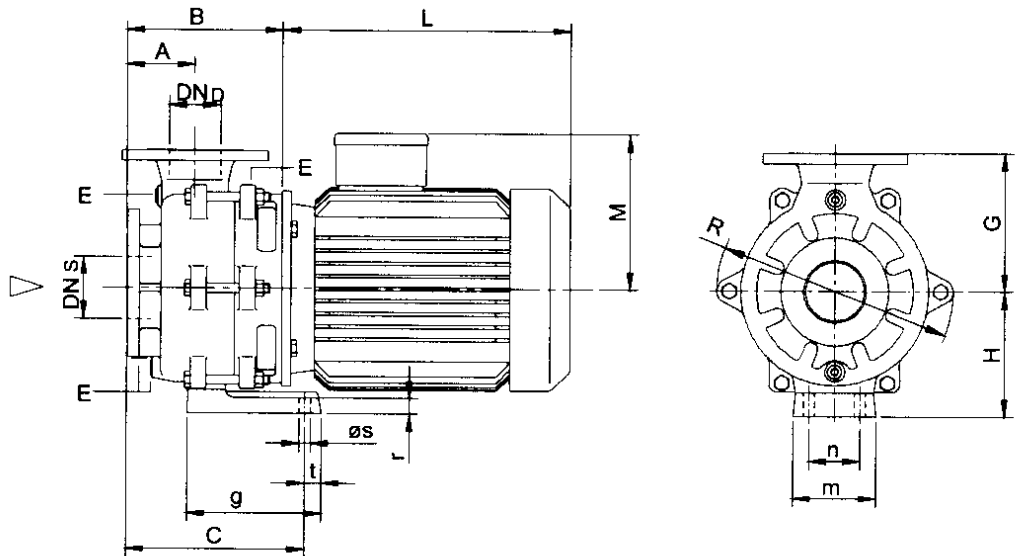
1.2.1.3 NPSH/ Q- Diagram for Type of Pump: ES- ED- U300



1.2.1.4 P/ Q- Diagram for Type of Pump: ES- ED- U300



1.2.2 Type of Pump: ES- ED- U500



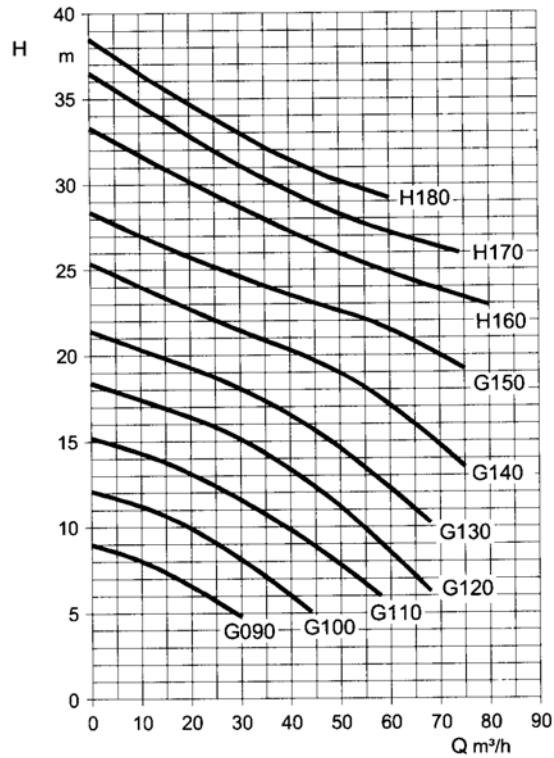
Flanges DIN EN 1092-2, PN 16	number of					
	øD	øk	ød	holes	slots	
DN _p 32	140	100	19	4		
DN _s 40	150	110	19		4	
DN _p 50	165	125	19	4		
DN _s 65	185	145	19		4	
DN _p 65	185	145	19	4		
DN _s 80	200	160	19		8	
DN _p 100	220	180	19	8		
DN _s 125	250	210	19		8	

