Etaline/Etaline-R

In-line pumps

50 Hz

Applications

- Heating systems
- Air-conditioning systems
- Cooling circuits
- Service water systems
- Water supply
- Industrial recirculation systems

Fluid handled

Fluids not chemically or mechanically aggressive to the pump materials (see list of fluids handled on pages 8 and 9).

Operating data

Q up to 1900 m^3/h, 528 l/s
H up to 97 m
t –30˚C up to +140˚C
p_d up to 25 bar [1])

[1]) For pressure / temperature limits see page 8 / 9

Designation

Etaline / -R G N 65 - 160 / 40 2

- Type series designation
- Material combination
- N = stub shaft, stand. motor
- Size
  - Nominal dia. (suct./disch. nozzle)
  - Approx. impeller diameter
- Motor rating x 10 (example 4.0 kW)
- Number of poles

Design

Etaline:
Close-coupled in-line pump with standardised motor; pump shaft and motor shaft are rigidly connected.
2 Etaline connected by 2 Y-pipes form a dual-pump station.
Etaline-R:
Close-coupled, vertical in-line pump with standardised motor; pump shaft and motor shaft are rigidly connected.
Etaline-R uncooled KSB mechanical seal.

Shaft seal

Uncooled mechanical seal, e. g. silicon carbide/silicon carbide, special elastomers or EP rubber.
Other variants as indicated in the list of fluids handled.

Materials

See page 6 / 7

Drive

Surface-cooled KSB IEC three-phase squirrel cage motor / Etaline-R with KSB/Siemens motor

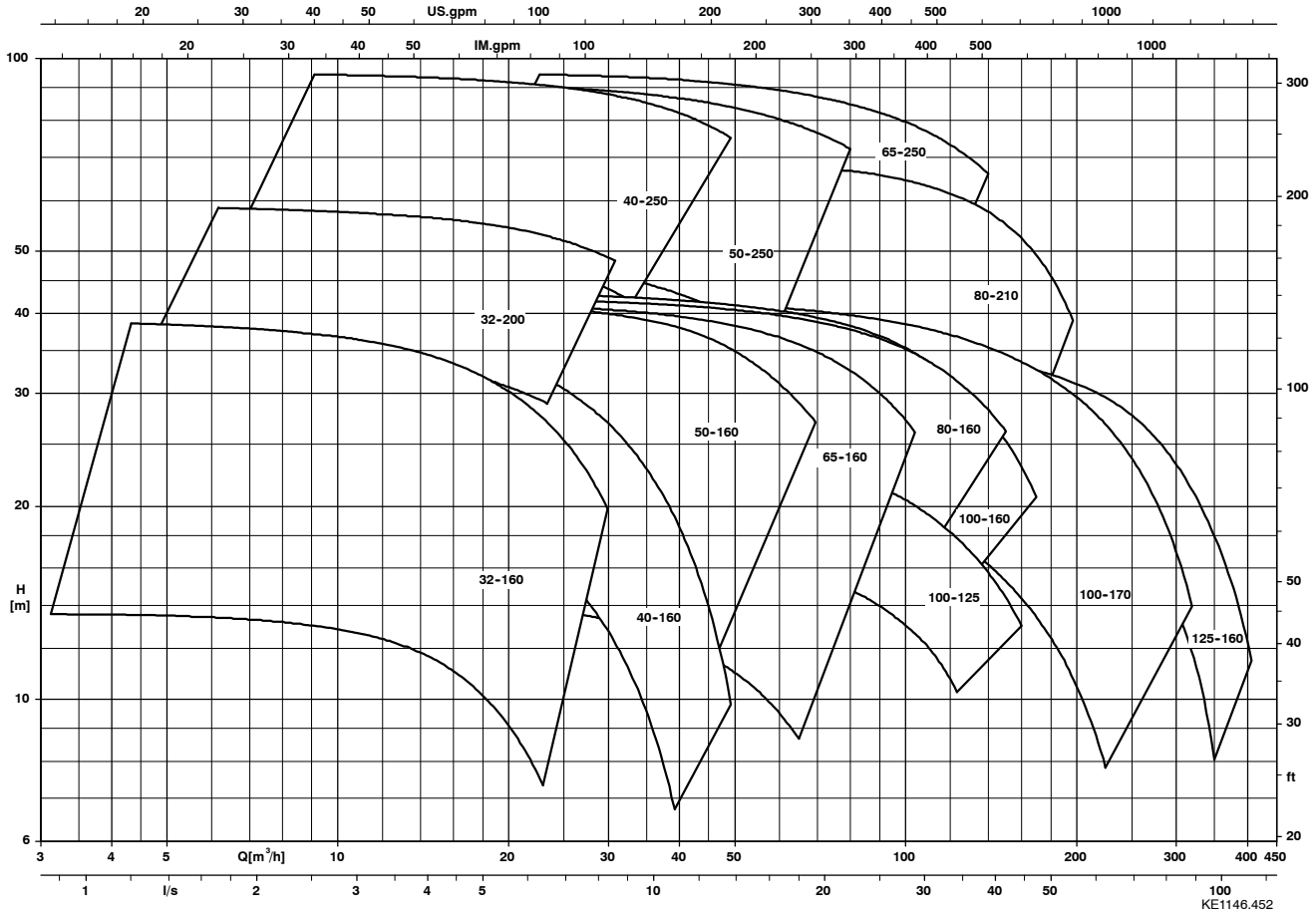
Winding:	up to 2.2 kW 220-240 V/380-420 V
	from 3 kW 380-420 V/660-725 V
Design up to 4 kW:	IM V1
	from 5.5 kW IM V 15
Type of enclosure:	IP 55
Thermal class:	F with temperature sensor:
	3 PTC thermistors
Mode of operation:	continuous operation S1

With motor-mounted variable speed system, see Etaline PumpDrive type series booklet 1149.52-10.

