In-line Pump

Etaline / Etaline-R

60 Hz

Type Series Booklet

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Type Series Booklet Etaline / Etaline-R

KSB Aktiengesellschaft

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Building Services: Heating

In-line Pumps

Etaline / Etaline-R

Main applications

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

Fluids handled

- Fluids not chemically or mechanically aggressive to the pump materials

Fluids table Etaline (⇨ Page 6) Etaline-R (⇨ Page 7)

Operating data

Operating properties

Characteristic		Value
Flow rate	Q	Up to 2280 m³/h, 633 l/s
Head	H	Up to 87 m
Fluid temperature	t	-30 °C to +140 °C
Operating pressure	p	Up to 25 bar

Pressure and temperature limits (⇨ Page 8)

Designation

Example: Etaline -R GN 65 - 160 / 402 GN 11

Key to the designation

Code	Description
Etaline	Type series
-R	Extended selection chart
G	**Casing/impeller material combination**

Code	Description	
	Etaline	
	G	= Casing in grey cast iron / impeller in grey cast iron
	M	= Casing in grey cast iron / impeller in tin bronze
	Etaline-R	
	G	= Casing in nodular cast iron / impeller in grey cast iron
	M	= Casing in nodular cast iron / impeller in tin bronze
	S	= Casing in nodular cast iron / impeller in grey cast iron
N	**Stub shaft design and standardised motor**	
65	**Nominal discharge nozzle diameter [mm]**	
160	**Nominal impeller diameter [mm]**	
40	**Motor rating: kW x 10 (example 4 kW)**	
2	**Number of motor poles**	
11	**Seal code**	
	Etaline	
	6	= Mechanical seal material U3BEGG
	9	= Mechanical seal material U3U3VGG
	10	= Mechanical seal material Q1Q1X4GG
	11	= Mechanical seal material BQ1EGG
	Etaline-R	
	Mechanical seal material Q1BE(V)GG	
	Mechanical seal material Q1Q1E(V)GG	
	Mechanical seal material Q1AEGG	

Design details

Design

- Close-coupled design/in-line design
- Single-stage
- Horizontal/vertical installation
- Rigid connection between pump and motor
- Ratings to EN 733

Pump casing

- Radially split volute casing

Impeller type

- Closed radial impeller

Shaft seal

Etaline

- Standardised mechanical seal to EN 12756
- Shaft equipped with a replaceable shaft sleeve in the shaft seal area

Etaline-R

- KSB mechanical seal

Bearings

Etaline

- Radial ball bearings in the motor housing
- Grease lubrication

Etaline-R

- Radial ball bearing in the bearing bracket
- Grease lubrication

Drive

- Surface-cooled KSB squirrel-cage motor
- KSB IEC frame standardised IE2 motor (from 0.75 kW)
- 440/480 V, other voltages on request
- IP 55 enclosure
- Thermal class F

Materials

Etaline

Overview of available materials

Component	Material	
	GN	MN
Volute casing	Grey cast iron JL1040	
Discharge cover	Grey cast iron JL1040	
Impeller	Grey cast iron JL1040	Tin bronze
Casing wear rings	Grey cast iron JL1040	Bronze
Shaft	Tempered steel C 45	
Shaft sleeve	Chrome nickel molybdenum steel 1.4571	
Drive lantern	Grey cast iron JL1040	

Etaline-R

Overview of available materials

Component	Material					
	GN	GCN	MN	SN	SCN	SMN
Pump casing	Nodular cast iron JS 1025					
Discharge cover	Grey cast iron JL1040			Nodular cast iron JS 1025		
Impeller	Grey cast iron JL1040	Stainless steel 1.4408	Tin bronze CC480K-GS	Grey cast iron JL1040	Stainless steel 1.4408	Tin bronze CC480K-GS
Casing wear ring Casing / discharge cover	Grey cast iron JL 1040		Lead bronze CC495K-GS	Grey cast iron JL 1040		Lead bronze CC495K-GS
Shaft	Tempered steel C45 or stainless steel 1.4057					
Bearing bracket	Grey cast iron JL1040					

Product benefits

- Very easy to service due to discharge-side and suction-side casing wear rings
- Optimised hydraulic system with impeller diameter precisely matched to the specified duty point
- Designed for easy installation and simple piping layout

Tables of fluids handled

Etaline

Table of fluids handled and associated material combinations
✘ = standard, ■ = delivery period on request

Fluid handled	Application limits	Materials Casing/impeller		Shaft seal Mechanical seal				Design variant code
		Grey cast iron/ grey cast iron	Grey cast iron/ tin bronze	U3BEGG	U3U3VGG	Q1Q1X4GG	BQ1EGG	
		GN	MN	6	9	10	11	
Water[1]								
Service water	t ≤ 110 °C, p ≤ 10 bar	■				■		GN 10
Heating water[2]	t ≤ 120 °C, p ≤ 10 bar	✘					✘	GN 11[3]
Heating water[2]	t ≤ 140 °C, p ≤ 16 bar	✘		✘				GN 6[3]
Heating water[2]	t ≤ 110 °C, p ≤ 10 bar	■				■		GN 10[3]
Condensate[4]	t ≤ 120 °C, p ≤ 10 bar	✘					✘	GN 11[5]
Cooling water (without antifreeze)	t ≤ 60 °C, p ≤ 10 bar	■				■		GN 10[6]
Cooling water pH ≥ 7.5 (with antifreeze)[7]	t ≥ -30 °C, p ≤ 10 bar t ≤ 110 °C	✘					✘	GN 11
Slightly contaminated water	t ≤ 60 °C, p ≤ 10 bar	■				■		GN 10
Pure water[4]	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[8]
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, inorg., pH ≥ 7.5, inhibited	t ≥ -30 °C, p ≤ 10 bar t ≤ 25 °C	✘					✘	GN 11
Water with antifreeze, pH ≥ 7.5[1][7]	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

1) General evaluation criteria for results of water analysis; pH value ≥ 7; chlorides content (Cl') ≤ 250 mg/kg, chlorine (Cl2) ≤ 0.6 mg/kg.
2) For heating water, we recommend application of the VDI 2035 or Vd TÜV 1466 standards; non-compliance may result in a shorter service life of the mechanical seal. Code for mech. seal materials: U3 = tungsten carbide (hard metal), B = carbon, resin-impregnated, Q1 = silicon carbide, G = CrNiMo steel, X4 = special elastomer, E = EP rubber
3) If used as circulator pump to DIN 4752; pmax ≤10 bar
4) No ultra-pure water: conductivity at 25 °C: <800 µS/cm, neutral with regard to chemical corrosion
5) Open circuit: MN 11 required (processing via product number)
6) Open circuit: MN 10 required
7) Antifreeze on ethylene glycol basis with inhibitors. Content > 20 to 50% (e.g. Antifrogen N)
8) In case of requirements as per DIN 19643 provide MN 10 (processing via product number)

Etaline-R

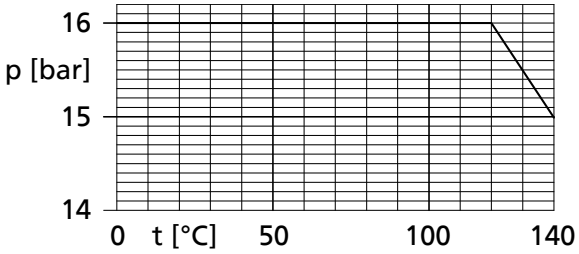
Table of fluids handled and associated material combinations
✘ = standard

Fluid handled	Application limits	Materials casing/impeller			Material mechanical seal	Design variant code mechanical seal
		G	M	S	4	
Water						
Service water	t ≤ 60 °C; p ≤ 16 bar	✘			✘	G4
Fire-fighting water[9)]	t ≤ 60 °C; p ≤ 16 bar		✘		✘	M4
Heating water[10)]	t ≤ 120 °C; p ≤16 bar	✘			✘	G4
Heating water[10)]	t ≤ 140 °C; p ≤ 25 bar			✘	✘	S4
Heating water[10)]	t ≤ 110 °C; p ≤ 16 bar	✘			✘	G4
Condensate[10)]	t ≤ 120 °C; p ≤16 bar	✘			✘	Please contact KSB
Cooling water [9)](without antifreeze)	t ≤ 60 °C; p ≤16 bar	✘			✘	G4
Cooling water pH ≥ 7.5 (with antifreeze)[11)]	t ≥ -30 °C; p ≤ 16 bar t ≤ 110 °C; p ≤ 25 bar	✘		✘	✘	G4
Slightly contaminated water[9)]	t ≤ 60 °C; p ≤ 16 bar	✘			✘	G4
Pure water[12)]	t ≤ 25 °C; p ≤ 16 bar	✘			✘	G4
Raw water (irrigation)[9)]	t ≤ 60 °C; p ≤ 16 bar	✘			✘	G4
Raw water (industrial application)[9)]	t ≤ 60 °C; p ≤ 16 bar	✘			✘	G4
Swimming pool water (fresh water)[9)]	t ≤ 60 °C; p ≤ 16 bar	✘			✘	G4
Dam water[9)]	t ≤ 60 °C; p ≤ 16 bar		✘		✘	M4
Drinking water[9)]	t ≤ 60 °C; p ≤ 16 bar		✘		✘	M4
Partly desalinated water[10)]	t ≤ 120 °C; p ≤ 16 bar	✘			✘	Please contact KSB
Fully desalinated water as boiler feed water[10)]	t ≤ 120 °C; p ≤ 16 bar	✘			✘	G4
Refrigerants, cooling brines						
Cooling brine, inorganic, pH ≥ 7.5, inhibited	t ≥ -30 °C; p ≤ 16 bar t ≤ 25 °C	✘			✘	G4
Water with antifreeze ph ≥7.5[9)11)]	t ≥ -30 °C; p ≤ 16 bar t ≤ 110 °C	✘			✘	G4
Oils/emulsions						
Diesel oil, fuel oil EL	t ≤ 60 °C; p ≤ 16 bar			✘	✘	S4
Lubricating oil, turbine oil, does not apply to SF-D oils (hardly flammable)	t ≤ 80 °C; p ≤ 16 bar			✘	✘	S4
Drilling/grinding emulsion	t ≤ 60 °C; p ≤ 16 bar	✘			✘	G4
Oil-water emulsion	t ≤ 60 °C; p ≤ 16 bar	✘			✘	G4
Cleaning agents						
Lyes for bottle rinsers	t ≤ 90 °C; p ≤ 16 bar	✘				
Brewery applications						
Beer mash	t ≤ 100 °C; p ≤ 16 bar	✘			✘	G4
Beer wort	t ≤ 100 °C; p ≤ 16 bar	✘			✘	G4

9) General evaluation criteria for results of water analysis; pH value ≥ 7; chlorides content (Cl') ≤ 250 mg/kg. Chlorine (Cl 2) ≤ 0.6 mg/kg
10) Treatment to VdTÜV 1466; additional requirement: O2 < 0.02 mg/l
11) Antifreeze on ethylene glycol basis with inhibitors. Content: >20 % to 50 % (e.g. Antifrogen N)
12) No ultra-pure water! Conductivity at 25 °C: < 800 µS/cm, neutral with regard to chemical corrosion

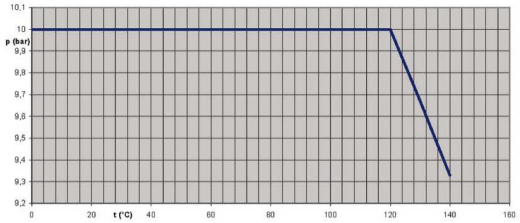
Pressure and temperature limits

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

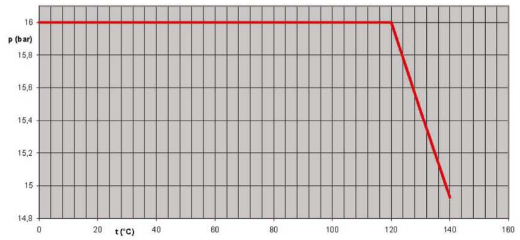


Etaline, JL 1040, PN 16

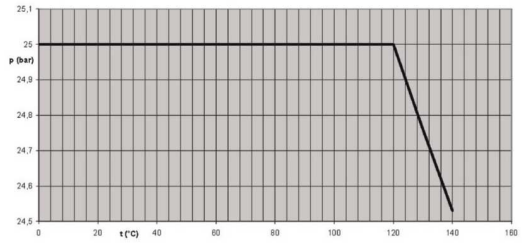
Pressure/temperature correlation for flanges



Etaline-R, JL 1040, PN 10



Etaline-R, JL 1040, PN 16



Etaline-R, JS 1025, PN 25

Technical data

Etaline, n = 3500 rpm

Etaline, n = 3500 rpm

Etaline	Motor 460 V			Single pumps
	Size	[kW]	~[A]	[kg]
32–160/112	80	1,27	1,94	37
32–160/152	90S	1,73	2,60	40

Etaline	Motor 460 V			Single pumps
	Size	[kW]	~[A]	[kg]
32–160/222	90L	2,53	3,85	43
32–160/302	100L	3,45	4,95	50
32–160/402	112M	4,60	6,10	61
32–160/552	132S	6,33	8,80	72
32–160/752	132S	8,63	11,40	85
32–200/302	100L	3,45	4,95	58
32–200/402	112M	4,60	6,10	69
32–200/552	132S	6,33	8,80	79
32–200/752	132S	8,63	11,40	92
32–200/1102	160M	12,65	17,20	115
32–200/1502	160M	17,25	23,00	124
40–160/222	90L	2,53	3,85	44
40–160/302	100L	3,45	4,95	51
40–160/402	112M	4,60	6,10	62
40–160/552	132S	6,33	8,80	73
40–160/752	132S	8,63	11,40	86
40–160/1102	160M	12,65	17,20	108
50–160/152	90S	1,73	2,60	43
50–160/222	90L	2,53	3,85	47
50–160/302	100L	3,45	4,95	54
50–160/402	112M	4,60	6,10	65
50–160/552	132S	6,33	8,80	75
50–160/752	132S	8,63	11,40	88
50–160/1102	160M	12,65	17,20	111
50–160/1502	160M	17,25	23,00	120
65–160/222	90L	2,53	3,85	49
65–160/302	100L	3,45	4,95	56
65–160/402	112M	4,60	6,10	67
65–160/552	132S	6,33	8,80	78
65–160/752	132S	8,63	11,40	91
65–160/1102	160M	12,65	17,20	113
65–160/1502	160M	17,25	23,00	122
65–160/1852	160L	21,28	28,00	142
65–160/2202	180M	24,64	36,00	171
80–160/552	132S	6,33	8,80	84
80–160/752	132S	8,63	11,40	97
80–160/1102	160M	12,65	17,20	119
80–160/1502	160M	17,25	23,00	128
80–160/1852	160L	21,28	28,00	148
80–160/2202	180M	24,64	36,00	177
80–160/3002	200L	33,60	46,50	237
100–125/552	132S	6,33	8,80	92
100–125/752	132S	8,63	11,40	105
100–125/1102	160M	12,65	17,20	127
100–125/1502	160M	17,25	23,00	136
100–160/752	132S	8,63	11,40	102
100–160/1102	160M	12,65	17,20	125
100–160/1502	160M	17,25	23,00	134
100–160/1852	160L	21,28	28,00	154
100–160/2202	180M	24,64	36,00	182
100–160/3002	200L	33,60	46,50	243

Etaline, n = 1750 rpm

Etaline, n = 1750 rpm

Etaline	Motor 460 V			Single pumps	Twin pumps[13)]
	Size	[kW]	~[A]	[kg]	[kg]
32 -160 024	71	0.30	0.80	28	—
32–160/034	71	0.43	1.15	29	—
32–160/054	80	0.63	1.60	33	—
32–160/074	80	0.88	2.00	34	—
32–160/114	90S	1.27	2.20	40	—
32–200/054	80	0.63	1.60	40	—
32–200/074	80	0.88	2.00	41	—
32–200/114	90S	1.27	2.20	47	—
32–200/154	90L	1.73	2.95	50	—
32–200/224	100L	2.53	4.04	59	—
40–160/024	71	0.30	0.80	30	84
40–160/034	71	0.43	1.15	31	86
40–160/054	80	0.63	1.60	34	93
40–160/074	80	0.88	2.00	35	95
40–160/114	90S	1.27	2.20	41	107
40–250/054	80	0.63	1.60	49	—
40–250/074	80	0.88	2.00	50	—
40–250/114	90S	1.27	2.20	56	—
40–250/154	90L	1.73	2.95	59	—
40–250/224	100L	2.53	4.05	68	—
40–250/304	100L	3.45	5.40	73	—
40–250/404	112M	4.60	6.80	80	—
40–250/554	132S	6.33	9.70	90	—
50–160/034	71	0.43	1.15	33	98
50–160/054	80	0.63	1.60	36	104
50–160/074	80	0.88	2.00	37	107
50–160/114	90S	1.27	2.20	43	118
50–160/154	90L	1.73	2.95	46	124
50–160/224	100L	2.53	4.05	55	141
50–250/114	90S	1.27	2.20	60	—
50–250/154	90L	1.73	2.95	63	—
50–250/224	100L	2.53	4.05	71	—
50–250/304	100L	3.45	5.40	76	—
50–250/404	112M	4.60	6.80	83	—
50–250/554	132S	6.33	9.70	94	—
50–250/754	132M	8.63	12.80	109	—
65–160/024	71	0.30	0.80	34	107
65–160/034	71	0.43	1.15	35	110
65–160/054	80	0.63	1.60	39	116
65–160/074	80	0.88	2.00	40	119
65–160/114	90S	1.27	2.20	46	130
65–160/154	90L	1.73	2.95	49	136
65–160/224	100L	2.53	4.05	57	153
65–160/304	100L	3.45	5.40	62	163
65–250/154	90L	1.73	2.95	67	—
65–250/224	100L	2.53	4.05	76	—
65–250/304	100L	3.45	5.40	81	—
65–250/404	112M	4.60	6.80	88	—
65–250/554	132S	6.33	9.70	98	—
65–250/754	132M	8.63	12.80	113	—
65–250/1104	160M	12.65	18.20	140	—
80–160/054	80	0.63	1.60	44	141
80–160/074	80	0.88	2.00	46	144
80–160/114	90S	1.27	2.20	51	155
80–160/154	90L	1.73	2.95	54	161
80–160/224	100L	2.53	4.05	63	179
80–160/304	100L	3.45	5.40	68	189
80–160/404	112M	4.60	6.80	75	203
80–210/114	90S	1.27	2.20	63	179
80–210/154	90L	1.73	2.95	66	185
80–210/224	100L	2.53	4.05	75	202
80–210/304	100L	3.45	5.40	80	212
80–210/404	112M	4.60	6.80	87	226
80–210/554	132S	6.33	9.70	97	248
80–210/754	132M	8.63	12.80	112	278
80–210/1104	160M	12.65	18.20	139	—
80–250/224	100L	2.53	4.05	86	—
80–250/304	100L	3.45	5.40	91	—
80–250/404	112M	4.60	6.80	98	—
80–250/554	132S	6.33	9.70	108	—
80–250/754	132M	8.63	12.80	121	—
80–250/1104	160M	12.65	18.20	149	—
80–250/1504	160L	17.25	24.00	175	—
100–125/074	80	0.88	2.00	54	176
100–125/114	90S	1.27	2.20	60	187
100–125/154	90L	1.73	2.95	63	193
100–125/224	100L	2.53	4.05	71	210
100–160/074	80	0.88	2.00	52	171
100–160/114	90S	1.27	2.20	57	182
100–160/154	90L	1.73	2.95	60	188
100–160/224	100L	2.53	4.05	69	205
100–160/304	100L	3.45	5.40	74	215
100–160/404	112M	4.60	6.80	81	229
100–170/224	100L	2.53	4.05	80	228
100–170/304	100L	3.45	5.40	85	238
100–170/404	112M	4.60	6.80	92	252
100–170/554	132S	6.33	9.70	103	273
100–170/754	132M	8.63	12.80	118	303
100–200/304	100L	3.45	5.40	120	—

13) Comprising: 2 Etaline pumps, 1 suction-side Y-pipe without changeover flap, 1 discharge-side Y-pipe with changeover flap, screws/bolts and sealing 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	Motor 460 V			Single pumps	Twin pumps[13]
	Size	[kW]	~[A]	[kg]	[kg]
100–200/404	112M	4.60	6.80	127	—
100–200/554	132S	6.33	9.70	137	—
100–200/754	132M	8.63	12.80	151	—
100–200/1104	160M	12.65	18.20	178	—
100–200/1504	160L	17.25	24.00	204	—
100–250/404	112M	4.60	6.80	130	—
100–250/554	132S	6.33	9.70	140	—
100–250/754	132M	8.63	12.80	153	—
100–250/1104	160M	12.65	18.20	181	—
100–250/1504	160L	17.25	24.00	207	—
100–250/1854	180M	21.28	30.50	226	—
100–250/2204	180L	25.30	36.50	246	—
125–160/304	100L	3.45	5.40	152	—
125–160/404	112M	4.60	6.80	159	—
125–160/554	132S	6.33	9.70	168	—
125–160/754	132M	8.63	12.80	182	—
125–200/404	112M	4.60	6.80	155	—
125–200/554	132S	6.33	9.70	165	—
125–200/754	132M	8.63	12.80	178	—
125–200/1104	160M	12.65	18.20	206	—
125–200/1504	160L	17.25	24.00	232	—
125–250/754	132M	8.63	12.80	186	—
125–250/1104	160M	12.65	18.20	214	—
125–250/1504	160L	17.25	24.00	240	—
125–250/1854	180M	21.28	30.50	258	—
125–250/2204	180L	25.30	36.50	278	—
125–250/3004	200L	34.50	47.00	339	—
150–200/754	132M	8.63	12.80	213	—
150–200/1104	160M	12.65	18.20	241	—
150–200/1504	160L	17.25	24.00	267	—
150–200/1854	180M	21.28	30.50	285	—
150–200/2204	180L	25.30	36.50	305	—
150–250/1104	160M	12.65	18.20	234	—
150–250/1504	160L	17.25	24.00	260	—
150–250/1854	180M	21.28	30.50	279	—
150–250/2204	180L	25.30	36.50	299	—
150–250/3004	200L	34.50	47.00	359	—
150–250/3704	225S	42.55	60.00	454	—

Etaline-R, n = 1750 rpm

Etaline-R, n = 1750 rpm

Etaline-R	Motor 460 V			Single pumps
	Size	[kW]	~[A]	[kg]
200–330/1504	160L	17,3	24	707
200–330/1854	180M	21,3	30.5	726
200–330/2204	180L	25,3	36.5	746
200–330/3004	200L	34,5	47	796
200–330/3704	225S	42,5	60	890
200–330/4504	225M	52	70	930
200–330/5504	250M	63	86	1110
200–330/7504	280S	86	114	1225
200–330/9004	280M	104	144	1325
200–330/11004	315S	127	170	1460
200–400/3004	200L	34,5	47	971
200–400/3704	225S	42,5	60	1065
200–400/4504	225M	52	70	1105
200–400/5504	250M	63	86	1280
200–400/7504	280S	86	114	1395
200–400/9004	280M	104	144	1495
200–400/11004	315S	127	170	1630
200–400/13204	315M	152	225	1925
200–400/16004	315L	192	280	2125
200–400/20004	315L	230	335	2165
250–250/754	132M	8,6	12.8	620
250–250/1104	160M	12,6	18.2	641
250–250/1504	160L	17,3	24	667
250–250/1854	180M	21,3	30.5	693
250–250/2204	180L	25,3	36.5	710
250–250/3004	200L	34,5	47	764
250–250/3704	225S	42,5	60	850
250–250/4504	225M	52	70	890
250–260/1104	160M	12,6	18.2	701
250–260/1504	160L	17,3	24	727
250–260/1854	180M	21,3	30.5	746
250–260/2204	180L	25,3	36.5	766
250–260/3004	200L	34,5	47	816
250–260/3704	225S	42,5	60	910
250–260/4504	225M	52	70	950
250–260/5504	250M	63	86	1130
250–300/1504	160L	17,3	24	882
250–300/1854	180M	21,3	30.5	901
250–300/2204	180L	25,3	36.5	921
250–300/3004	200L	34,5	47	971
250–300/3704	225S	42,5	60	1065
250–300/4504	225M	52	70	1105
250–300/5504	250M	63	86	1265
250–300/7504	280S	86	114	1380
250–300/9004	280M	104	144	1480
250–330/2204	180L	25,3	36.5	886

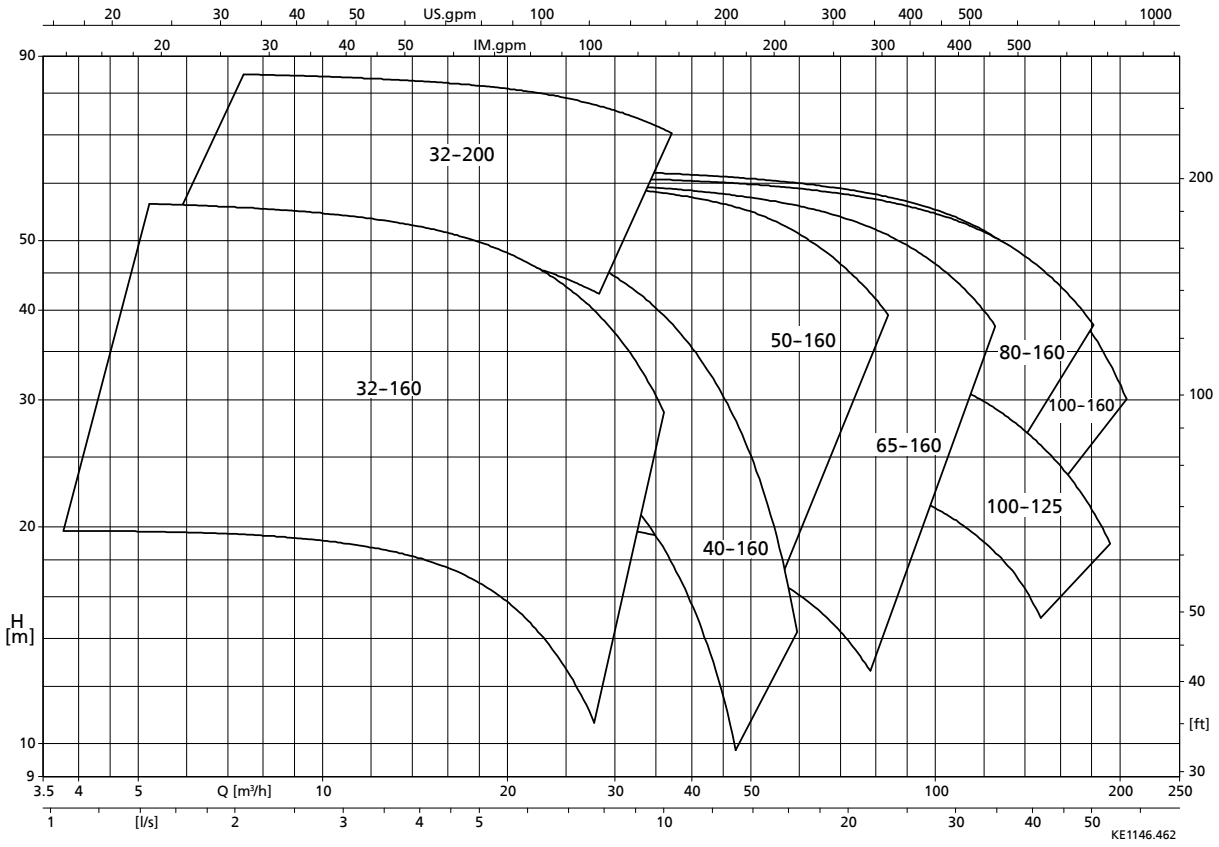
13) Comprising: 2 Etaline pumps, 1 suction-side Y-pipe without changeover flap, 1 discharge-side Y-pipe with changeover flap, screws/bolts and sealing elements. Pumps and Y-pipes are supplied in separate packages. For the two Y-pipes, friction losses equivalent to those of approx. 9 m of straight pipe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

Etaline-R	Motor 460 V			Single pumps
	Size	[kW]	~[A]	[kg]
250–330/3004	200L	34,5	47	936
250–330/3704	225S	42,5	60	1030
250–330/4504	225M	52	70	1070
250–330/5504	250M	63	86	1250
250–330/7504	280S	86	114	1365
250–330/9004	280M	104	144	1465
250–330/11004	315S	127	170	1600
250–330/13204	315M	152	225	1895
250–330/16004	315L	184	280	2095
250–400/3004	200L	34,5	47	1101
250–400/3704	225S	42,5	60	1195
250–400/4504	225M	52	70	1235
250–400/5504	250M	63	86	1410
250–400/7504	280S	86	114	1525
250–400/9004	280M	104	144	1625
250–400/11004	315S	127	170	1760
250–400/13204	315M	152	225	2055
250–400/16004	315L	192	280	2255
250–400/20004	315L	230	335	2295
250–400/25004	315	300	434	2250
300–360/3704	225S	42,5	60	1465
300–360/4504	225M	52	70	1505
300–360/5504	250M	63	86	1680
300–360/7504	280S	86	114	1795

