

# Trockenaufgestellte Spiralgehäusepumpe

## KWP

50 Hz  
K-Laufrad

## Kennlinienheft



## **Impressum**

Kennlinienheft KWP

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Generell gilt: Technische Änderungen vorbehalten.

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| $n = 580 \text{ min}^{-1}$ .....             | 168      |
| $n = 480 \text{ min}^{-1}$ .....             | 200      |

## Kreiselpumpen mit Wellendichtung

### Trockenaufgestellte Spiralgehäusepumpe

## KWP



#### Einsatzgrenzen

Werkstoffbedingte oder ausführungsbedingten Einsatzgrenzen beachten.

Sofern in den Kennlinien keine anderen Angaben gemacht werden, gilt:

- Kurzzeitbetrieb
  - Bei Baugrößen < DN 600:  $Q_{\min}^1 = 0,1 \times Q_{\text{opt}}^2$
  - Bei Baugrößen  $\geq$  DN 600:  $Q_{\min}^1 = 0,4 \times Q_{\text{opt}}^2$
- Dauerbetrieb
  - Bei Baugrößen  $\leq$  DN 125:  $Q_{\min}^1 = 0,2 \times Q_{\text{opt}}^2$
  - Bei Baugrößen  $\geq$  DN 150:  $Q_{\min}^1 = 0,3 \times Q_{\text{opt}}^2$
  - Bei 2-poligem Betrieb:  $Q_{\max} = 1,1 \times Q_{\text{opt}}^2$
  - Bei 4-poligem Betrieb:  $Q_{\max} = 1,25 \times Q_{\text{opt}}^2$

Die in manchen Kennlinien ausgewiesenen senkrechten Angaben zu  $Q_{\max}$  beschreiben  $Q_{\max}$  drehzahlunabhängig als Funktion von  $v_s = 7,5 \text{ m/s}^3$

#### Motornennleistung

Die angegebenen Motornennleistungen gelten unter folgenden Bedingungen:

- Umgebungstemperaturen bis 40 °C
- Aufstellungshöhe bis 1000 m über Meeresspiegel
- Spannungen von 230/400 V - 400/690 V

#### Allgemein

**Abnahmeklasse:** Kennlinien gemäß ISO 9906-Klasse 2B

#### NPSH-Werte

Die in den Kennlinien angegebenen NPSH-Messwerte entsprechen einem Förderhöhenabfall von 3%. Es sind Minimalwerte. Sie gelten für entgastetes Wasser. Aus Sicherheitsgründen die Kurvenwerte für die Anwendung um mindestens 0,5 m, bei Laufrädern aus KeramikPolySiC (erkennbar an der Endziffern 8 oder 9 in der Baugrößenbezeichnung) ab Baugröße DN 400 um mindestens 3 m erhöhen.

#### NPSH-Wert im Teillastgebiet

NPSH-Werte für Förderströme kleiner als  $Q = 0,3 \times Q_{\text{opt}}$  können nur mit sehr hohem Aufwand gemessen werden. Der Nachweis von NPSH-Werten im Teillastgebiet wird nicht erbracht.

#### Dichte des Fördermediums

Förderhöhen und Leistungsangaben gelten für Fördermedien mit einer Dichte  $\rho = 1,0 \text{ kg/dm}^3$  und einer kinematischen Viskosität  $\nu$  bis max.  $20 \text{ mm}^2/\text{s}$ . Ist die Dichte  $\neq 1,0$ , muss die Leistungsangabe mit  $\rho$  multipliziert werden. Bei Viskosität  $> 20 \text{ mm}^2/\text{s}$  müssen entsprechende Kaltwasserdaten berechnet und der Einfluss auf die Pumpenleistung ermittelt werden.

#### Abdrehen des Laufrads

Ein Abdrehen des Laufrads ist für jeden Durchmesser bis zum angegebenen Minstdurchmesser möglich.

---

1) Kleinster zulässiger Förderstrom  
 2) Förderstrom im Betriebspunkt mit dem größten Wirkungsgrad  
 3) Rohrleitungsgeschwindigkeit saugseitig



**Technische Daten Hydraulik**

## Technische Daten Hydraulik

| Baugrößen   | Lagerträger         | Kugeldurchgang | Schaufelanzahl | Laufreddurchmesser |      |
|-------------|---------------------|----------------|----------------|--------------------|------|
|             |                     |                |                | max.               | min. |
|             |                     | [mm]           |                | [mm]               | [mm] |
| 065-040-250 | P03ax               | 15             | 3              | 260                | 170  |
| 065-050-200 | P03ax               | 34             | 2              | 209                | 120  |
| 080-065-200 | P03ax               | 46             | 2              | 209                | 145  |
| 080-040-315 | P04ax               | 15             | 2              | 320                | 230  |
| 080-050-400 | P04ax               | 15             | 2              | 408                | 330  |
| 080-065-315 | P04ax               | 42             | 2              | 320                | 230  |
| 080-065-313 | P04ax               | 15             | 5              | 320                | 230  |
| 080-065-400 | P04ax               | 34             | 2              | 408                | 330  |
| 100-080-250 | P03ax               | 50             | 2              | 260                | 170  |
| 100-080-315 | P04ax               | 44             | 2              | 320                | 260  |
| 100-080-400 | P05ax               | 46             | 2              | 404                | 280  |
| 100-080-403 | P05ax               | 16             | 5              | 404                | 280  |
| 125-080-500 | P06x                | 20             | 3              | 504                | 380  |
| 125-100-250 | P04ax               | 60             | 2              | 260                | 180  |
| 125-100-253 | P04ax               | 28             | 6              | 260                | 180  |
| 125-100-315 | P04ax               | 54             | 2              | 320                | 230  |
| 125-100-400 | P05ax               | 50             | 2              | 404                | 280  |
| 125-100-403 | P05ax               | 20             | 6              | 404                | 280  |
| 150-125-500 | P06x                | 50             | 3              | 504                | 350  |
| 150-125-503 | P06x                | 21             | 6              | 509                | 350  |
| 150-150-315 | P05ax               | 88             | 2              | 320                | 260  |
| 150-150-400 | P05ax               | 64             | 3              | 404                | 320  |
| 150-150-403 | P05ax               | 41             | 5              | 404                | 320  |
| 200-200-320 | P05ax               | 75             | 3              | 320                | 257  |
| 200-200-400 | P06x                | 80             | 3              | 403                | 320  |
| 200-200-403 | P06x                | 40             | 6              | 404                | 320  |
| 200-200-500 | P08xs, P10ax, P12sx | 75             | 3              | 504                | 400  |
| 200-200-501 | P08xs, P10ax, P12sx | 75             | 3              | 504                | 400  |
| 200-200-503 | P08xs, P10ax, P12sx | 40             | 5              | 504                | 400  |
| 250-250-315 | P06x                | 70             | 3              | 324                | 285  |
| 250-250-400 | P08xs, P10ax        | 80             | 3              | 409                | 338  |
| 250-250-403 | P08xs, P10ax        | 44             | 5              | 409                | 340  |
| 250-250-500 | P08xs, P10ax, P12sx | 85             | 3              | 504                | 400  |
| 250-250-503 | P08xs, P10ax, P12sx | 48             | 6              | 504                | 400  |
| 250-250-505 | P08xs, P10ax, P12sx | 70             | 4              | 504                | 436  |
| 250-250-630 | P08xs, P10ax, P12sx | 86             | 4              | 630                | 500  |
| 250-250-634 | P08xs, P10ax, P12sx | 41             | 5              | 630                | 480  |
| 300-300-400 | P08xs, P10ax        | 85             | 3              | 409                | 320  |
| 300-300-500 | P08xs, P10ax, P12sx | 89             | 3              | 504                | 400  |
| 300-300-503 | P08xs, P10ax, P12sx | 50             | 5              | 504                | 420  |
| 350-350-400 | P08xs, P10ax        | 110            | 3              | 408                | 330  |
| 350-350-500 | P08xs, P10ax, P12sx | 110            | 3              | 508                | 390  |
| 350-350-503 | P08xs, P10ax, P12sx | 65             | 5              | 508                | 472  |
| 350-350-504 | P08xs, P10ax, P12sx | 55             | 5              | 507                | 460  |
| 350-350-630 | P08xs, P10ax, P12sx | 135            | 3              | 630                | 500  |
| 350-350-633 | P08xs, P10ax, P12sx | 75             | 5              | 630                | 500  |
| 400-400-500 | P08xs, P10ax, P12sx | 123            | 3              | 508                | 430  |
| 400-400-503 | P08xs, P10ax, P12sx | 90             | 4              | 508                | 445  |
| 400-400-533 | P10ax, P12sx        | 90             | 5              | 538                | 496  |
| 400-400-583 | P10ax, P12sx        | 90             | 5              | 600                | 550  |
| 500-400-710 | P10ax, P12sx, P16ax | 160            | 3              | 730                | 630  |
| 500-400-713 | P10ax, P12sx, P16ax | 65             | 5              | 730                | 630  |
| 500-500-544 | P10ax, P12sx        | 75             | 4              | 572                | 495  |
| 500-500-630 | P10ax, P12sx, P16ax | 142            | 3              | 636                | 528  |
| 500-500-633 | P10ax, P12sx, P16ax | 90             | 5              | 636                | 534  |
| 500-500-634 | P10ax, P12sx, P16ax | 85             | 5              | 636                | 554  |

| Baugrößen    | Lagerträger         | Kugeldurchgang | Schaufelanzahl | Lafraddurchmesser |      |
|--------------|---------------------|----------------|----------------|-------------------|------|
|              |                     |                |                | max.              | min. |
|              |                     | [mm]           |                | [mm]              | [mm] |
| 500-500-635  | P10ax, P12sx, P16ax | 75             | 5              | 636               | 565  |
| 500-500-637  | P10ax, P12sx, P16ax | 85             | 5              | 636               | 540  |
| 600-600-663  | P12sx               | 80             | 5              | 700               | 620  |
| 600-600-669  | P12sx               | 80             | 5              | 700               | 630  |
| 600-600-710  | P12sx, P16ax        | 165            | 3              | 716               | 650  |
| 600-600-753  | P16ax               | 112            | 5              | 750               | 675  |
| 600-600-803  | P16ax               | 100            | 5              | 780               | 718  |
| 600-600-813  | P16ax               | 95             | 5              | 830               | 710  |
| 600-600-824  | P16ax               | 95             | 5              | 794               | 720  |
| 600-600-825  | P16ax               | 95             | 5              | 800               | 709  |
| 600-600-873  | P16ax               | 97             | 5              | 880               | 800  |
| 600-600-923  | P20sx               | 113            | 5              | 930               | 840  |
| 700-700-923  | P20sx               | 115            | 5              | 870               | 765  |
| 700-700-929  | P20sx               | 100            | 6              | 870               | 780  |
| 800-700-953  | P20sx               | 110            | 5              | 940               | 834  |
| 800-700-959  | P20sx               | 105            | 5              | 940               | 820  |
| 800-800-934  | P20sx               | 115            | 5              | 950               | 845  |
| 800-800-939  | P20sx               | 86             | 6              | 950               | 854  |
| 800-900-883  | P20sx               | 155            | 4              | 855               | 750  |
| 900-900-1133 | P20sx               | 140            | 5              | 1120              | 1018 |
| 900-900-1134 | P20sx               | 150            | 5              | 1120              | 1008 |
| 900-900-1138 | P20sx               | 120            | 6              | 1122              | 1006 |
| 900-900-1139 | P20sx               | 110            | 6              | 1120              | 980  |

**Baugrößenübersicht**

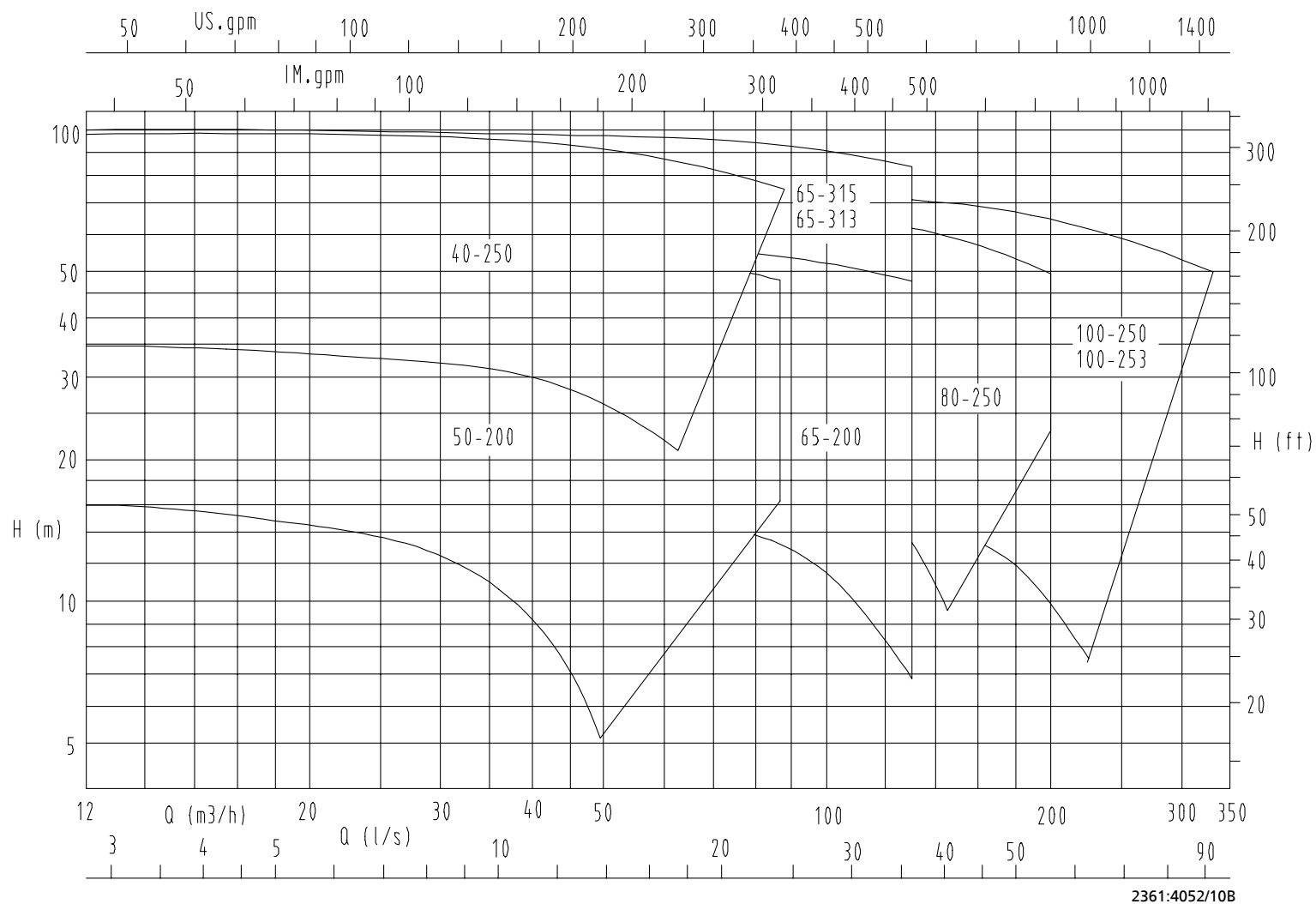
Baugrößenübersicht KWP K

| Baugröße    | Drehzahl [min <sup>-1</sup> ] |              |              |               |               |     |
|-------------|-------------------------------|--------------|--------------|---------------|---------------|-----|
|             | 2900                          | 1450         | 960          | 725           | 580           | 480 |
| 065-040-250 | (⇒ Seite 14)                  | (⇒ Seite 22) | (⇒ Seite 61) | –             | –             | –   |
| 080-040-315 | –                             | (⇒ Seite 24) | (⇒ Seite 63) | –             | –             | –   |
| 065-050-200 | (⇒ Seite 15)                  | (⇒ Seite 23) | (⇒ Seite 62) | –             | –             | –   |
| 080-050-400 | –                             | (⇒ Seite 25) | (⇒ Seite 64) | –             | –             | –   |
| 080-065-200 | (⇒ Seite 16)                  | (⇒ Seite 26) | (⇒ Seite 65) | –             | –             | –   |
| 080-065-315 | (⇒ Seite 17)                  | (⇒ Seite 28) | (⇒ Seite 67) | –             | –             | –   |
| 080-065-313 | (⇒ Seite 18)                  | (⇒ Seite 27) | (⇒ Seite 66) | –             | –             | –   |
| 080-065-400 | –                             | (⇒ Seite 29) | (⇒ Seite 68) | –             | –             | –   |
| 100-080-250 | (⇒ Seite 19)                  | (⇒ Seite 30) | (⇒ Seite 69) | –             | –             | –   |
| 100-080-315 | –                             | (⇒ Seite 31) | (⇒ Seite 70) | –             | –             | –   |
| 100-080-400 | –                             | (⇒ Seite 32) | (⇒ Seite 71) | –             | –             | –   |
| 100-080-403 | –                             | (⇒ Seite 33) | (⇒ Seite 72) | –             | –             | –   |
| 125-080-500 | –                             | (⇒ Seite 34) | (⇒ Seite 73) | (⇒ Seite 119) | –             | –   |
| 125-100-250 | (⇒ Seite 20)                  | (⇒ Seite 35) | (⇒ Seite 74) | –             | –             | –   |
| 125-100-253 | (⇒ Seite 21)                  | (⇒ Seite 36) | (⇒ Seite 75) | –             | –             | –   |
| 125-100-315 | –                             | (⇒ Seite 37) | (⇒ Seite 76) | –             | –             | –   |
| 125-100-400 | –                             | (⇒ Seite 38) | (⇒ Seite 77) | –             | –             | –   |
| 125-100-403 | –                             | (⇒ Seite 39) | (⇒ Seite 78) | –             | –             | –   |
| 150-125-500 | –                             | (⇒ Seite 40) | (⇒ Seite 79) | (⇒ Seite 120) | –             | –   |
| 150-125-503 | –                             | (⇒ Seite 41) | (⇒ Seite 80) | (⇒ Seite 121) | –             | –   |
| 150-150-315 | –                             | (⇒ Seite 42) | (⇒ Seite 81) | (⇒ Seite 122) | –             | –   |
| 150-150-400 | –                             | (⇒ Seite 43) | (⇒ Seite 82) | (⇒ Seite 123) | –             | –   |
| 150-150-403 | –                             | (⇒ Seite 44) | (⇒ Seite 83) | (⇒ Seite 124) | –             | –   |
| 200-200-320 | –                             | (⇒ Seite 45) | (⇒ Seite 84) | (⇒ Seite 125) | –             | –   |
| 200-200-400 | –                             | (⇒ Seite 46) | (⇒ Seite 85) | (⇒ Seite 126) | –             | –   |
| 200-200-403 | –                             | (⇒ Seite 47) | (⇒ Seite 86) | (⇒ Seite 127) | –             | –   |
| 200-200-500 | –                             | (⇒ Seite 48) | –            | –             | –             | –   |
| 200-200-501 | –                             | –            | (⇒ Seite 87) | (⇒ Seite 128) | –             | –   |
| 200-200-503 | –                             | (⇒ Seite 49) | (⇒ Seite 88) | (⇒ Seite 129) | –             | –   |
| 250-250-315 | –                             | (⇒ Seite 50) | (⇒ Seite 89) | (⇒ Seite 130) | –             | –   |
| 250-250-400 | –                             | (⇒ Seite 51) | (⇒ Seite 90) | (⇒ Seite 131) | –             | –   |
| 250-250-403 | –                             | (⇒ Seite 52) | (⇒ Seite 91) | (⇒ Seite 132) | –             | –   |
| 250-250-500 | –                             | (⇒ Seite 53) | (⇒ Seite 92) | (⇒ Seite 133) | –             | –   |
| 250-250-503 | –                             | (⇒ Seite 54) | (⇒ Seite 93) | (⇒ Seite 134) | –             | –   |
| 250-250-505 | –                             | (⇒ Seite 55) | (⇒ Seite 94) | (⇒ Seite 135) | –             | –   |
| 250-250-630 | –                             | –            | (⇒ Seite 95) | (⇒ Seite 136) | (⇒ Seite 168) | –   |
| 250-250-634 | –                             | –            | (⇒ Seite 96) | (⇒ Seite 137) | (⇒ Seite 169) | –   |
| 300-300-400 | –                             | (⇒ Seite 56) | (⇒ Seite 97) | (⇒ Seite 138) | –             | –   |
| 300-300-401 | –                             | (⇒ Seite 57) | (⇒ Seite 98) | (⇒ Seite 139) | –             | –   |
| 300-300-500 | –                             | (⇒ Seite 58) | (⇒ Seite 99) | (⇒ Seite 140) | –             | –   |

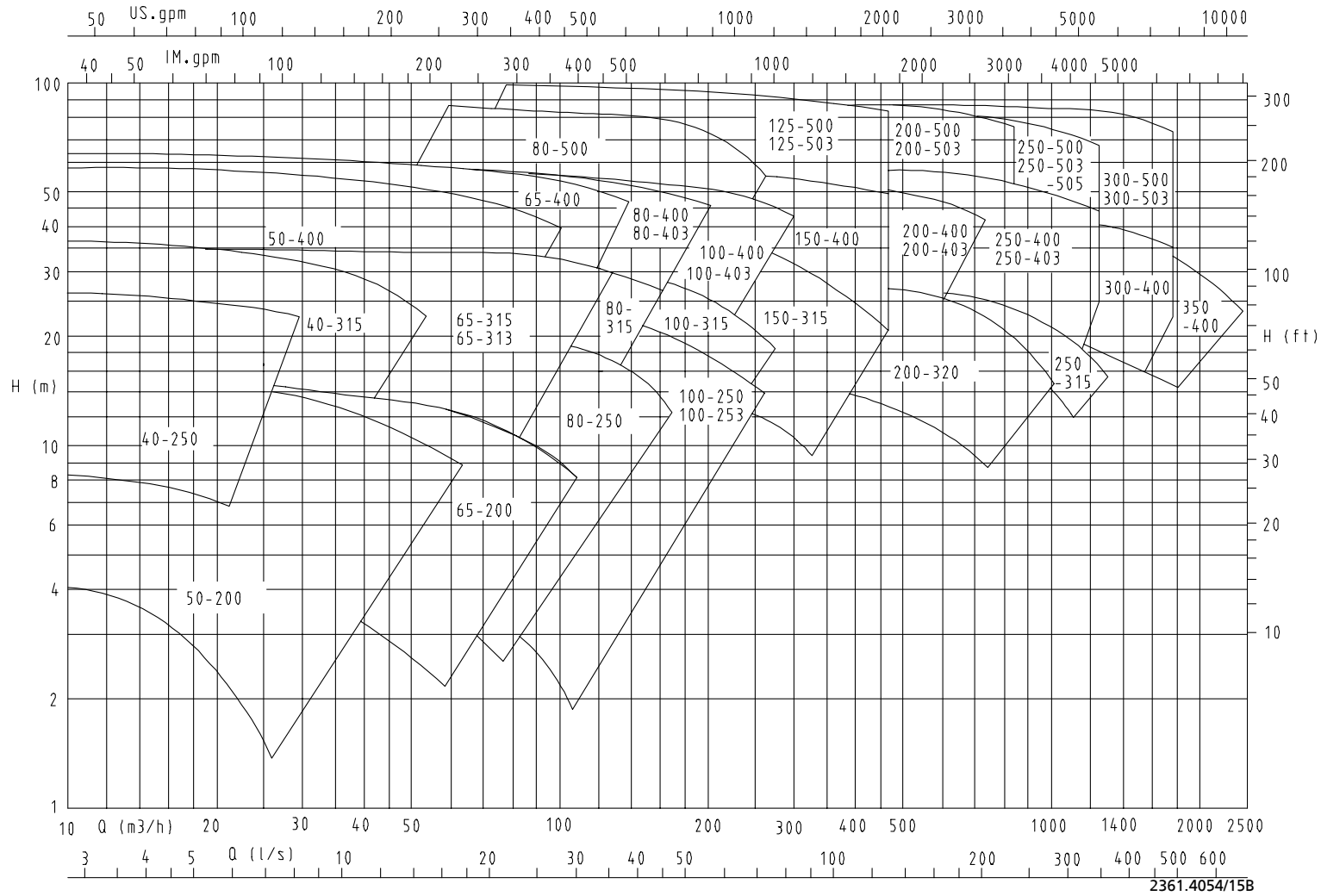
| Baugröße     | Drehzahl [min <sup>-1</sup> ] |              |               |               |               |               |
|--------------|-------------------------------|--------------|---------------|---------------|---------------|---------------|
|              | 2900                          | 1450         | 960           | 725           | 580           | 480           |
| 300-300-503  | –                             | (⇒ Seite 59) | (⇒ Seite 100) | (⇒ Seite 141) | –             | –             |
| 350-350-400  | –                             | (⇒ Seite 60) | (⇒ Seite 101) | (⇒ Seite 142) | –             | –             |
| 350-350-500  | –                             | –            | (⇒ Seite 102) | (⇒ Seite 143) | –             | –             |
| 350-350-503  | –                             | –            | (⇒ Seite 103) | (⇒ Seite 144) | –             | –             |
| 350-350-504  | –                             | –            | (⇒ Seite 104) | (⇒ Seite 145) | –             | –             |
| 350-350-630  | –                             | –            | (⇒ Seite 105) | (⇒ Seite 146) | (⇒ Seite 170) | –             |
| 350-350-633  | –                             | –            | (⇒ Seite 106) | (⇒ Seite 147) | (⇒ Seite 171) | –             |
| 400-400-500  | –                             | –            | (⇒ Seite 107) | (⇒ Seite 148) | –             | –             |
| 400-400-503  | –                             | –            | (⇒ Seite 108) | (⇒ Seite 149) | –             | –             |
| 400-400-533  | –                             | –            | (⇒ Seite 109) | (⇒ Seite 150) | (⇒ Seite 172) | –             |
| 400-400-583  | –                             | –            | (⇒ Seite 110) | (⇒ Seite 151) | (⇒ Seite 173) | –             |
| 500-400-710  | –                             | –            | (⇒ Seite 111) | (⇒ Seite 152) | (⇒ Seite 174) | (⇒ Seite 200) |
| 500-400-713  | –                             | –            | (⇒ Seite 112) | (⇒ Seite 153) | (⇒ Seite 175) | (⇒ Seite 201) |
| 500-500-544  | –                             | –            | (⇒ Seite 113) | (⇒ Seite 154) | (⇒ Seite 176) | –             |
| 500-500-630  | –                             | –            | (⇒ Seite 114) | (⇒ Seite 155) | (⇒ Seite 177) | –             |
| 500-500-633  | –                             | –            | (⇒ Seite 115) | (⇒ Seite 156) | (⇒ Seite 178) | –             |
| 500-500-634  | –                             | –            | (⇒ Seite 116) | (⇒ Seite 157) | (⇒ Seite 179) | –             |
| 500-500-635  | –                             | –            | (⇒ Seite 117) | (⇒ Seite 158) | (⇒ Seite 180) | –             |
| 500-500-637  | –                             | –            | (⇒ Seite 118) | (⇒ Seite 159) | (⇒ Seite 181) | –             |
| 600-600-663  | –                             | –            | –             | (⇒ Seite 160) | (⇒ Seite 182) | –             |
| 600-600-669  | –                             | –            | –             | (⇒ Seite 161) | (⇒ Seite 183) | –             |
| 600-600-710  | –                             | –            | –             | (⇒ Seite 162) | (⇒ Seite 184) | (⇒ Seite 202) |
| 600-600-753  | –                             | –            | –             | (⇒ Seite 163) | (⇒ Seite 185) | (⇒ Seite 203) |
| 600-600-803  | –                             | –            | –             | (⇒ Seite 164) | (⇒ Seite 186) | (⇒ Seite 204) |
| 600-600-813  | –                             | –            | –             | (⇒ Seite 165) | (⇒ Seite 187) | (⇒ Seite 205) |
| 600-600-824  | –                             | –            | –             | (⇒ Seite 166) | (⇒ Seite 188) | (⇒ Seite 206) |
| 600-600-825  | –                             | –            | –             | (⇒ Seite 167) | (⇒ Seite 189) | (⇒ Seite 207) |
| 600-600-873  | –                             | –            | –             | –             | (⇒ Seite 190) | (⇒ Seite 208) |
| 600-600-923  | –                             | –            | –             | –             | (⇒ Seite 191) | (⇒ Seite 209) |
| 700-700-923  | –                             | –            | –             | –             | (⇒ Seite 192) | (⇒ Seite 210) |
| 700-700-929  | –                             | –            | –             | –             | (⇒ Seite 193) | (⇒ Seite 211) |
| 800-700-953  | –                             | –            | –             | –             | (⇒ Seite 194) | (⇒ Seite 212) |
| 800-700-959  | –                             | –            | –             | –             | (⇒ Seite 195) | (⇒ Seite 213) |
| 800-800-934  | –                             | –            | –             | –             | (⇒ Seite 196) | (⇒ Seite 214) |
| 800-800-935  | –                             | –            | –             | –             | (⇒ Seite 197) | (⇒ Seite 215) |
| 800-800-939  | –                             | –            | –             | –             | (⇒ Seite 198) | (⇒ Seite 216) |
| 800-900-883  | –                             | –            | –             | –             | (⇒ Seite 199) | (⇒ Seite 217) |
| 900-900-1133 | –                             | –            | –             | –             | –             | (⇒ Seite 218) |
| 900-900-1134 | –                             | –            | –             | –             | –             | (⇒ Seite 219) |
| 900-900-1138 | –                             | –            | –             | –             | –             | (⇒ Seite 220) |
| 900-900-1139 | –                             | –            | –             | –             | –             | (⇒ Seite 221) |