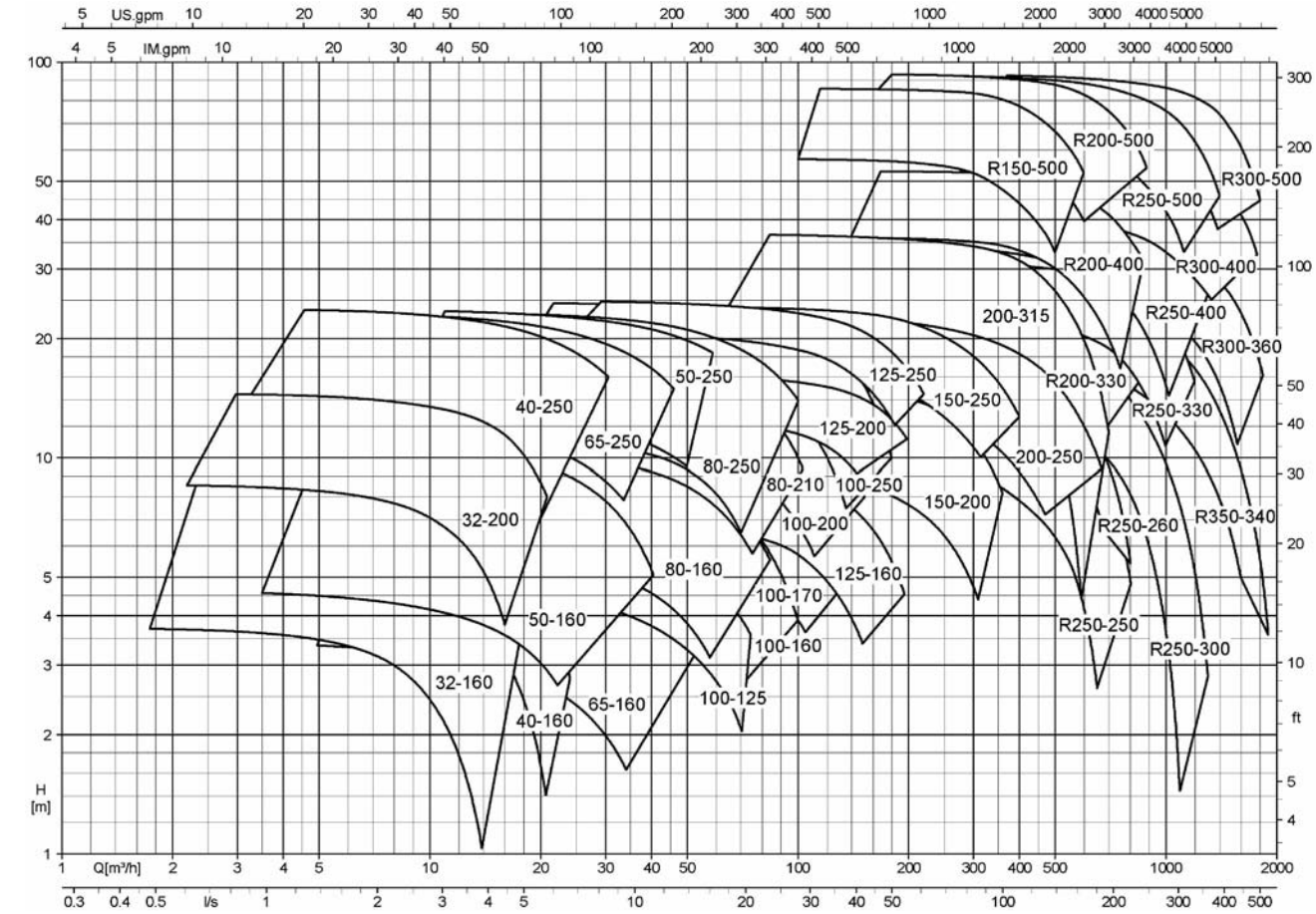
Bearings

Grease-lubricated deep-groove ball bearings.