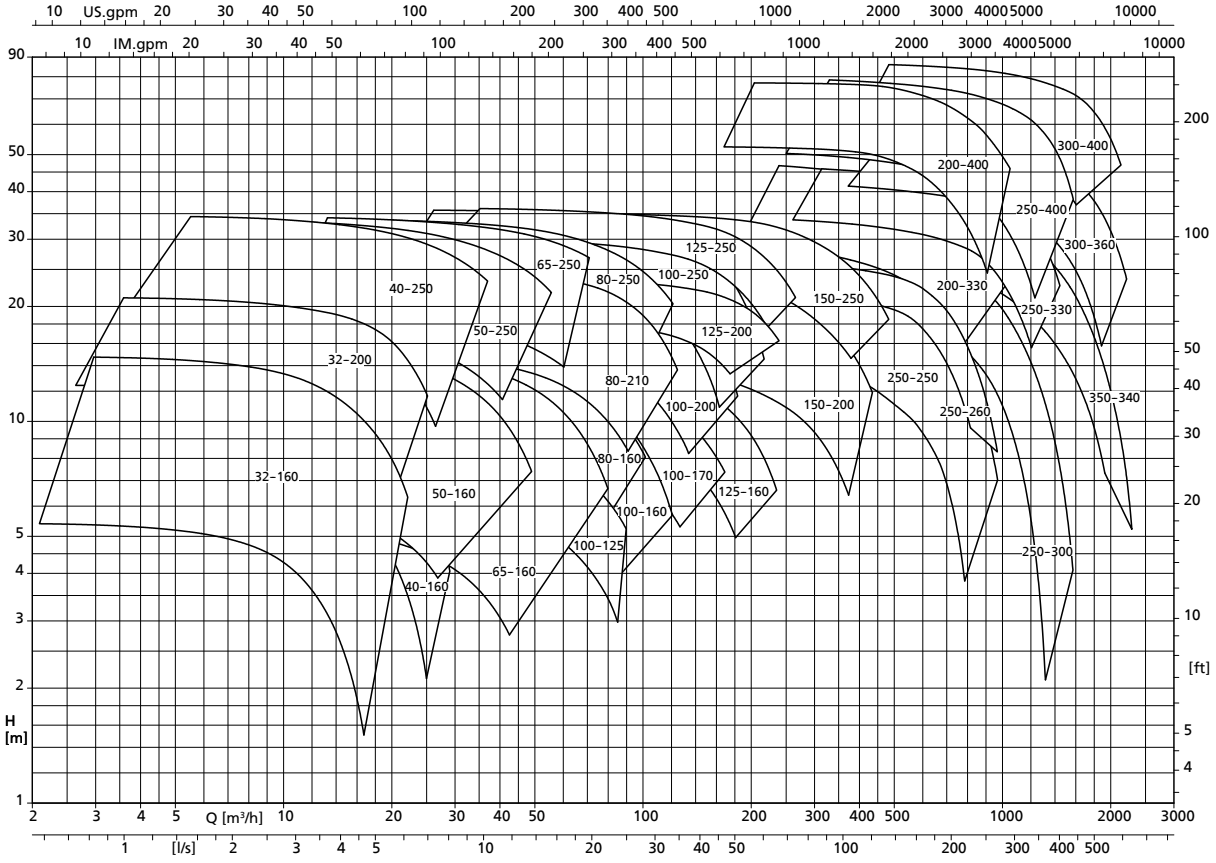
Etaline-R	Motor 460 V			Single pumps
	Size	[kW]	~[A]	[kg]
300–360/9004	280M	104	144	1895
300–360/11004	315S	127	170	2030
300–360/13204	315M	152	225	2325
300–360/16004	315L	192	280	2525
300–360/20004	315L	230	335	2565
300–400/5504	250M	63	86	1645
300–400/7504	280S	86	114	1760
300–400/9004	280M	104	144	1860
300–400/11004	315S	127	170	1995
300–400/13204	315M	152	225	2290
300–400/16004	315L	192	280	2490
300–400/20004	315L	230	335	2530
300–400/25004	315	300	436	2475
300–400/31504	315	378	554	2685
350–340/2204	180L	25,3	36.5	1171
350–340/3004	200L	34,5	47	1221
350–340/3704	225S	42,5	60	1315
350–340/4504	225M	52	70	1355
350–340/5504	250M	63	86	1530
350–340/7504	280S	86	114	1645
350–340/9004	280M	104	144	1745
350–340/11004	315S	127	170	1880
350–340/13204	315M	152	225	2175