# Kennfelder

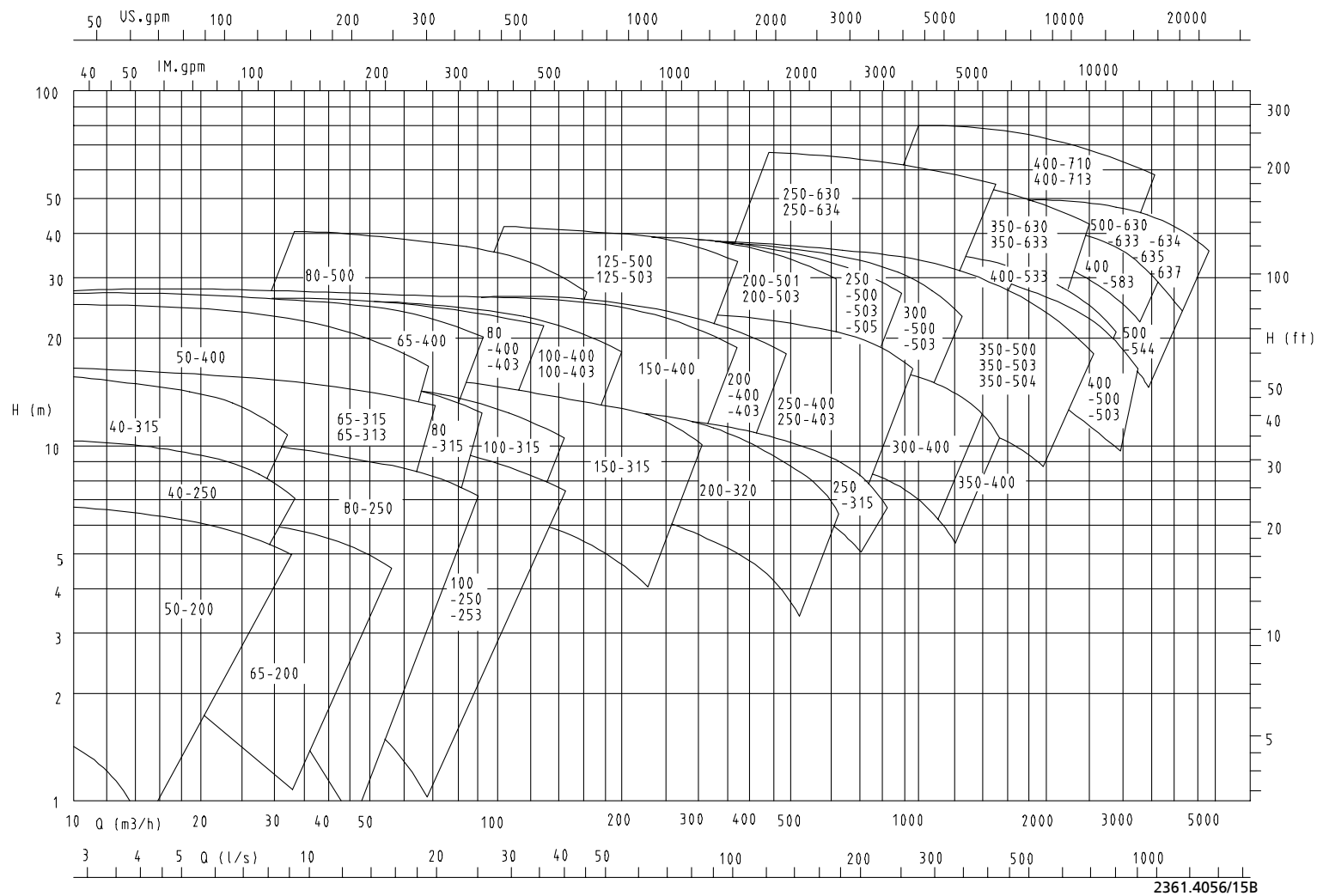
KWP K,  $n = 2900 \text{ min}^{-1}$

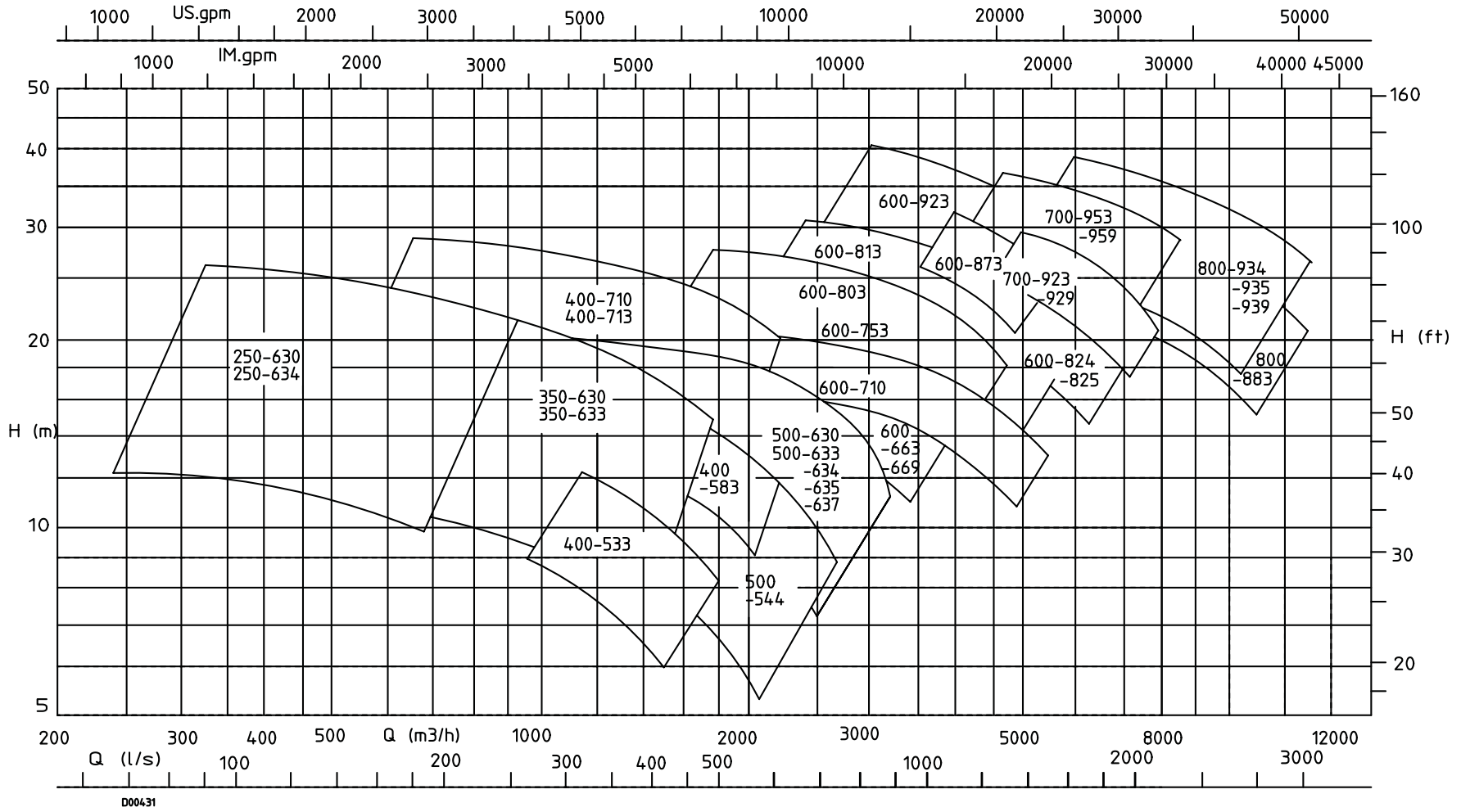


2361:4052/10B

KWP K,  $n = 1450 \text{ min}^{-1}$ 

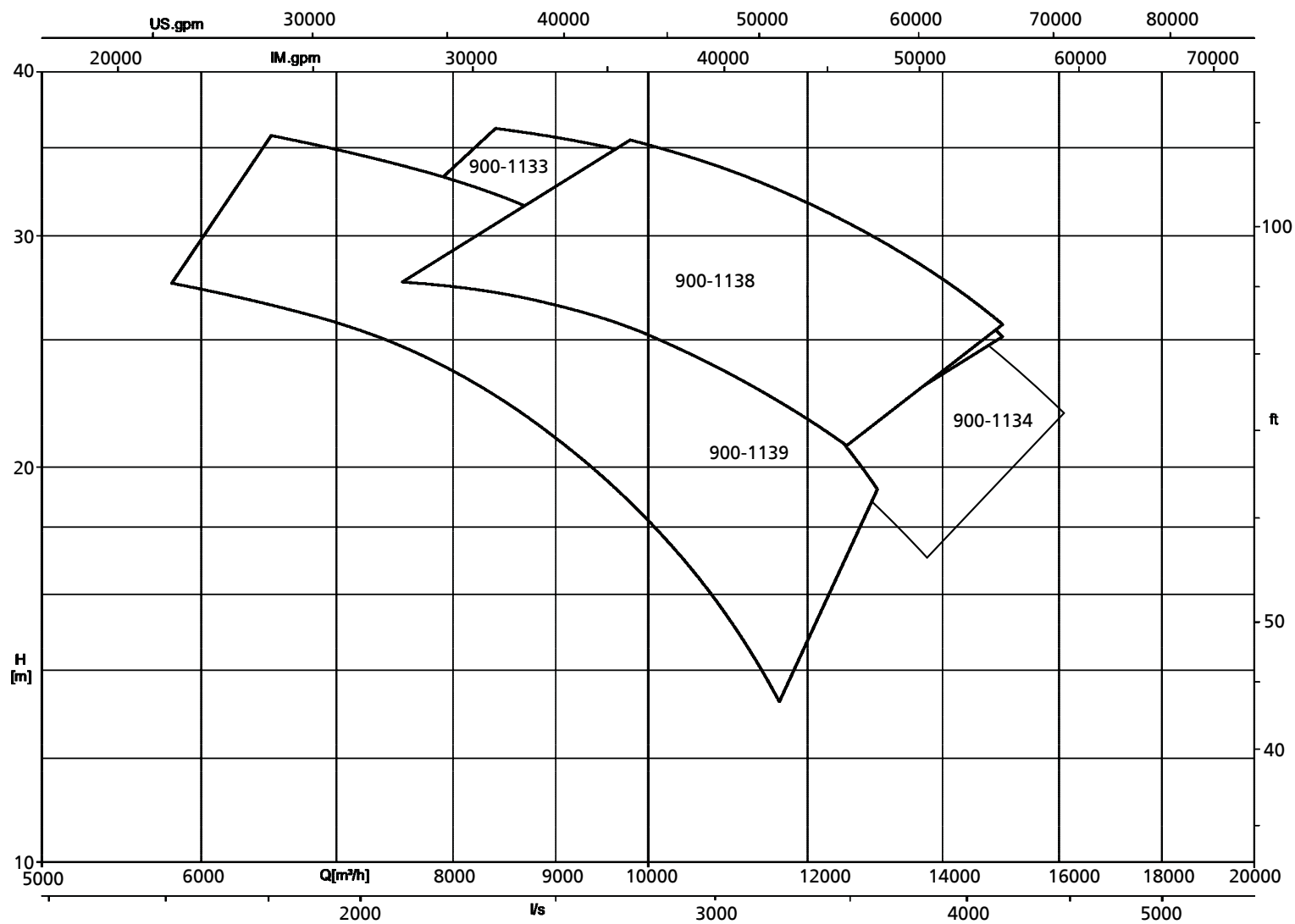
KWP K,  $n = 960 \text{ min}^{-1}$



KWP K,  $n = 580 \text{ min}^{-1}$ 



KWP K,  $n = 480 \text{ min}^{-1}$

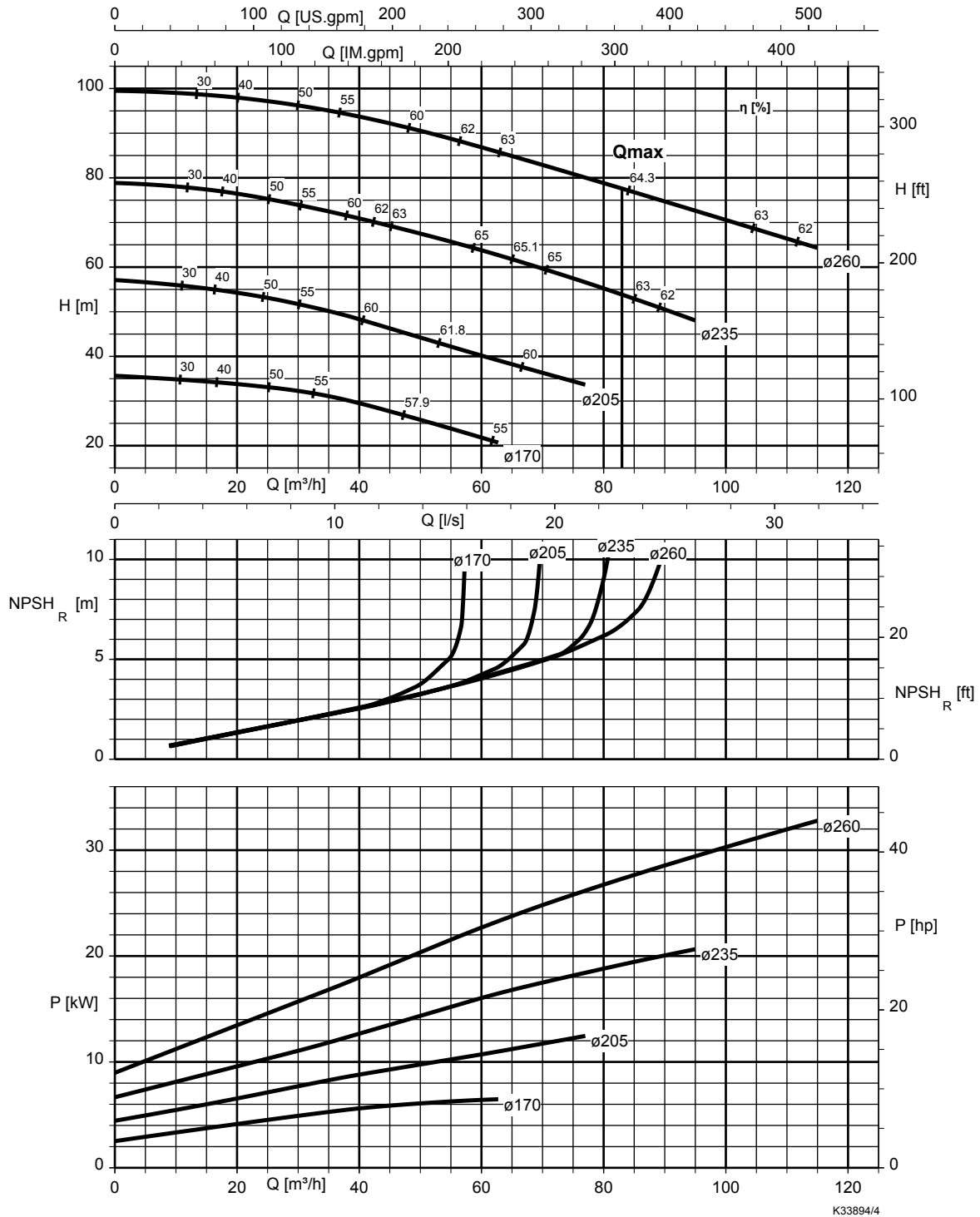


## Kennlinien

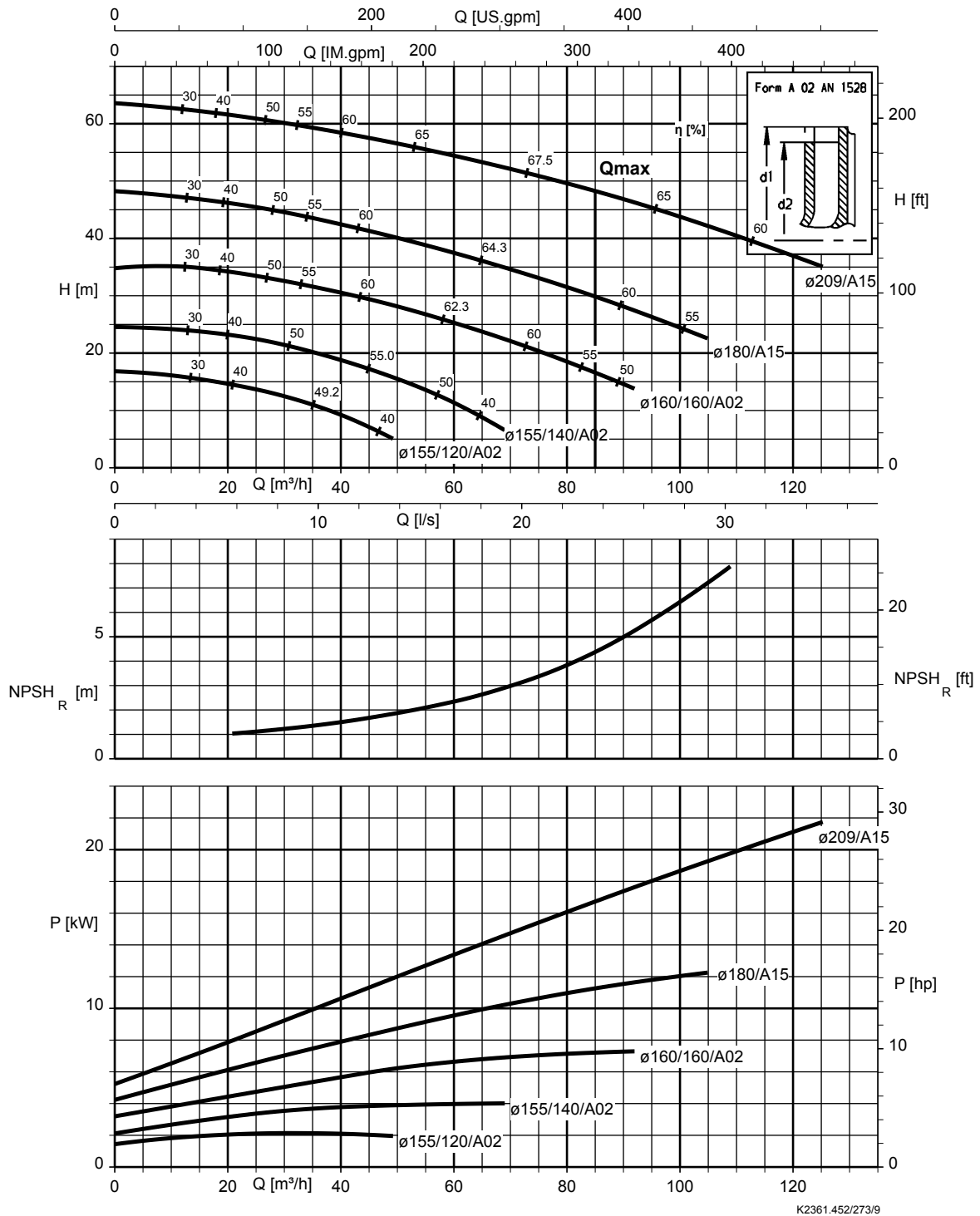
### K-Rad

$n = 2900 \text{ min}^{-1}$

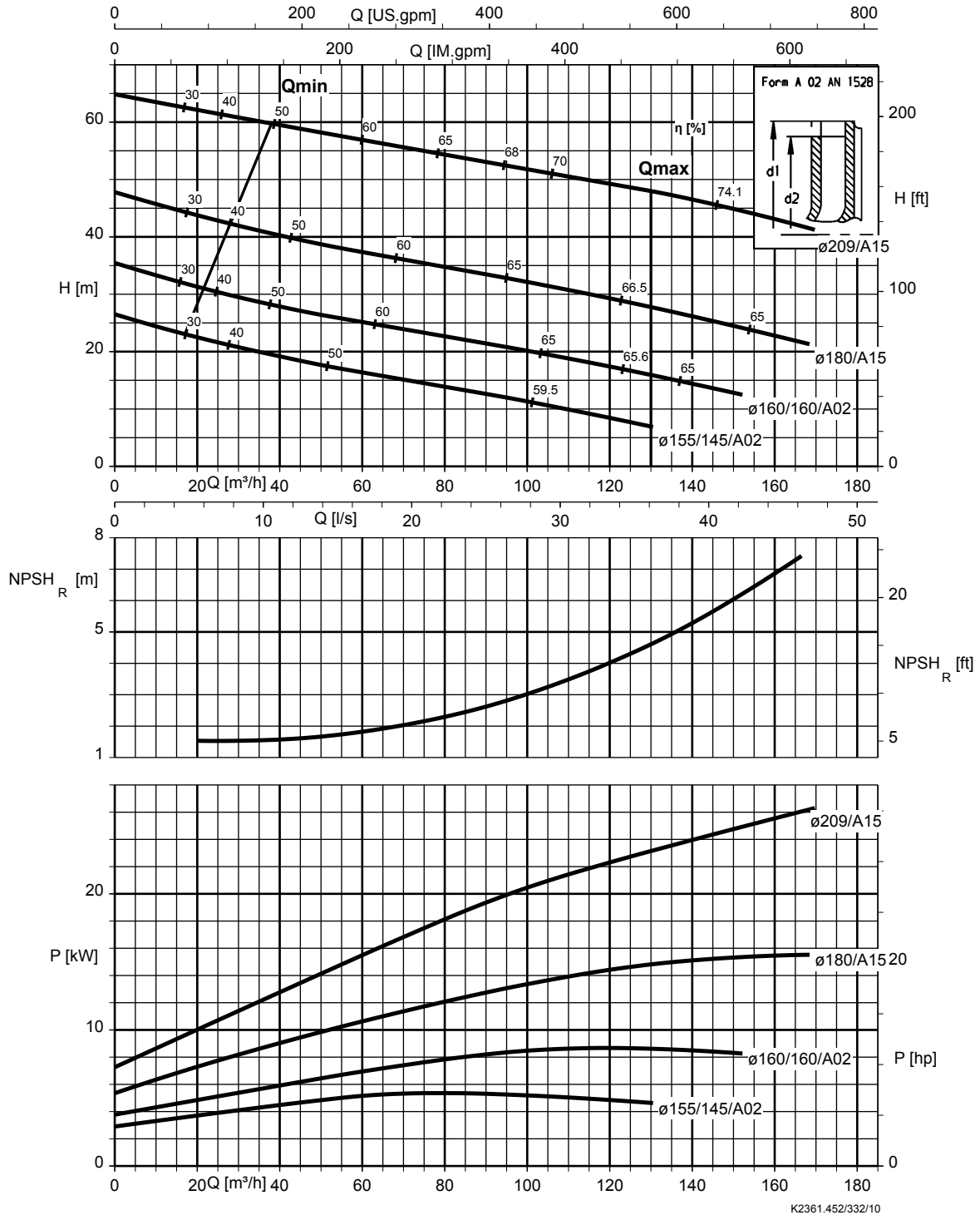
KWP K 065-040-250,  $n = 2900 \text{ min}^{-1}$



