

Process Pump

RPH-V

50 Hz and 60 Hz

Characteristic Curves Booklet



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Characteristic Curves Booklet RPH-V

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Centrifugal Pumps with Shaft Seal

Process Pumps

RPH-V



General

Vertically suspended, single-stage, single-suction, single-casing, line shaft volute casing pump with integral thrust bearing assembly and separate discharge line in accordance with API 610 / ISO 13709 (VS4).

Acceptance grade

ISO 9906 / ANSI/HI 14.6 Grade 1B or API 610 11th Edition, Table 16

Guarantee of operating data

The operating data for one operating point are guaranteed to be within the tolerances as per standard ISO 9906 / ANSI/HI 14.6 Grade 1B or API 610 11th Edition, Table 16. Guarantees for other operating points along the characteristic curve are available on request only.

The heads and performance data apply to fluids handled of a density $\rho = 1000 \text{ kg/m}^3$ and a kinematic viscosity ν of up to $20 \text{ mm}^2/\text{s}$. If the density is different from 1000 kg/m^3 , the power must be multiplied by ρ .

Maximum flow rate

The maximum permissible flow rates Q_{max} result from the NPSH values required for pump operation (NPSH₃) and the NPSH values available in the system (NPSH_A). The operating range is further limited by the mechanical limits of the pump. The mechanical limits are marked by Q_{max} . Q_{max} must not be exceeded.

Minimum flow rate

The minimum flow rates are indicated in the characteristic curves as Q_{min} and must be met during normal operation. In the region of flow rate $Q < Q_{\text{min}}$ the tolerances given above for the characteristic curve may be exceeded for physical reasons (influences by pump and system). This must be taken into account especially when selecting pumps for systems with a high proportion of static head, e.g. for several pumps connected to one header or for variable speed pumps.

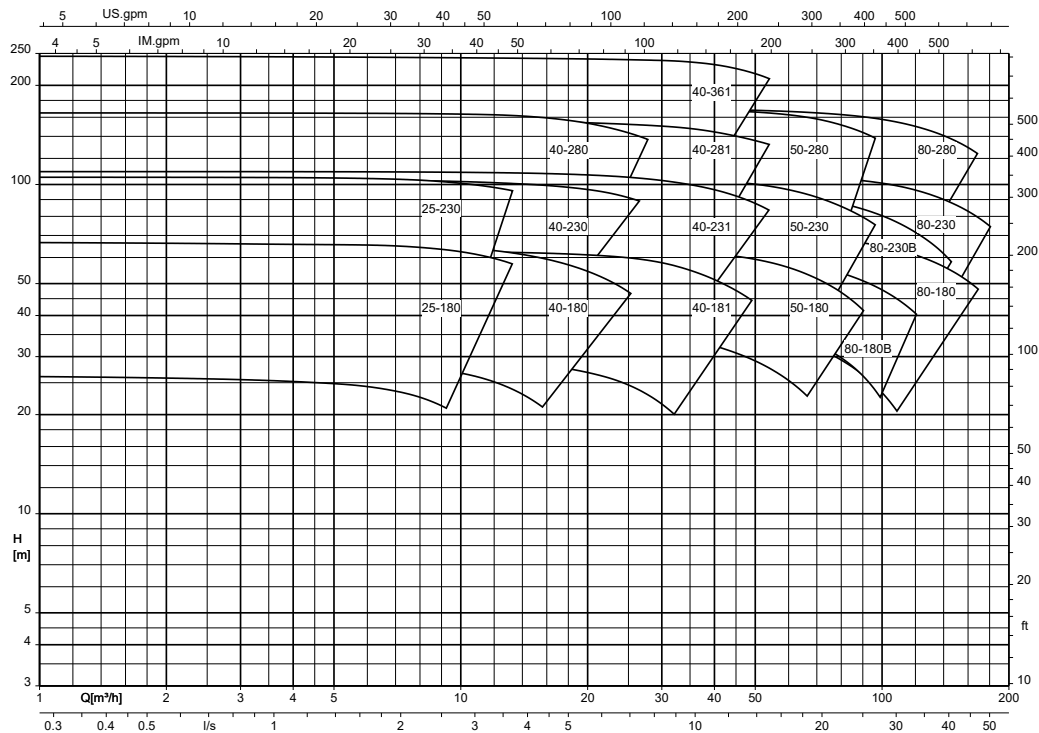
Overview of sizes

Overview of sizes

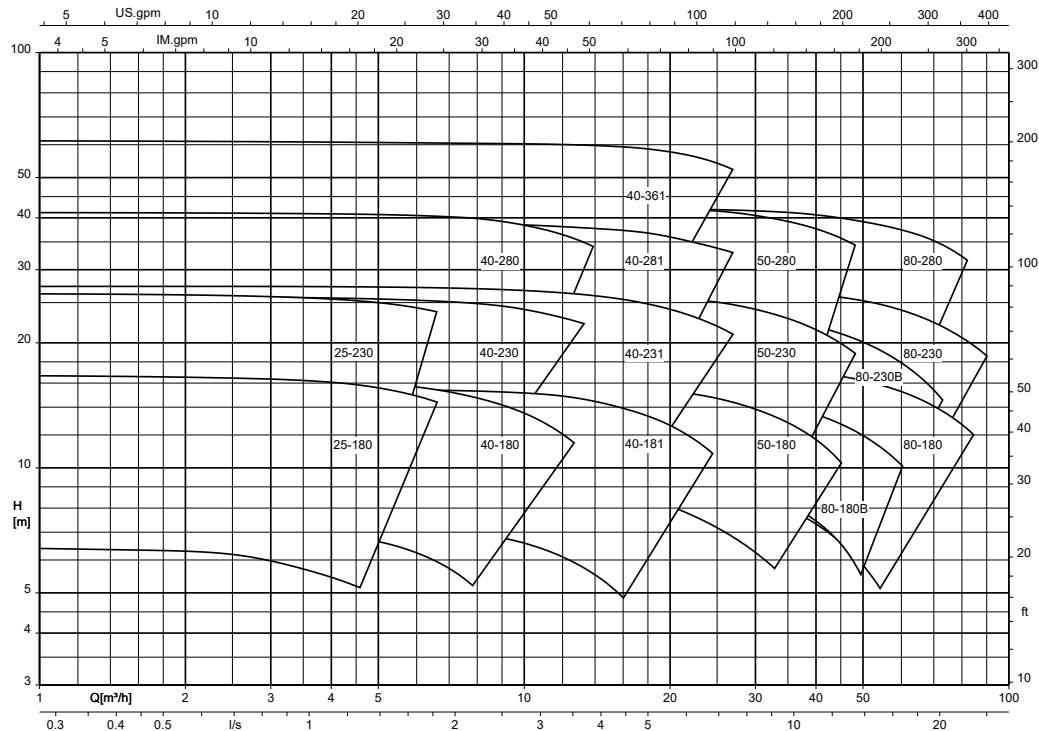
Size	Speed			
	2900 rpm	1450 rpm	3500 rpm	1750 rpm
25-180	(⇒ Page 7)	(⇒ Page 24)	(⇒ Page 41)	(⇒ Page 58)
25-230	(⇒ Page 8)	(⇒ Page 25)	(⇒ Page 42)	(⇒ Page 59)
40-180	(⇒ Page 9)	(⇒ Page 26)	(⇒ Page 43)	(⇒ Page 60)
40-230	(⇒ Page 11)	(⇒ Page 28)	(⇒ Page 45)	(⇒ Page 62)
40-280	(⇒ Page 13)	(⇒ Page 30)	(⇒ Page 47)	(⇒ Page 64)
40-181	(⇒ Page 10)	(⇒ Page 27)	(⇒ Page 44)	(⇒ Page 61)
40-231	(⇒ Page 12)	(⇒ Page 29)	(⇒ Page 46)	(⇒ Page 63)
40-281	(⇒ Page 14)	(⇒ Page 31)	(⇒ Page 48)	(⇒ Page 65)
40-361	(⇒ Page 15)	(⇒ Page 32)	(⇒ Page 49)	(⇒ Page 66)
50-180	(⇒ Page 16)	(⇒ Page 33)	(⇒ Page 50)	(⇒ Page 67)
50-230	(⇒ Page 17)	(⇒ Page 34)	(⇒ Page 51)	(⇒ Page 68)
50-280	(⇒ Page 18)	(⇒ Page 35)	(⇒ Page 52)	(⇒ Page 69)
80-180	(⇒ Page 19)	(⇒ Page 36)	(⇒ Page 53)	(⇒ Page 70)
80-180B	(⇒ Page 20)	(⇒ Page 37)	(⇒ Page 54)	(⇒ Page 71)
80-230	(⇒ Page 21)	(⇒ Page 38)	(⇒ Page 55)	(⇒ Page 72)
80-230B	(⇒ Page 22)	(⇒ Page 39)	(⇒ Page 56)	(⇒ Page 73)
80-280	(⇒ Page 23)	(⇒ Page 40)	(⇒ Page 57)	(⇒ Page 74)