Selection charts

Etaline, n = 3500 rpm



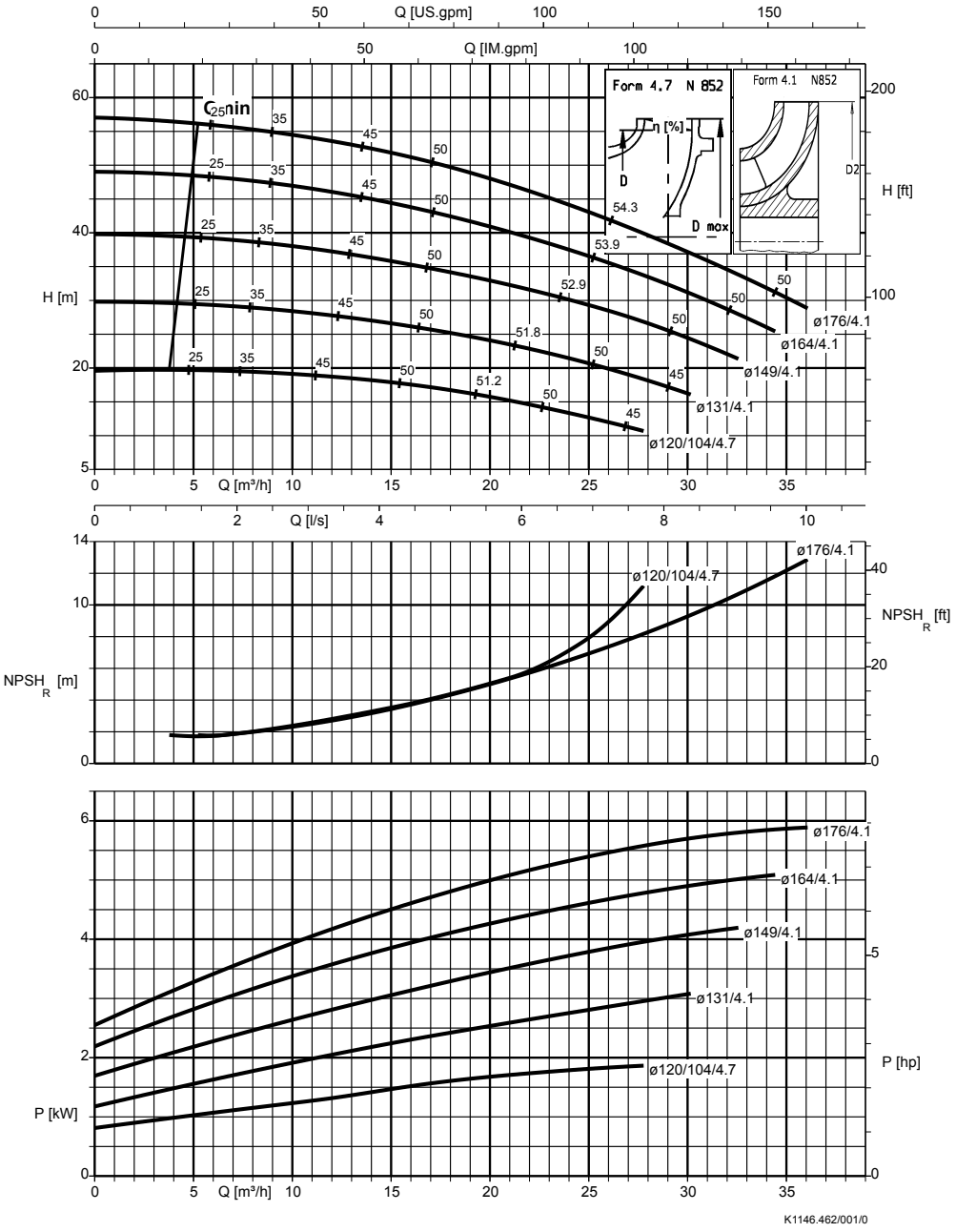
Etaline / Etaline-R, n = 1750 rpm



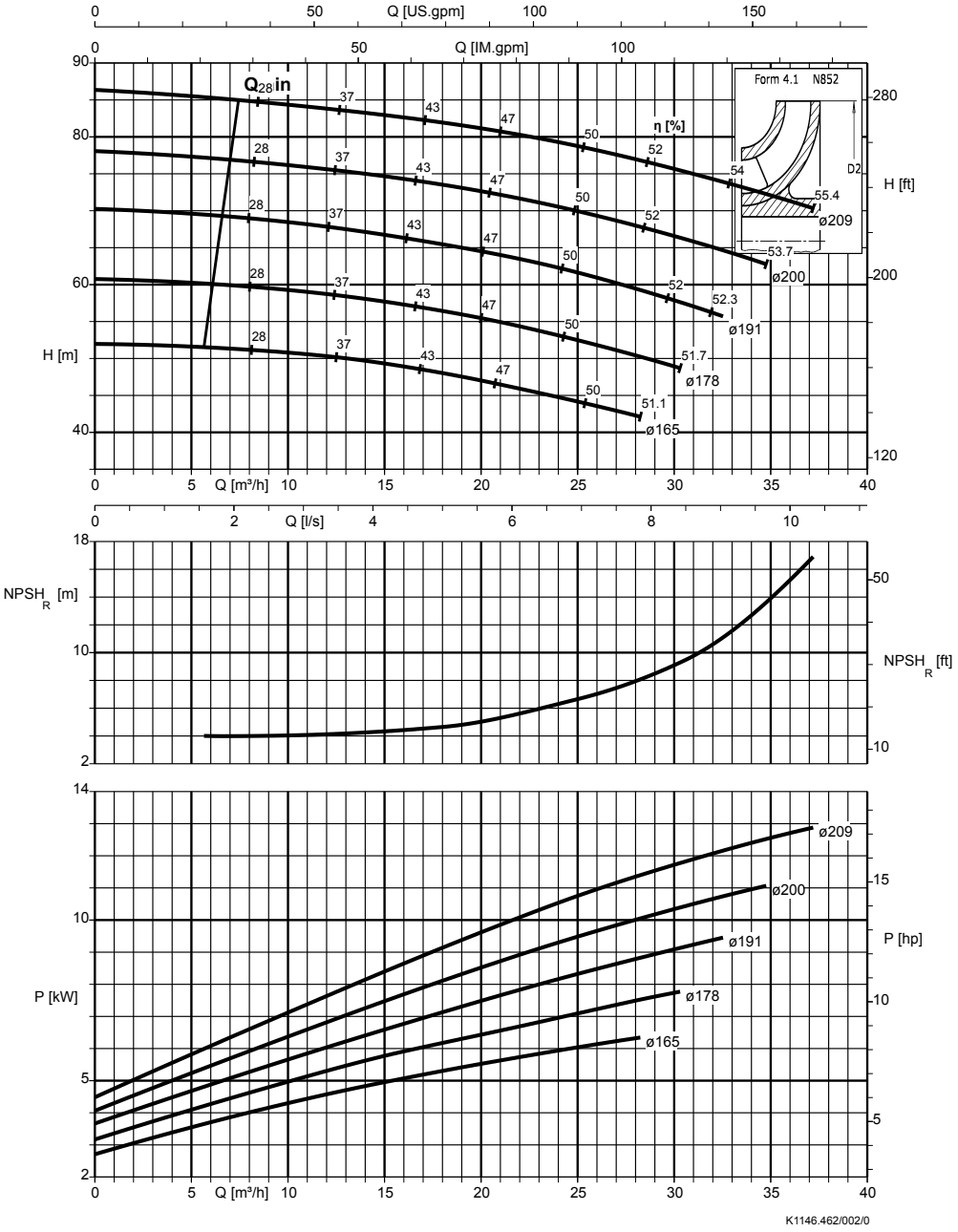
Characteristic curves

Etaline, n = 3500 rpm

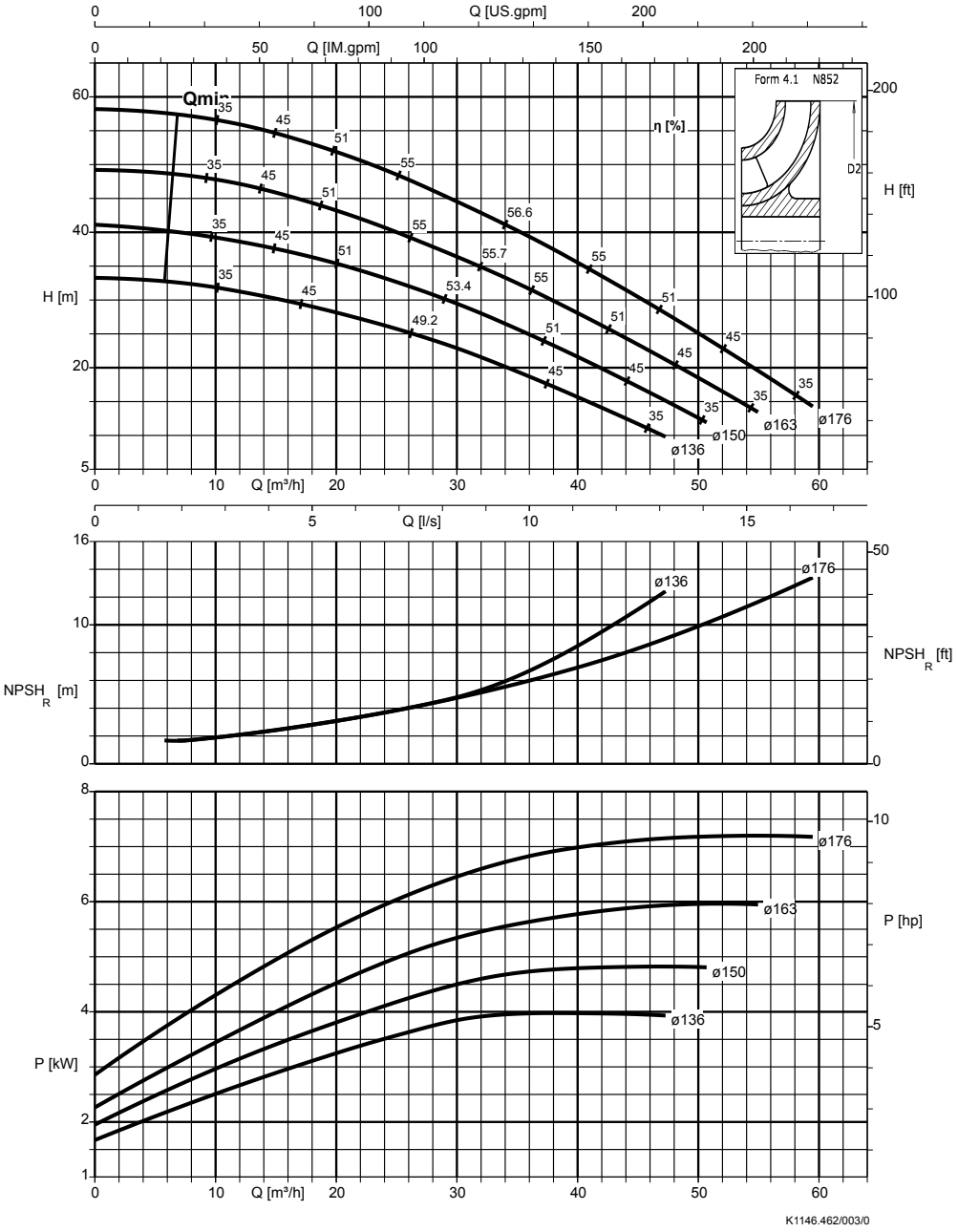
Etaline 32-160, n = 3500 rpm



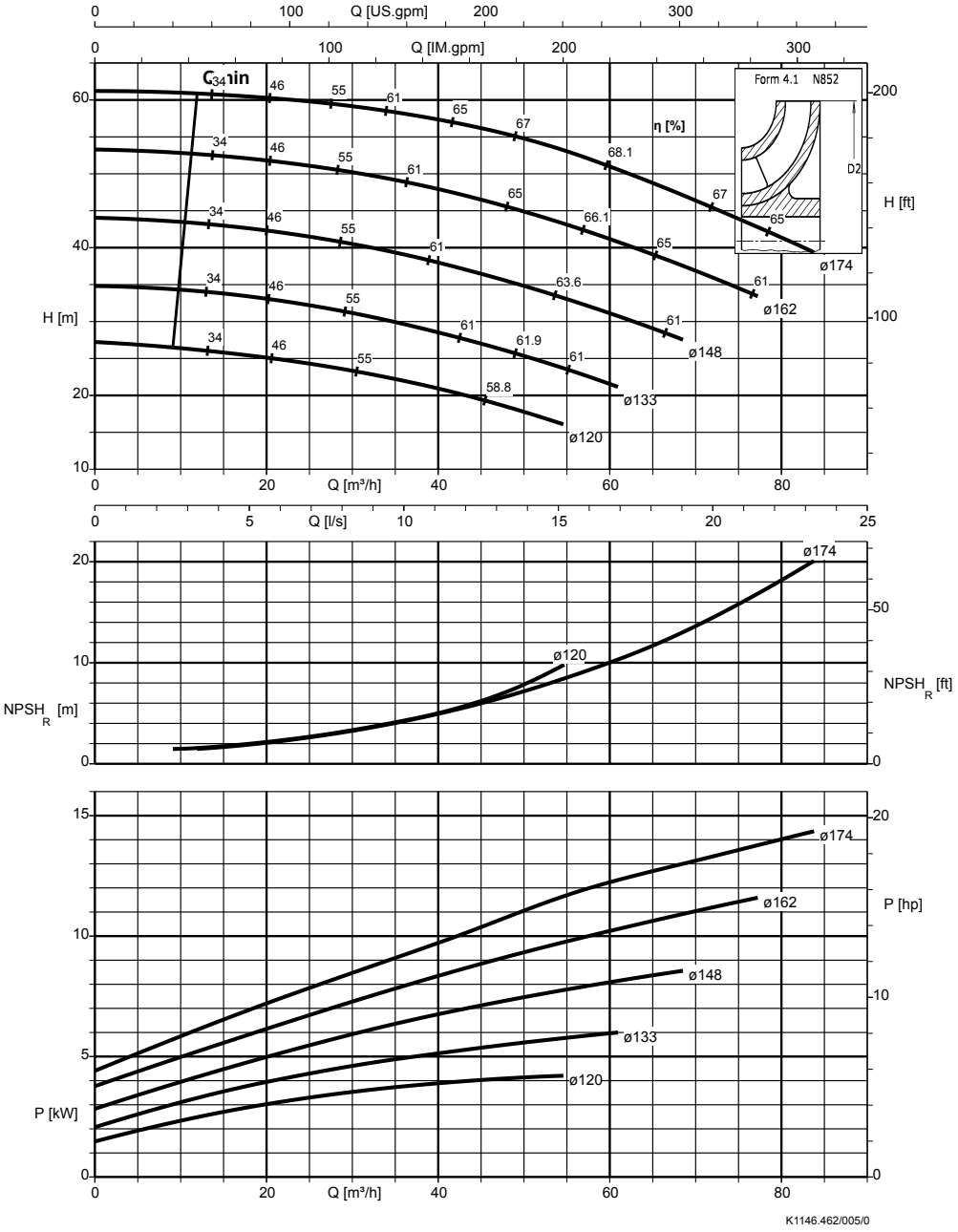
Etaline 32-200, n = 3500 rpm



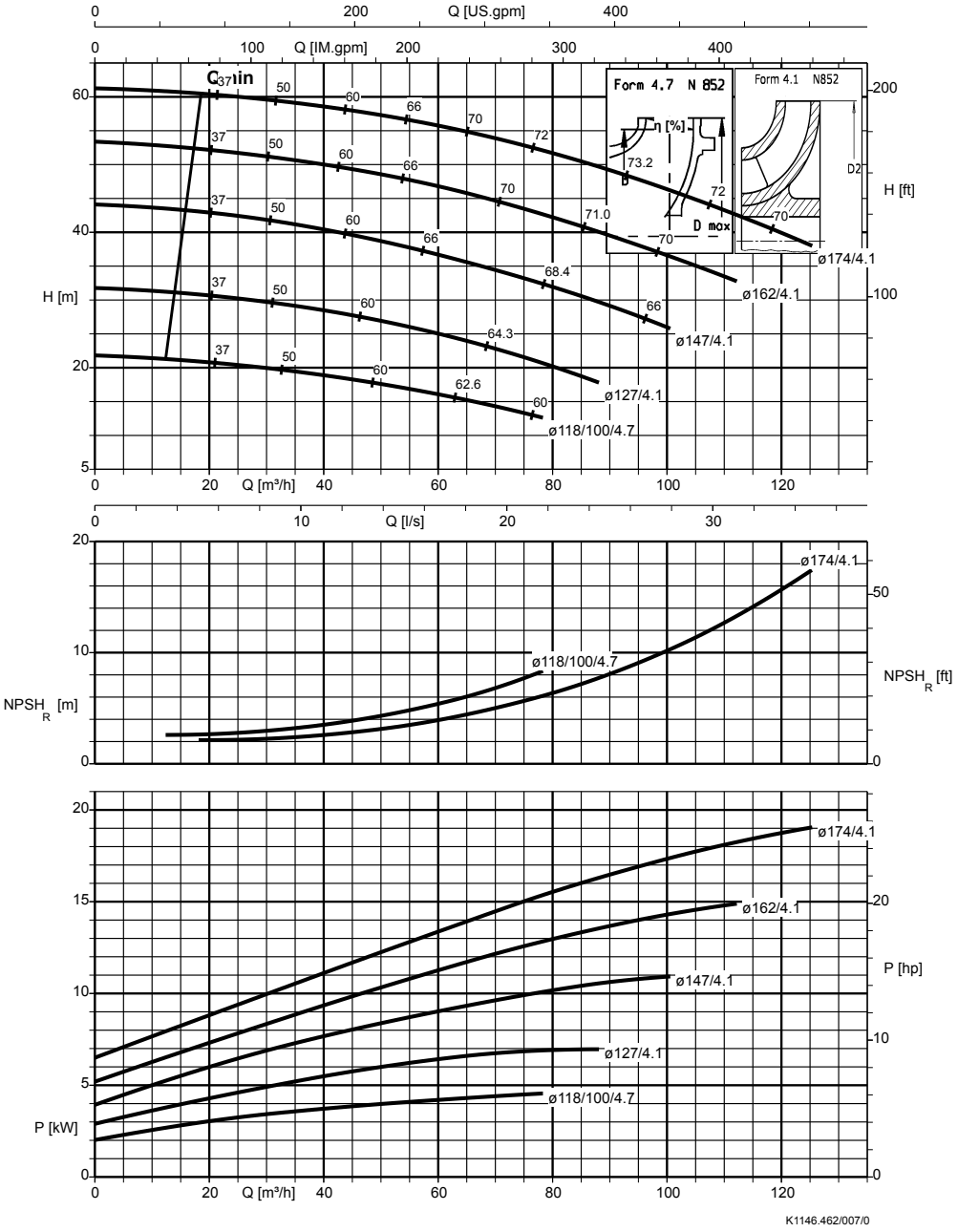
Etaline 40-160, n = 3500 rpm



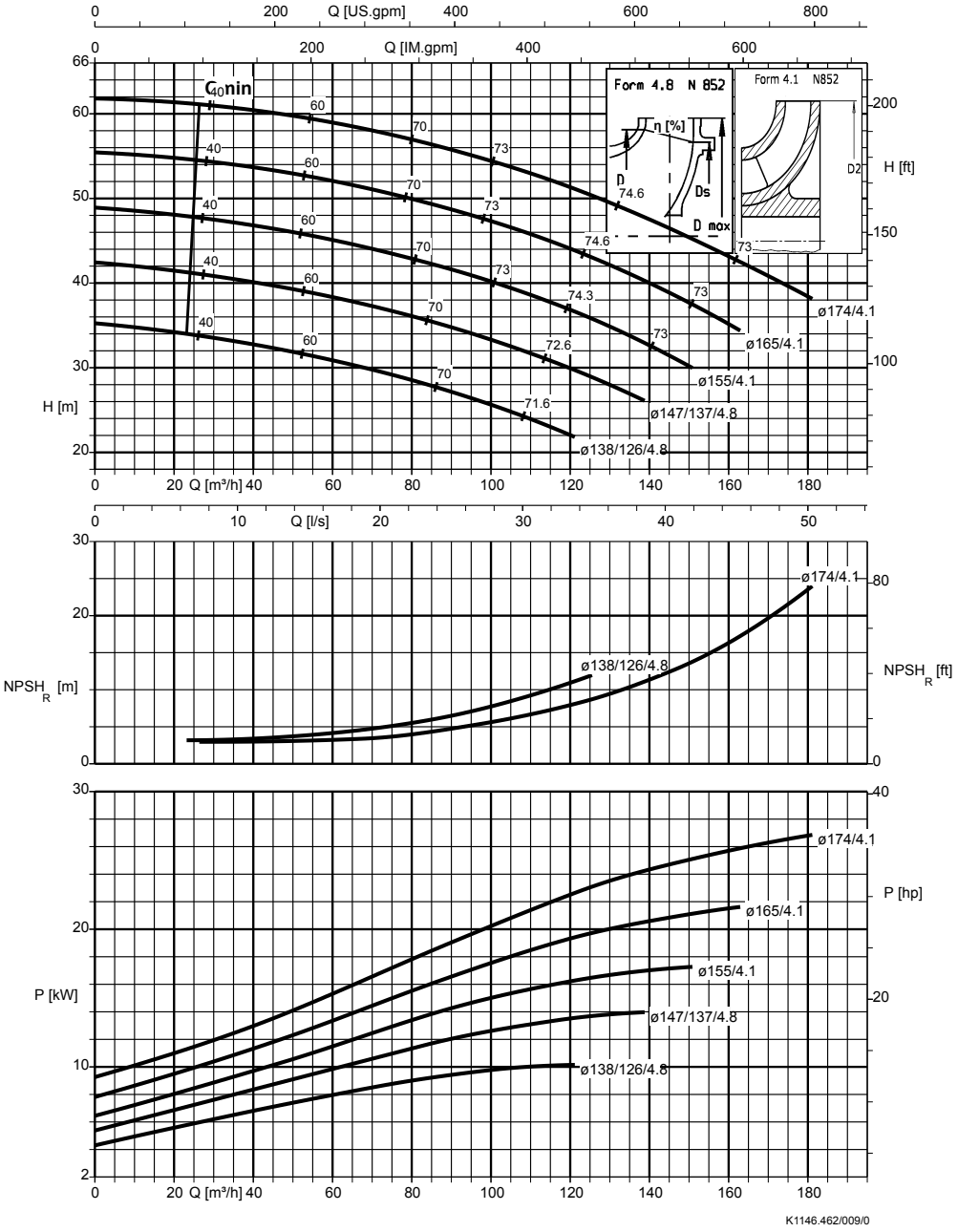
Etaline 50-160, n = 3500 rpm



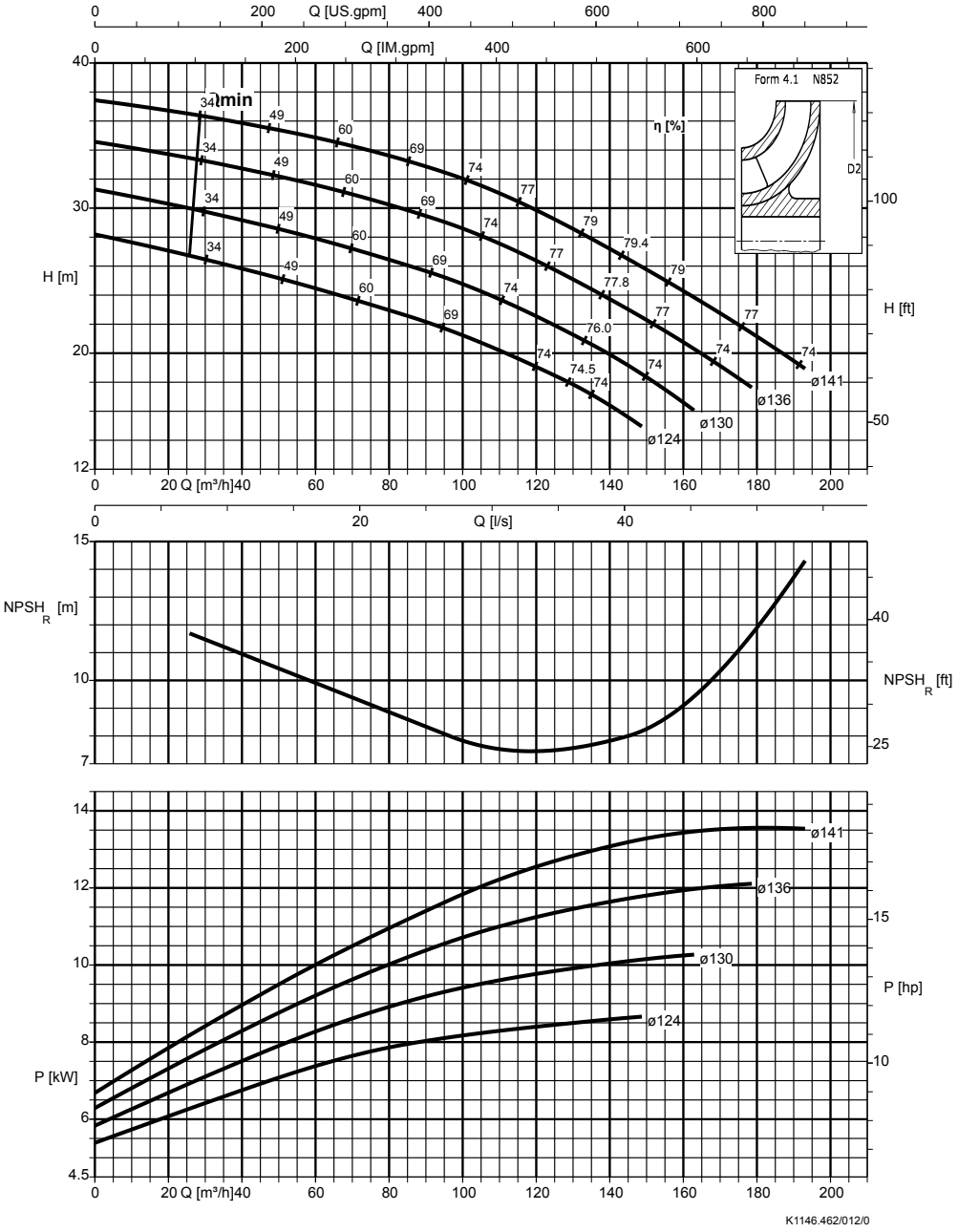
Etaline 65-160, n = 3500 rpm



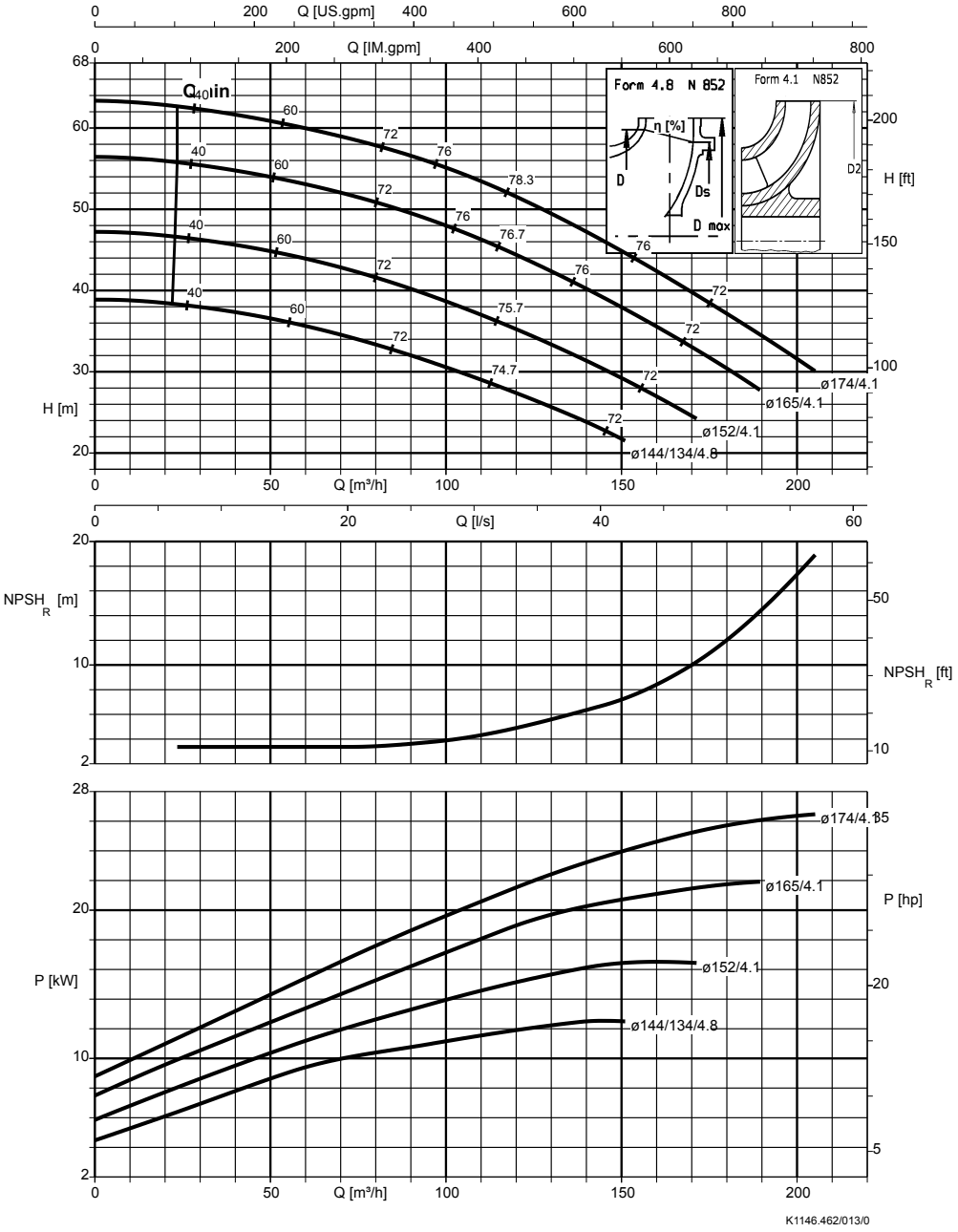
Etaline 80-160, n = 3500 rpm



Etaline 100-125, n = 3500 rpm

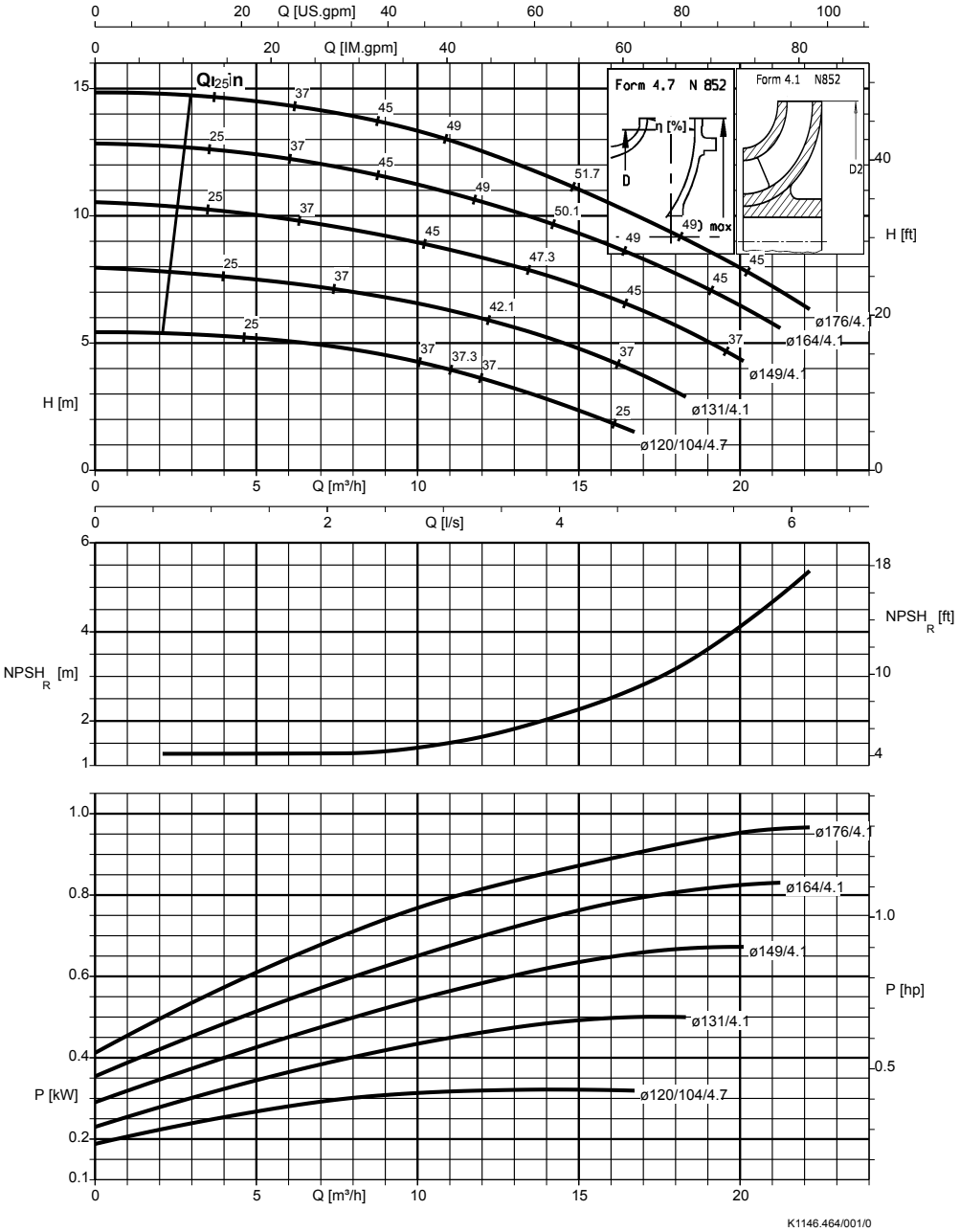


Etaline 100-160, n = 3500 rpm

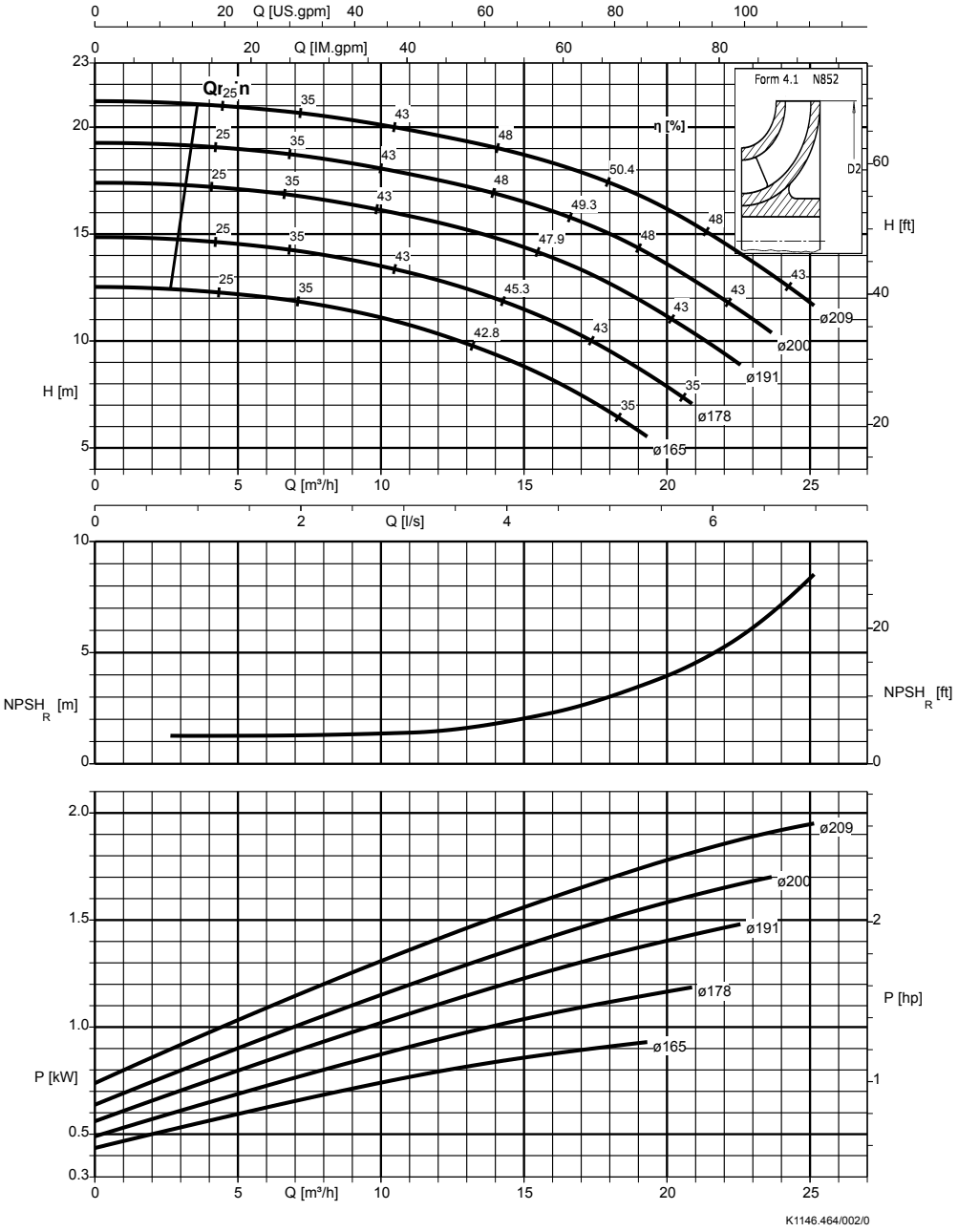


Etaline, n = 1750 rpm

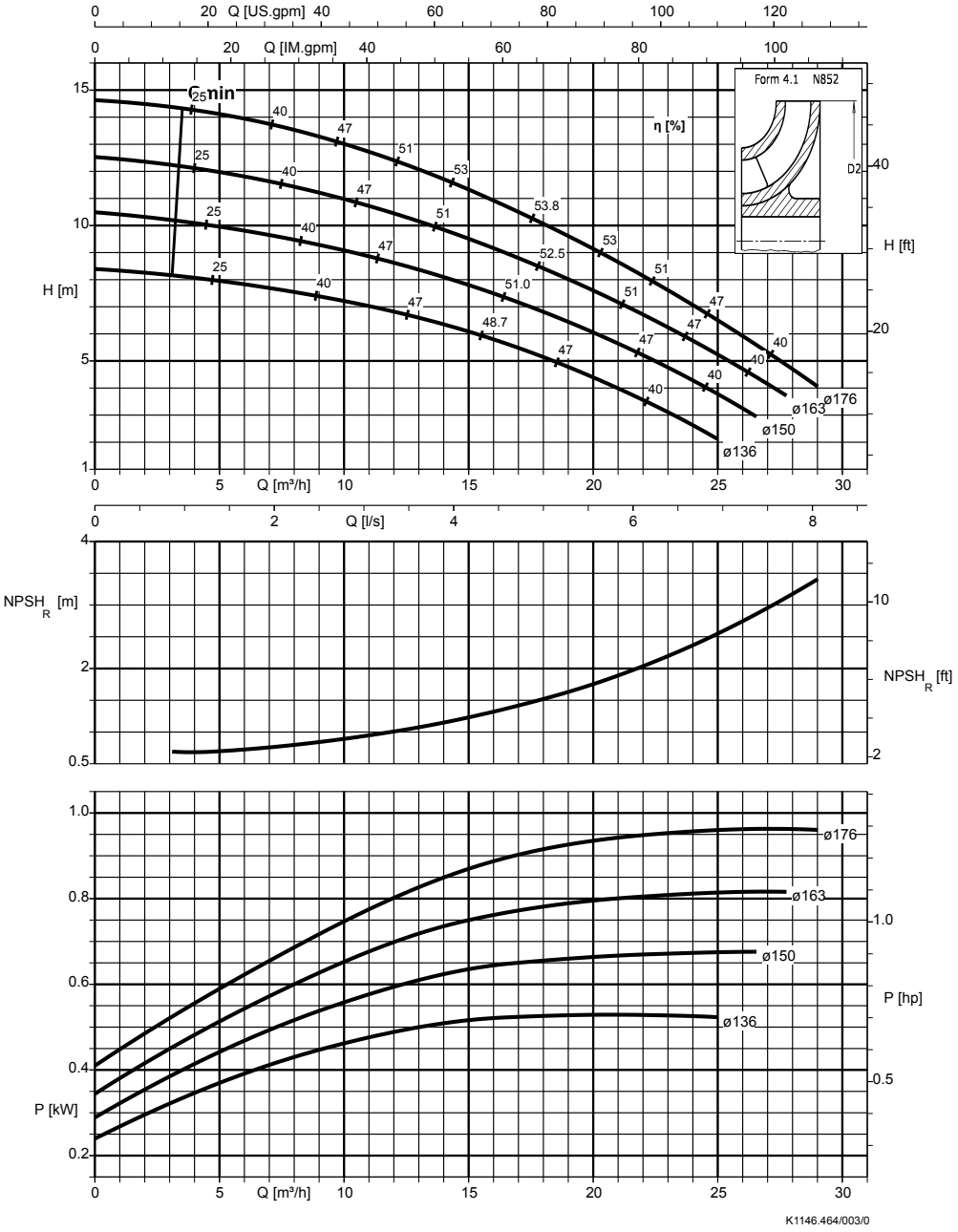
Etaline 32-160, n = 1750 rpm



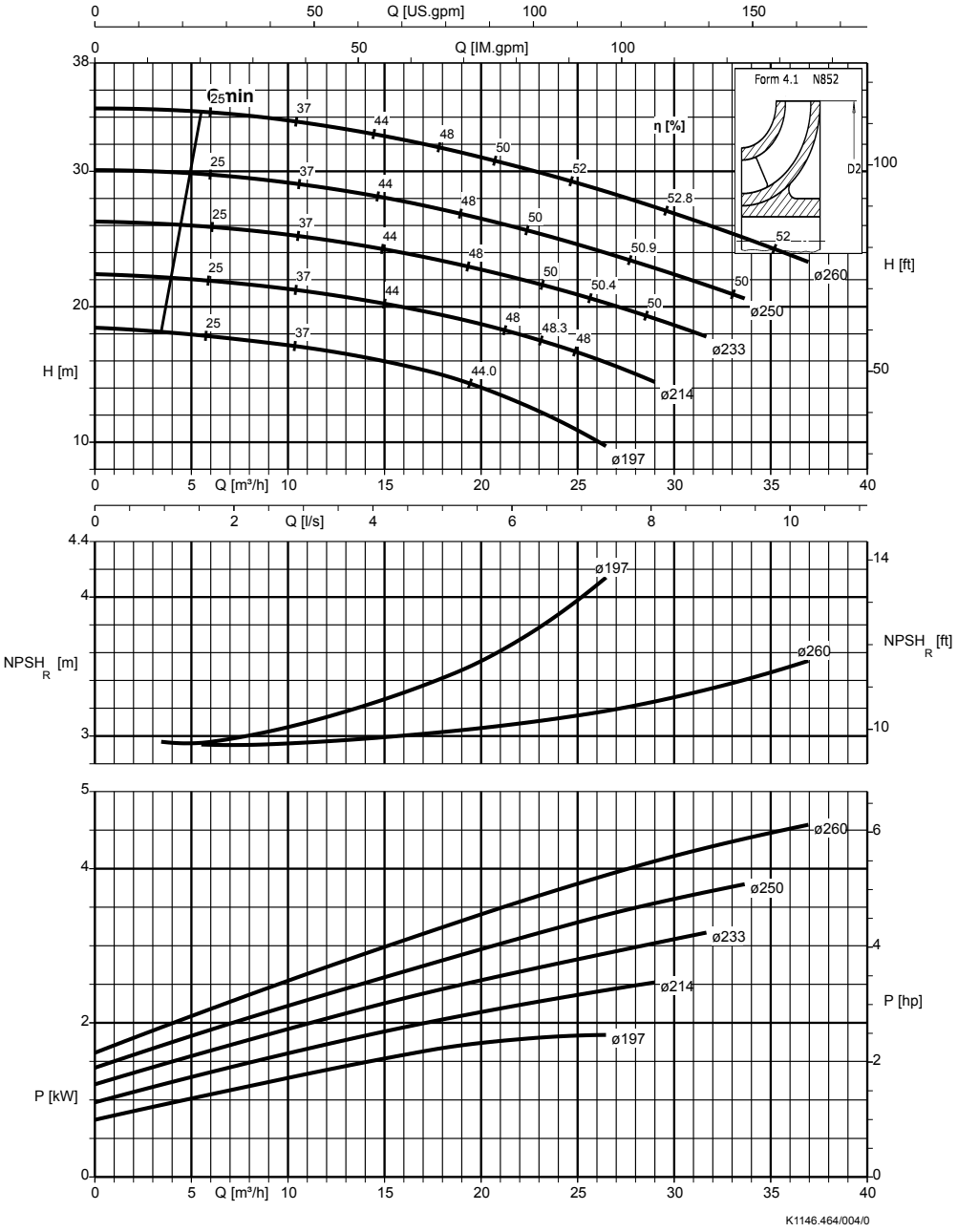
Etaline 32-200, n = 1750 rpm



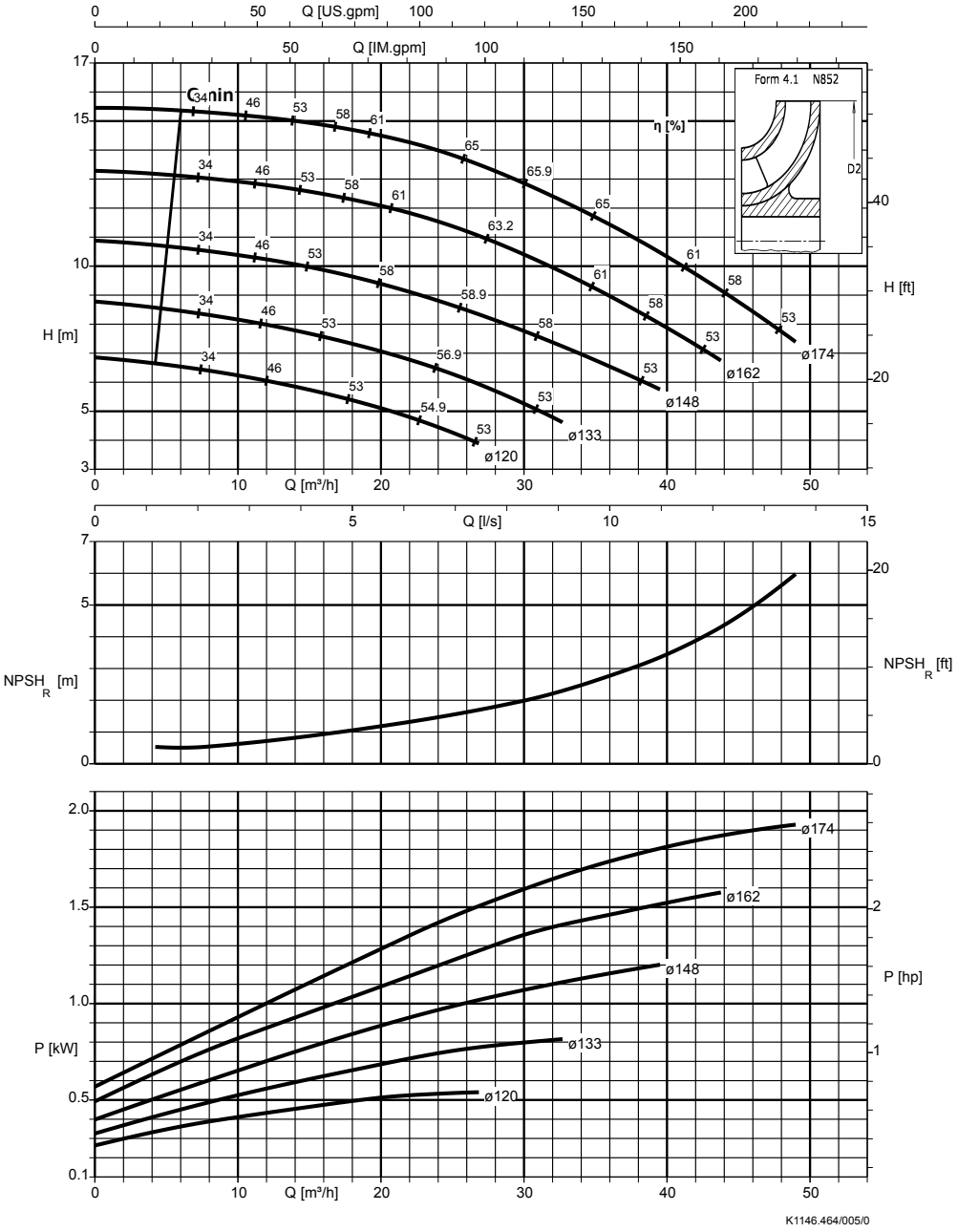
Etaline 40-160, n = 1750 rpm



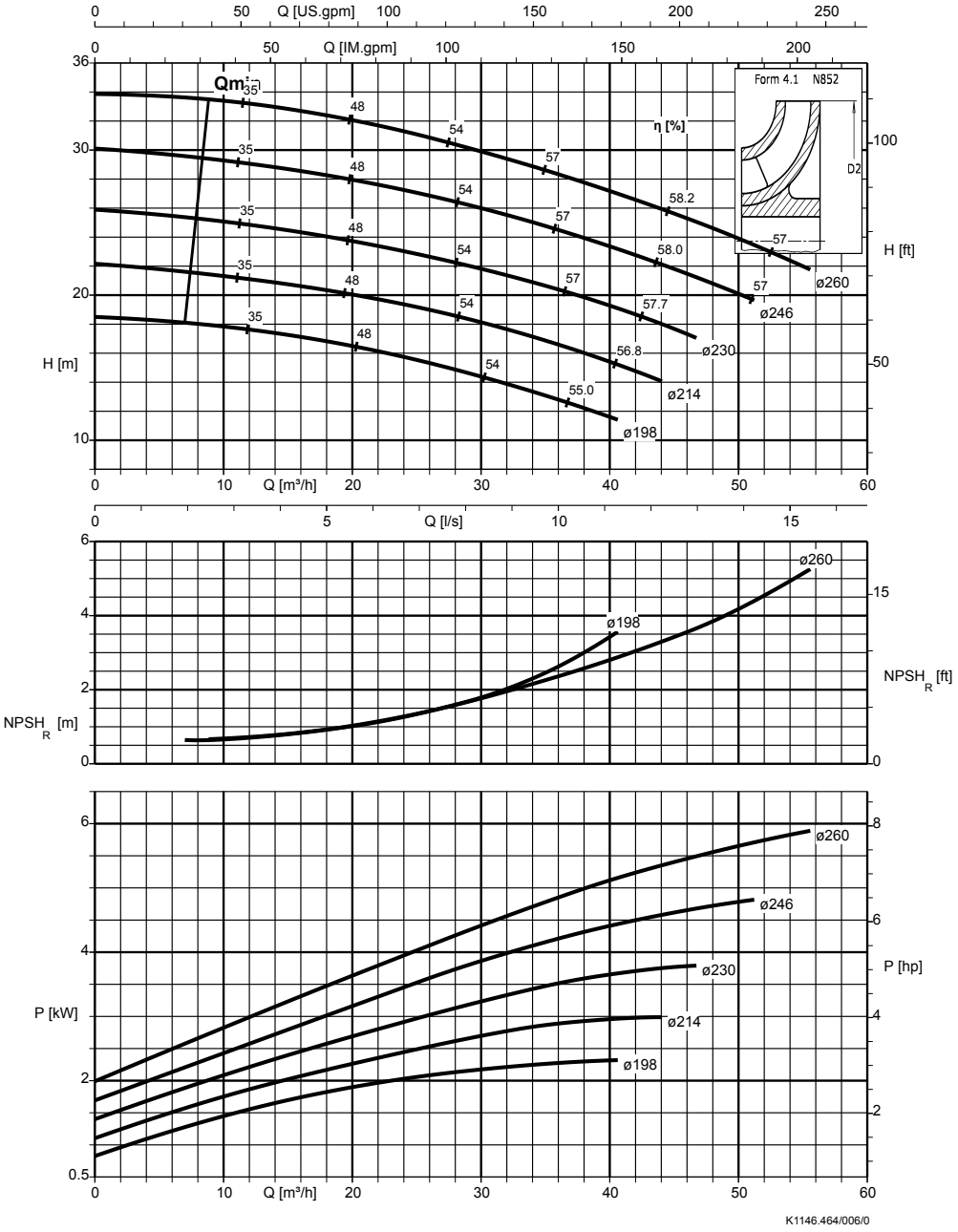
Etaline 40-250, n = 1750 rpm



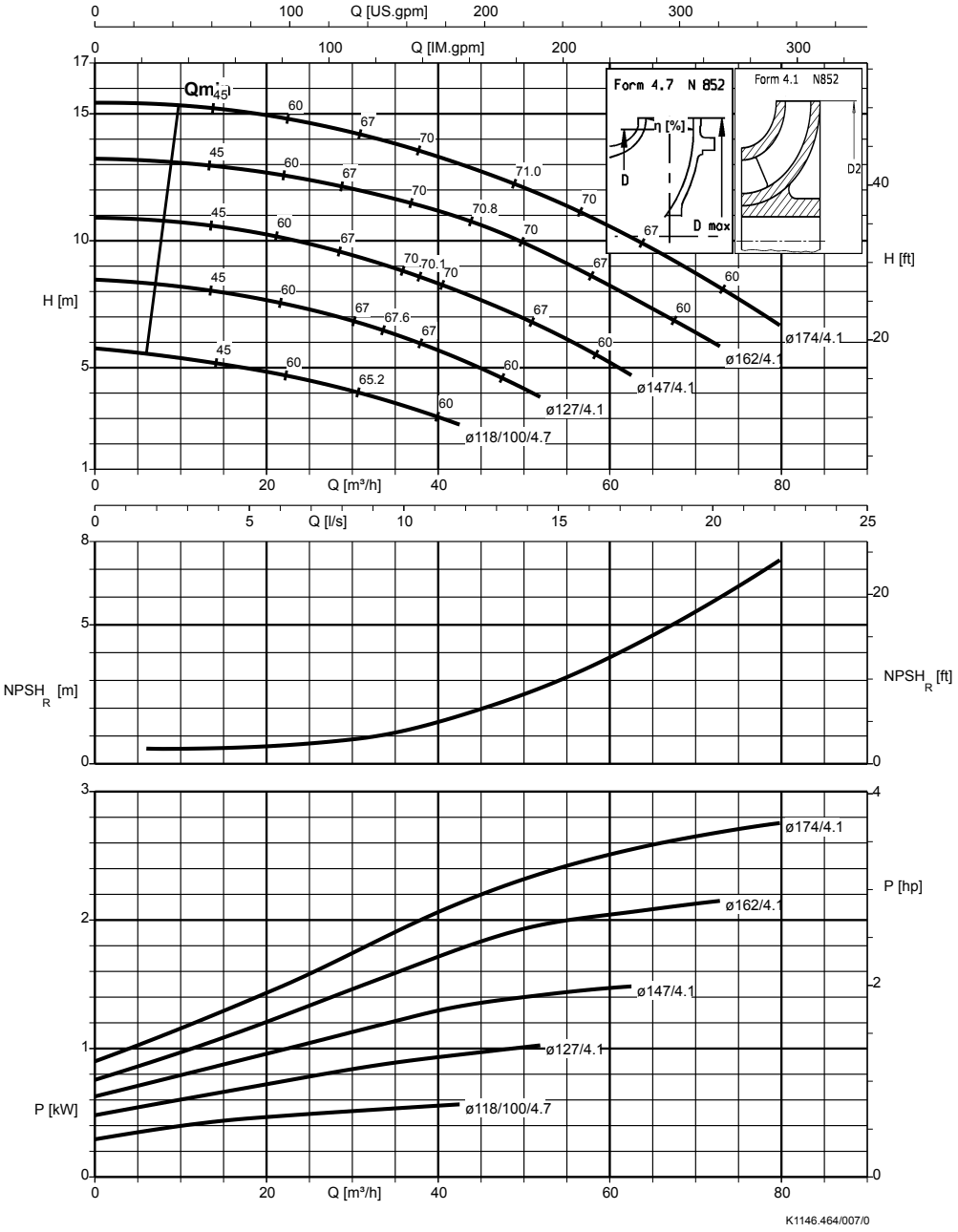
Etaline 50-160, n = 1750 rpm



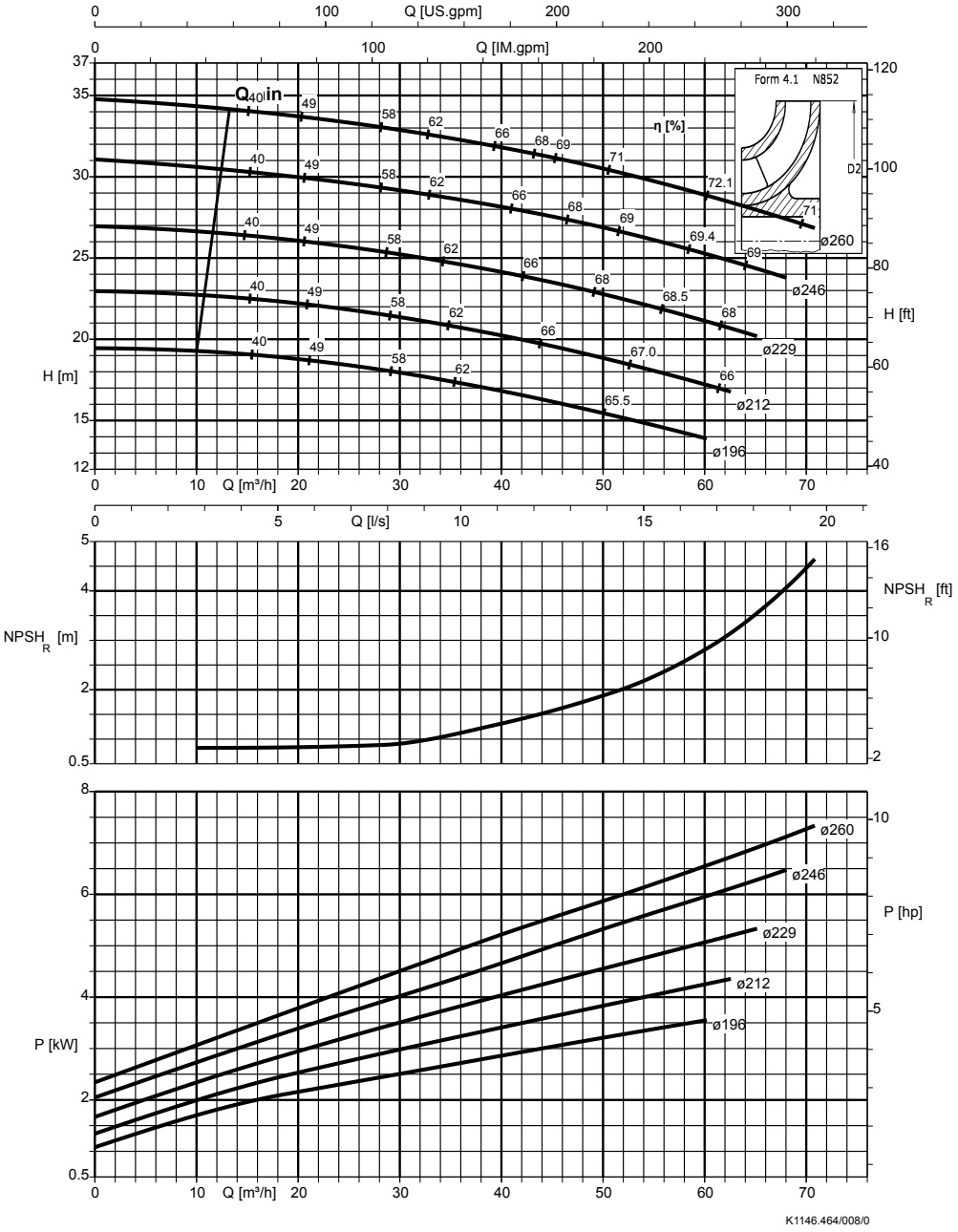
Etaline 50-250, n = 1750 rpm



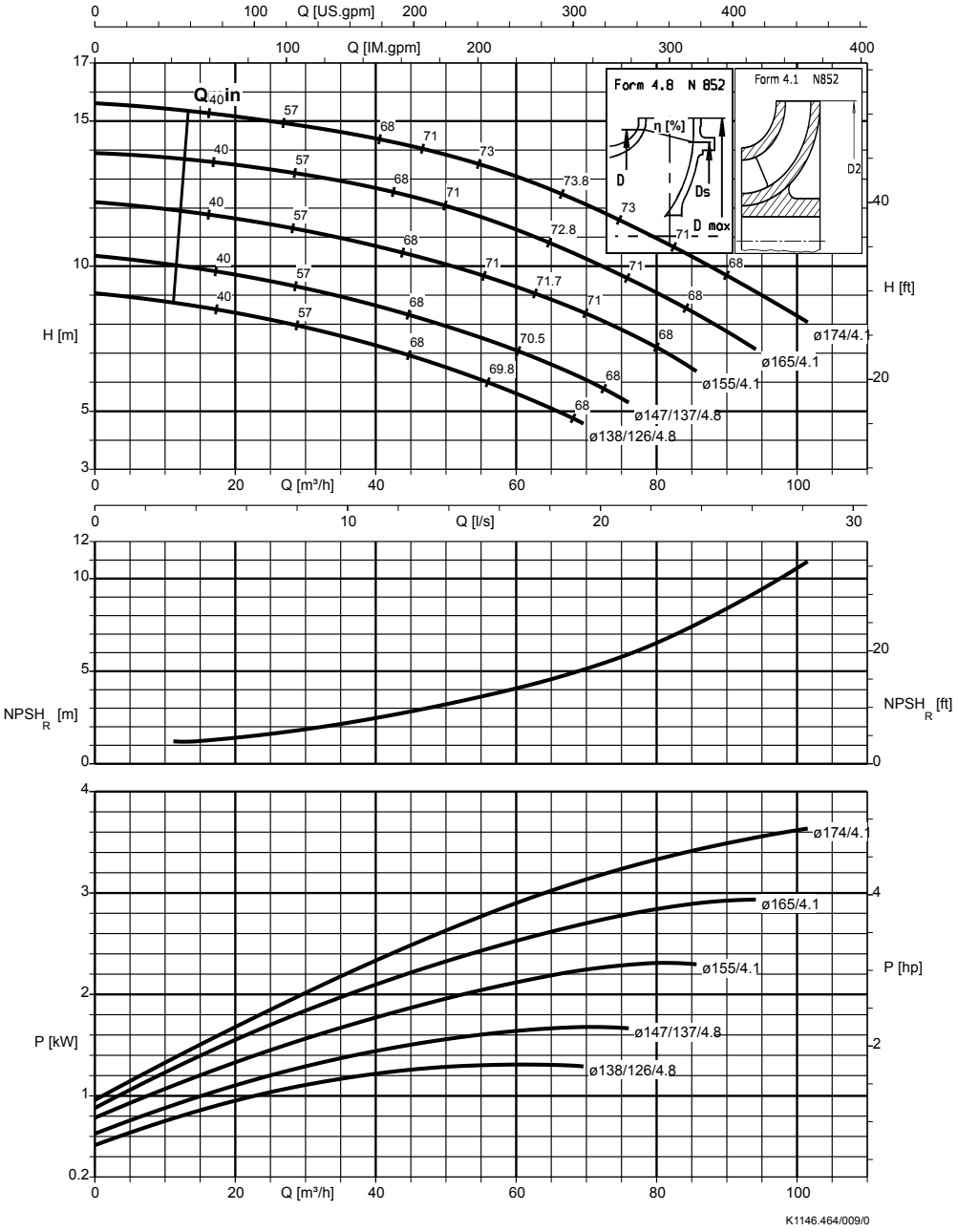
Etaline 65-160, n = 1750 rpm



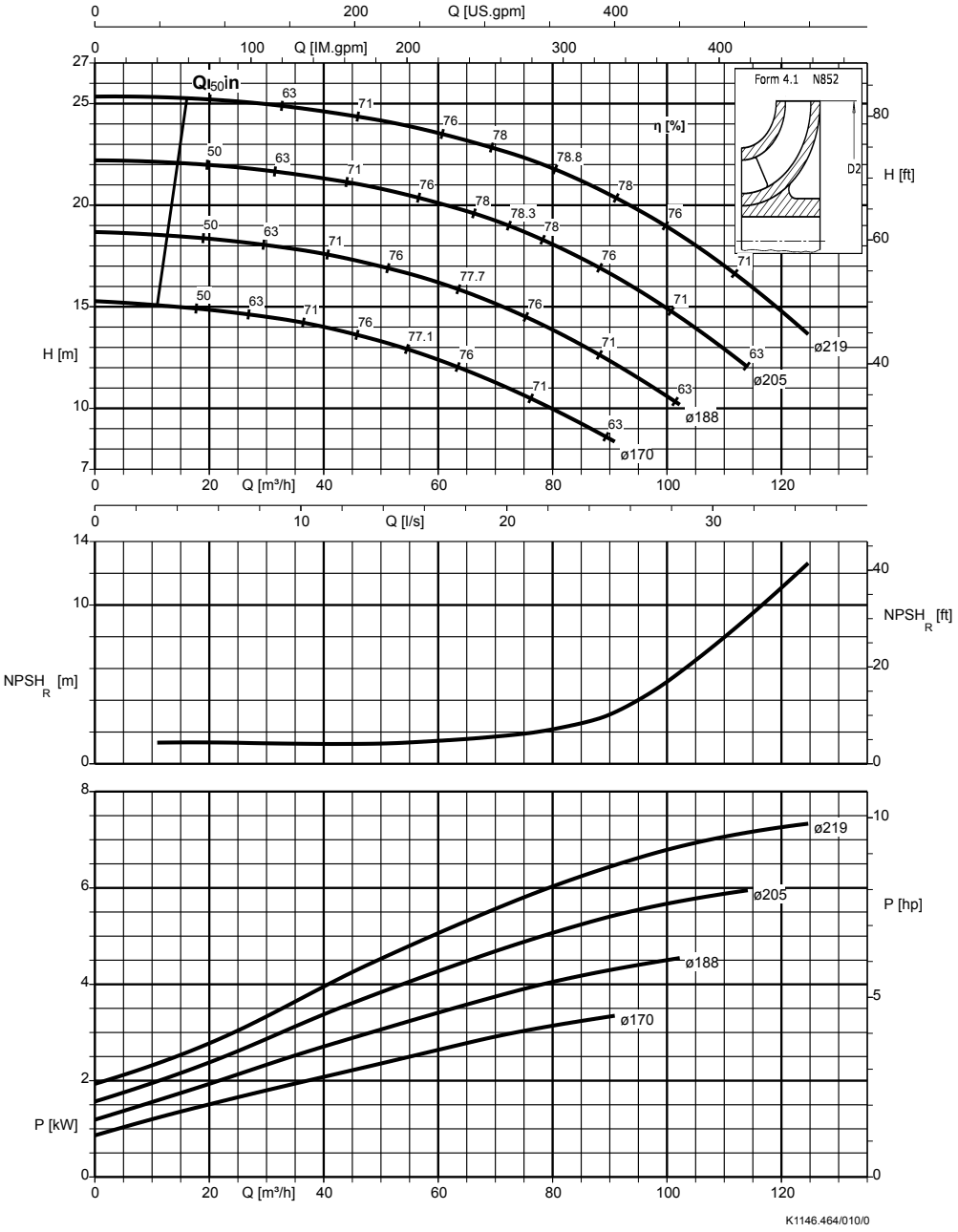
Etaline 65-250, n = 1750 rpm



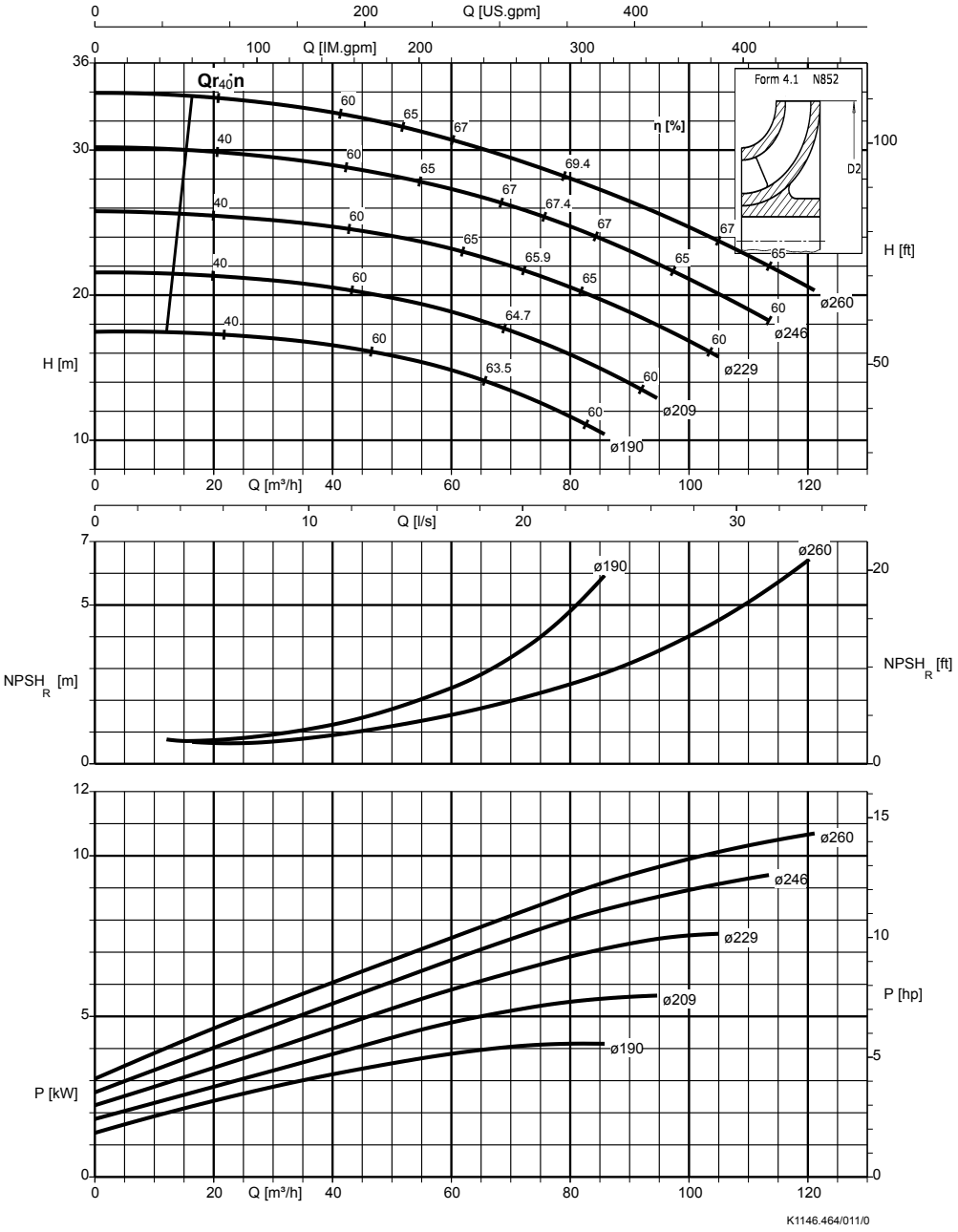
Etaline 80-160, n = 1750 rpm



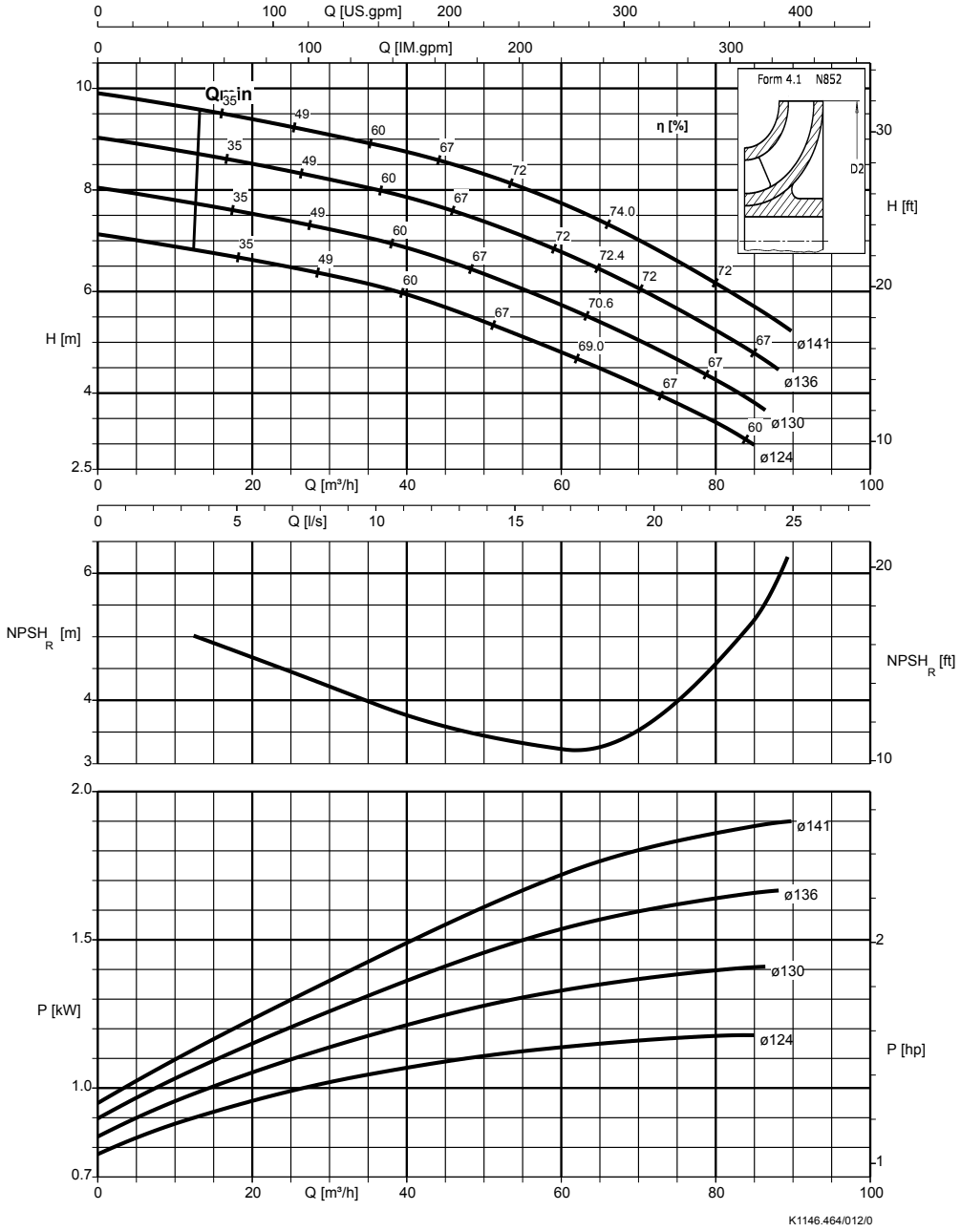
Etaline 80-210, n = 1750 rpm



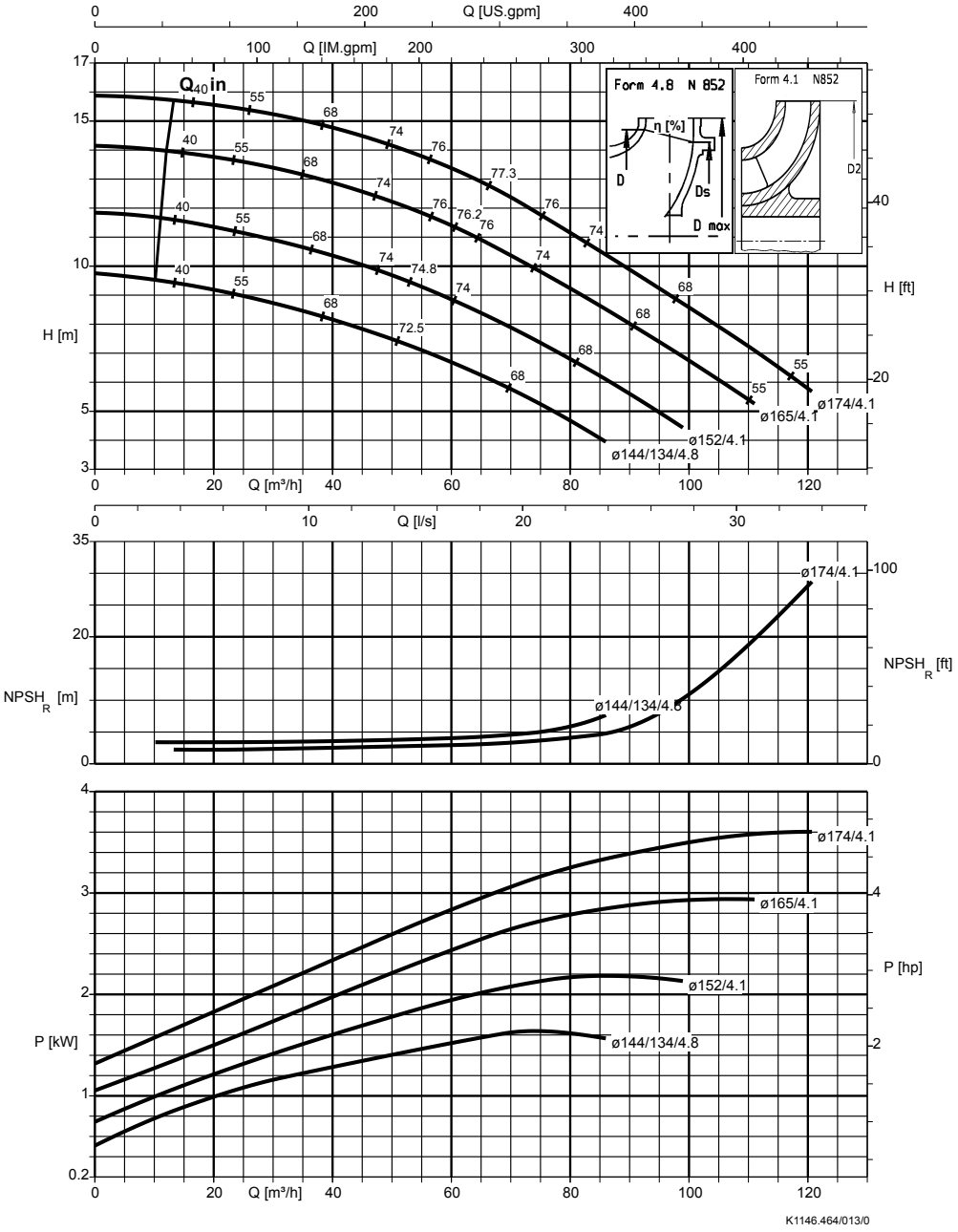
Etaline 80-250, n = 1750 rpm



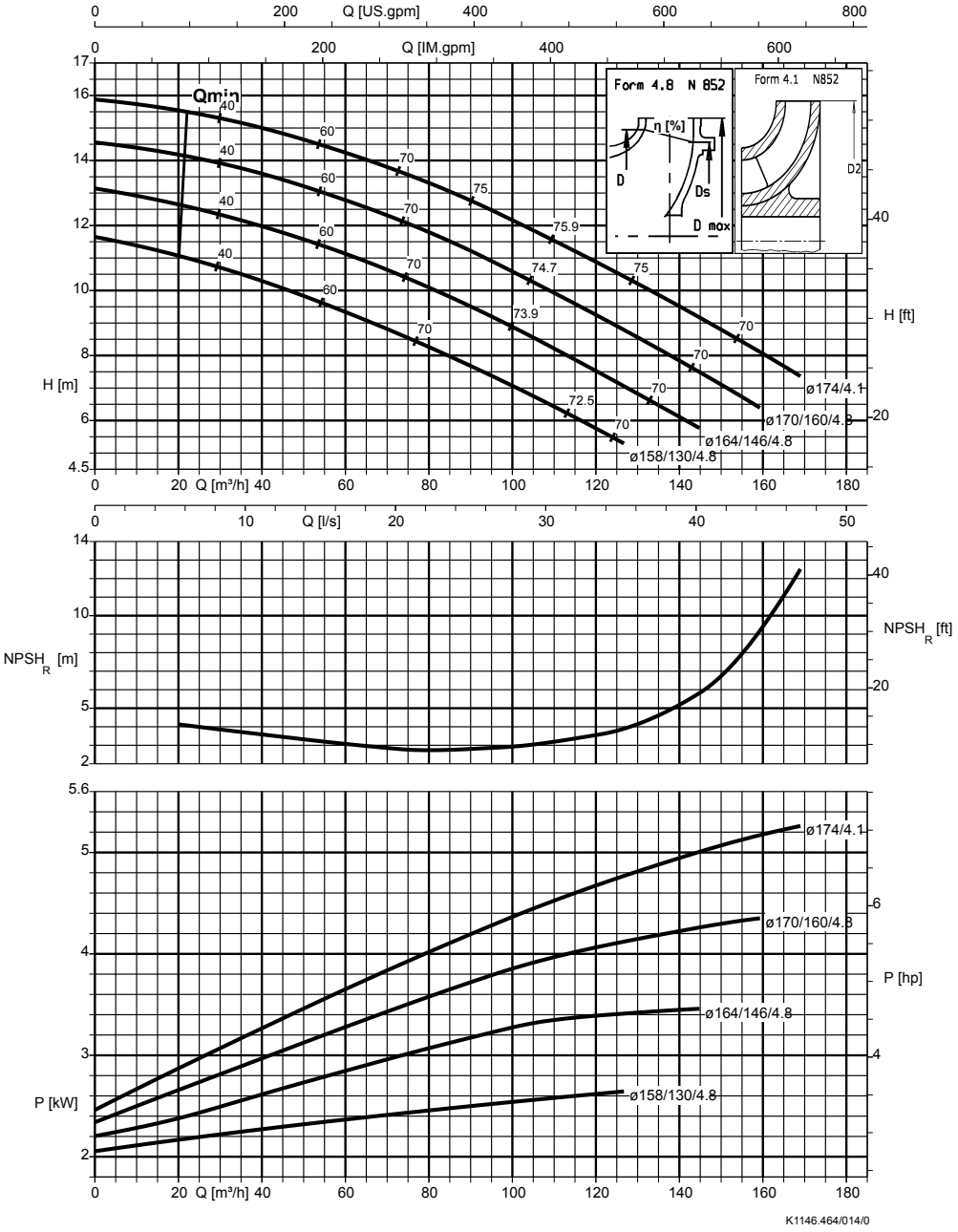
Etaline 100-125, n = 1750 rpm



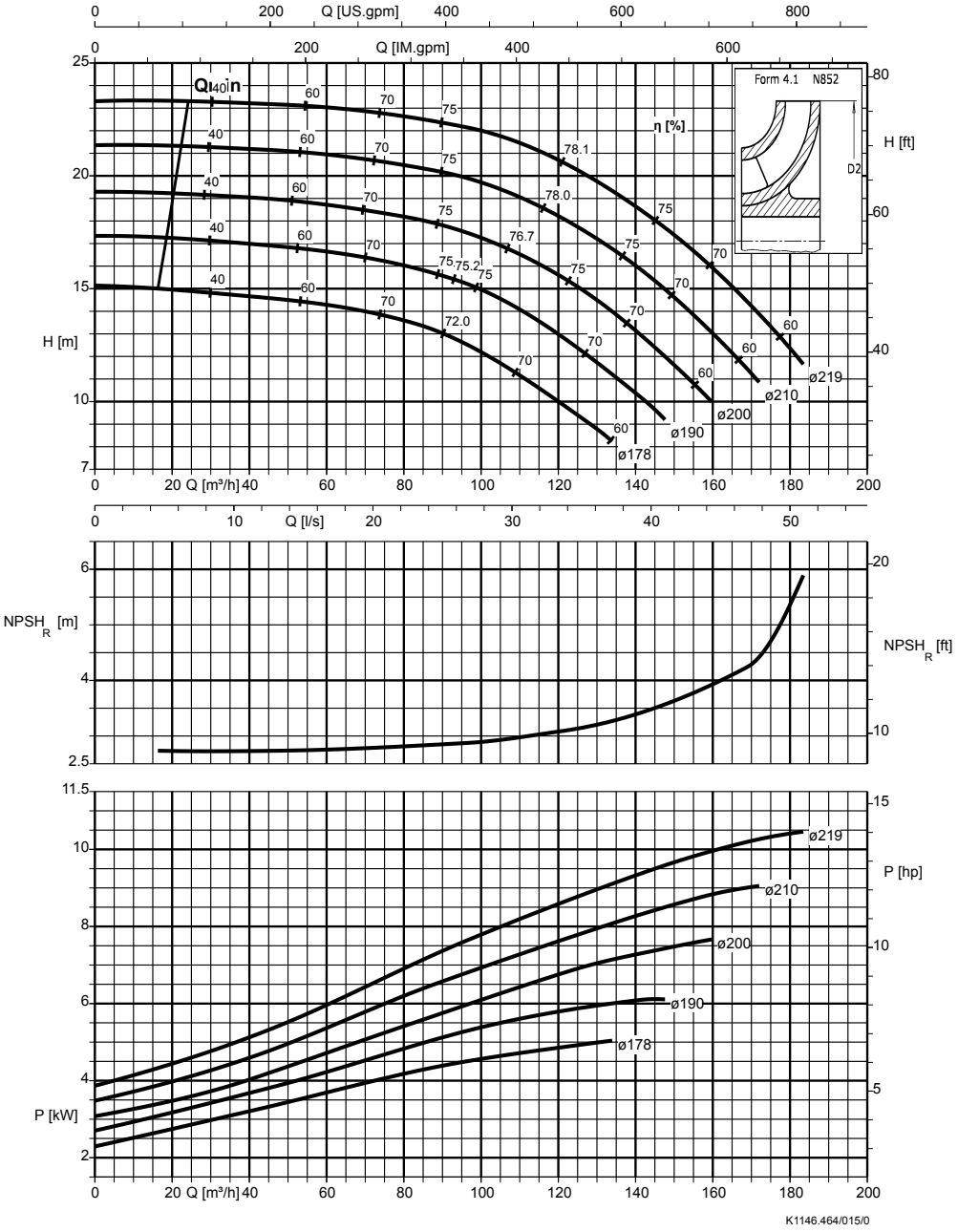
Etaline 100-160, n = 1750 rpm



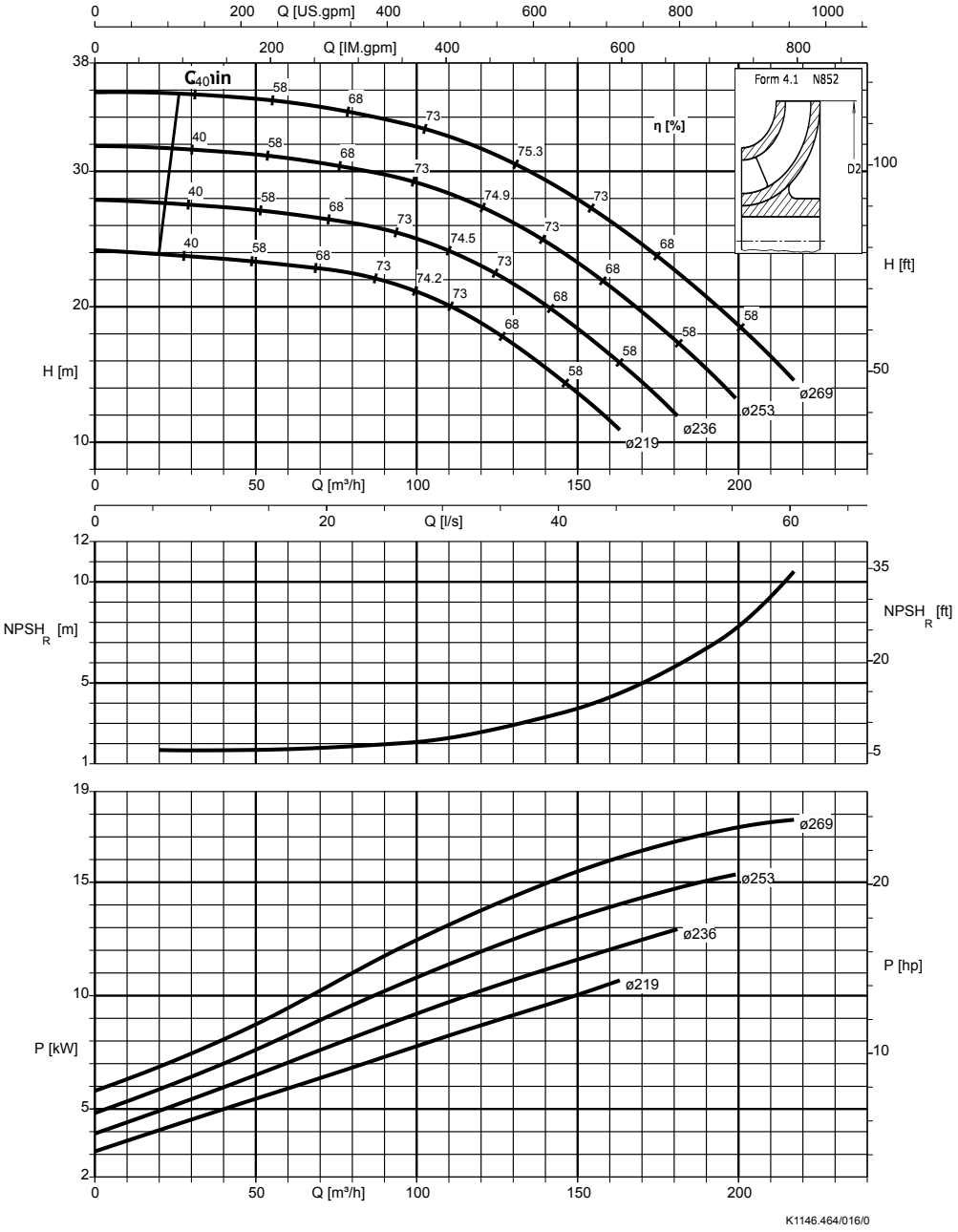
Etaline 100-170, n = 1750 rpm



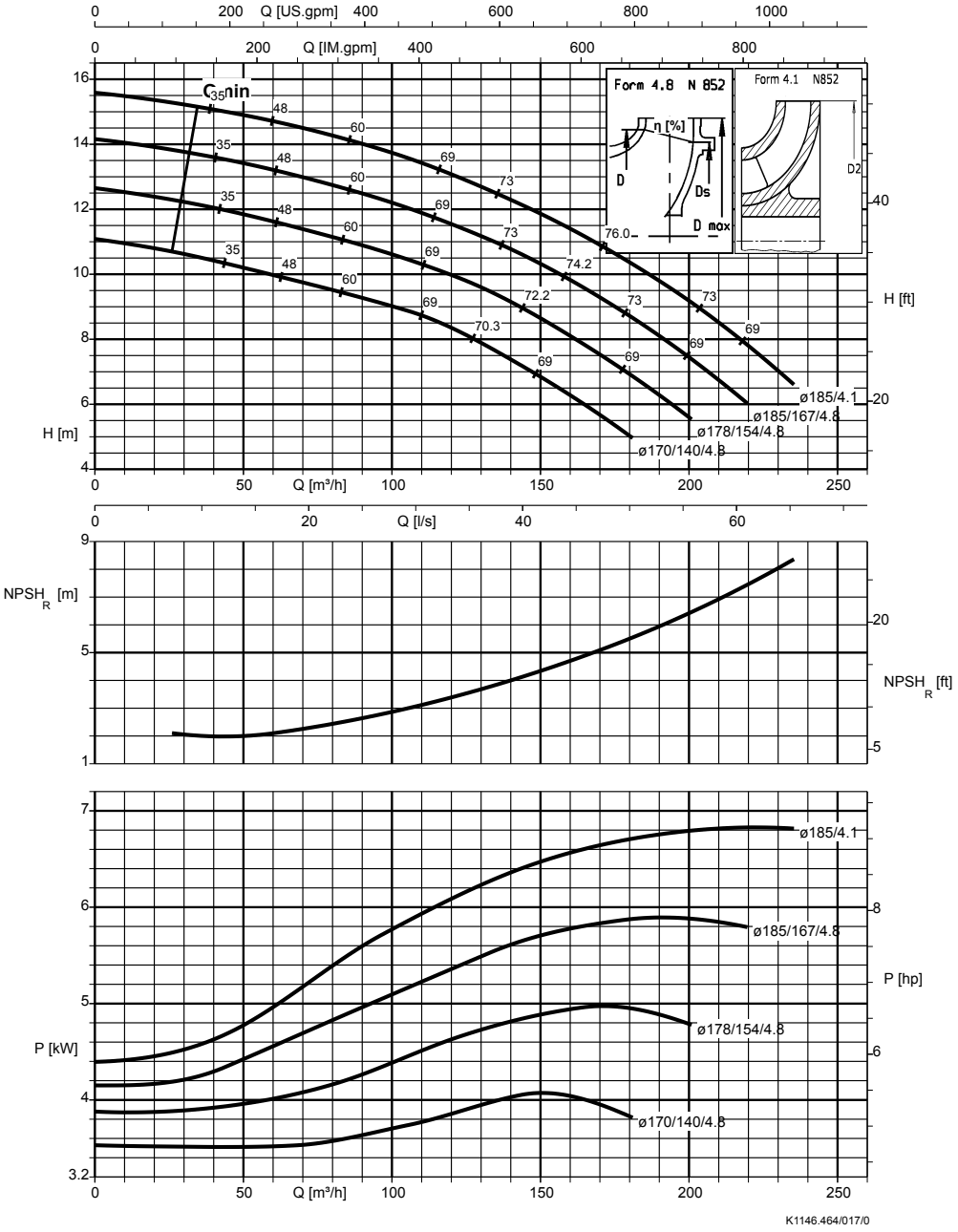
Etaline 100-200, n = 1750 rpm



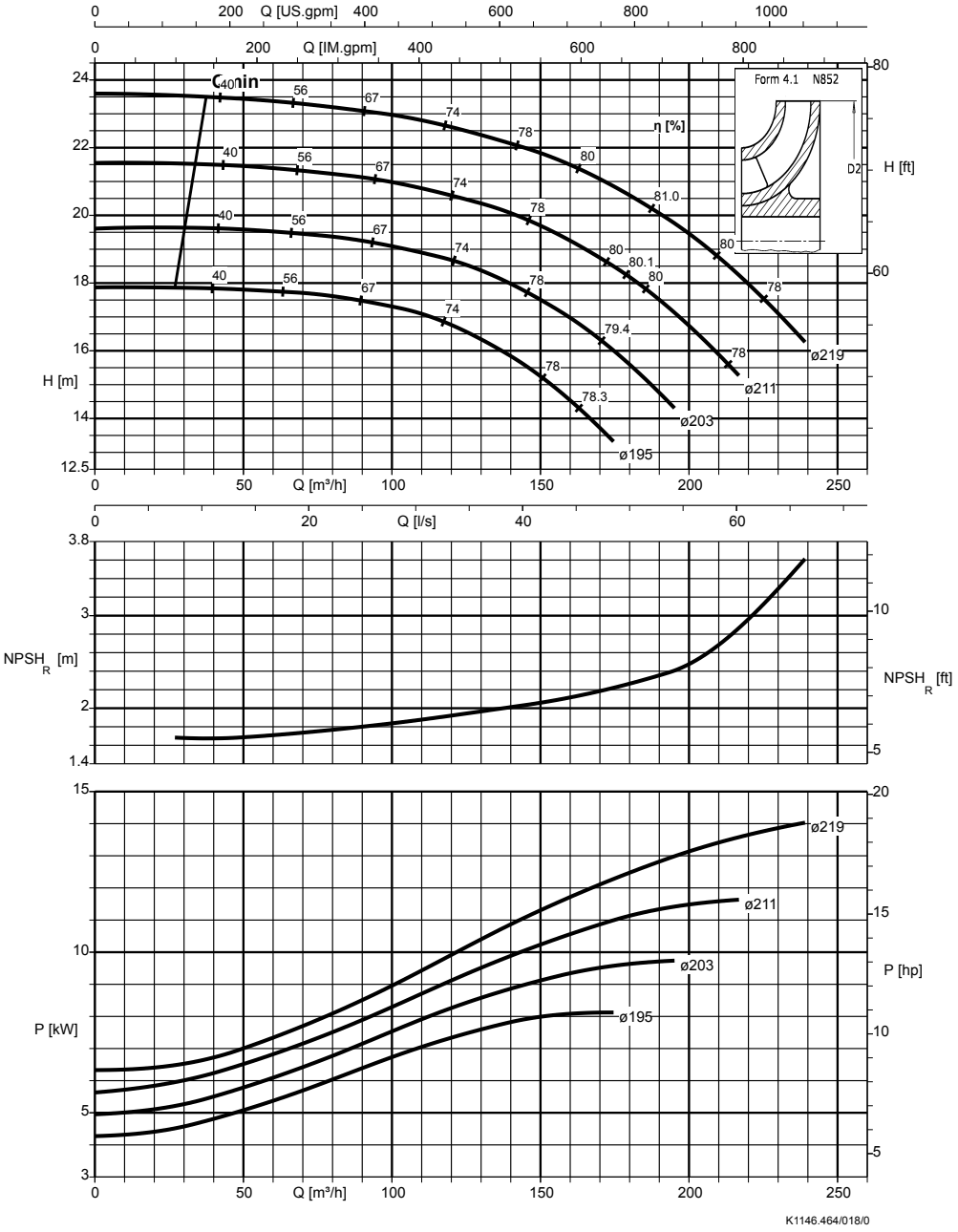
Etaline 100-250, n = 1750 rpm



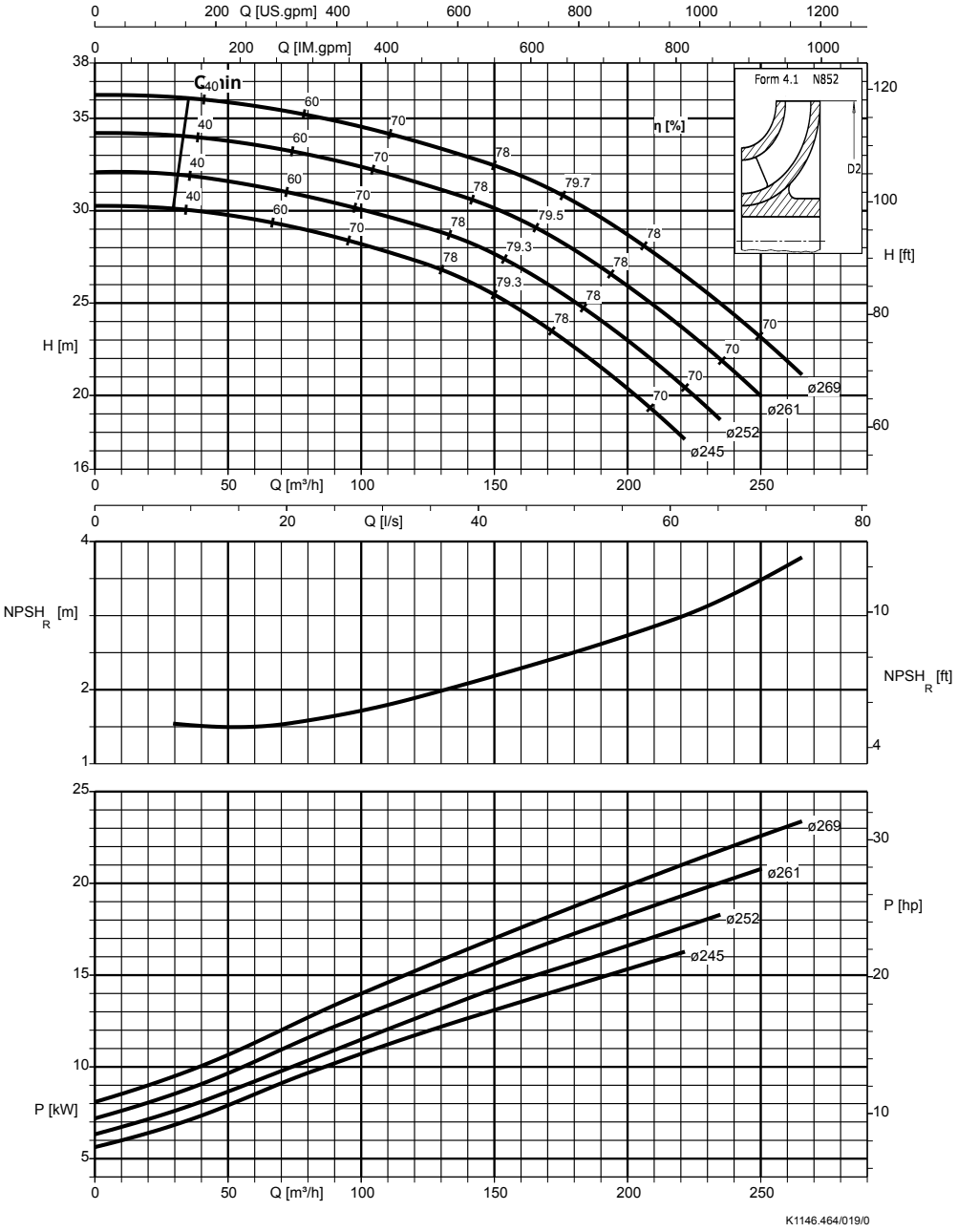
Etaline 125-160, n = 1750 rpm



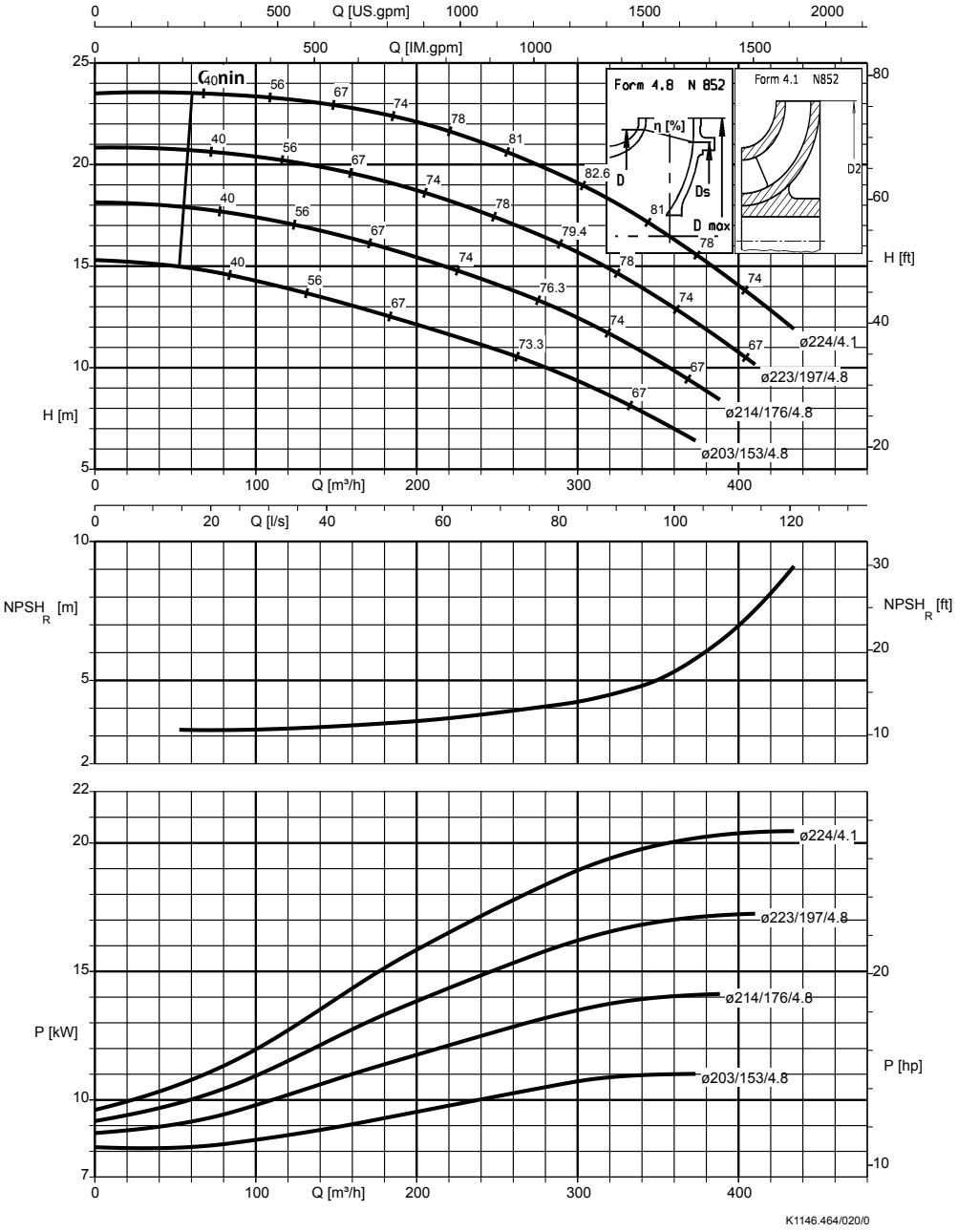
Etaline 125-200, n = 1750 rpm



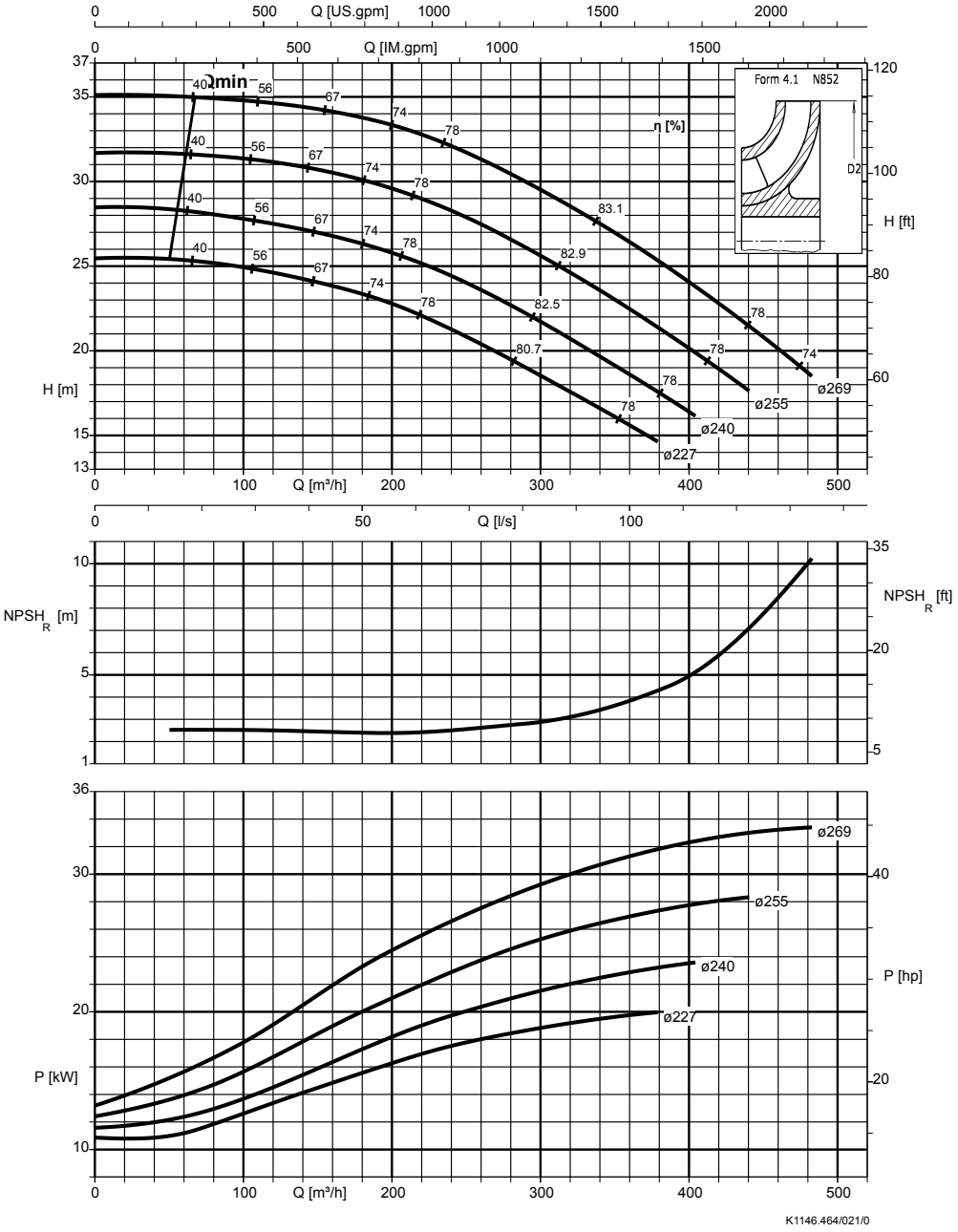
Etaline 125-250, n = 1750 rpm



Etaline 150-200, n = 1750 rpm

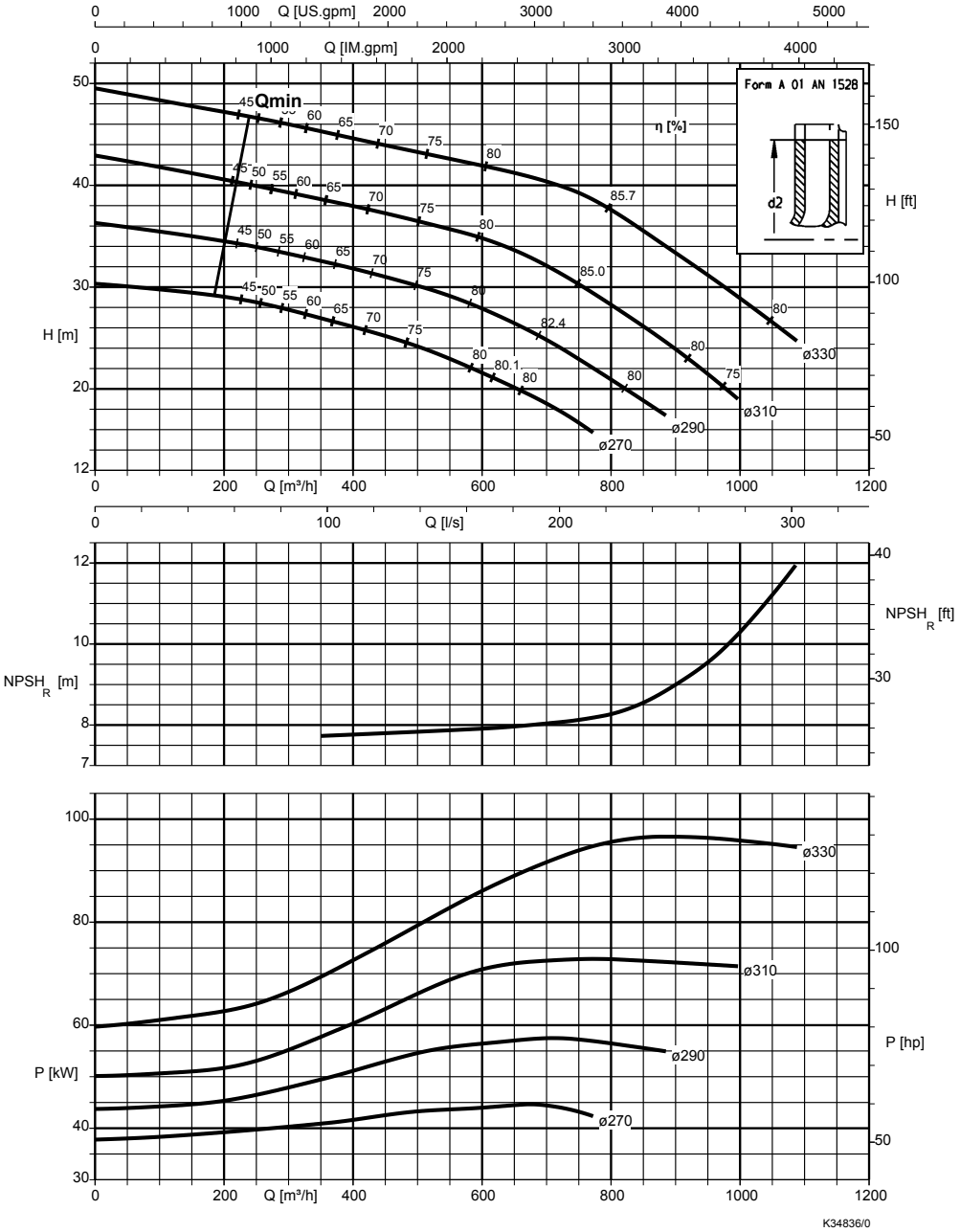


Etaline 150-250, n = 1750 rpm

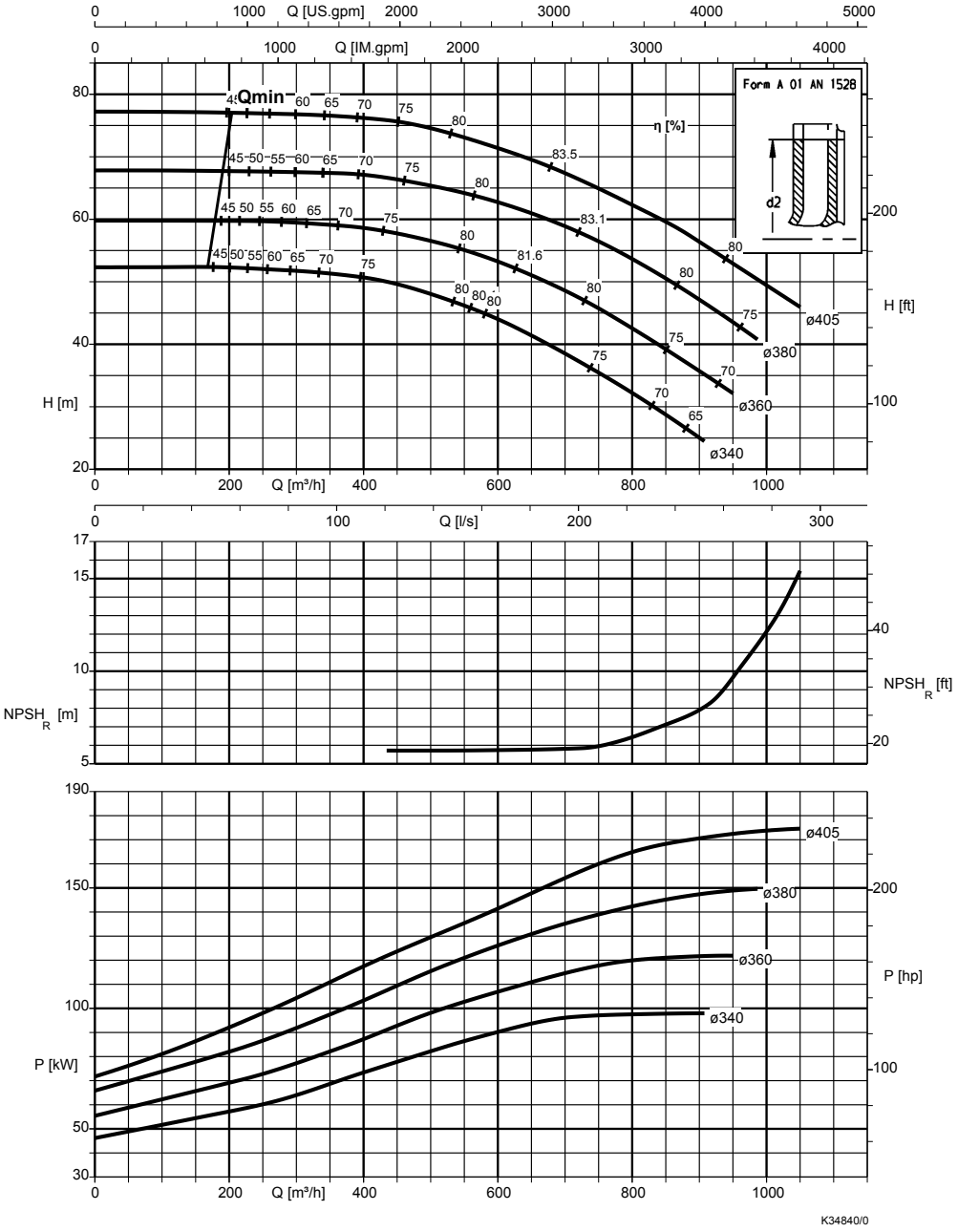


Etaline-R, n = 1750 rpm

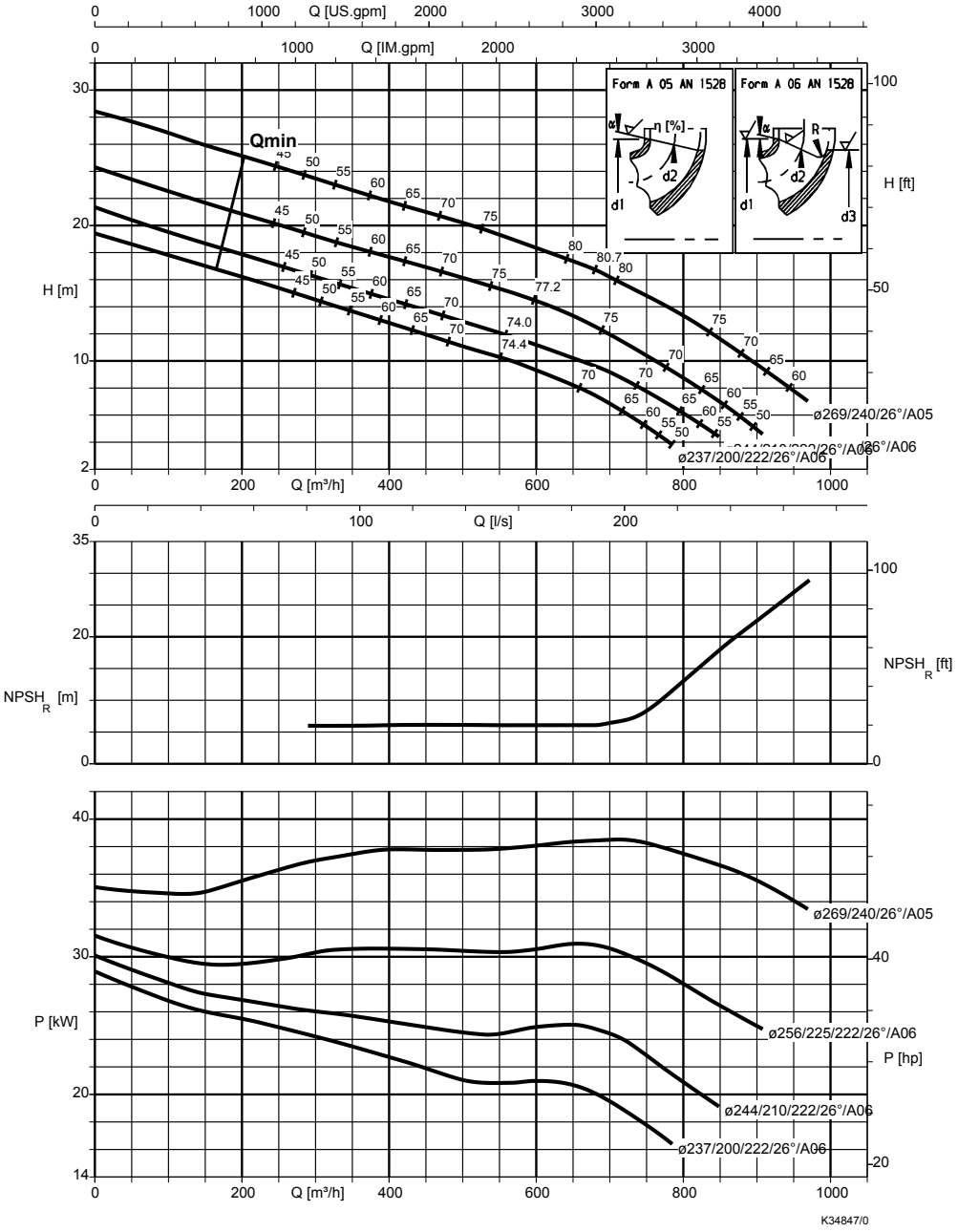
Etaline-R 200-330, n = 1750 rpm



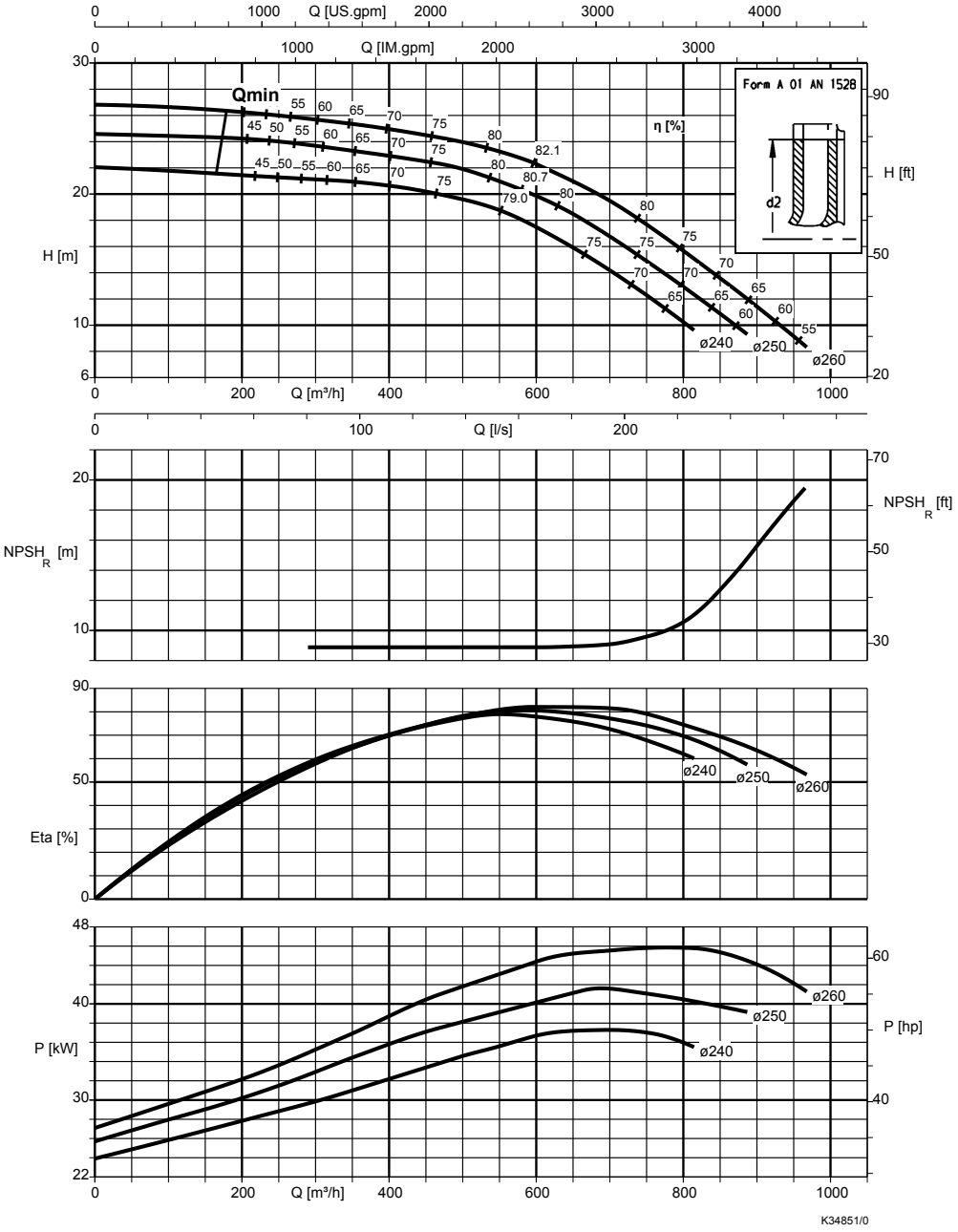
Etaline-R 200-400, n = 1750 rpm



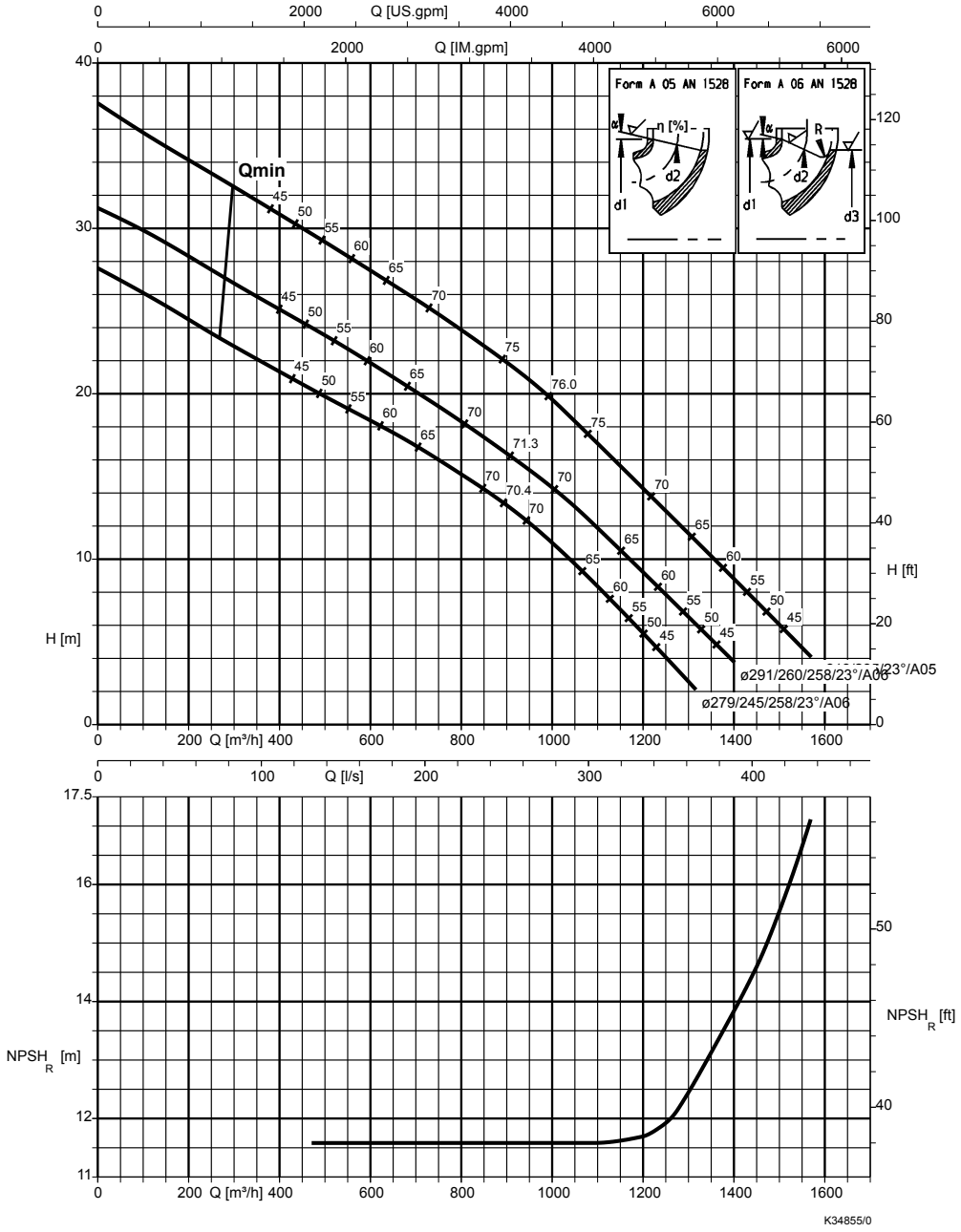
Etaline-R 250-250, n = 1750 rpm



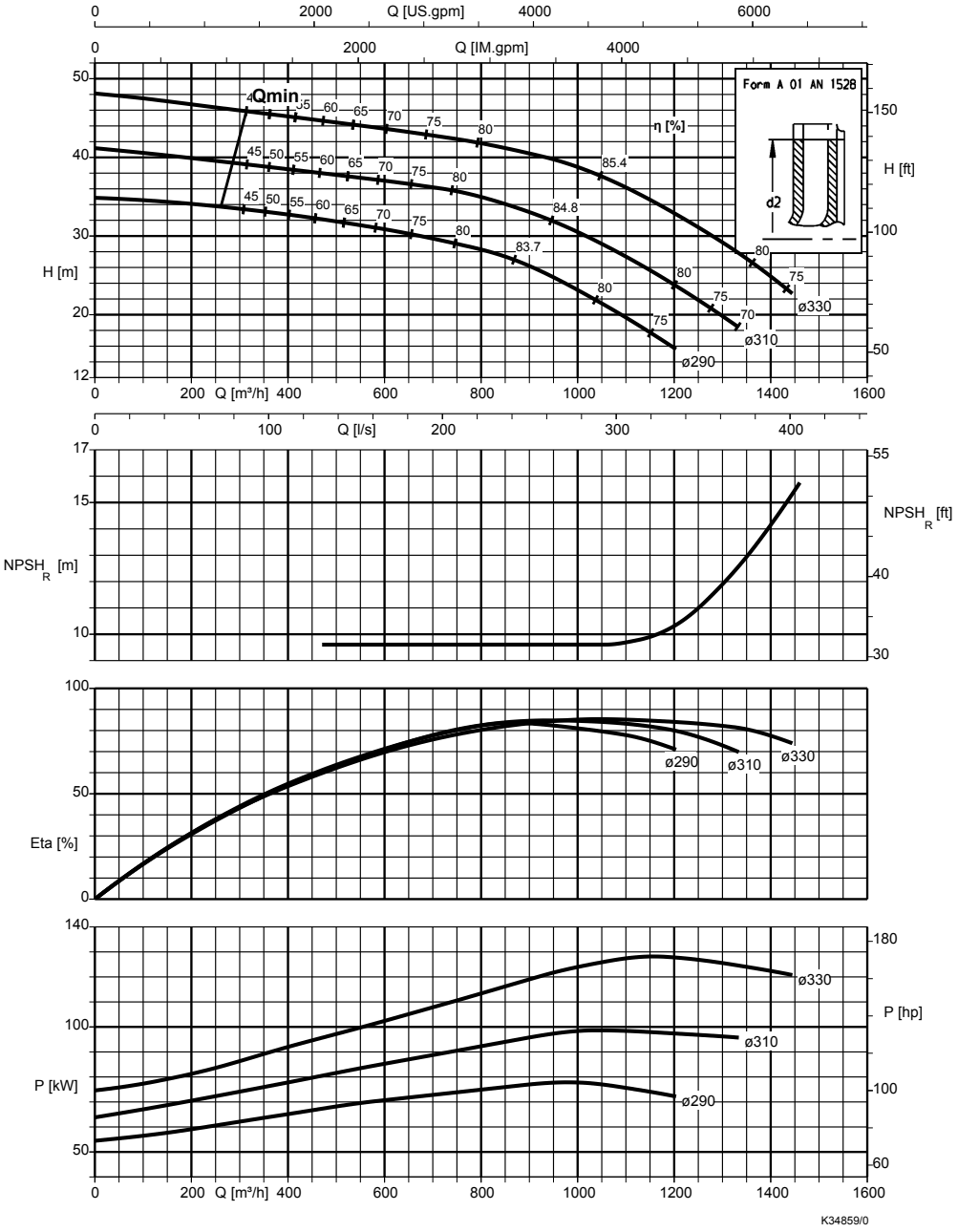
Etaline-R 250-260, n = 1750 rpm



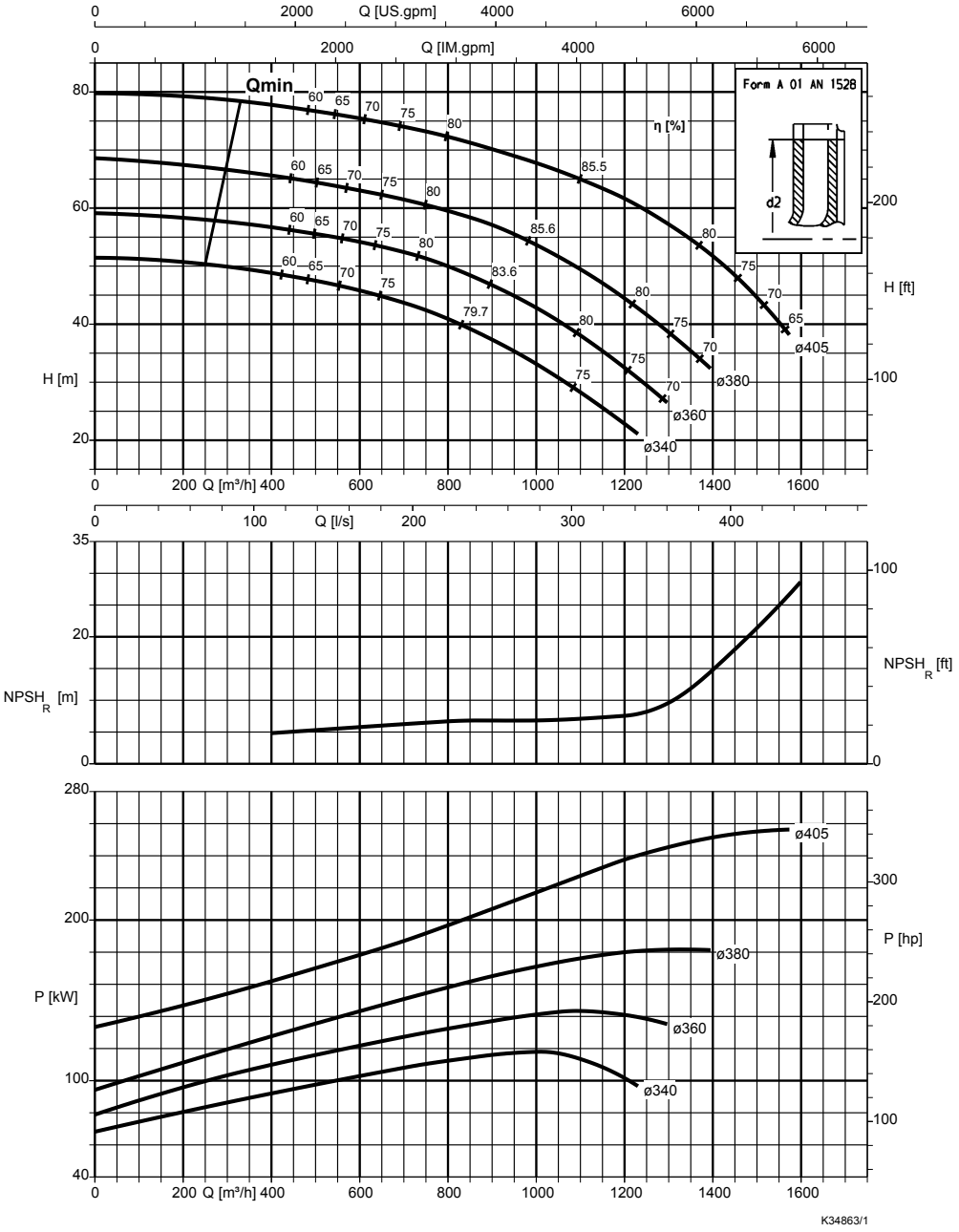
Etaline-R 250-300, n = 1750 rpm



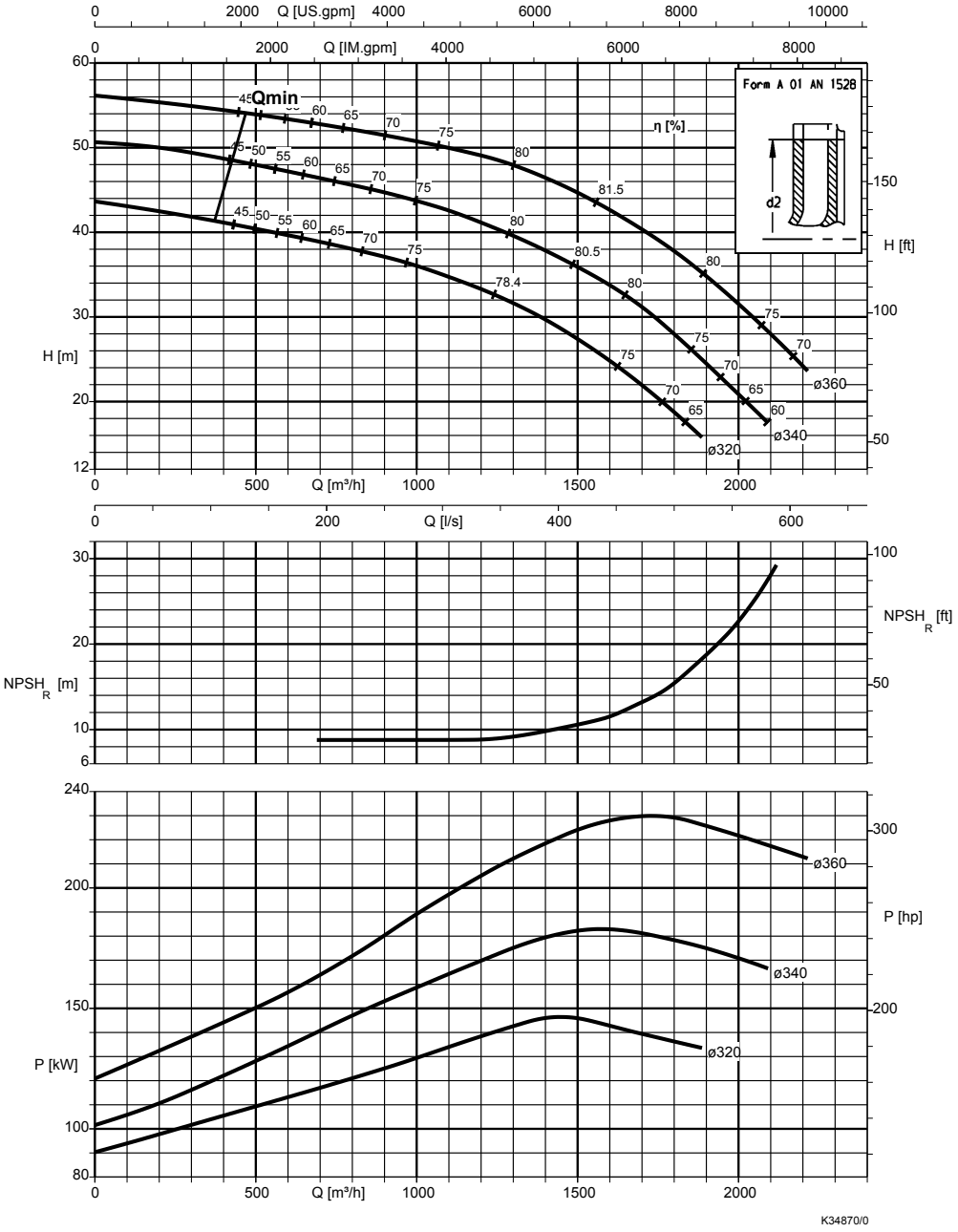
Etaline-R 250-330, n = 1750 rpm



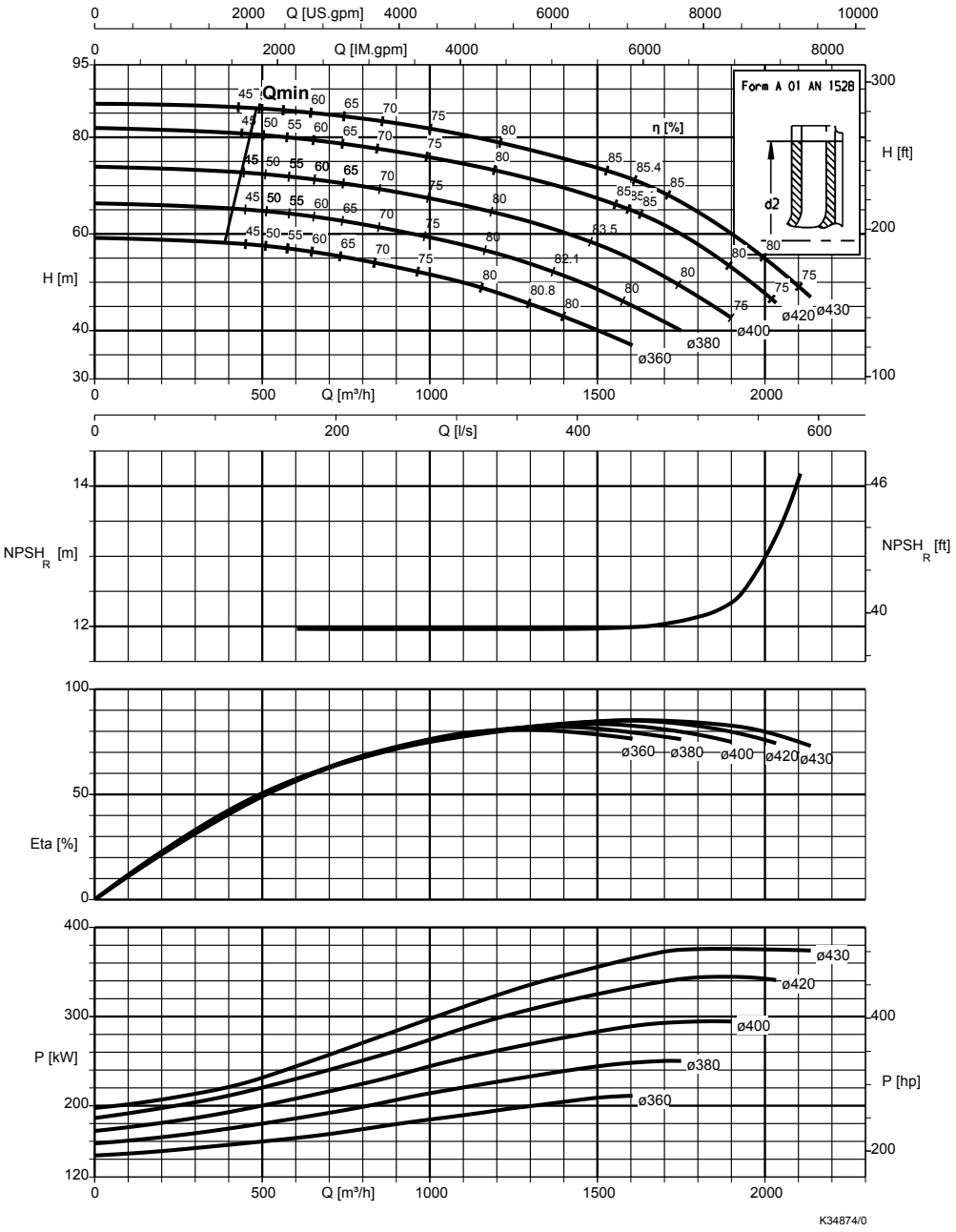
Etaline-R 250-400, n = 1750 rpm



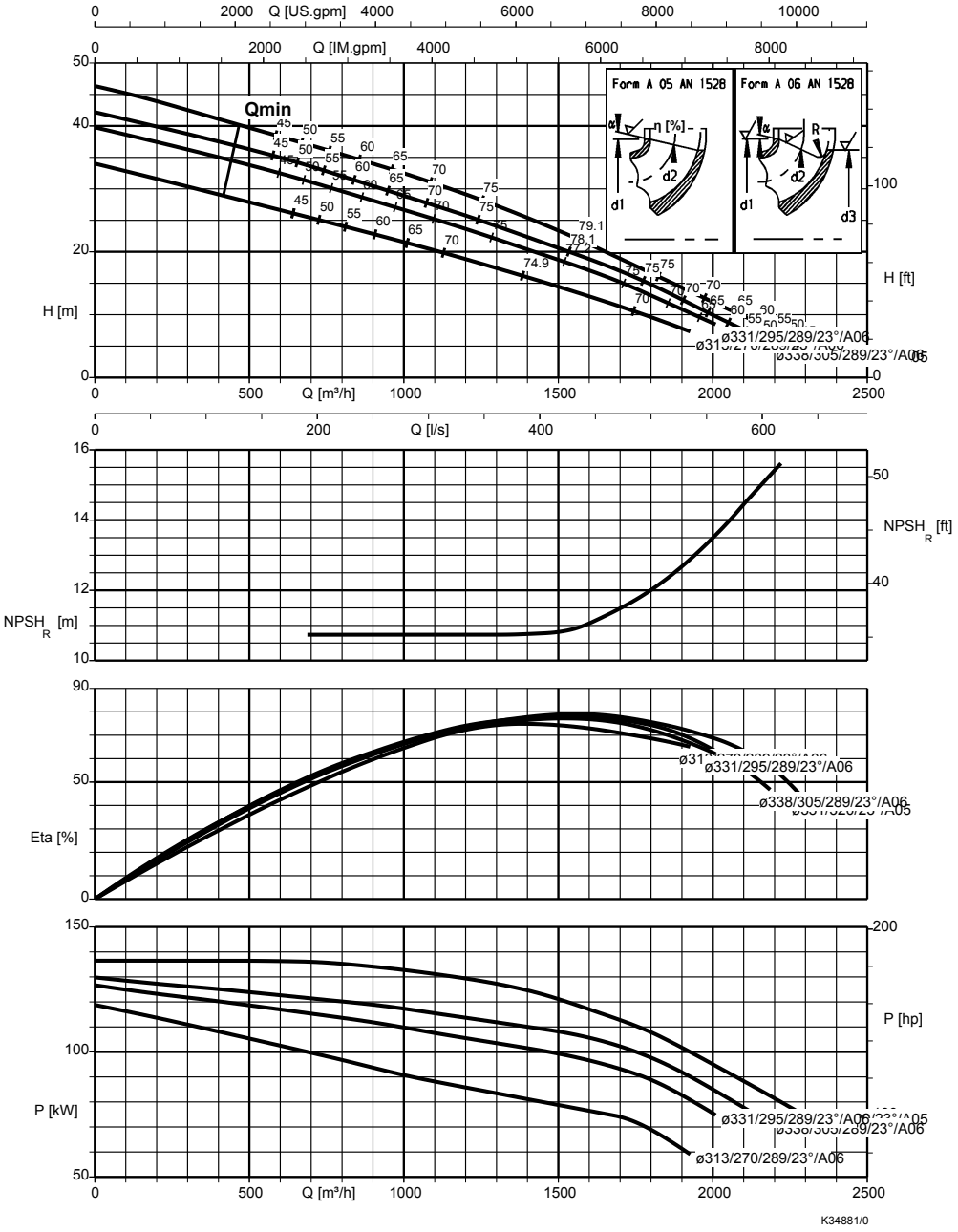
Etaline-R 300-360, n = 1750 rpm



Etaline-R 300-400, n = 1750 rpm

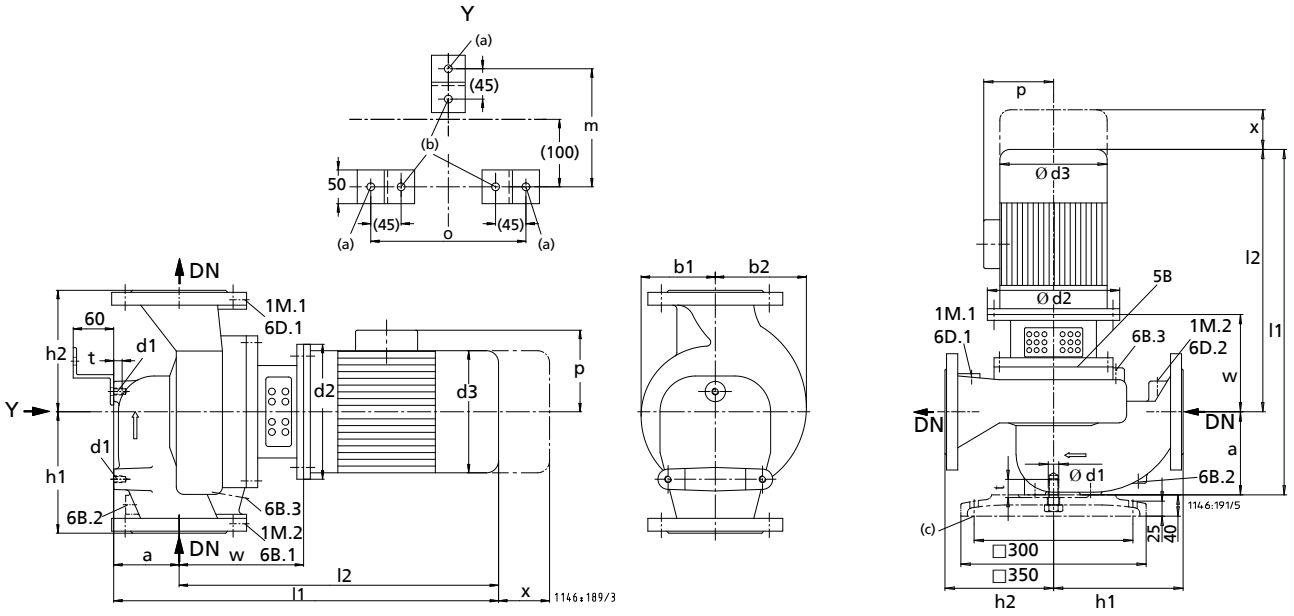


Etaline-R 350-340, n = 1750 rpm



Dimensions

Etaline GN, MN, n = 3500 rpm



~ x	Clearance for removal	6D.1/.2	Fluid venting
1M.1/.2	Connection for pressure gauge	(a)	Foundation fastening