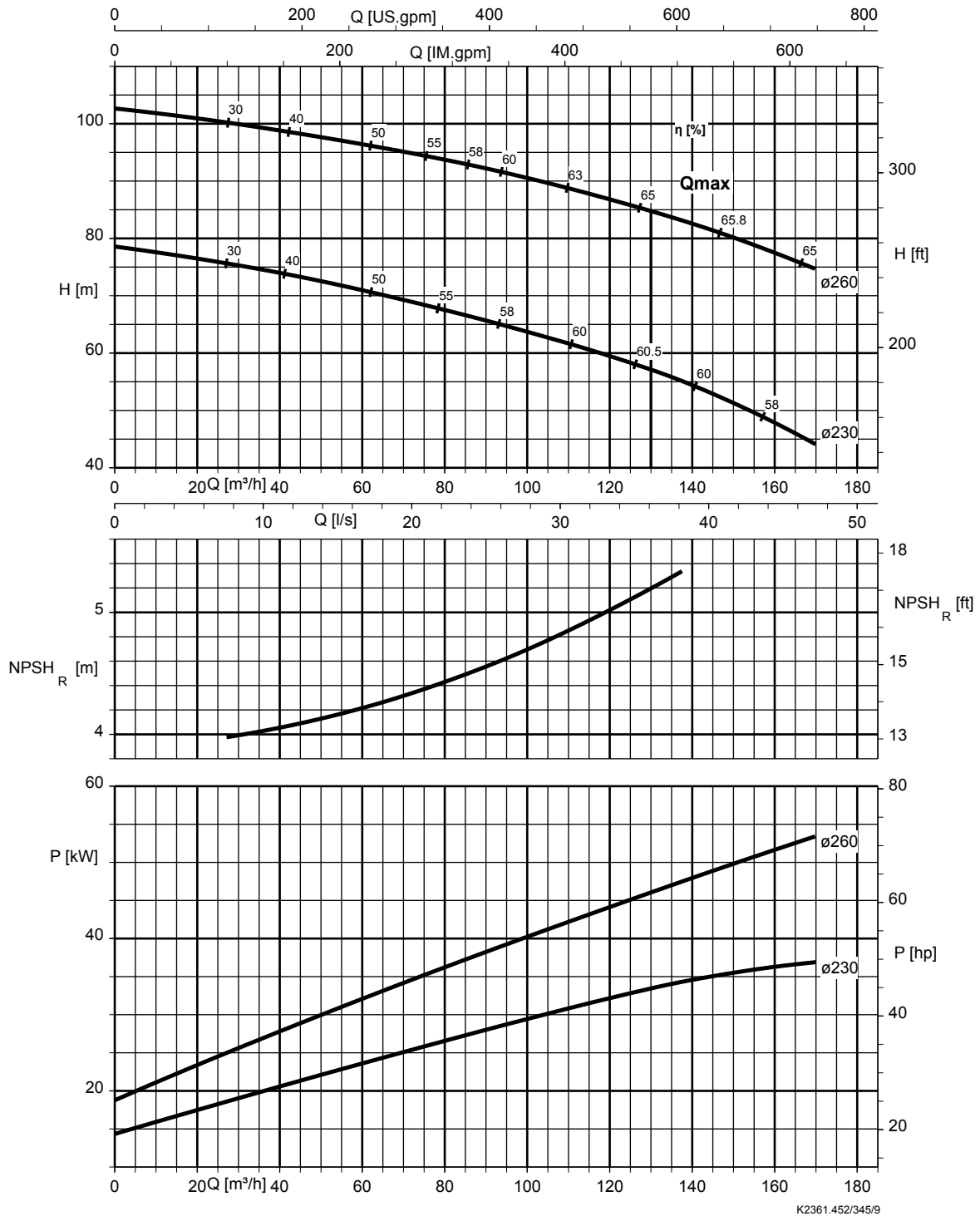
KWP K 065-050-200,  $n = 2900 \text{ min}^{-1}$



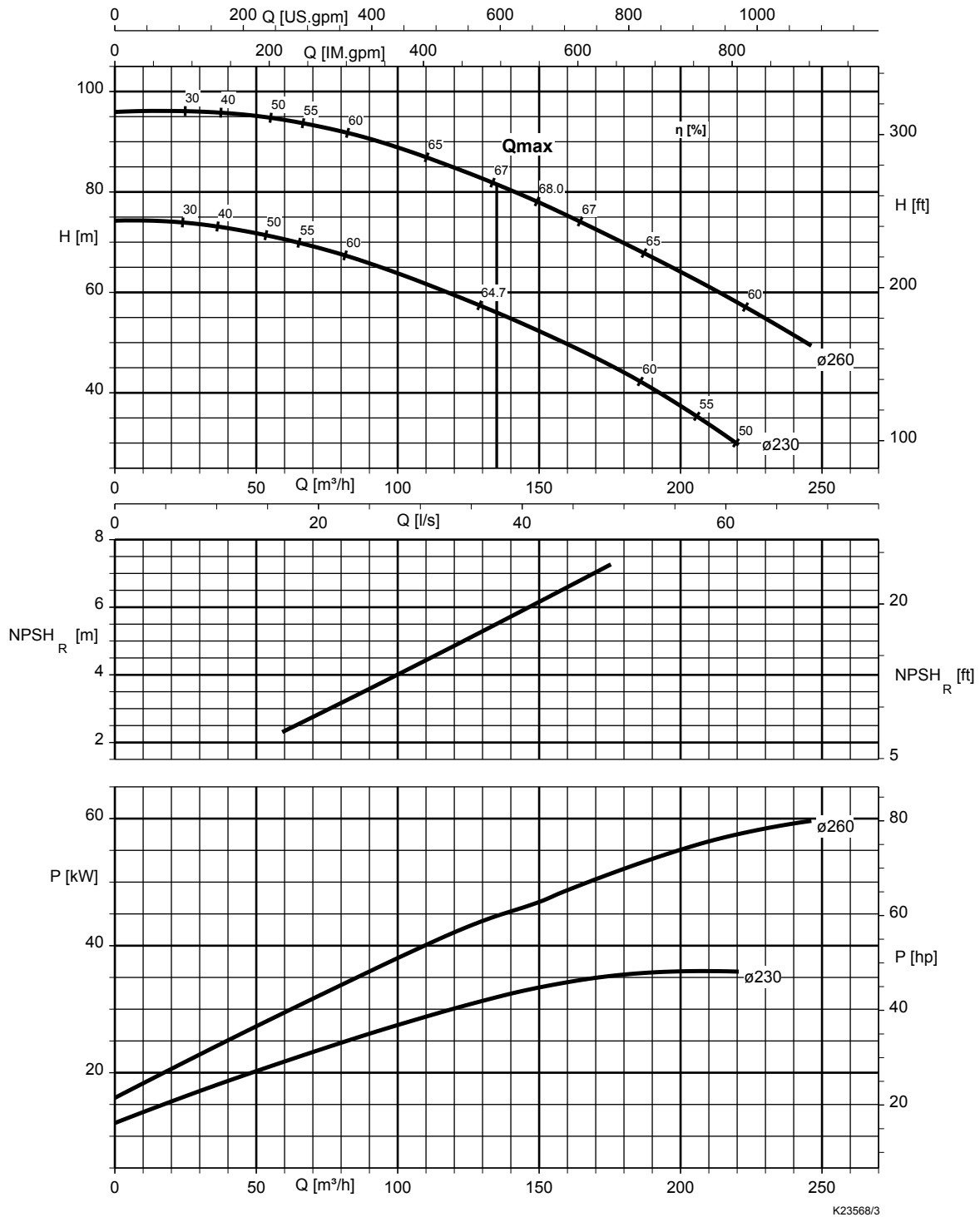
KWP K 080-065-200,  $n = 2900 \text{ min}^{-1}$



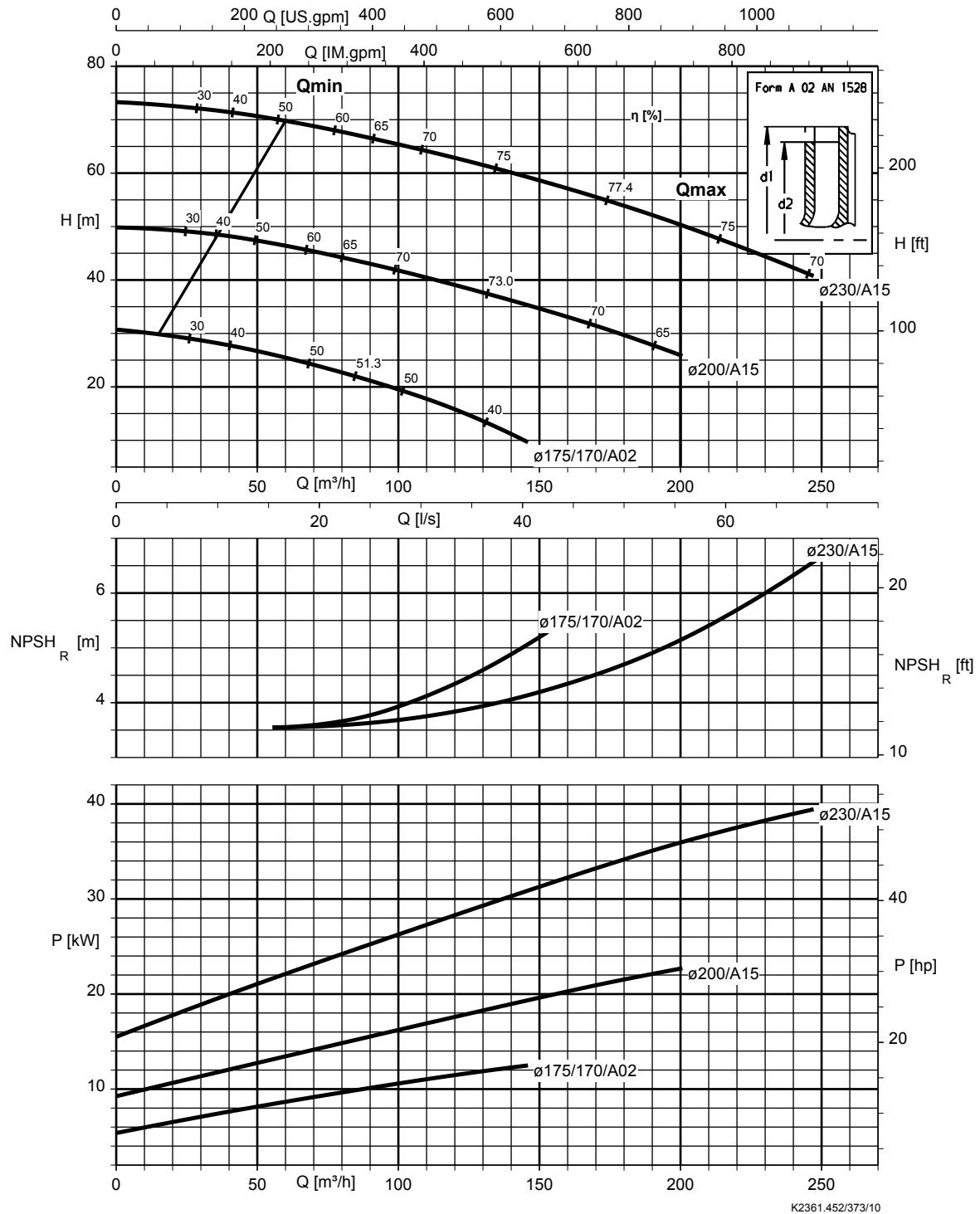
KWP K 080-065-315,  $n = 2900 \text{ min}^{-1}$



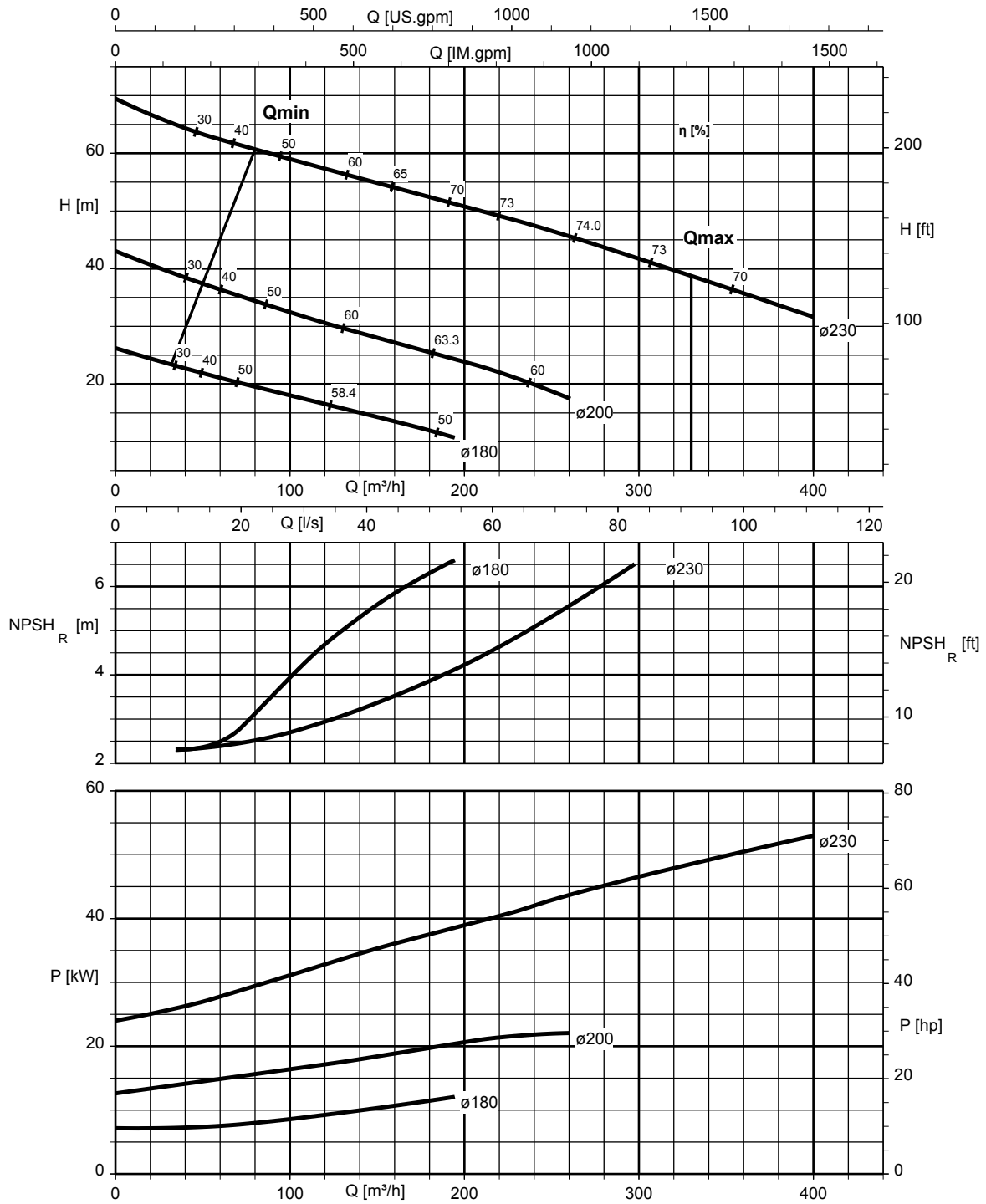
KWP K 080-065-313,  $n = 2900 \text{ min}^{-1}$



**KWP K 100-080-250,  $n = 2900 \text{ min}^{-1}$**



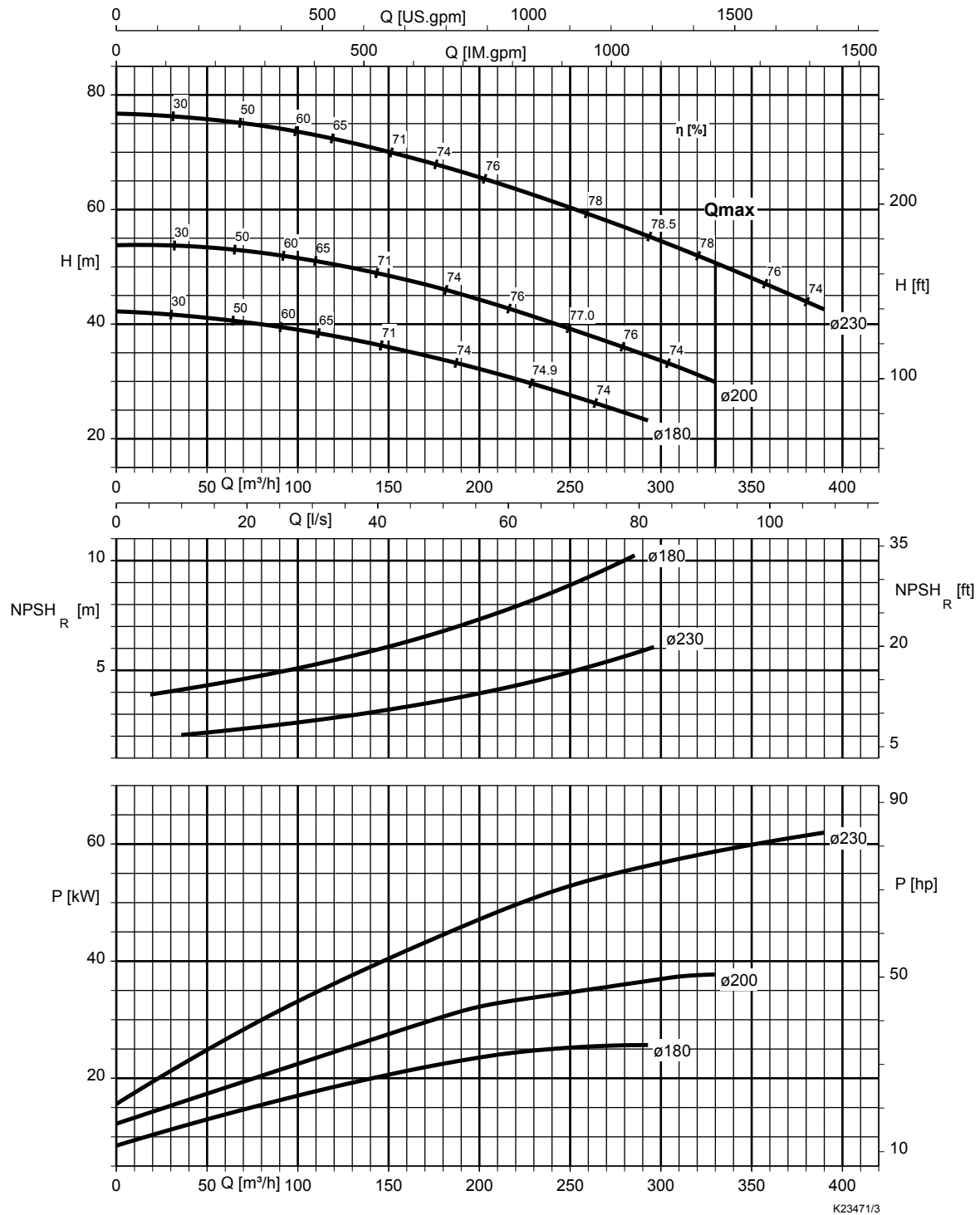
KWP K 125-100-250,  $n = 2900 \text{ min}^{-1}$



K2361.452/403/12

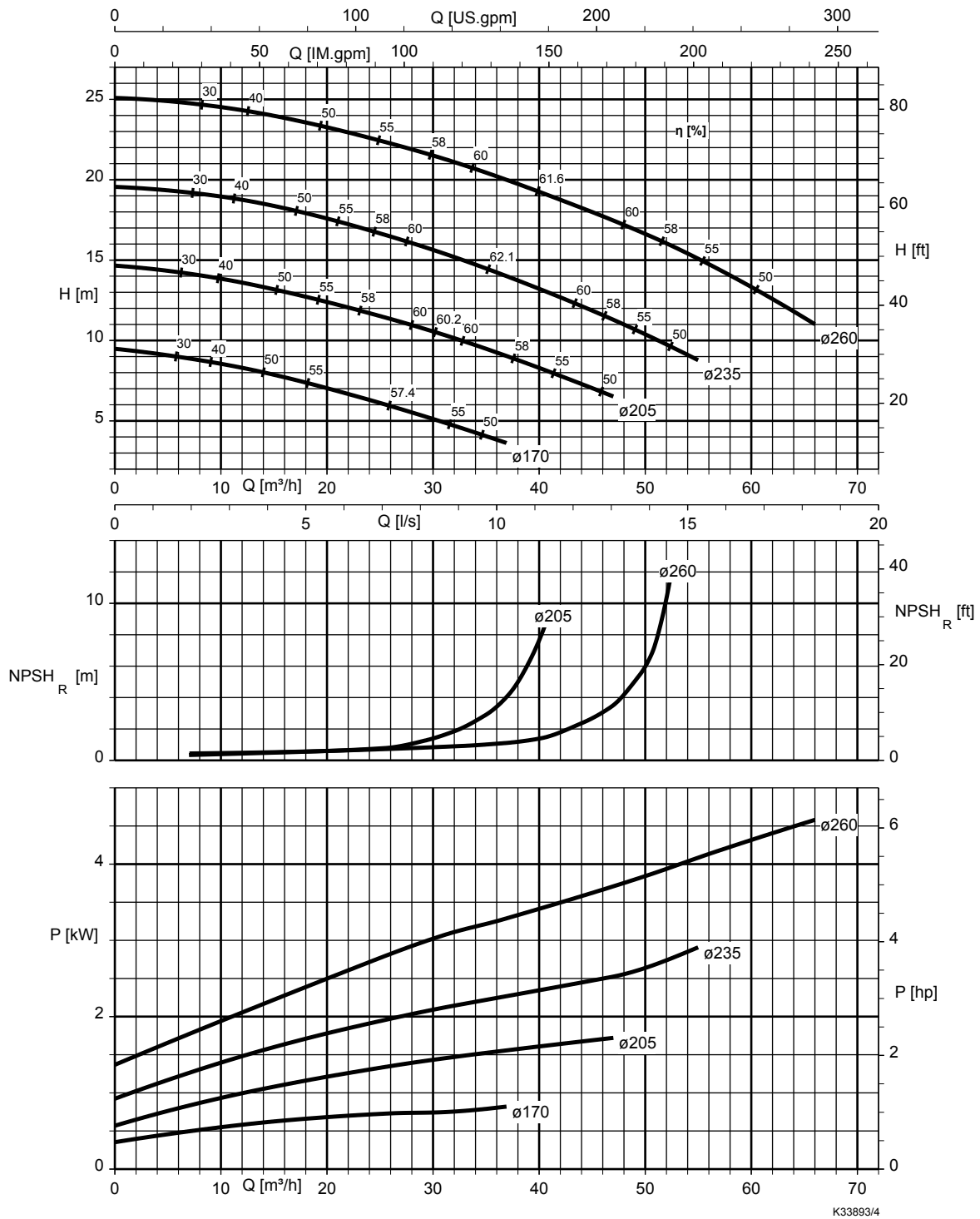


KWP K 125-100-253,  $n = 2900 \text{ min}^{-1}$

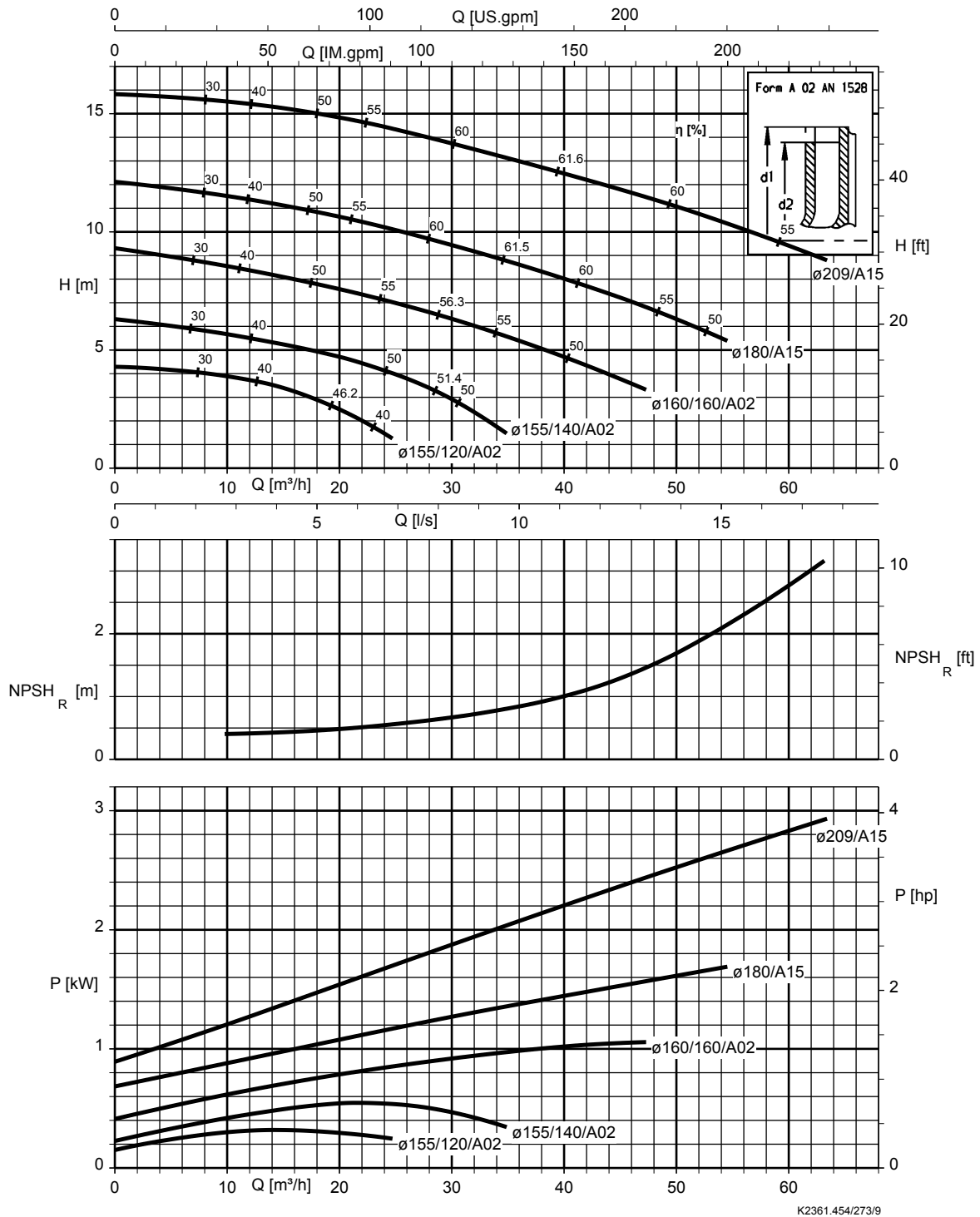


$n = 1450 \text{ min}^{-1}$

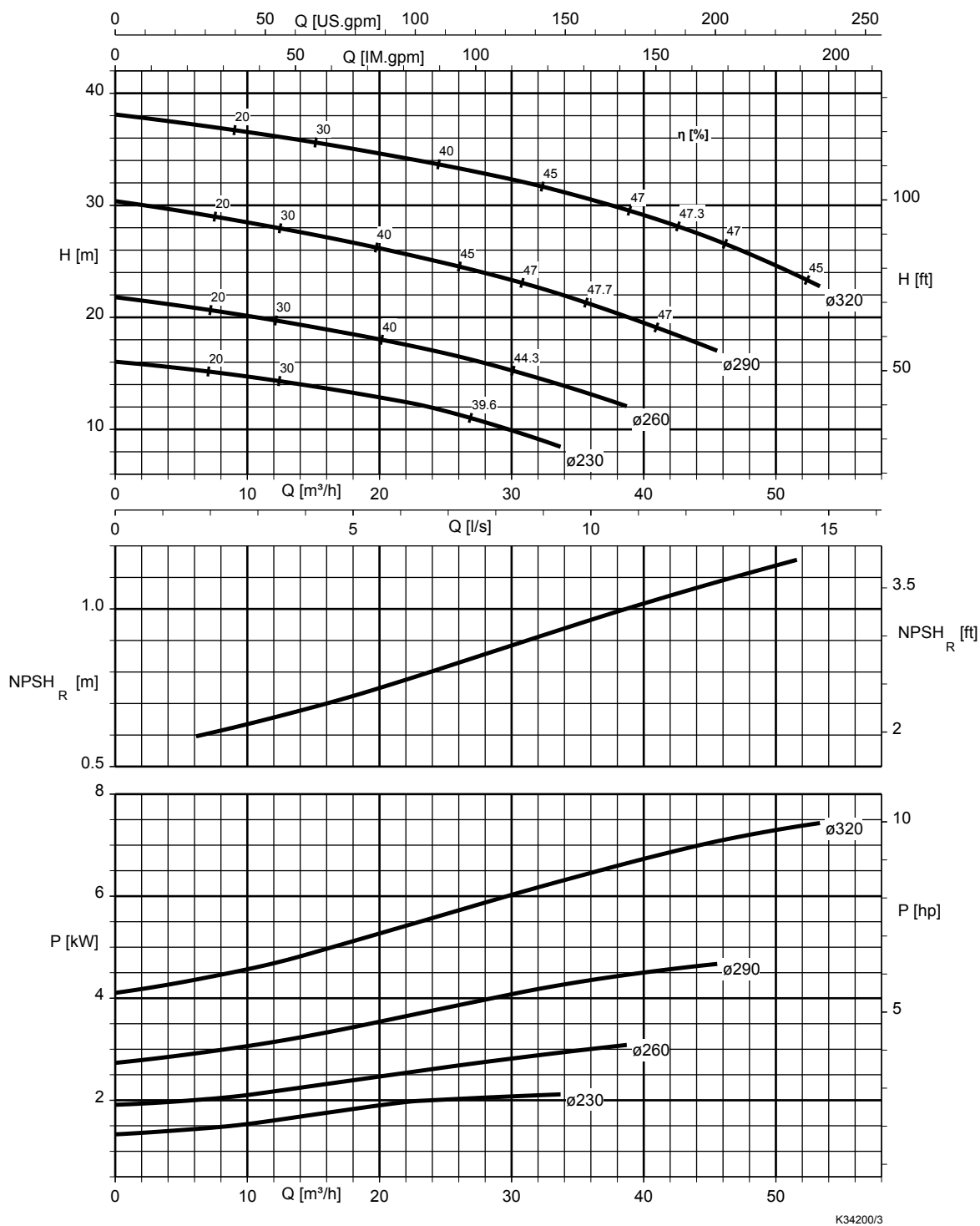
KWP K 065-040-250,  $n = 1450 \text{ min}^{-1}$