Selection charts

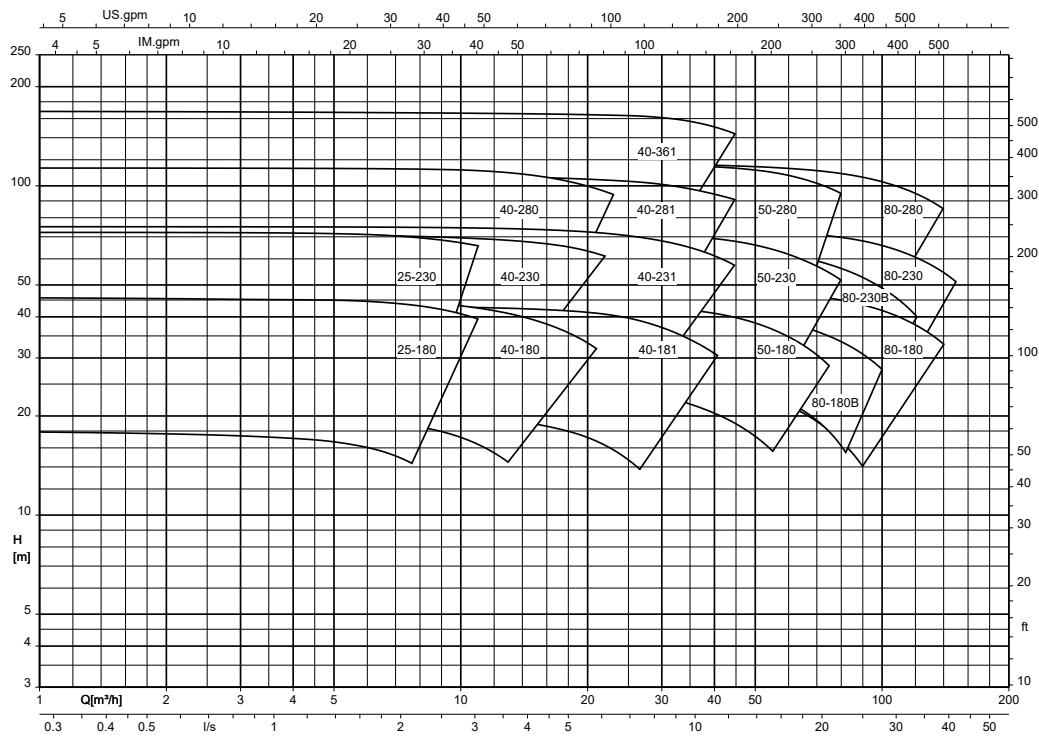
RPH-V, 60 Hz n = 3500 rpm



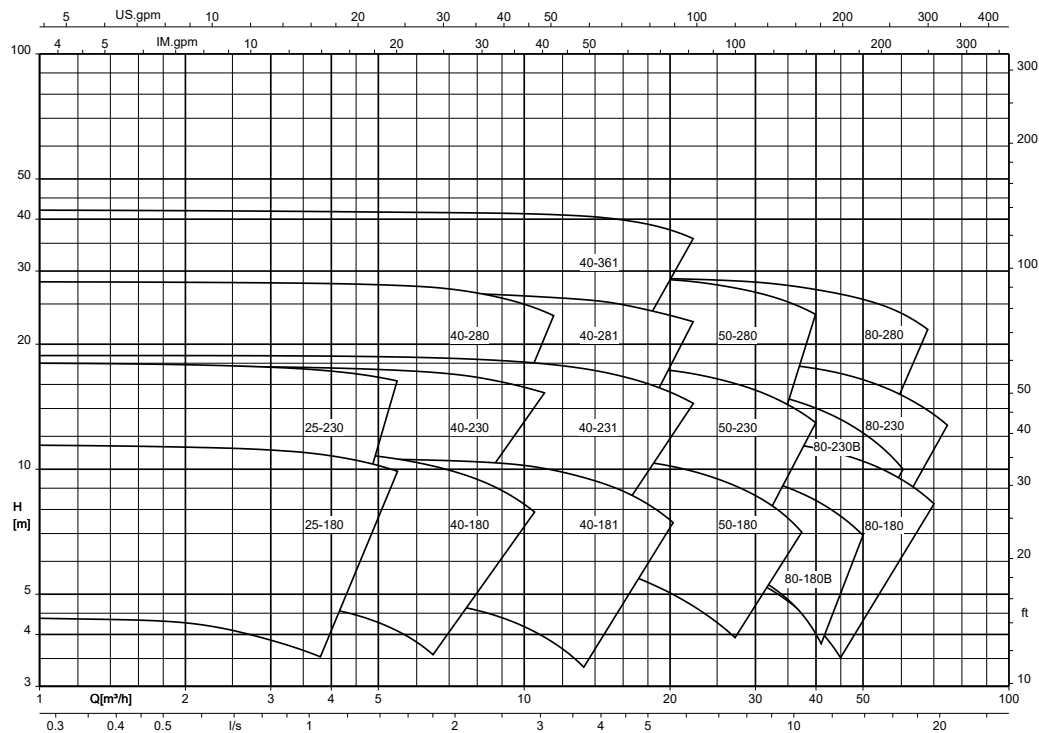
RPH-V, 60 Hz n = 1750 rpm



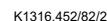
RPH-V, 50 Hz n = 2900 rpm



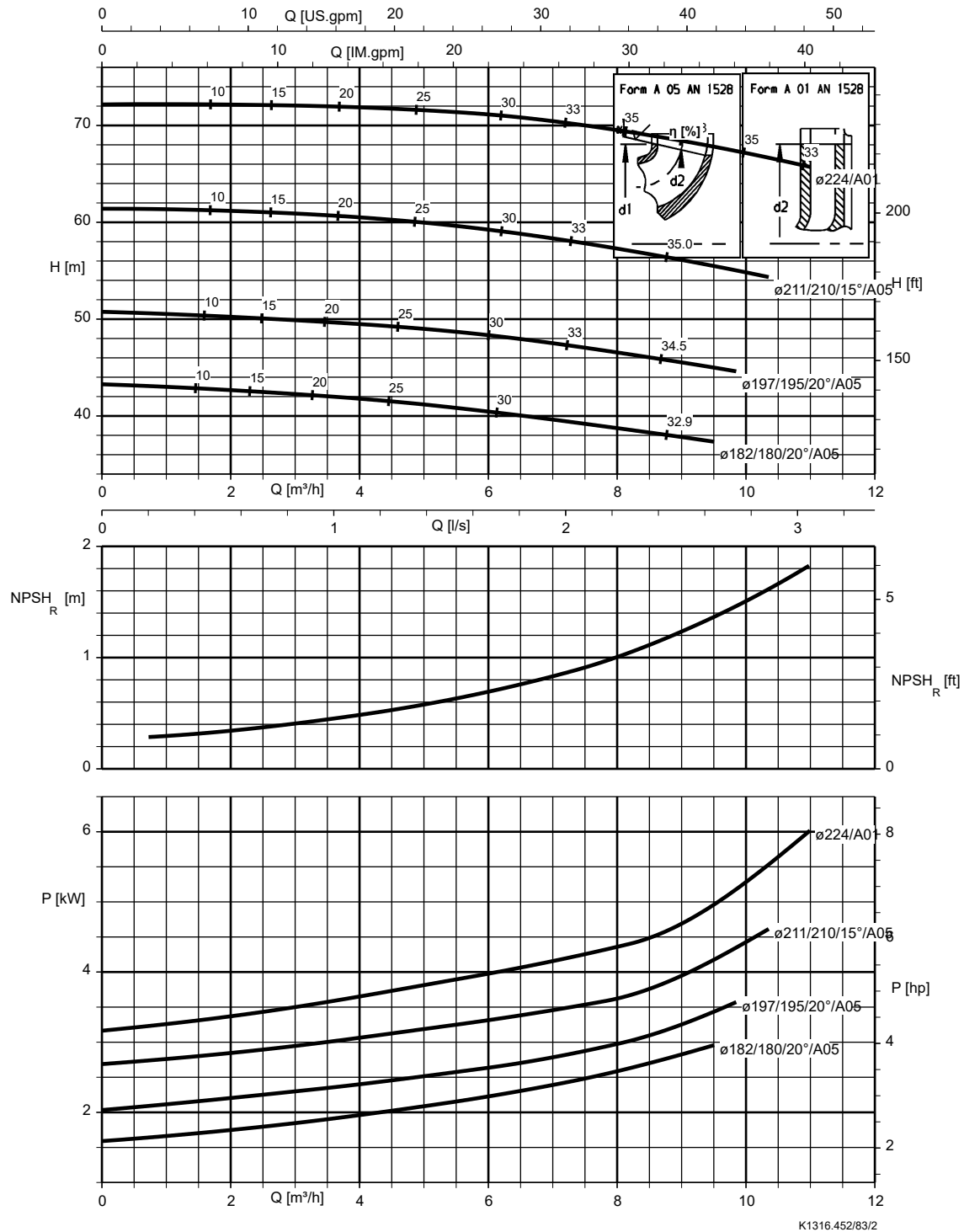
RPH-V, 50 Hz n = 1450 rpm



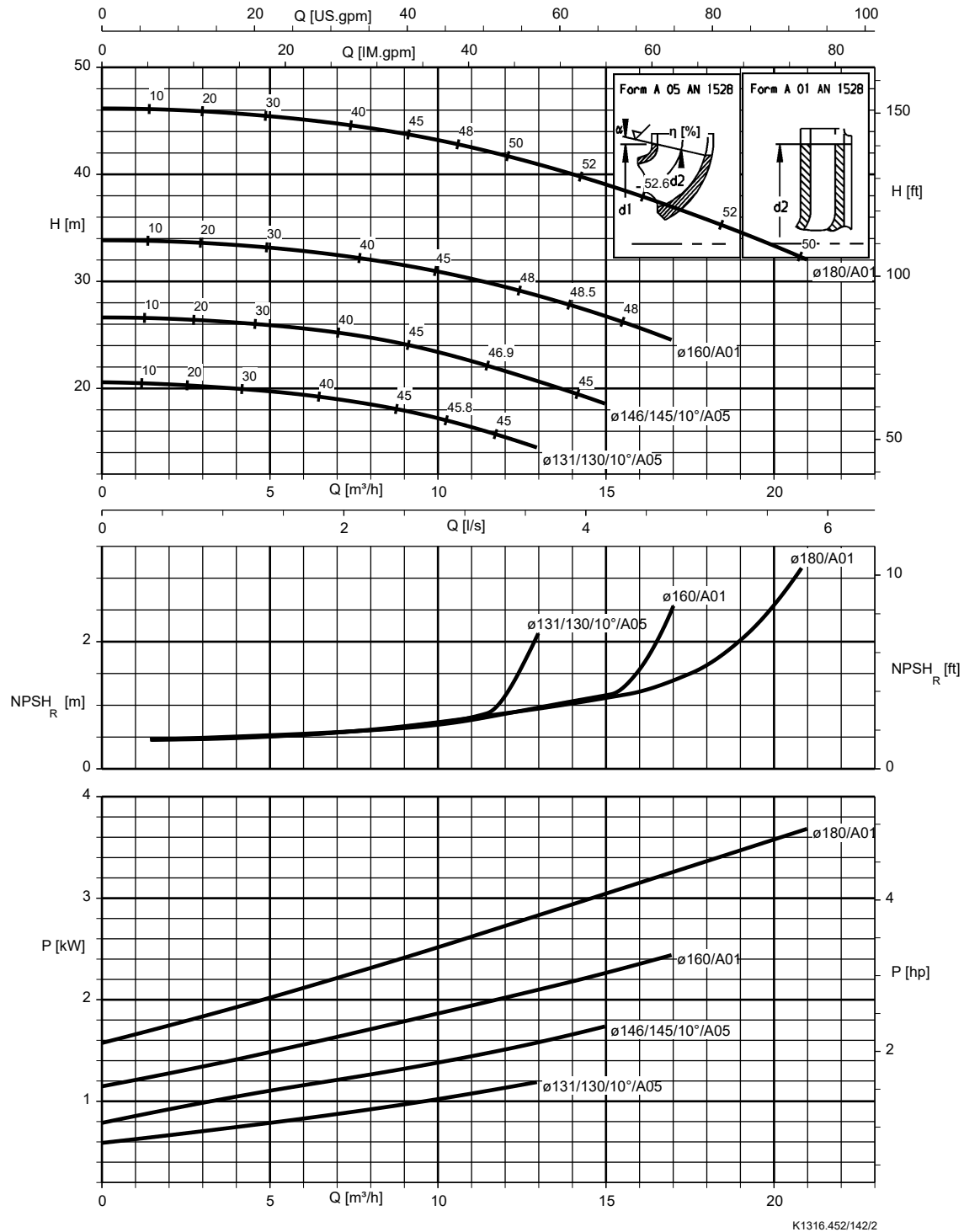
RPH-V 25-180, n = 2900 rpm



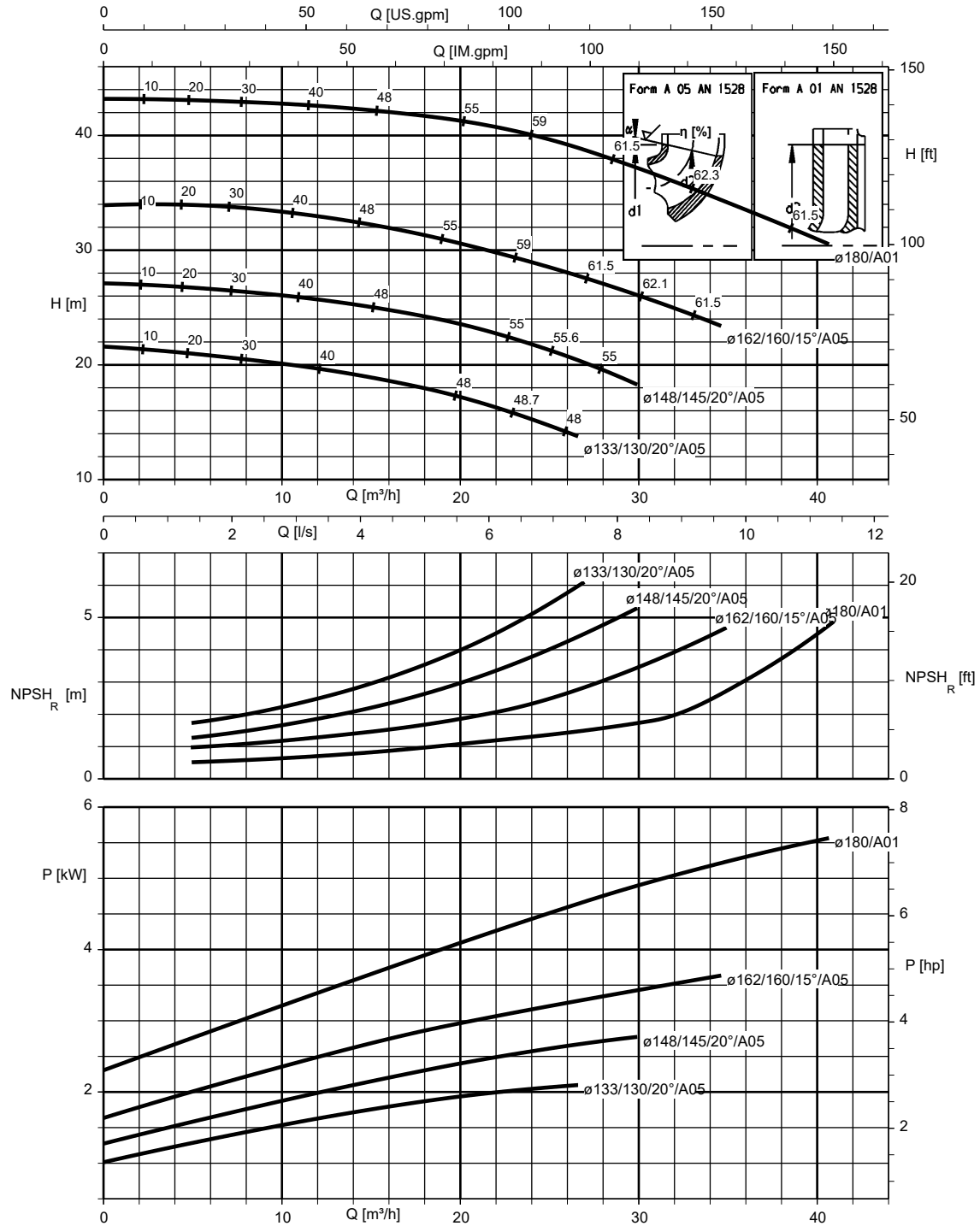
RPH-V 25-230, $n = 2900$ rpm



RPH-V 40-180, $n = 2900$ rpm

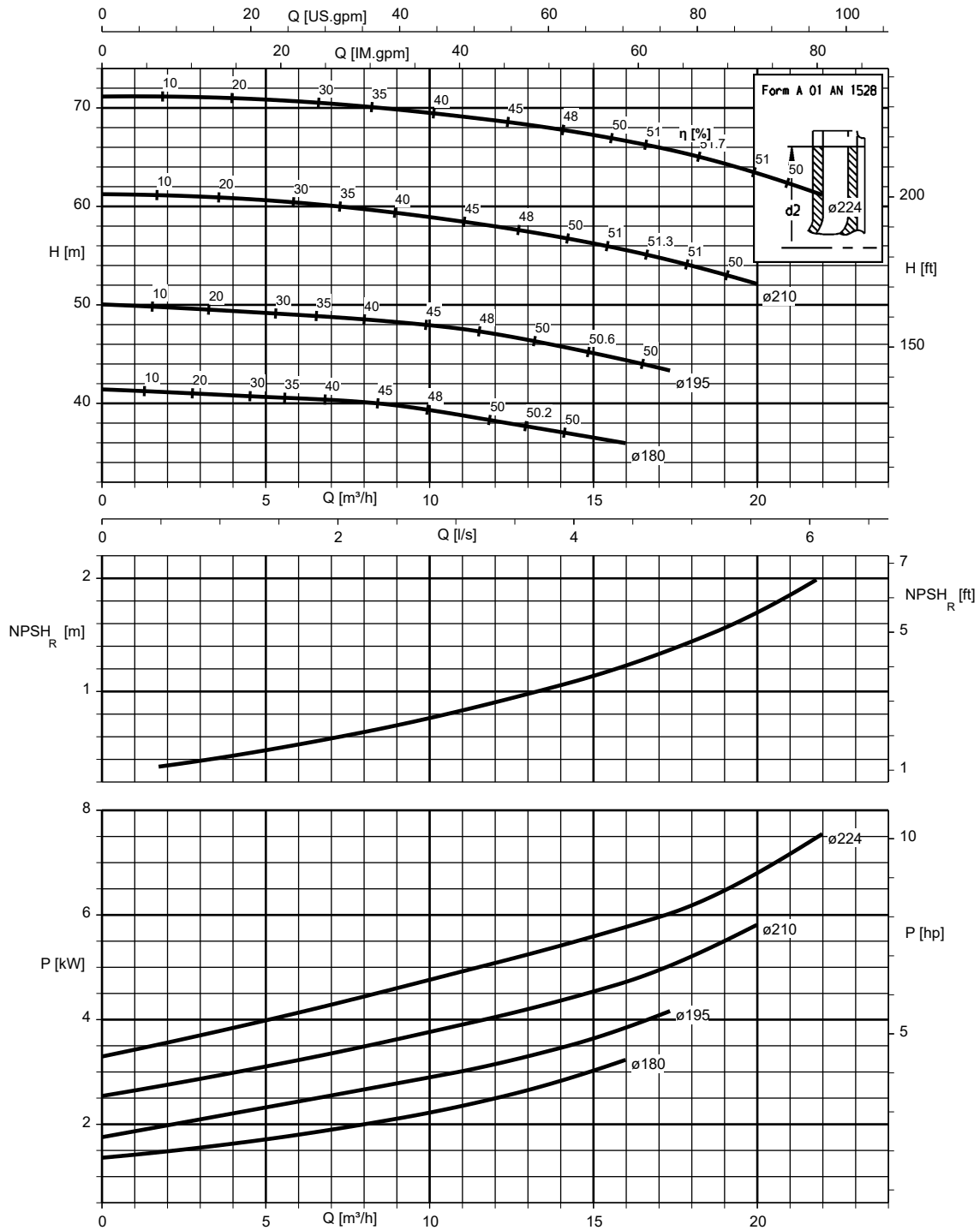


RPH-V 40-181, n = 2900 rpm



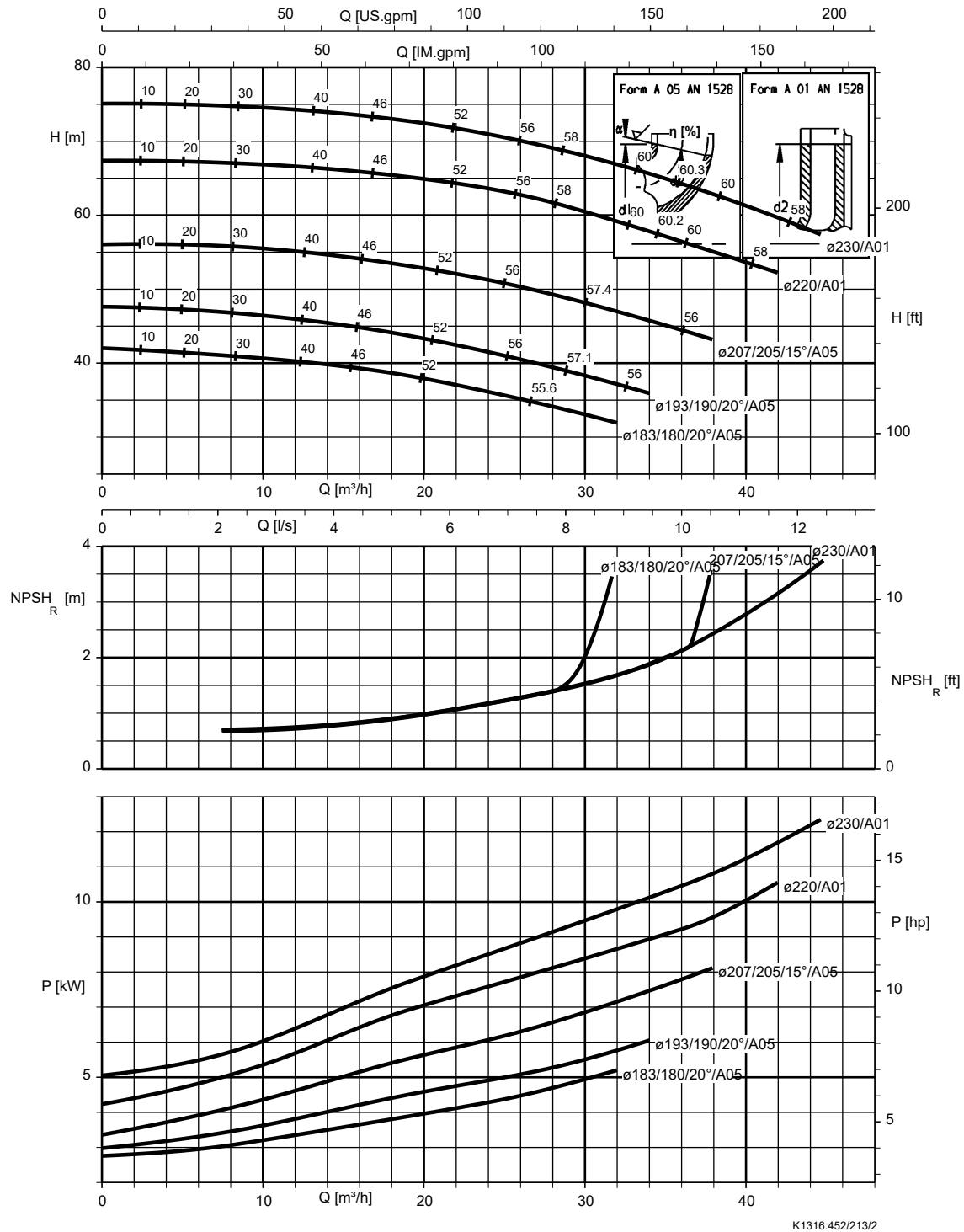
K1316.452/202/2

RPH-V 40-230, n = 2900 rpm

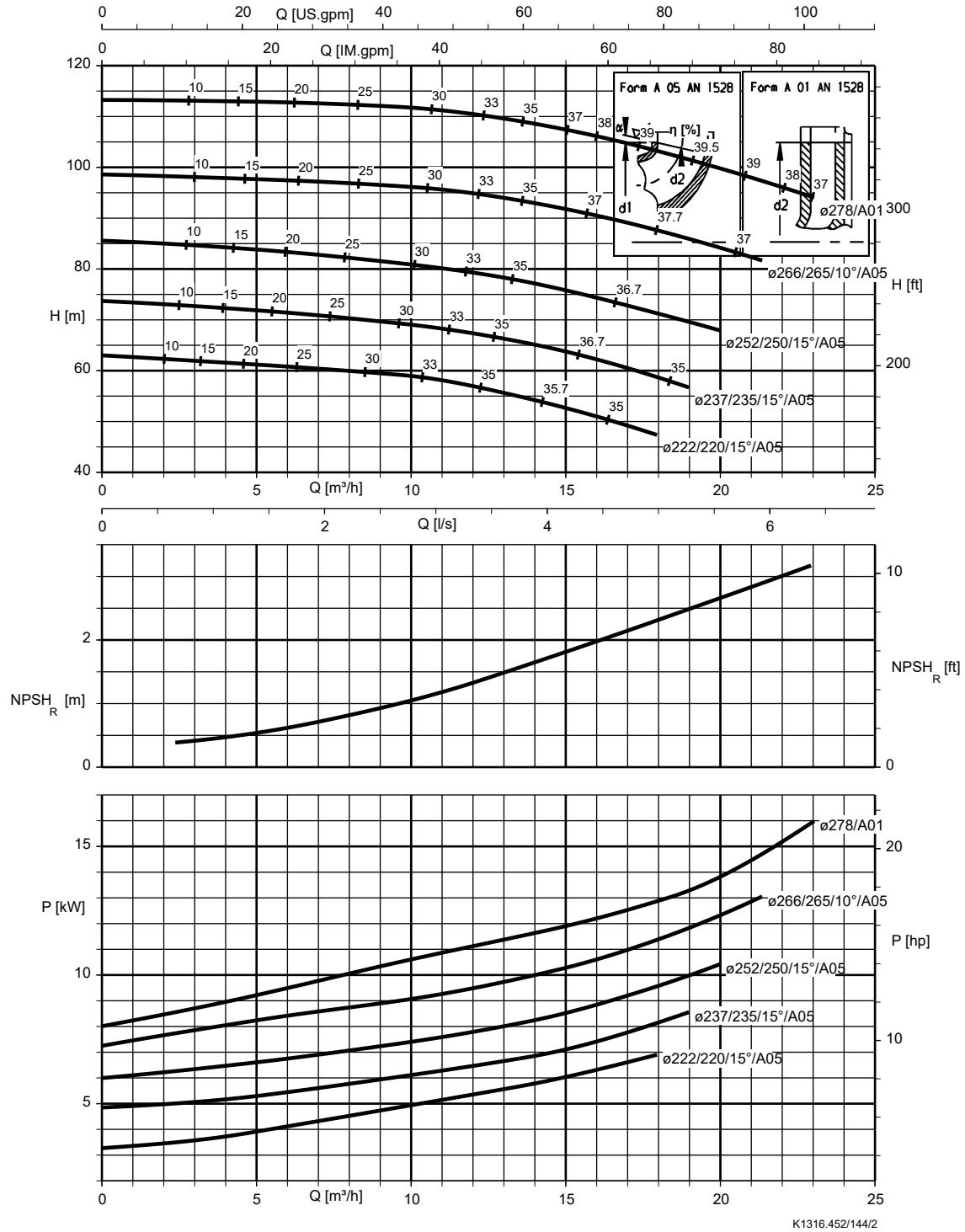


K1316.452/143/2

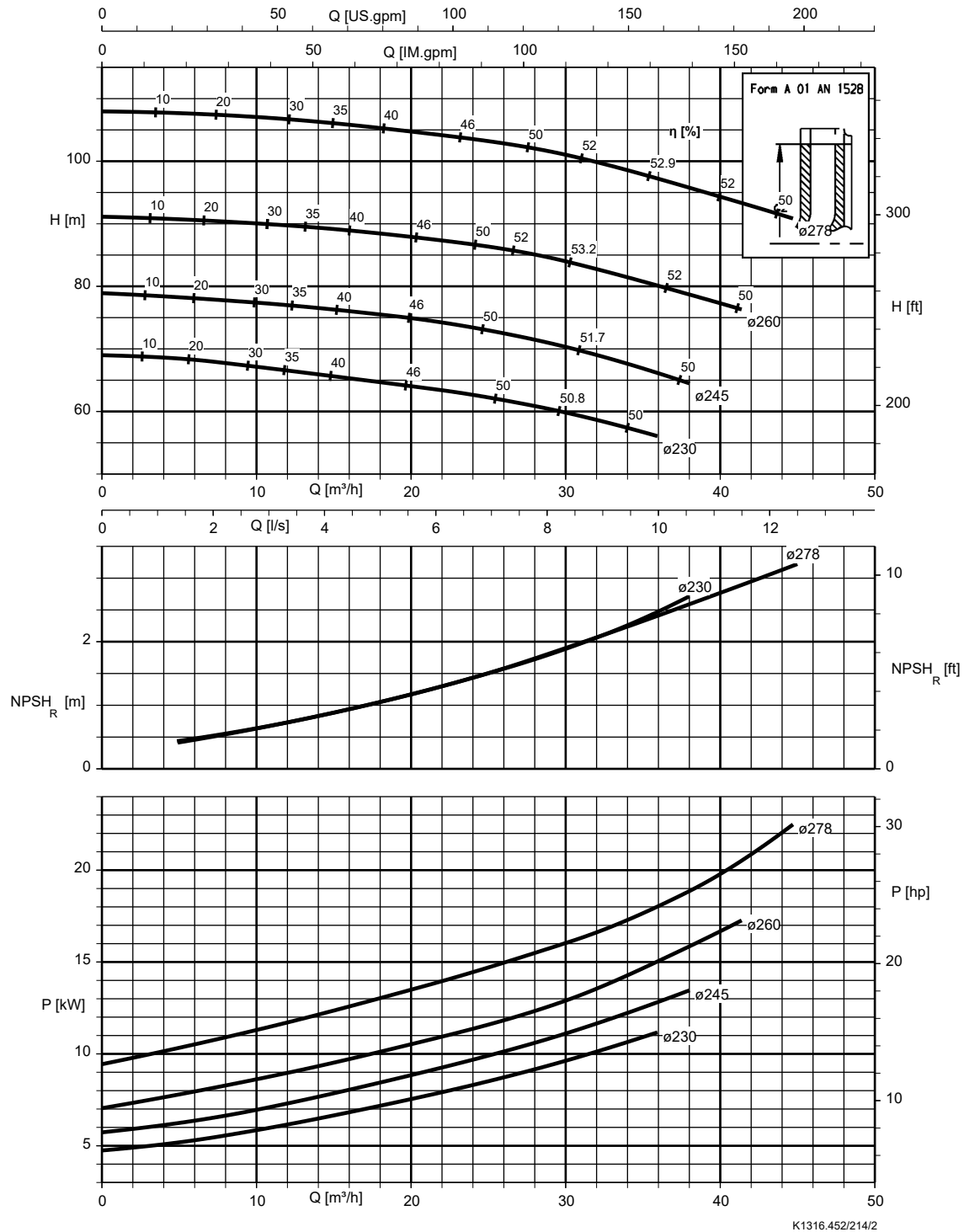
RPH-V 40-231, n = 2900 rpm



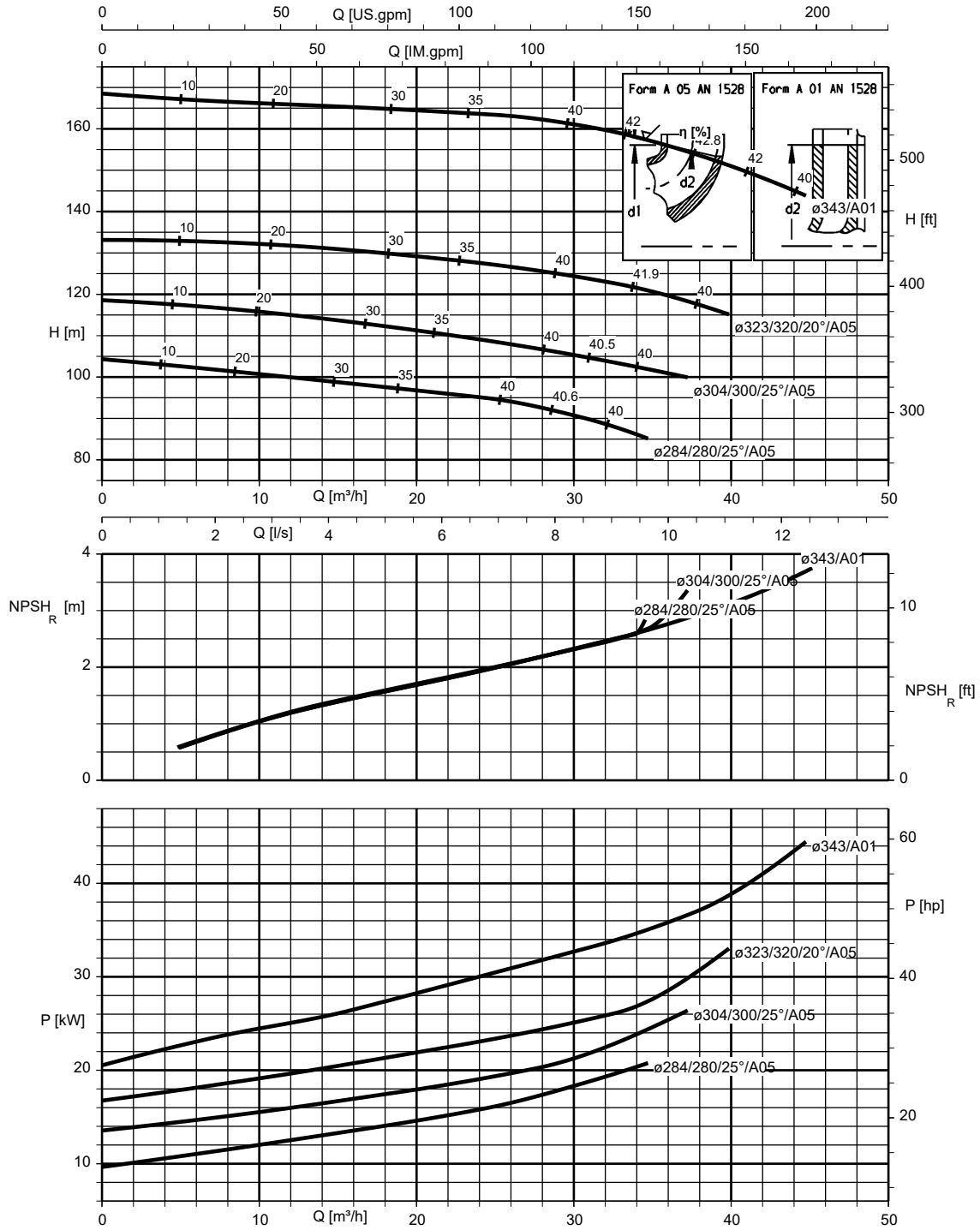
RPH-V 40-280, n = 2900 rpm



RPH-V 40-281, n = 2900 rpm

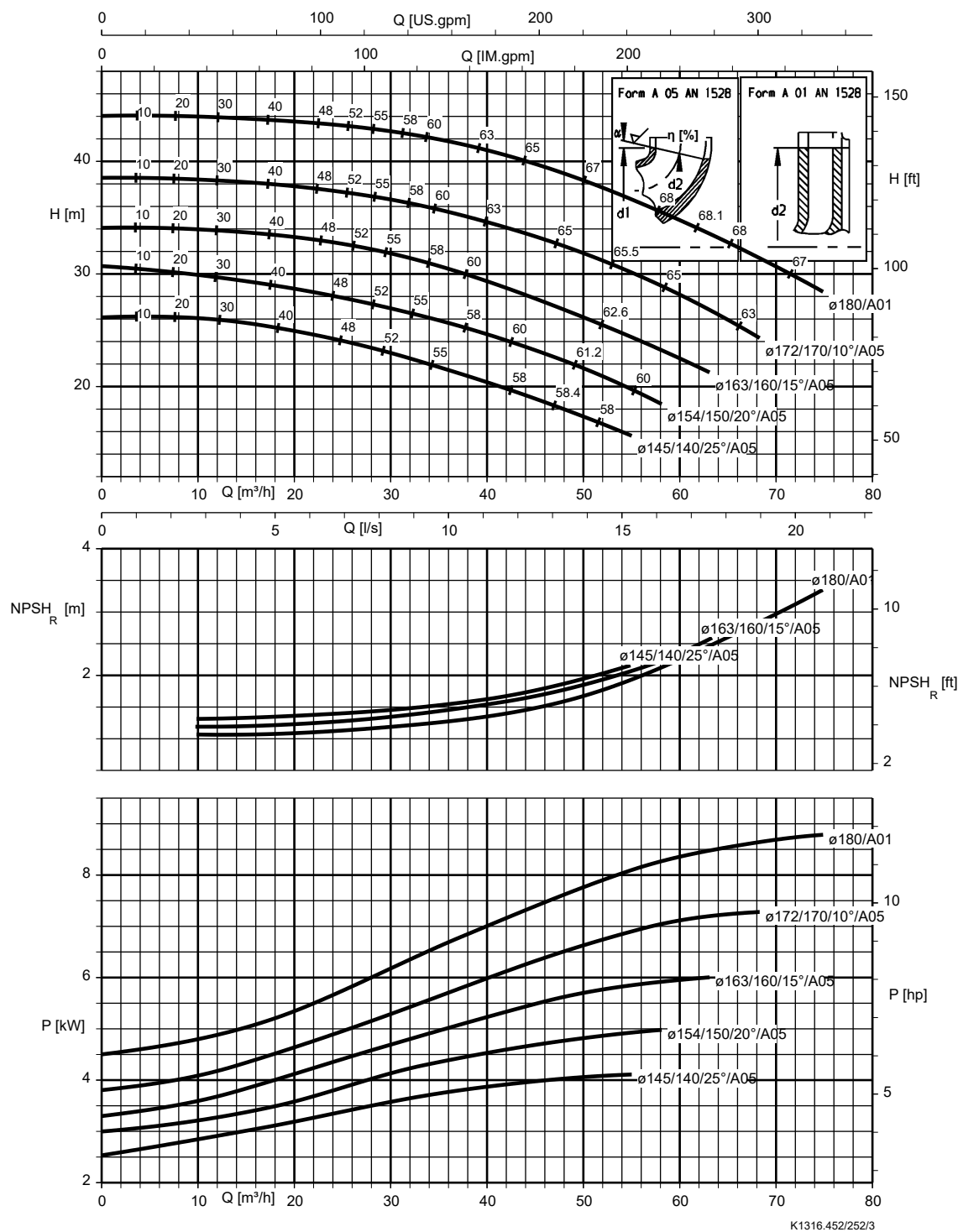


RPH-V 40-361, $n = 2900$ rpm

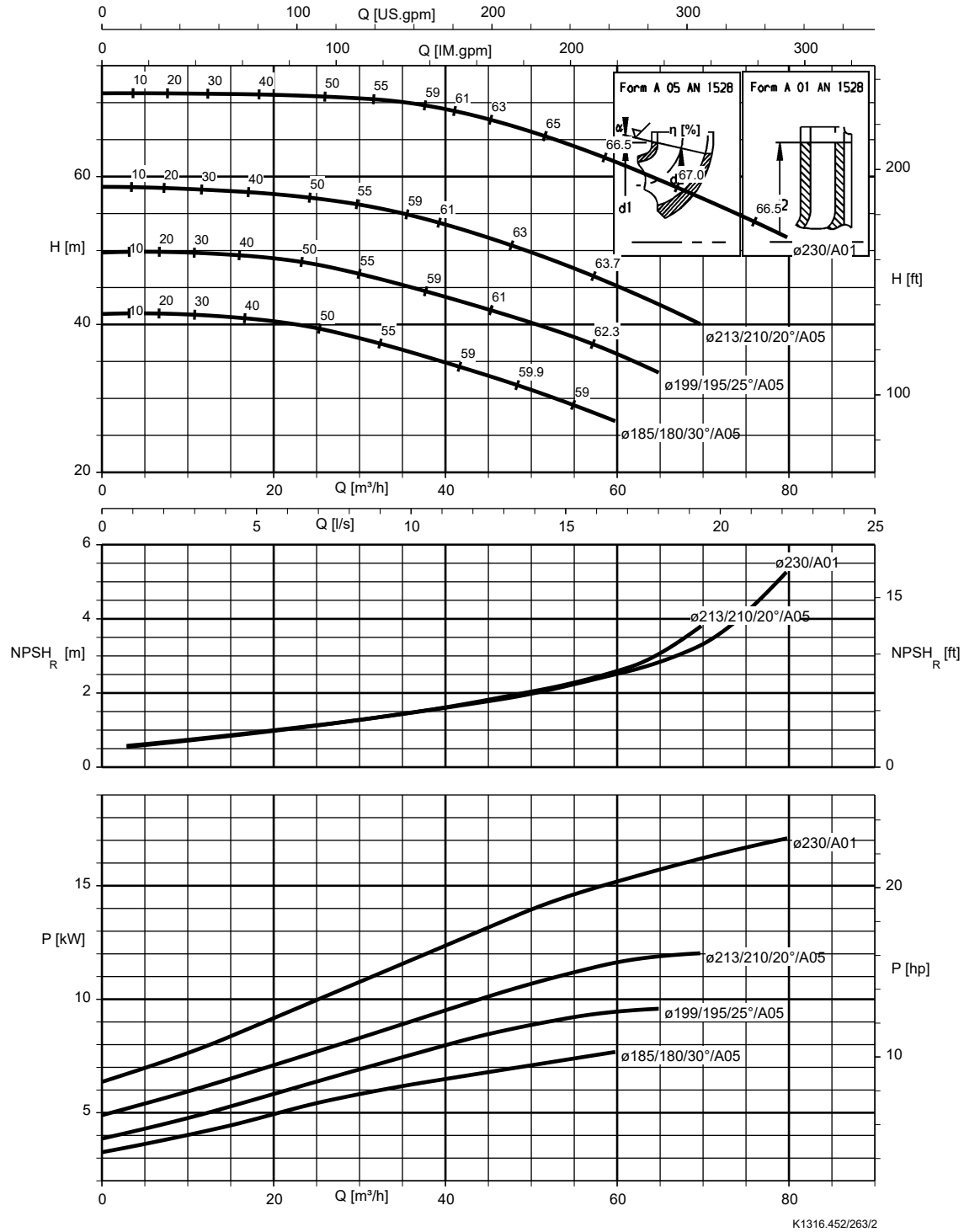


K1316.452/215/3

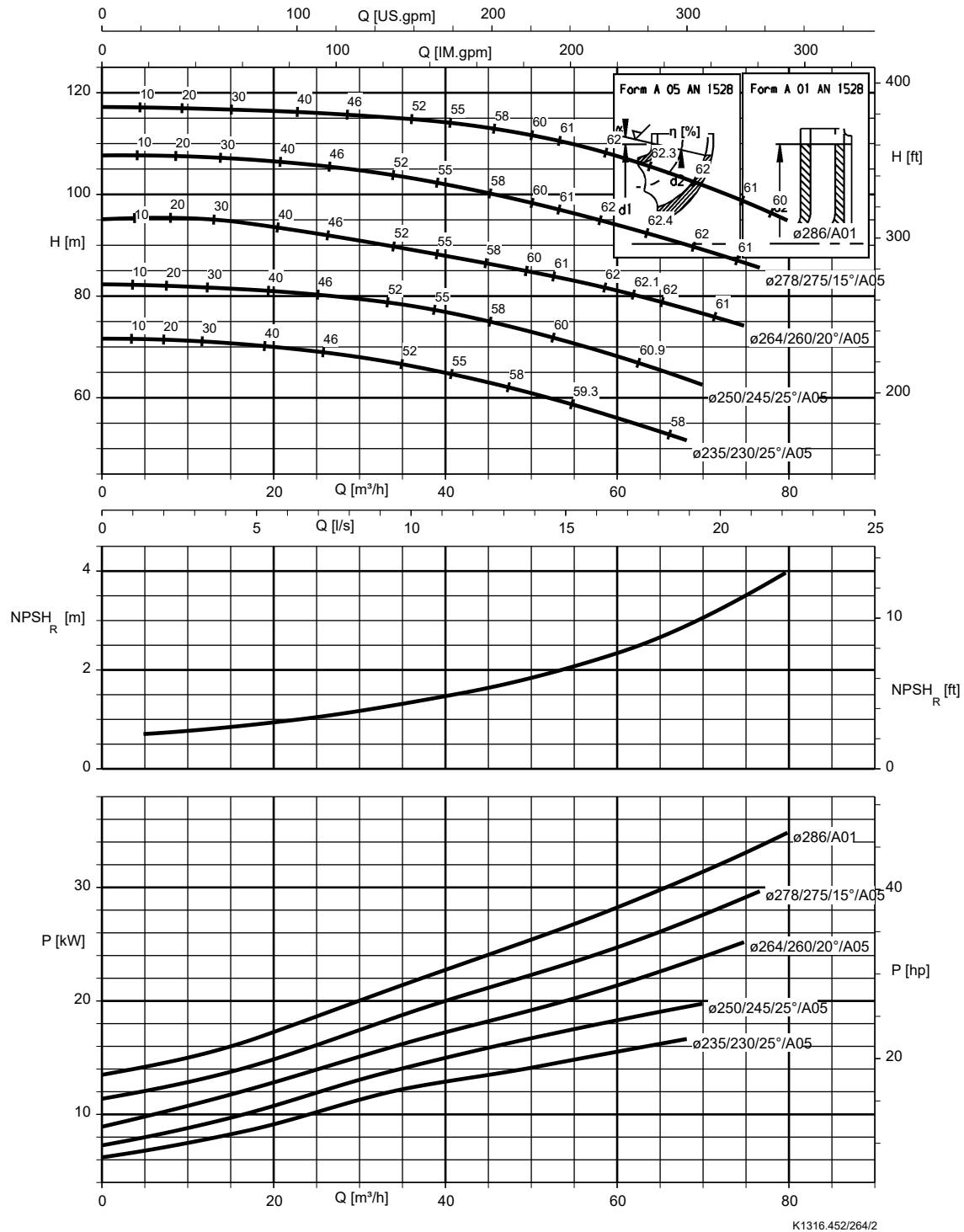
RPH-V 50-180, n = 2900 rpm



RPH-V 50-230, n = 2900 rpm



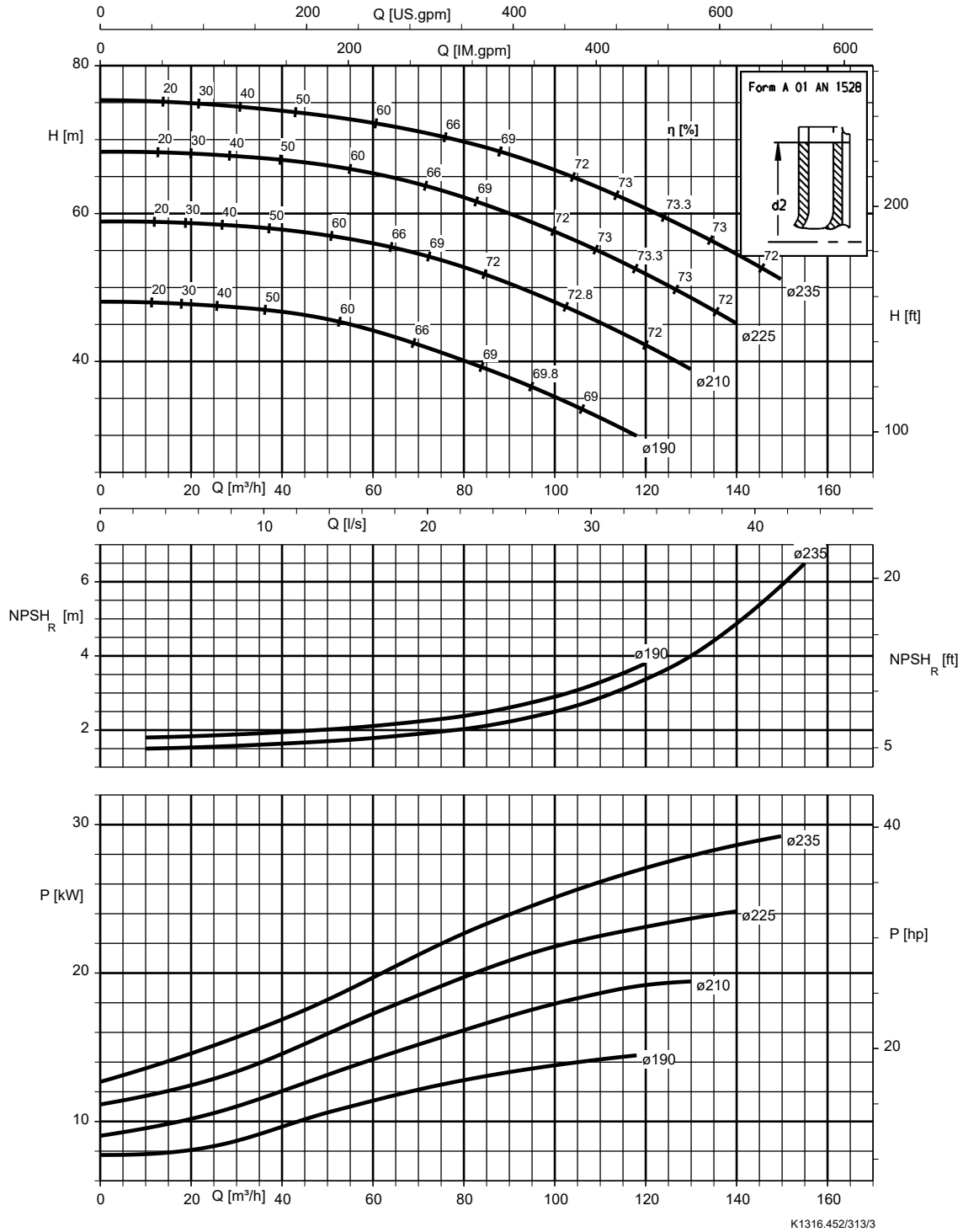