Etaline, n = 2900 1/min



Etaline/Etaline-R, n = 1450 1/min



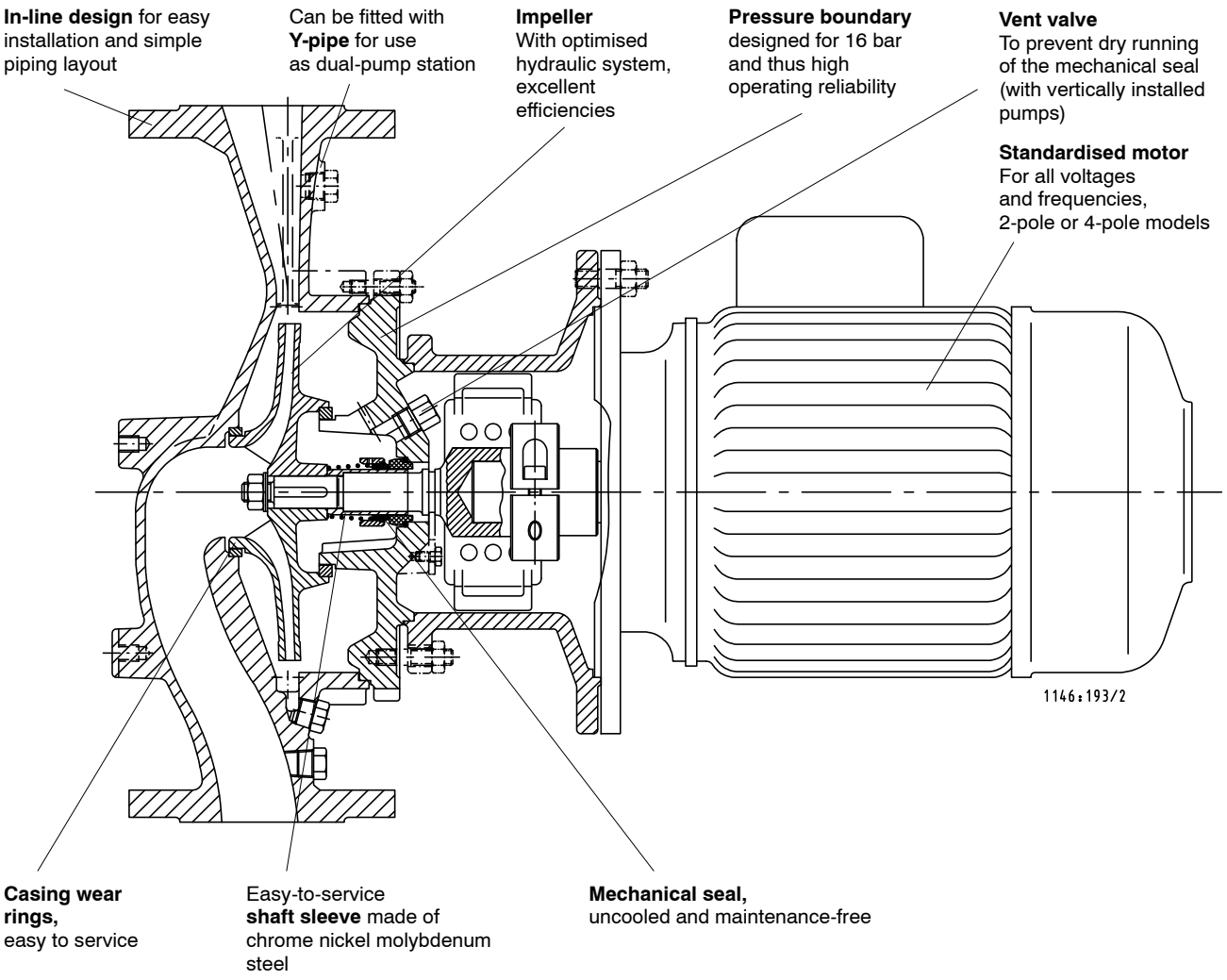
Etaline n = 2900 1/min

Etaline	Motor	kW	400V ≈A	Single pump ≈kg	Dual-pump stations [1] ≈kg
32-160/112	80	1,10	2,15	37	–
32-160/152	90S	1,50	2,95	40	–
32-160/222	90L	2,20	4,25	43	–
32-160/302	100L	3,00	5,70	50	–
32-160/402	112M	4,00	7,40	61	–
32-160/552	132S	5,50	9,90	72	–
32-160/752	132S	7,50	13,00	85	–
32-200/302	100L	3,00	5,70	58	–
32-200/402	112M	4,00	7,40	69	–
32-200/552	132S	5,50	9,90	79	–
32-200/752	132S	7,50	13,00	92	–
32-200/1102	160M	11,00	19,40	115	–
32-200/1502	160M	15,00	26,30	124	–
40-160/222	90L	2,20	4,25	44	–
40-160/302	100L	3,00	5,70	51	–
40-160/402	112M	4,00	7,40	62	–
40-160/552	132S	5,50	9,90	73	–
40-160/752	132S	7,50	13,00	86	–
40-160/1102	160M	11,00	19,40	108	–
40-250/402	112M	4,00	7,40	78	–
40-250/552	132S	5,50	9,90	88	–
40-250/752	132S	7,50	13,00	101	–
40-250/1102	160M	11,00	19,40	124	–
40-250/1502	160M	15,00	26,30	133	–
40-250/1852	160L	18,50	31,50	153	–
40-250/2202	180M	22,00	38,00	181	–
50-160/152	90S	1,50	2,95	43	–
50-160/222	90L	2,20	4,25	47	–
50-160/302	100L	3,00	5,70	54	–
50-160/402	112M	4,00	7,40	65	–
50-160/552	132S	5,50	9,90	75	–
50-160/752	132S	7,50	13,00	88	–
50-160/1102	160M	11,00	19,40	111	–
50-160/1502	160M	15,00	26,30	120	–
50-250/752	132S	7,50	13,00	105	–
50-250/1102	160M	11,00	19,40	127	–
50-250/1502	160M	15,00	26,30	136	–
50-250/1852	160L	18,50	31,50	156	–
50-250/2202	180M	22,00	38,00	185	–
50-250/3002	200L	30,00	52,00	245	–
65-160/222	90L	2,20	4,25	49	–
65-160/302	100L	3,00	5,70	56	–
65-160/402	112M	4,00	7,40	67	–
65-160/552	132S	5,50	9,90	78	–
65-160/752	132S	7,50	13,00	91	–
65-160/1102	160M	11,00	19,40	113	–
65-160/1502	160M	15,00	26,30	122	–
65-160/1852	160L	18,50	31,50	142	–
65-160/2202	180M	22,00	38,00	171	–
65-250/752	132S	7,50	13,00	109	–
65-250/1102	160M	11,00	19,40	132	–
65-250/1502	160M	15,00	26,30	141	–
65-250/1852	160L	18,50	31,50	161	–
65-250/2202	180M	22,00	38,00	189	–
65-250/3002	200L	30,00	52,00	249	–
65-250/3702	200L	37,00	64,00	278	–

Etaline	Motor	kW	400V ≈A	Single pump ≈kg	Dual-pump stations [1] ≈kg
80-160/552	132S	5,50	9,90	84	–
80-160/752	132S	7,50	13,00	97	–
80-160/1102	160M	11,00	19,40	119	–
80-160/1502	160M	15,00	26,30	128	–
80-160/1852	160L	18,50	31,50	148	–
80-160/2202	180M	22,00	38,00	177	–
80-160/3002	200L	30,00	52,00	237	–
80-210/1102	160M	11,00	19,40	131	–
80-210/1502	160M	15,00	26,30	140	–
80-210/1852	160L	18,50	31,50	160	–
80-210/2202	180M	22,00	38,00	188	–
80-210/3002	200L	30,00	52,00	249	–
100-125/552	132S	5,50	9,90	92	–
100-125/752	132S	7,50	13,00	105	–
100-125/1102	160M	11,00	19,40	127	–
100-125/1502	160M	15,00	26,30	136	–
100-160/752	132S	7,50	13,00	102	–
100-160/1102	160M	11,00	19,40	125	–
100-160/1502	160M	15,00	26,30	134	–
100-160/1852	160L	18,50	31,50	154	–
100-160/2202	180M	22,00	38,00	182	–
100-160/3002	200L	30,00	52,00	243	–
100-170/1102	160M	11,00	19,40	136	–
100-170/1502	160M	15,00	26,30	145	–
100-170/1852	160L	18,50	31,50	165	–
100-170/2202	180M	22,00	38,00	194	–
100-170/3002	200L	30,00	52,00	254	–
125-160/1852	160L	18,50	31,50	230	–
125-160/2202	180M	22,00	38,00	259	–
125-160/3002	200L	30,00	52,00	320	–

[1]) Includes: 2 Etaline pumps, 1 suction-side Y-pipe without changeover flap, 1 discharge-side Y-pipe with changeover flap, screws, bolts and seal elements. Pumps and Y-pipes are supplied in separate packages.
For the two Y-pipes, friction losses equivalent to those of approx. 9 m of straight pipe have to be taken into account.