KWP K 065-050-200,  $n = 1450 \text{ min}^{-1}$

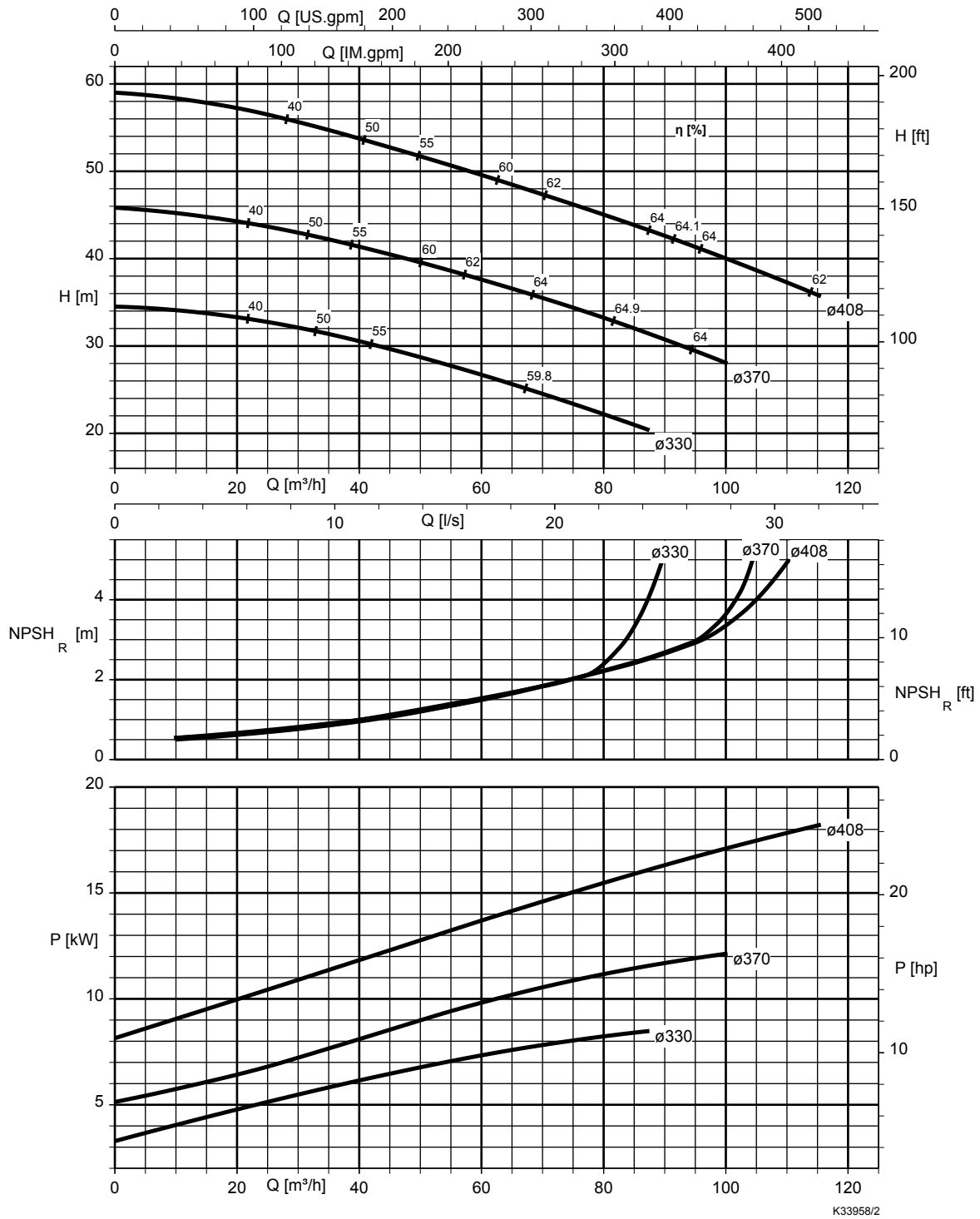


KWP K 080-040-315,  $n = 1450 \text{ min}^{-1}$

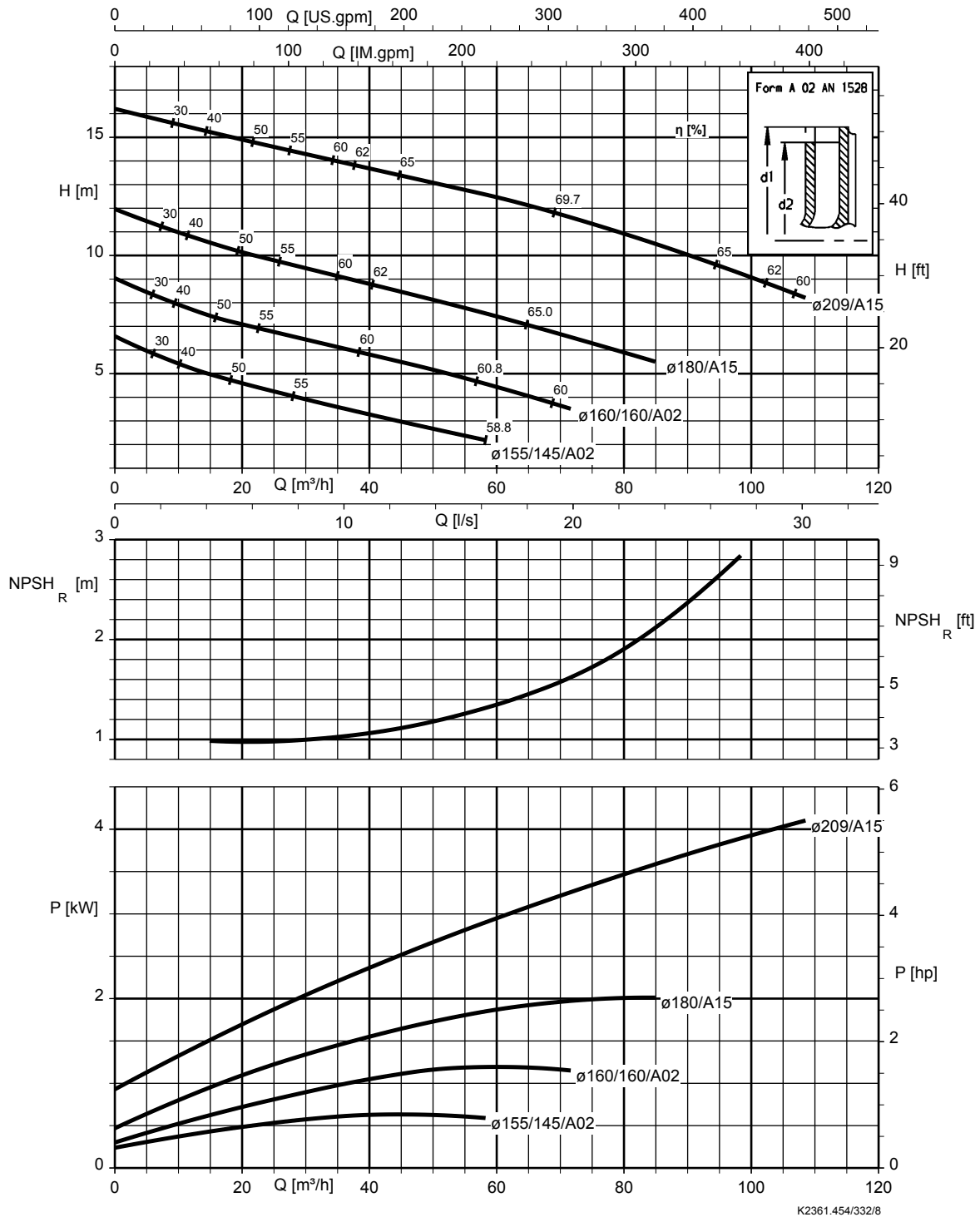


K34200/3

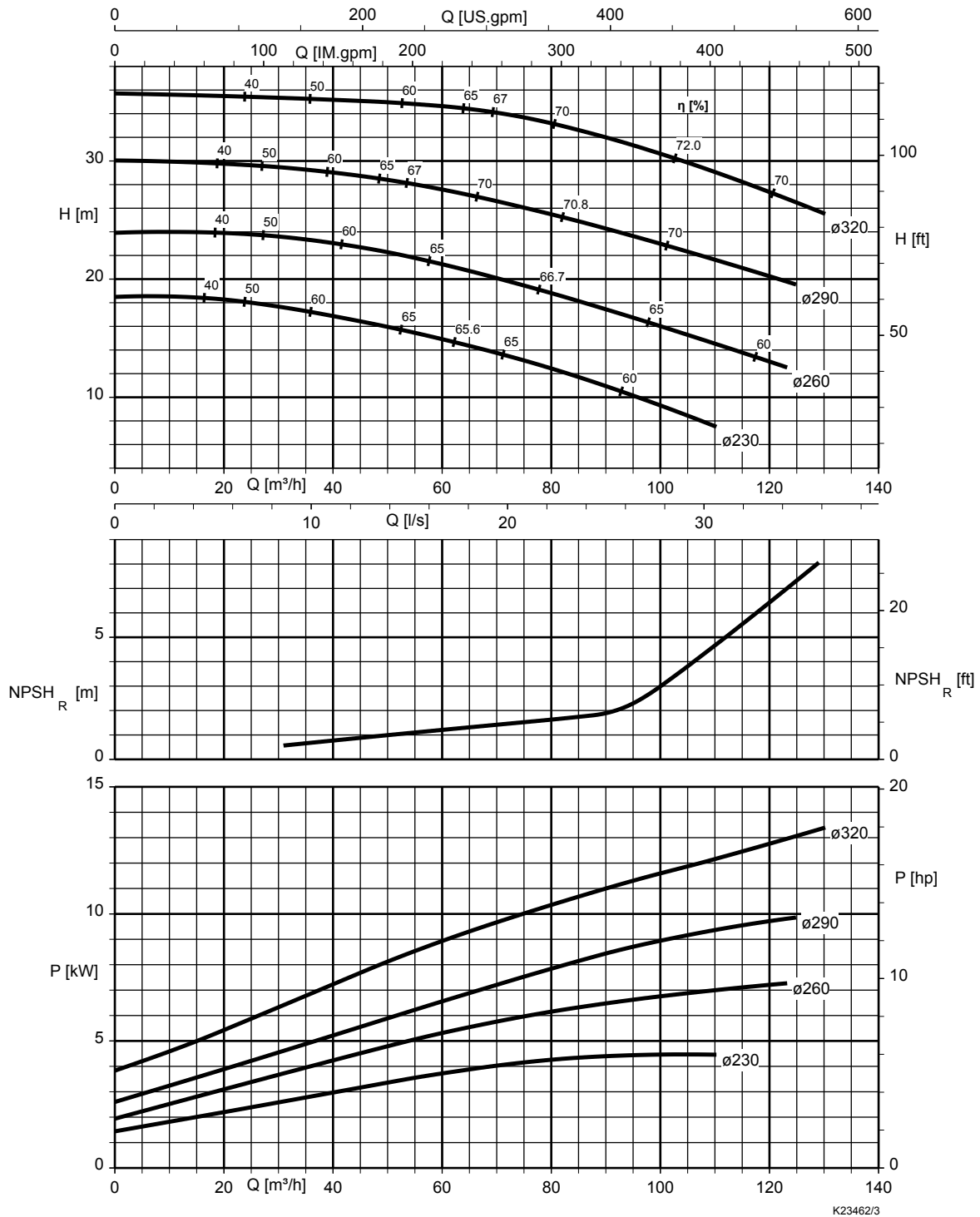
KWP K 080-050-400,  $n = 1450 \text{ min}^{-1}$



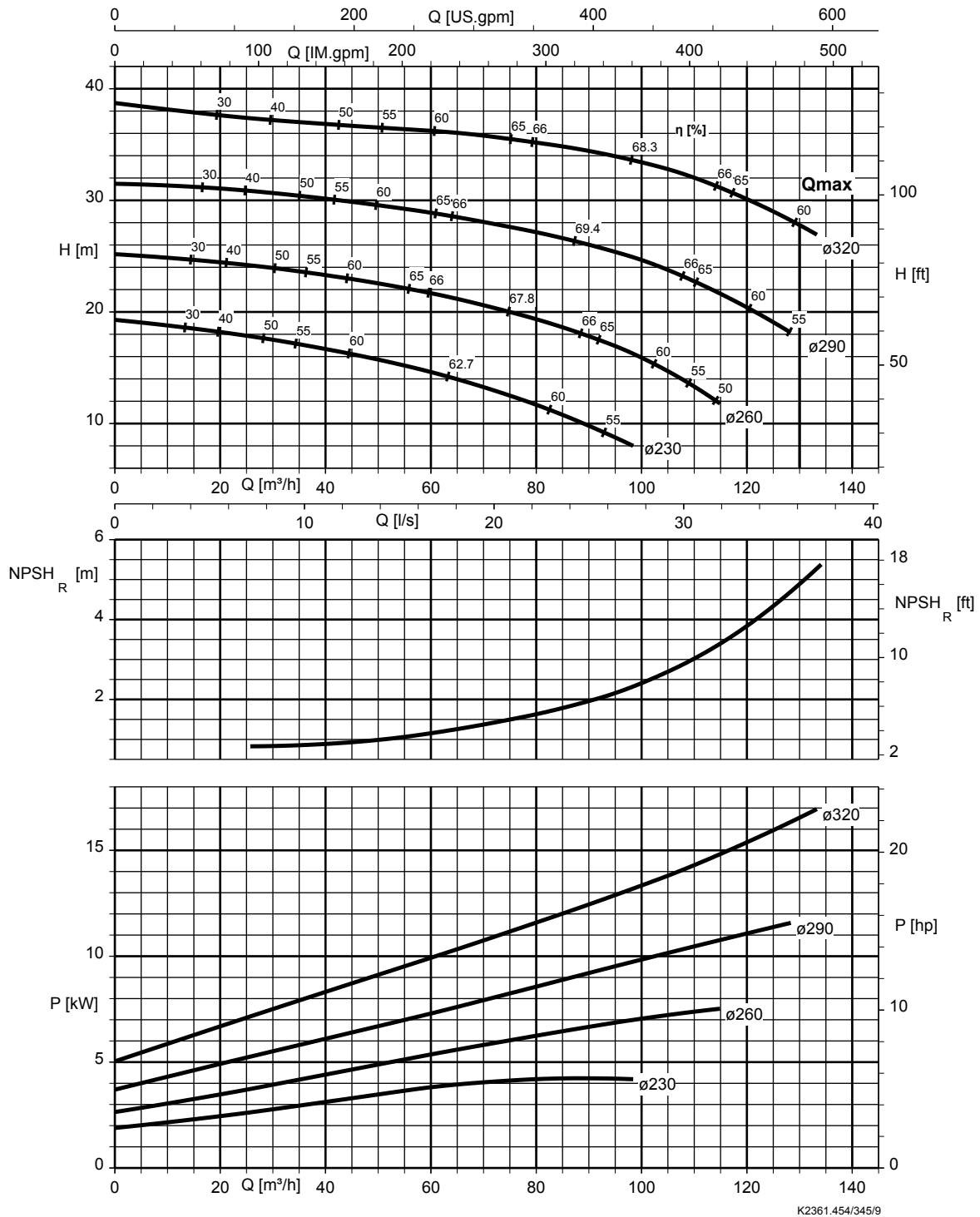
KWP K 080-065-200,  $n = 1450 \text{ min}^{-1}$



KWP K 080-065-313,  $n = 1450 \text{ min}^{-1}$

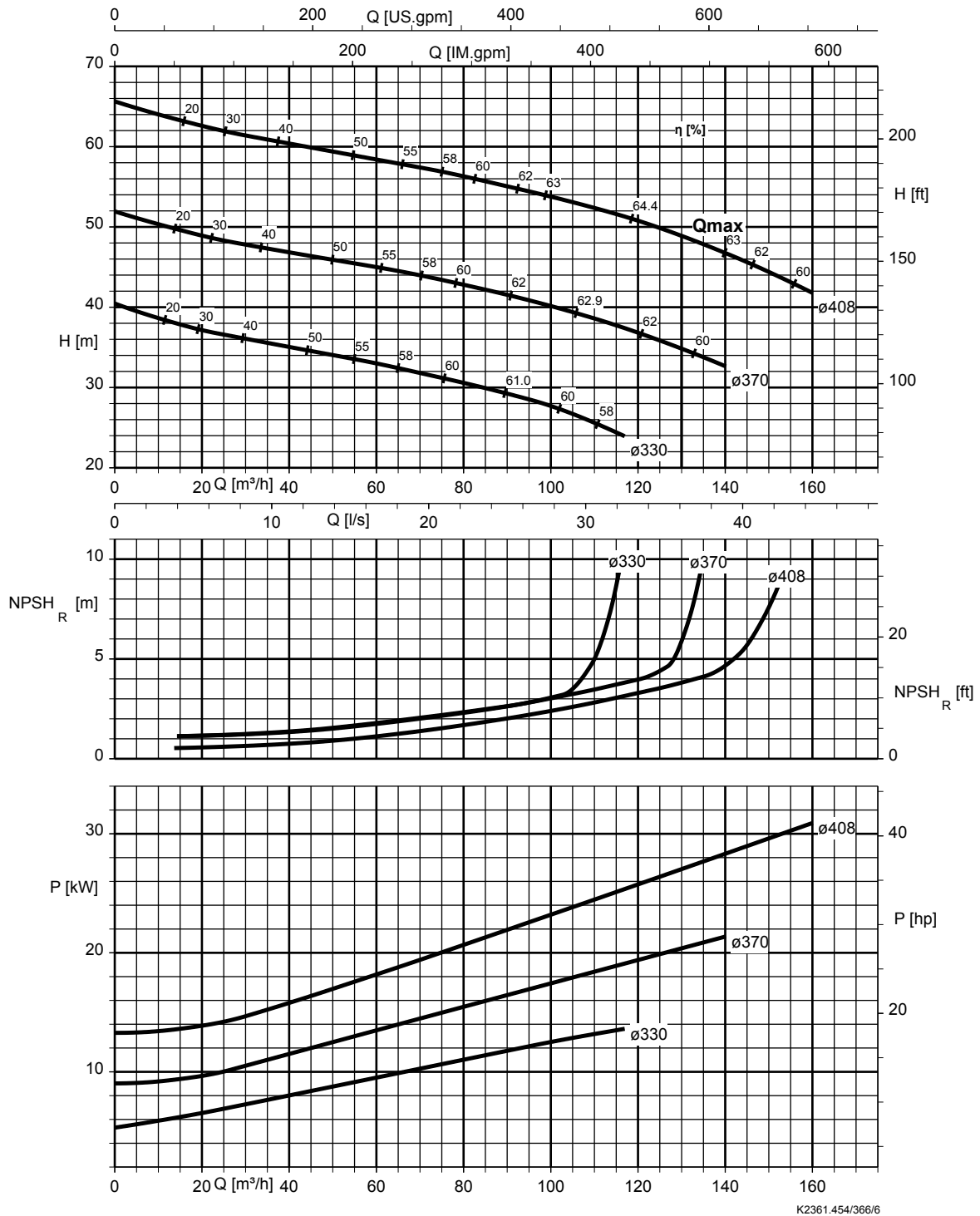


KWP K 080-065-315,  $n = 1450 \text{ min}^{-1}$

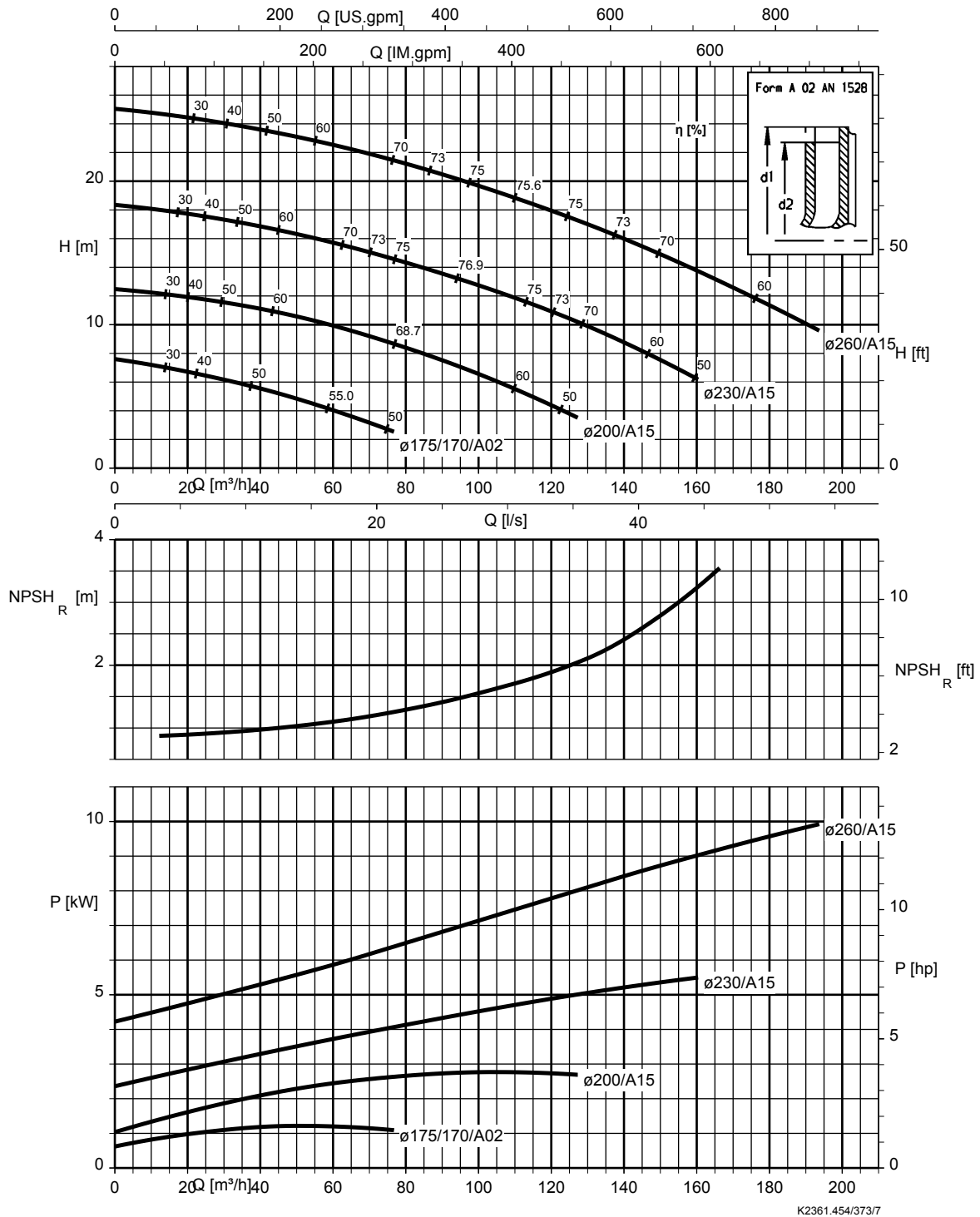




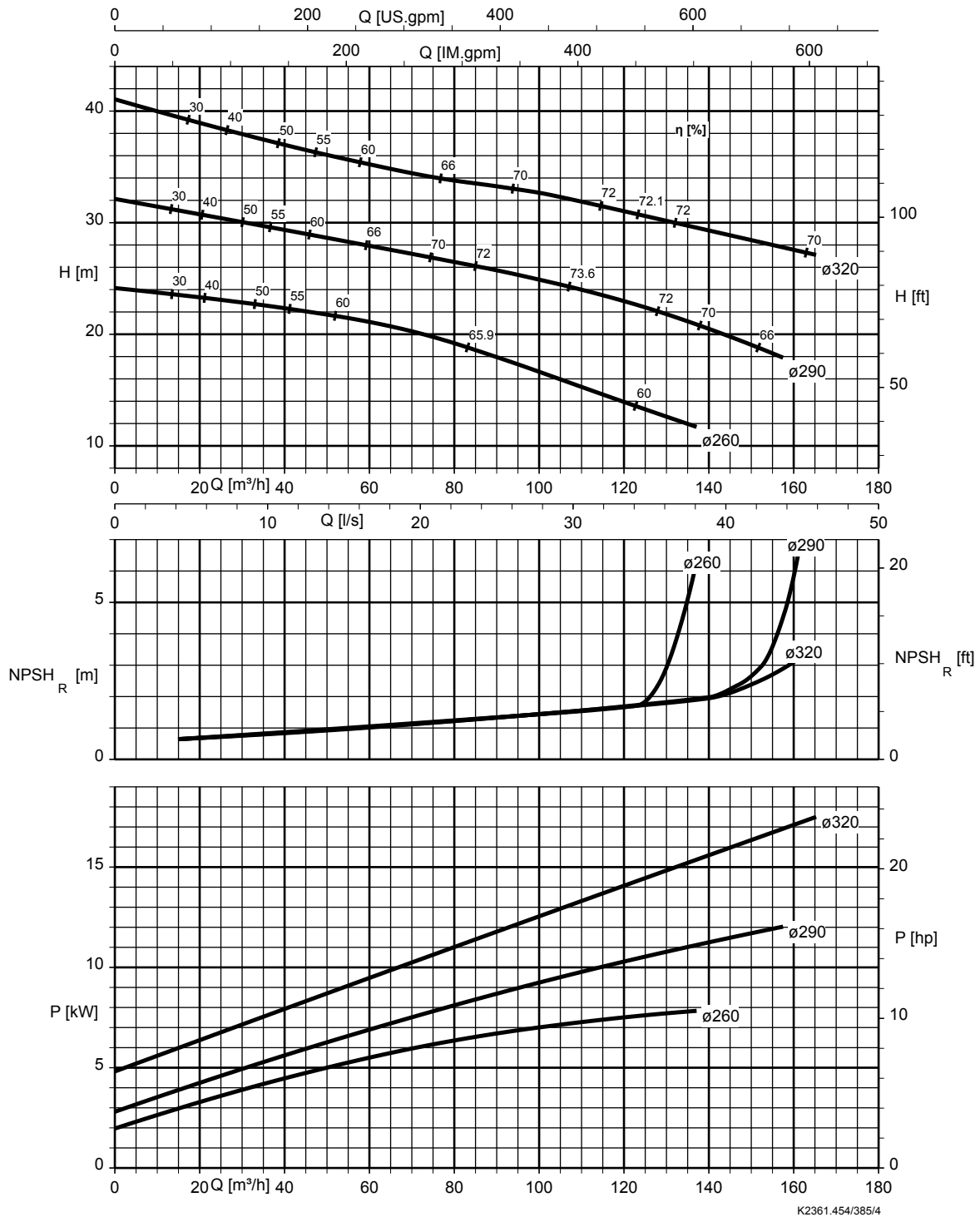
KWP K 080-065-400,  $n = 1450 \text{ min}^{-1}$