RPH-V 50-280, n = 2900 rpm



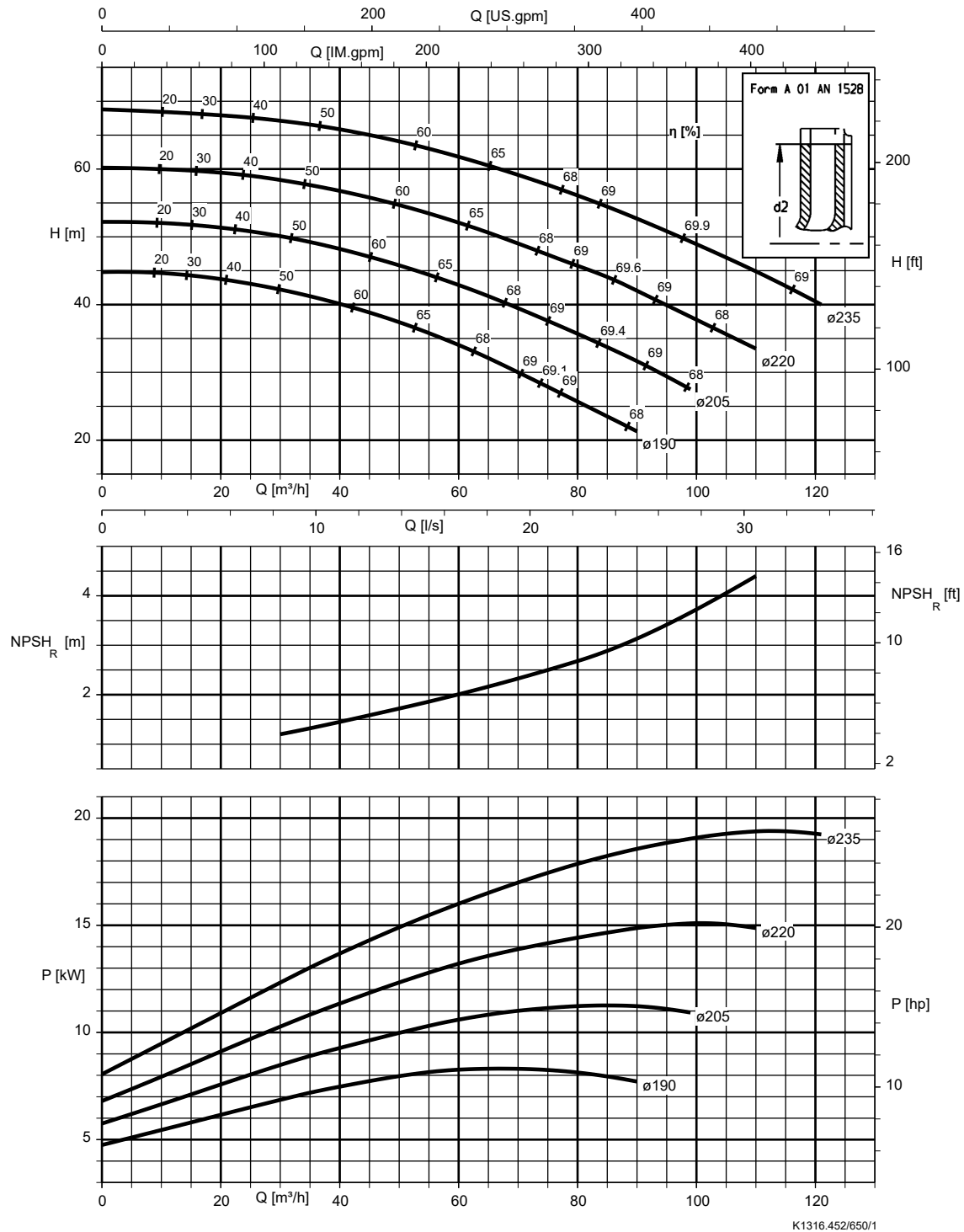
The three graphs show the performance of the K33214/0 pump across a range of flow rates (Q) and head (H). The top graph shows Total Head (H_T) in meters and feet, the middle graph shows Required Head (H_R) in meters, and the bottom graph shows Power (P) in kW and hp. The flow rate (Q) is measured in m³/h, l/s, and US/gpm. The head (H) is measured in meters and feet. The power (P) is measured in kW and hp. The graphs include curves for different pipe diameters (ø140, ø155, ø170, ø180, ø190) and a diagram of the pump assembly.

The top graph shows Total Head (H) in meters and feet versus Flow Rate (Q) in US.gpm, IM.gpm, and m³/h. It includes efficiency curves (η [%]) and a diagram of the pump assembly (Form A 01 AN 1528) with a vertical arrow indicating the direction of flow and a dimension d2. The middle graph shows Required Net Positive Suction Head (NPSH_R) in meters and feet versus Flow Rate (Q) in m³/h. The bottom graph shows Power (P) in kW and hp versus Flow Rate (Q) in m³/h. All graphs are for the K1316.452/654/1 pump.

