

In-line Pump

# Etaline-R

50 Hz

## Type Series Booklet



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Type Series Booklet Etaline-R

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## Heating / Air-conditioning / Ventilation

### In-line Pumps

# 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 materials

#### Further information on fluids handled

#### Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m <sup>3</sup> /h]	1900
	Q [l/s]	528
Head	H [m]	93
Fluid temperature	T [°C]	-30 to +140
Operating pressure	p [bar]	≤ 25

#### Designation

Example: Etaline-R GN 300-400/31504

Designation key

Code	Description
Etaline	Type series
R	Extended selection chart
G	Material combination volute casing / casing cover / impeller
G	Nodular cast iron / grey cast iron / grey cast iron
GC	Nodular cast iron / grey cast iron / stainless steel
M	Nodular cast iron / grey cast iron / tin bronze
S	Nodular cast iron / nodular cast iron / grey cast iron
SC	Nodular cast iron / nodular cast iron / stainless steel
SM	Nodular cast iron / nodular cast iron / tin bronze
N	Stub shaft design and standardised motor
300	Nominal discharge nozzle diameter [mm]
400	Nominal impeller diameter [mm]
3150	Motor rating × 10, e.g. 315 kW
4	Number of motor poles

#### Design details

##### Design

- Close-coupled design/in-line design
- Single-stage
- Vertical installation
- Rigid connection between pump and motor

##### Pump casing

- Radially split volute casing

##### Impeller type

- Closed radial impeller

##### Shaft seal

- KSB mechanical seal

##### Bearings

- Radial ball bearing in the bearing bracket
- Grease lubrication

##### Drive

Standard design:

- KSB/Siemens surface-cooled IEC frame three-phase squirrel-cage motor
- Winding 220-240 V / 380-420 V ≤ 2.20 kW
- Winding 380-420 V / 660-725 V ≥ 3.00 kW
- Type of construction IM V1 ≤ 4.00 kW
- Type of construction IM V1 ≥ 5.50 kW
- IP55 enclosure
- Duty cycle: continuous duty

- Thermal class F with temperature sensor, 3 PTC thermistors
- Efficiency class IE2 / IE3 to IEC 60034-30

**KSB SuPremE motor (up to 45 kW only):**

- Surface-cooled KSB SuPremE motor, IEC-compatible, magnetless synchronous reluctance motor (PumpDrive required)
- Motor mounting points to EN 50347
- Envelope dimensions to DIN V 42673 (07-2011)
- Frequency 50/60 Hz (PumpDrive input)
- Voltage 380/480 V (PumpDrive input)

- Type of construction IM V15
- IP55 enclosure
- Duty cycle: continuous duty
- Thermal class F with temperature sensor, 3 PTC thermistors
- Efficiency class IE4 to IEC 60034-30

**Automation**

Automation options:

- PumpDrive
- PumpMeter

**Materials**

Overview of available materials

Part. No.	Description	Material	Material variant					
			GN	GCN	MN	SN	SCN	SMN
102	Volute casing	Nodular cast iron EN-GJS-400-18-LT	X	X	X	X	X	X
161	Casing cover	Grey cast iron EN-GJL-250	X	X	X	-	-	-
		Nodular cast iron EN-GJS-400-18-LT	-	-	-	X	X	X
210	Shaft	Tempered steel C45	X	X	X	X	X	X
		Stainless steel 1.4057 (optional)	X	X	X	X	X	X
230	Impeller	Grey cast iron EN-GJL-250	X	-	-	X	-	-
		Stainless steel 1.4408	-	X	-	-	X	-
		Tin bronze CC480K-GS	-	-	X	-	-	X
330	Bearing bracket	Grey cast iron EN-GJL-250	X	X	X	X	X	X
400	Sealing elements	DPAF, asbestos-free	X	X	X	X	X	X
502	Casing wear ring Casing/discharge cover	Grey cast iron EN-GJL-250	X	X	-	X	X	-
		Lead bronze CC495K-GS	-	-	X	-	-	X
902.01	Studs	1.7709	X	X	X	-	-	-
		1.6772	-	-	-	X	X	X
920.01	Nut	1.7218	X	X	X	-	-	-
		1.6772	-	-	-	X	X	X
920.95	Impeller nut	Stainless steel 1.4571	X	X	X	X	X	X

**Coating and preservation**

- Coating and preservation to KSB standard

**Product benefits**

- Improved efficiency and  $NPSH_{req}$  by experimentally verified hydraulic design of impellers (vanes)
- Low energy costs through compliance with Commission Regulation 547/2012 (minimum efficiency index  $MEI \geq 0.4$ )
- Operating costs reduced by trimming the impeller diameter to match the specified duty point
- Little wear, low vibration levels and excellent smooth running characteristics thanks to good suction performance and virtually cavitation-free operation across a wide operating range
- Casing sealed reliably – even in varying operating conditions – by confined casing gasket
- Large variety of materials for perfectly matching the pump to the fluid handled. Large range of materials for many applications available as standard.

**Product information as per Regulation No. 547/2012 (for water pumps with a maximum shaft power of 150 kW) implementing "Ecodesign" Directive 2009/125/EC**

- Minimum efficiency index: see data sheet

- The benchmark for the most efficient water pumps is  $MEI \geq 0.70$ .
- Year of construction: see data sheet
- Manufacturer's name or trade mark, commercial registration number and place of manufacture: see data sheet or order documentation
- Product's type and size identifier: see data sheet
- Hydraulic pump efficiency (%) with trimmed impeller: see data sheet
- Pump performance curves, including efficiency characteristics: see documented characteristic curve
- The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with full impeller diameter. Trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.
- Operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system.
- Information relevant for disassembly, recycling or disposal at end of life: see installation/operating manual
- Information on benchmark efficiency or benchmark efficiency graph for  $MEI = 0.70$  (0.40) for the pump based on the model shown in the Figure are available at: <http://www.europump.org/efficiencycharts>

**FluidFuture energy efficiency concept developed by KSB**

<http://www.ksb.com/fluidfuture>
**Acceptance tests and warranty**

The following acceptance tests may be performed at a surcharge:

- Materials testing

- Test report 2.2
- **Final inspection**
  - Inspection certificate 3.1 to EN 10204
- **Hydraulic test**
  - The duty point of each pump is guaranteed according to ISO 9906/2B or ISO 9906/3B.
  - NPSH test
- Other inspections/tests on request

**Warranties**

- Warranties are given within the scope of the valid delivery conditions.

**Overview of fluids handled**

Table of fluids handled and suitable material combinations

**X** = standard

Fluid handled	Application limits	Casing/impeller materials			Mechanical seal material	Mechanical seal design code
		G	M	S	4	
<b>Water</b>						
Service water	t ≤ 60 °C; p ≤ 16 bar	X			X	G4
Fire-fighting water <sup>1)</sup>	t ≤ 60 °C; p ≤ 16 bar		X		X	M4
Heating water <sup>2)</sup>	t ≤ 120 °C; p ≤ 16 bar	X			X	G4
Heating water <sup>2)</sup>	t ≤ 140 °C; p ≤ 25 bar			X	X	S4
Heating water <sup>2)</sup>	t ≤ 110 °C; p ≤ 16 bar	X			X	G4
Condensate <sup>2)</sup>	t ≤ 120 °C; p ≤ 16 bar	X			X	Contact KSB.
Cooling water <sup>1)</sup> (without antifreeze)	t ≤ 60 °C; p ≤ 16 bar	X			X	G4
Cooling water pH ≥ 7.5 (with antifreeze) <sup>3)</sup>	t ≥ -30 °C; p ≤ 16 bar t ≤ 110 °C; p ≤ 25 bar	X		X	X	G4
Slightly contaminated water <sup>1)</sup>	t ≤ 60 °C; p ≤ 16 bar	X			X	G4
Pure water <sup>4)</sup>	t ≤ 25 °C; p ≤ 16 bar	X			X	G4
Raw water (irrigation) <sup>1)</sup>	t ≤ 60 °C; p ≤ 16 bar	X			X	G4
Raw water (industrial application) <sup>1)</sup>	t ≤ 60 °C; p ≤ 16 bar	X			X	G4
Swimming pool water (fresh water) <sup>1)</sup>	t ≤ 60 °C; p ≤ 16 bar	X			X	G4
Dam water <sup>1)</sup>	t ≤ 60 °C; p ≤ 16 bar		X		X	M4
Drinking water <sup>1)</sup>	t ≤ 60 °C; p ≤ 16 bar		X		X	M4
Partly desalinated water <sup>2)</sup>	t ≤ 120 °C; p ≤ 16 bar	X			X	Contact KSB.
Fully desalinated water as boiler feed water <sup>2)</sup>	t ≤ 120 °C; p ≤ 16 bar	X			X	G4
<b>Refrigerants, cooling brines</b>						
Cooling brine, inorganic, pH ≥ 7.5, inhibited	t ≥ -30 °C; p ≤ 16 bar t ≤ 25 °C	X			X	G4
Water with antifreeze pH ≥ 7.5 <sup>1)3)</sup>	t ≥ -30 °C; p ≤ 16 bar t ≤ 110 °C	X			X	G4
<b>Oils/ emulsions</b>						
Diesel oil, extra light fuel oil	t ≤ 60 °C; p ≤ 16 bar			X	X	S4
Lubricating oil, turbine oil, does not apply to SF-D oils (hardly flammable)	t ≤ 80 °C; p ≤ 16 bar			X	X	S4
Drilling emulsion, grinding emulsion	t ≤ 60 °C; p ≤ 16 bar	X			X	G4
Oil-water emulsion	t ≤ 60 °C; p ≤ 16 bar	X			X	G4
<b>Cleaning agents</b>						
Lyes for bottle rinsers	t ≤ 90 °C; p ≤ 16 bar	X				

- 1) General evaluation criteria for results of water analysis; pH > 7; chlorides content (Cl-) < 250 mg/kg. Chlorine (Cl2) < 0.6 mg/kg
- 2) Treatment to VdTÜV 1466; additional requirement: O2 < 0.02 mg/l
- 3) Antifreeze agent on ethylene glycol basis with inhibitors. Content: > 20 % to 50 % (e.g. Antifrogen N)
- 4) No ultra-pure water! Electrical conductivity at 25 °C: < 800 µS/cm, neutral with regard to chemical corrosion

Fluid handled	Application limits	Casing/impeller materials			Mechanical seal material	Mechanical seal design code
		G	M	S		
<b>Brewery applications</b>						
Beer mash	t ≤ 100 °C; p ≤ 16 bar	✗			✗	G4
Beer wort	t ≤ 100 °C; p ≤ 16 bar	✗			✗	G4

### Pressure limits and temperature limits

Pressure limits and temperature limits as a function of material variant

Material variant	Fluid temperature <sup>5)6)</sup>	Test pressure <sup>7)</sup>
	[°C]	[bar]
GN, MN, GCN	-30 to +140	≤ 24
SN, SCN, SMN	-30 to +140	≤ 37,5

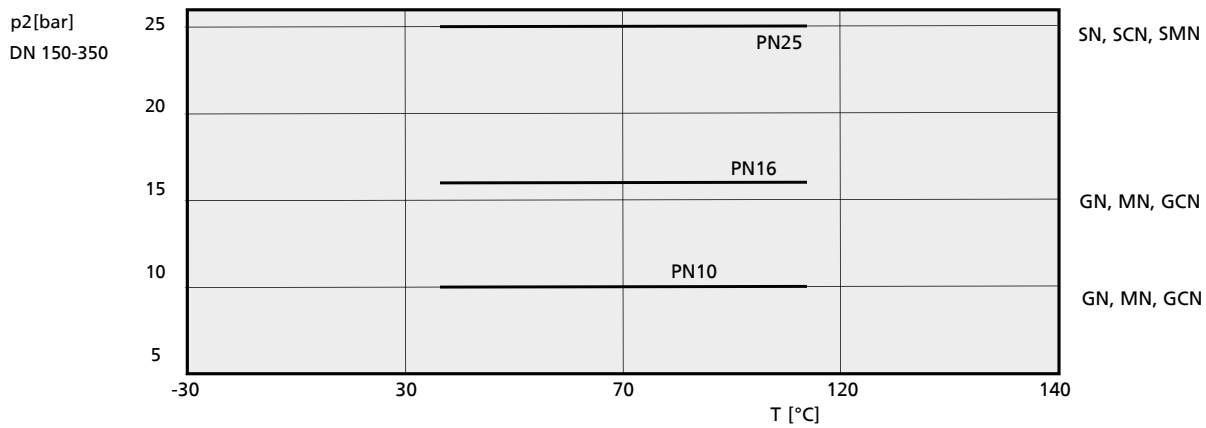


Fig. 1: Operating pressure limits and temperature limits of an Etaline-R pump

5) For hot water heating systems to DIN 4752, Section 4.5, application limits must be observed.

6) For fluid temperatures >140 °C use Etanorm SYT.

7) The casing components are checked for leakage by means of internal pressure tests to AN 1897/75-03D00 with water.