1.2.2.1 Dimensions for Type of Pump: ES- ED- U500

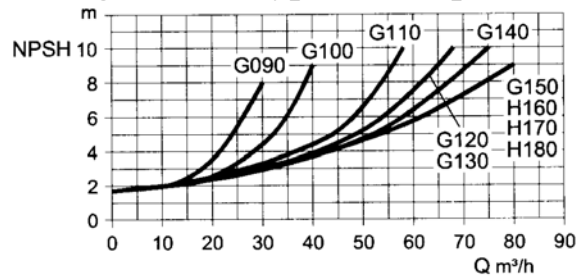
Model of Pump	Electric power	Flanges		Dimensions														Weight
		DN _{in}	DN _{out}	A	B	C	G	H	L	M	R	g	m	n	r	t	s	
	[kW]	[-]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
ES- ED- U500	1,5	65	50	70	265	203	162	156	242	124	277	170	106	65	20	21	14	48
ES- ED- U500	2,2	65	50	70	265	203	162	156	262	124	277	170	106	65	20	21	14	51
ES- ED- U500	3,0	65	50	70	185	203	162	156	312	161	277	170	106	65	20	21	14	58
ES- ED- U500	4,0	65	50	70	185	203	162	156	334	175	277	170	106	65	20	21	14	65

1.2.2.2 Q/ H- Diagram for Type of Pump: ES- ED- U500

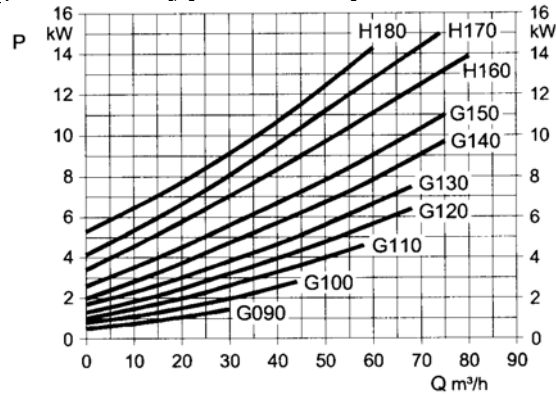
for pumped media with a density of $\rho = 1 \text{ kg/dm}^3$ viscosity $\nu = 1 \text{ mm}^2/\text{s}$ temperature $t = 20^\circ\text{C}$



1.2.2.3 NPSH/ Q- Diagram for Type of Pump: ES- ED- U500



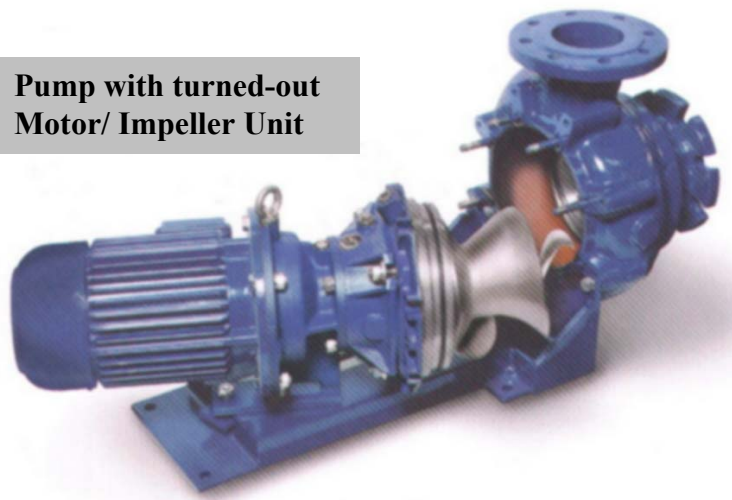
1.2.2.4 P/ Q- Diagram for Type of Pump: ES- ED- U500



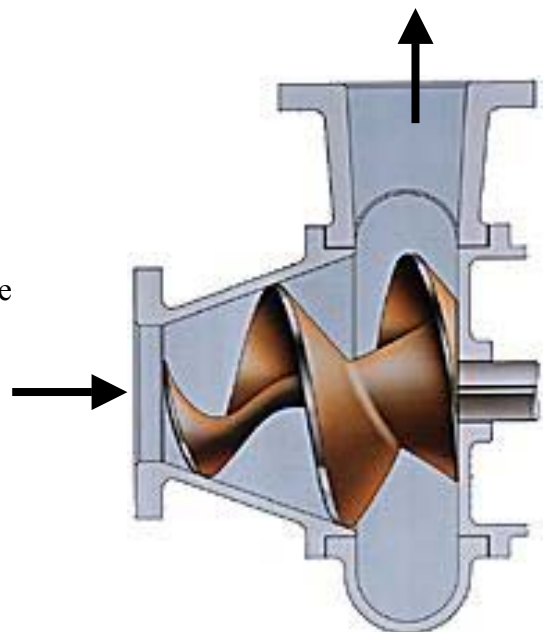
2. Type of Pump: ES- HI (Screw- Centrifugal- Impeller- Pump)