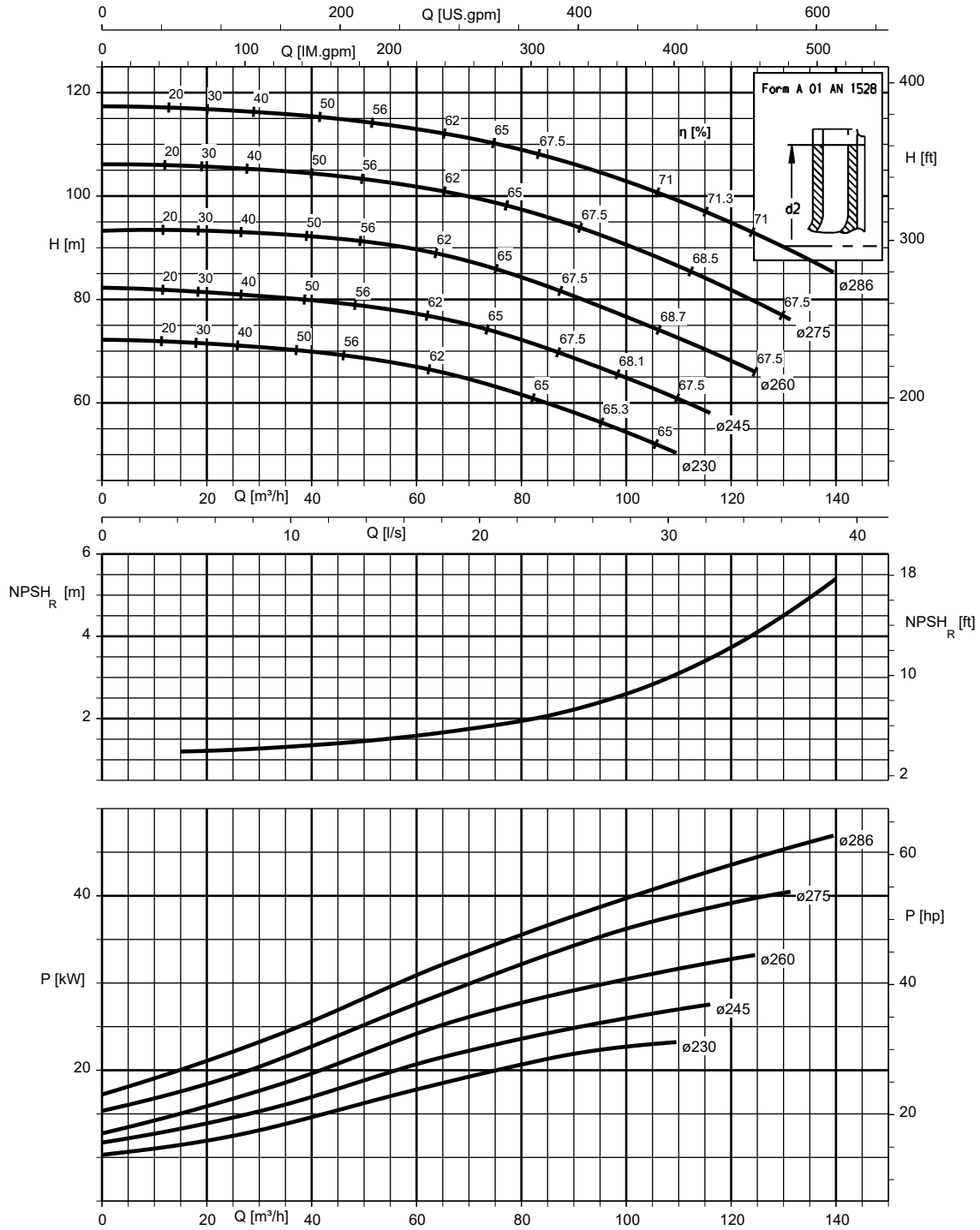
RPH-V 80-230, n = 2900 rpm



RPH-V 80-230B, n = 2900 rpm

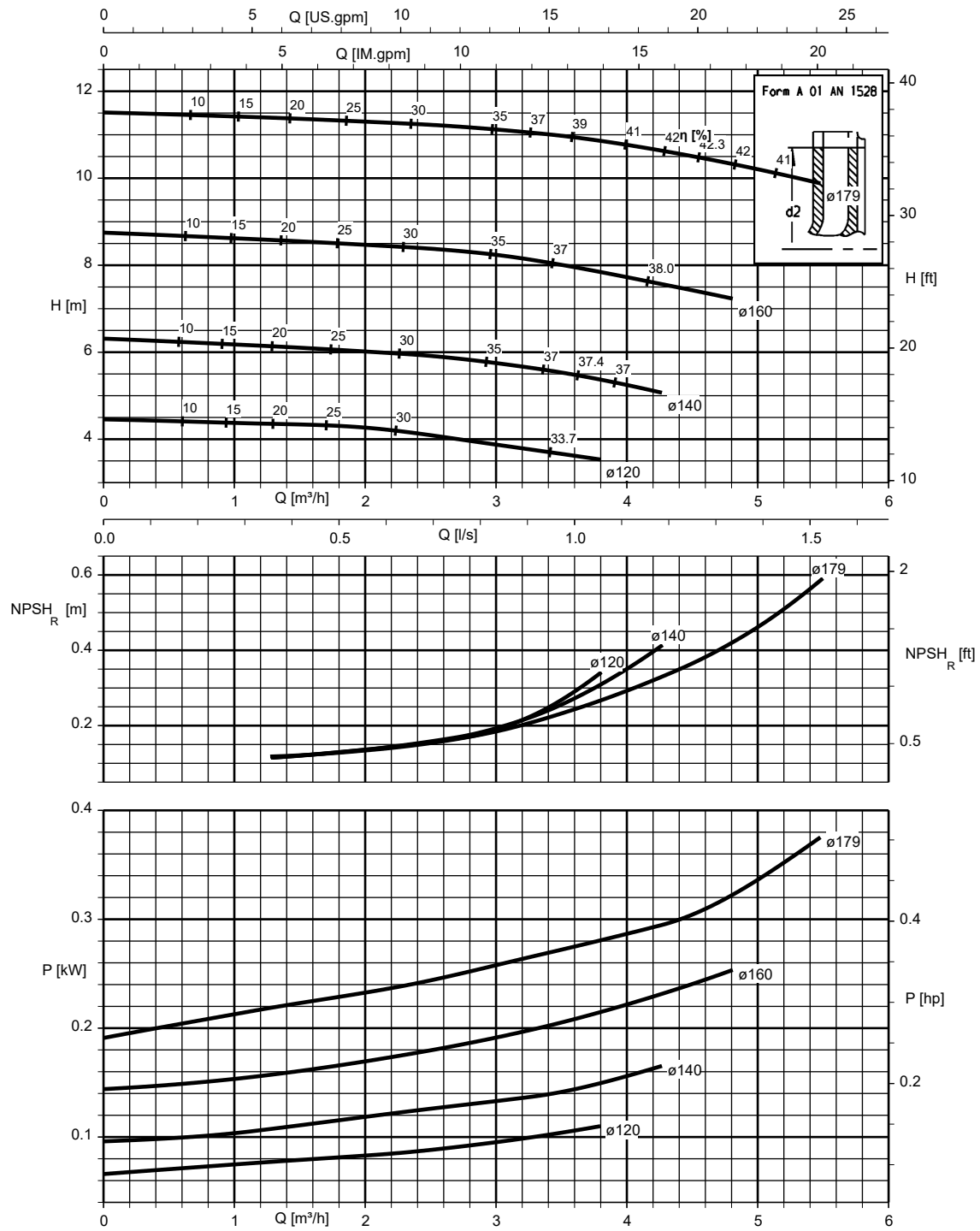


RPH-V 80-280, n = 2900 rpm

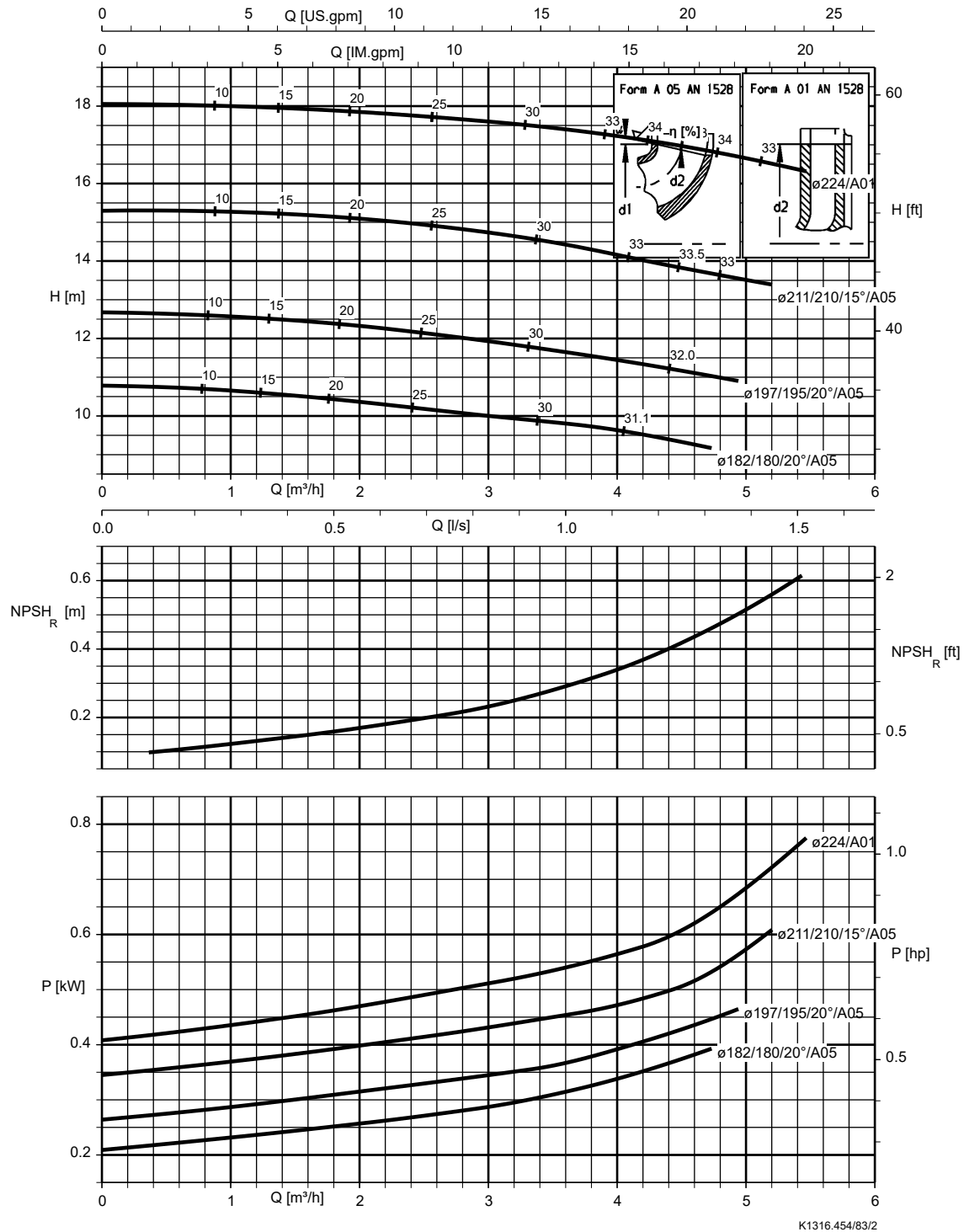


$n = 1450 \text{ rpm}$

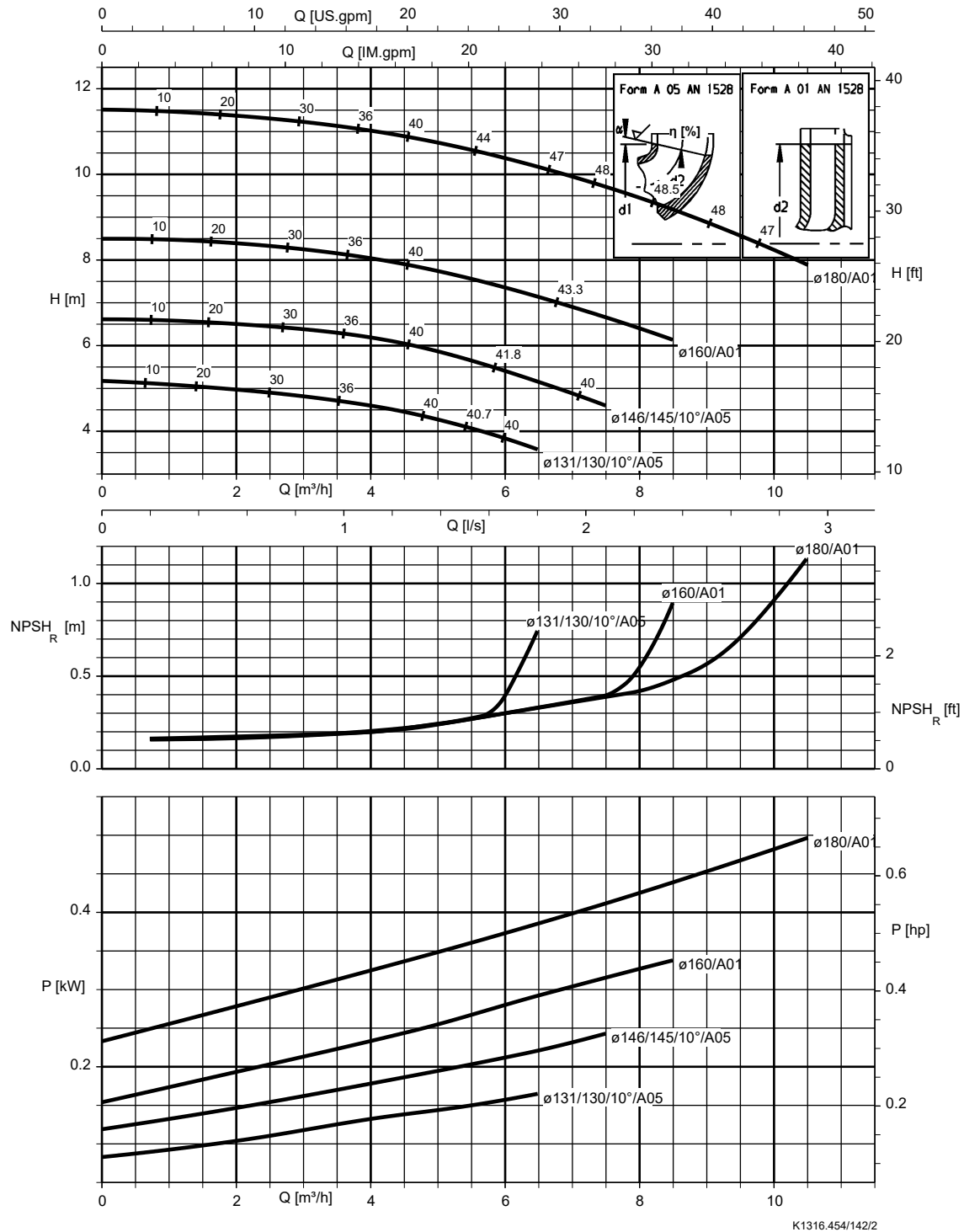
RPH-V 25-180, $n = 1450 \text{ rpm}$



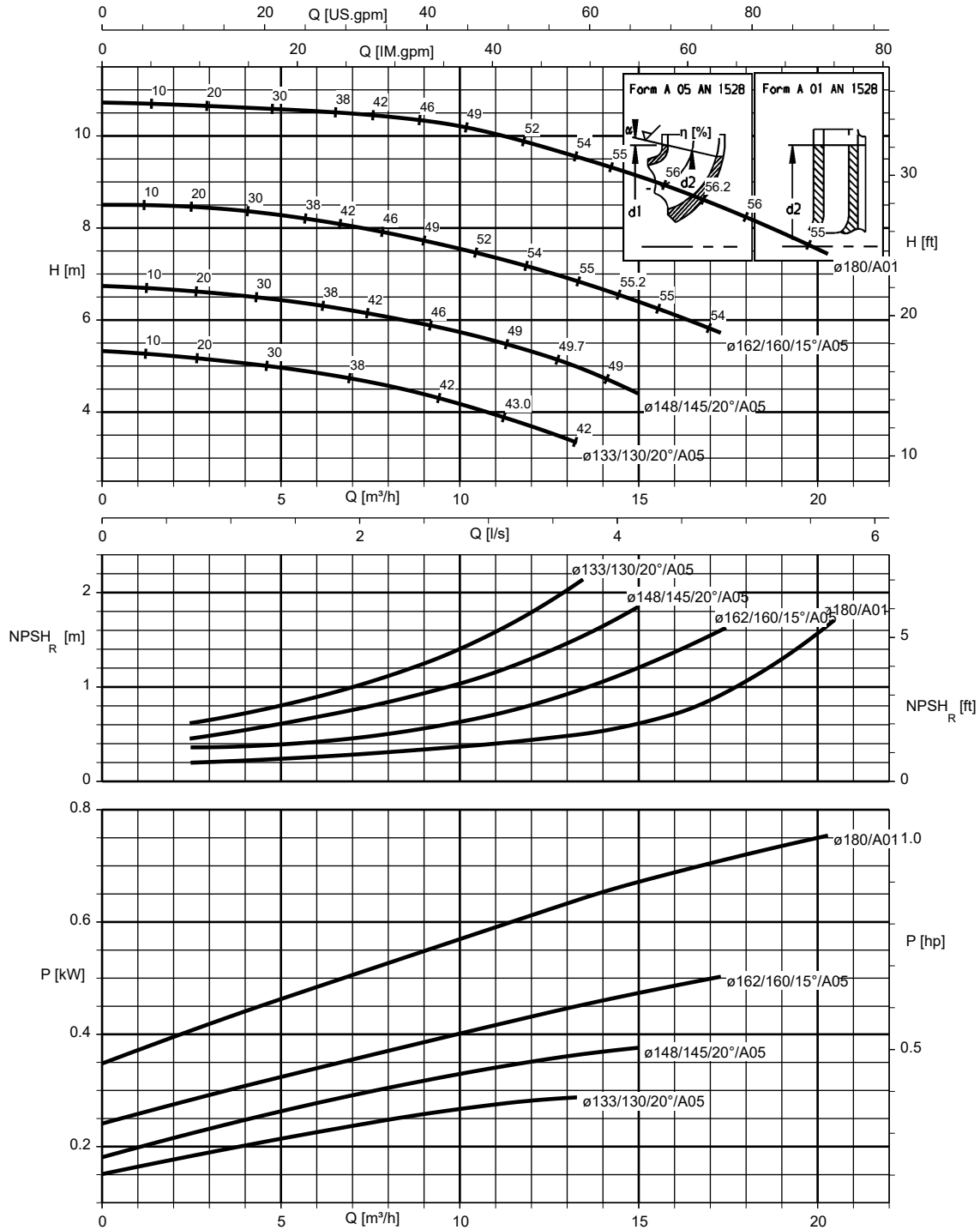
RPH-V 25-230, n = 1450 rpm



RPH-V 40-180, n = 1450 rpm

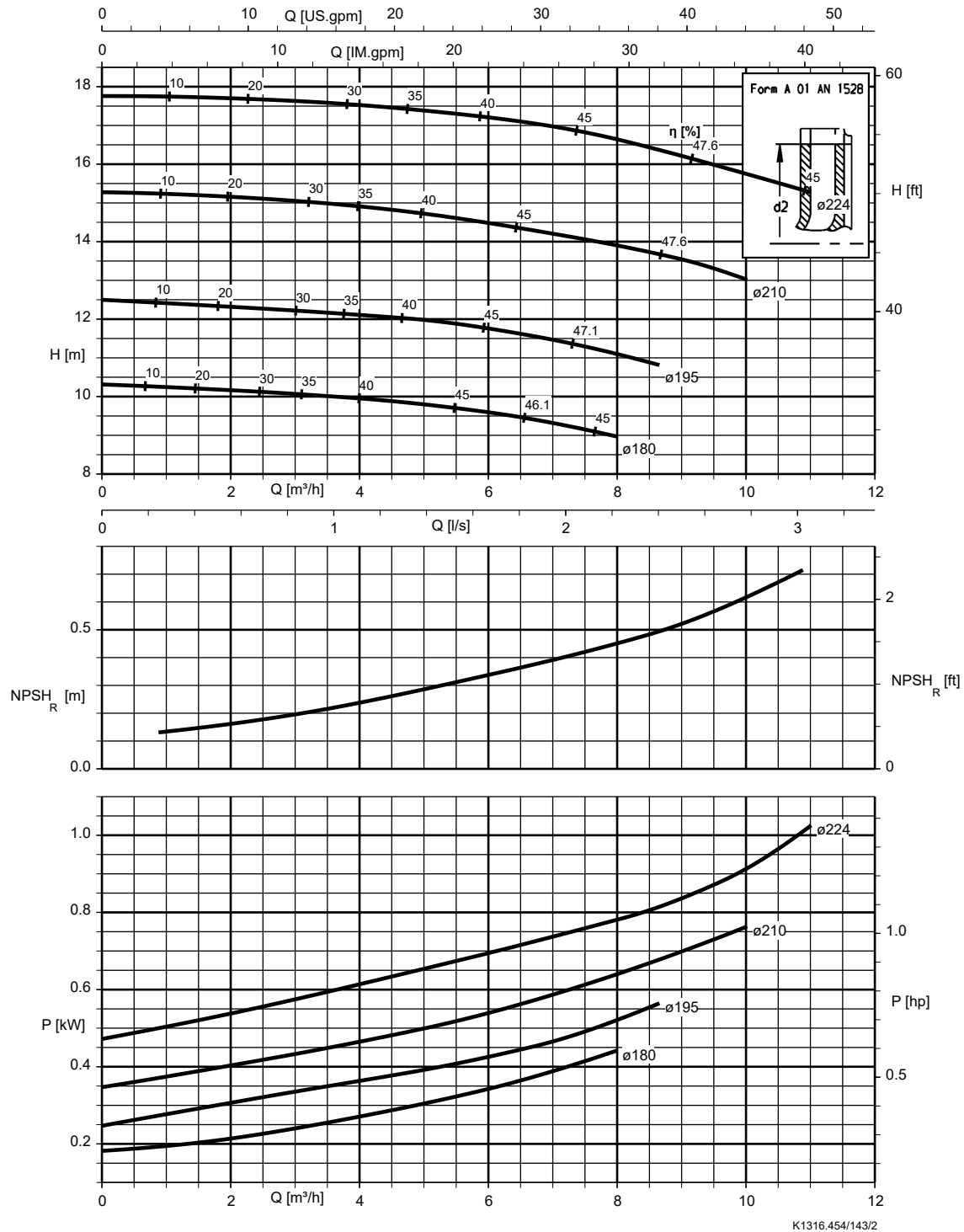


RPH-V 40-181, n = 1450 rpm

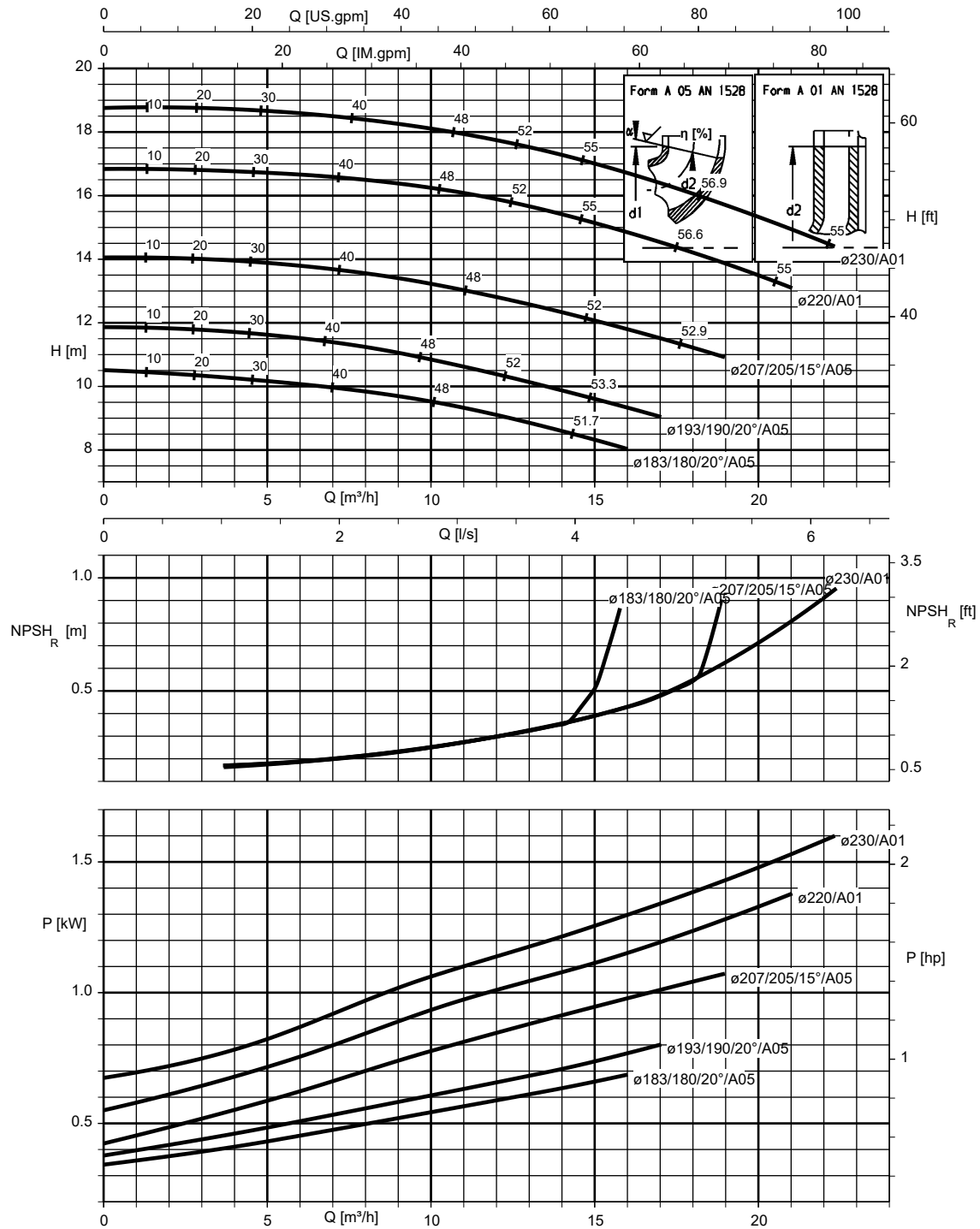


K1316.454/202/2

RPH-V 40-230, n = 1450 rpm

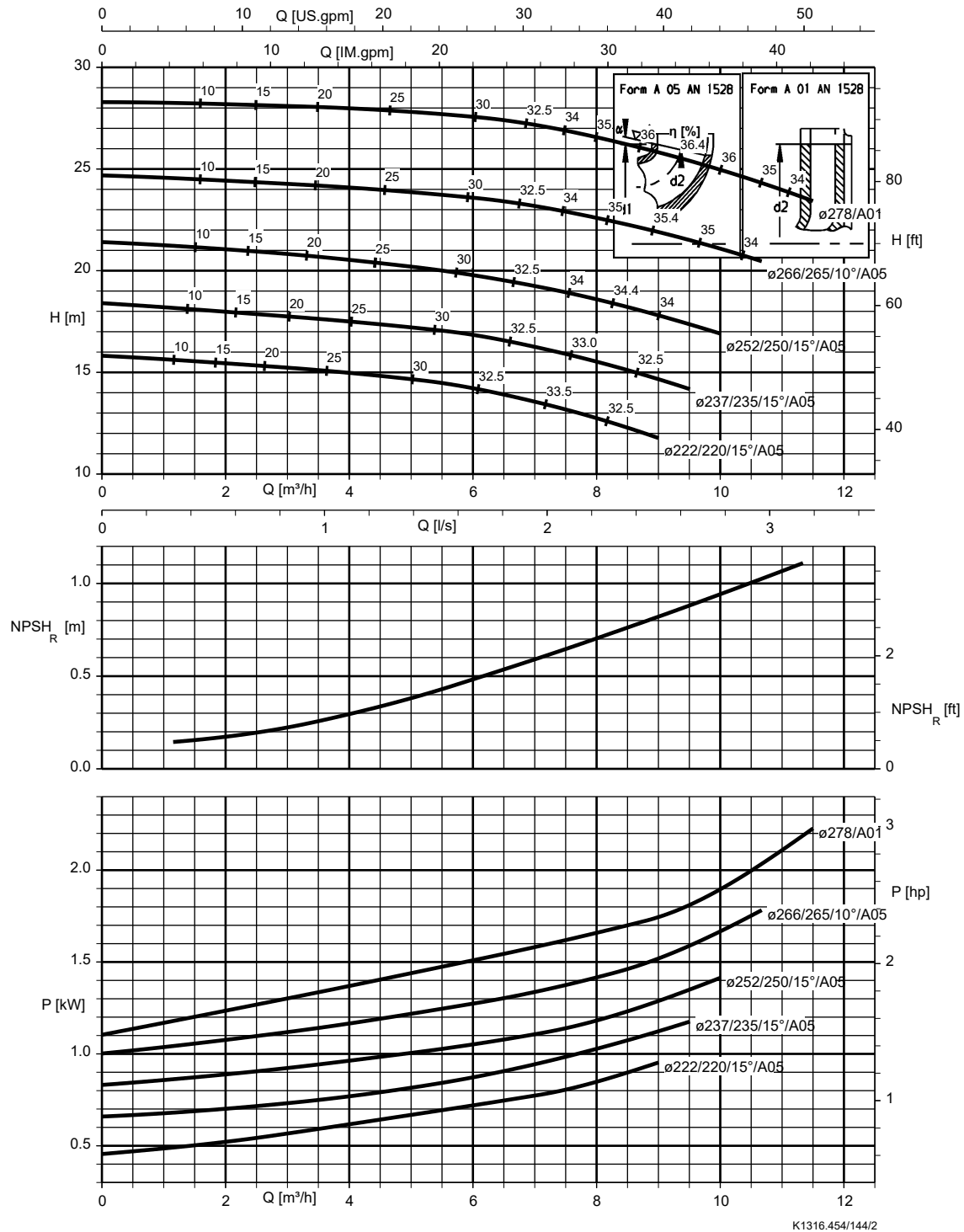


RPH-V 40-231, n = 1450 rpm

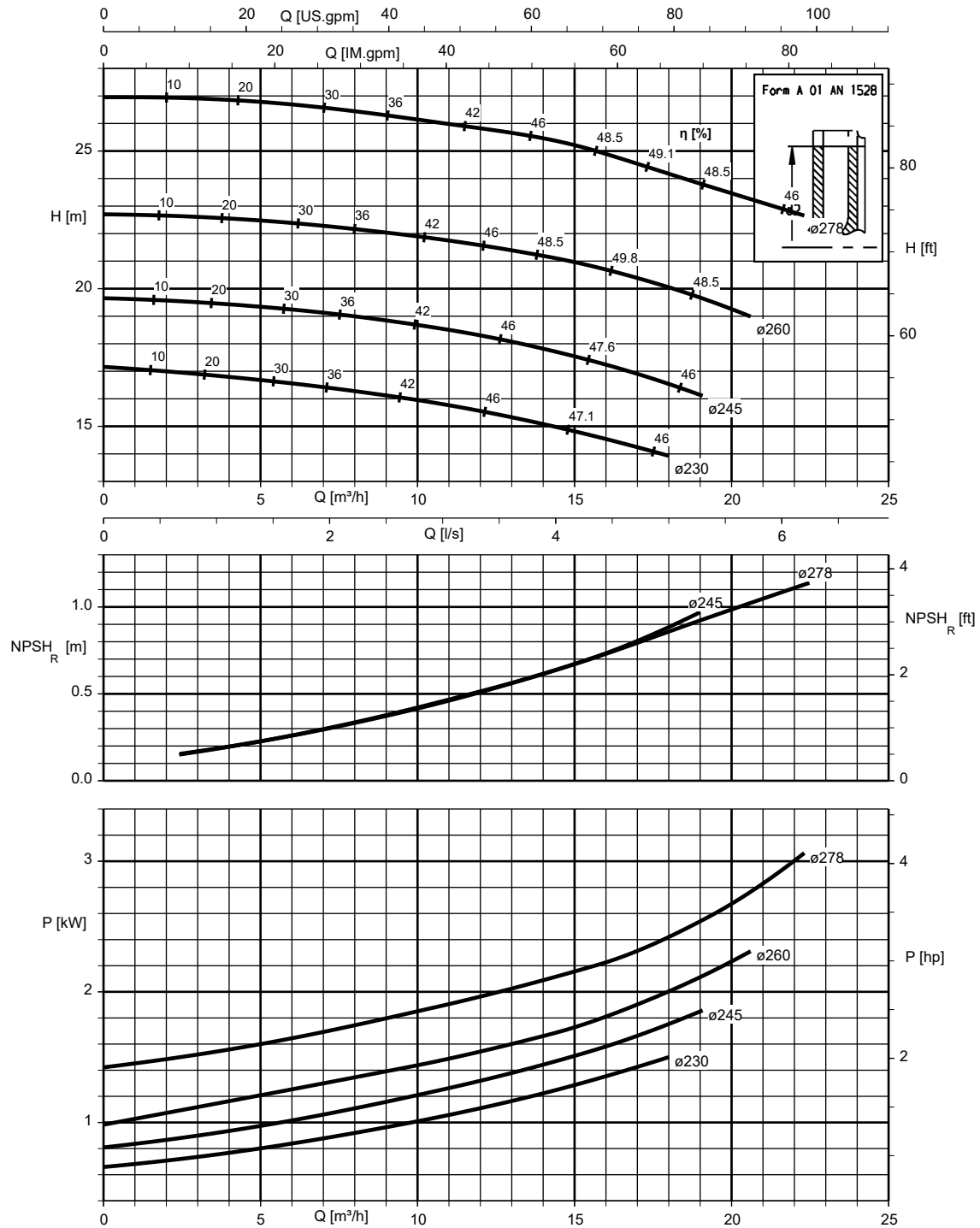


K1316.454/213/2

RPH-V 40-280, $n = 1450 \text{ rpm}$

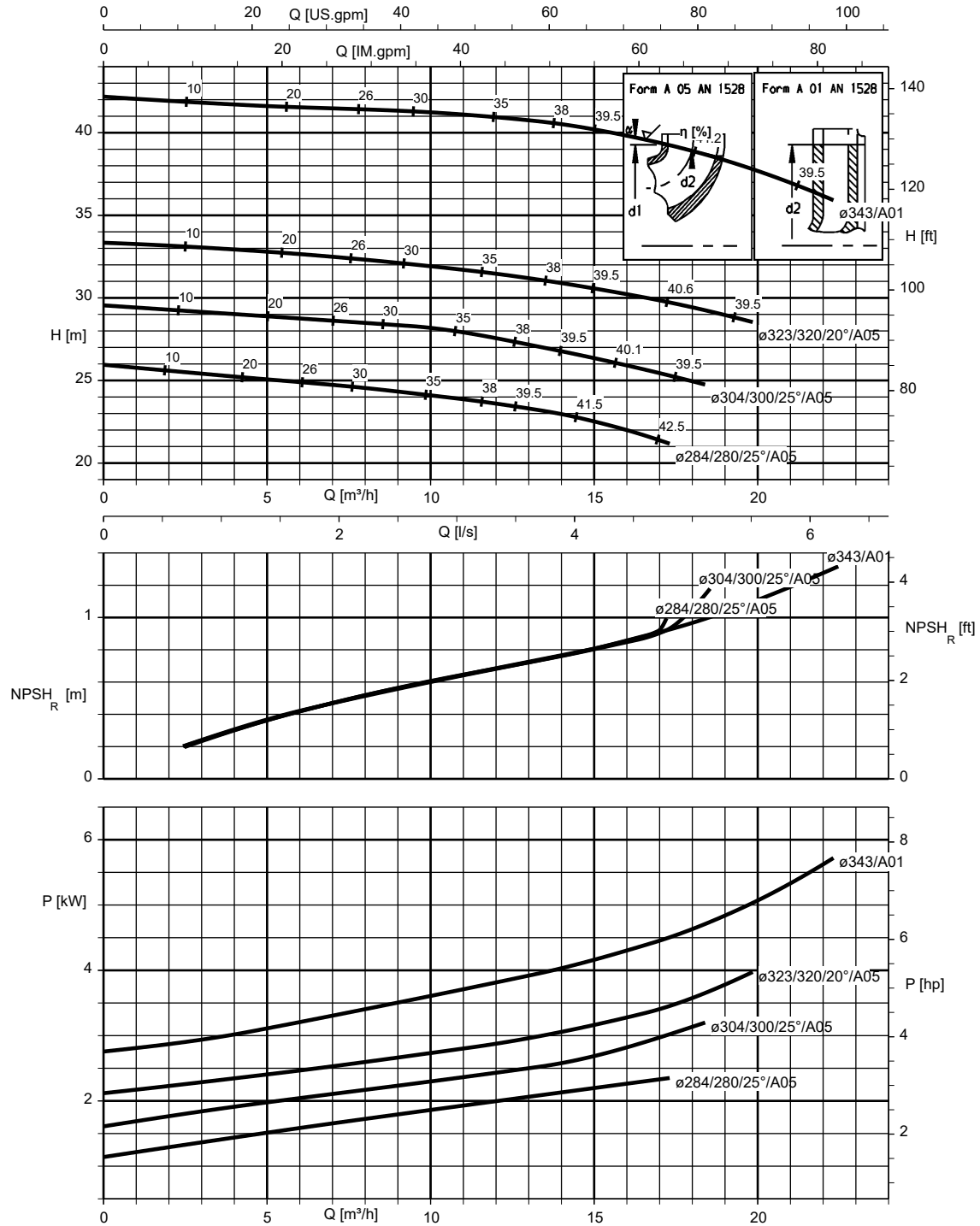


RPH-V 40-281, n = 1450 rpm



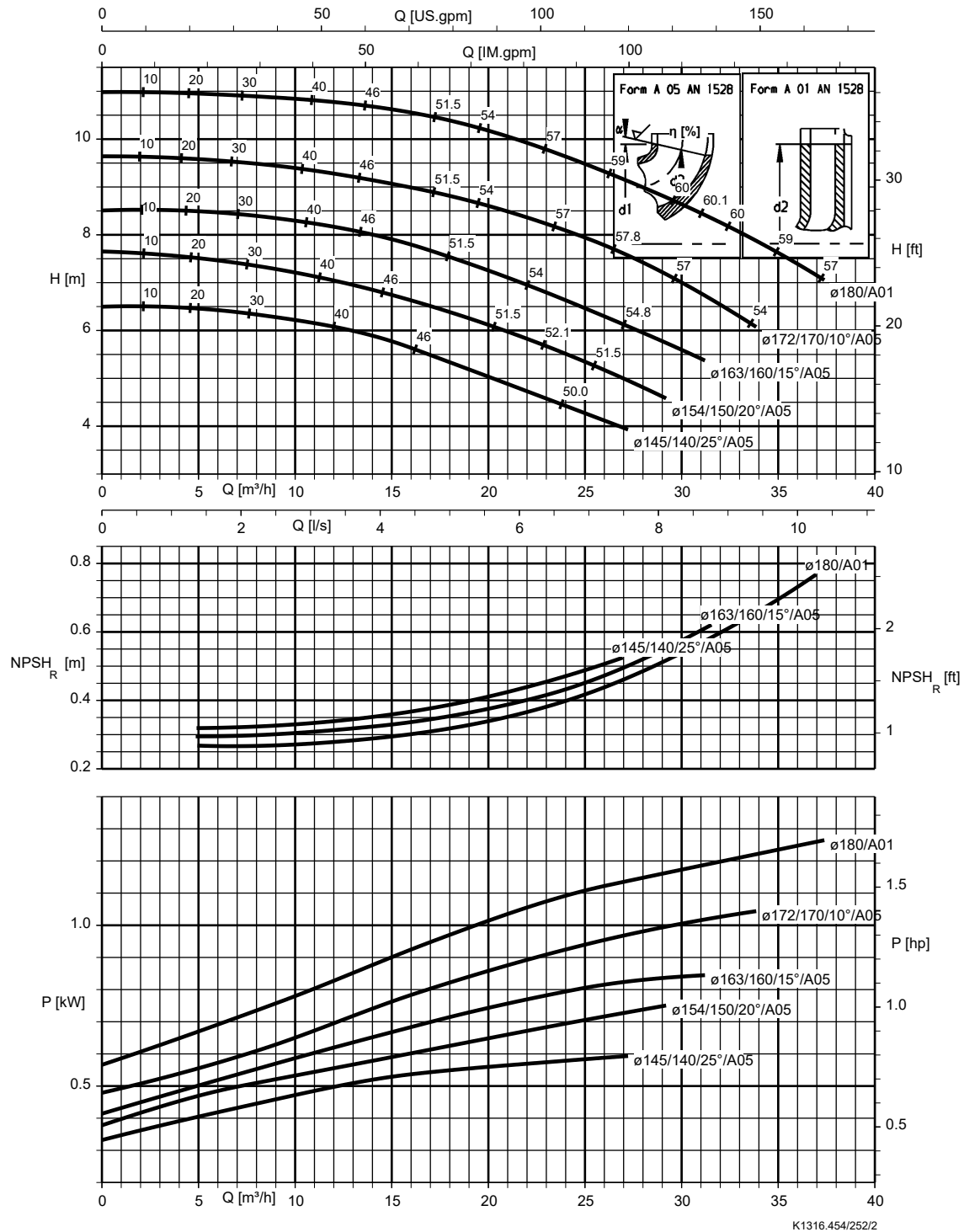
K1316.454/214/2

RPH-V 40-361, $n = 1450 \text{ rpm}$

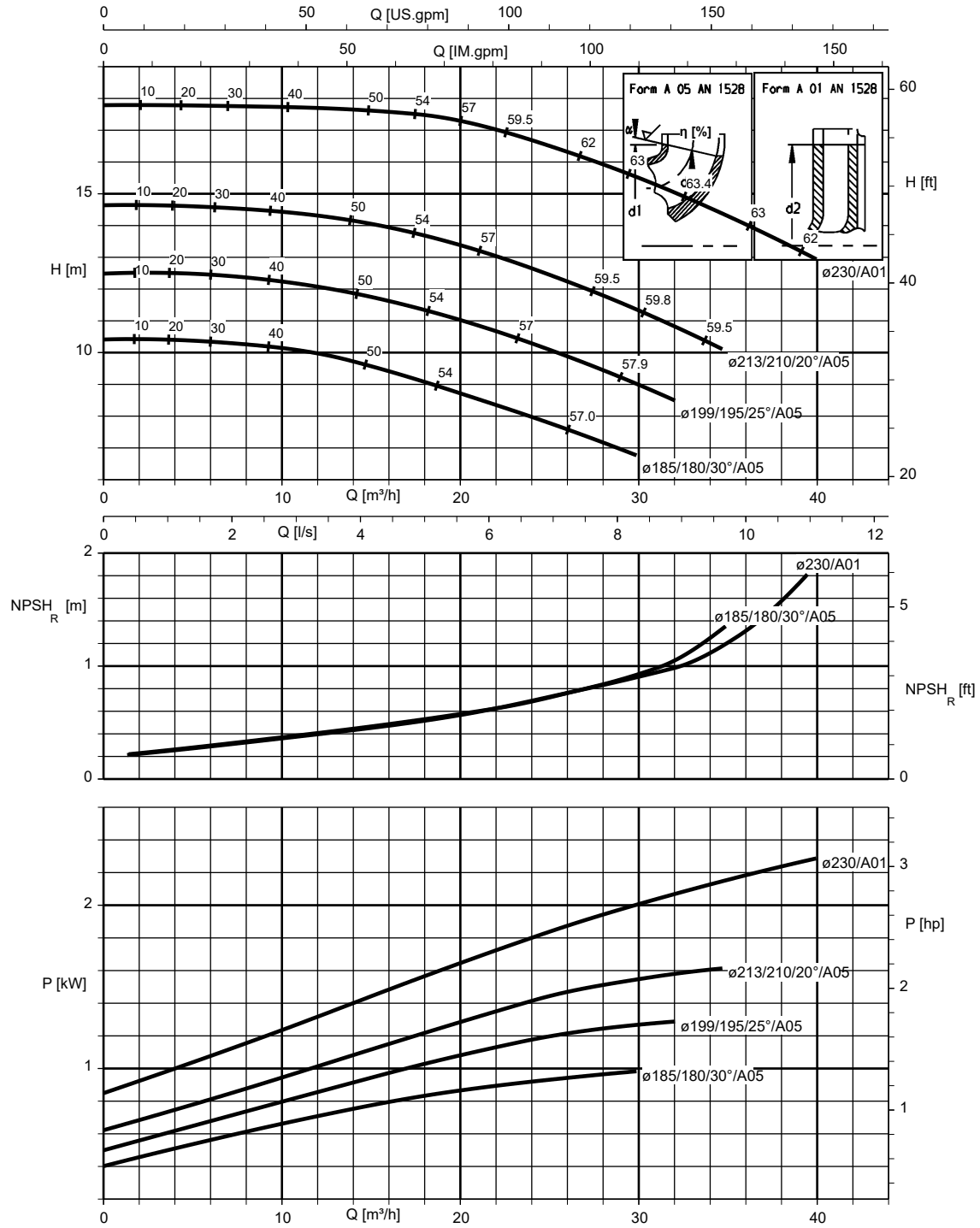


K1316.454/215/3

RPH-V 50-180, n = 1450 rpm



RPH-V 50-230, n = 1450 rpm

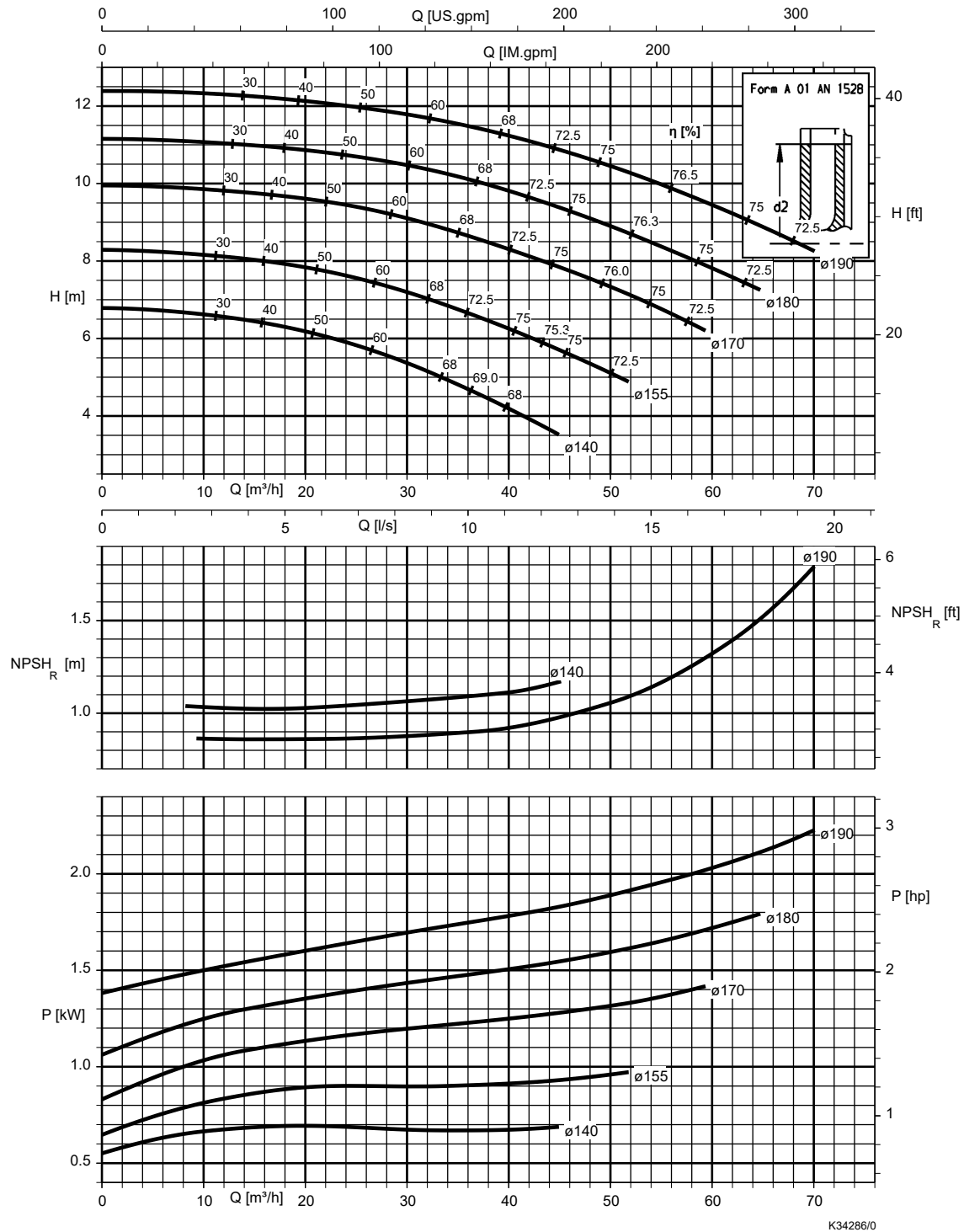


K1316.454/263/2

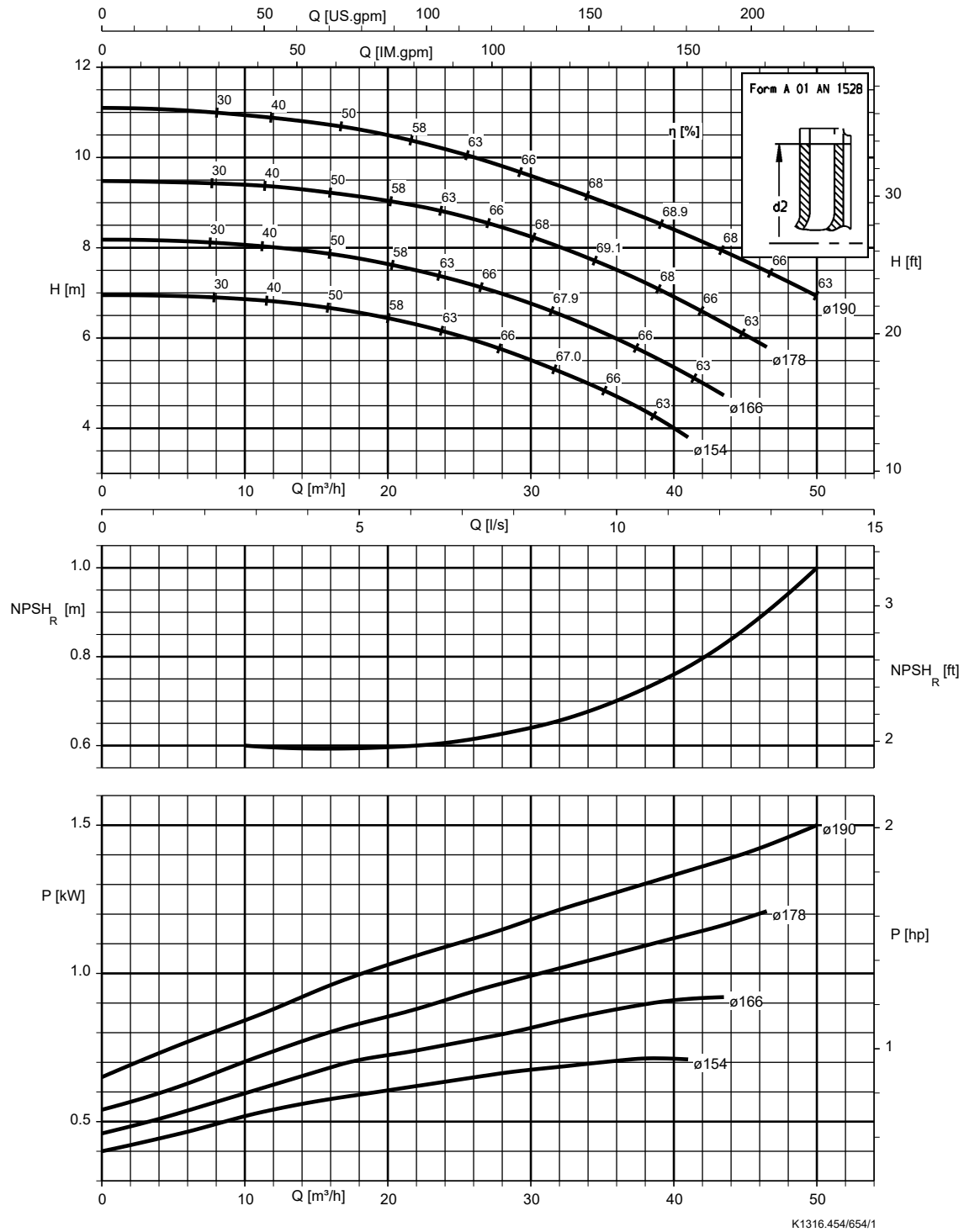
The three graphs illustrate the performance of the K1316.454/264/2 pump across a range of flow rates (Q) from 0 to 40 m³/h.

- Top Graph: Total Head (H) vs. Flow Rate (Q)**
 - Y-axis:** H [m] (15 to 30) and H [ft] (40 to 100).
 - X-axis:** Q [US.gpm] (0 to 150), Q [IM.gpm] (0 to 150), Q [m³/h] (0 to 40), and Q [l/s] (0 to 12).
 - Curves:** Five curves represent different impeller diameters: $\phi 286/A01$, $\phi 278/275/15^\circ/A05$, $\phi 264/260/20^\circ/A05$, $\phi 250/245/25^\circ/A05$, and $\phi 235/230/25^\circ/A05$. Efficiency values (η [%]) are marked on the curves, ranging from 58.0 to 60.2.
 - Inset:** Shows the impeller design (Form A 05 AN 1528) and a cross-section of the pump housing (Form A 01 AN 1528).
- Middle Graph: Required Head (H_R) vs. Flow Rate (Q)**
 - Y-axis:** H_R [m] (0.5 to 1.0) and NPSH_R [ft] (1 to 3.5).
 - X-axis:** Q [m³/h] (0 to 40).
 - Curve:** A single curve showing the required head increasing with flow rate.
- Bottom Graph: Power (P) vs. Flow Rate (Q)**
 - Y-axis:** P [kW] (2 to 4) and P [hp] (2 to 6).
 - X-axis:** Q [m³/h] (0 to 40).
 - Curves:** Five curves representing the power consumption for the same impeller diameters as the top graph.