## Technical data

## Technical data of the motor

n = 1450 rpm

Size	Motor			Weight [kg]
	Size	[kW]	400 V [A]	
150-500/3004	200L	30,00	55,00	884
150-500/3704	225S	37,00	66,00	965
150-500/4504	225M	45,00	80,00	1015
150-500/5504	250M	55,00	96,00	1205
150-500/7504	280S	75,00	133,00	1305
150-500/9004	228M	90,00	157,00	1485
150-500/11004	315S	110,00	191,00	1571
150-500/13204	315M	132,00	230,00	1796
150-500/16004	315L	160,00	275,00	1896
200-330/1504	160L	15,00	28,50	724
200-330/1854	180M	18,50	35,00	748
200-330/2204	180L	22,00	41,00	770
200-330/3004	200L	30,00	55,00	814
200-330/3704	225S	37,00	66,00	895
200-330/4504	225M	45,00	80,00	945
200-330/5504	250M	55,00	96,00	1145
200-330/7504	280S	75,00	133,00	1245
200-330/9004	228M	90,00	157,00	1425
200-330/11004	315S	110,00	191,00	1511
200-400/3004	200L	30,00	55,00	989
200-400/3704	225S	37,00	66,00	1070
200-400/4504	225M	45,00	80,00	1120
200-400/5504	250M	55,00	96,00	1315
200-400/7504	280S	75,00	133,00	1415
200-400/9004	228M	90,00	157,00	1595
200-400/11004	315S	110,00	191,00	1681
200-400/13204	315M	132,00	230,00	1906
200-400/16004	315L	160,00	275,00	2006
200-400/2004	315L	200,00	340,00	2006
200-500/4504	225M	45,00	80,00	1190
200-500/5504	250M	55,00	96,00	1380
200-500/7504	280S	75,00	133,00	1480
200-500-9004	228M	90,00	157,00	1660
200-500/11004	315S	110,00	191,00	1746
200-500/13204	315M	132,00	230,00	1971
200-500/16004	315L	160,00	275,00	2071
200-500/20004	315L	200,00	340,00	2071
200-500/25004	315L	250,00	249,27	2185
250-250/754	132M	7,50	15,05	620
250-250/1104	160M	11,00	21,58	641
250-250/1504	160L	15,00	28,50	684
250-250/1854	180M	18,50	35,00	708
250-250/2204	180L	22,00	41,00	730
250-250/3004	200L	30,00	55,00	774
250-250/3704	225S	37,00	66,00	855
250-250/4504	225M	45,00	80,00	905
250-260/1104	160M	11,00	21,58	701
250-260/1504	160L	15,00	28,50	744
250-260/1854	180M	18,50	35,00	768
250-260/2204	180L	22,00	41,00	790
250-260/3004	200L	30,00	55,00	834
250-260/3704	225S	37,00	66,00	915



Size	Motor			Weight [kg]
	Size	[kW]	400 V [A]	
250-260/4504	225M	45,00	80,00	965
250-260/5504	250M	55,00	96,00	1165
250-300/1504	160L	15,00	28,50	899
250-300/1854	180M	18,50	35,00	923
250-300/2204	180L	22,00	41,00	945
250-300/3004	200L	30,00	55,00	989
250-300/3704	225S	37,00	66,00	1070
250-300/4504	225M	45,00	80,00	1120
250-300/5504	250M	55,00	96,00	1300
250-300/7504	280S	75,00	133,00	1400
250-300*9004	228M	90,00	157,00	1580
250-330/2204	180L	22,00	41,00	910
250-330/3004	200L	30,00	55,00	954
250-330/3704	225S	37,00	66,00	1035
250-330/4504	225M	45,00	80,00	1085
250-330/5504	250M	55,00	96,00	1285
250-330/7504	280S	75,00	133,00	1385
250-330/9004	228M	90,00	157,00	1565
250-330/11004	315S	110,00	191,00	1651
250-330/13204	315M	132,00	230,00	1876
250-330/16004	315L	160,00	275,00	1976
250-400/3004	200L	30,00	55,00	1119
250-400/3704	225S	37,00	66,00	1200
250-400/4504	225M	45,00	80,00	1250
250-400/5504	250M	55,00	96,00	1445
250-400/7504	280S	75,00	133,00	1545
250-400/9004	228M	90,00	157,00	1725
250-400/11004	315S	110,00	191,00	1811
250-400/13204	315M	132,00	230,00	2036
250-400/16004	315L	160,00	275,00	2136
250-400/20004	315L	200,00	340,00	2136
250-400/25004	315L	250,00	249,27	2250
250-500/7504	280S	75,00	133,00	1760
250-500/9004	228M	90,00	157,00	1940
250-500/11004	315S	110,00	191,00	2026
250-500/13204	315M	132,00	230,00	2251
250-500/16004	315L	160,00	275,00	2351
250-500/20004	315L	200,00	340,00	2351
250-500/25004	315L	250,00	249,27	2465
250-500/31504	315L	318,84	315,00	2665
300-360/3704	225S	37,00	66,00	1470
300-360/4504	225M	45,00	80,00	1520
300-360/5504	250M	55,00	96,00	1715
300-360/7504	280S	75,00	133,00	1815
300-360/9004	228M	90,00	157,00	1995
300-360/11004	315S	110,00	191,00	2081
300-360/13204	315M	132,00	230,00	2306
300-360/16004	315L	160,00	275,00	2406
300-360/20004	315L	200,00	340,00	2406
300-400/5504	250M	55,00	96,00	1680
300-400/7504	280S	75,00	133,00	1780
300-400/9004	228M	90,00	157,00	1960
300-400/11004	315S	110,00	191,00	2046
300-400/13204	315M	132,00	230,00	2271
300-400/16004	315L	160,00	275,00	2371
300-400/20004	315L	200,00	340,00	2371
300-400/25004	315L	250,00	249,27	2485
300-400/31504	315L	315,00	318,84	2685

Size	Motor			Weight [kg]
	Size	[kW]	400 V [A]	
300-500/11004	315S	110,00	191,00	2171
300-500/13204	315M	132,00	230,00	2396
300-500/16004	315L	160,00	275,00	2496
300-500/20004	315L	200,00	340,00	2496
300-500/25004	315L	250,00	249,27	2610
300-500/31504	315L	315,00	318,84	2810
350-340/2204	180L	22,00	41,00	1195
350-340/3004	200L	30,00	55,00	1239
350-340/3704	225S	37,00	66,00	1320
350-340/4504	225M	45,00	80,00	1370
350-340/5504	250M	55,00	96,00	1565
350-340/7504	280S	75,00	133,00	1665
350-340/9004	228M	90,00	157,00	1845

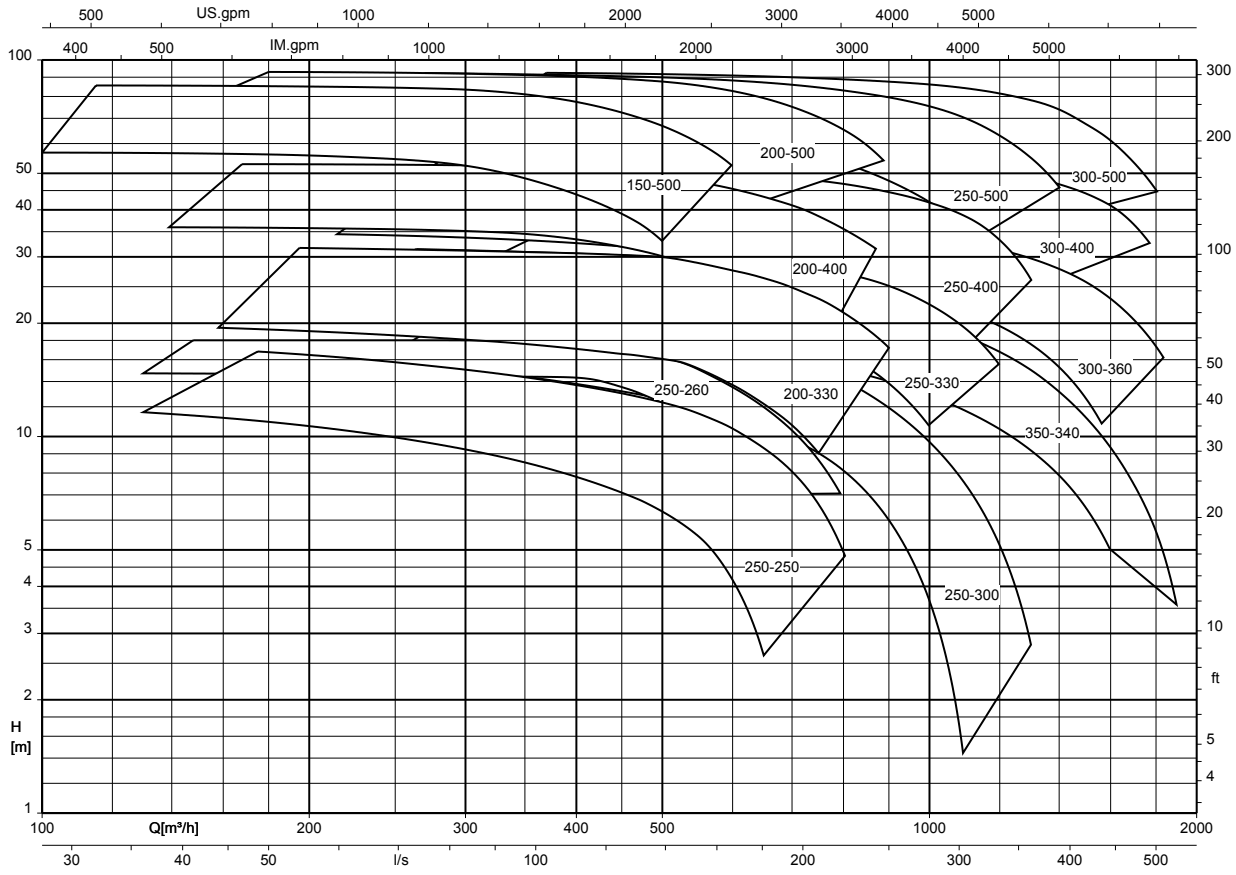
### Technical data of the pump

Technical data

Size	Shaft unit	Impeller				Speed limit	
		Impeller outlet width	Impeller inlet diameter	Impeller diameter		Minimum	Maximum
				Minimum	Maximum		
[mm]	[mm]	[mm]	[mm]	[rpm]	[rpm]		
150-500	SU65	21,0	200	500	410	300	1500
200-330	SU65	54,0	220	330	270	300	1800
200-400	SU65	38,0	240	405	340	300	1800
200-500	SU65	36,0	220	510	420	300	1500
250-250	SU65	57,0	213	240	200	300	1800
250-260	SU65	62,0	190	260	240	300	1800
250-300	SU65	66,5	248	285	245	300	1800
250-330	SU65	72,0	240	330	290	300	1800
250-400	SU65	58,0	280	405	340	300	1800
250-500	SU65	44,0	260	520	440	300	1500
300-360	SU65	78,0	260	360	320	300	1800
300-400	SU65	65,0	290	430	360	300	1800
300-500	SU65	56,0	290	520	450	300	1500
350-340	SU65	74,5	278	270	320	300	1800

## Selection charts

Etaline-R, n = 1450 rpm



## Characteristic curves

### General

#### Test class

Characteristic curves to ISO 9906 Class 3B

#### NPSH values

The NPSH values indicated in the characteristic curves correspond to a head drop of 3 %.

#### NPSH values in low-flow conditions

NPSH values for flow rates below  $Q = 0.3 \times Q_{opt}$  can only be measured with intense technical efforts. Evidence of NPSH values in the low-flow range cannot be provided.

#### Density of the fluid handled

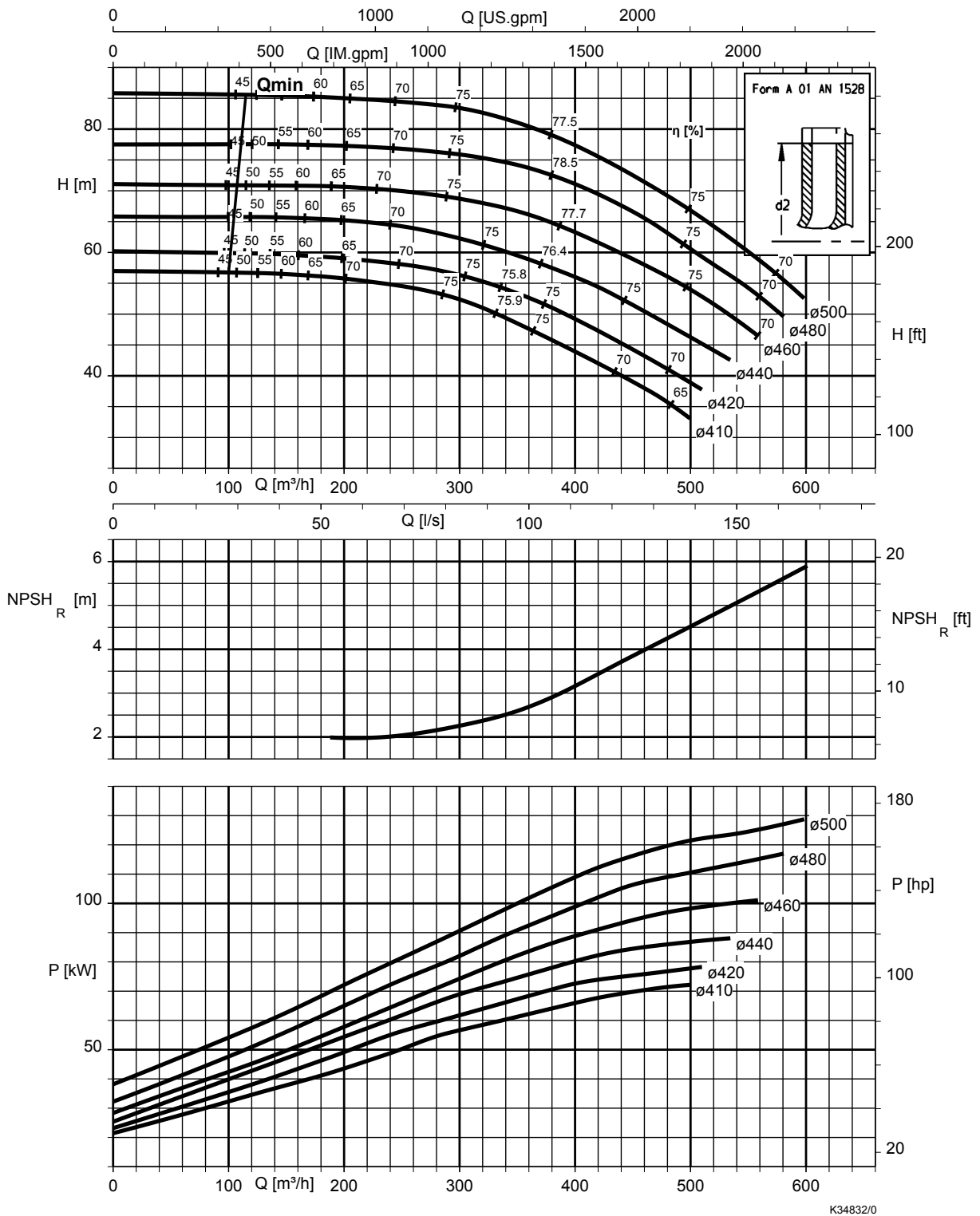
The indicated heads and performance data apply to pumped fluids with a density  $\rho = 1.0 \text{ kg/dm}^3$  and a kinematic viscosity of up to  $20 \text{ mm}^2/\text{s}$  max. If the density  $\neq 1.0$ , the performance data must be multiplied by  $\rho$ . For viscosities  $>20 \text{ mm}^2/\text{s}$  the corresponding data for cold water has to be calculated and the impact on the pump's performance has to be determined.