Etaline GN with bolted discharge cover



Materials

Component	Etaline GN	Etaline MN
Volute casing	Grey cast iron JL 1040	Grey cast iron JL 1040
Discharge cover	Grey cast iron JL 1040	Grey cast iron JL 1040
Impeller	Grey cast iron JL 1040	Bronze
Casing wear rings	Grey cast iron JL 1040	Bronze
Shaft	Tempered steel C 45	Tempered steel C 45
Shaft sleeve	Chrome nickel molybdenum steel 1.4571	Chrome nickel molybdenum steel 1.4571
Drive lantern	Grey cast iron JL 1040	Grey cast iron JL 1040
Y-pipes	Grey cast iron JL 1040	-

Etaline list of fluids handled

Fluid handled	Application limits	Materials Casing/impeller: Grey cast iron/ Grey cast iron	Materials Casing/impeller: Grey cast iron/ Tin bronze	Shaft seal Mechanical seal: U3BEGG	Shaft seal Mechanical seal: U3U3X4GG	Shaft seal Mechanical seal: Q1Q1X4GG	Shaft seal Mechanical seal: BQ1EGG	Variant code	Comments
		GN	MN	6	9	10	11		
Water [1]									
Service water	t ≤ 110°C, p ≤ 10 bar	□				□		**GN 10**	
Heating water [4]	t ≤ 120°C, p ≤ 10 bar	■					■	**GN 11**	If used as circulator pump to DIN 4752; $p_{max.}$ ≤10 bar
Heating water [4]	t ≤ 140°C, p ≤ 16 bar	■		■				**GN 6**	
Heating water [4]	t ≤ 110°C, p ≤ 10 bar	□				□		**GN 10**	
Condensate[3]	t ≤ 120°C, p ≤ 10 bar	■					■	**GN 11**	Provide open-loop circuit MN 11 (processing via product-number)
Cooling water (without antifreeze agent)	t ≤ 60°C, p ≤ 10 bar	□				□		**GN 10**	Provide open-loop circuit MN 10
Cooling water pH value ≥7,5 (with antifreeze agent) [2]	t ≥ -30°C, p ≤ 10 bar t ≤ 110°C	■					■	**GN 11**	
Slightly contaminated water	t ≤ 60°C, p ≤ 10 bar	□				□		**GN 10**	
Pure water [3]	t ≤ 60°C, p ≤ 10 bar	■					■	**GN 11**	
Raw water	t ≤ 60°C, p ≤ 10 bar	□				□		**GN 10**	
Swimming pool water, fresh water	t ≤ 60°C, p ≤ 10 bar	□				□		**GN 10**	In case of requirements as per DIN 19 643 provide MN 10 (processing via product-number)
Drinking water	t ≤ 60°C, p ≤ 10 bar		□				□	**MN 11**	
Partly desalinated water	t ≤ 120°C, p ≤ 10 bar	■					■	**GN 11**	
Refrigerants, cooling brines									
Cooling brine, inorganic, pH ≥7,5, inhibited	t ≥ -30°C, p ≤ 10 bar t ≤ 25 °C	■					■	**GN 11**	
Water with antifreeze agent pH ≥7,5 [1] [2]	t ≥ -30°C, p ≤ 10 bar t ≤ 110°C	■					■	**GN 11**	
Oils/emulsions									
Drilling/grinding emulsion	t ≤ 60°C, p ≤ 10 bar	□			□			**GN 9**	
Oil/water emulsion	t ≤ 60°C, p ≤ 10 bar	□			□			**GN 9**	
Cleaning agents									
Degreasing/cleaning solutions pH 7 to 14	t ≤ 90°C, p ≤ 10 bar	□				□		**GN 10**	
Lye for bottle rinsers	t ≤ 90°C, p ≤ 10 bar	□				□		**GN 10**	

■ = Standard □ = Prices and delivery times on request

Selection example:
Given:
Clean water 20°C; Q = 60 m^3/h, H = 28 m
Found: Etaline GN 65-160/752 GN 11

Pump size as per selection chart

Variant code

G = Pump casing and impeller made of EN-GJL-250 [5]
N = Standardised motor and stub shaft
11 = Mechanical seal materials BQ1EGG (to EN 12 756)

[1] General evaluation criteria for results of water analysis; pH value ≥ 7; chlorides content (Cl') ≤ 250 mg/kg,
Chlorine (Cl_2) ≤ 0,6 mg/kg.

[2] Antifreeze agent on ethylene glycol basis with inhibitors.
Content >20 to 50% (e.g. Antifrogen N)

[3] No ultrapure water: conductivity at 25°C: ≤ 800 µS/cm, chemically neutral to corrosion

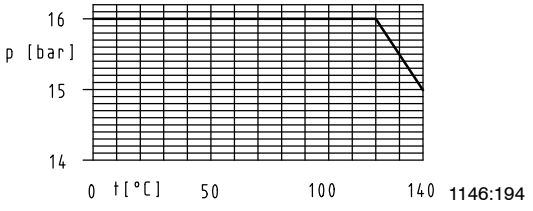
[4] For heating water, we recommend application of the VDI 2035 or Vd TÜV 1466 standards, otherwise a shorter service life of the mechanical seal may be the consequence.