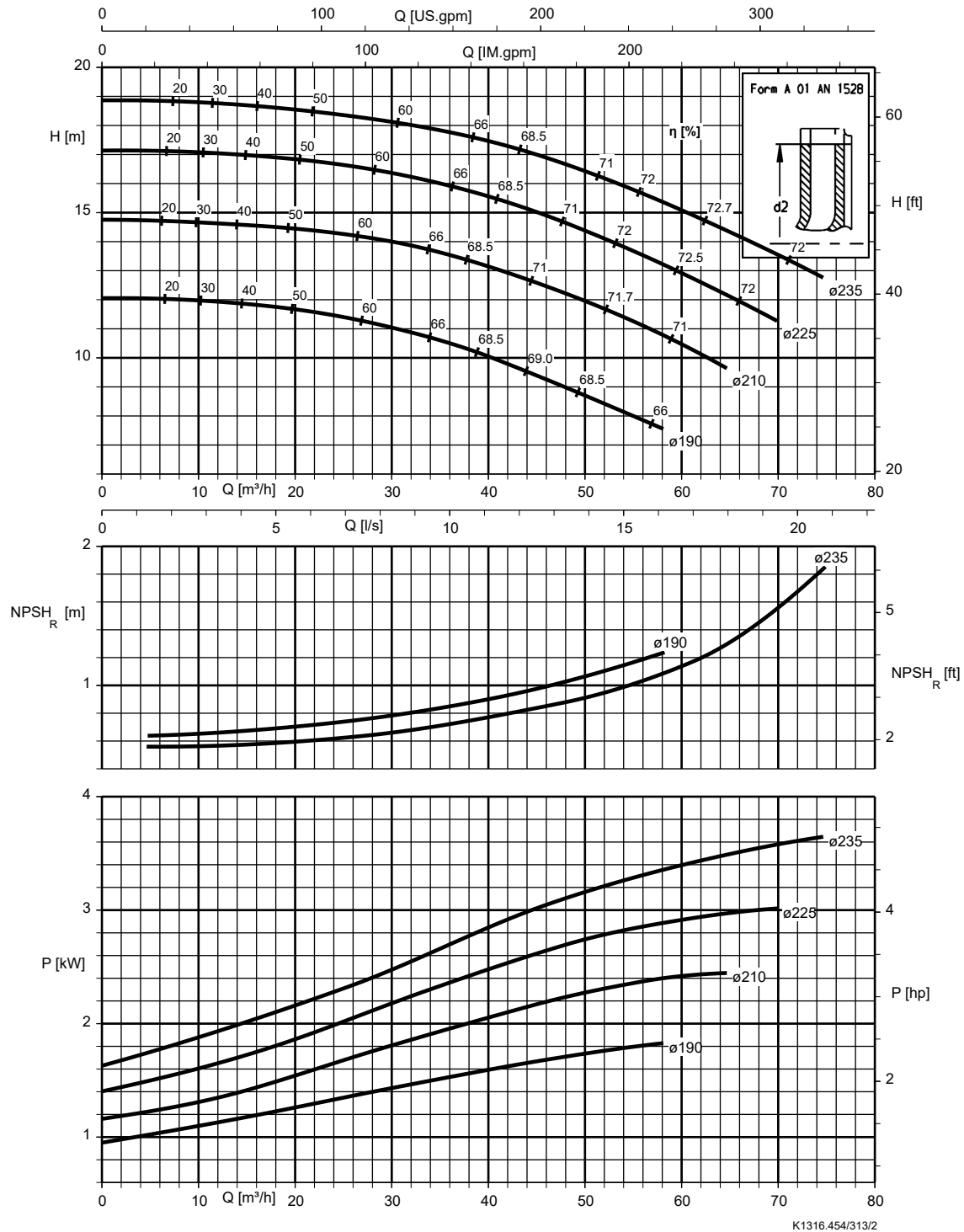
RPH-V 80-180, n = 1450 rpm



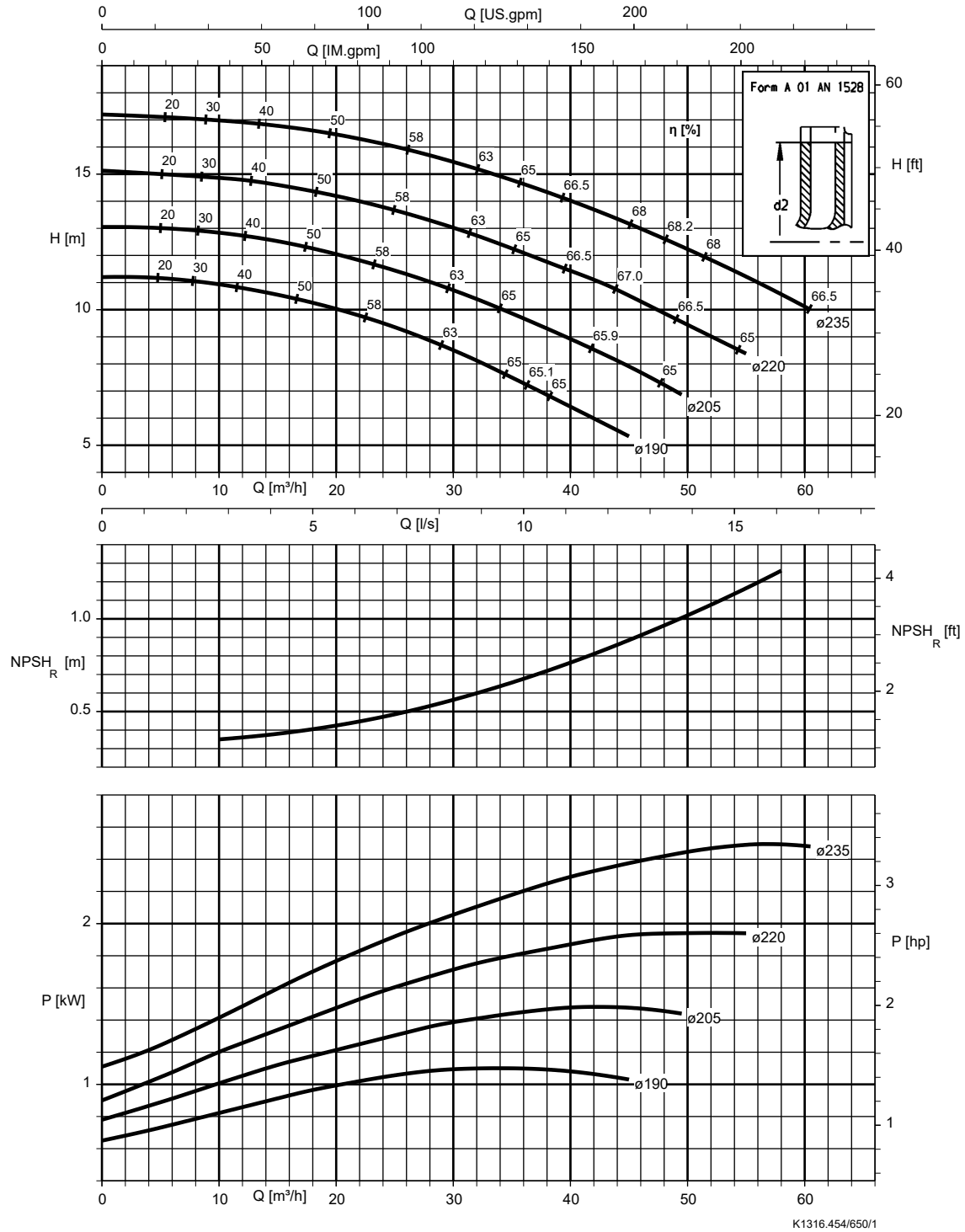
RPH-V 80-180B, n = 1450 rpm



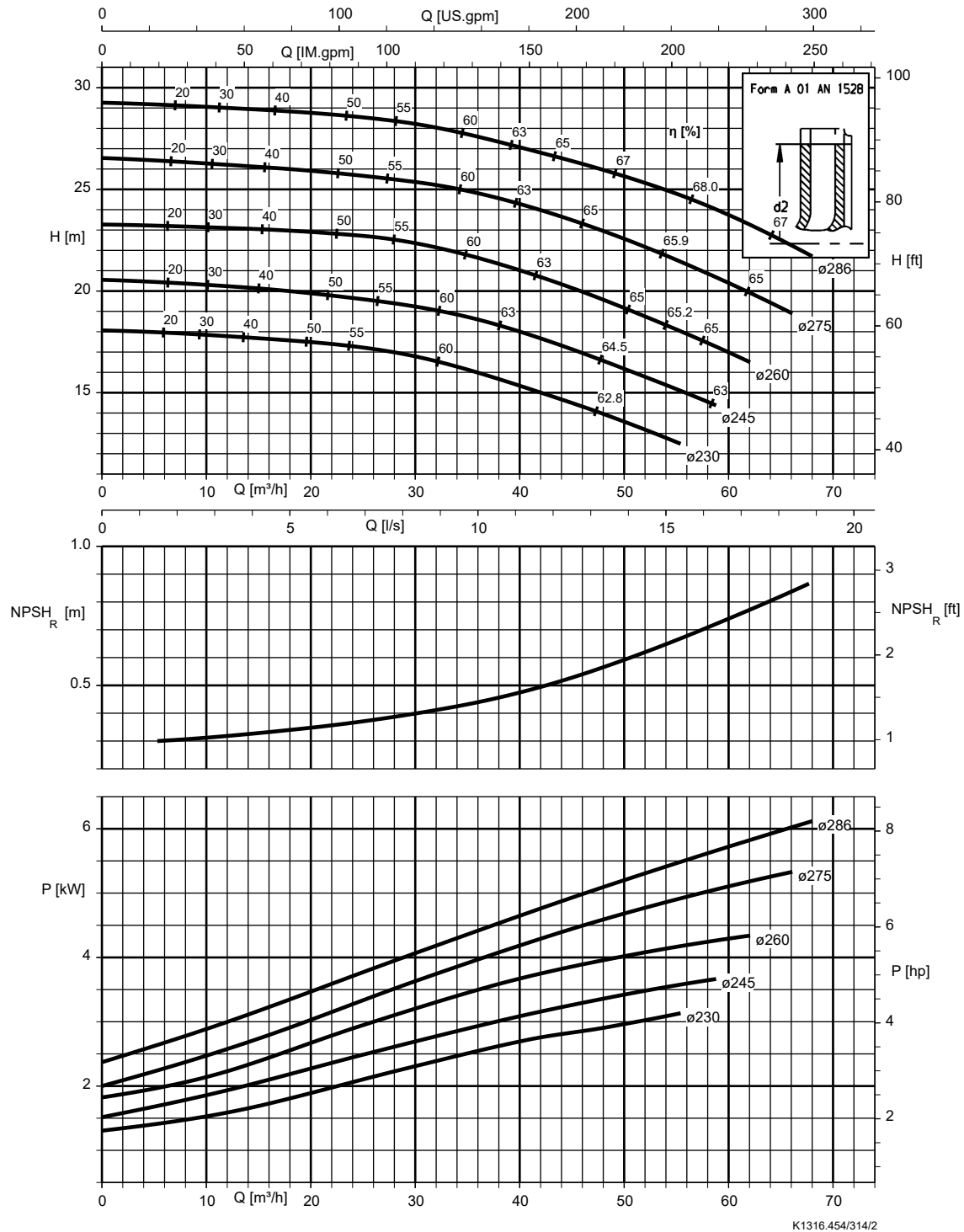
RPH-V 80-230, $n = 1450$ rpm



RPH-V 80-230B, n = 1450 rpm

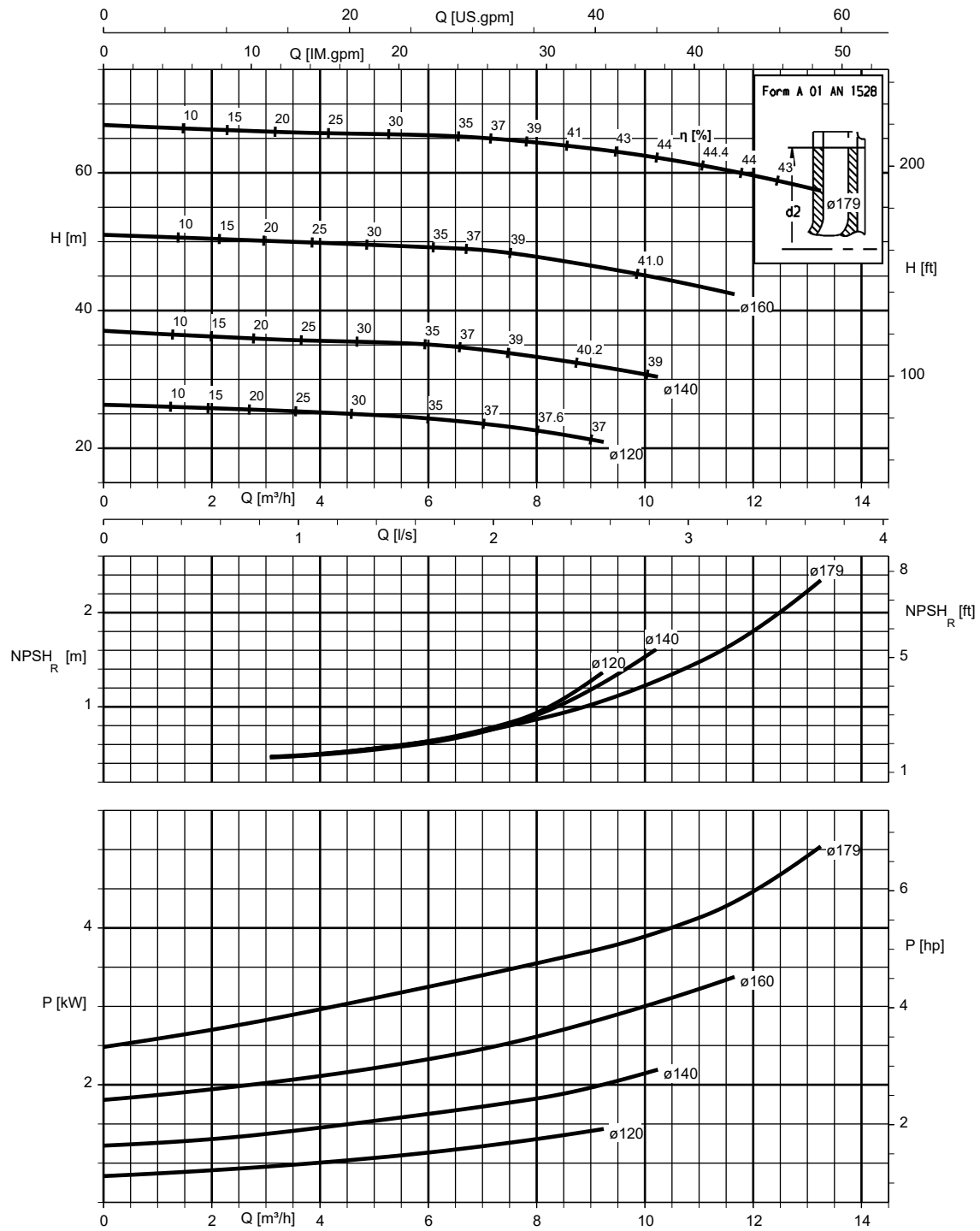


RPH-V 80-280, n = 1450 rpm



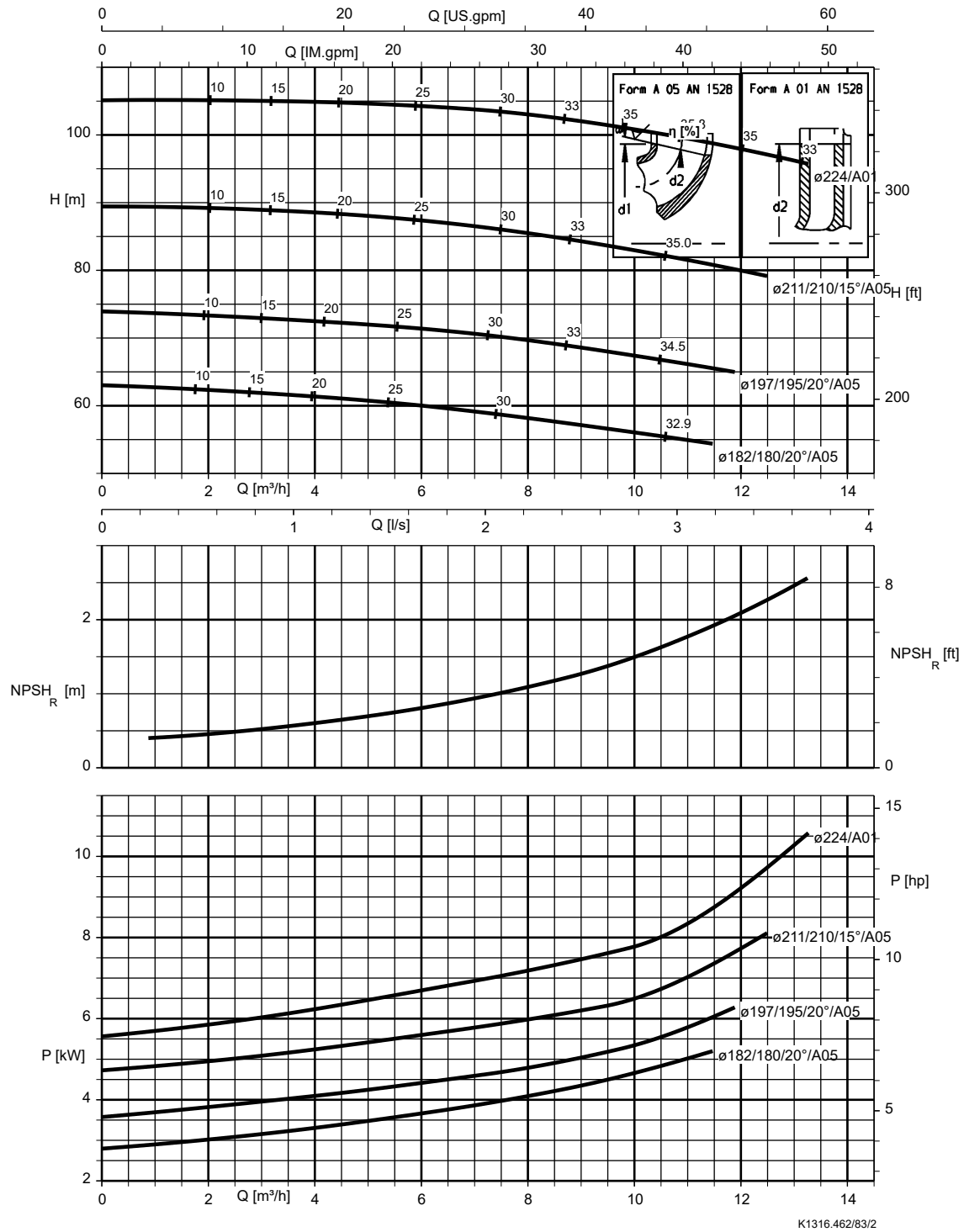
$n = 3500 \text{ rpm}$

RPH-V 25-180, $n = 3500 \text{ rpm}$

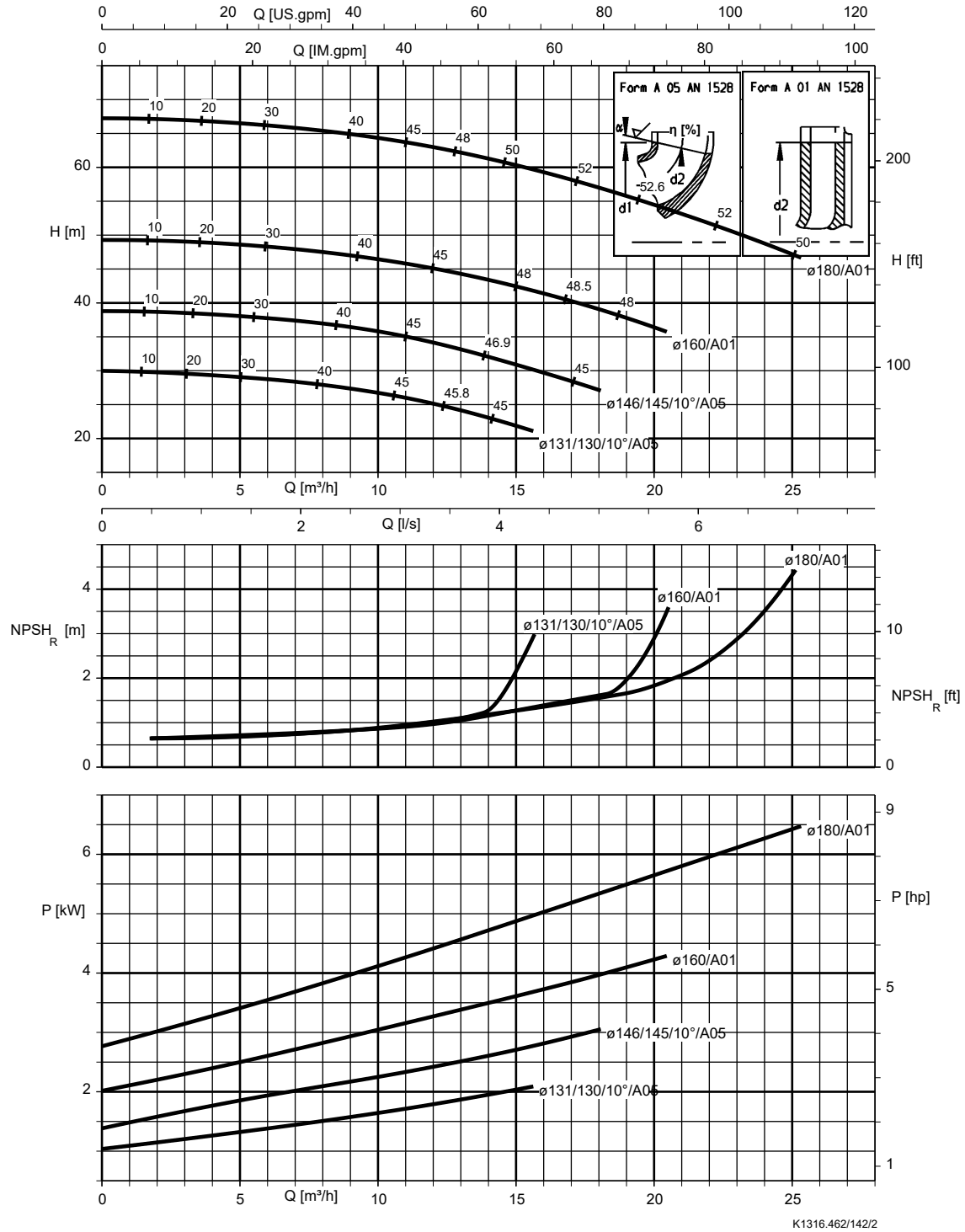


K1316.462/82/2

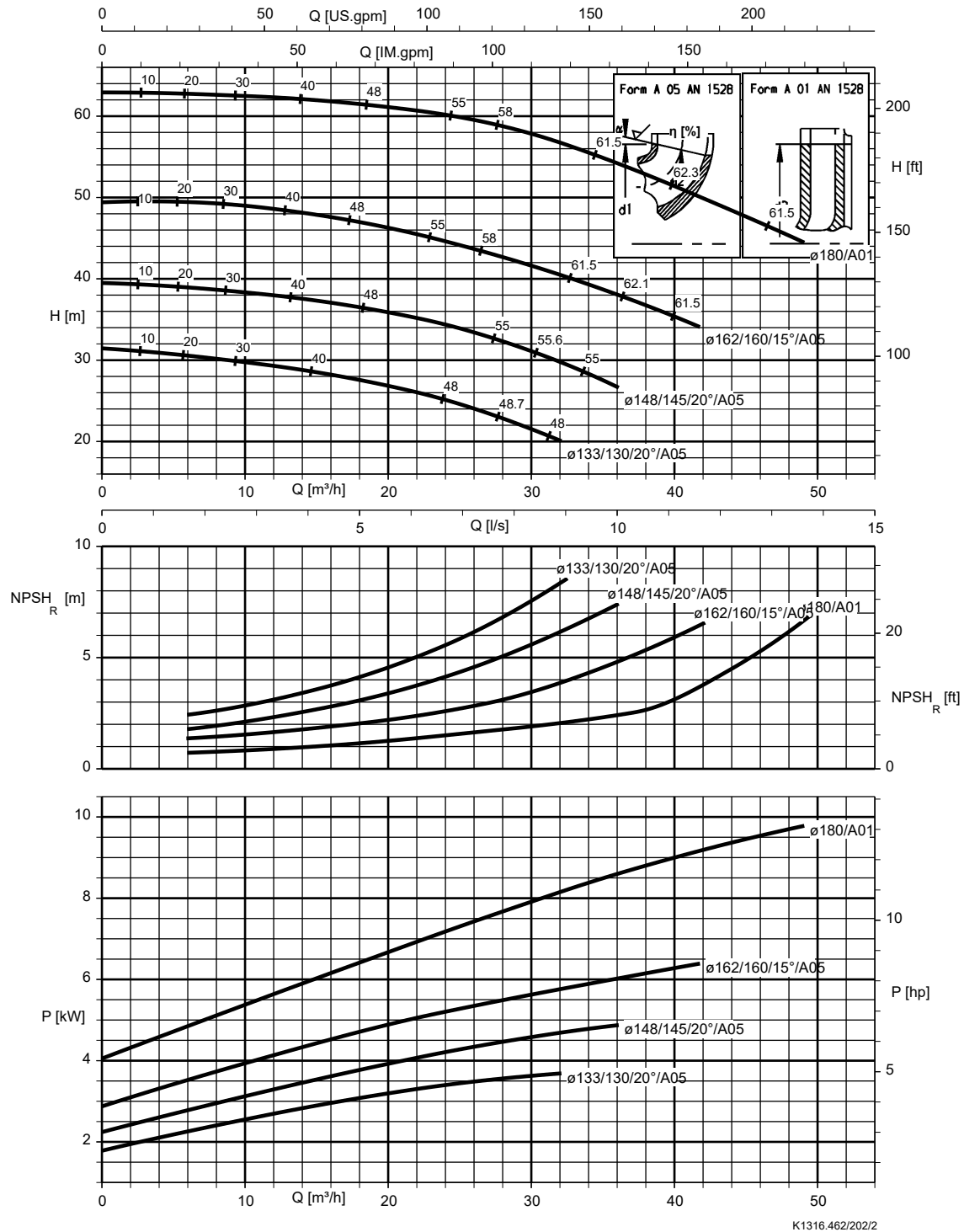
RPH-V 25-230, n = 3500 rpm



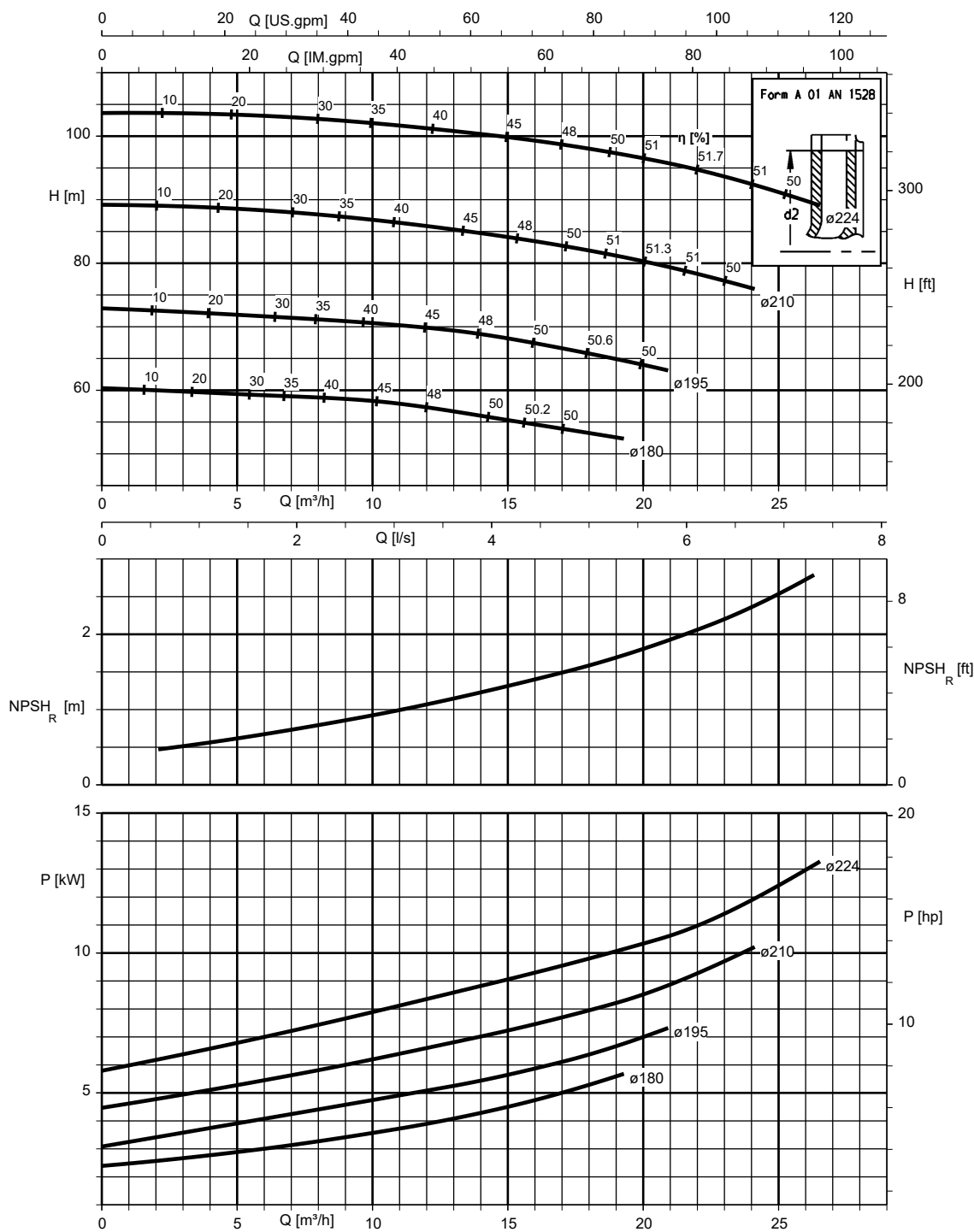
RPH-V 40-180, n = 3500 rpm



RPH-V 40-181, $n = 3500 \text{ rpm}$

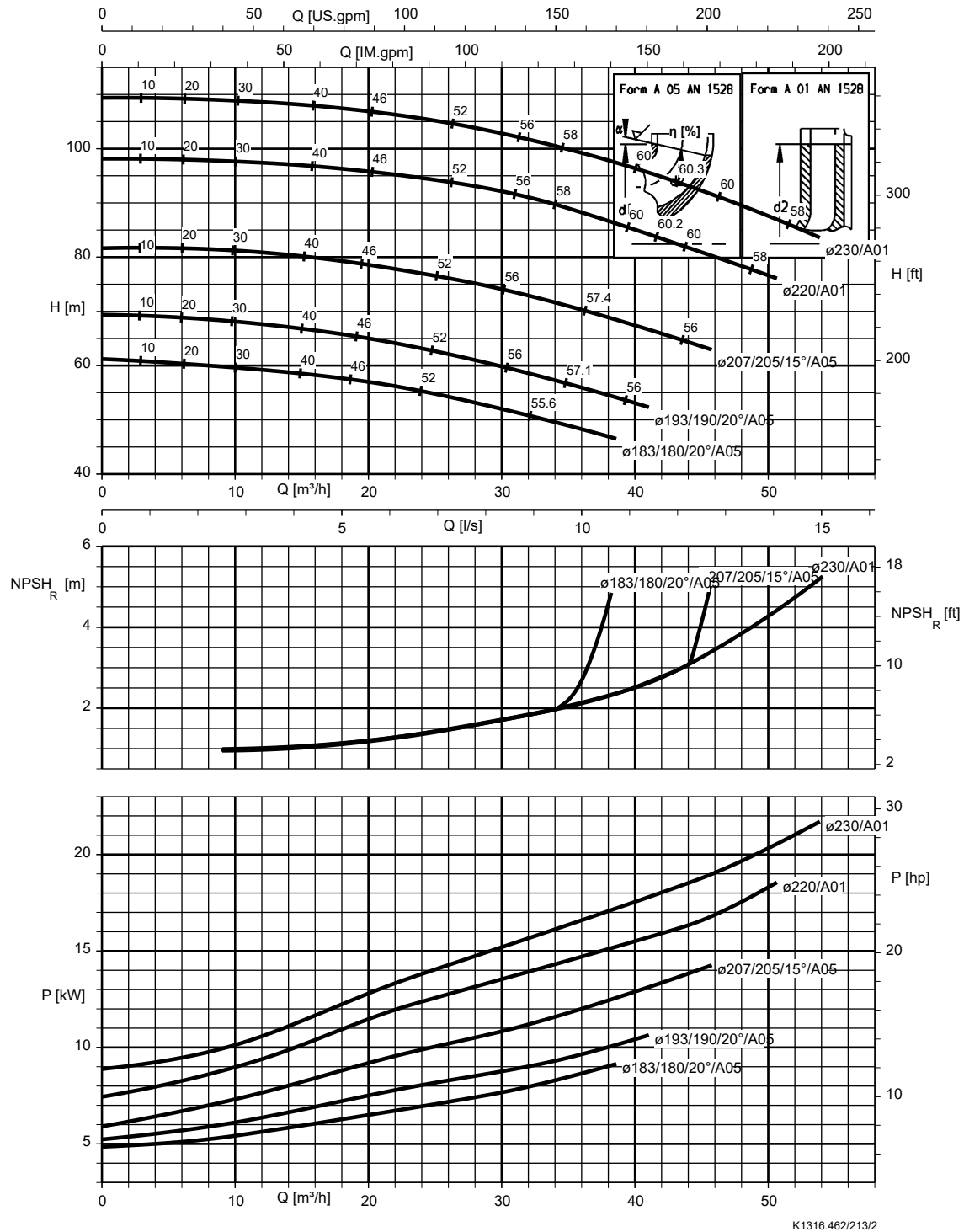


RPH-V 40-230, n = 3500 rpm