#### Correction factors

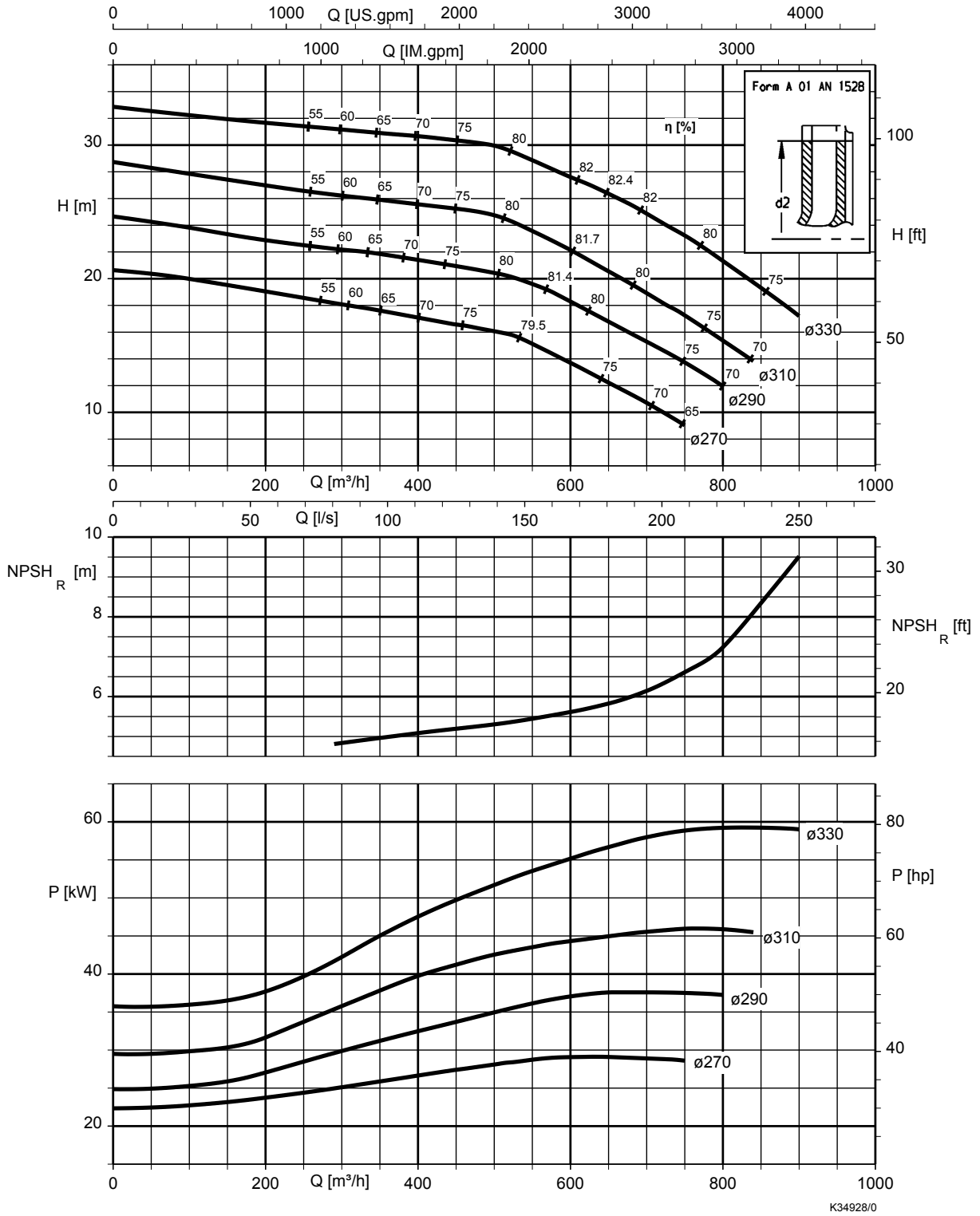
The characteristic curves apply to pumps with cast iron or bronze impellers. When using an impeller made of cast steel materials the efficiency and pump power of the corresponding pump sizes have to be multiplied by the correction factors indicated in the characteristic curves.