5B	Venting - special design for vertical installation	(b)	Pump fastening
6B.1/.2/.3	Fluid drain	(c)	For 4 M12 bolts
Pump sizes Etaline 32-160/... to 100-160/... are mounted with three steel angle feet.			
Pump sizes Etaline 100-170/... to 150-250/... are mounted with a pump foot made of grey cast iron.			

Mating dimensions [mm]

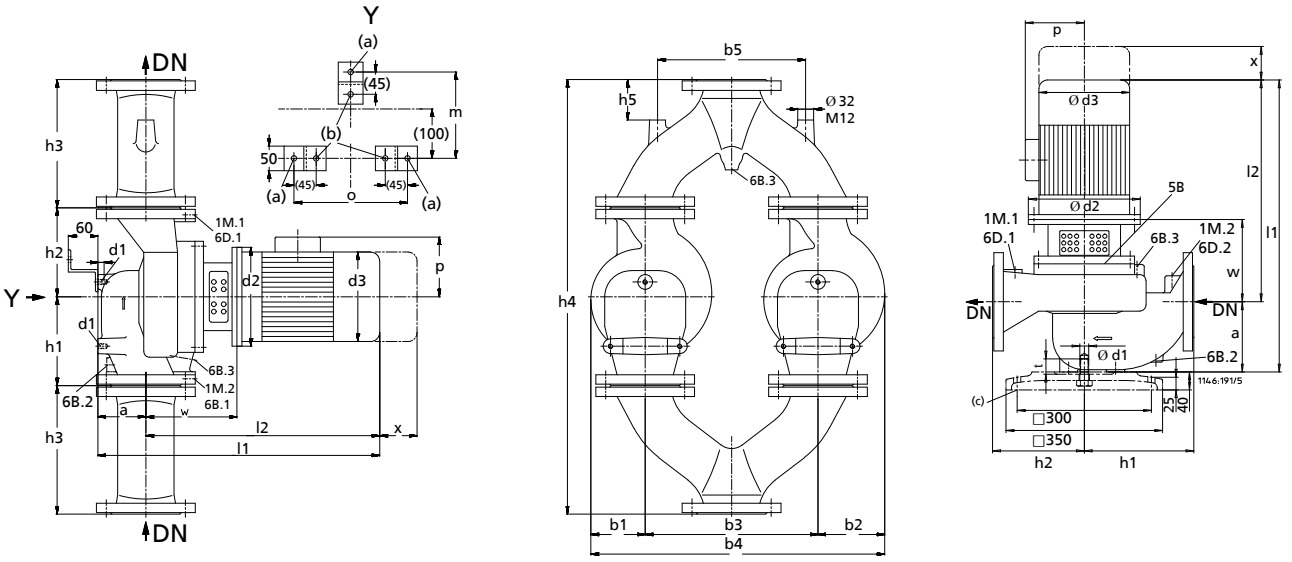
Etaline	DN[14]	a	~ b1	~ b2	d1	d2	d3	p	h1	h2	~l1	~l2	t	~x	w	1M. 1/.2	6B. $_1$15)	6B. $_2$15)	6B. $_3$15)	6D. $_1$15)	6D. $_2$15)	m	o
32-160/112	32	69	112	120	M10	200	162	120	160	160	508	439	12.5	100	170	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-160/152	32	69	112	120	M10	200	190	128	160	160	521	452	12.5	100	170	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-160/222	32	69	112	120	M10	200	190	128	160	160	547	478	12.5	100	170	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-160/302	32	69	112	120	M10	250	213	135	160	160	600	531	12.5	100	184	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-160/402	32	69	112	120	M10	250	234	148	160	160	624	555	12.5	100	184	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-160/552	32	69	112	120	M10	300	266	167	160	160	689	620	12.5	100	207	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-160/752	32	69	112	120	M10	300	266	167	160	160	689	620	12.5	100	207	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-200/302	32	95	129	135	M10	250	213	135	190	190	622	527	12.5	100	180	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-200/402	32	95	129	135	M10	250	234	148	190	190	646	551	12.5	100	180	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-200/552	32	95	129	135	M10	300	266	167	190	190	711	616	12.5	100	203	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-200/752	32	95	129	135	M10	300	266	167	190	190	711	616	12.5	100	203	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-200/1102	32	95	129	135	M10	350	325	197	190	190	877	782	12.5	100	236	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
32-200/1502	32	95	129	135	M10	350	325	197	190	190	877	782	12.5	100	236	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
40-160/222	40	80	112	119	M10	200	190	128	160	160	559	479	12.5	100	171	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
40-160/302	40	80	112	119	M10	250	213	135	160	160	612	532	12.5	100	185	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
40-160/402	40	80	112	119	M10	250	234	148	160	160	636	556	12.5	100	185	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
40-160/552	40	80	112	119	M10	300	266	167	160	160	701	621	12.5	100	208	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
40-160/752	40	80	112	119	M10	300	266	167	160	160	701	621	12.5	100	208	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
40-160/1102	40	80	112	119	M10	350	325	197	160	160	867	787	12.5	100	241	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
50-160/152	50	85	113	125	M10	200	190	128	170	170	543	458	12.5	100	176	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
50-160/222	50	85	113	125	M10	200	190	128	170	170	569	484	12.5	100	176	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
50-160/302	50	85	113	125	M10	250	213	135	170	170	622	537	12.5	100	190	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