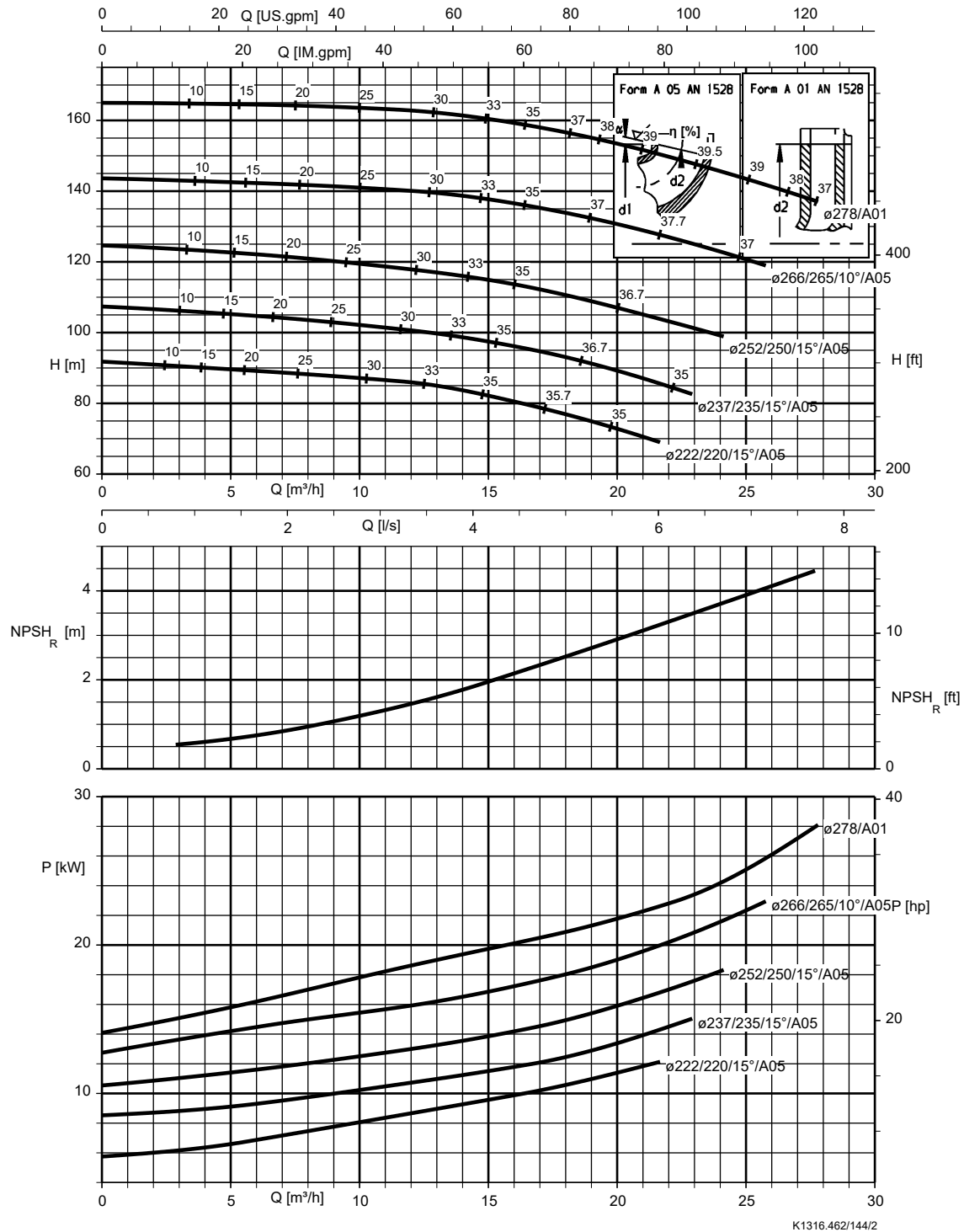


K1316.462/143/2

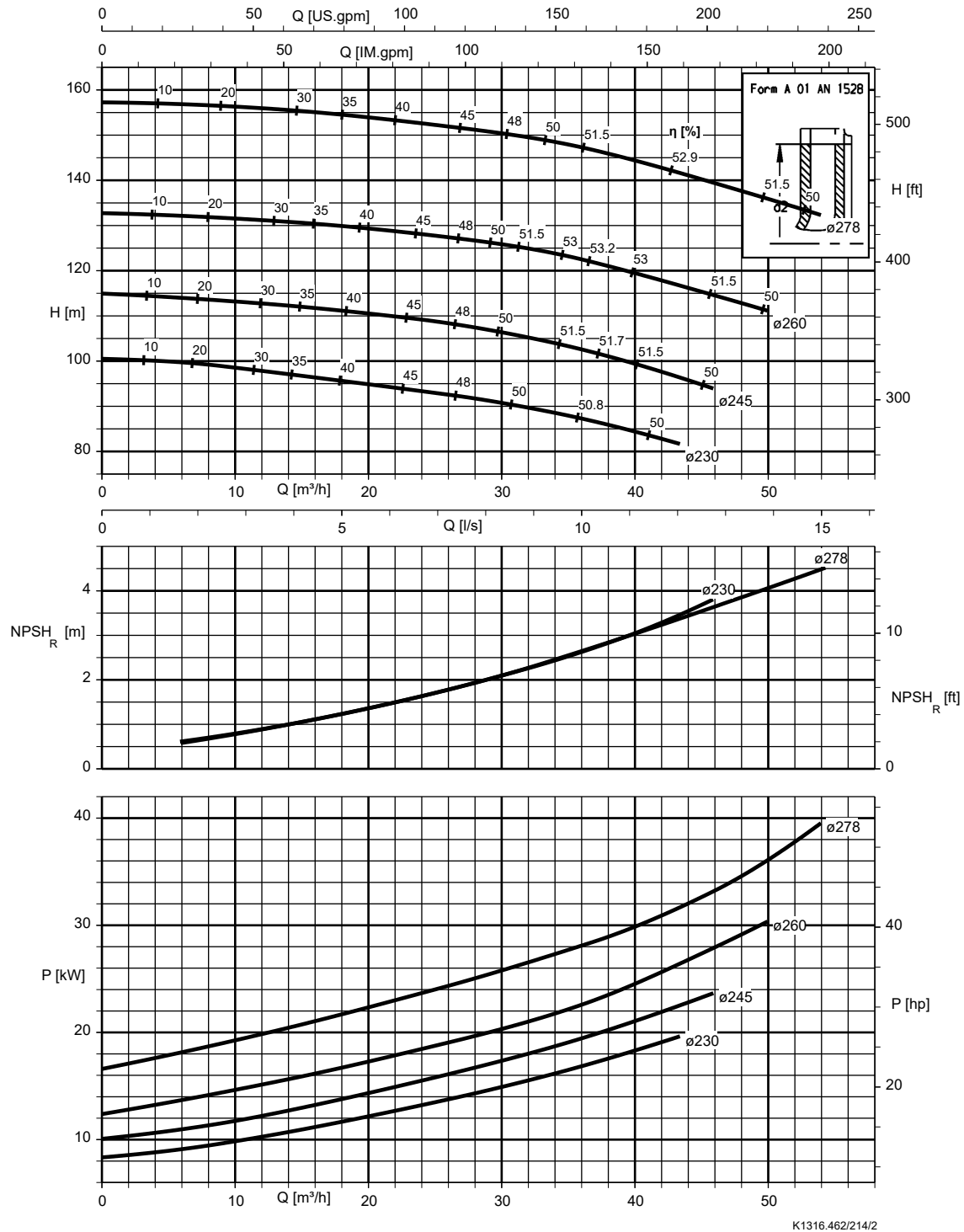
RPH-V 40-231, n = 3500 rpm



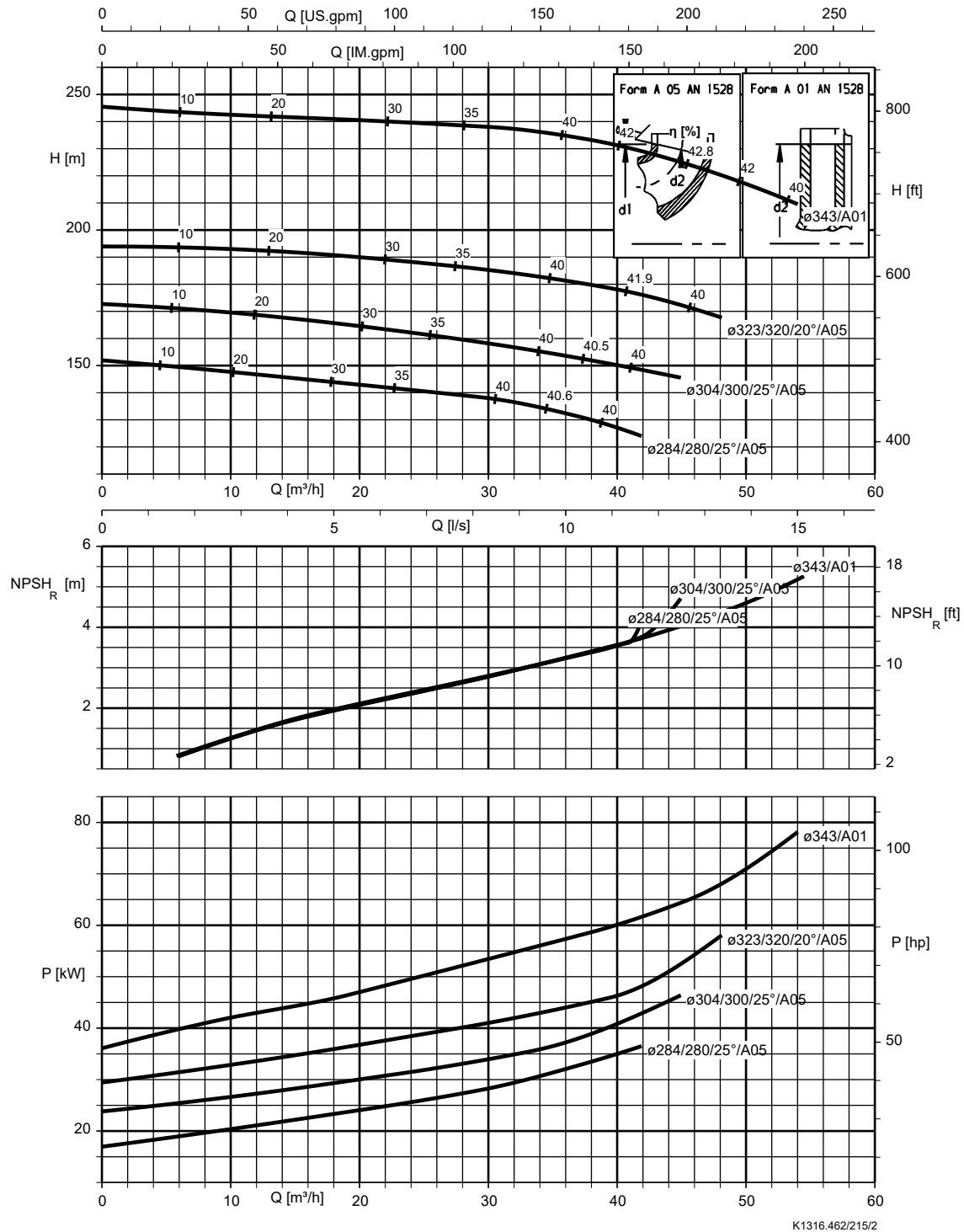
RPH-V 40-280, n = 3500 rpm



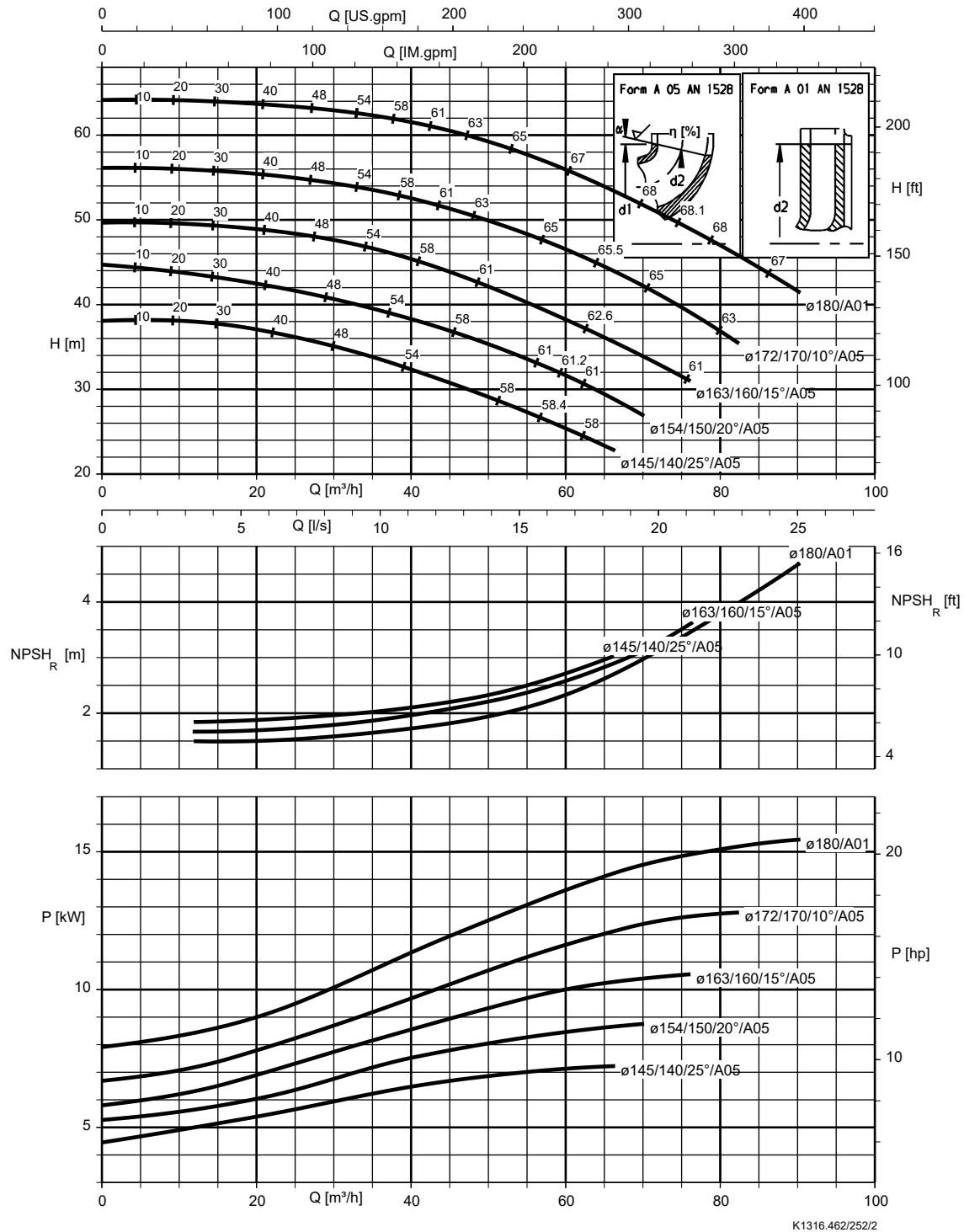
RPH-V 40-281, n = 3500 rpm



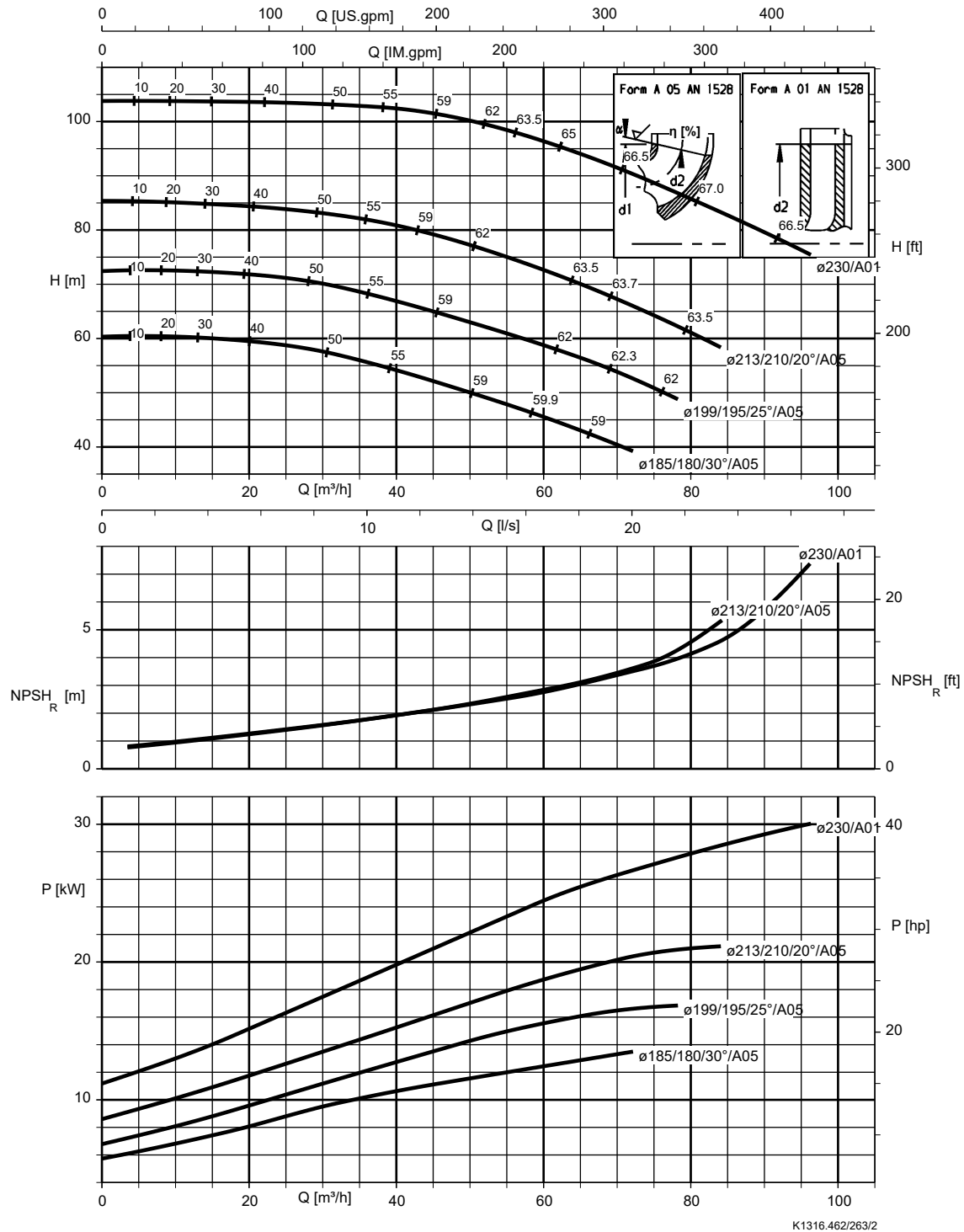
RPH-V 40-361, n = 3500 rpm



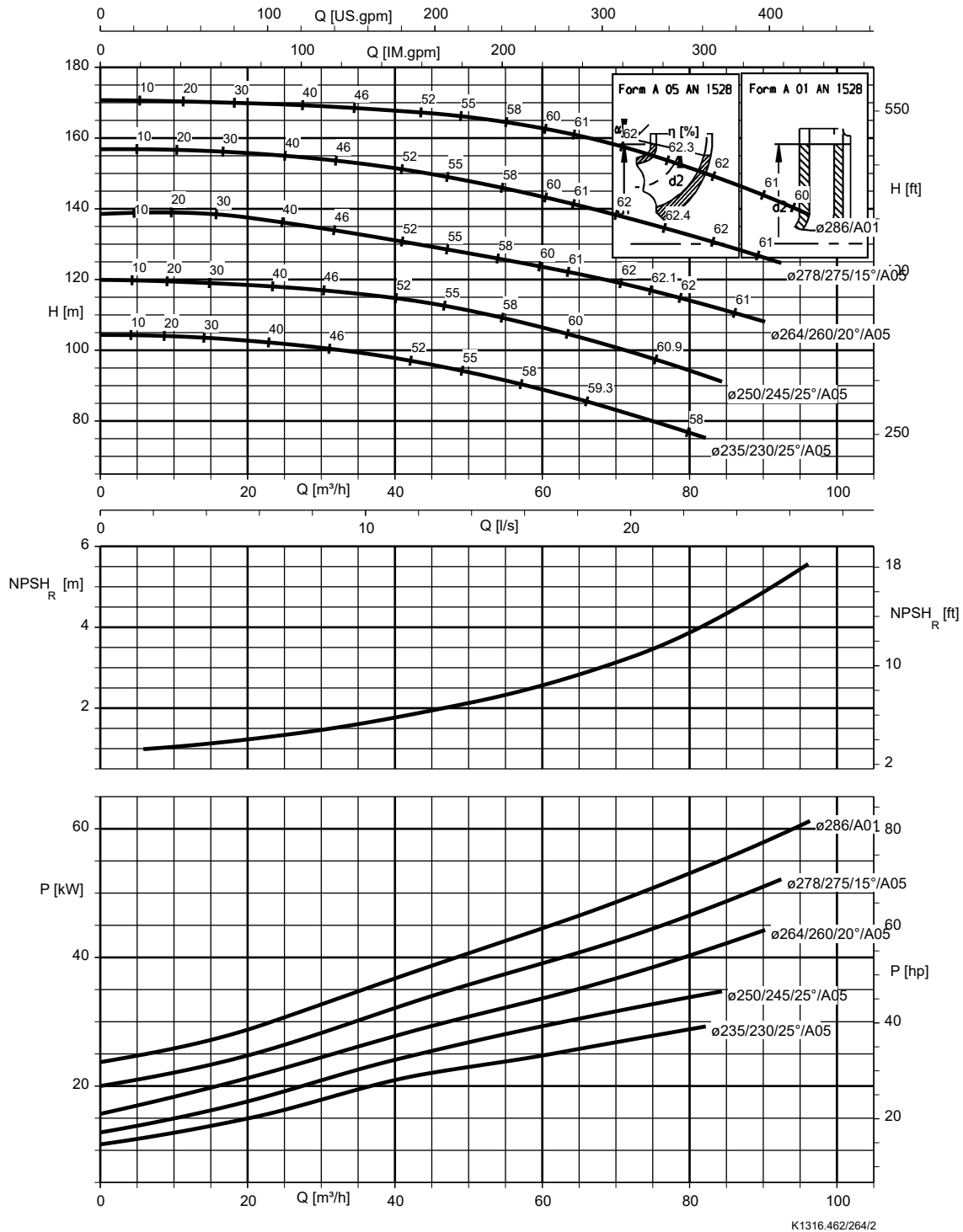
RPH-V 50-180, n = 3500 rpm



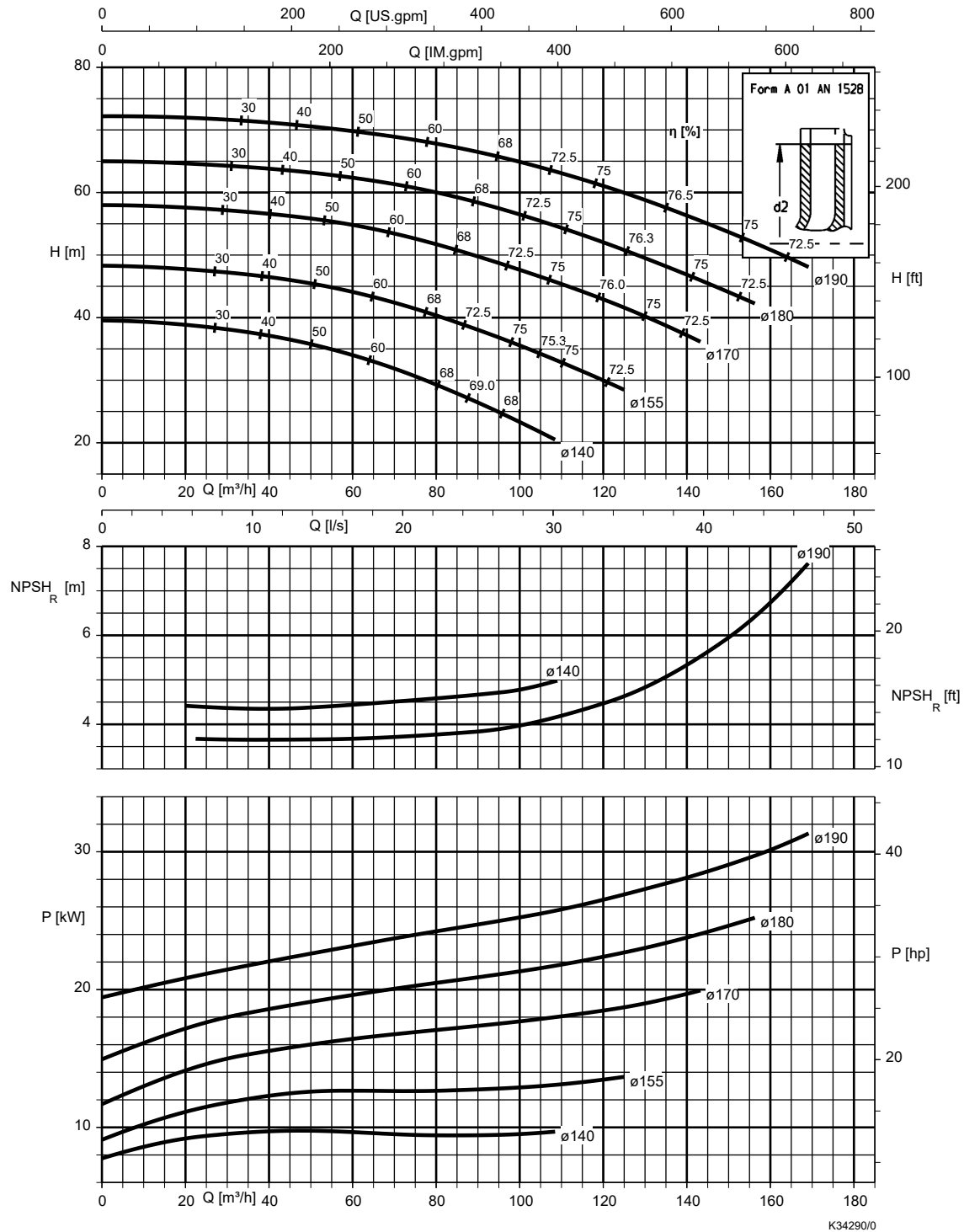
RPH-V 50-230, n = 3500 rpm



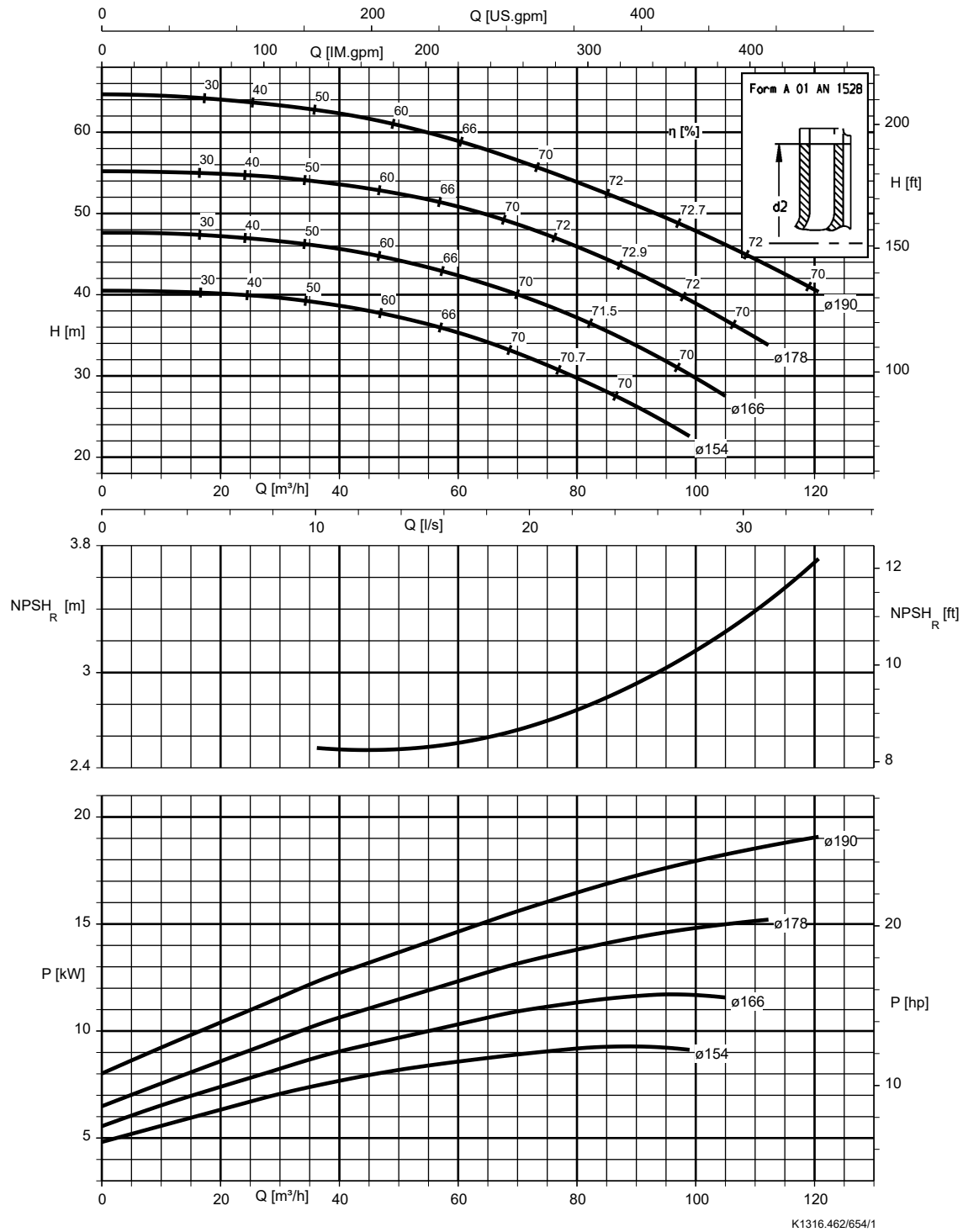
RPH-V 50-280, n = 3500 rpm



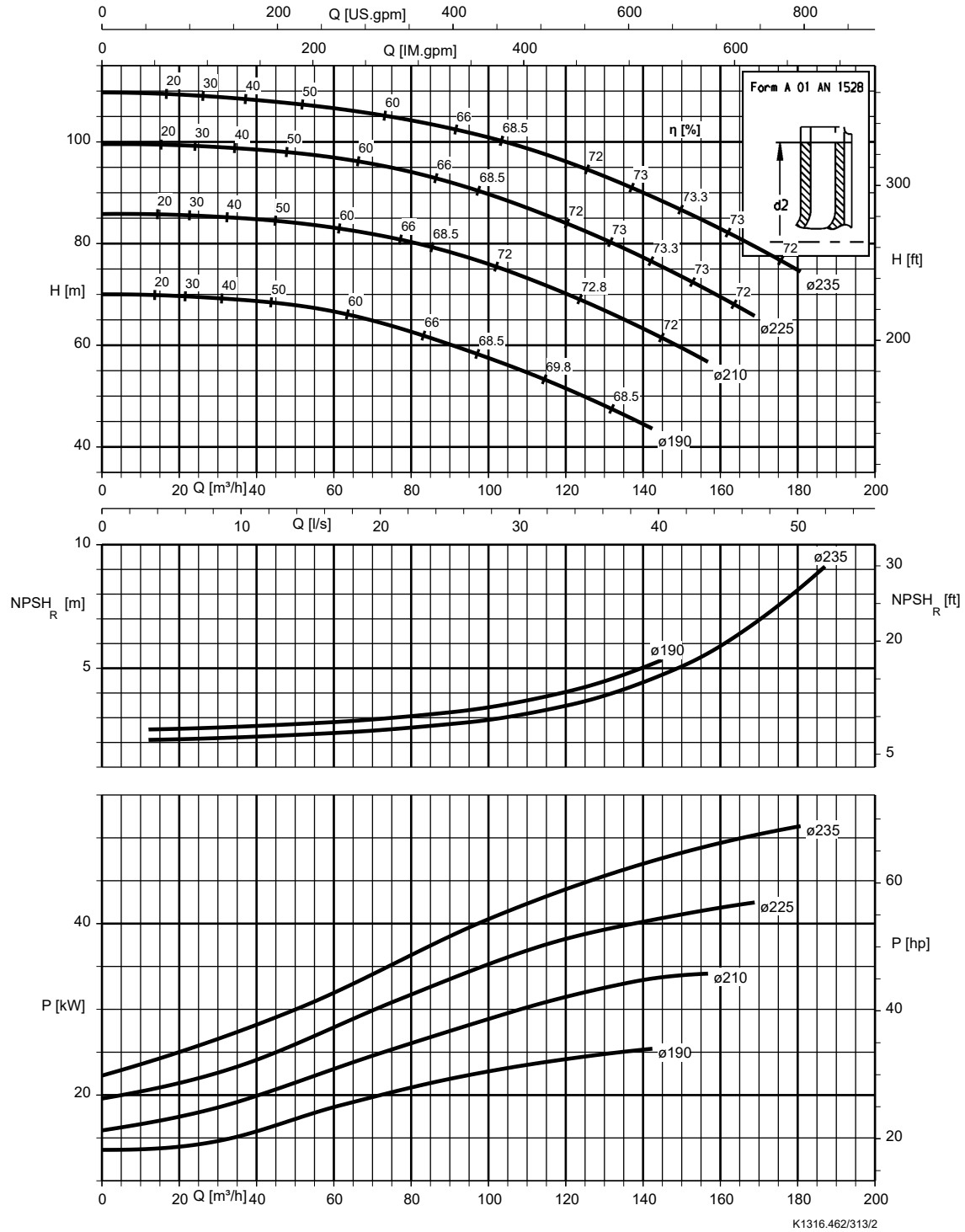
RPH-V 80-180, n = 3500 rpm



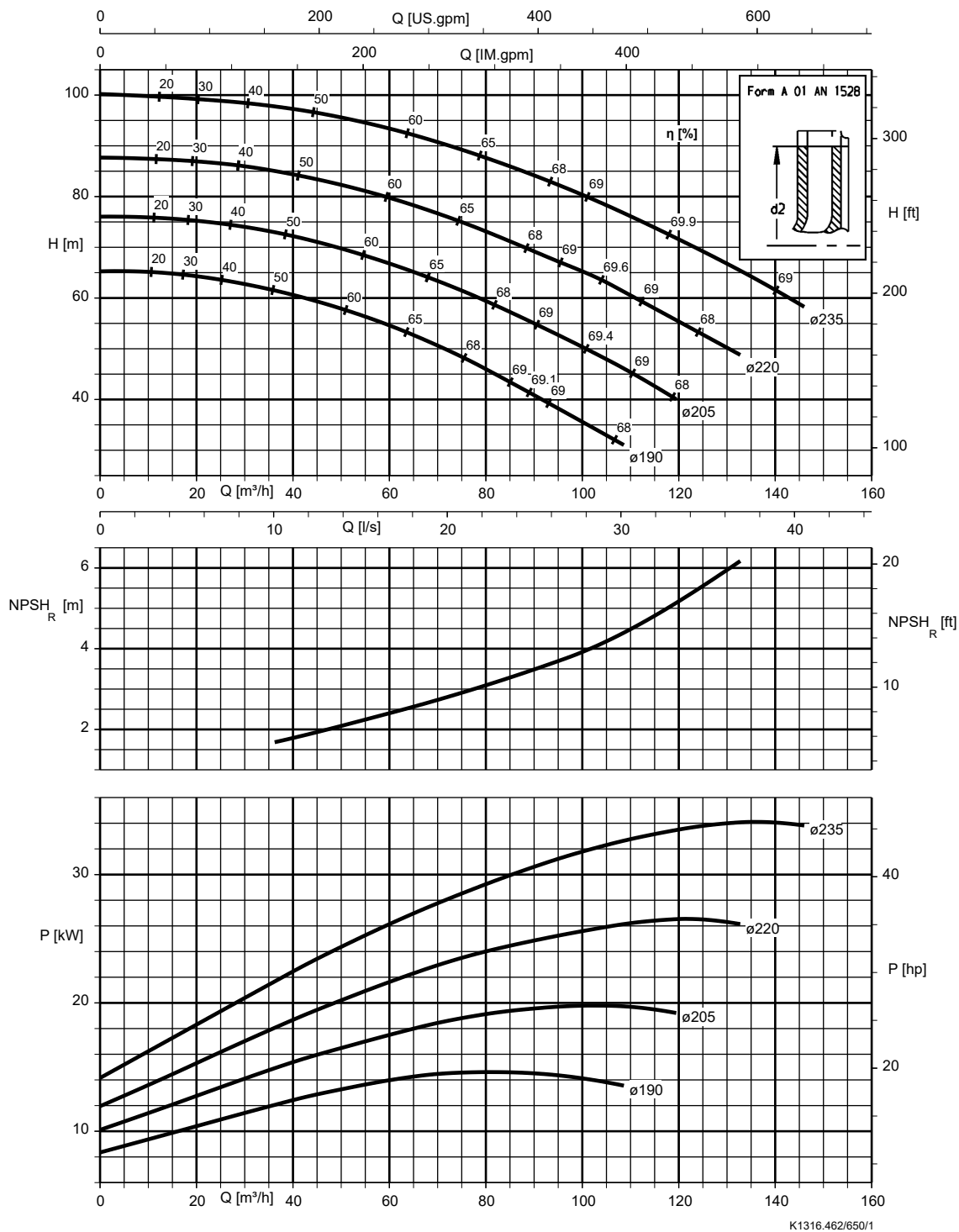
RPH-V 80-180B, n = 3500 rpm



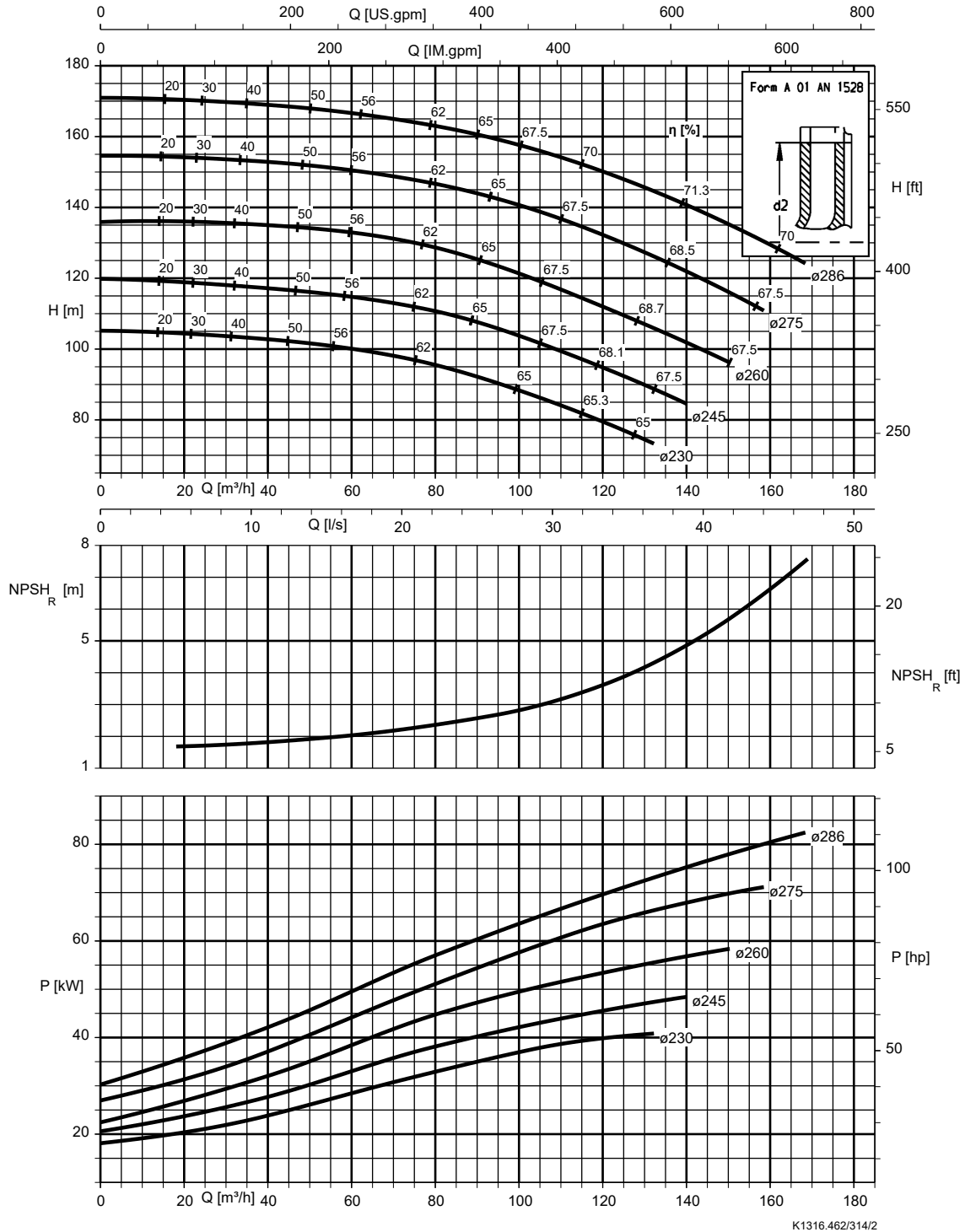