Etaline-R, n = 1450 rpm

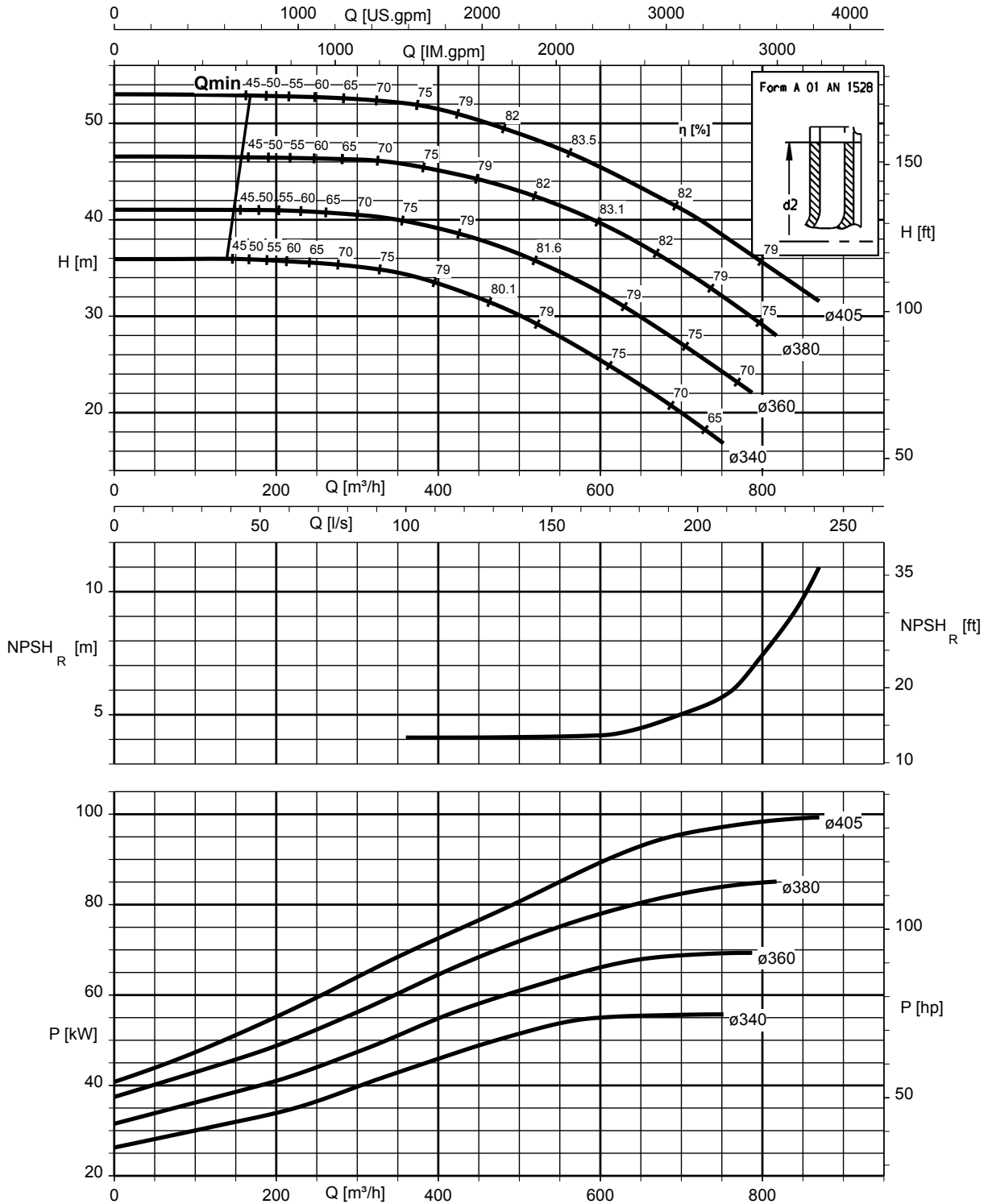
Etaline-R 150-500, n = 1450 rpm



**Etaline-R 200-330, n = 1450 rpm**

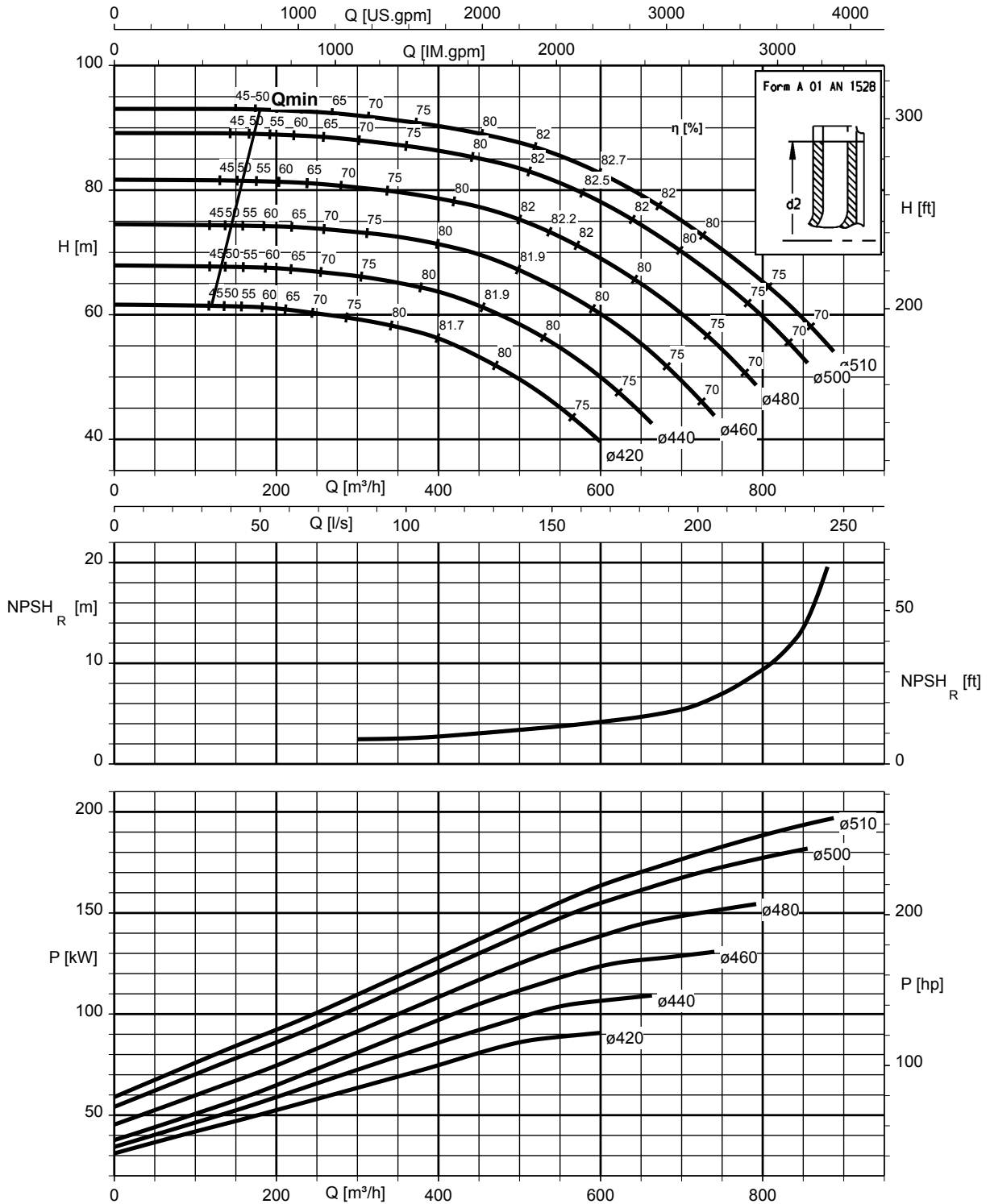


Etaline-R 200-400, n = 1450 rpm



K34839/0

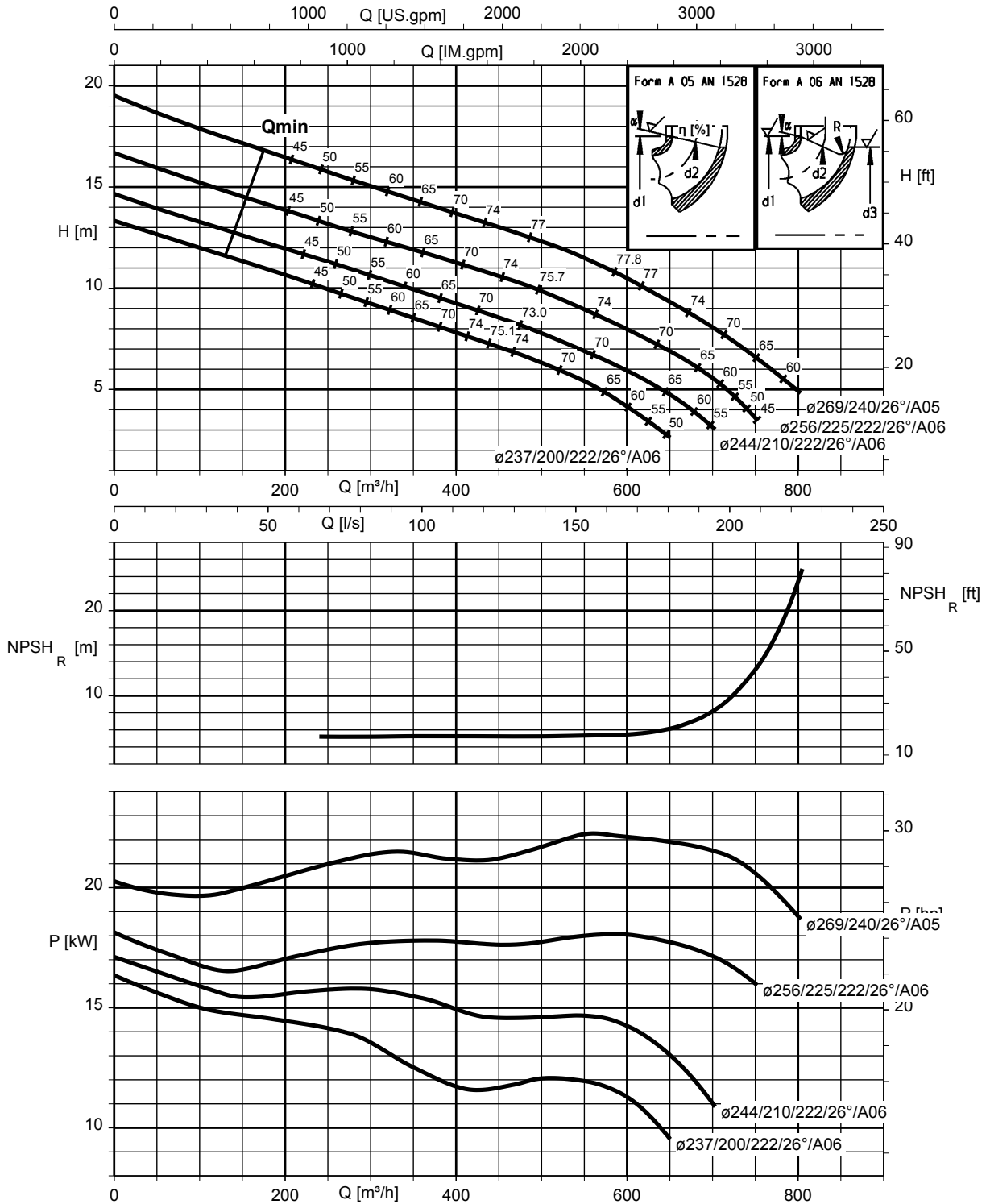
Etaline-R 200-500, n = 1450 rpm



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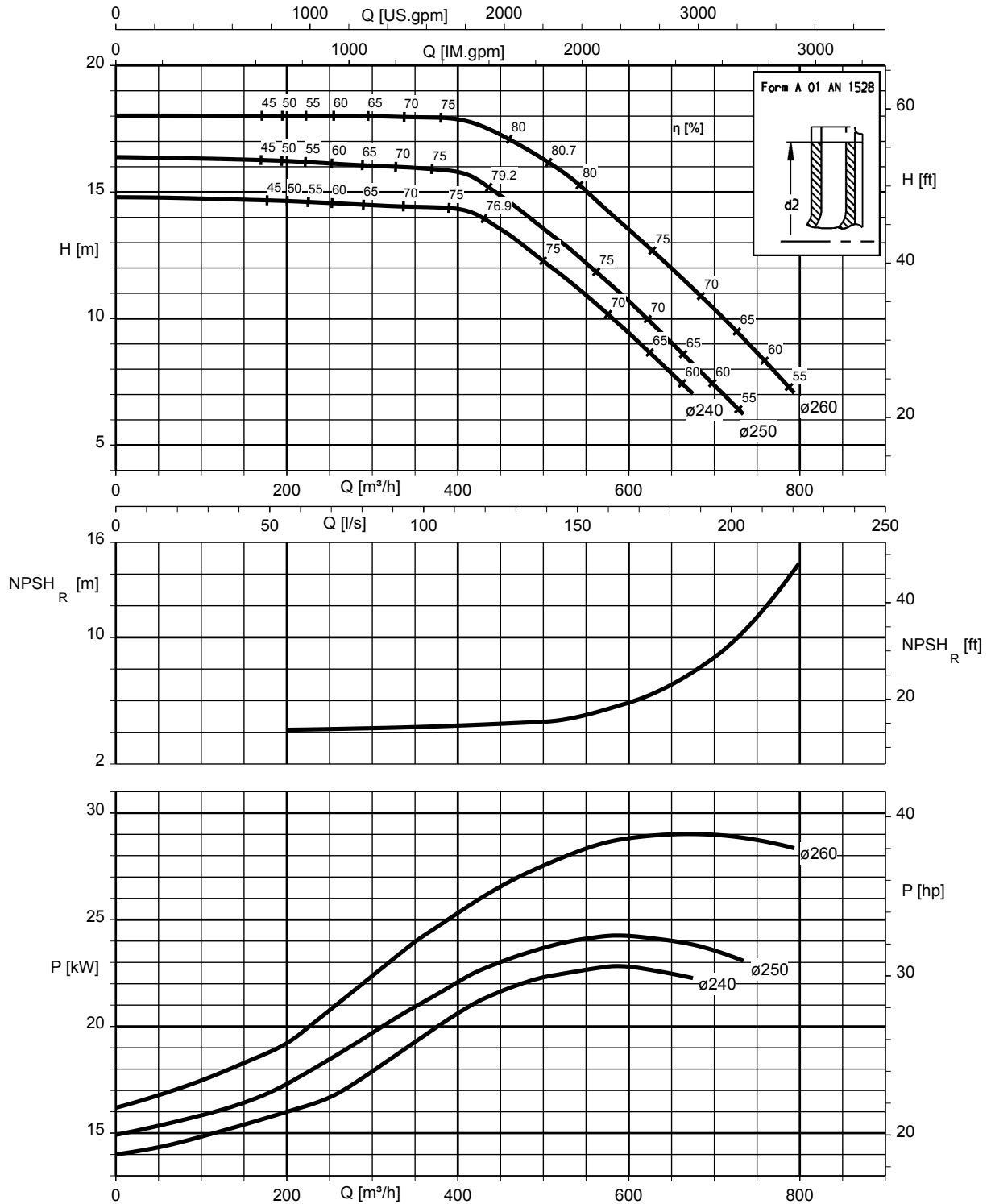


**Etaline-R 250-250, n = 1450 rpm**



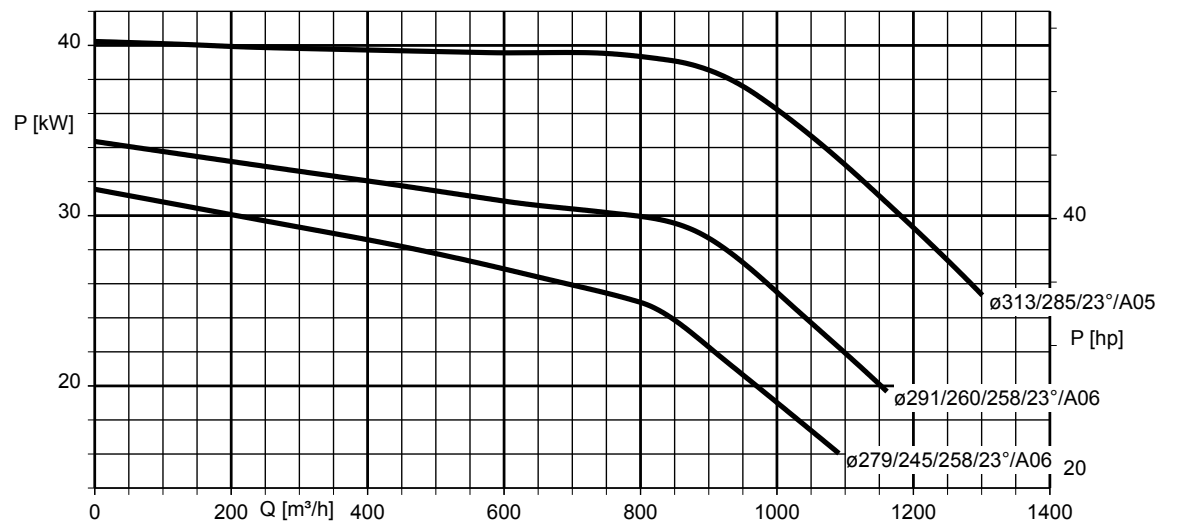
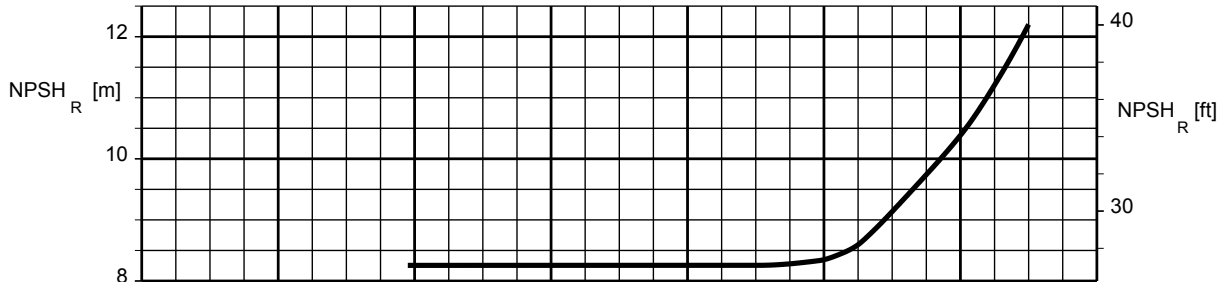
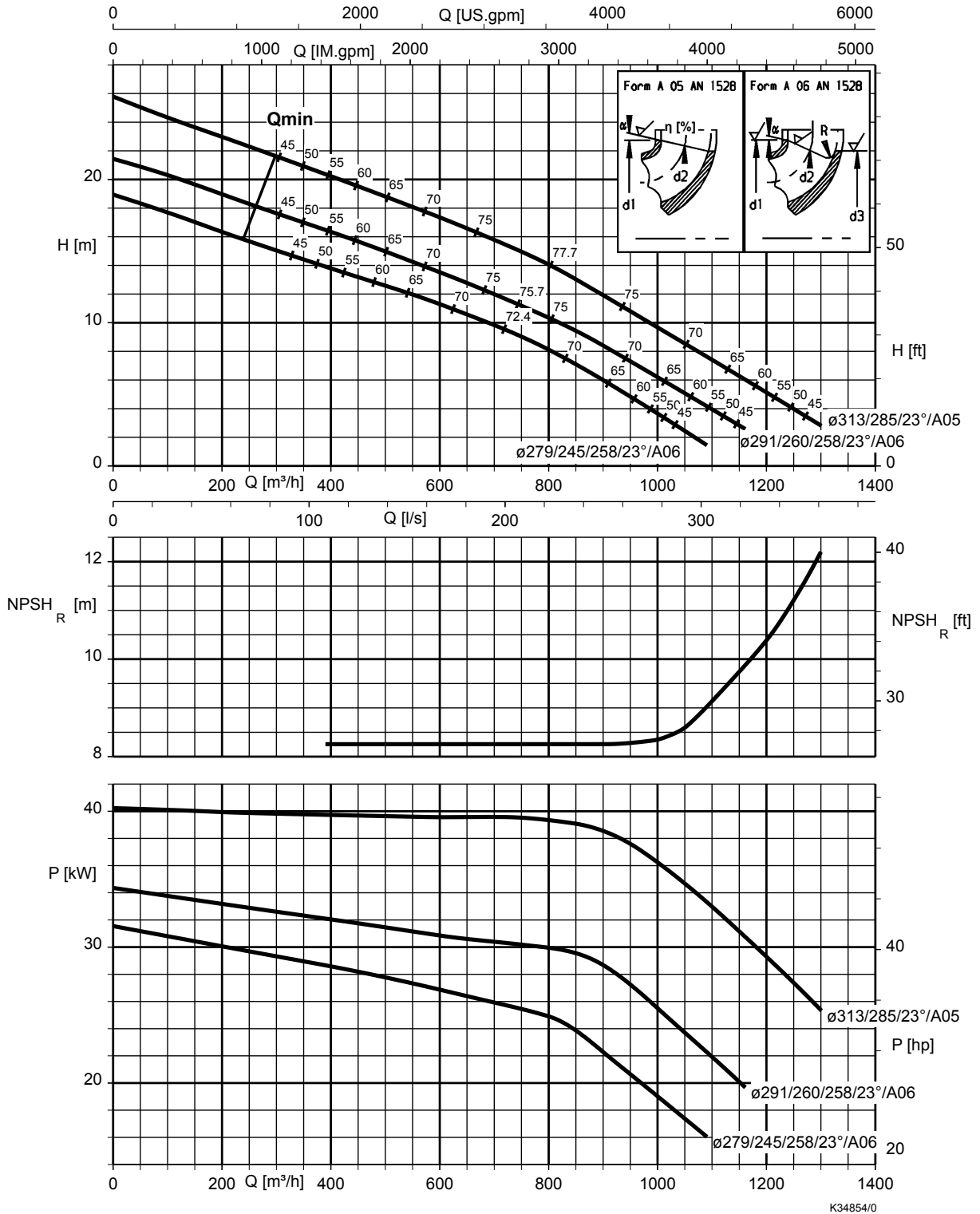
K34846/0