Mechanical seal material codes:
U3 = Tungsten carbide (hard metal) B = Carbon, resin-impregnated
Q1 = Silicon carbide G = CrNiMo steel
X4 = Special elastomer E = EP rubber

[5] to EN 1561 (previously GG-25)

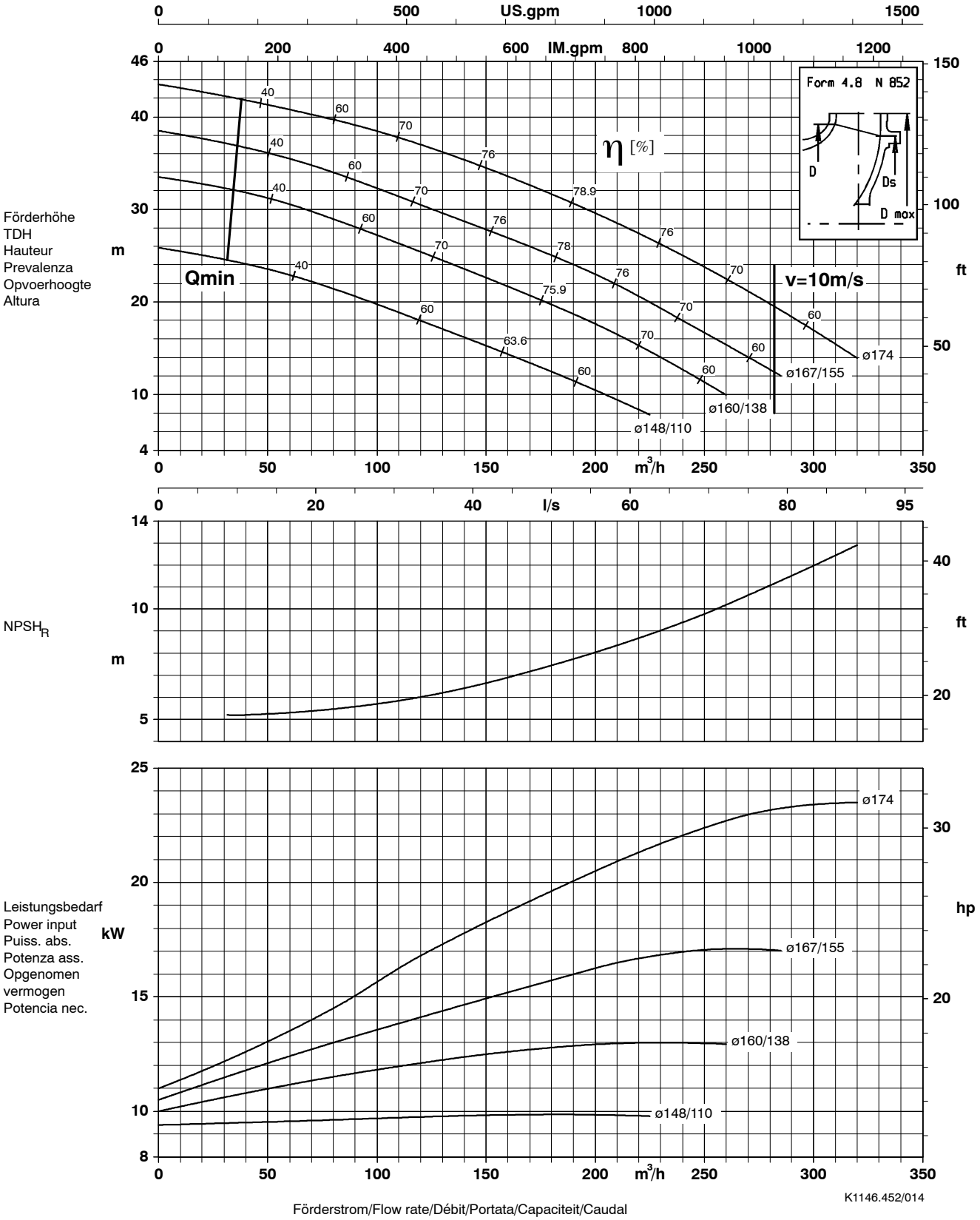
Pressure and temperature limits

Pressure/temperature correlation for flanges to ISO 7005 and EN 1092-2, material: EN-GJL-250.
The sum of inlet pressure and shutoff head must not exceed the values indicated in the diagram.



Baureihe-Größe Type/Size Modèle	Tipo/Grandezza Pomptype/-grootte Tipo/Tamaño	Nenndrehzahl Nom. speed Vitesse nom.	Velocità di rotazione nom. Nominaal toerental Revoluciones nom.	Laufrad-ø Impeller dia. Diamètre de roue	ø Girante ø Waaier ø Rodete
Etaline 100-170		2900 1/min			
Projekt Project Projet	Progetto Projekt Proyecto	Angebots-Nr. Quotation No. No. de l'offre	Offerta No. Offertenr. Oferta No	Pos.-Nr. Item No. No. de pos.	Pos.-Nr. Positienr. Pos. No