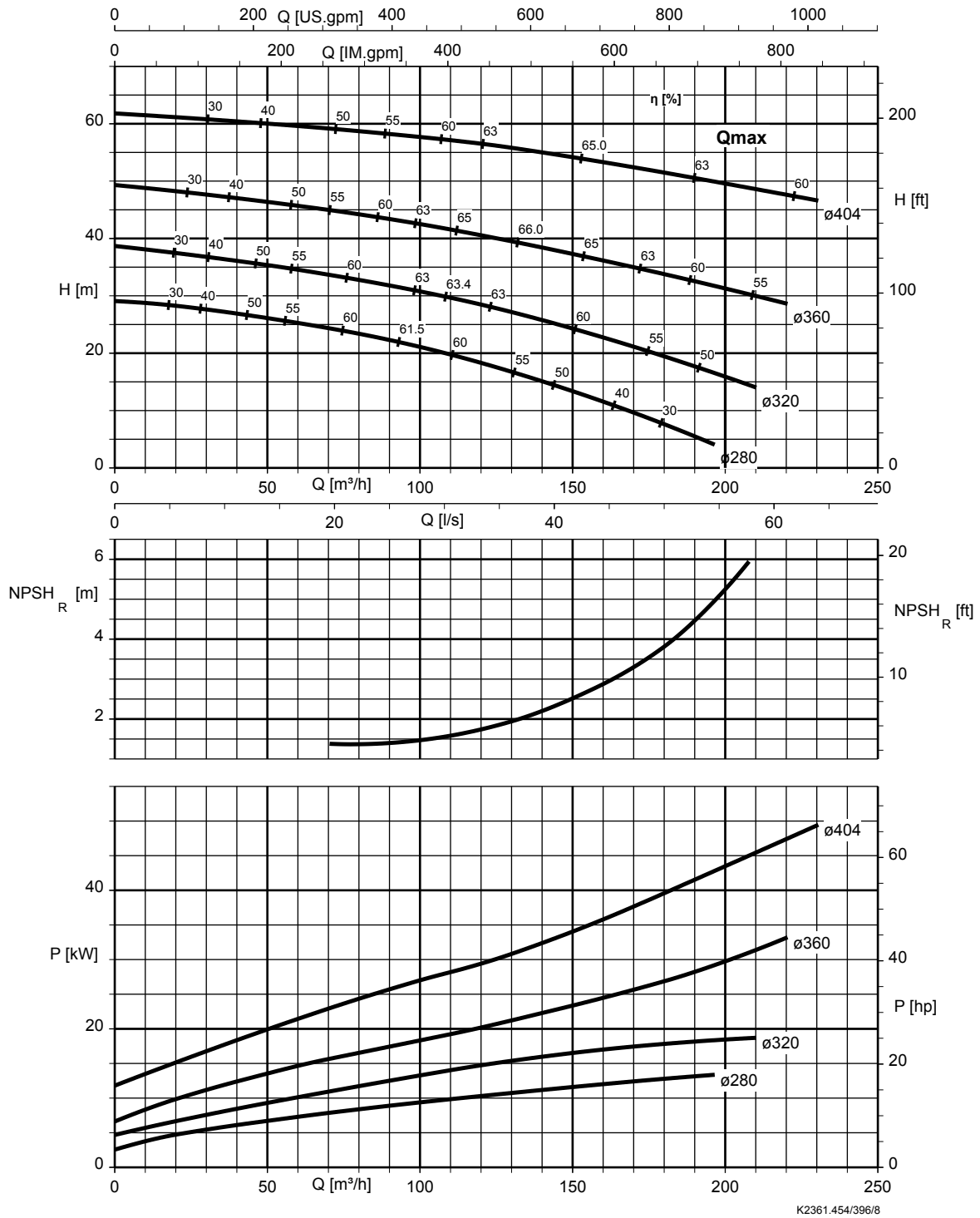
KWP K 100-080-250,  $n = 1450 \text{ min}^{-1}$



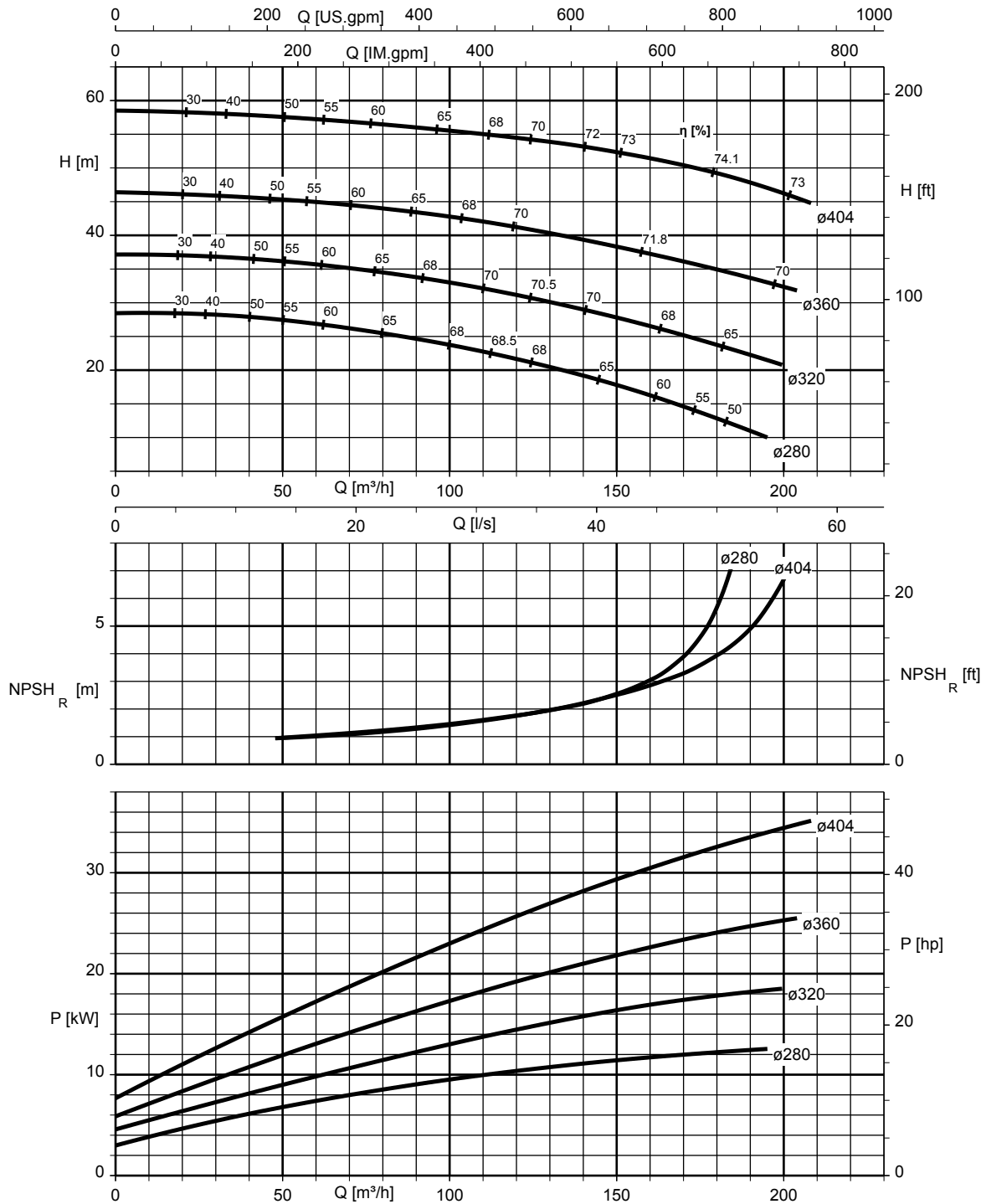
KWP K 100-080-315,  $n = 1450 \text{ min}^{-1}$



KWP K 100-080-400,  $n = 1450 \text{ min}^{-1}$

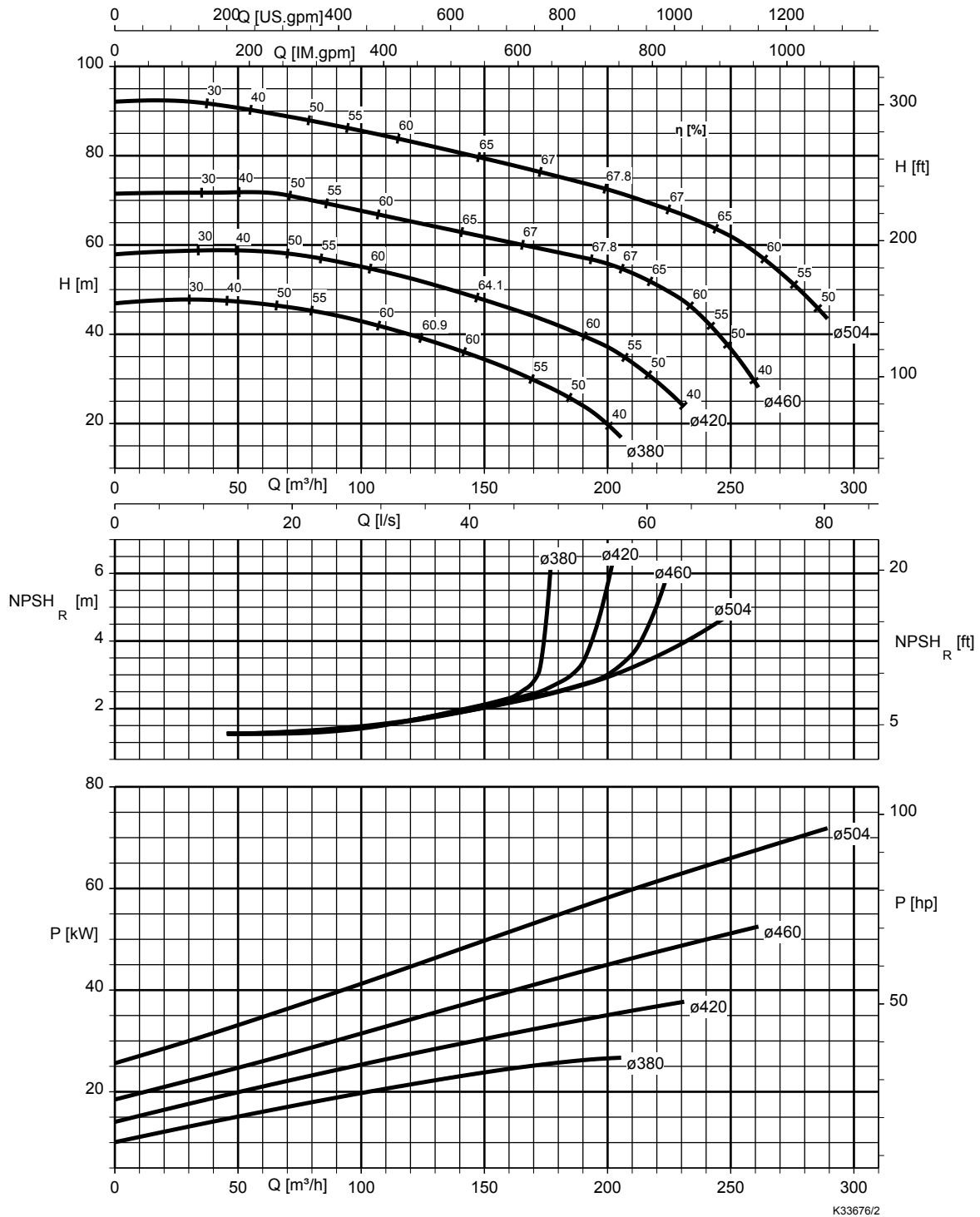


KWP K 100-080-403,  $n = 1450 \text{ min}^{-1}$

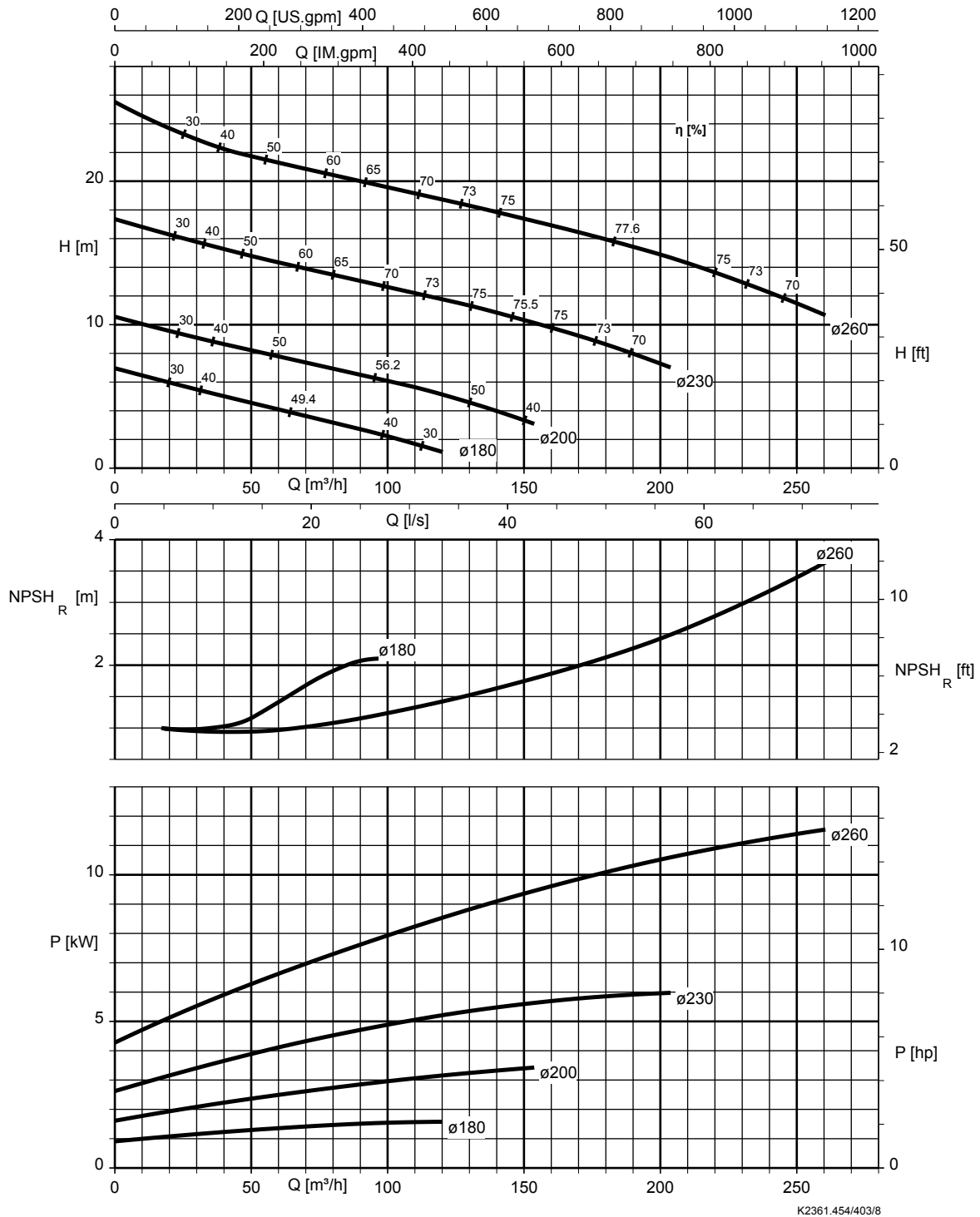


K23466/2

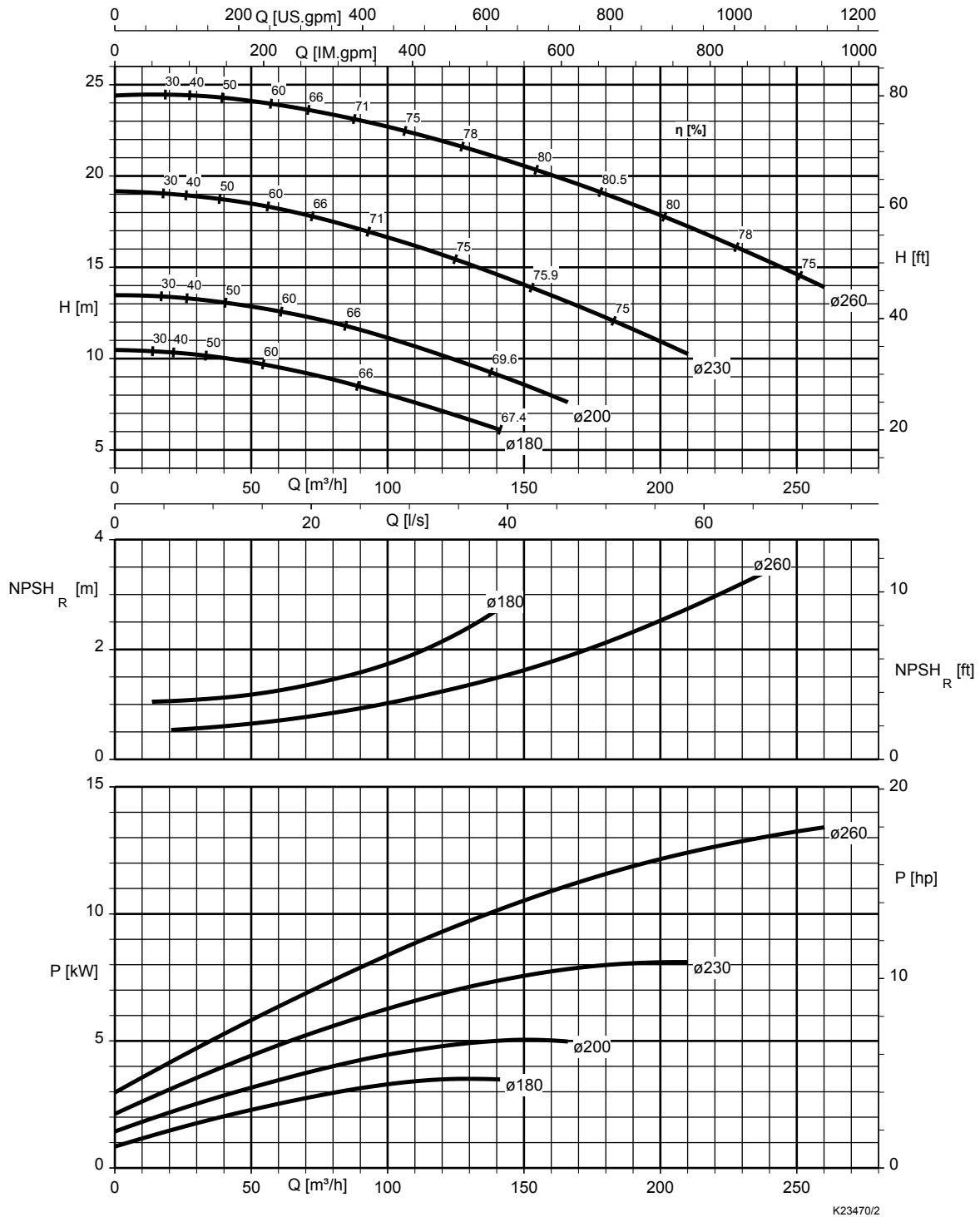
KWP K 125-080-500,  $n = 1450 \text{ min}^{-1}$