50-160/402	50	85	113	125	M10	250	234	148	170	170	646	561	12.5	100	190	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
50-160/552	50	85	113	125	M10	300	266	167	170	170	711	626	12.5	100	213	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
50-160/752	50	85	113	125	M10	300	266	167	170	170	711	626	12.5	100	213	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
50-160/1102	50	85	113	125	M10	350	325	197	170	170	877	792	12.5	100	246	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
50-160/1502	50	85	113	125	M10	350	325	197	170	170	877	792	12.5	100	246	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	190	190
65-160/222	65	100	113	125	M10	200	190	128	170	170	584	484	12.5	100	176	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
65-160/302	65	100	113	125	M10	250	213	135	170	170	637	537	12.5	100	190	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
65-160/402	65	100	113	125	M10	250	234	148	170	170	661	561	12.5	100	190	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
65-160/552	65	100	113	125	M10	300	266	167	170	170	726	626	12.5	100	213	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
65-160/752	65	100	113	125	M10	300	266	167	170	170	726	626	12.5	100	213	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
65-160/1102	65	100	113	125	M10	350	325	197	170	170	892	792	12.5	100	246	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
65-160/1502	65	100	113	125	M10	350	325	197	170	170	892	792	12.5	100	246	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
65–160/1852	65	100	113	125	M10	350	325	197	170	170	898	798	12.5	100	246	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
65-160/2202	65	100	113	125	M10	350	370	258	170	170	956	856	12.5	100	246	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	175	210	210
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	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	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	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	230

14) DN = EN 1092-2, PN 16
15) Rc = ISO 7/1

Etaline	DN[14]	a	~b1	~b2	d1	d2	d3	p	h1	h2	~l1	~l2	t	~x	w	1M. 1/.2	6B. $_1$[15]	6B. $_2$[15]	6B. $_3$[15]	6D. $_1$[15]	6D. $_2$[15]	m	o
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	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	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	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	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	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	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	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	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	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	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	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	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	230

14) DN = EN 1092-2, PN 16
15) Rc = ISO 7/1

Etaline GN, MN, n = 1750 rpm



~ x	Clearance for removal	6 D.1/.2	Fluid venting
1 M.1/.2	Connection for pressure gauge	(a)	Foundation fastening
5 B	Venting - special design for vertical installation	(b)	Pump fastening
6 B.1/.2/.3	Fluid drain	(c)	For 4 M12 bolts
Pump sizes Etaline 32-160/... to 100-160/... are mounted with three steel angle feet.			