RPH-V 80-230, n = 3500 rpm



RPH-V 80-230B, n = 3500 rpm

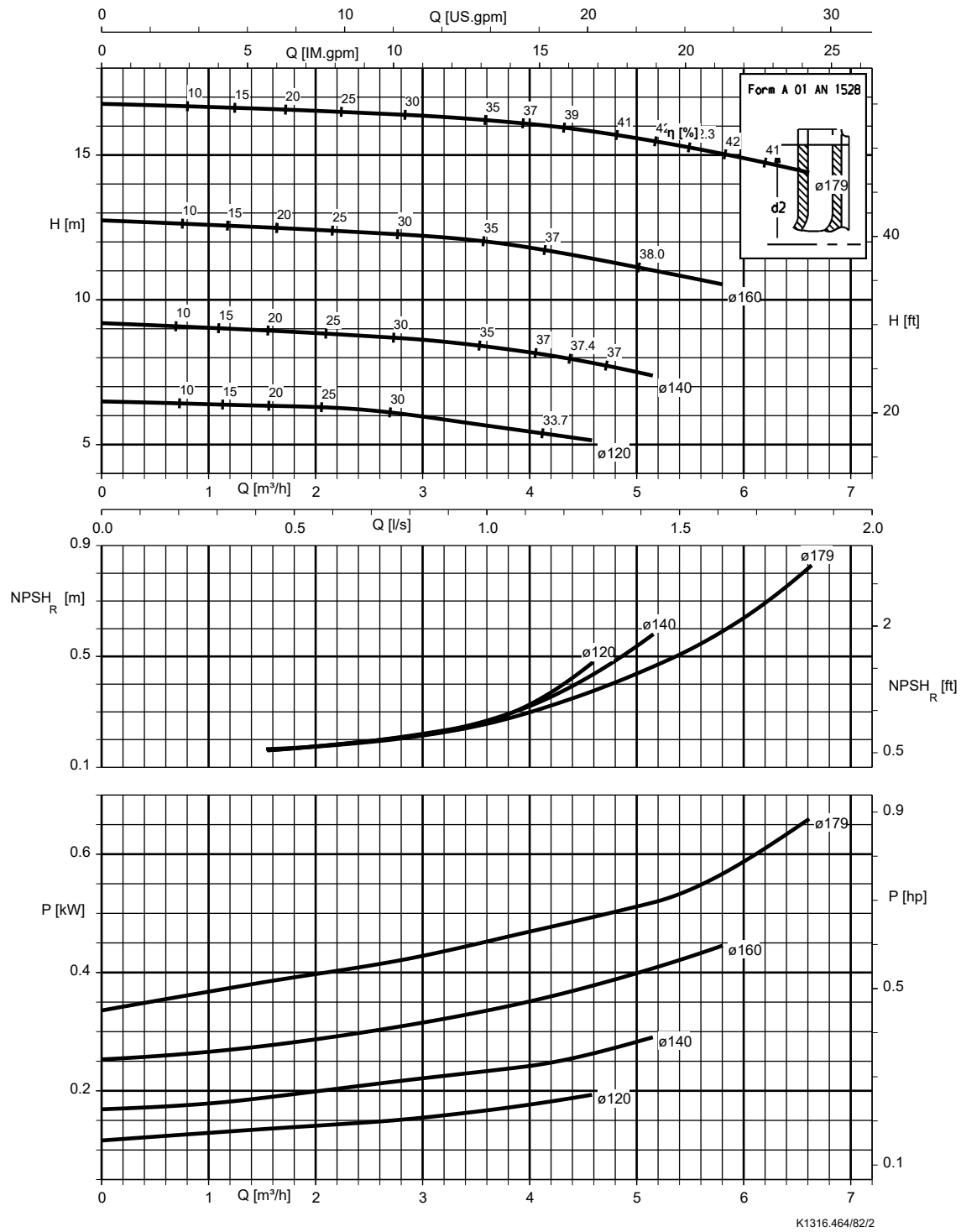


RPH-V 80-280, n = 3500 rpm

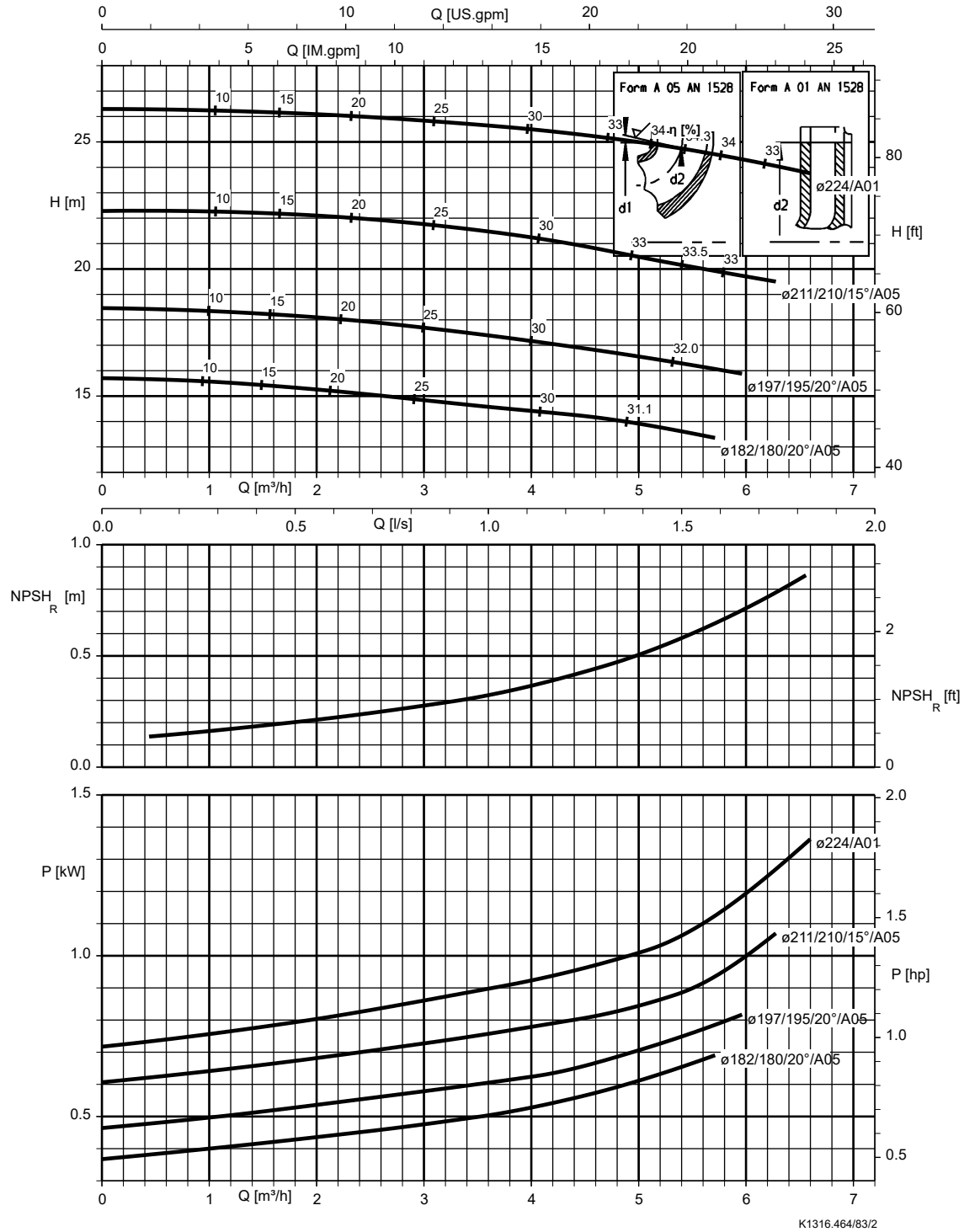


$n = 1750 \text{ rpm}$

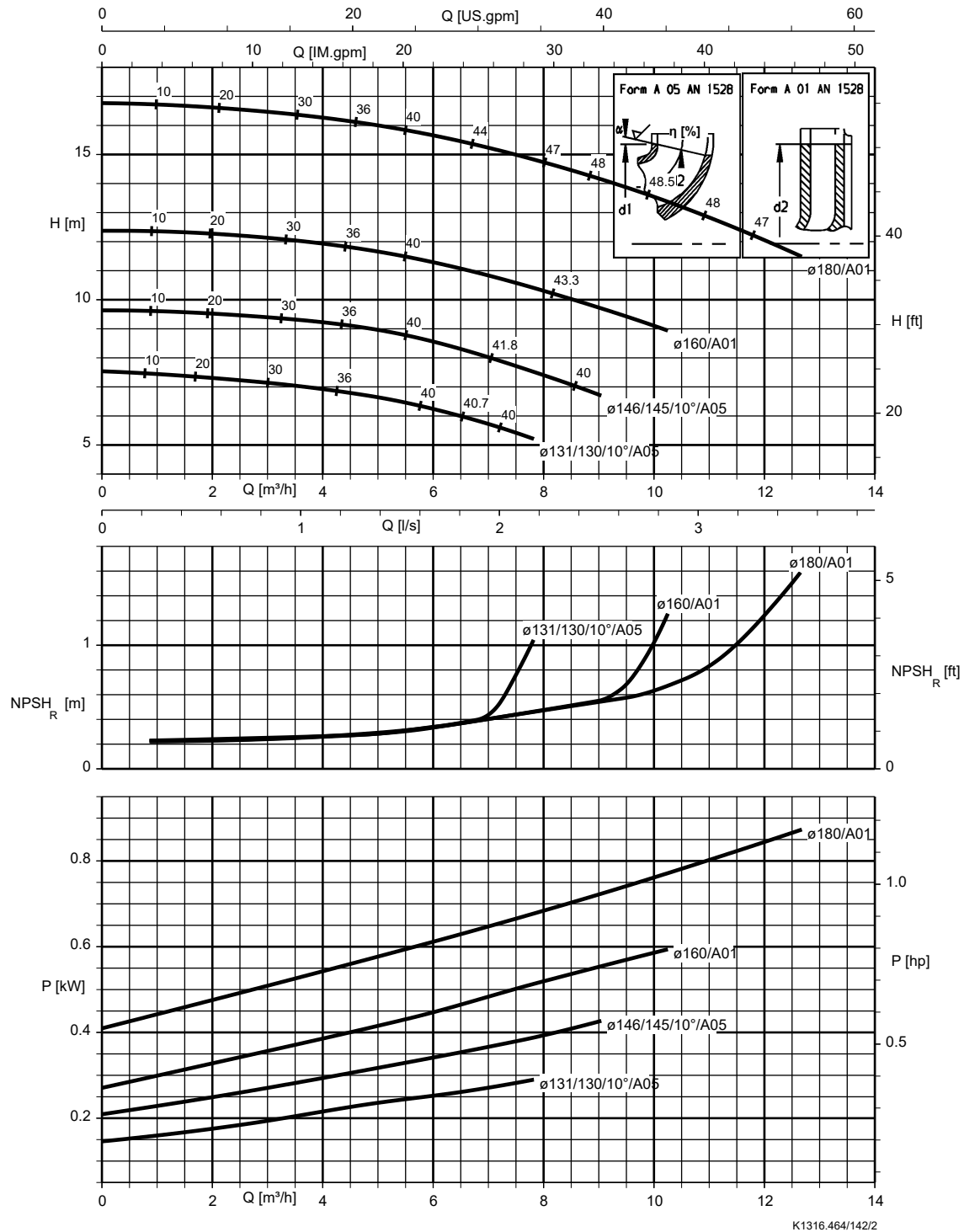
RPH-V 25-180, $n = 1750 \text{ rpm}$



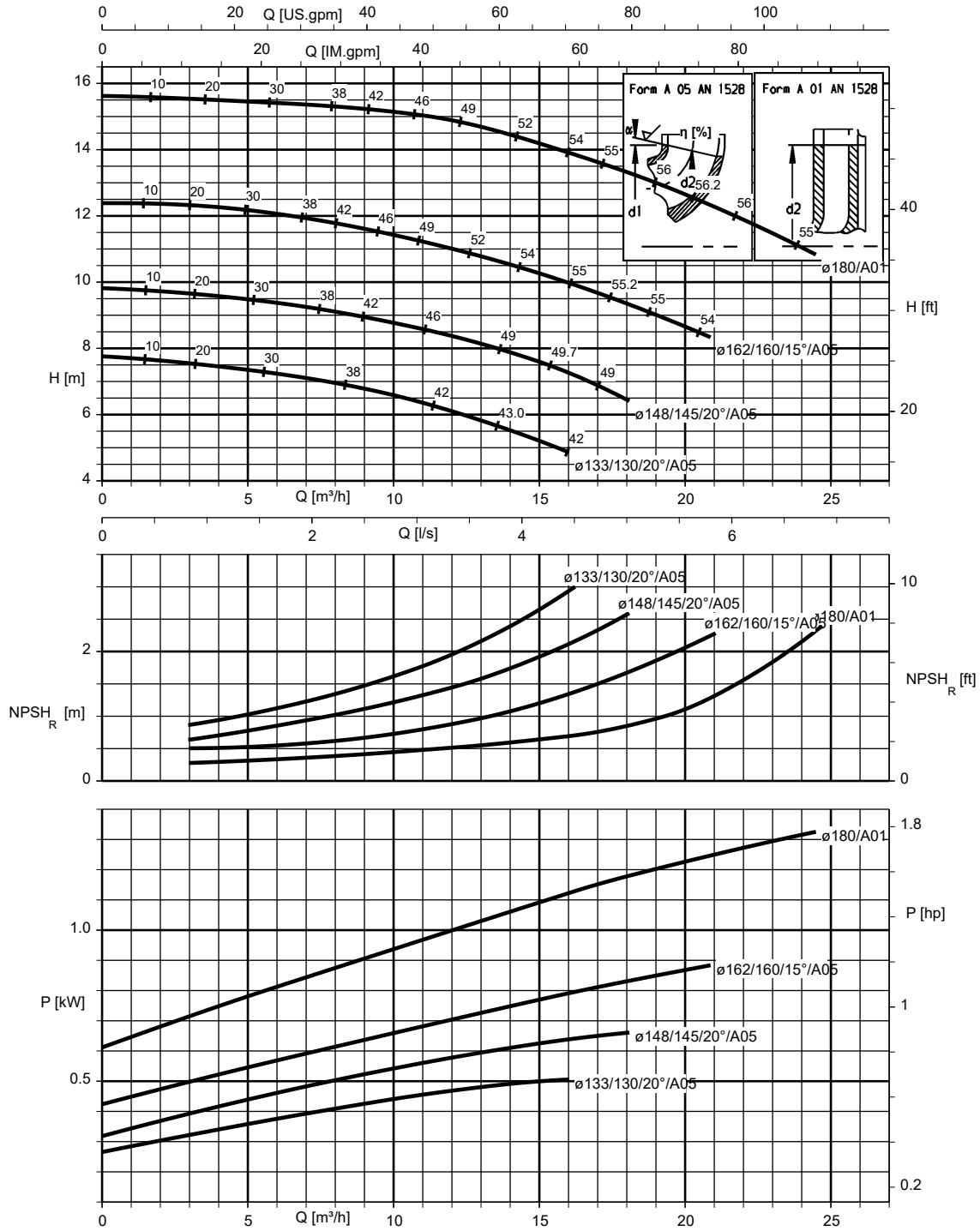
RPH-V 25-230, n = 1750 rpm



RPH-V 40-180, $n = 1750 \text{ rpm}$

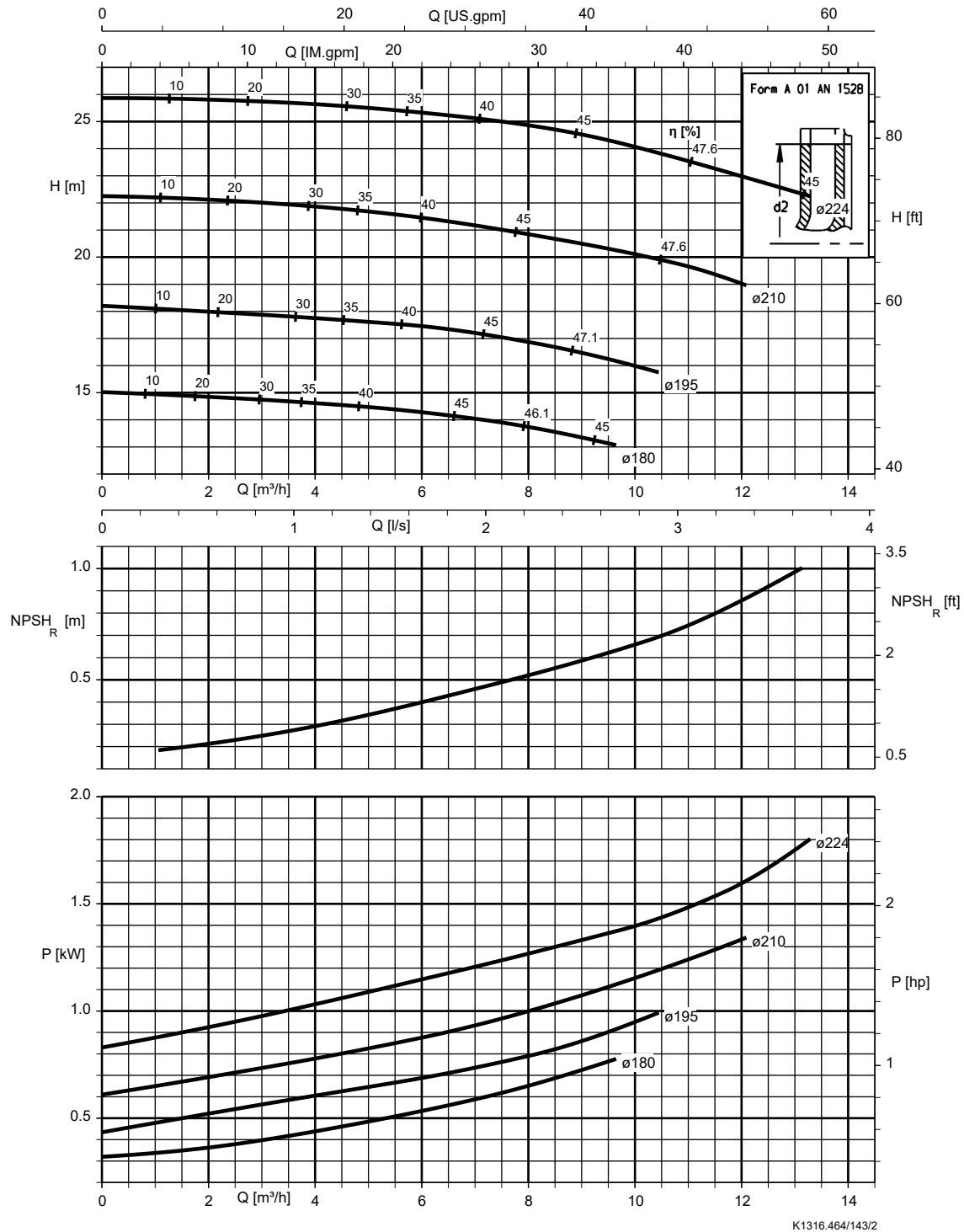


RPH-V 40-181, n = 1750 rpm

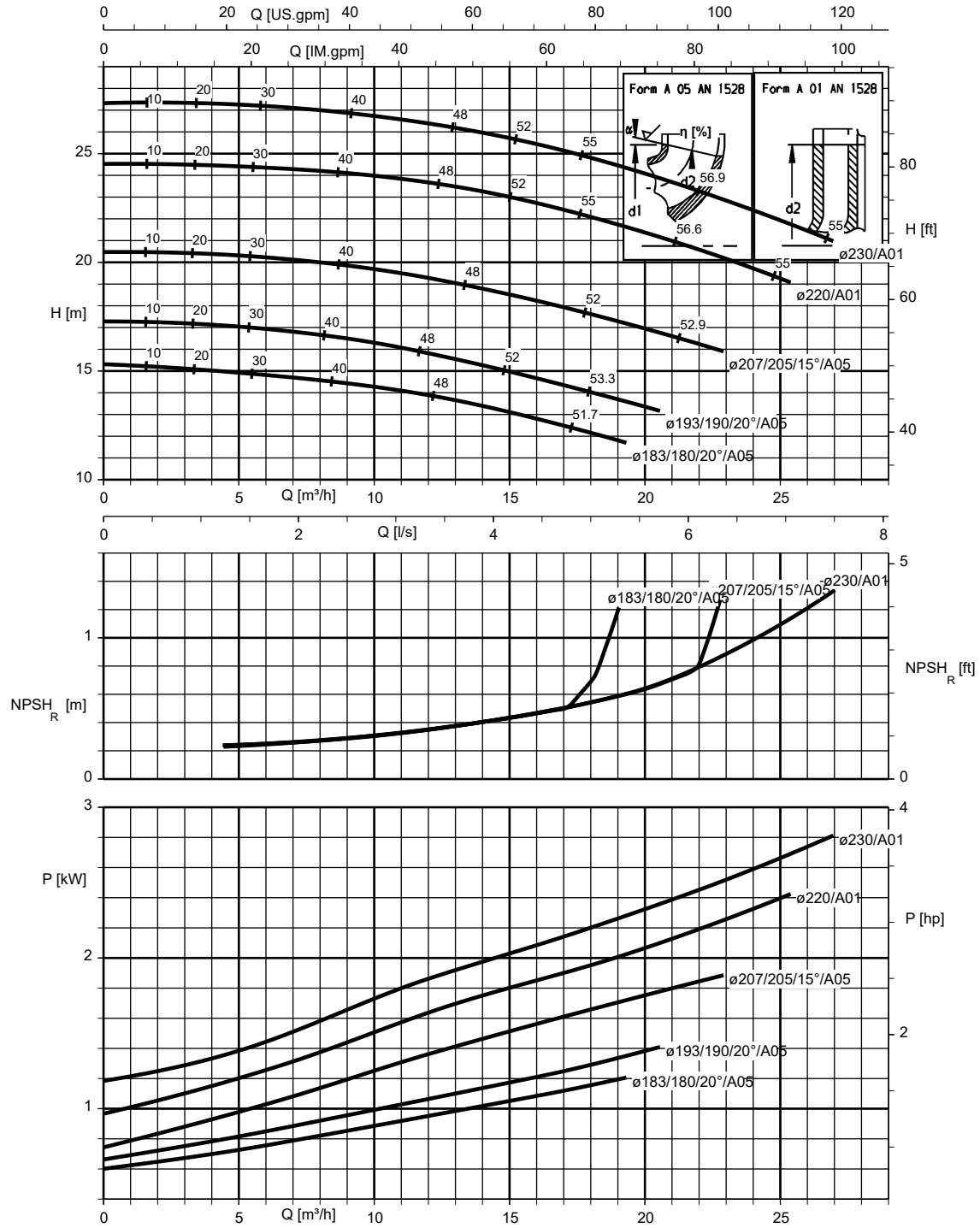


K1316.464/202/2

RPH-V 40-230, n = 1750 rpm

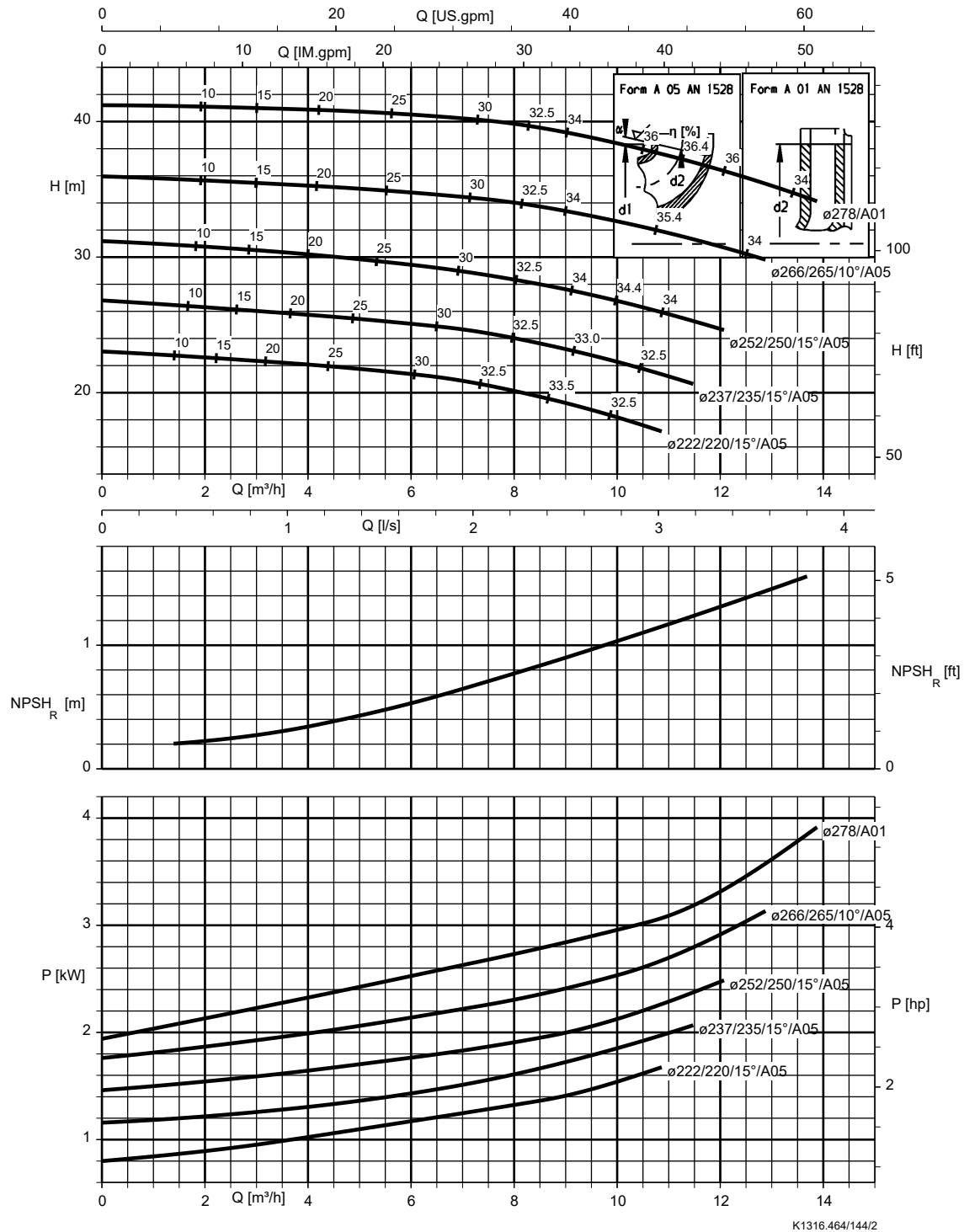


RPH-V 40-231, n = 1750 rpm

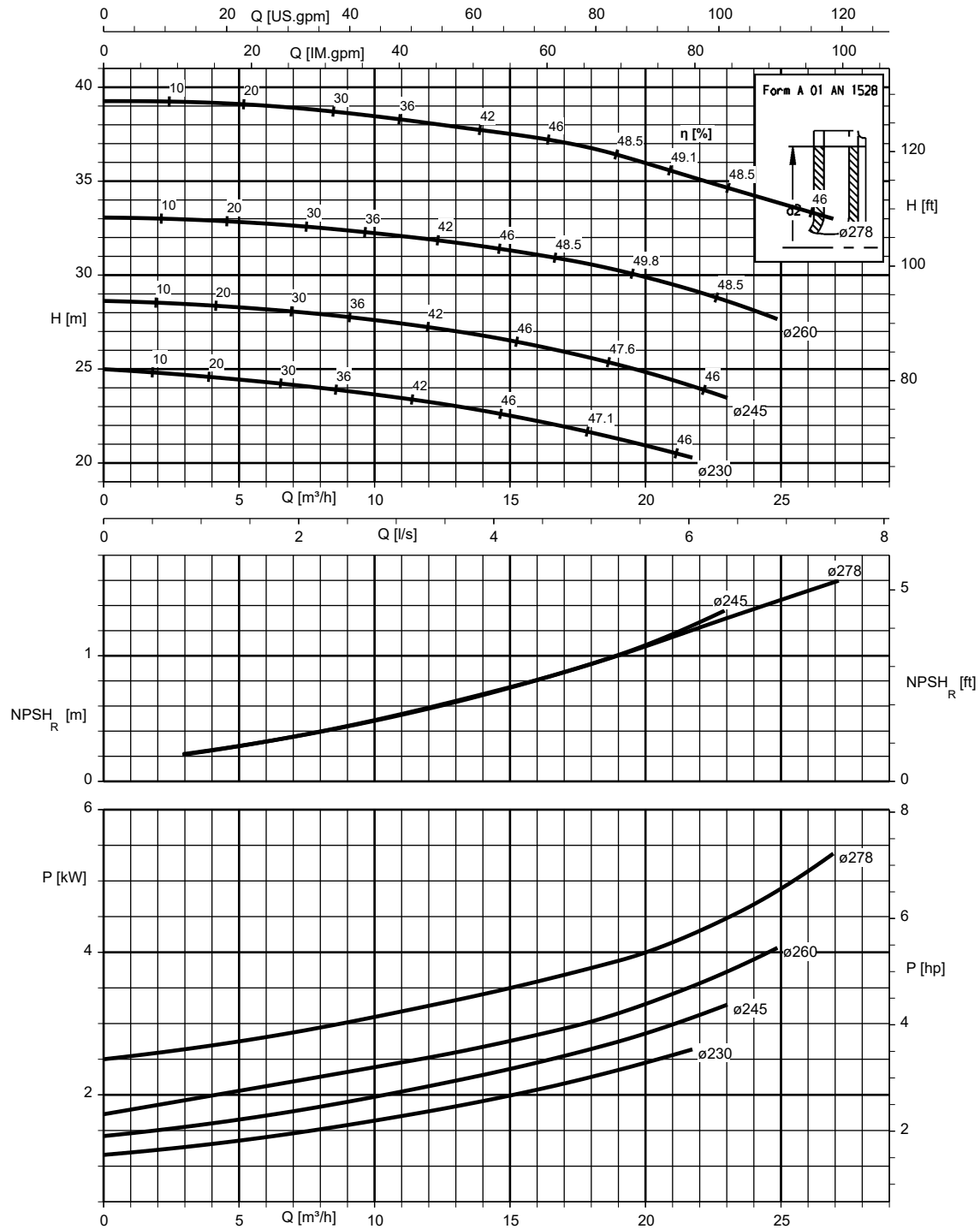


K1316.464/213/2

RPH-V 40-280, $n = 1750 \text{ rpm}$

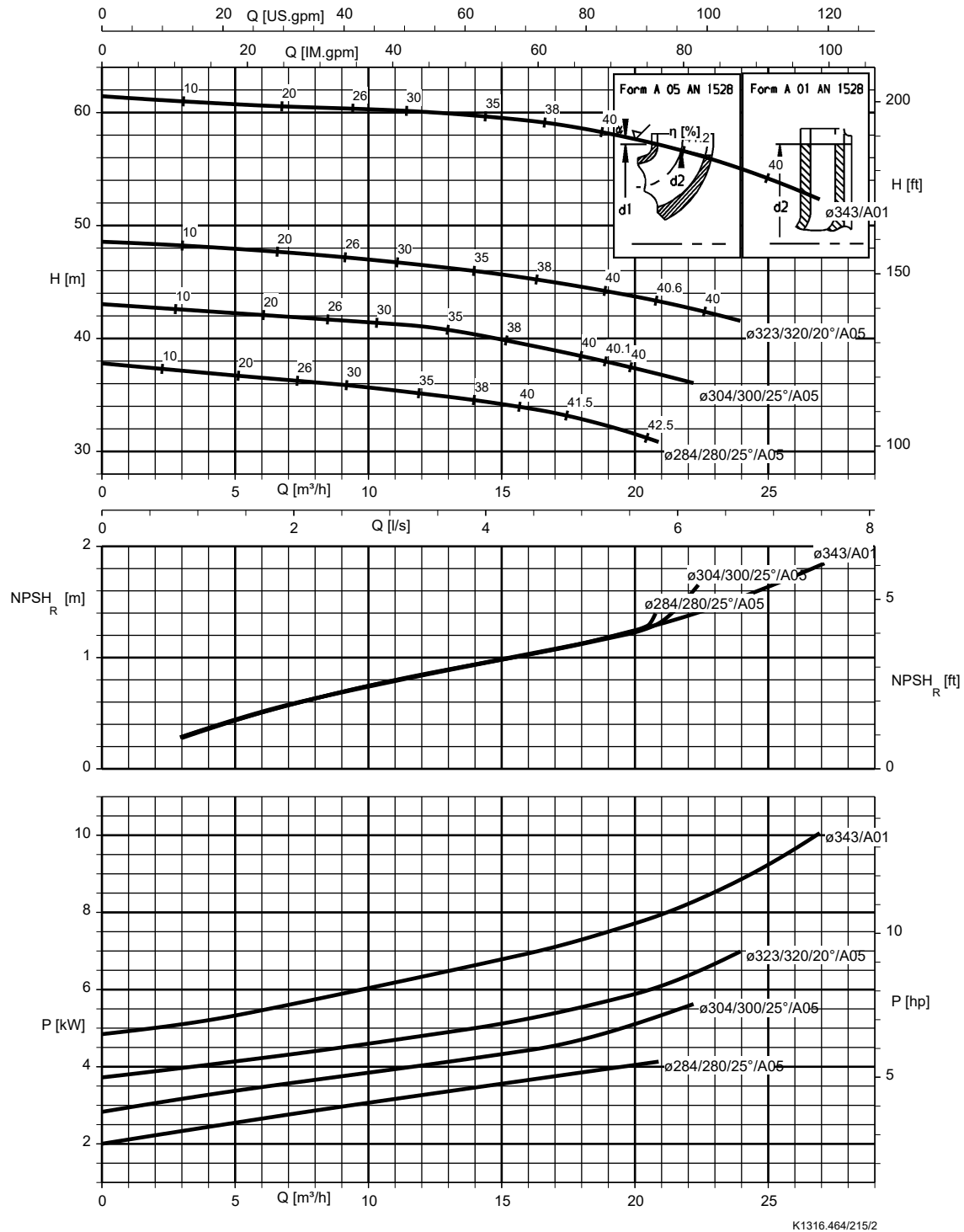