KWP K 125-100-250,  $n = 1450 \text{ min}^{-1}$

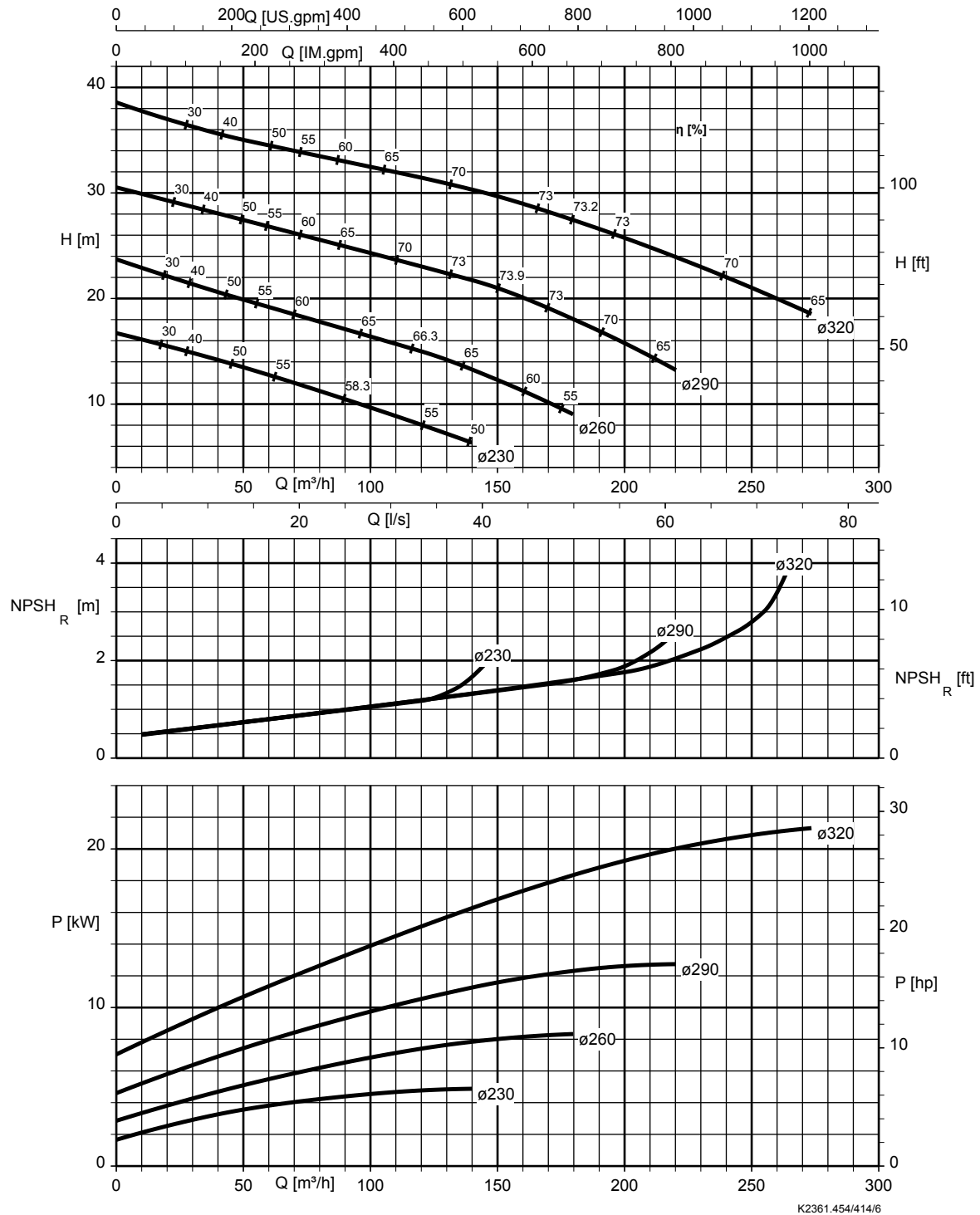


KWP K 125-100-253,  $n = 1450 \text{ min}^{-1}$

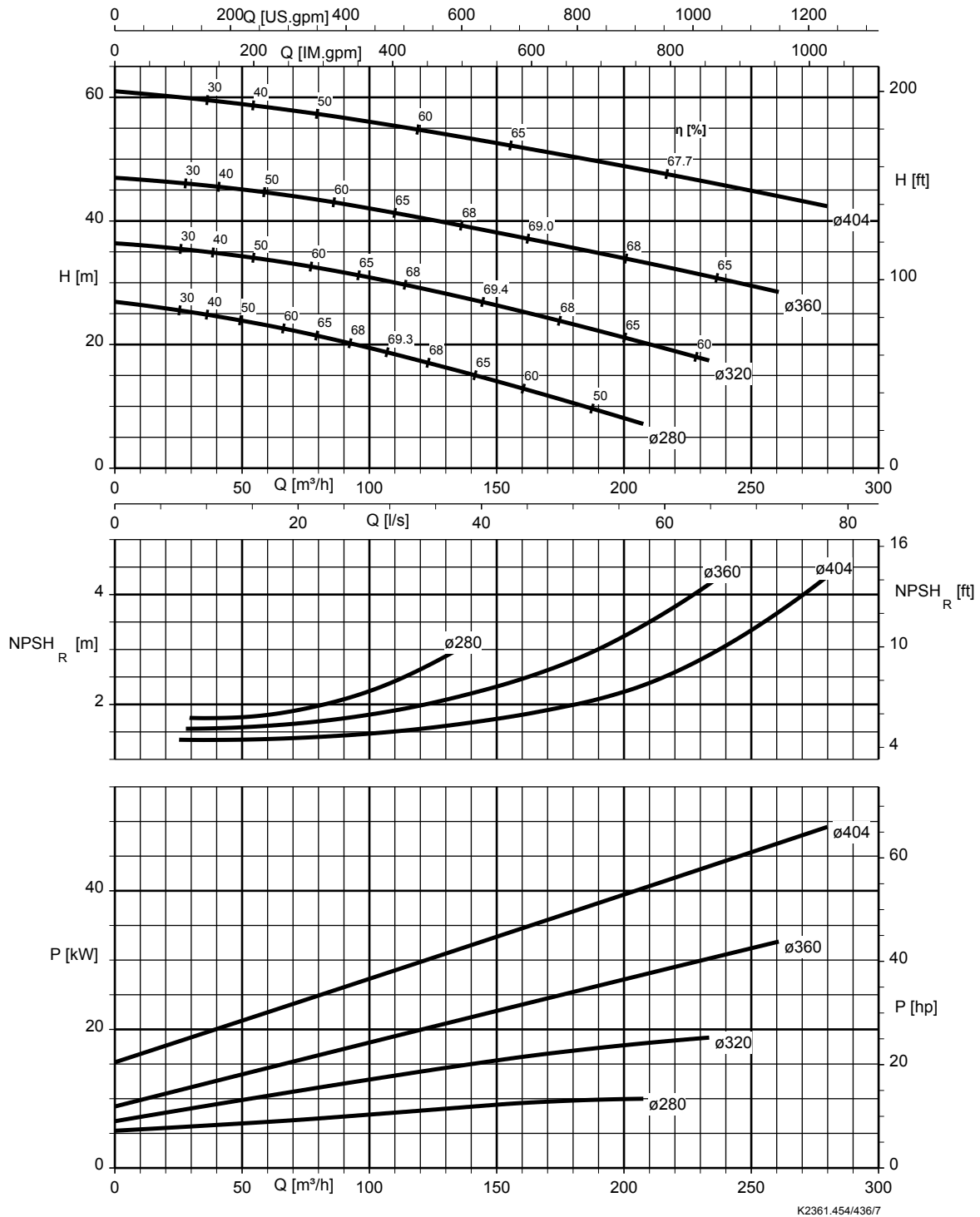




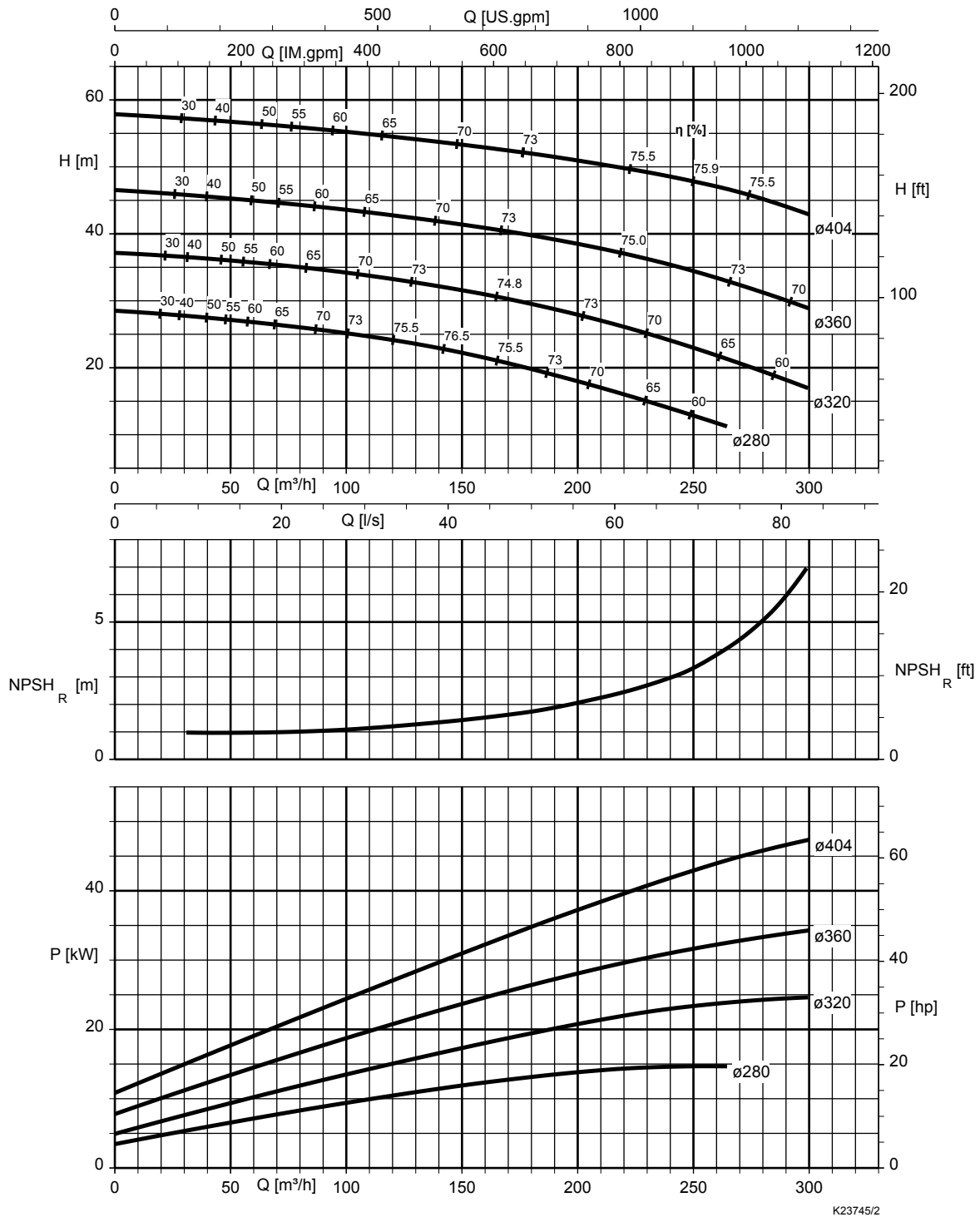
KWP K 125-100-315,  $n = 1450 \text{ min}^{-1}$



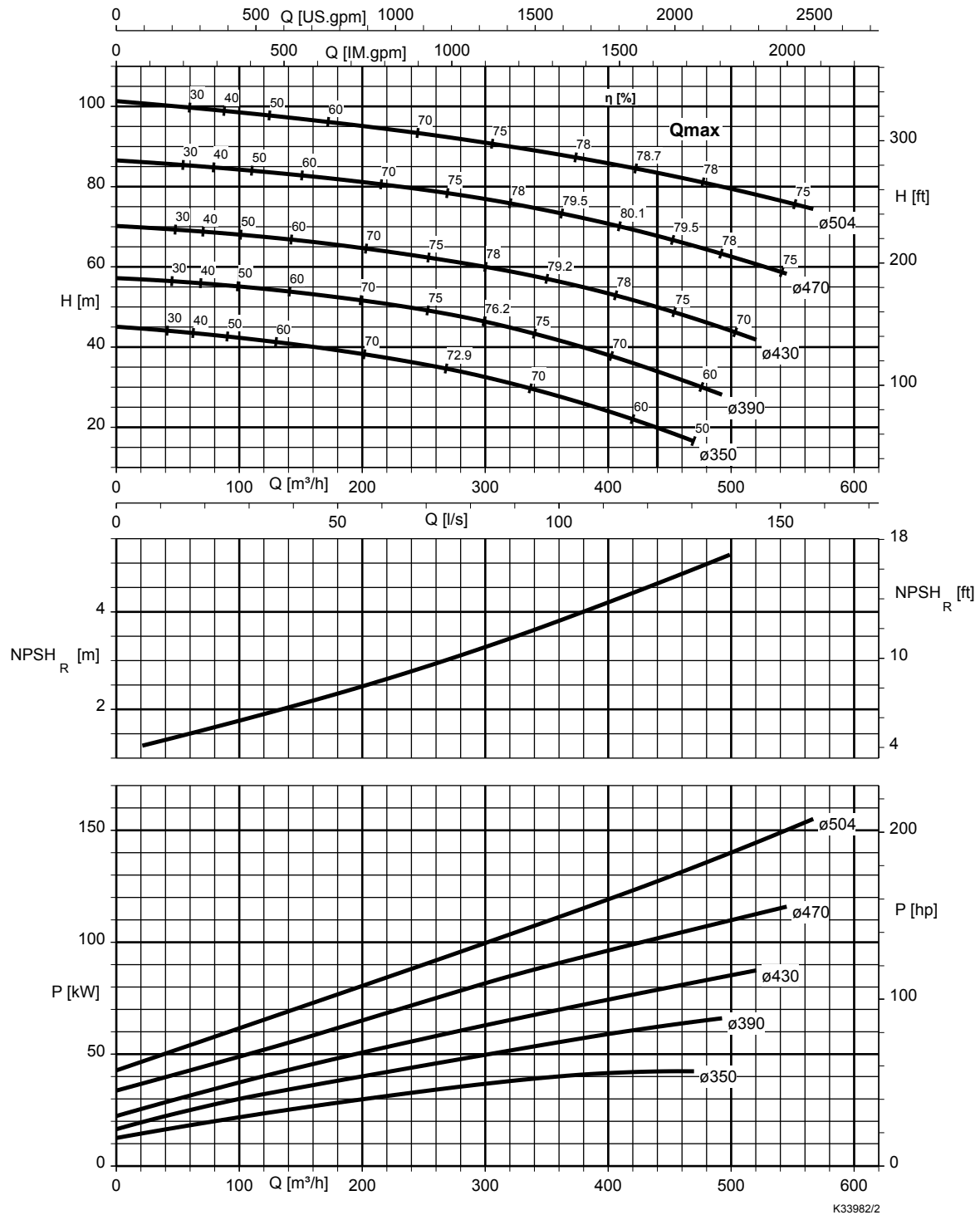
KWP K 125-100-400,  $n = 1450 \text{ min}^{-1}$



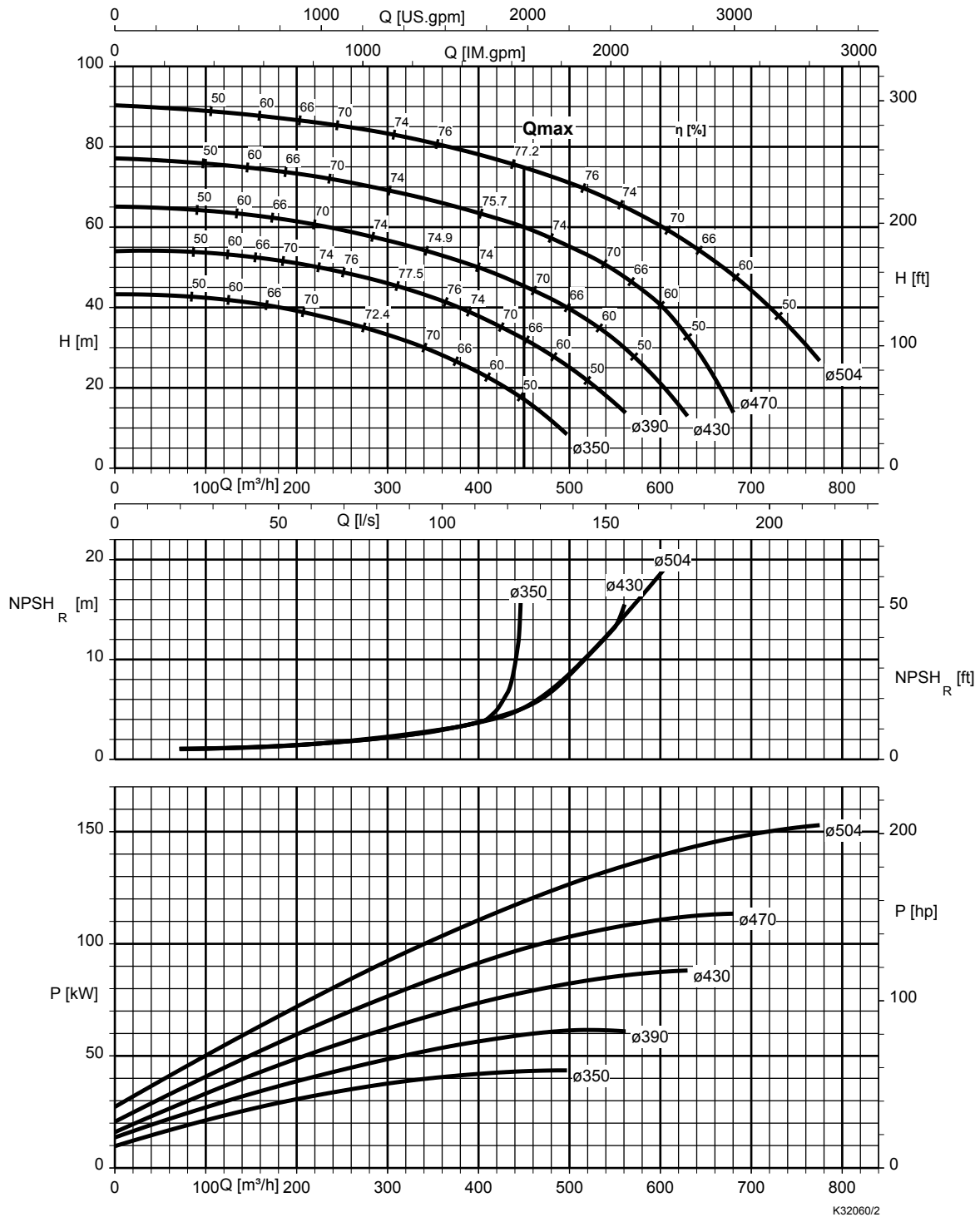
KWP K 125-100-403,  $n = 1450 \text{ min}^{-1}$



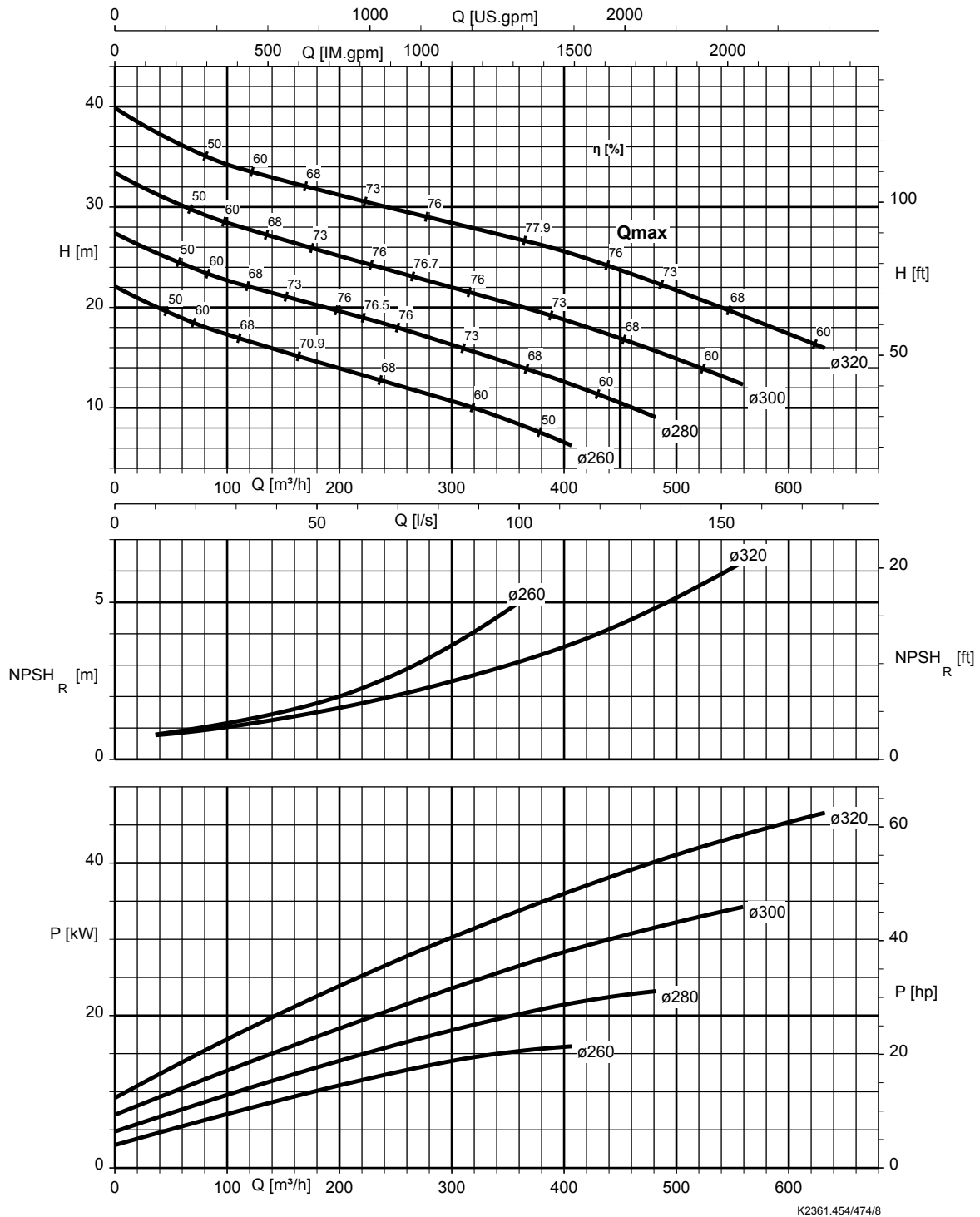
KWP K 150-125-500,  $n = 1450 \text{ min}^{-1}$



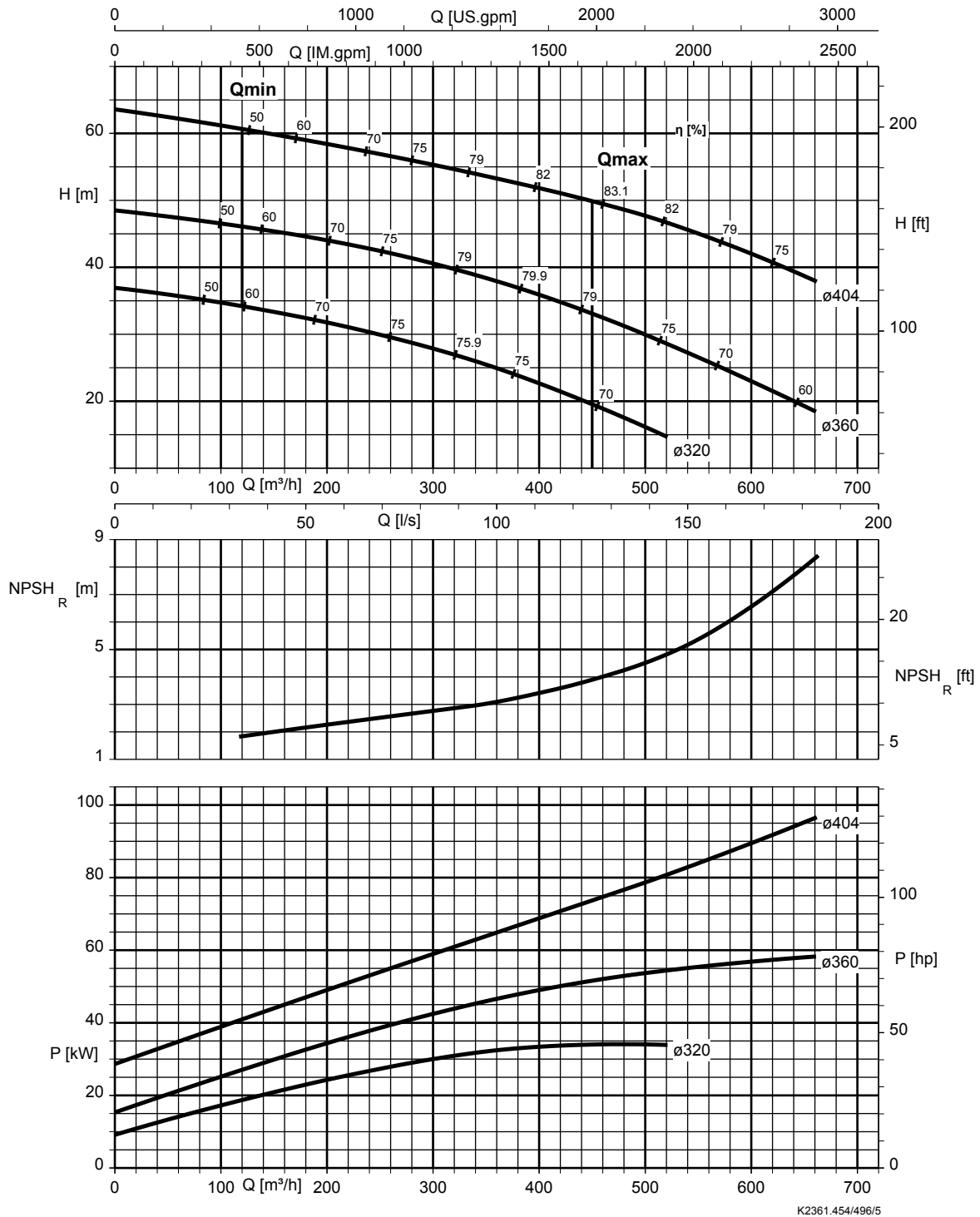
KWP K 150-125-503,  $n = 1450 \text{ min}^{-1}$



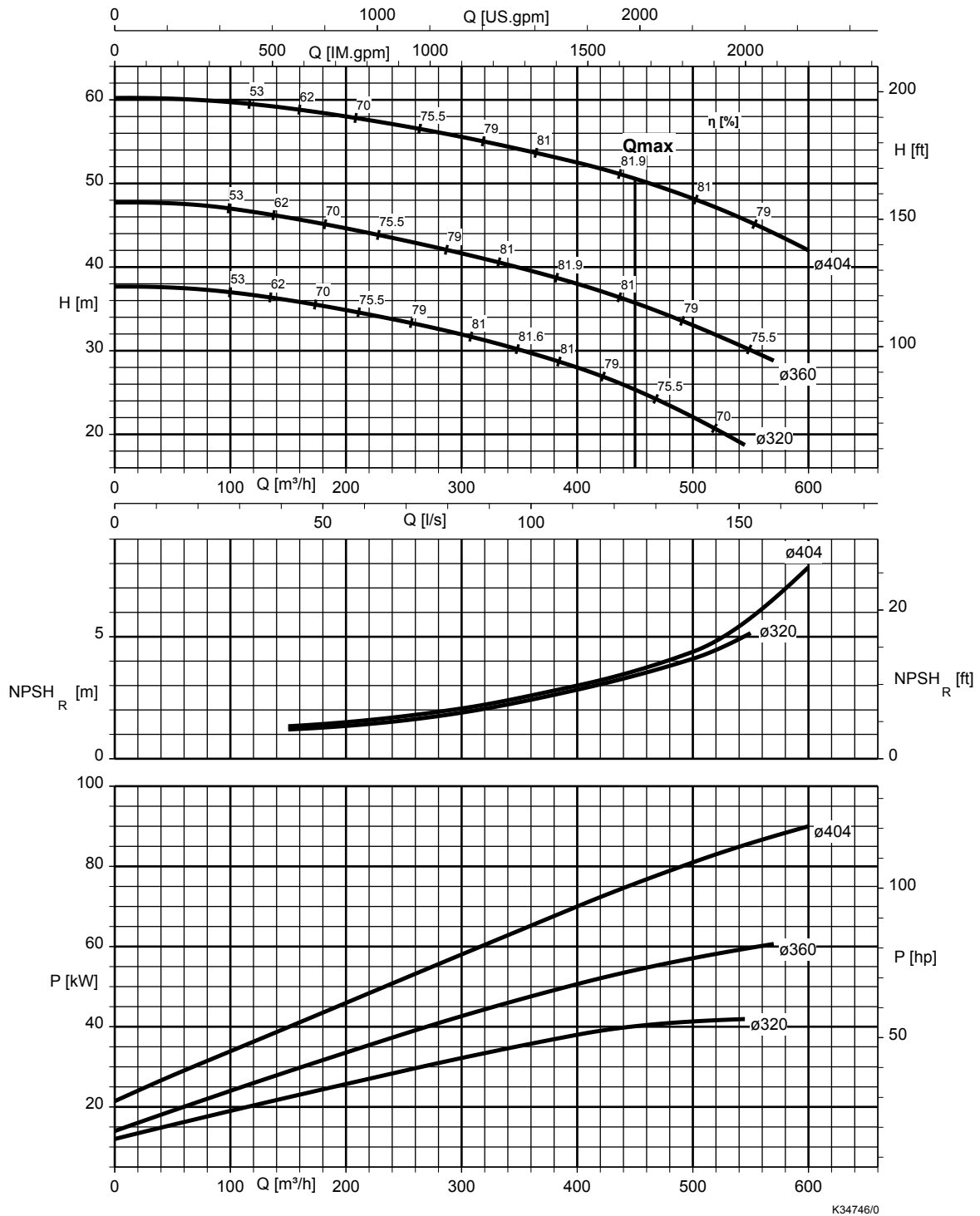
KWP K 150-150-315,  $n = 1450 \text{ min}^{-1}$