Pump sizes Etaline 100-170/... to 150-250/... are mounted with a pump foot made of grey cast iron.			

Mating dimensions [mm]

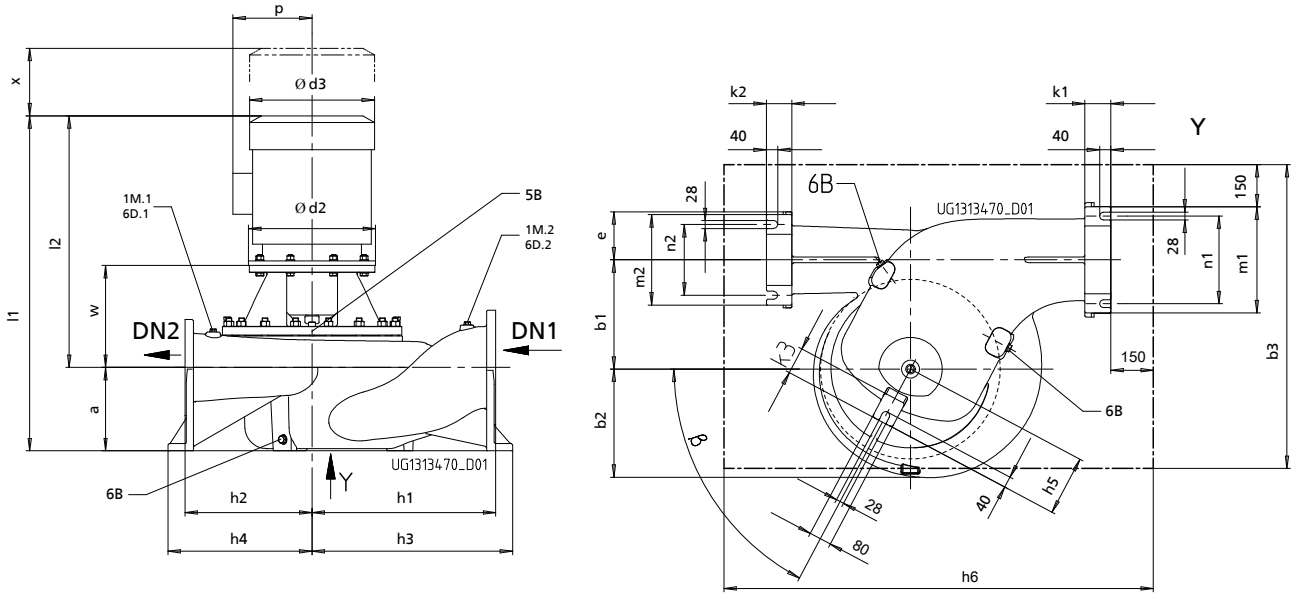
Etaline	DN[16]	a	~ b1	~ b2	d1	d2	d3	p	h1	h2	~l1	~l2	t	~x	w	1M. 1/.2[17]	6B.1	6B.2	6B.3	6D.1	6D.2	m	o	b3	b4	b5	h3	h4	h5
32-160/024	32	69	112	120	M10	160	145	111	160	160	456	387	12.5	100	150	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-60/034	32	69	112	120	M10	160	145	111	160	160	456	387	12.5	100	150	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-160/054	32	69	112	120	M10	200	162	120	160	160	494	425	12.5	100	170	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-160/074	32	69	112	120	M10	200	162	120	160	160	494	425	12.5	100	170	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-160/114	32	69	112	120	M10	200	190	128	160	160	521	452	12.5	100	170	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-200/054	32	95	129	135	M10	200	162	120	190	190	516	421	12.5	100	166	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-200/074	32	95	129	135	M10	200	162	120	190	190	516	421	12.5	100	166	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-200/114	32	95	129	135	M10	200	190	128	190	190	543	448	12.5	100	166	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-200/154	32	95	129	135	M10	200	190	128	190	190	569	474	12.5	100	166	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
32-200/224	32	95	129	135	M10	250	213	135	190	190	622	527	12.5	100	180	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
40-160/024	40	80	112	119	M10	160	145	111	160	160	468	388	12.5	100	151	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	275	506	230	190	700	60
40-160/034	40	80	112	119	M10	160	145	111	160	160	468	388	12.5	100	151	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	275	506	230	190	700	60
40-160/054	40	80	112	119	M10	200	162	120	160	160	506	426	12.5	100	171	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	275	506	230	190	700	60
40-160/074	40	80	112	119	M10	200	162	120	160	160	506	426	12.5	100	171	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	275	506	230	190	700	60
40-160/114	40	80	112	119	M10	200	190	128	160	160	533	453	12.5	100	171	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	275	506	230	190	700	60
40-250/054	40	95	161	168	M10	200	162	120	220	220	516	421	12.5	100	166	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
40-250/074	40	95	161	168	M10	200	162	120	220	220	516	421	12.5	100	166	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
40-250/114	40	95	161	168	M10	200	190	128	220	220	543	448	12.5	100	166	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
40-250/154	40	95	161	168	M10	200	190	128	220	220	569	474	12.5	100	166	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
40-250/224	40	95	161	168	M10	250	213	135	220	220	622	527	12.5	100	180	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
40-250/304	40	95	161	168	M10	250	213	135	220	220	657	562	12.5	100	180	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
40-250/404	40	95	161	168	M10	250	234	148	220	220	646	551	12.5	100	180	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
40-250/554	40	95	161	168	M10	300	266	167	220	220	711	616	12.5	100	203	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