KSB Aktiengesellschaft
67225 Frankenthal
Johann-Klein-Straße 9
67227 Frankenthal



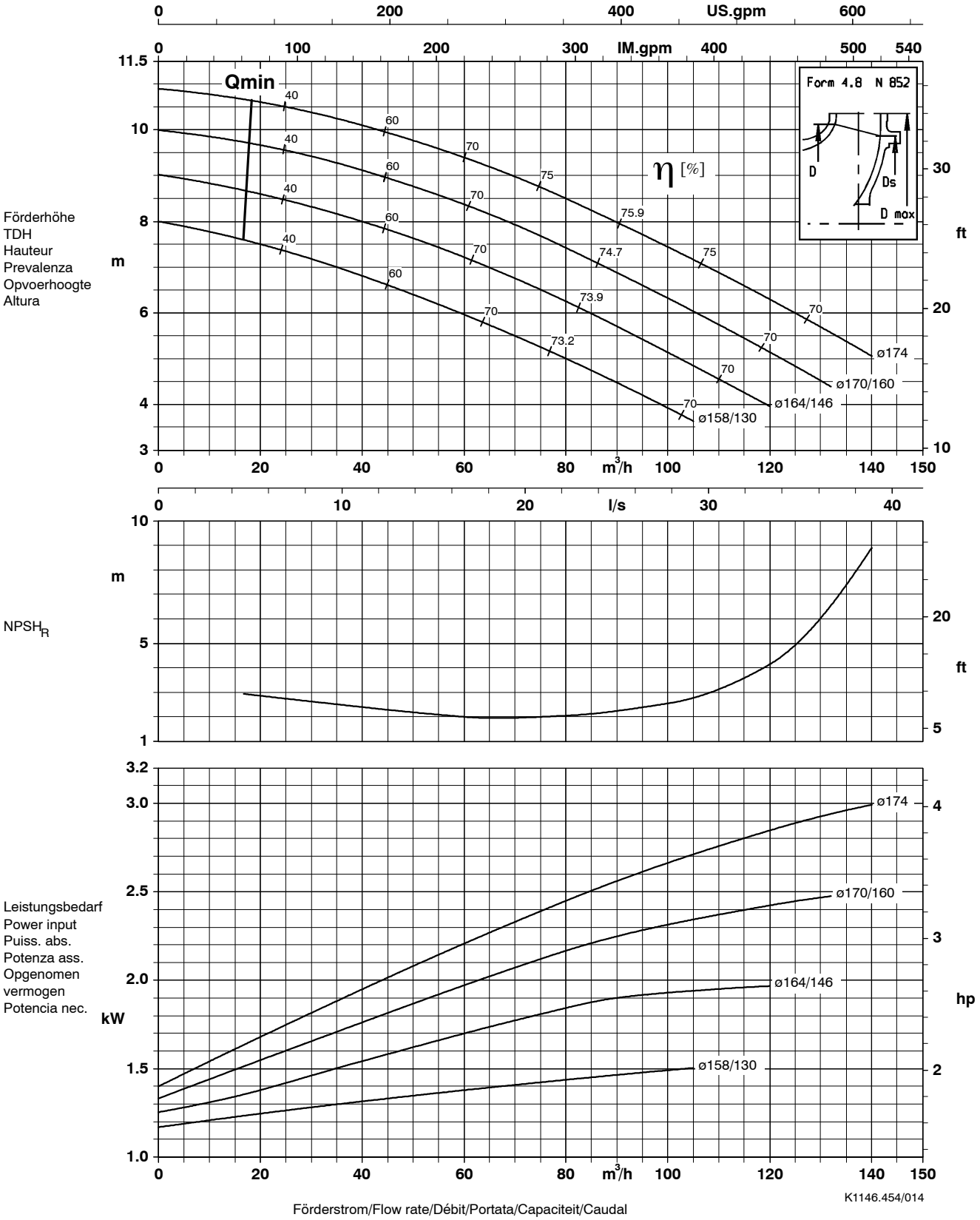
Förderstrom/Flow rate/Débit/Portata/Capaciteit/Caudal

Laufradaustrittsbreite/Impeller outlet width/Largeur à la sortie de la roue 16,0 mm
Luce della girante/Waaier uittredebreedte/Anchura de salida rodete 16,0 mm

NPSH + 0,5 m Sicherheitszuschlag / safety allowance / marge de sécurité / margine di sicurezza / zekerheidsmarge / margen de seguridad

Baureihe-Größe / Type/Size / Modèle	Tipo/Grandezza / Pomptype/-grootte / Tipo/Tamaño	Nenndrehzahl / Nom. speed / Vitesse nom.	Velocità di rotazione nom. / Nominaal toerental / Revoluciones nom.	Laufrad-ø / Impeller dia. / Diamètre de roue	ø Girante / ø Waaier / ø Rodete
Etaline 100-170		1450 1/min			
Projekt / Project / Projet	Progetto / Projekt / Proyecto	Angebots-Nr. / Quotation No. / No. de l'offre	Offerta No. / Offertenr. / Oferta No	Pos.-Nr. / Item No. / No. de pos.	Pos.-Nr. / Positienr. / Pos. No

KSB Aktiengesellschaft
67225 Frankenthal
Johann-Klein-Straße 9
67227 Frankenthal

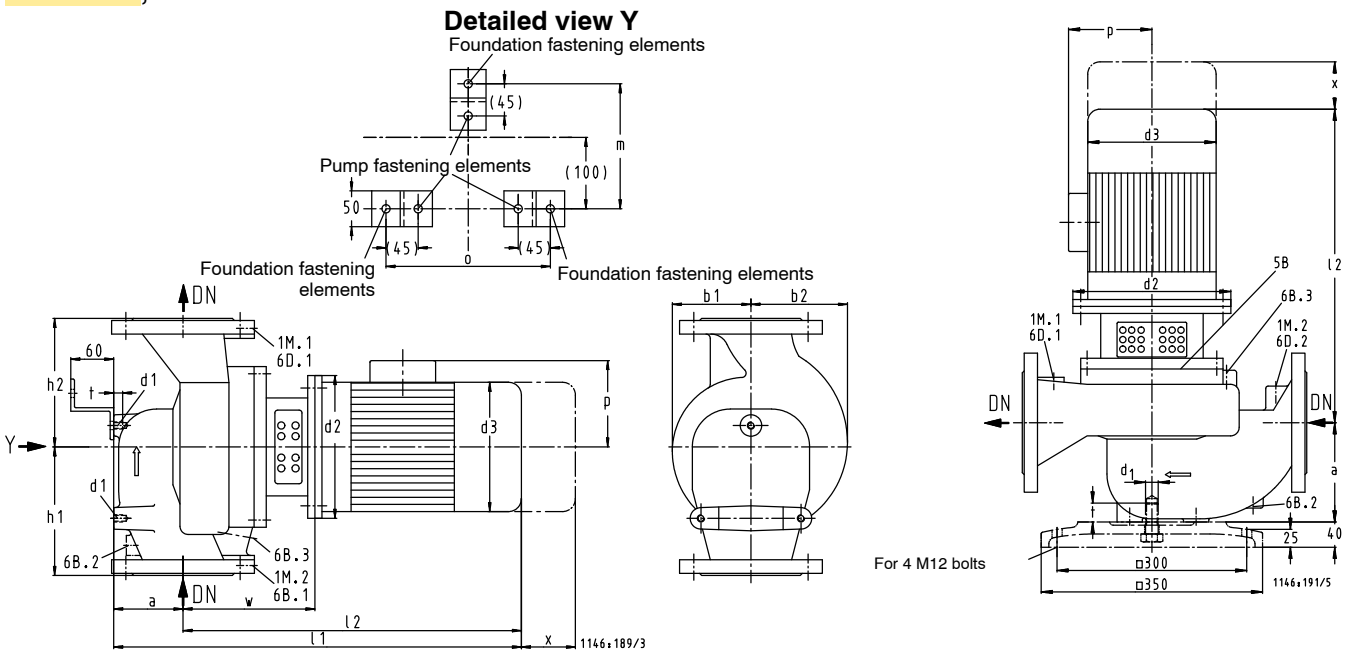


Förderstrom/Flow rate/Débit/Portata/Capaciteit/Caudal

Laufradaustrittsbreite/Impeller outlet width/Largeur à la sortie de la roue	16,0 mm
Luce della girante/Waaier uittredebreedte/Anchura de salida rodete	16,0 mm