Etaline-R 250-260, n = 1450 rpm



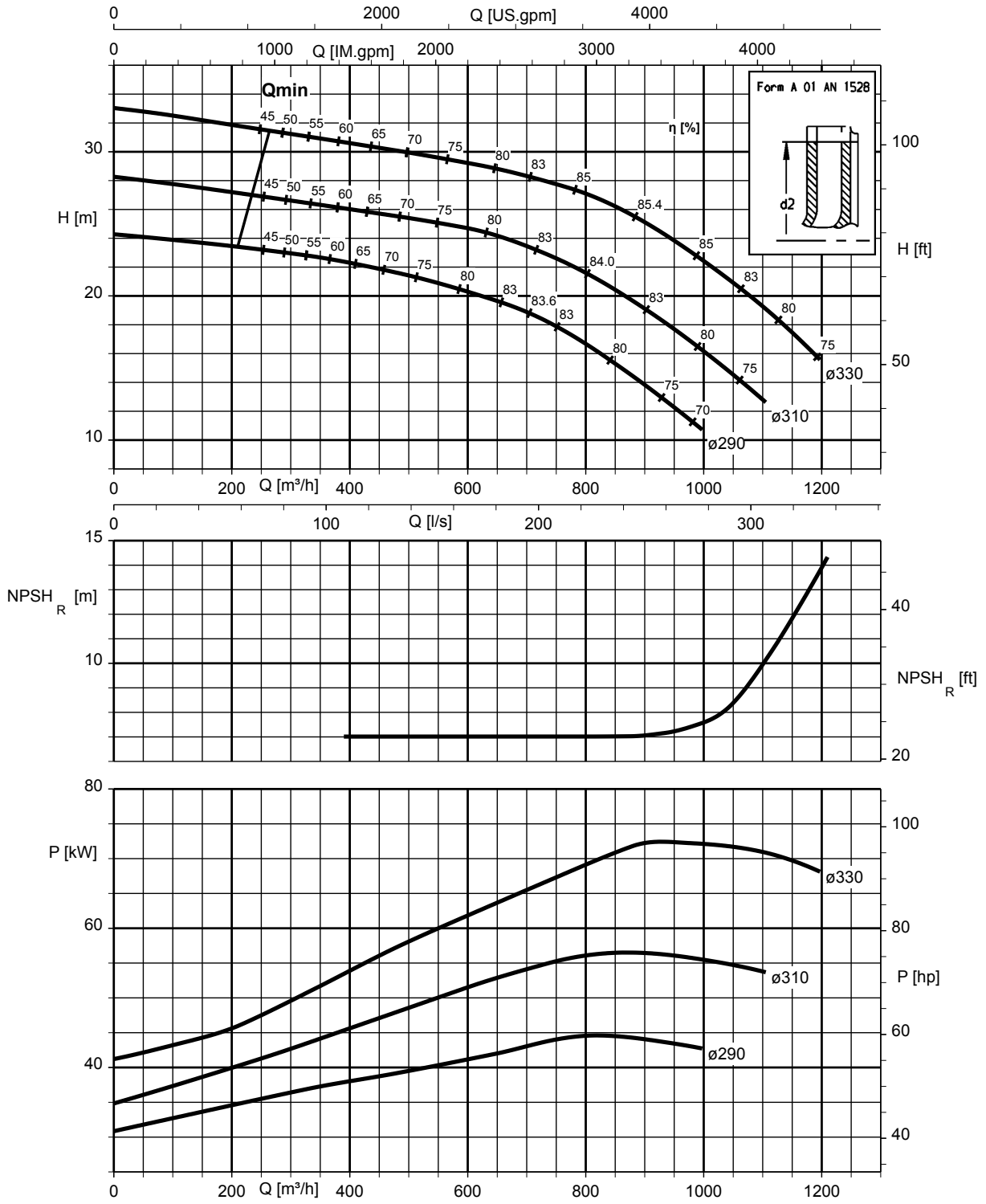
K34924/0

Etaline-R 250-300, n = 1450 rpm



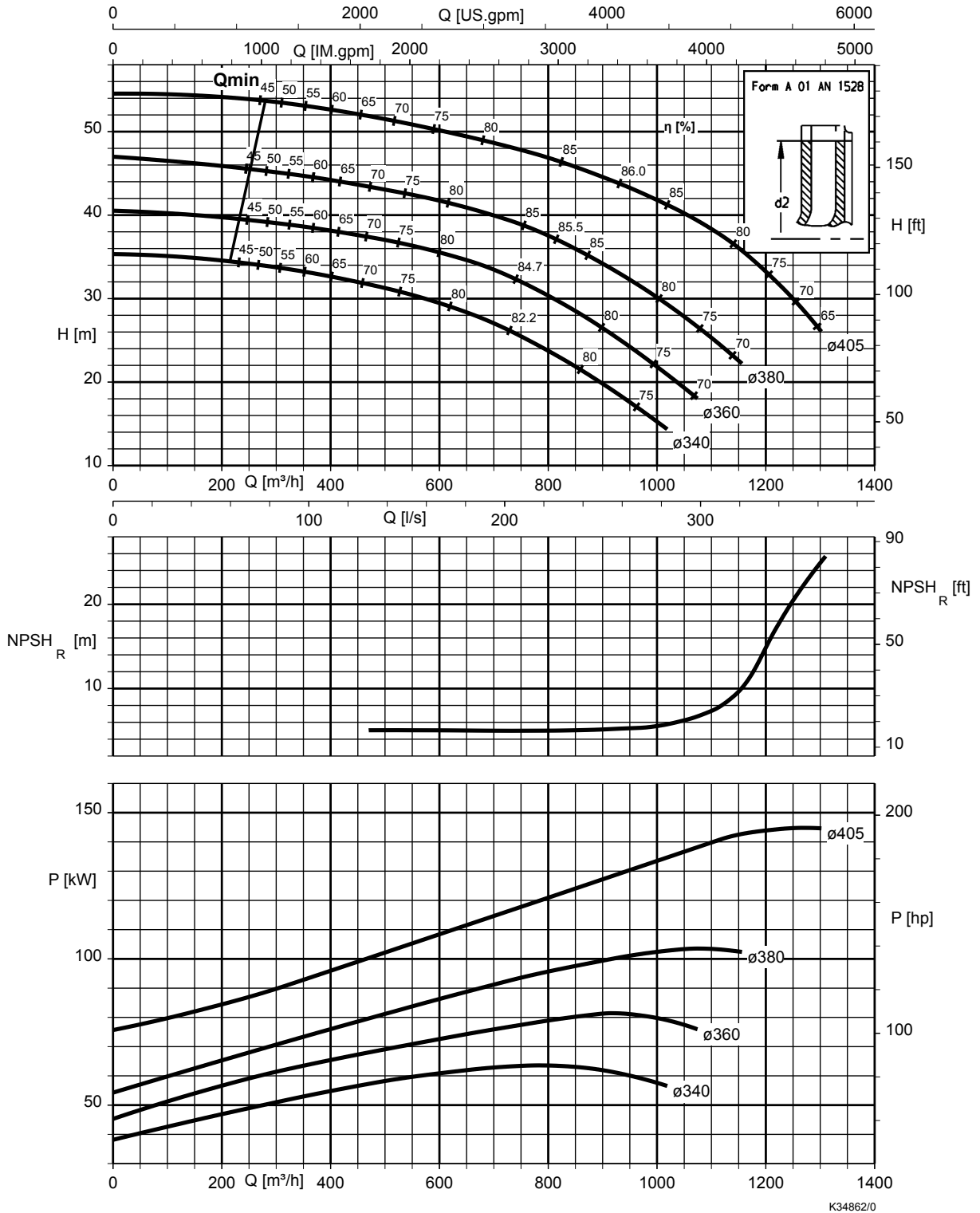
K34854/0

**Etaline-R 250-330, n = 1450 rpm**

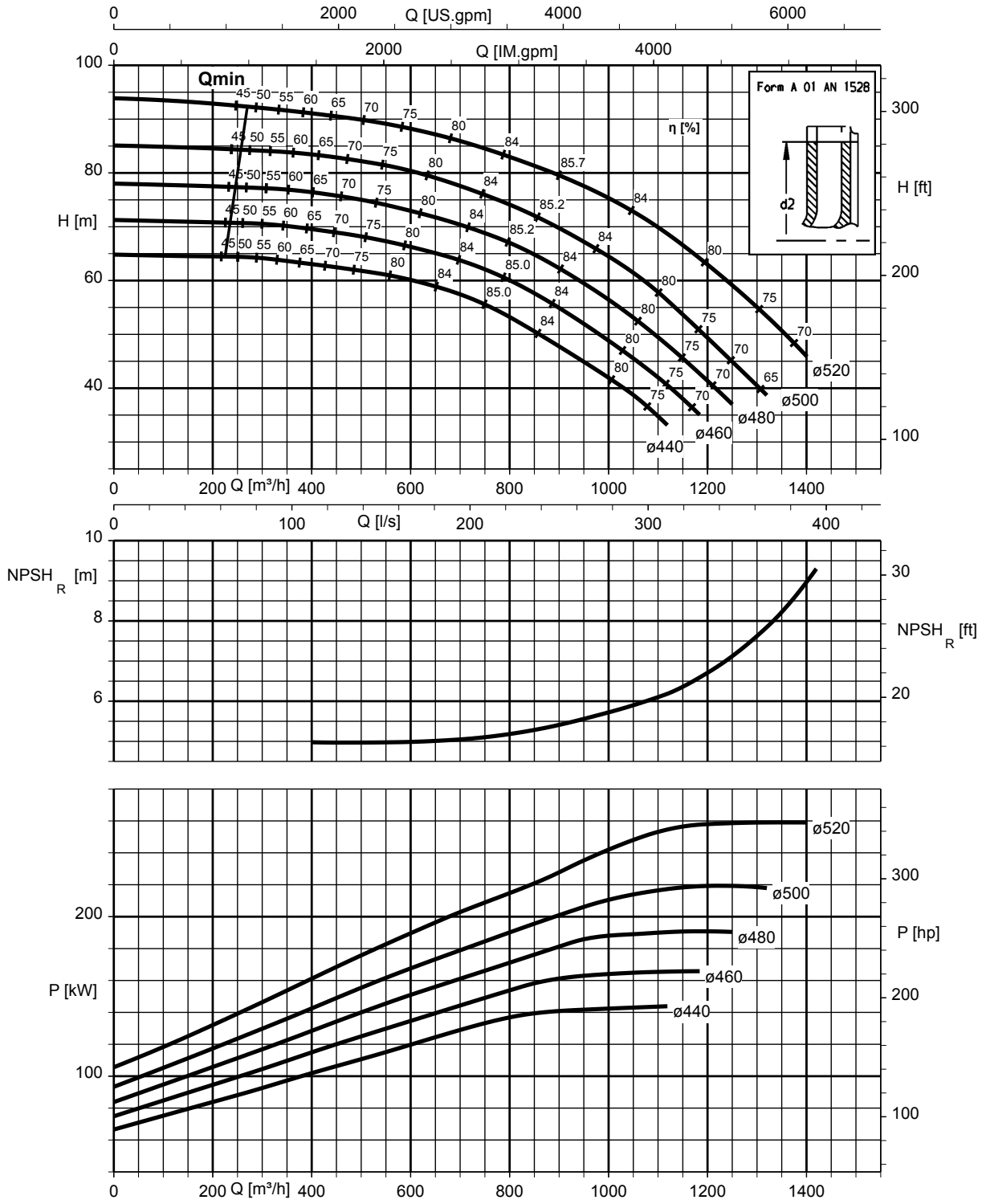


K34858/0

**Etaline-R 250-400, n = 1450 rpm**

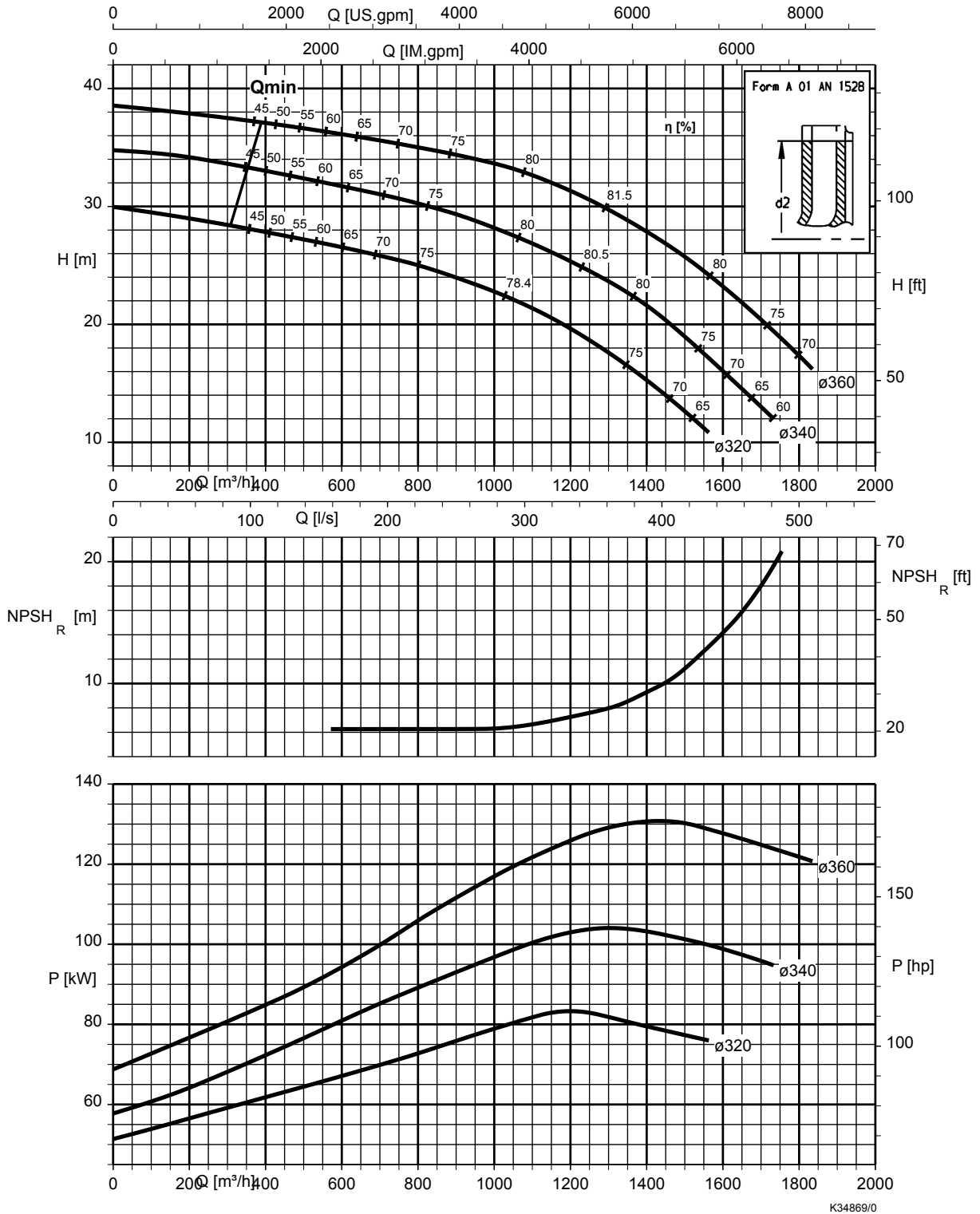


**Etaline-R 250-500, n = 1450 rpm**

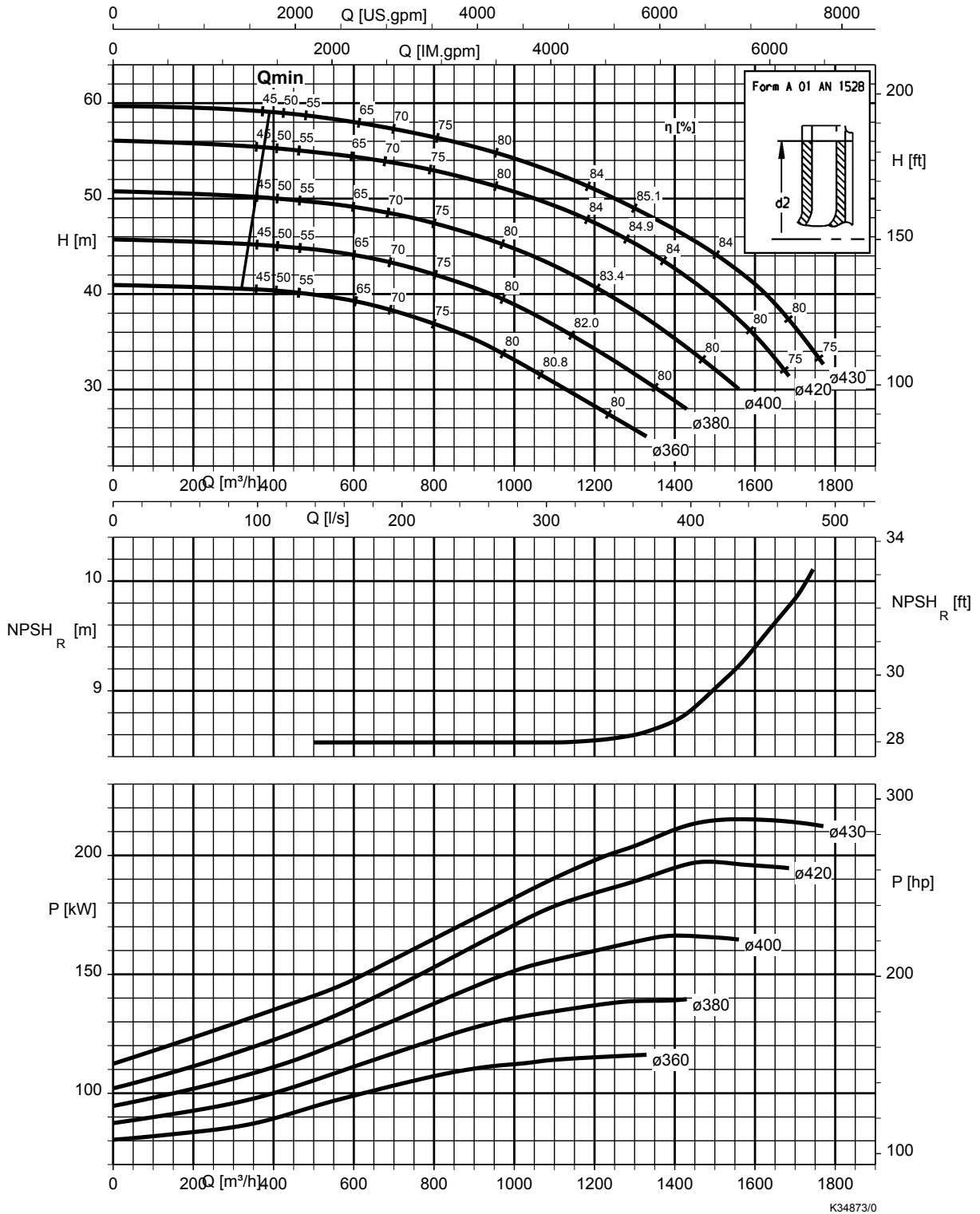


K34866/0

**Etaline-R 300-360, n = 1450 rpm**



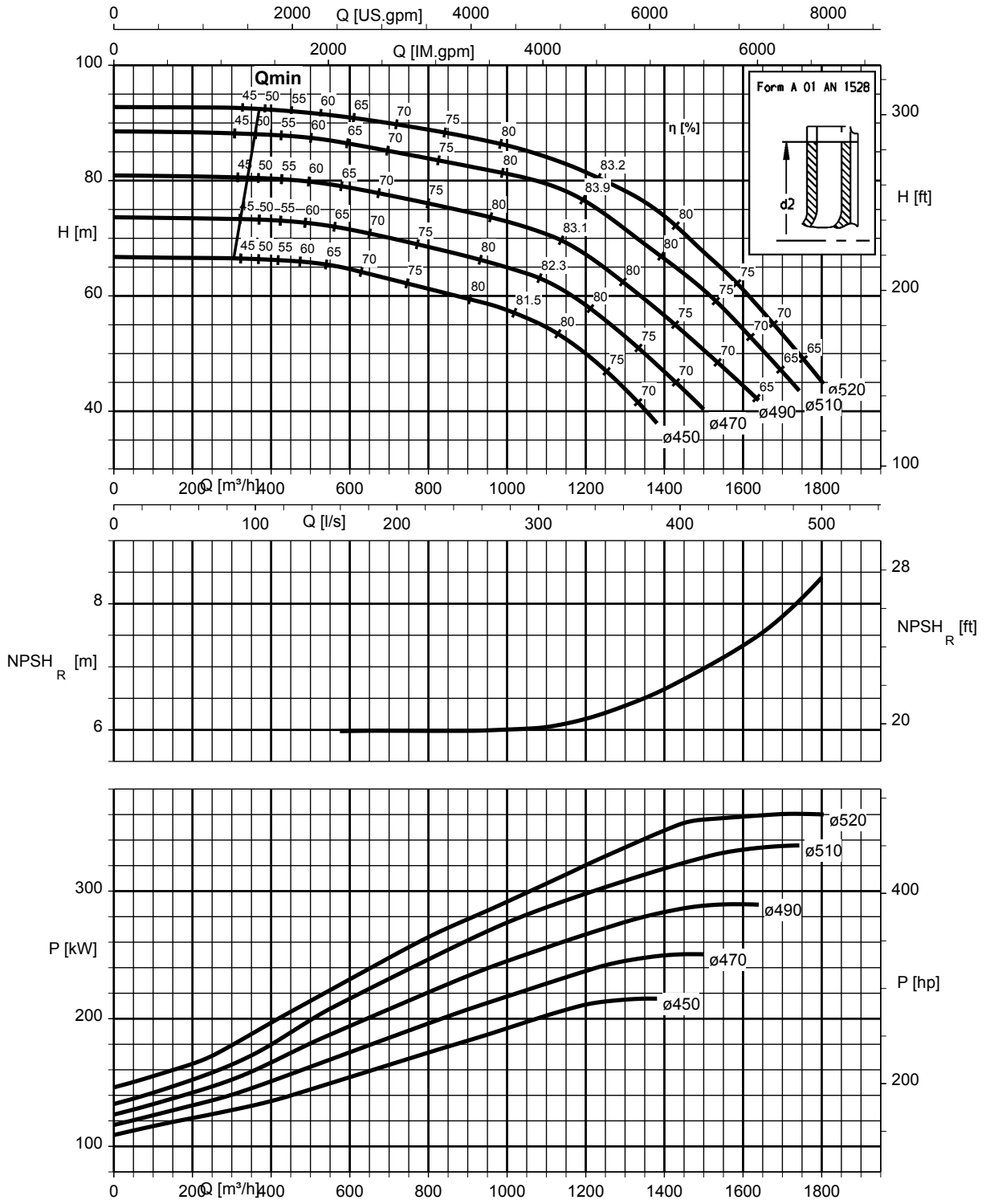
Etaline-R 300-400, n = 1450 rpm



K34873/0

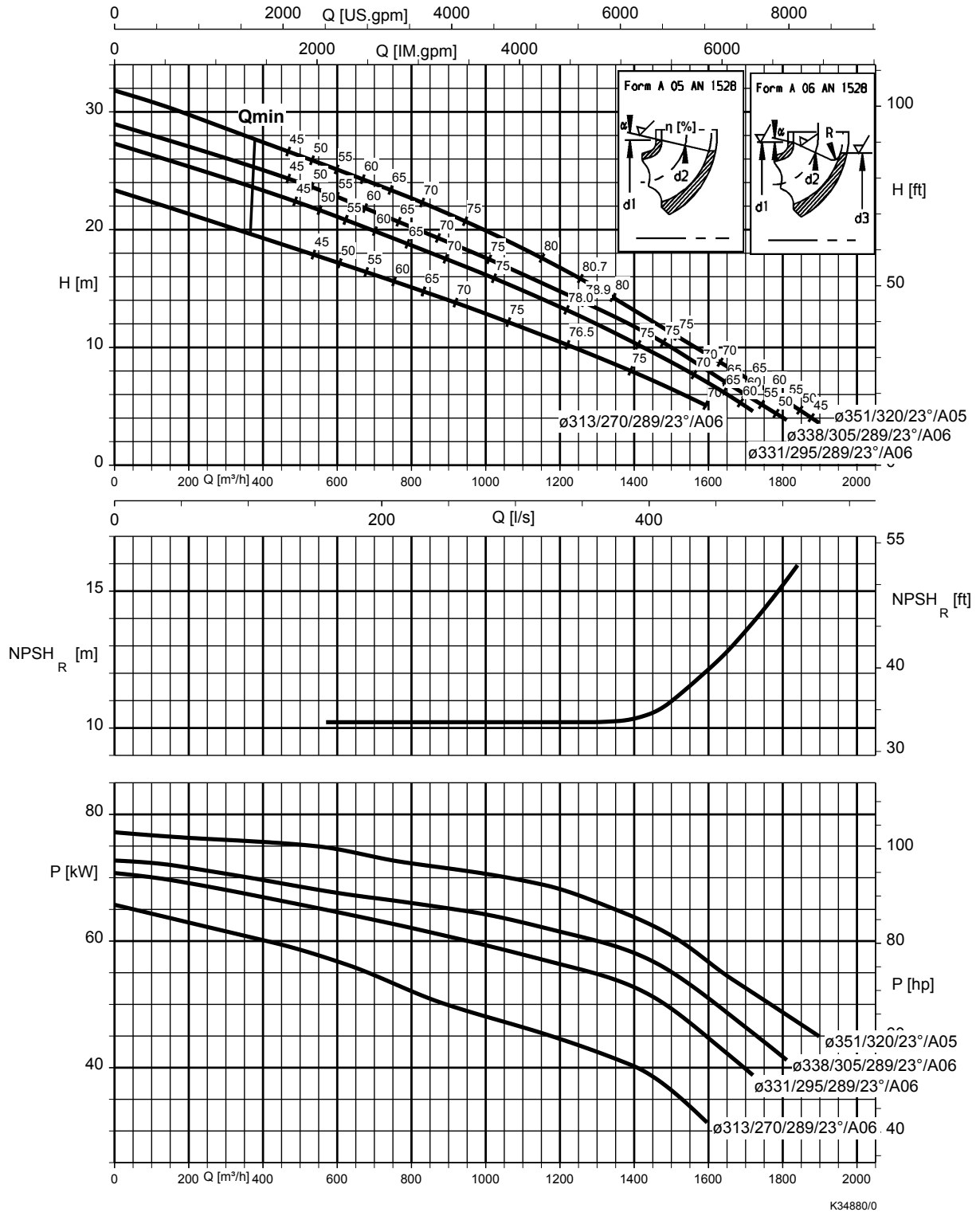


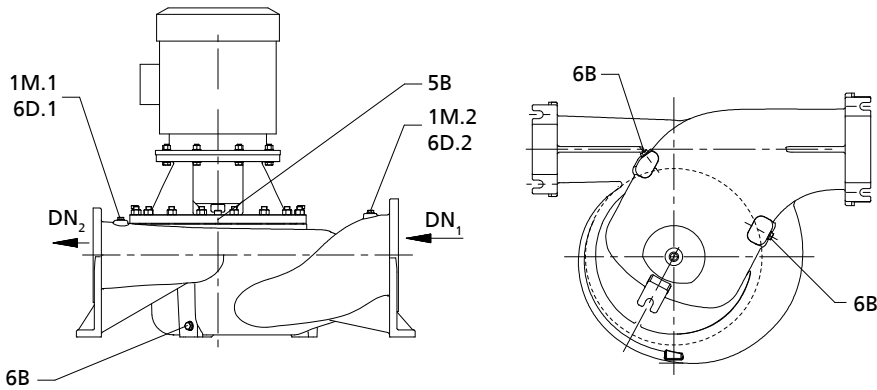
**Etaline-R 300-500, n = 1450 rpm**



K34877/0

Etaline-R 350-340, n = 1450 rpm

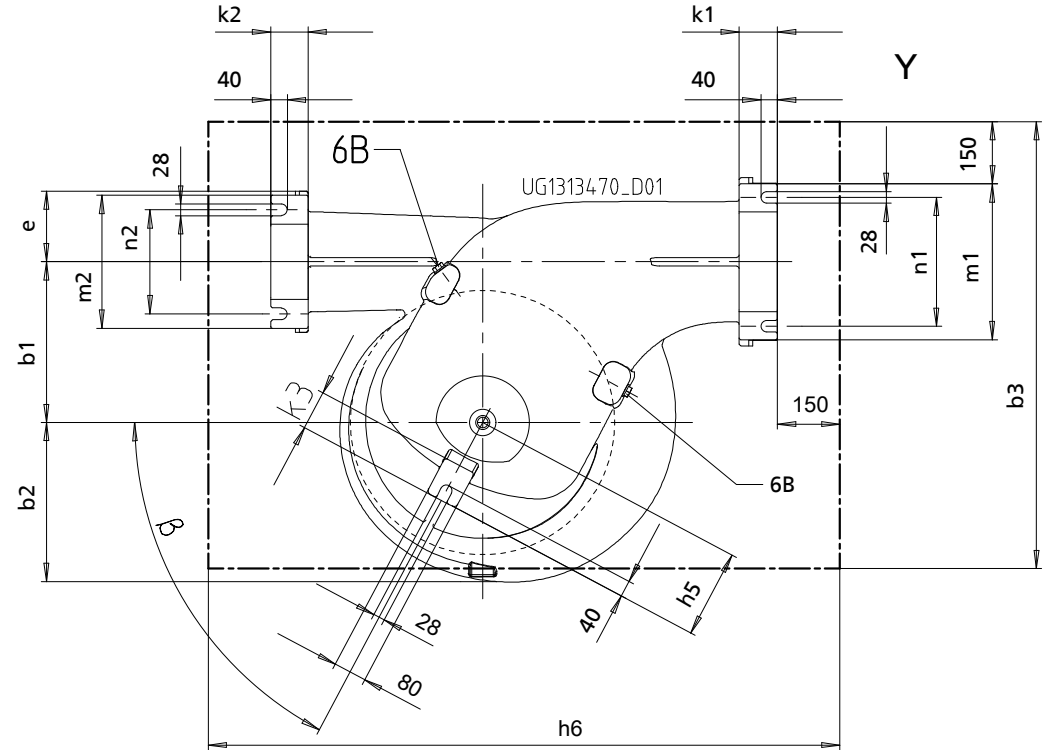
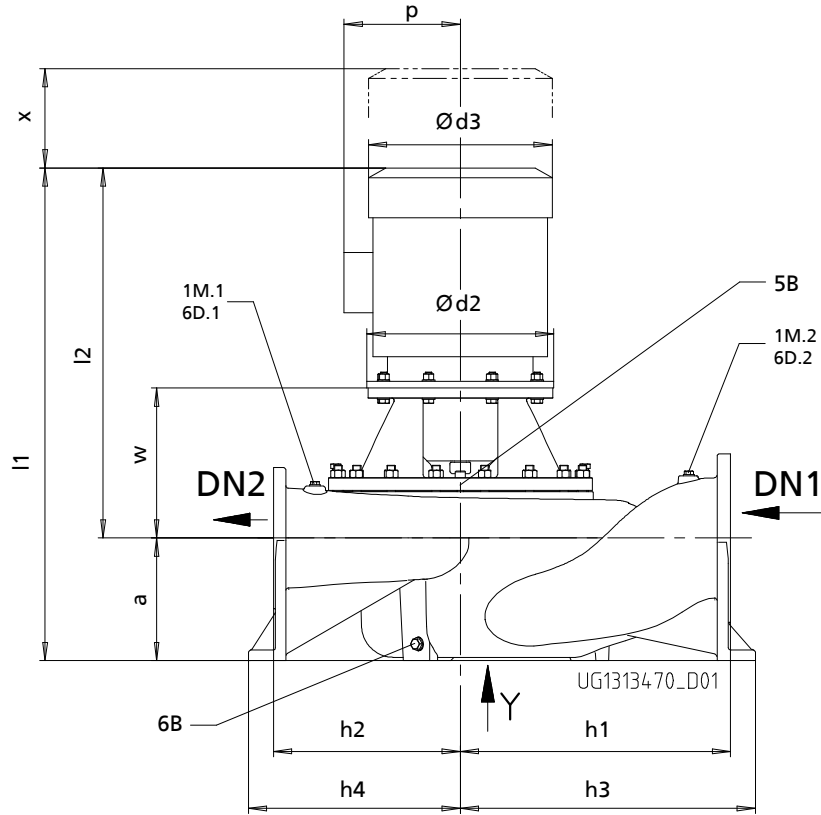


**Dimensions and connections**
**Connections**

**Fig. 2: Connections**
**Connection types**

Connection	Description	Configuration	Position	Thread
1M.1/2	Pressure gauge connection	Drilled and closed, or pressure sensor for PumpMeter (if selected)	Suction flange and discharge flange	G1/2
5B	Vent connection for the mechanical seal chamber	Plugged with vent plug	Casing cover	G1/4
6B	Fluid drain	Drilled and closed	Casing	G3/4
6D.1/2	Fluid priming and venting	Drilled and closed	Casing	G1/2

Dimensions

Etaline-R, n = 1450 rpm



Dimensions [mm]

Size	DN <sub>1</sub> <sup>8)</sup>	DN <sub>2</sub> <sup>8)</sup>	a	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	d <sub>2</sub>	d <sub>3</sub>	e	h <sub>1</sub>	h <sub>2</sub>	h <sub>3</sub>	h <sub>4</sub>	h <sub>5</sub>	h <sub>6</sub>	k <sub>1</sub>	k <sub>2</sub>	k <sub>3</sub>	l <sub>1</sub>	l <sub>2</sub>	m <sub>1</sub>	m <sub>2</sub>	n <sub>1</sub>	n <sub>2</sub>	p	w	x	β
150-500/3004	200	150	280	315	350	955	450	402	180	650	450	710	510	207	1520	90	86	75	1291	1011	320	260	250	190	300	352	200	50
150-500/3704	200	150	280	315	350	955	450	442	180	650	450	710	510	207	1520	90	86	75	1281	1001	320	260	250	190	325	352	200	50
150-500/4504	200	150	280	315	350	955	450	442	180	650	450	710	510	207	1520	90	86	75	1464	1184	320	260	250	190	325	361	200	50
150-500/5504	200	150	280	315	350	955	660	495	180	650	450	710	510	207	1520	90	86	75	1515	1235	320	260	250	190	392	418	200	50
150-500/7504	200	150	280	315	350	955	660	555	180	650	450	710	510	207	1520	90	86	75	1518	1238	320	260	250	190	432	418	200	50
150-500/9004	200	150	280	315	350	955	660	555	180	650	450	710	510	207	1520	90	86	75	1628	1348	320	260	250	190	432	418	200	50

8) EN 1092-2, PN 25

Size	DN <sub>1</sub> <sup>8)</sup>	DN <sub>2</sub> <sup>8)</sup>	a	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	d <sub>2</sub>	d <sub>3</sub>	e	h <sub>1</sub>	h <sub>2</sub>	h <sub>3</sub>	h <sub>4</sub>	h <sub>5</sub>	h <sub>6</sub>	k <sub>1</sub>	k <sub>2</sub>	k <sub>3</sub>	l <sub>1</sub>	l <sub>2</sub>	m <sub>1</sub>	m <sub>2</sub>	n <sub>1</sub>	n <sub>2</sub>	p	w	x	β