50-160/034	50	85	113	125	M10	160	145	111	170	170	478	393	12.5	100	156	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	300	538	230	210	760	65
50-160/054	50	85	113	125	M10	200	162	120	170	170	516	431	12.5	100	176	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	300	538	230	210	760	65
50-160/074	50	85	113	125	M10	200	162	120	170	170	516	431	12.5	100	176	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	300	538	230	210	760	65
50-160/114	50	85	113	125	M10	200	190	128	170	170	543	458	12.5	100	176	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	300	538	230	210	760	65
50-160/154	50	85	113	125	M10	200	190	128	170	170	569	484	12.5	100	176	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	300	538	230	210	760	65
50-160/224	50	85	113	125	M10	250	213	135	170	170	622	537	12.5	100	190	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	300	538	230	210	760	65
50-250/114	50	100	160	175	M10	200	190	128	220	220	553	453	12.5	100	171	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
50-250/154	50	100	160	175	M10	200	190	128	220	220	579	479	12.5	100	171	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
50-250/224	50	100	160	175	M10	250	213	135	220	220	632	532	12.5	100	185	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
50-250/304	50	100	160	175	M10	250	213	135	220	220	667	567	12.5	100	185	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
50-250/404	50	100	160	175	M10	250	234	148	220	220	656	556	12.5	100	185	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
50-250/554	50	100	160	175	M10	300	266	167	220	220	721	621	12.5	100	208	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
50-250/754	50	100	160	175	M10	300	298	167	220	220	749	649	12.5	100	208	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	190	-	-	-	-	-	-
65-160/024	65	100	113	125	M10	160	145	111	170	170	493	393	12.5	100	156	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	210	325	563	300	230	800	82
65-160/034	65	100	113	125	M10	160	145	111	170	170	493	393	12.5	100	156	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	210	325	563	300	230	800	82
65-160/054	65	100	113	125	M10	200	162	120	170	170	531	431	12.5	100	176	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	210	325	563	300	230	800	82
65-160/074	65	100	113	125	M10	200	162	120	170	170	531	431	12.5	100	176	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	210	325	563	300	230	800	82
65-160/114	65	100	113	125	M10	200	190	128	170	170	558	458	12.5	100	176	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	210	325	563	300	230	800	82
65-160/154	65	100	113	125	M10	200	190	128	170	170	584	484	12.5	100	176	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	210	325	563	300	230	800	82
65-160/224	65	100	113	125	M10	250	213	135	170	170	637	537	12.5	100	190	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	210	325	563	300	230	800	82
65-160/304	65	100	113	125	M10	250	213	135	170	170	672	572	12.5	100	190	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	210	325	563	300	230	800	82
65-250/154	65	105	167	190	M10	200	190	128	225	250	594	489	12.5	100	181	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
65-250/224	65	105	167	190	M10	250	213	135	225	250	647	542	12.5	100	195	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-