- Pump design for easy service/ maintenance because of turnable designed Motor/ Impeller Unit
- Long lifetime > 50.000 operation hours
- Clogging free pumping
- Ball free passage: Ø60 mm- Ø100 mm (depends on type of pump)

**Pump with turned-out
Motor/ Impeller Unit**



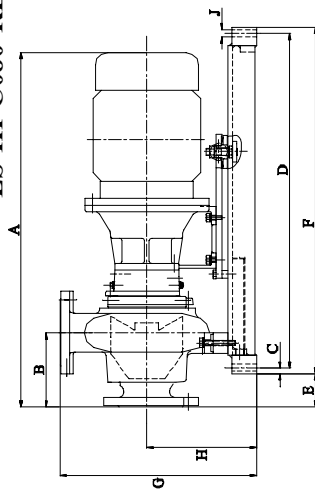
- For fluids, such as:
 - Fluids with high amount of solids/ granulates
 - High abrasion fluids
 - Gaseous fluids
 - High viscosity fluids, up to 4000 mPas
 - Fluids with fibrous solids
 - Sewage macerated food waste/ water mixture
 - Sludge oil
 - Emulsions
- Low NPSH- less danger of cavitation
- Material:
 - Stainless steel, 1.4571
alternative
 - Cast Iron



**Principle of clogging
free Impeller**

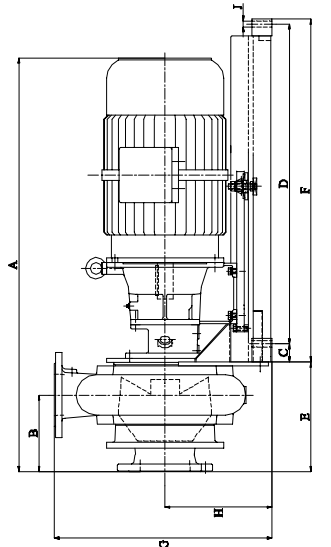
For Type of Pumps

- ES-HI-C080-R
- ES-HI-C080-S
- ES-HI-C080-RL
- ES-HI-C080LH
- ES-HI-C080-MH



For Type of Pumps

- ES-HI-E125-L
- ES-HI-E125-H



Type of Pump	Ball free Passage [mm]	Electric Power [kW]	Flanges		Dimensions													Weight		
			Inlet [DN]	Outlet [DN]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	J [mm]	K [mm]	L [mm]	M [mm]	N [mm]	O [mm]	P [mm]	[kg]
ES-HI-C080-R	75	1,1	100	80	771	180	20	760	25	800	420	200	15	20	180	-	220	152	304	92
ES-HI-C080-S	75	2,2	100	80	772	180	20	760	25	800	420	200	15	20	180	-	220	152	304	103
ES-HI-C080-RL	75	4,0	100	80	772	180	20	760	25	800	420	200	15	20	180	-	220	152	304	124
ES-HI-C080-LH	60	4,0	100	80	772	180	20	760	25	800	420	200	15	20	180	-	220	152	304	124
ES-HI-C080-MH	60	5,5	100	80	941	180	15	810	80	840	475	265	18	22,5	180	-	225	152	304	151
ES-HI-E125-L	100	7,5	150	125	1047	230	54	726	328	795	650	320	16	15	220	325	355	214	466	272
ES-HI-E125-H	100	15,0	150	125	1170	230	54	956	329	1025	650	320	18	15	220	335	365	214	466	325

Q/ H- Diagram for Type of Pump: ES- HI

for pumped media with a density of $\rho = 1 \text{ kg/dm}^3$ viscosity $\nu = 1 \text{ mm}^2/\text{s}$ temperature $t = 20^\circ\text{C}$