150-500/11004	200	150	280	315	350	955	660	610	180	650	450	710	510	207	1520	90	86	75	1635	1355	320	260	250	190	495	425	200	50
150-500/13204	200	150	280	315	350	955	660	610	180	650	450	710	510	207	1520	90	86	75	1637	1357	320	260	250	190	495	425	200	50
150-500/16004	200	150	280	315	350	955	660	610	180	650	450	710	510	207	1520	90	86	75	1797	1517	320	260	250	190	495	425	200	50
200-330/1504	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	250	200	295	290	351	975	660	610	213	700	400	760	460	225	1520	85	82	105	1952	1657	375	320	310	250	495	425	200	50
200-500/4504	250	200	295	397	385	1100	450	442	213	650	450	710	510	212	1520	85	82	95	1407	1112	375	320	310	250	325	352	200	50
200-500/5504	250	200	295	397	385	1100	660	495	213	650	450	710	510	212	1520	85	82	95	1473	1178	375	320	310	250	392	361	200	62
200-500/7504	250	200	295	397	385	1100	660	555	213	650	450	710	510	212	1520	85	82	95	1533	1238	375	320	310	250	432	418	200	62
200-500/9004	250	200	295	397	385	1100	660	555	213	650	450	710	510	212	1520	85	82	95	1643	1348	375	320	310	250	432	418	200	62
200-500/1004	250	200	295	397	385	1100	660	610	213	650	450	710	510	212	1520	85	82	95	1652	1357	375	320	310	250	495	425	200	62
200-500/13204	250	200	295	397	385	1100	660	610	213	650	450	710	510	212	1520	85	82	95	1812	1517	375	320	310	250	495	425	200	62
200-500/16004	250	200	295	397	385	1100	660	610	213	650	450	710	510	212	1520	85	82	95	1812	1517	375	320	310	250	495	425	200	62
200-500/20004	250	200	295	397	385	1100	660	610	213	650	450	710	510	212	1520	85	82	95	1952	1657	375	320	310	250	495	425	200	62
200-500/25004	250	200	295	397	385	1100	800	610	213	650	450	710	510	212	1520	85	82	95	2041	1746	375	320	310	250	495	454	200	62
250-250/754	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	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	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	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	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	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	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	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	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	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	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	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

Size	DN <sub>1</sub> <sup>8)</sup>	DN <sub>2</sub> <sup>8)</sup>	a	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	d <sub>2</sub>	d <sub>3</sub>	e	h <sub>1</sub>	h <sub>2</sub>	h <sub>3</sub>	h <sub>4</sub>	h <sub>5</sub>	h <sub>6</sub>	k <sub>1</sub>	k <sub>2</sub>	k <sub>3</sub>	l <sub>1</sub>	l <sub>2</sub>	m <sub>1</sub>	m <sub>2</sub>	n <sub>1</sub>	n <sub>2</sub>	p	w	x	β