16) DN = EN 1092-2, PN 16
17) Rc = ISO 7/1

Etaline	DN[1] 6)	a	~b1	~b2	d1	d2	d3	p	h1	h2	~l1	~l2	t	~x	w	1M. 1/2[17])	6B.1	6B.2	6B.3	6D.1	6D.2	m	o	b3	b4	b5	h3	h4	h5
65-250/304	65	105	167	190	M10	250	213	135	225	250	682	577	12.5	100	195	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
65-250/404	65	105	167	190	M10	250	234	148	225	250	671	566	12.5	100	195	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
65-250/554	65	105	167	190	M10	300	266	167	225	250	736	631	12.5	100	218	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
65-250/754	65	105	167	190	M10	300	298	167	225	250	764	659	12.5	100	218	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
65-250/1104	65	105	167	190	M10	350	325	197	225	250	902	797	12.5	100	251	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
80-160/054	80	97	113	135	M10	200	162	120	180	180	538	441	12.5	100	186	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	350	598	300	260	880	82
80-160/074	80	97	113	135	M10	200	162	120	180	180	538	441	12.5	100	186	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	350	598	300	260	880	82
80-160/114	80	97	113	135	M10	200	190	128	180	180	565	468	12.5	100	186	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	350	598	300	260	880	82
80-160/154	80	97	113	135	M10	200	190	128	180	180	591	494	12.5	100	186	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	350	598	300	260	880	82
80-160/224	80	97	113	135	M10	250	213	135	180	180	644	547	12.5	100	200	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	350	598	300	260	880	82
80-160/304	80	97	113	135	M10	250	213	135	180	180	679	582	12.5	100	200	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	350	598	300	260	880	82
80-160/404	80	97	113	135	M10	250	234	148	180	180	668	571	12.5	100	200	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	350	598	300	260	880	82
80-210/114	80	151	140	160	M10	200	190	128	250	250	589	438	12.5	140	156	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230	350	650	300	260	1020	82
80-210/154	80	151	140	160	M10	200	190	128	250	250	615	464	12.5	140	156	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230	350	650	300	260	1020	82
80-210/224	80	151	140	160	M10	250	213	135	250	250	668	517	12.5	140	170	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230	350	650	300	260	1020	82
80-210/304	80	151	140	160	M10	250	213	135	250	250	703	552	12.5	140	170	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230	350	650	300	260	1020	82
80-210/404	80	151	140	160	M10	250	234	148	250	250	692	541	12.5	140	170	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230	350	650	300	260	1020	82
80-210/554	80	151	140	160	M10	300	266	167	250	250	757	606	12.5	140	193	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230	350	650	300	260	1020	82
80-210/754	80	151	140	160	M10	300	298	167	250	250	785	634	12.5	140	193	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	Rc 3/8	195	230	350	650	300	260	1020	82
80-210/1104	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	Rc 3/8	195	230	350	650	300	260	1020	82
80-250/224	80	114	165	184	M10	250	213	135	250	250	672	558	12.5	140	211	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
80-250/304	80	114	165	184	M10	250	213	135	250	250	707	593	12.5	140	211	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
80-250/404	80	114	165	184	M10	250	234	148	250	250	696	582	12.5	140	211	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
80-250/554	80	114	165	184	M10	300	266	167	250	250	761	647	12.5	140	234	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
80-250/754	80	114	165	184	M10	300	298	167	250	250	789	675	12.5	140	234	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
80-250/1104	80	114	165	184	M10	350	325	197	250	250	927	813	12.5	140	267	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
80-250/1504	80	114	165	184	M10	350	325	197	250	250	933	819	12.5	140	267	Rc 3/8	Rc 3/8	-	Rc 3/8	Rc 3/8	Rc 3/8	175	230	-	-	-	-	-	-
100-125/074	100	121	113	153	M10	200	162	120	230	220	541	420	12.5	100	165	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	591	300	295	1040	85
100-125/114	100	121	113	153	M10	200	190	128	230	220	568	447	12.5	100	165	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	591	300	295	1040	85
100-125/154	100	121	113	153	M10	200	190	128	230	220	594	473	12.5	100	165	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	591	300	295	1040	85
100-125/224	100	121	113	153	M10	250	213	135	230	220	647	526	12.5	100	179	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	591	300	295	1040	85
100-160/074	100	118	114	144	M10	200	162	120	250	200	546	428	12.5	100	173	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	583	300	295	1040	85
100-160/114	100	118	114	144	M10	200	190	128	250	200	573	455	12.5	100	173	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	583	300	295	1040	85
100-160/154	100	118	114	144	M10	200	190	128	250	200	599	481	12.5	100	173	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	583	300	295	1040	85
100-160/224	100	118	114	144	M10	250	213	135	250	200	652	534	12.5	100	187	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	583	300	295	1040	85
100-160/304	100	118	114	144	M10	250	213	135	250	200	687	569	12.5	100	187	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	583	300	295	1040	85
100-160/404	100	118	114	144	M10	250	234	148	250	200	676	558	12.5	100	187	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	195	230	325	583	300	295	1040	85
100-170/224	100	157	121	155	M20	250	213	135	245	205	694	537	25.0	100	190	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	-	-	325	601	300	295	1040	85
100-170/304	100	157	121	155	M20	250	213	135	245	205	729	572	25.0	100	190	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	-	-	325	601	300	295	1040	85
100-170/404	100	157	121	155	M20	250	234	148	245	205	718	561	25.0	100	190	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	-	-	325	601	300	295	1040	85
100-170/554	100	157	121	155	M20	300	266	167	245	205	783	626	25.0	100	213	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	-	-	325	601	300	295	1040	85
100-170/754	100	157	121	155	M20	300	298	167	245	205	811	654	25.0	100	213	Rc 1/2	Rc 1/2	-	Rc 1/2	Rc 1/2	Rc 1/2	-	-	325	601	300	295	1040	85
100-200/304	100	180	166	195	M20	250	213	135	305	245	752	572	25.0	140	190	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-200/404	100	180	166	195	M20	250	234	148	305	245	741	561	25.0	140	190	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-200/554	100	180	166	195	M20	300	266	167	305	245	806	626	25.0	140	213	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-200/754	100	180	166	195	M20	300	298	167	305	245	834	654	25.0	140	213	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-200/1104	100	180	166	195	M20	350	325	197	305	245	972	792	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-200/1504	100	180	166	195	M20	350	325	197	305	245	978	798	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-250/404	100	158	191	212	M20	250	234	148	290	260	743	585	25.0	140	214	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100–250/554	100	158	191	212	M20	300	266	167	290	260	808	650	25.0	140	237	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-250/754	100	158	191	212	M20	300	298	167	290	260	836	678	25.0	140	237	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-250/1104	100	158	191	212	M20	350	325	197	290	260	974	816	25.0	140	270	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-250/1504	100	158	191	212	M20	350	325	197	290	260	980	822	25.0	140	270	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-250/1854	100	158	191	212	M20	350	370	258	290	260	1038	880	25.0	140	270	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
100-250/2204	100	158	191	212	M20	350	370	258	290	260	1038	880	25.0	140	270	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-160/304	125	203	173	220	M20	250	213	135	340	280	775	572	25.0	140	190	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-160/404	125	203	173	220	M20	250	234	148	340	280	764	561	25.0	140	190	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-160/554	125	203	173	220	M20	300	266	167	340	280	829	626	25.0	140	213	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-160/754	125	203	173	220	M20	300	298	167	340	280	857	654	25.0	140	213	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-200/404	125	207	175	213	M20	250	234	148	340	280	768	561	25.0	140	190	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-200/554	125	207	175	213	M20	300	266	167	340	280	833	626	25.0	140	213	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-200/754	125	207	175	213	M20	300	298	167	340	280	861	654	25.0	140	213	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-200/1104	125	207	175	213	M20	350	325	197	340	280	999	792	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-200/1504	125	207	175	213	M20	350	325	197	340	280	1005	798	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-250/754	125	212	183	215	M20	300	298	167	340	280	866	654	25.0	140	213	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-250/1104	125	212	183	215	M20	350	325	197	340	280	1004	792	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-250/1504	125	212	183	215	M20	350	325	197	340	280	1010	798	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-250/1854	125	212	183	215	M20	350	370	258	340	280	1068	856	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-250/2204	125	212	183	215	M20	350	370	258	340	280	1068	856	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
125-250/3004	125	212	183	215	M20	400	422	305	340	280	1127	915	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-200/754	150	226	185	235	M20	300	298	167	375	315	880	654	25.0	140	213	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-200/1104	150	226	185	235	M20	350	325	197	375	315	1018	792	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-200/1504	150	226	185	235	M20	350	325	197	375	315	1024	798	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-200/1854	150	226	185	235	M20	350	370	258	375	315	1082	856	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-200/2204	150	226	185	235	M20	350	370	258	375	315	1082	856	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-250/1104	150	220	221	270	M20	350	325	197	370	330	1012	792	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-250/1504	150	220	221	270	M20	350	325	197	370	330	1018	798	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-250/1854	150	220	221	270	M20	350	370	258	370	330	1076	856	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-250/2204	150	220	221	270	M20	350	370	258	370	330	1076	856	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-250/3004	150	220	221	270	M20	400	422	305	370	330	1135	915	25.0	140	246	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-
150-250/3704	150	220	221	270	M20	450	460	325	370	330	1185	965	25.0	140	270	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	Rc 1/2	-	-	-	-	-	-	-	-

16) DN = EN 1092-2, PN 16
17) Rc = ISO 7/1

Etaline-R, n = 1750 rpm



DN 1 / DN 2 = EN 1092-2, PN 25		
1M.1/.2	Connection for pressure gauge	G $^1/_2$
5B	Mechanical seal venting	G $^1/_4$
6B	Fluid drain	G $^3/_4$
6D.1/.2	Fluid venting	G $^1/_2$

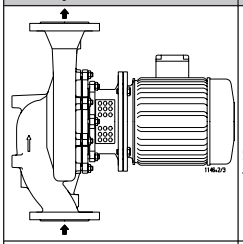
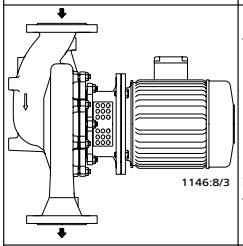
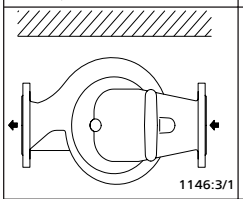
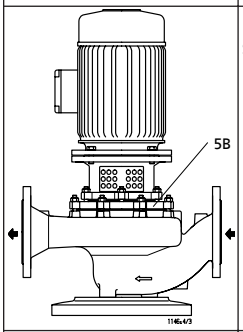
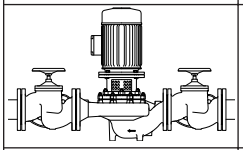
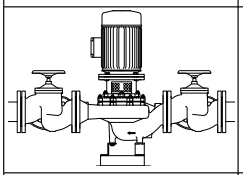
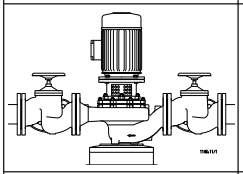
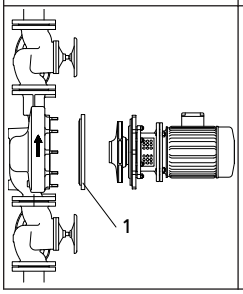
Mating dimensions [mm]

Etaline-R		DN1	DN2	a	b1	b2	b3	d2	d3	e	h1	h2	h3	h4	h5	h6	k1	k2	k3	l1	l2	m1	m2	n1	n2	p	w	x	β
200-330/1504	160L	250	200	310	295	333	955	450	320	213	650	300	710	360	225	1370	85	82	105	1180	870	375	320	310	250	197	352	200	40
200-330/1854	180M	250	200	310	295	333	955	450	363	213	650	300	710	360	225	1370	85	82	105	1264	954	375	320	310	250	262	352	200	40
200-330/2204	180L	250	200	310	295	333	955	450	363	213	650	300	710	360	225	1370	85	82	105	1264	954	375	320	310	250	262	352	200	40
200-330/3004	200L	250	200	310	295	333	955	450	402	213	650	300	710	360	225	1370	85	82	105	1321	1011	375	320	310	250	300	352	200	40
200-330/3704	225S	250	200	310	295	333	955	450	442	213	650	300	710	360	225	1370	85	82	105	1320	1010	375	320	310	250	325	361	200	40
200-330/4504	225M	250	200	310	295	333	955	450	442	213	650	300	710	360	225	1370	85	82	105	1494	1184	375	320	310	250	325	361	200	40
200-330/5504	250M	250	200	310	295	333	955	660	495	213	650	300	710	360	225	1370	85	82	105	1488	1178	375	320	310	250	392	418	200	40
200-330/7504	280S	250	200	310	295	333	955	660	555	213	650	300	710	360	225	1370	85	82	105	1548	1238	375	320	310	250	432	418	200	40
200-330/9004	280M	250	200	310	295	333	955	660	555	213	650	300	710	360	225	1370	85	82	105	1658	1348	375	320	310	250	432	418	200	40
200-330/11004	315S	250	200	310	295	333	955	660	610	213	650	300	710	360	225	1370	85	82	105	1667	1357	375	320	310	250	495	425	200	40
200-400/3004	200L	250	200	295	290	351	975	450	402	213	700	400	760	460	225	1520	85	82	105	1306	1011	375	320	310	250	300	352	200	50
200-400/3704	225S	250	200	295	290	351	975	450	442	213	700	400	760	460	225	1520	85	82	105	1305	1010	375	320	310	250	325	352	200	50
200-400/4504	225M	250	200	295	290	351	975	450	442	213	700	400	760	460	225	1520	85	82	105	1479	1184	375	320	310	250	325	361	200	50
200-400/5504	250M	250	200	295	290	351	975	660	495	213	700	400	760	460	225	1520	85	82	105	1473	1178	375	320	310	250	392	418	200	50
200-400/7504	280S	250	200	295	290	351	975	660	555	213	700	400	760	460	225	1520	85	82	105	1533	1238	375	320	310	250	432	418	200	50
200-400/9004	280M	250	200	295	290	351	975	660	555	213	700	400	760	460	225	1520	85	82	105	1643	1348	375	320	310	250	432	418	200	50
200-400/11004	315S	250	200	295	290	351	975	660	610	213	700	400	760	460	225	1520	85	82	105	1652	1357	375	320	310	250	495	425	200	50
200-400/13204	315M	250	200	295	290	351	975	660	610	213	700	400	760	460	225	1520	85	82	105	1812	1517	375	320	310	250	495	425	200	50
200-400/16004	315L	250	200	295	290	351	975	660	610	213	700	400	760	460	225	1520	85	82	105	1812	1517	375	320	310	250	495	425	200	50
200-400/20004	315L	250	200	295	290	351	975	660	610	213	700	400	760	460	225	1520	85	82	105	1812	1517	375	320	310	250	495	425	200	50
250-250/754	132M	250	250	320	265	322	910	450	267	203	555	345	615	405	215	1320	85	85	105	1166	846	375	375	310	310	167	435	200	40
250-250/1104	160M	250	250	320	265	322	910	450	320	203	555	345	615	405	215	1320	85	85	105	1233	913	375	375	310	310	167	435	200	40
250-250/1504	160L	250	250	320	265	322	910	450	320	203	555	345	615	405	215	1320	85	85	105	1275	955	375	375	310	310	197	437	200	40
250-250/1854	180M	250	250	320	265	322	910	450	363	203	555	345	615	405	215	1320	85	85	105	1359	1039	375	375	310	310	262	437	200	40
250-250/2204	180L	250	250	320	265	322	910	450	363	203	555	345	615	405	215	1320	85	85	105	1359	1039	375	375	310	310	300	437	200	40
250-250/3004	200L	250	250	320	265	322	910	450	402	203	555	345	615	405	215	1320	85	85	105	1416	1096	375	375	310	310	300	437	200	40
250-250/3704	225S	250	250	320	265	322	910	450	442	203	555	345	615	405	215	1320	85	85	105	1406	1086	375	375	310	310	325	437	200	40
250-250/4504	225M	250	250	320	265	322	910	450	442	203	555	345	615	405	215	1320	85	85	105	1589	1269	375	375	310	310	325	446	200	40
250-260/1104	160M	250	250	320	300	335	955	450	320	203	580	350	640	410	200	1350	85	85	90	1150	830	375	375	310	310	197	352	200	49
250-260/1504	160L	250	250	320	300	335	955	450	320	203	580	350	640	410	200	1350	85	85	90	1190	870	375	375	310	310	197	352	200	49
250-260/1854	180M	250	250	320	300	335	955	450	363	203	580	350	640	410	200	1350	85	85	90	1274	954	375	375	310	310	262	352	200	49
250-260/2204	180L	250	250	320	300	335	955	450	402	203	580	350	640	410	200	1350	85	85	90	1274	954	375	375	310	310	262	352	200	49
250-260/3004	200L	250	250	320	300	335	955	450	402	203	580	350	640	410	200	1350	85	85	90	1331	1011	375	375	310	310	300	352	200	49
250-260/3704	225S	250	250	320	300	335	955	450	442	203	580	350	640	410	200	1350	85	85	90	1321	1001	375	375	310	310	325	352	200	49
250-260/4504	225M	250	250	320	300	335	955	450	442	203	580	350	640	410	200	1350	85	85	90	1504	1184	375	375	310	310	325	361	200	49
250-260/5504	250M	250	250	320	300	335	955	660	495	203	580	350	640	410	200	1350	85	85	90	1555	1235	375	375	310	310	392	418	200	49
250-300/1504	160L	300	250	340	300	352	1015	450	320	243	650	450	710	510	225	1520	88	85	95	1325	985	430	375	360	310	197	467	250	50
250-300/1854	180M	300	250	340	300	352	1015	450	363	243	650	450	710	510	225	1520	88	85	95	1409	1069	430	375	360	310	262	467	250	50
250-300/2204	180L	300	250	340	300	352	1015	450	363	243	650	450	710	510	225	1520	88	85	95	1409	1069	430	375	360	310	262	467	250	50
250-300/3004	200L	300	250	340	300	352	1015	450	402	243	650	450	710	510	225	1520	88	85	95	1466	1126	430	375	360	310	300	467	250	50
250-300/3704	225S	300	250	340	300	352	1015	450	442	243	650	450	710	510	225	1520	88	85	95	1456	1116	430	375	360	310	325	467	250	50
250-300/4504	225M	300	250	340	300	352	1015	450	442	243	650	450	710	510	225	1520	88	85	95	1639	1299	430	375	360	310	325	476	250	50
250-300/5504	250M	300	250	340	300	352	1015	660	495	243	650	450	710	510	225	1520	88	85	95	1690	1350	430	375	360	310	392	533	250	50
250-300/7504	280S	300	250	340	300	352	1015	660	555	243	650	450	710	510	225	1520	88	85	95	1593	1253	430	375	360	310	432	533	250	50
250-300/9004	280M	300	250	340	300	352	1015	660	555	243	650	450	710	510	225	1520	88	85	95	1803	1463	430	375	360	310	432	533	250	50
250-330/2204	180L	300	250	385	325	355	1050	450	363	243	600	350	660	410	225	1370	88	85	95	1339	954	430	380	360	310	262	352	200	53
250-330/3004	200L	300	250	385	325	355	1050	450	402	243	600	350	660	410	225	1370	88	85	95	1396	1011	430	380	360	310	300	352	200	53
250-330/3704	225S	300	250	385	325	355	1050	450	442	243	600	350	660	410	225	1370	88	85	95	1386	1001	430	380	360	310	325	352	200	53
250-330/4504	225M	300	250	385	325	355	1050	450	442	243	600	350	660	410	225	1370	88	85	95	1569	1184	430	380	360	310	325	361	200	53
250-330/5504	250M	300	250	385	325	355	1050	660	495	243	600	350	660	410	225	1370	88	85	95	1620	1235	430	380	360	310	392	418	200	53
250-330/7504	280S	300	250	385	325	355	1050	660	555	243	600	350	660	410	225	1370	88	85	95	1623	1238	430	380	360	310	432	418	200	53
250-330/9004	280M	300	250	385	325	355	1050	660	555	243	600	350	660	410	225	1370	88	85	95	1733	1348	430	380	360	310	432	418	200	53

Etaline-R		DN1	DN2	a	b1	b2	b3	d2	d3	e	h1	h2	h3	h4	h5	h6	k1	k2	k3	l1	l2	m1	m2	n1	n2	p	w	x	β
250-330/11004	315S	300	250	385	325	355	1050	660	610	243	600	350	660	410	225	1370	88	85	95	1742	1357	430	380	360	310	495	425	200	53
250-330/13204	315M	300	250	385	325	355	1050	660	610	243	600	350	660	410	225	1370	88	85	95	1902	1517	430	380	360	310	495	425	200	53
250-330/16004	315L	300	250	385	325	355	1050	660	610	243	600	350	660	410	225	1370	88	85	95	1902	1517	430	380	360	310	495	425	200	53
250-400/3004	200L	300	250	355	325	376	1065	450	402	243	750	450	810	510	255	1620	88	85	105	1410	1055	430	380	360	310	300	352	200	50
250-400/3704	225S	300	250	355	325	376	1065	450	442	243	750	450	810	510	255	1620	88	85	105	1386	1031	430	380	360	310	325	352	200	50
250-400/4504	225M	300	250	355	325	376	1065	450	442	243	750	450	810	510	255	1620	88	85	105	1476	1121	430	380	360	310	325	361	200	50
250-400/5504	250M	300	250	355	325	376	1065	660	555	243	750	450	810	510	255	1620	88	85	105	1590	1235	430	380	360	310	392	418	200	50
250-400/7504	280S	300	250	355	325	376	1065	660	555	243	750	450	810	510	255	1620	88	85	105	1593	1238	430	380	360	310	432	418	200	50
250-400/9004	280M	300	250	355	325	376	1065	660	555	243	750	450	810	510	255	1620	88	85	105	1703	1348	430	380	360	310	432	418	200	50
250-400/11004	315S	300	250	355	325	376	1065	660	610	243	750	450	810	510	255	1620	88	85	105	1712	1357	430	380	360	310	495	425	200	50
250-400/13204	315M	300	250	355	325	376	1065	660	610	243	750	450	810	510	255	1620	88	85	105	1872	1517	430	380	360	310	495	425	200	50
250-400/16004	315L	300	250	355	325	376	1065	660	610	243	750	450	810	510	255	1620	88	85	105	1872	1517	430	380	360	310	495	425	200	50
250-400/20004	315L	300	250	355	325	376	1065	660	610	243	750	450	810	510	255	1620	88	85	105	1872	1517	430	380	360	310	495	425	200	50
250-400/25004	315	300	250	355	325	376	1065	660	610	243	750	450	810	510	255	1620	88	85	105	2020	1665	430	380	360	310	495	425	200	50
300-360/3704	225S	300	300	435	387	458	1100	450	442	243	800	450	860	510	240	1670	88	87,5	105	1447	1012	430	430	360	360	325	363	250	45
300-360/4504	225M	300	300	435	387	458	1100	450	442	243	800	450	860	510	240	1670	88	87,5	105	1621	1186	430	430	360	360	325	363	250	45
300-360/5504	250M	300	300	435	387	458	1100	660	495	243	800	450	860	510	240	1670	88	87,5	105	1667	1237	430	430	360	360	392	420	250	45
300-360/7504	280S	300	300	435	387	458	1100	660	555	243	800	450	860	510	240	1670	88	87,5	105	1670	1240	430	430	360	360	432	420	250	45
300-360/9004	280M	300	300	435	387	458	1100	660	555	243	800	450	860	510	240	1670	88	87,5	105	1780	1350	430	430	360	360	432	420	250	45
300-360/11004	315S	300	300	435	387	458	1100	660	610	243	800	450	860	510	240	1670	88	87,5	105	1789	1359	430	430	360	360	495	427	250	45
300-360/13204	315M	300	300	435	387	458	1100	660	610	243	800	450	860	510	240	1670	88	87,5	105	1949	1519	430	430	360	360	495	427	250	45
300-360/16004	315L	300	300	435	387	458	1100	660	610	243	800	450	860	510	240	1670	88	87,5	105	1954	1519	430	430	360	360	495	427	250	45
300-360/20004	315L	300	300	435	387	458	1100	660	610	243	800	450	860	510	240	1670	88	87,5	105	1954	1519	430	430	360	360	495	427	250	45
300-400/5504	250M	350	300	410	425	439	1200	660	495	278	800	500	860	560	245	1720	90	87,5	95	1645	1235	490	430	420	360	392	418	250	53,5
300-400/7504	280S	350	300	410	425	439	1200	660	555	278	800	500	860	560	245	1720	90	87,5	95	1748	1338	490	430	420	360	432	418	250	53,5
300-400/9004	280M	350	300	410	425	439	1200	660	555	278	800	500	860	560	245	1720	90	87,5	95	1758	1348	490	430	420	360	432	418	250	53,5
300-400/11004	315S	350	300	410	425	439	1200	660	610	278	800	500	860	560	245	1720	90	87,5	95	1767	1357	490	430	420	360	495	425	250	53,5
300-400/13204	315M	350	300	410	425	439	1200	660	610	278	800	500	860	560	245	1720	90	87,5	95	1927	1517	490	430	420	360	495	425	250	53,5
300-400/16004	315L	350	300	410	425	439	1200	660	610	278	800	500	860	560	245	1720	90	87,5	95	1927	1517	490	430	420	360	495	425	250	53,5
300-400/20004	315L	350	300	410	425	439	1200	660	610	278	800	500	860	560	245	1720	90	87,5	95	1927	1517	490	430	420	360	495	425	250	53,5
300-400/25004	315	350	300	410	425	439	1200	660	610	278	800	500	860	560	245	1720	90	87,5	95	2075	1665	490	430	420	360	495	425	250	53,5
300-400/31504	315	350	300	410	425	439	1200	660	610	278	800	500	860	560	245	1720	90	87,5	95	2075	1665	490	430	420	360	495	425	250	53,5
350-340/2204	180L	350	350	380	315	386	1075	450	363	278	750	450	810	510	235	1045	90	90	95	1469	1089	490	490	420	420	262	487	250	50
350-340/3004	200L	350	350	380	315	386	1075	450	402	278	750	450	810	510	235	1045	90	90	95	1526	1146	490	490	420	420	300	487	250	50
350-340/3704	225S	350	350	380	315	386	1075	450	442	278	750	450	810	510	235	1045	90	90	95	1690	1310	490	490	420	420	325	487	250	50
350-340/4504	225M	350	350	380	315	386	1075	450	442	278	750	450	810	510	235	1045	90	90	95	1636	1256	490	490	420	420	325	496	250	50
350-340/5504	250M	350	350	380	315	386	1075	660	495	278	750	450	810	510	235	1045	90	90	95	1750	1370	490	490	420	420	392	553	250	50
350-340/7504	280S	350	350	380	315	386	1075	660	555	278	750	450	810	510	235	1045	90	90	95	1753	1373	490	490	420	420	432	553	250	50
350-340/9004	280M	350	350	380	315	386	1075	660	555	278	750	450	810	510	235	1045	90	90	95	1863	1483	490	490	420	420	432	553	250	50
350-340/11004	315S	350	350	380	315	386	1075	660	610	278	750	450	810	510	235	1045	90	90	95	1872	1492	490	490	420	420	495	560	250	50
350-340/13204	315M	350	350	380	315	386	1075	660	610	278	750	450	810	510	235	1045	90	90	95	2032	1652	490	490	420	420	495	560	250	50

Typical installation positions

Typical installation positions

Examples	Special features
	Horizontal installation, direction of flow from bottom to top Note: 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.
	Horizontal installation, direction of flow from top to bottom. The motor must be turned by 180° so that the terminal box remains located on top. Note: 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.
	Horizontal installation (for example under the ceiling)
	For vertical installation a vent valve must be fitted to prevent dry running of the mechanical seal (can be selected and processed in EasySelect). For vertical installation with the motor on top, use connection 5B for venting.
	Etaline fastening ▪ Without feet, Etaline 32-160/... to 100-125/...
	▪ With three angle feet, Etaline 32-160/... to 100-160/...
	▪ With one pump foot, Etaline 100-170/... to 150-250/...
	1 = Blind flange (accessory)

Accessories

Pump accessories

Etaline

Component	Connection		Mat. No.	[kg]
Pump foot for vertical installation	Etaline 32–160/... to 100–160/...[18]		47077960	1.5
	Etaline 100–170/... to 150–250/...[19]		47086291	14
Vent valve 5B for vertical installation[20]				
Y-pipes for twin pump sets, cast iron, with hexagon head bolts, nuts and gaskets; flanges drilled to DIN 2501 PN 16 Suction-side Y-pipe without changeover flap Discharge-side Y-pipe with changeover flap	DN 40	Suction side	40000688	10.6
	DN 40	Discharge side	40000679	13
	DN 50	Suction side	40000689	13.5
	DN 50	Discharge side	40000680	16
	DN 65	Suction side	40000690	18.3
	DN 65	Discharge side	40000681	20.4
	DN 80	Suction side	48936065	25
	DN 80	Discharge side	48936202	28.1
	DN 100	Suction side	40000692	31
	DN 100	Discharge side	40000440	34

Electrical accessories

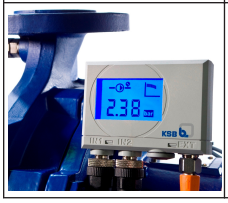
Etaline

	Component	Type 3~400 V	Setting range [A] min - max	Mat. No.	[kg]
E 1	Switchgear MSD IP 54	MSD 10.1	0,54 - 0,8	19070113	1.1
		MSD 12.1	0,8 - 1,2	19071255	1
		MSD 16.1	1,2 - 1,8	19070114	1
		MSD 25.1	1,8 - 2,6	19070115	1
		MSD 40.1	2,6 - 3,7	19070116	1
		MSD 60.1	3,7 - 5,5	19070117	1
		MSD 80.1	5,5 - 8,0	19070118	1
		MSD 100.1	8,0 - 11,5	19070119	1
E 11	Control unit for single-pump station LevelControl Basic 2 Level control via float switches (Model without PTC data analysis)	BC1 400 DFNO 010	0,63 - 1,0	19074369	4.5
		BC1 400 DFNO 016	1,0 - 1,6	19073761	4.5
		BC1 400 DFNO 025	1,6 - 2,5	19073762	4.5
		BC1 400 DFNO 040	2,5 - 4,0	19073763	4.5
		BC1 400 DFNO 063	4,0 - 6,3	19073764	4.5
		BC1 400 DFNO 100	6,3 - 10,0	19073765	4.5
	LevelControl Basic 2 control unit for single-pump stations Level control via float switches (Model with PTC data analysis relay)[21]	BS1 400 DFNP 010	0,63 - 1,0		10
		BS1 400 DFNP 016	1,0 - 1,6		10
		BS1 400 DFNP 025	1,6 - 2,5		10
		BS1 400 DFNP 040	2,5 - 4,0		10
		BS1 400 DFNP 063	4,0 - 6,3		10
		BS1 400 DFNP 100	6,3 - 10,0		10
E 12	Control unit for single-pump station LevelControl Basic 2 Level control via float switches	BS1 400 SFNO 140	9,0 - 14,0	19073794	20
		BS1 400 SFNO 180	13,0 - 18,0	19073795	20
		BS1 400 SFNO 230	17,0 - 23,0	19073796	20
		BS1 400 SFNO 250	20,0 - 25,0	19073797	20
		BS1 400 SFNO 400	25,0 - 40,0	19073798	30
		BS1 400 SFNO 630	40,0 - 63,0	19073799	30

18) Three pump feet with bolts
19) One pump foot with bolt
20) Variants must be selected and processed via KSB EasySelect.
21) Variants must be selected and processed via KSB EasySelect.

	Component	Type 3~400 V	Setting range [A] min - max	Mat. No.	[kg]
	Switchgear DDU IP 54	DDU 10.1	0,6 - 1,0	19070267	20
		DDU 16.1	1,0 - 1,6	19070268	20
		DDU 25.1	1,6 - 2,5	19070269	20
		DDU 40.1	2,5 - 4,0	19070270	20
		DDU 60.1	4,0 - 6,0	19070271	20
		DDU 100.1	6,3 - 10,0	19070272	20
	Switchgear DSU IP 54	DSU 140.1	9,0 - 14,0	19071258	20
		DSU 160.1	13,0 - 18,0	19070273	17
		DSU 200.1	17,0 - 23,0	19070274	17
		DSU 250.1	20,0 - 25,0	19070275	17
		DSU 400.1	25,0 - 40,0	19070722	36
		DSU 630.1	40,0 - 63,0	19070723	39

LevelControl Basic 2 installation options (processed via KSB EasySelect)[22)]
Etaline

	Component	Mat. No.	[kg]
E90	Rechargeable battery retrofit kit for LevelControl Basic 2, for powering the electronics, the float switches or internal pressure sensor and the alarm equipment (buzzer, horn, alarm combination), for single-pump and dual-pump stations For type BC, consisting of 2 rechargeable batteries 6 V, 1,3 Ah and charging unit	19074194	0.8
E 91	Rechargeable battery retrofit kit for LevelControl Basic 2, for powering the electronics, the float switches or internal pressure sensor and the alarm equipment (buzzer, horn, alarm combination), for single-pump and dual-pump stations For type BS, consisting of 1 rechargeable battery 12 V, 1.2 Ah and charging unit	19074199	1
O 1	Master switch for LevelControl Basic 2, installed for type BC... 3-pole, 20 A, lockable	01143084	0.2
	PumpMeter Intelligent pressure transmitter for pumps, with on-site display of measured values and operating data.		

22) Installation options must be selected and processed via KSB EasySelect, otherwise they will be supplied with the unit but not fitted.

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