KWP K 150-150-400,  $n = 1450 \text{ min}^{-1}$

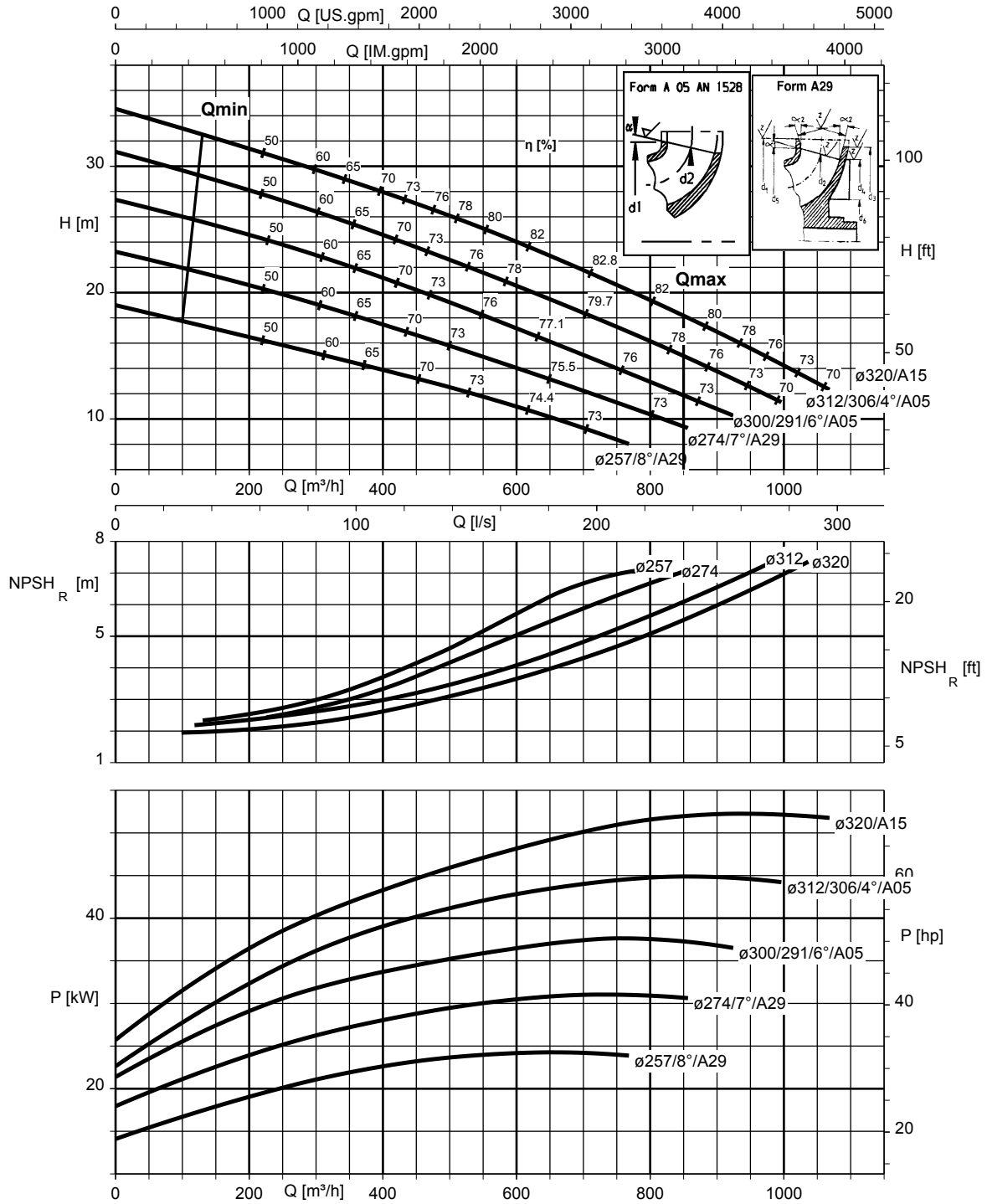


KWP K 150-150-403,  $n = 1450 \text{ min}^{-1}$



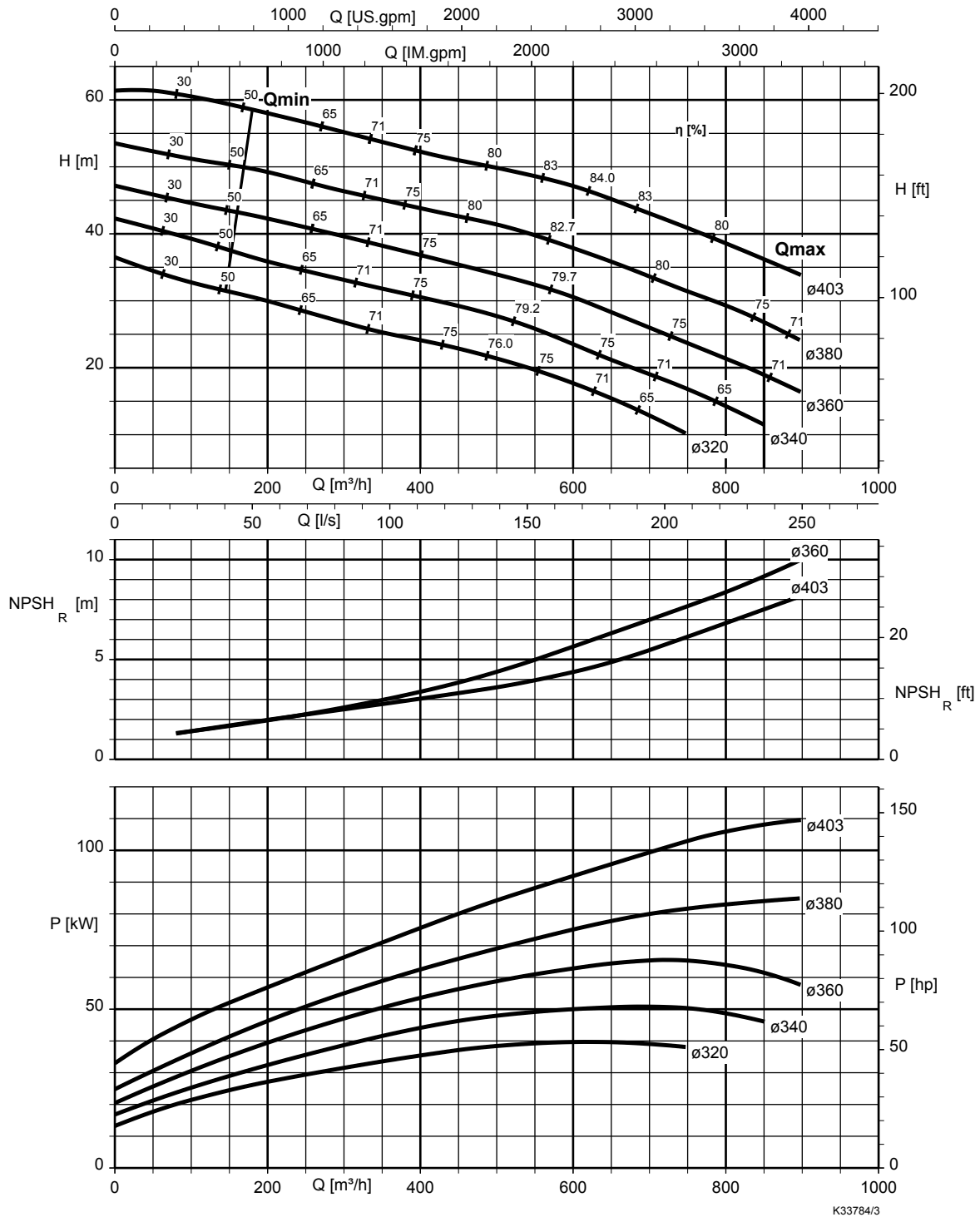


KWP K 200-200-320,  $n = 1450 \text{ min}^{-1}$

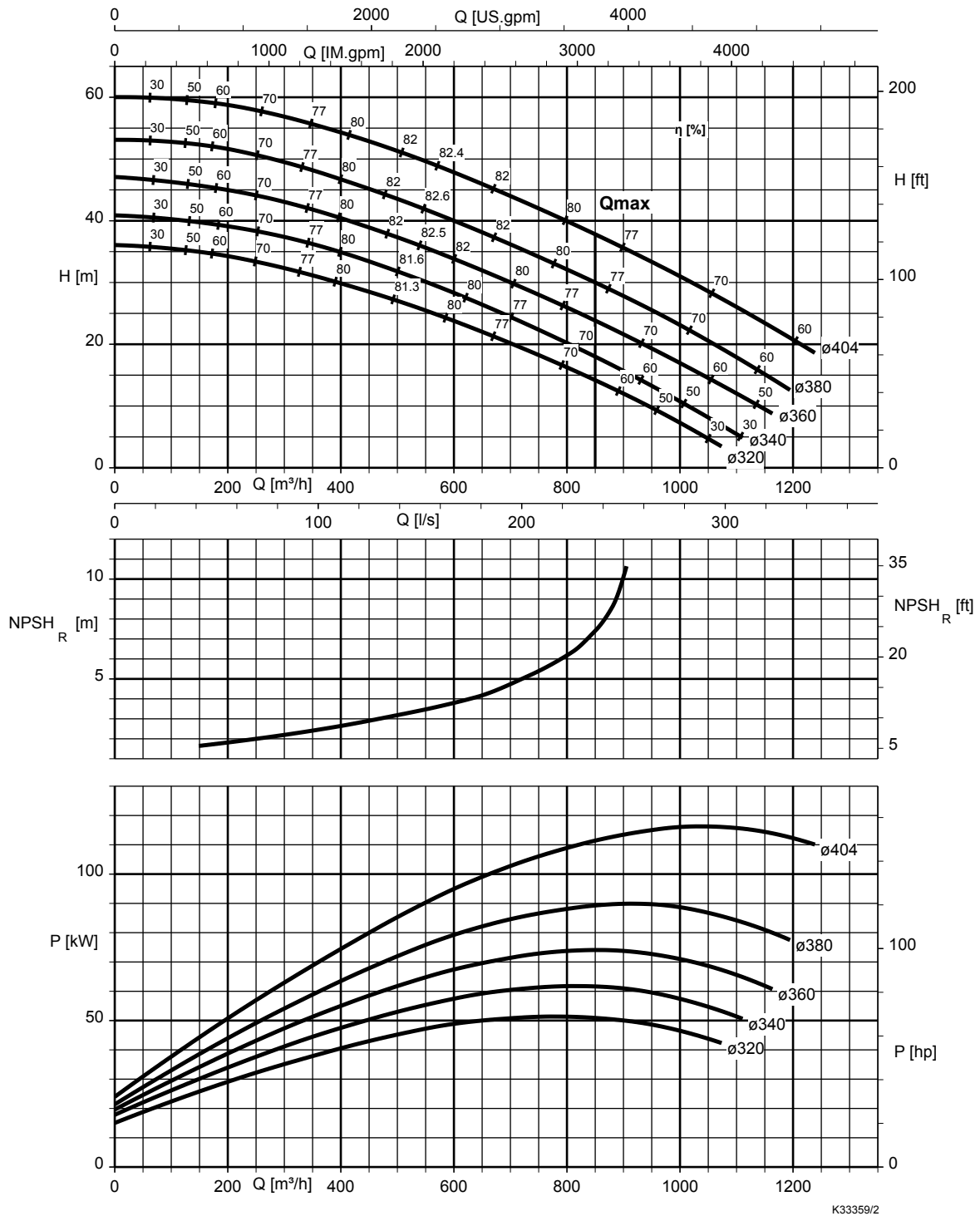


K34437/3

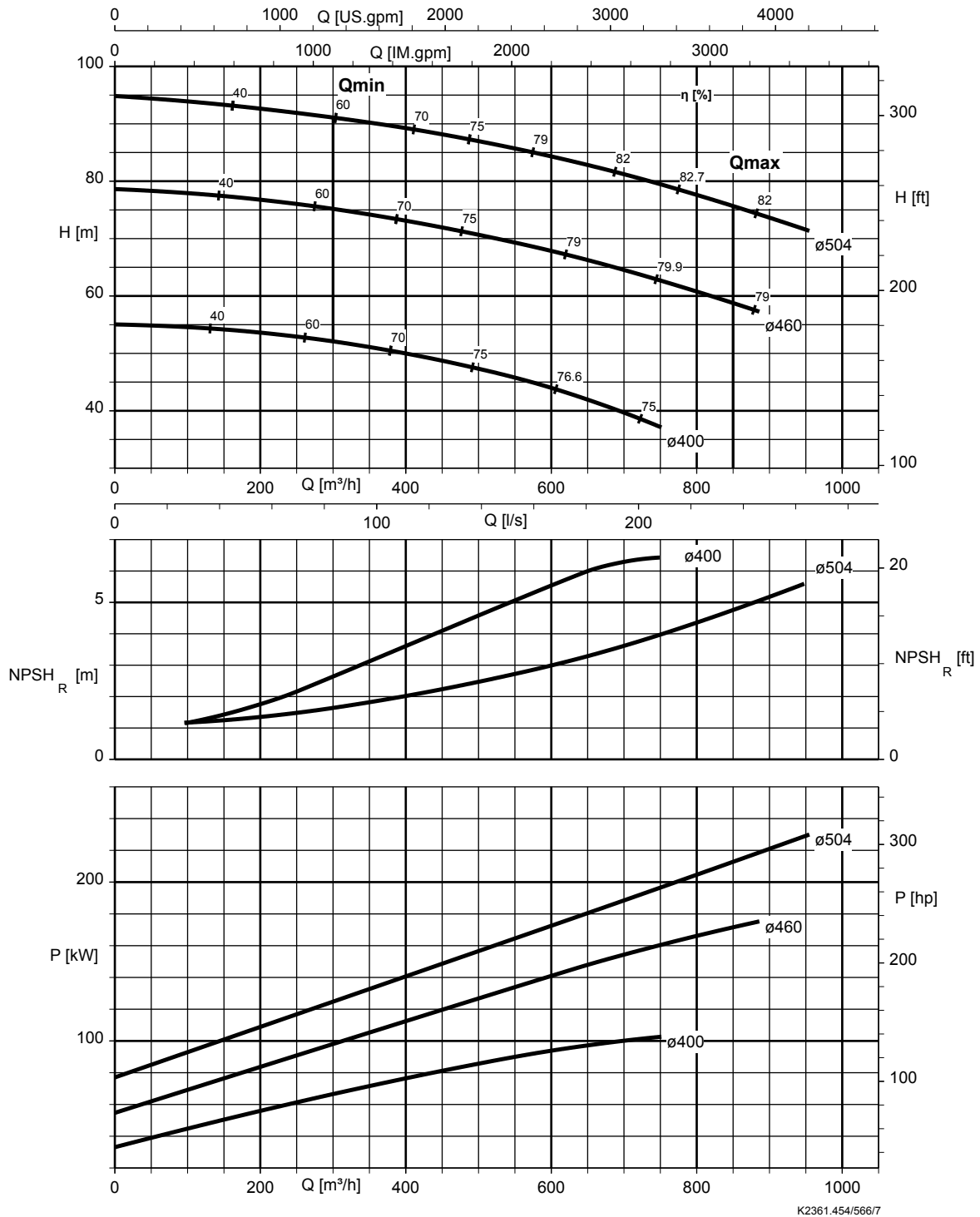
KWP K 200-200-400,  $n = 1450 \text{ min}^{-1}$



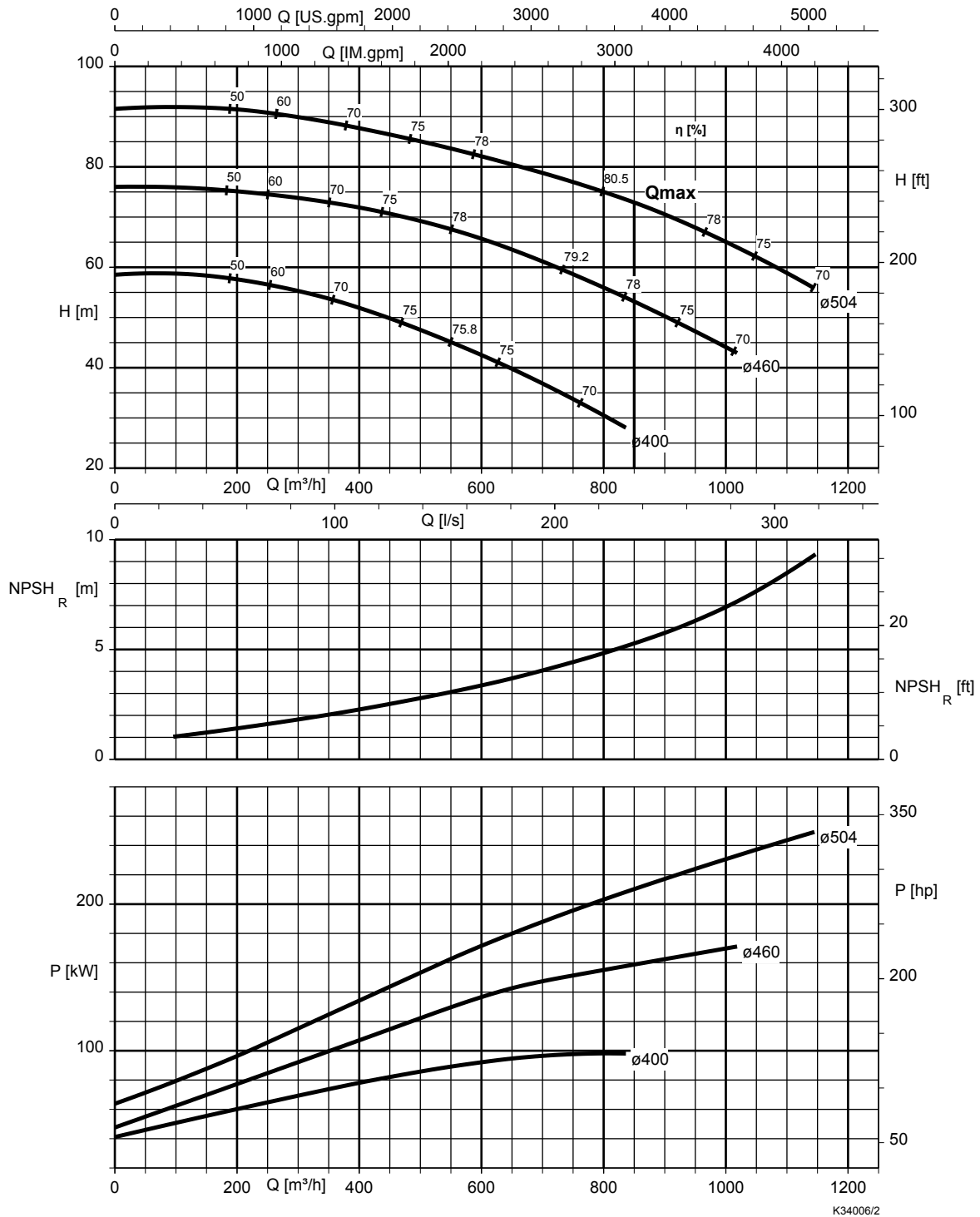
KWP K 200-200-403,  $n = 1450 \text{ min}^{-1}$



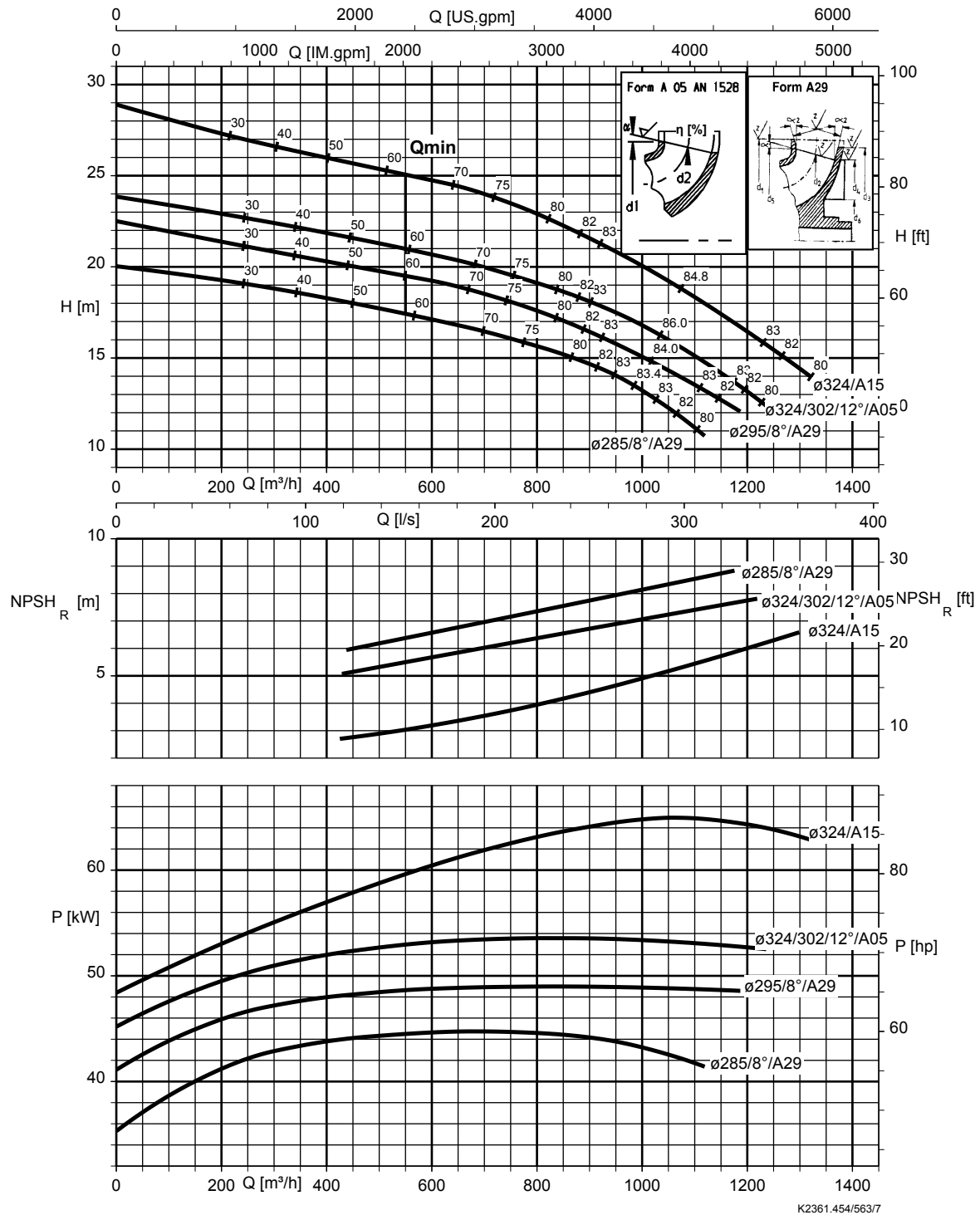
KWP K 200-200-500,  $n = 1450 \text{ min}^{-1}$