250-260/3004	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	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	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	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	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	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	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	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	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	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	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	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	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
250-330/220	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
250-330/300	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
250-330/370	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
250-330/450	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
250-330/550	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
250-330/750	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
250-330/900	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
250-330/1100	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	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	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	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
250-400/370	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	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	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	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	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	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	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	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	300	250	355	325	376	1065	660	610	243	750	450	810	510	255	1620	88	85	105	2012	1657	430	380	360	310	495	425	200	50
250-400/25004	300	250	355	325	376	1065	800	610	243	750	450	810	510	255	1620	88	85	105	2101	1746	430	380	360	310	495	454	200	50
250-500/7504	300	250	360	425	443	1160	660	555	243	800	500	860	560	230	1720	88	85	95	1598	1238	430	375	360	310	432	418	200	55
250-500/9004	300	250	360	425	443	1160	660	555	243	800	500	860	560	230	1720	88	85	95	1708	1348	430	375	360	310	432	418	200	55
250-500/11004	300	250	360	425	443	1160	660	610	243	800	500	860	560	230	1720	88	85	95	1717	1357	430	375	360	310	495	425	200	55
250-500/13204	300	250	360	425	443	1160	660	610	243	800	500	860	560	230	1720	88	85	95	1877	1517	430	375	360	310	495	425	200	55
250-500/16004	300	250	360	425	443	1160	660	610	243	800	500	860	560	230	1720	88	85	95	1877	1517	430	375	360	310	495	425	200	55
250-500/20004	300	250	360	425	443	1160	660	610	243	800	500	860	560	230	1720	88	85	95	2017	1657	430	375	360	310	495	425	200	55
250-500/25004	300	250	360	425	443	1160	800	710	243	800	500	860	560	230	1720	88	85	95	2106	1746	430	375	360	310	570	454	200	55
250-500/31504	300	250	360	425	443	1160	800	710	243	800	500	860	560	230	1720	88	85	95	2190	1830	430	375	360	310	570	454	200	55
300-360/3704	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	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