RPH-V 40-281, $n = 1750 \text{ rpm}$

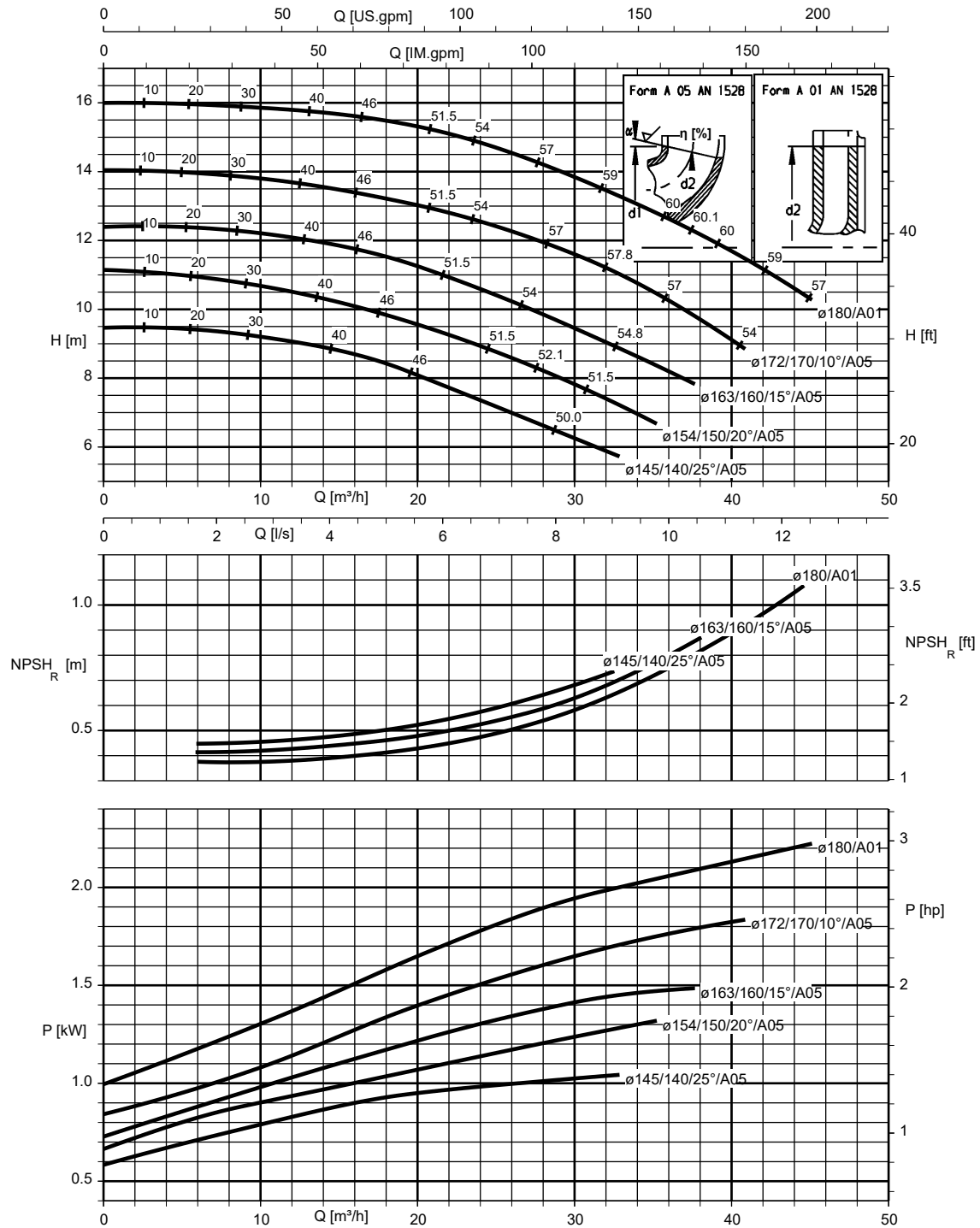


K1316.464/214/2

RPH-V 40-361, $n = 1750$ rpm

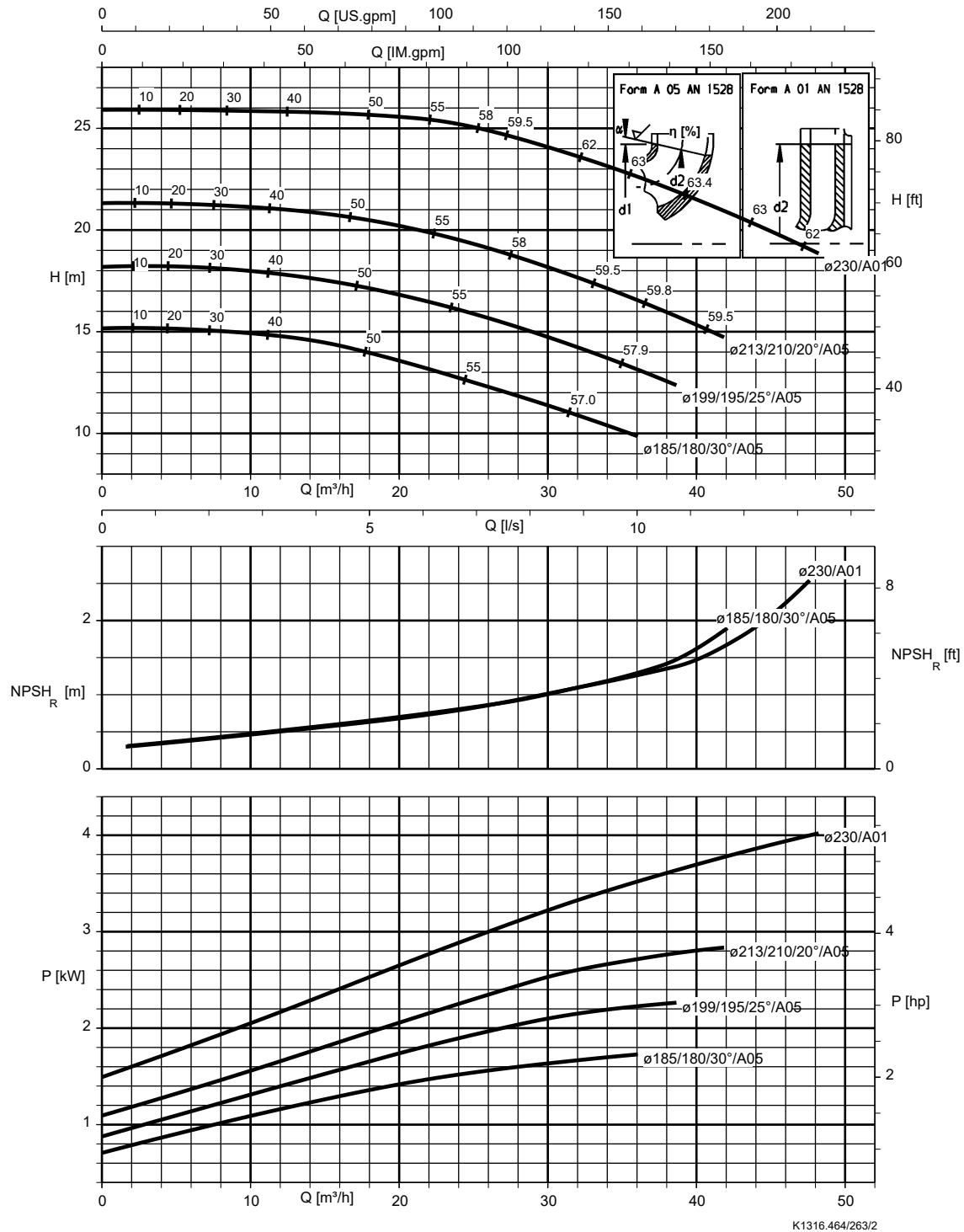


RPH-V 50-180, n = 1750 rpm

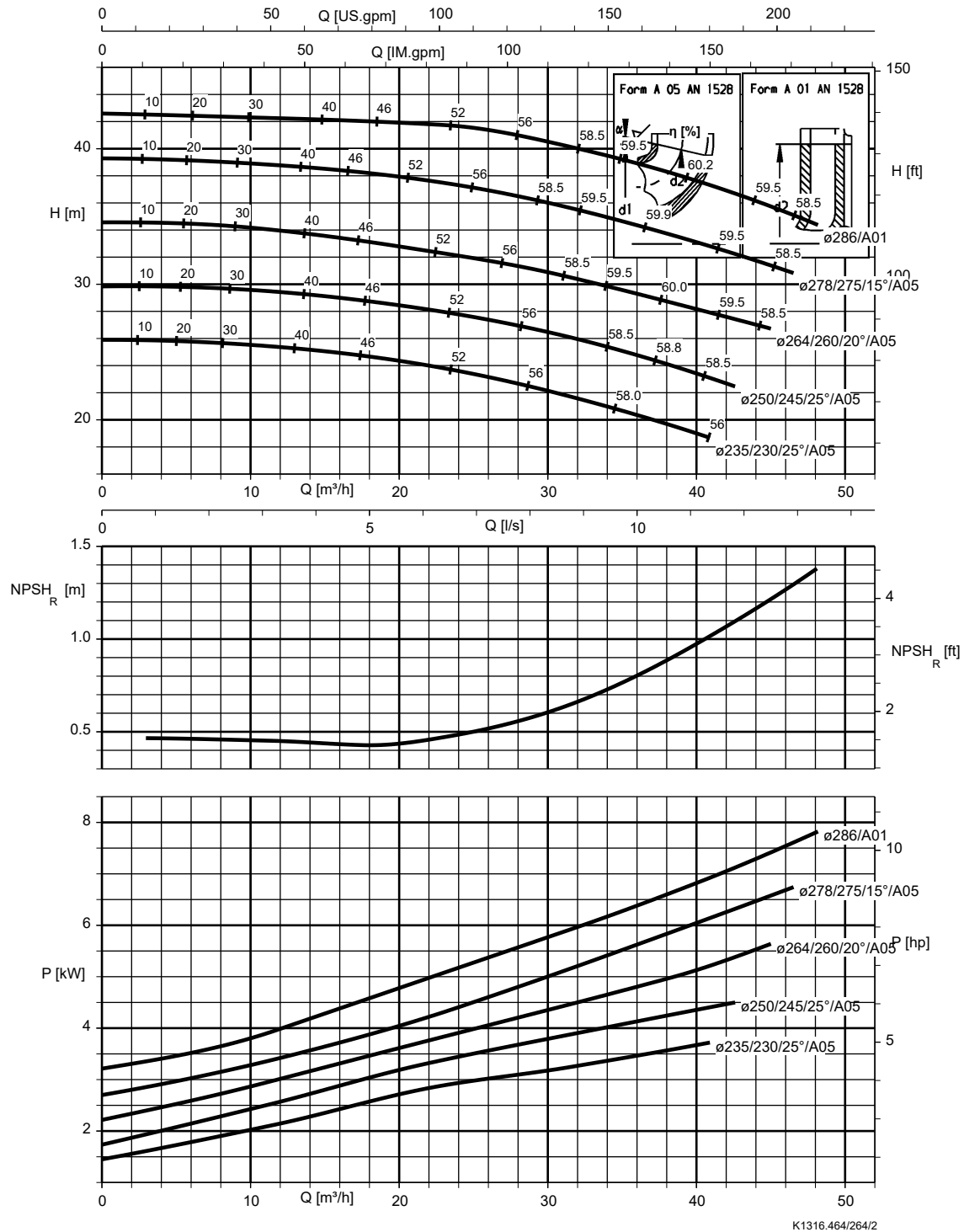


K1316.464/252/2

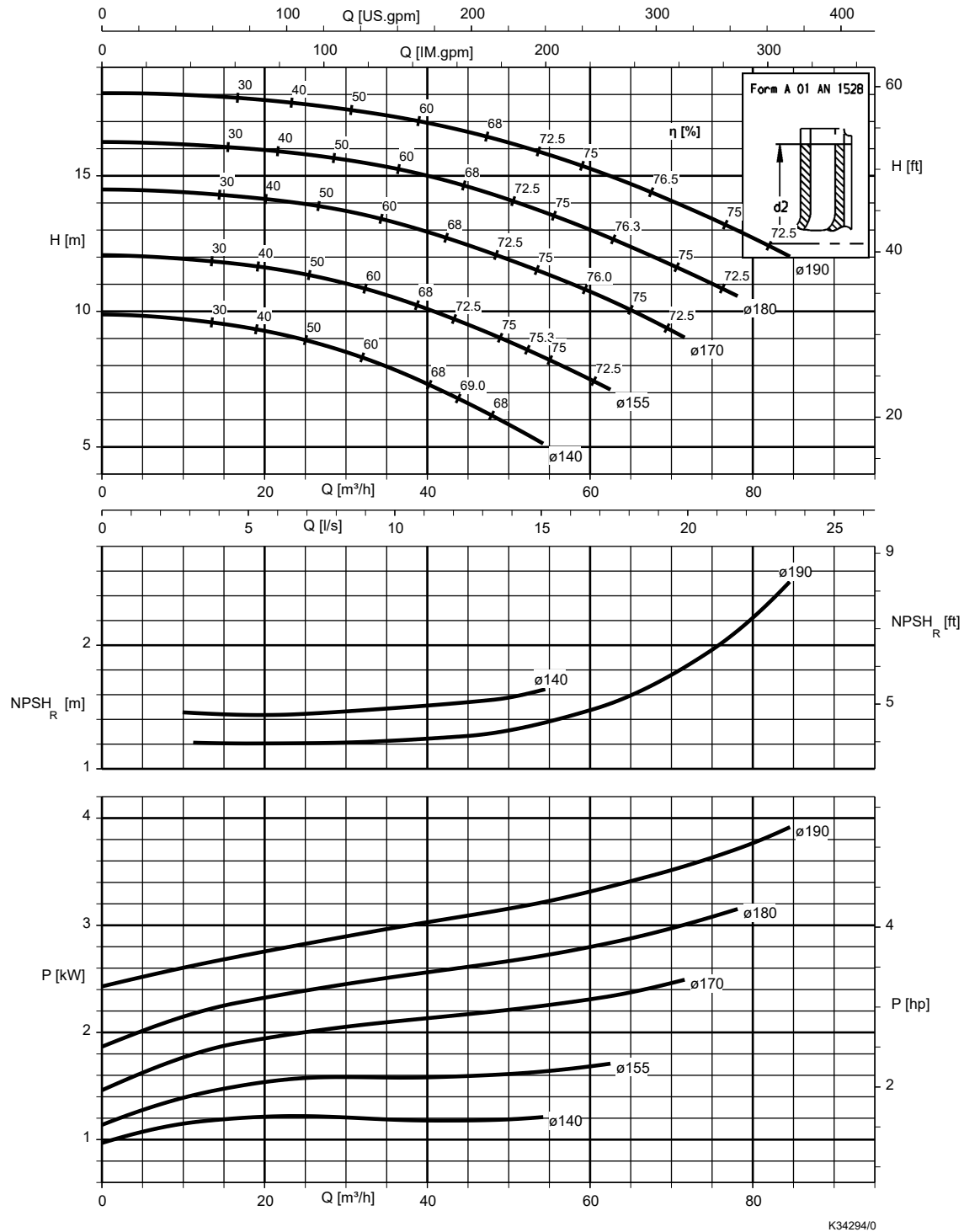
RPH-V 50-230, n = 1750 rpm



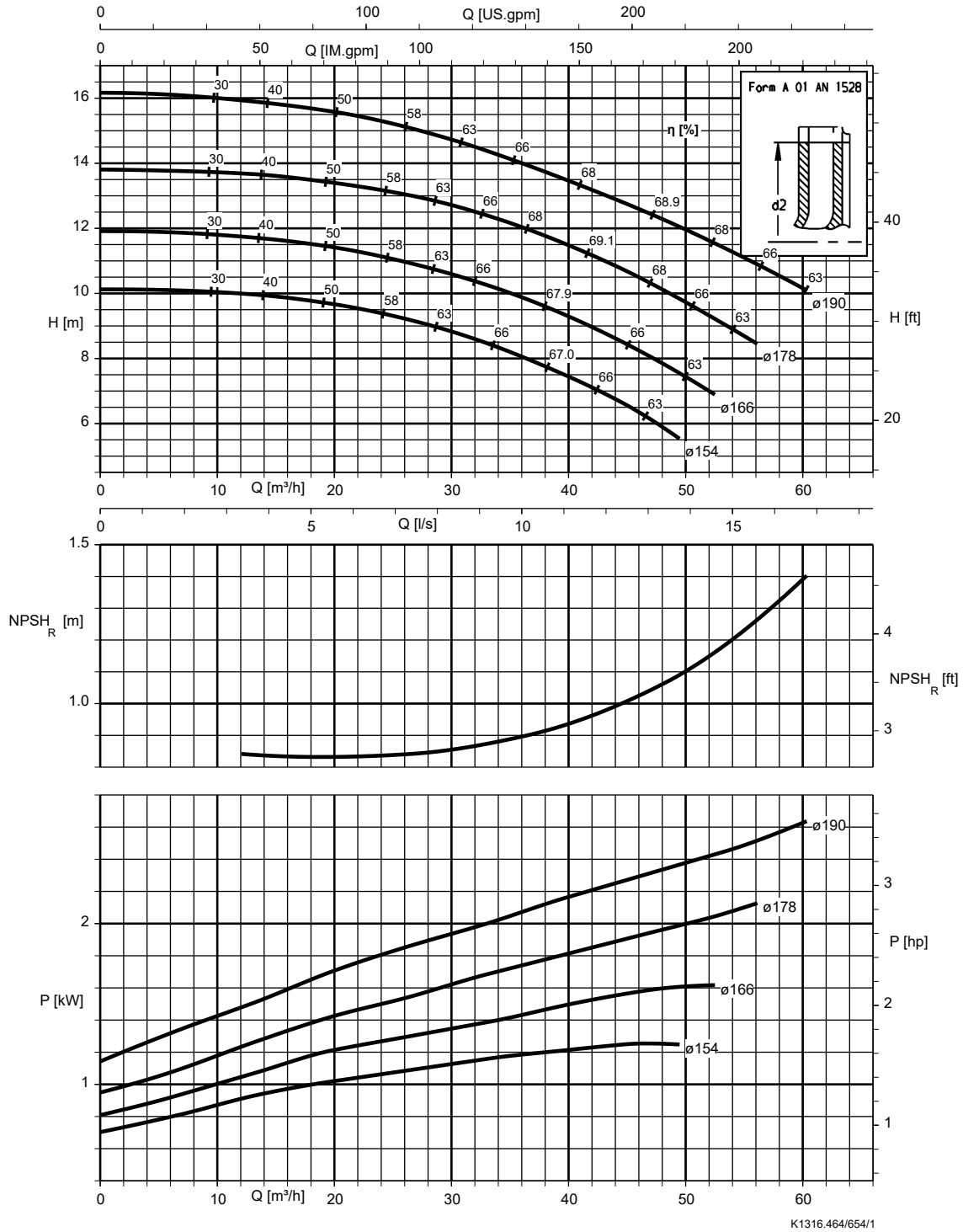
RPH-V 50-280, $n = 1750$ rpm



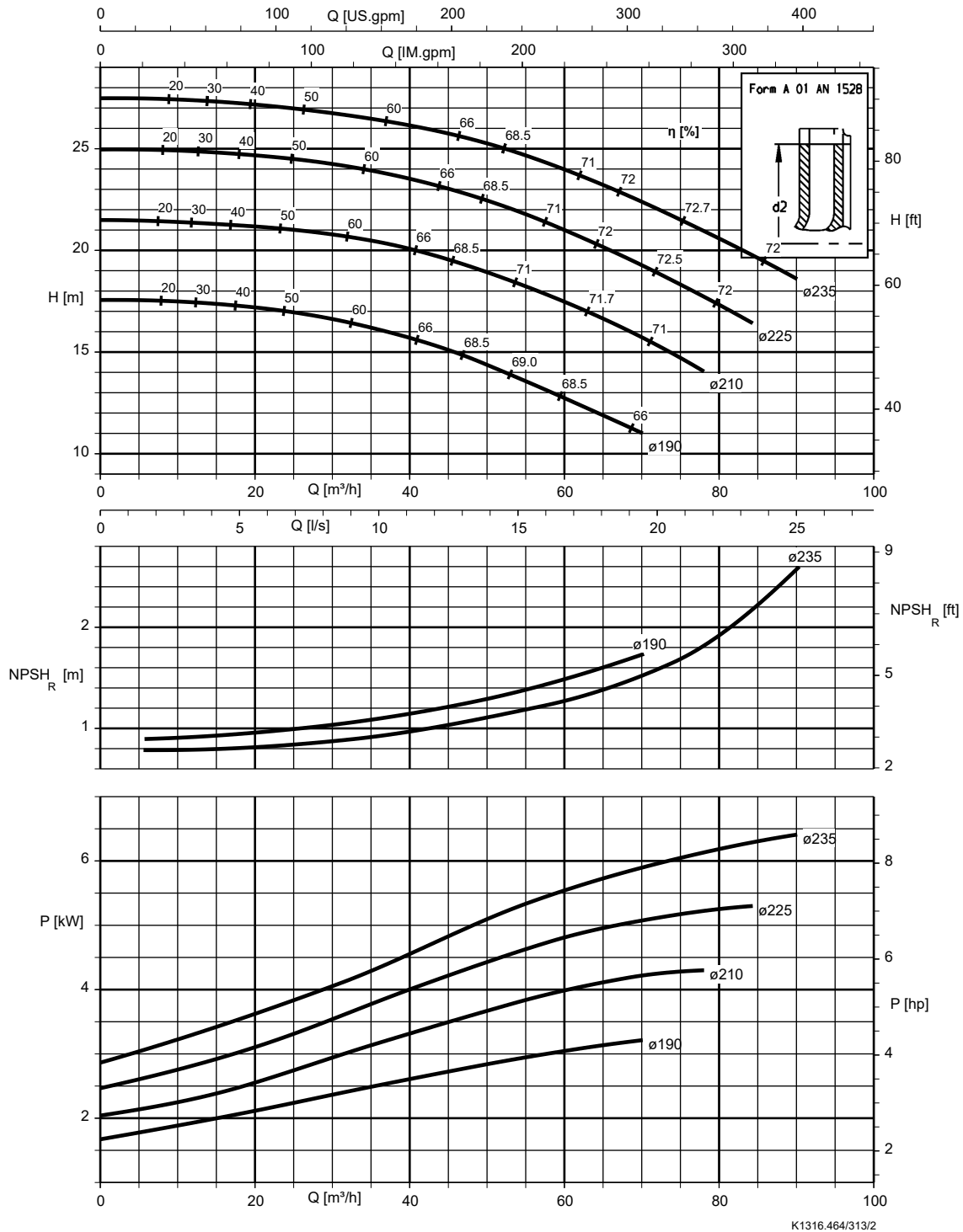
RPH-V 80-180, $n = 1750 \text{ rpm}$



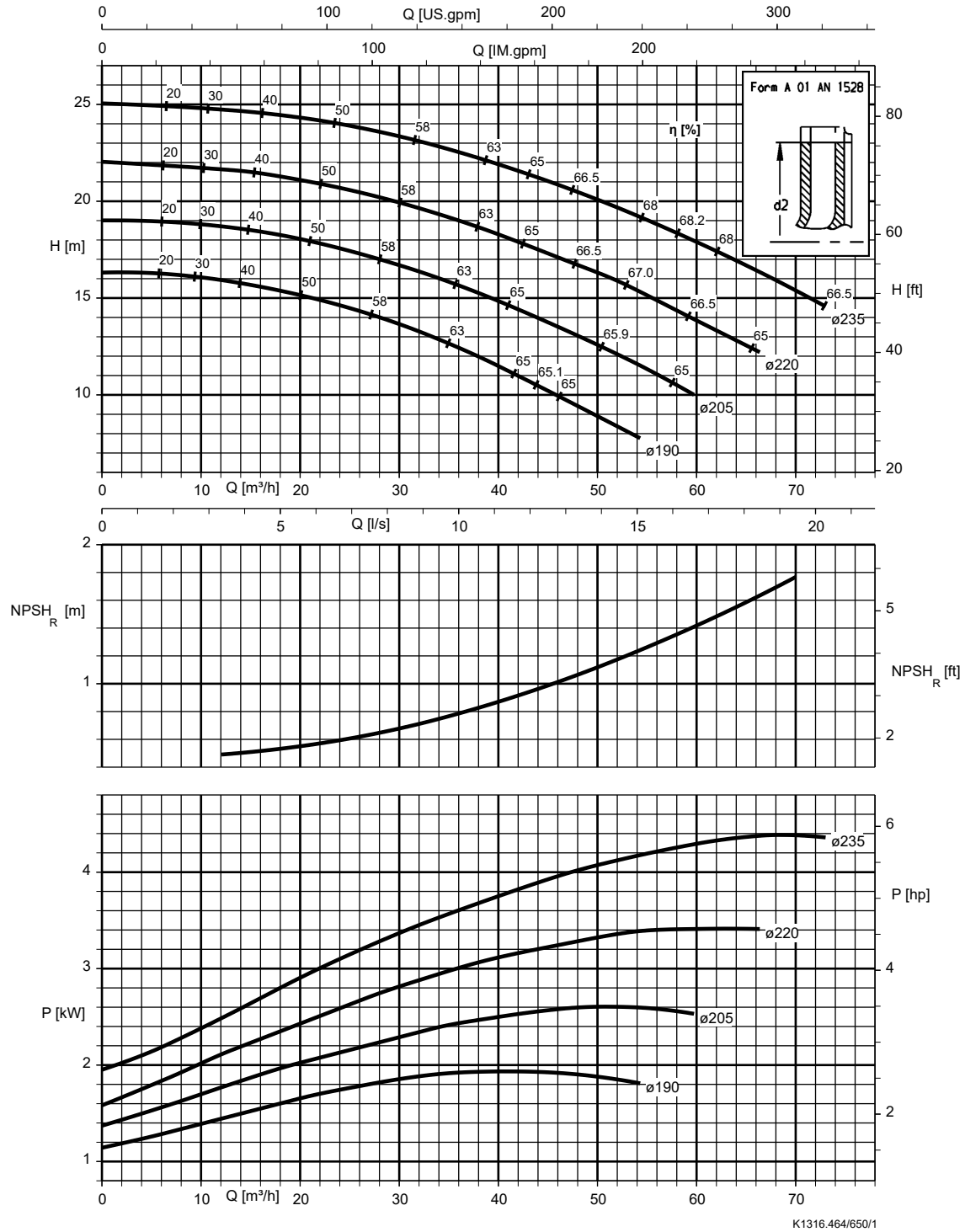
RPH-V 80-180B, n = 1750 rpm



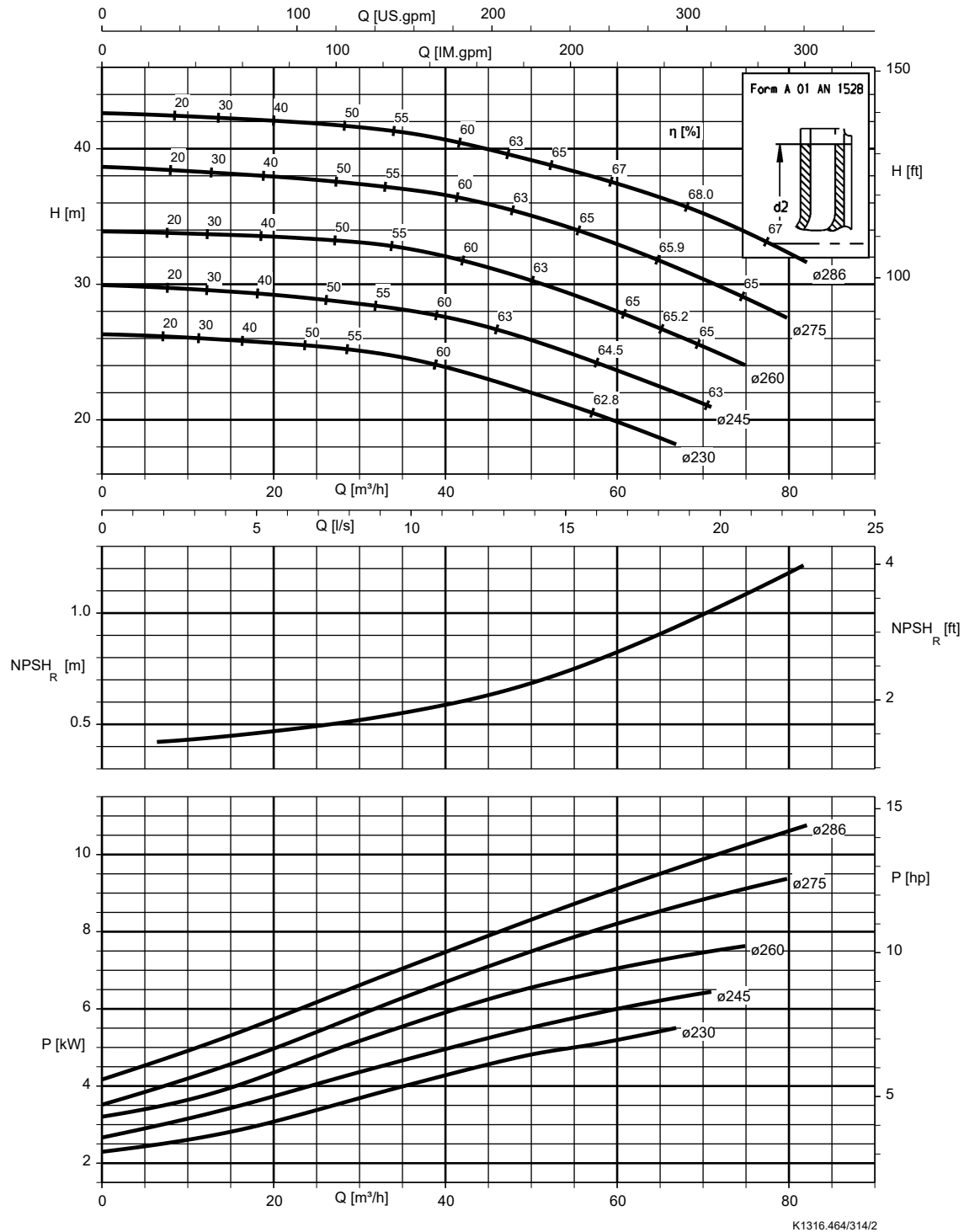
RPH-V 80-230, n = 1750 rpm



RPH-V 80-230B, n = 1750 rpm



RPH-V 80-280, n = 1750 rpm





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