NPSH + 0,5 m Sicherheitszuschlag / safety allowance / marge de sécurité / margine di sicurezza / zekerheidsmarge / margen de seguridad

Etaline, n = 2900 1/min
Etaline GN, MN

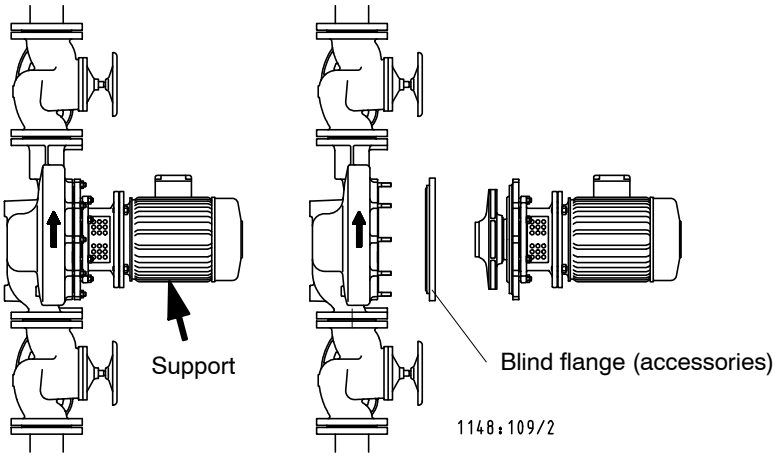


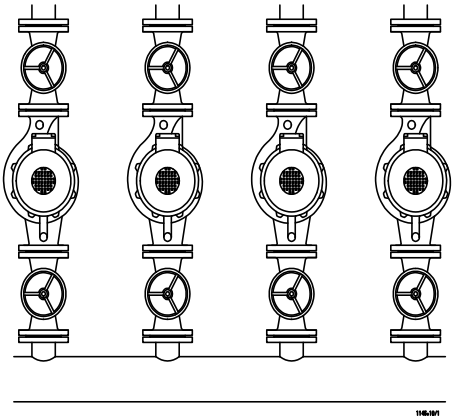
Etaline	DN [1]	a	≈b_1	≈b_2	d_1	d_2	d_3	p	h_1	h_2	≈l_1	≈l_2	t	≈x	w	1M.1/.2[2]	6B.1[2]	6B.3[2]	6D.1[2]	6D.2[2]	m	o
80-160/552	80	97	113	135	M10	300	266	167	180	180	733	636	12,5	100	223	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	230
80-160/752	80	97	113	135	M10	300	266	167	180	180	733	636	12,5	100	223	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	230
80-160/1102	80	97	113	135	M10	350	325	197	180	180	899	802	12,5	100	256	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	230
80-160/1502	80	97	113	135	M10	350	325	197	180	180	899	802	12,5	100	256	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	230
80-160/1852	80	97	113	135	M10	350	325	197	180	180	905	808	12,5	100	256	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	230
80-160/2202	80	97	113	135	M10	350	370	258	180	180	963	866	12,5	100	256	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	230
80-160/3002	80	97	113	135	M10	400	422	305	180	180	1022	925	12,5	100	256	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	230
80-210/1102	80	151	140	160	M10	350	325	197	250	250	923	772	12,5	140	226	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230
80-210/1502	80	151	140	160	M10	350	325	197	250	250	923	772	12,5	140	226	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230
80-210/1852	80	151	140	160	M10	350	325	197	250	250	929	778	12,5	140	226	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230
80-210/2202	80	151	140	160	M10	350	370	262	250	250	987	836	12,5	140	226	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230
80-210/3002	80	151	140	160	M10	400	422	305	250	250	1046	895	12,5	140	226	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230
100-125/552	100	121	113	153	M10	300	266	167	230	220	736	615	12,5	100	202	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-125/752	100	121	113	153	M10	300	266	167	230	220	736	615	12,5	100	202	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-125/1102	100	121	113	153	M10	350	325	197	230	220	902	781	12,5	100	235	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-125/1502	100	121	113	153	M10	350	325	197	230	220	902	781	12,5	100	235	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-160/752	100	118	114	144	M10	300	266	167	250	200	741	623	12,5	100	210	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-160/1102	100	118	114	144	M10	350	325	197	250	200	907	789	12,5	100	243	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-160/1502	100	118	114	144	M10	350	325	197	250	200	907	789	12,5	100	243	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-160/1852	100	118	114	144	M10	350	325	197	250	200	913	795	12,5	100	243	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-160/2202	100	118	114	144	M10	350	370	258	250	200	971	853	12,5	100	243	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-160/3002	100	118	114	144	M10	400	422	305	250	200	1030	912	12,5	100	243	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	195	230
100-170/1102	100	157	121	155	M20	350	325	197	245	205	949	792	25,0	100	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-
100-170/1502	100	157	121	155	M20	350	325	197	245	205	949	792	25,0	100	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-
100-170/1852	100	157	121	155	M20	350	325	197	245	205	955	798	25,0	100	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-
100-170/2202	100	157	121	155	M20	350	370	262	245	205	1013	856	25,0	100	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-
100-170/3002	100	157	121	155	M20	400	422	305	245	205	1072	915	25,0	100	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-
125-160/1852	125	203	173	220	M20	350	325	197	340	280	1001	798	25,0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-
125-160/2202	125	203	173	220	M20	350	370	258	340	280	1059	856	25,0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-
125-160/3002	125	203	173	220	M20	400	422	305	340	280	1118	915	25,0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-