Size	DN <sub>1</sub> <sup>8)</sup>	DN <sub>2</sub> <sup>8)</sup>	a	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	d <sub>2</sub>	d <sub>3</sub>	e	h <sub>1</sub>	h <sub>2</sub>	h <sub>3</sub>	h <sub>4</sub>	h <sub>5</sub>	h <sub>6</sub>	k <sub>1</sub>	k <sub>2</sub>	k <sub>3</sub>	l <sub>1</sub>	l <sub>2</sub>	m <sub>1</sub>	m <sub>2</sub>	n <sub>1</sub>	n <sub>2</sub>	p	w	x	β
300-360/5504	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	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	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	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	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	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	300	300	435	387	458	1100	660	610	243	800	450	860	510	240	1670	88	87,5	105	2094	1659	430	430	360	360	495	427	250	45
300-400/5504	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	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	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	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	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	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	350	300	410	425	439	1200	660	610	278	800	500	860	560	245	1720	90	87,5	95	2067	1657	490	430	420	360	495	425	250	53,5
300-400/25004	350	300	410	425	439	1200	800	610	278	800	500	860	560	245	1720	90	87,5	95	2156	1746	490	430	420	360	495	454	250	53,5
300-400/31504	350	300	410	425	439	1200	800	610	278	800	500	860	560	245	1720	90	87,5	95	2240	1830	490	430	420	360	495	454	250	53,5
300-500/1104	350	300	395	450	456	1235	660	610	278	800	500	860	560	255	1720	90	88	105	1747	1357	490	430	420	360	495	425	250	54
300-500/13204	350	300	395	450	456	1235	660	610	278	800	500	860	560	255	1720	90	88	105	1907	1517	490	430	420	360	495	425	250	54
300-500/16004	350	300	395	450	456	1235	660	610	278	800	500	860	560	255	1720	90	88	105	1912	1517	490	430	420	360	495	425	250	54
300-500/20004	350	300	395	450	456	1235	660	610	278	800	500	860	560	255	1720	90	88	105	2052	1657	490	430	420	360	495	425	250	54
300-500/25004	350	300	395	450	456	1235	800	710	278	800	500	860	560	255	1720	90	88	105	2141	1746	490	430	420	360	570	454	250	54
300-500/31504	350	300	395	450	456	1235	800	710	278	800	500	860	560	255	1720	90	88	105	2225	1830	490	430	420	360	570	454	250	54
350-340/2204	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	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	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	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	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	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	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	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	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

### Flange dimensions

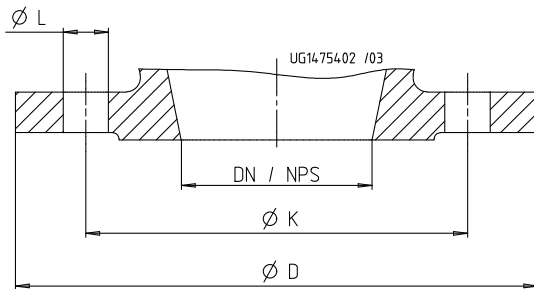


Fig. 3: Flange dimensions

Flange dimensions [mm]

DN/ NPS	Standard											
	EN 1092-2									ASME B 16.1		
	Material											
	S			G, M			G, M			G, M, S		
	PN 25			PN 16			PN 10			Class 125		
Ø K	Ø D	Number of holes L	Ø K	Ø D	Number of holes L	Ø K	Ø D	Number of holes L	Ø K	Ø D	Number of holes L	
150 / NPS6	250	300	8×Ø28	240	285	8×Ø23	240	285	8×Ø23	241,3	279,4	8×Ø22,4
200 / NPS8	310	360	12×Ø28	295	340	12×Ø23	295	340	8×Ø23	298,5	342,9	8×Ø22,4
250 / NPS10	370	425	12×Ø31	355	405	12×Ø28	350	395	12×Ø23	362	406,4	12×Ø25,4
300 / NPS12	430	485	16×Ø31	410	460	12×Ø28	400	445	12×Ø23	431,8	482,6	12×Ø25,4
350 / NPS14	490	555	16×Ø34	470	520	16×Ø28	460	505	16×Ø23	476,3	533,4	12×Ø28,4

### Flange design

Flange design by materials

Material variant	Standard	Nominal size	Pressure class
SN, SCN, SMN	EN 1092-2	DN 150 - DN 350	PN 25
	Drilled to ASME B16.1	DN 150 - DN 350	Class 125
GN, GCN, MN	Drilled to EN 1092-2	DN 150 - DN 350	PN 16
	Drilled to ASME B16.1	DN 150 - DN 350	PN 10
			Class 125



## Accessories

## Electrical accessories

Further electrical accessories

Component	Description
	<p><b>PumpMeter</b> intelligent pressure transmitter</p> <p>The PumpMeter device is an intelligent pressure transmitter for pumps, with on-site display of measured values and operating data. The device comprises two pressure sensors and a display unit. It records the load profile of the pump in order to indicate any potential for optimising energy efficiency and availability. PumpMeter is supplied completely assembled and parameterised for the pump it is used with. It is ready for operation as soon as the M12 plug connector is plugged in.</p>
 <p data-bbox="145 1037 461 1064">PumpDrive 2 / PumpDrive 2 Eco</p>	<p><b>PumpDrive</b> self-cooling frequency inverter</p> <p>PumpDrive is a modular, self-cooling frequency inverter which enables continuously variable speed control of asynchronous motors and synchronous reluctance motors by means of analog standard signals or the control panel.</p> <p>The parts of the PumpDrive housing which are in contact with the atmosphere are free from paint-wetting impairment substances.</p> <p>Mounting options:</p> <ul style="list-style-type: none"> <li>▪ Motor-mounted model</li> <li>▪ Wall-mounted model</li> <li>▪ Cabinet-mounted model</li> </ul>
	<p><b>KSB SuPremE</b> motor</p> <p>Magnetless synchronous reluctance motor of efficiency class IE4 in compliance with IEC CD 60034-30 Ed. 2, 05-2011 for operation with a KSB PumpDrive variable speed system, no rotor position sensors needed</p>

General assembly drawings

General assembly drawing with list of components

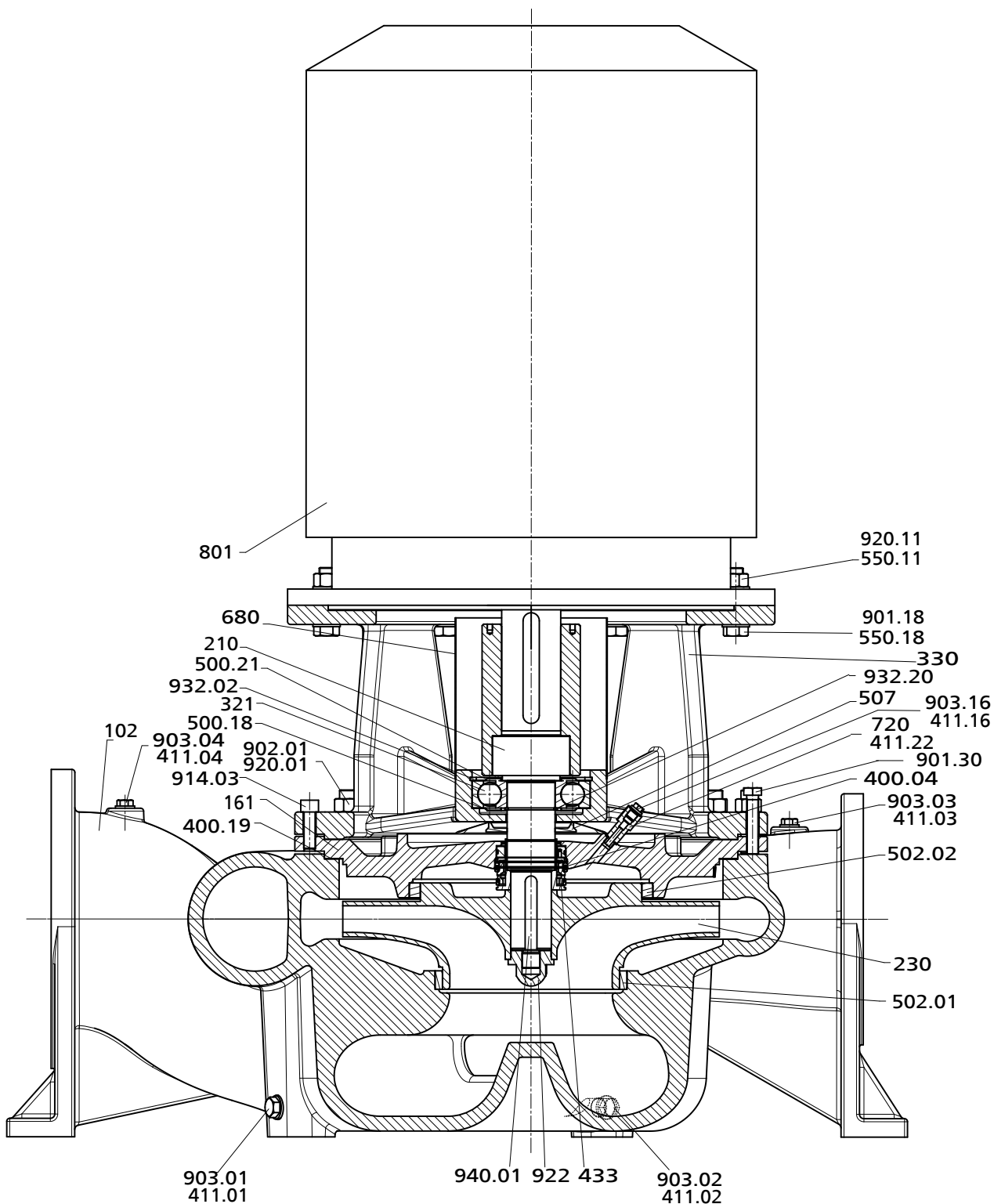


Fig. 4: General assembly drawing

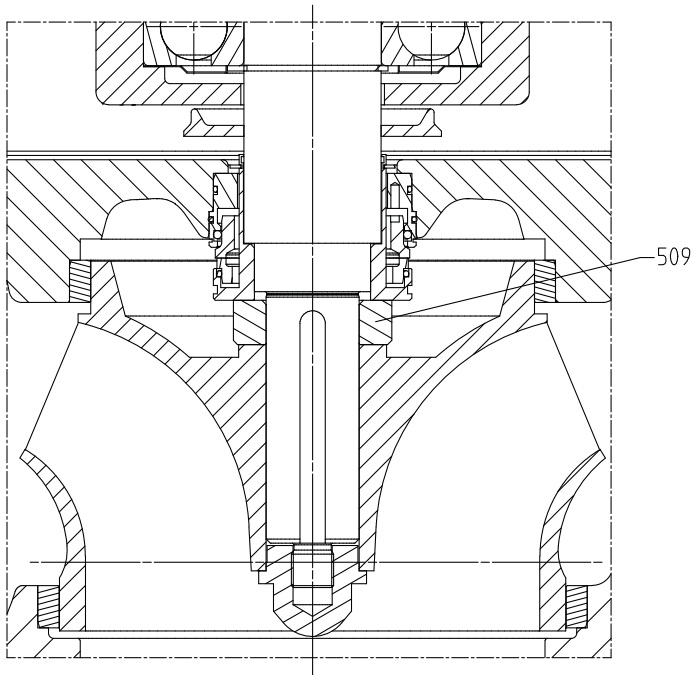


Fig. 5: Design with intermediate ring (for sizes 250-250, 250-300, 350-340 only)

List of components

Part No.	Description	Part No.	Description
102	Volute casing	550.11/.18	Disc
161	Casing cover	680	Guard
210	Shaft	720	Fitting
230	Impeller	801	Flanged motor
321	Radial ball bearing	901.18/.30	Hexagon head bolt
330	Bearing bracket	902.01	Stud
400.04/.19	Gasket	903.01/.02/.03/.04/.16	Screw plug
411.01/.02/.03/.04/.16/.22	Joint ring	914.03	Hexagon socket head cap screw
433	Mechanical seal	920.01/.11	Nut
500.18/.21	Ring	922	Impeller nut
502.01/.02	Casing wear ring	932.02/.20	Circlip
507	Thrower	940.01	Key
509 <sup>9)</sup>	Intermediate ring		

9) For sizes 250-250, 250-300, 250-340 only

Your local KSB representative:



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