≈x	Clearance for removal
1M.1/.2	Pressure gauge
6B.1/.2/.3	Fluid drain
6 D.1/.2	Fluid priming and venting
5 B	Vent connection for the mechanical seal chamber

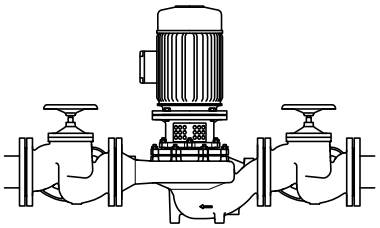
1) DN = EN 1092-2, PN 16 (previously DIN 2633)
2) Rc = ISO 7/1

**Pump sizes Etaline 32-160/... to 100-160/...
are fastened by means of three steel angle feet.
Pump sizes Etaline 100-170/... to 125-160/...
are fastened by means of a pump foot made of EN-GJL.**

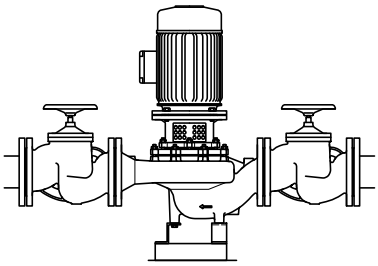




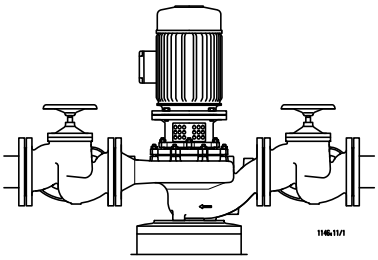
Motors of size 180 and above on Etaline pump sets with horizontal motor axis need to be adequately supported.
The foot fastening holes on the motor housing can be used for this purpose.



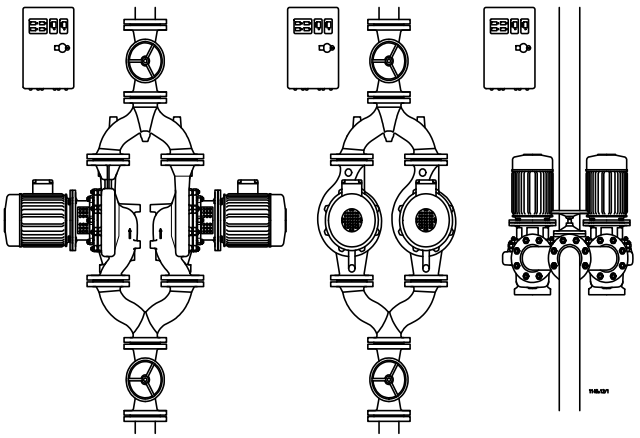
Etaline pump sizes
32-160/... to 100-125/...
fastened without feet.



Etaline pump sizes
32-160/... to 100-160/... are fastened by means of three angle feet.

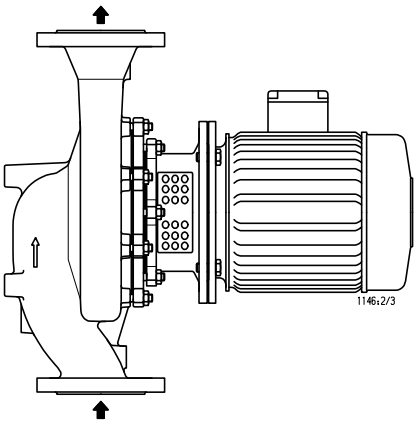


Pump sizes Etaline
100-170/... to 200-315/...
are fastened by means of a pump foot made of EN-GJL.

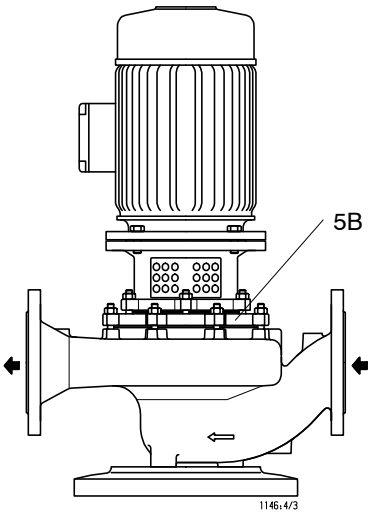


If flexible pipe joints (expansion joints) are used or if the pump set is installed with a pump foot, Etaline must be additionally fastened. The list of pump accessories includes appropriate fastening elements.
When dismantling the motor the volute casing may remain in the piping.

Horizontal installation, direction of flow from bottom to top

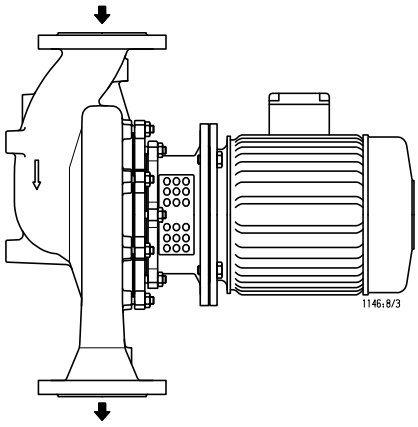


Vertical installation

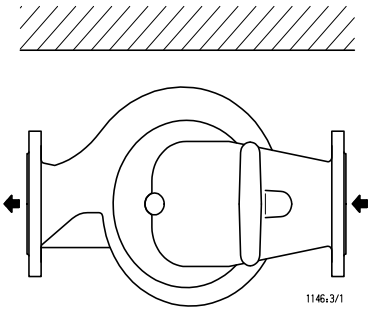


If the pump set is installed vertically, the pump must be vented through vent valve 5B so as to avoid dry running of the mechanical seal.

Horizontal installation, direction of flow from top to bottom. The motor must be turned by 180° so that the terminal box remains in its current position on the top.



Horizontal installation (for example under the ceiling)



The pumps can be directly installed in the piping in any position, but not with the motor pointing downwards.

Dual-pump stations must not be arranged in 'flow direction from top to bottom', since under certain operating conditions the changeover flap will not shut off completely, which might produce reverse flow in the second pump. In this case, changeover from the first to the second pump might cause damage.