KWP K 200-200-503,  $n = 1450 \text{ min}^{-1}$

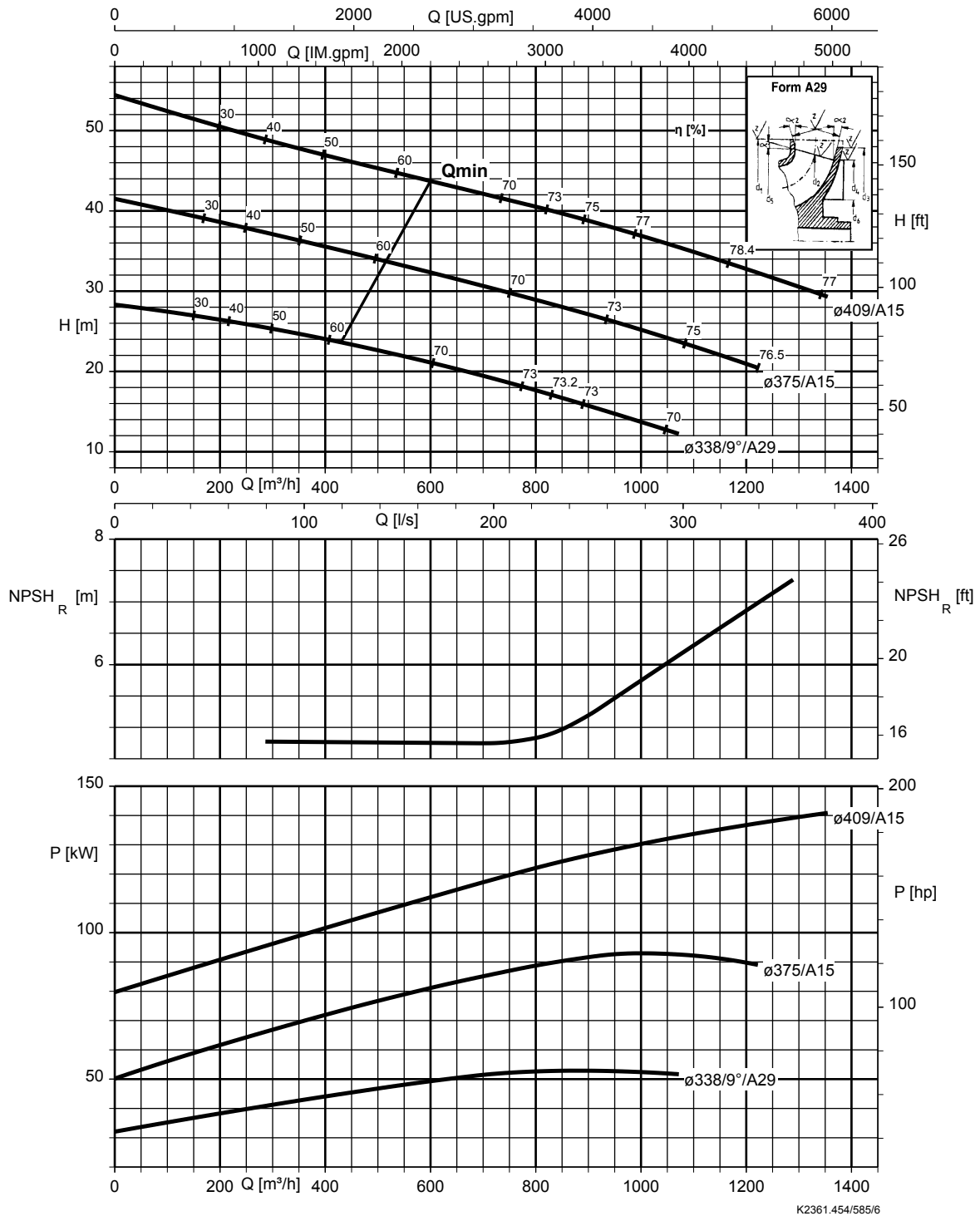


KWP K 250-250-315,  $n = 1450 \text{ min}^{-1}$

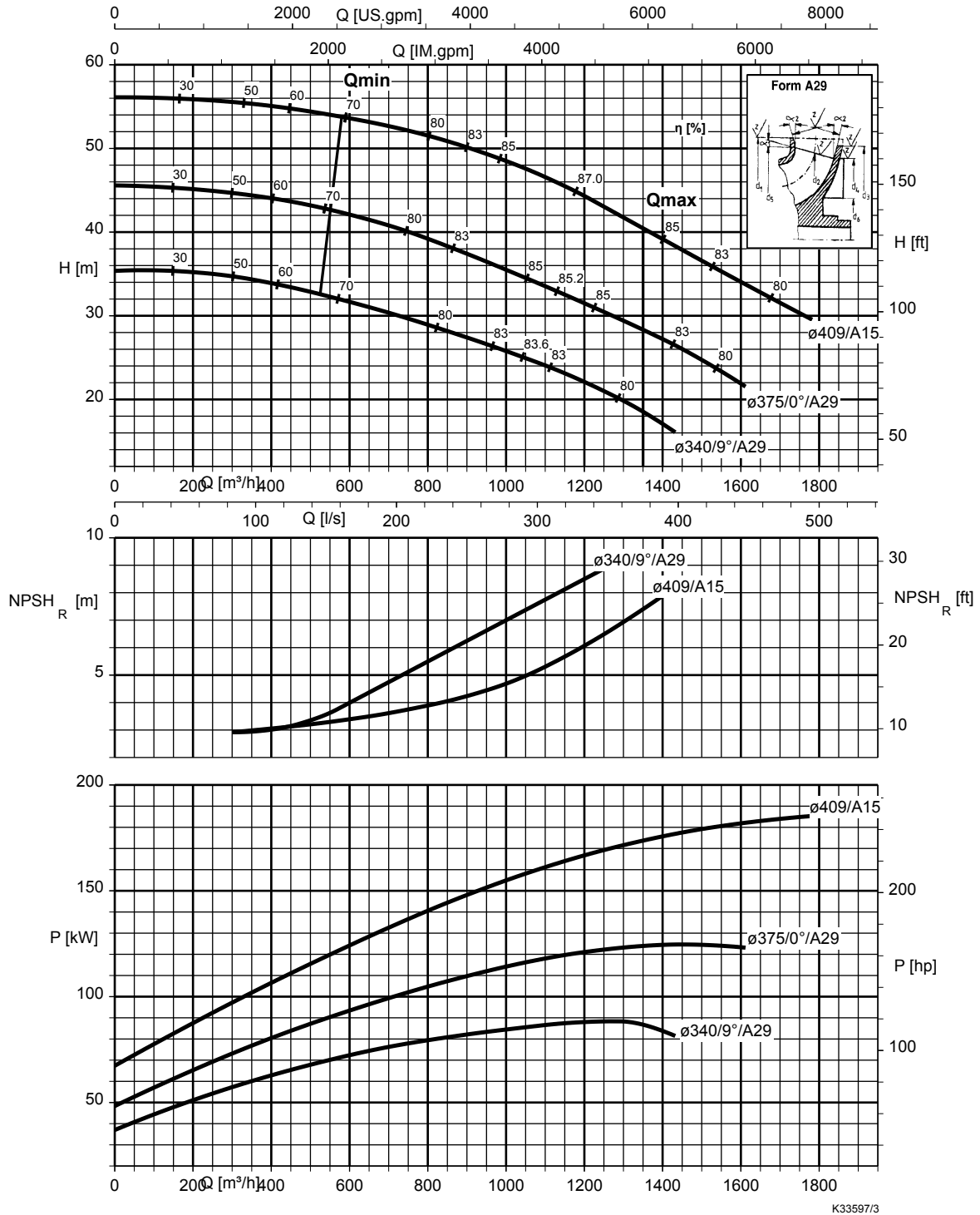


K2361.454/563/7

KWP K 250-250-400,  $n = 1450 \text{ min}^{-1}$



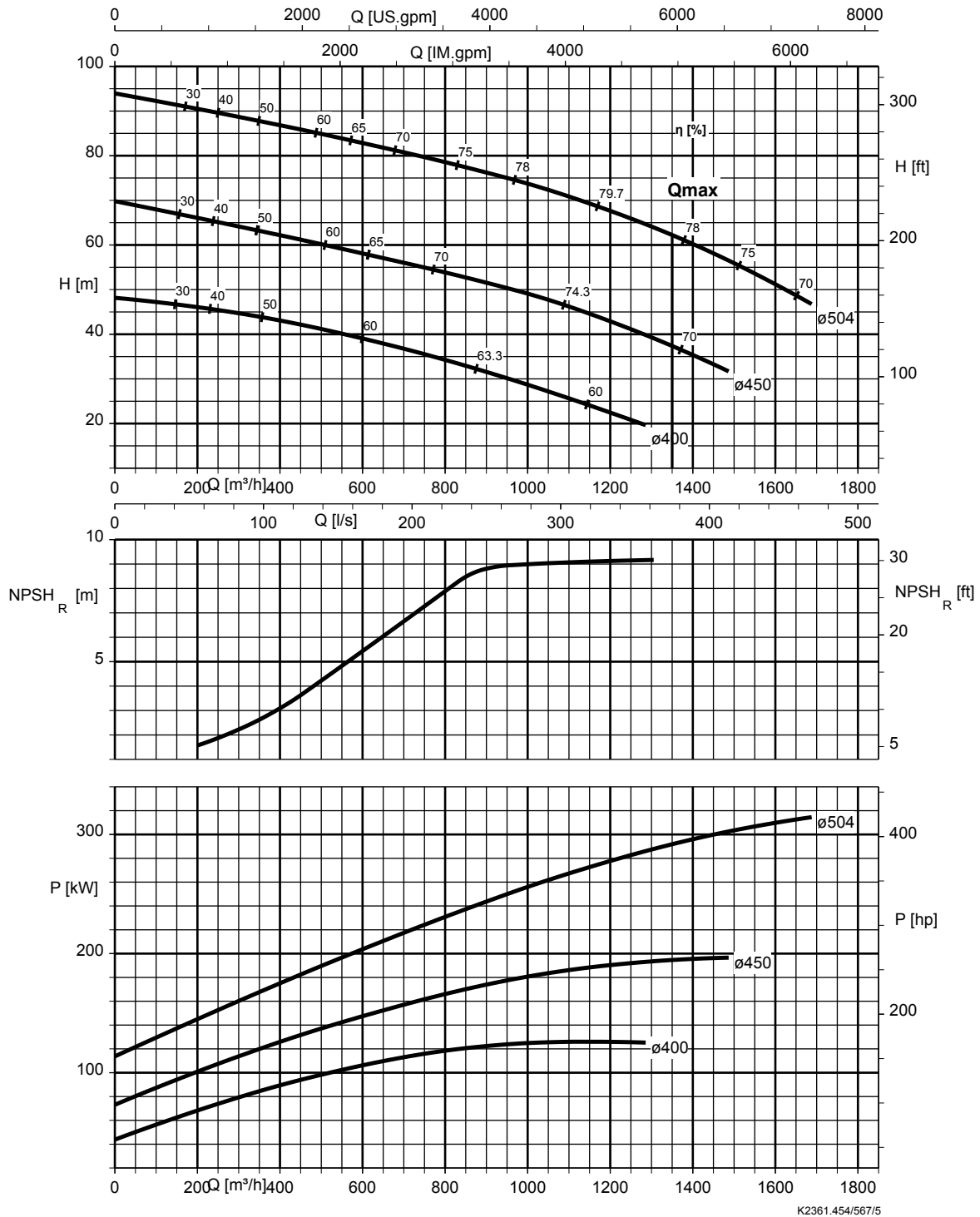
KWP K 250-250-403,  $n = 1450 \text{ min}^{-1}$



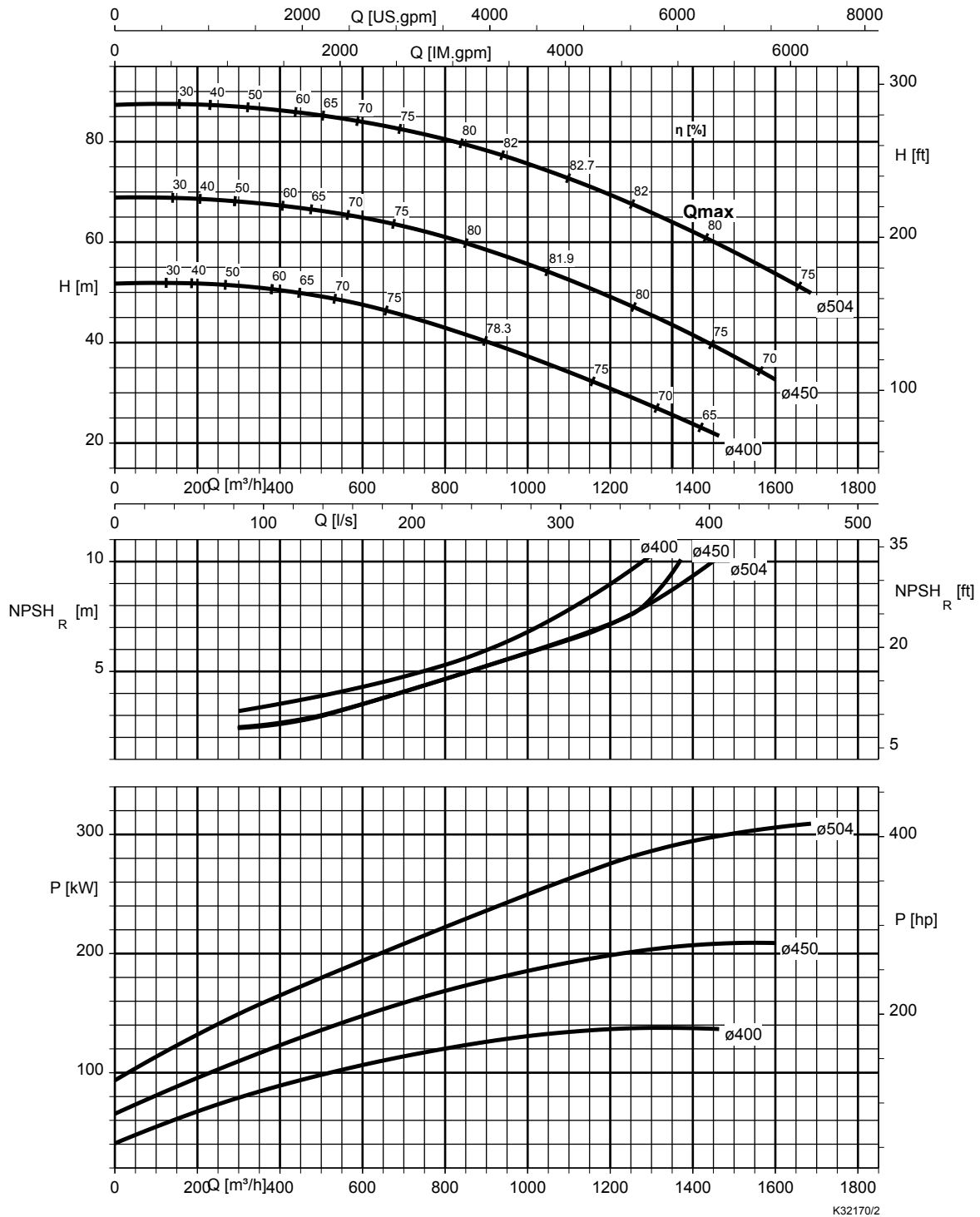
K33597/3



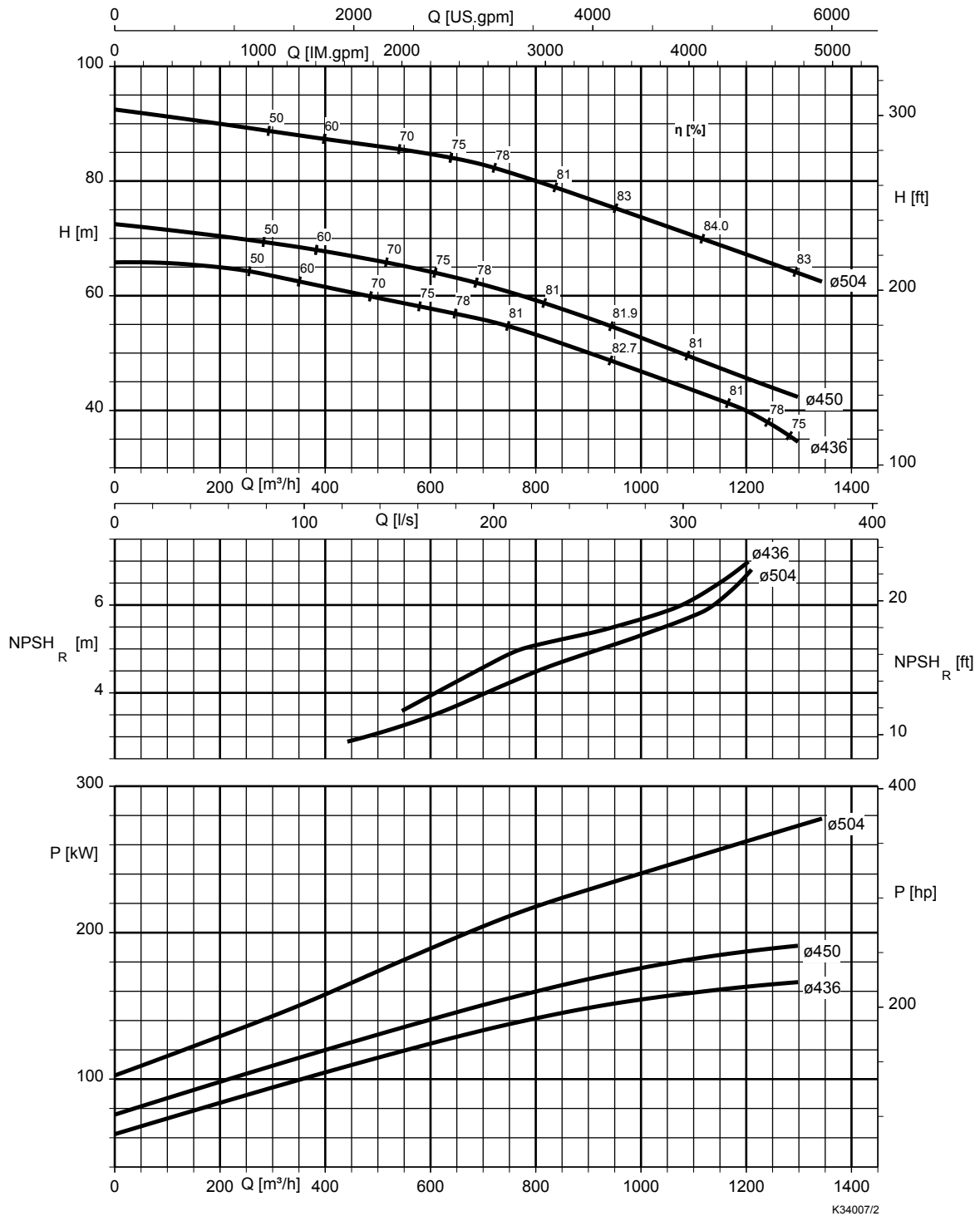
KWP K 250-250-500,  $n = 1450 \text{ min}^{-1}$



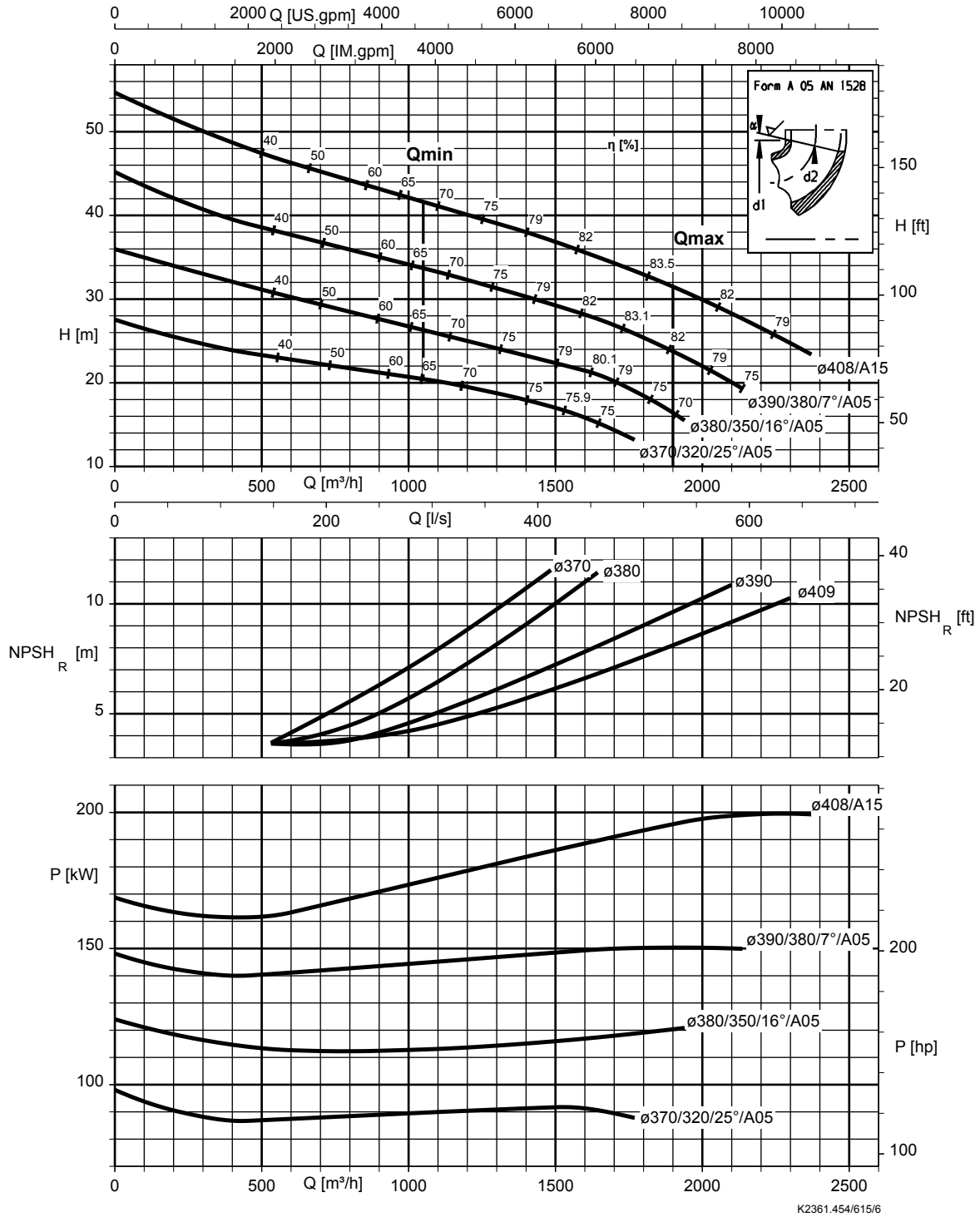
KWP K 250-250-503,  $n = 1450 \text{ min}^{-1}$



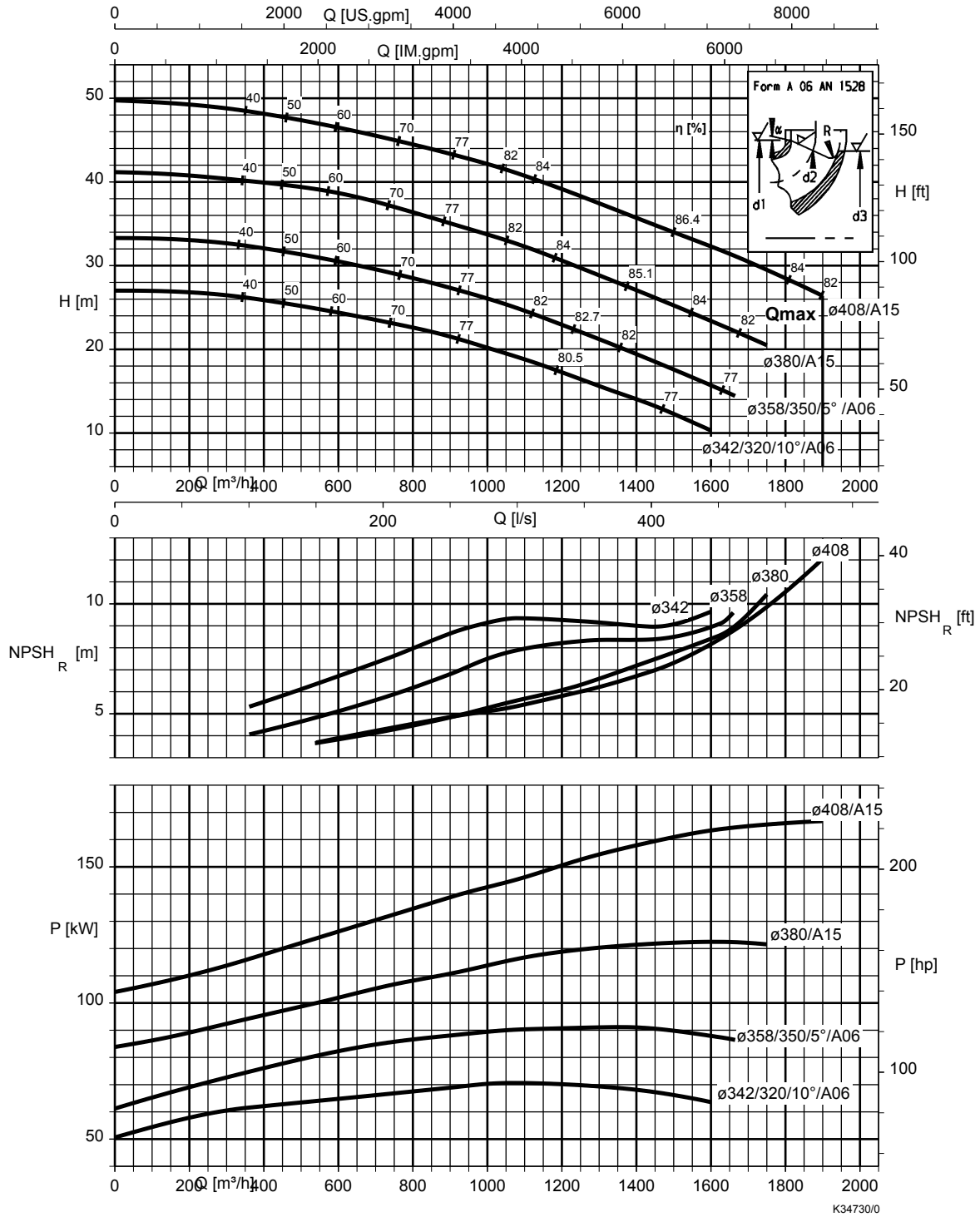
KWP K 250-250-505,  $n = 1450 \text{ min}^{-1}$



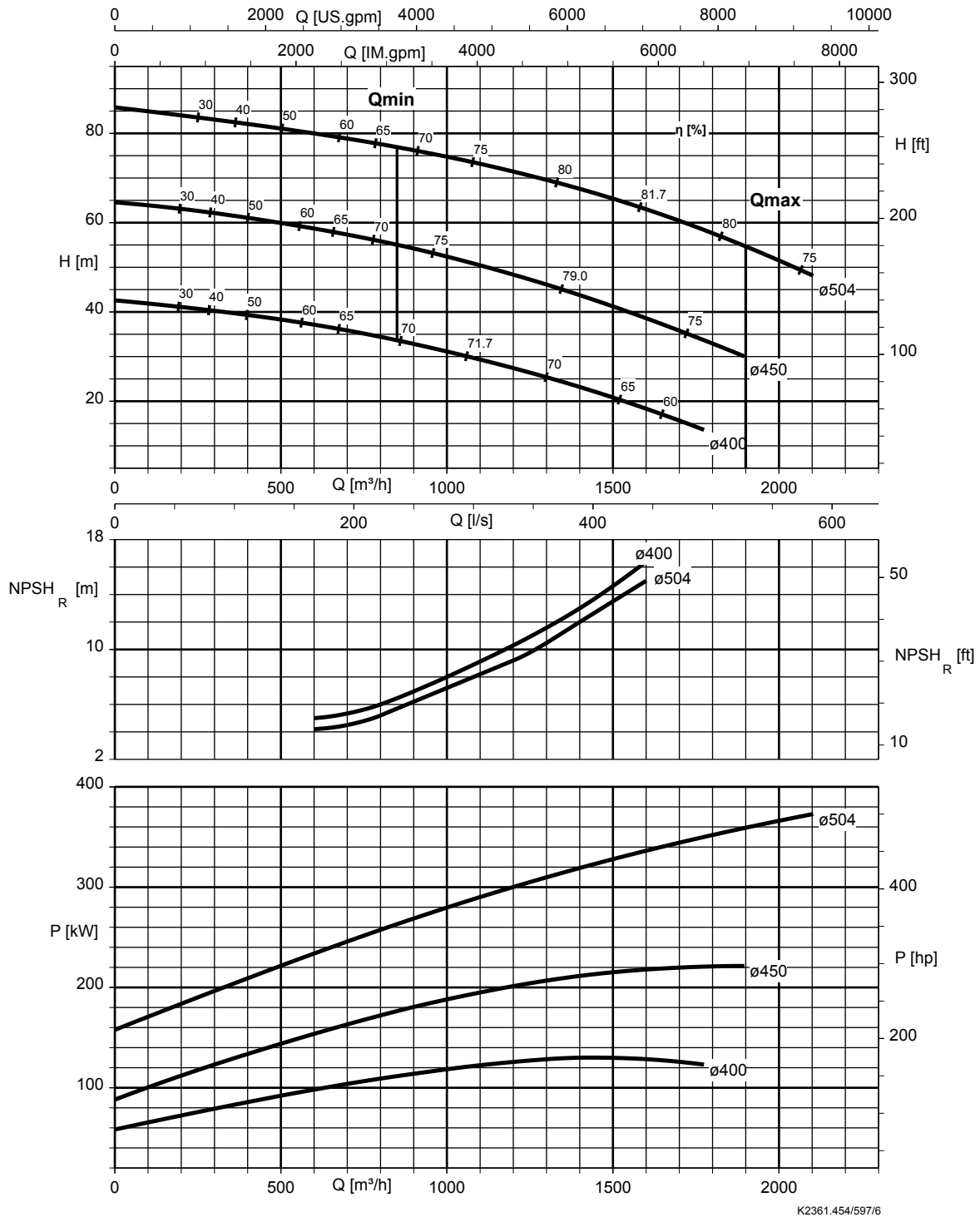
KWP K 300-300-400,  $n = 1450 \text{ min}^{-1}$



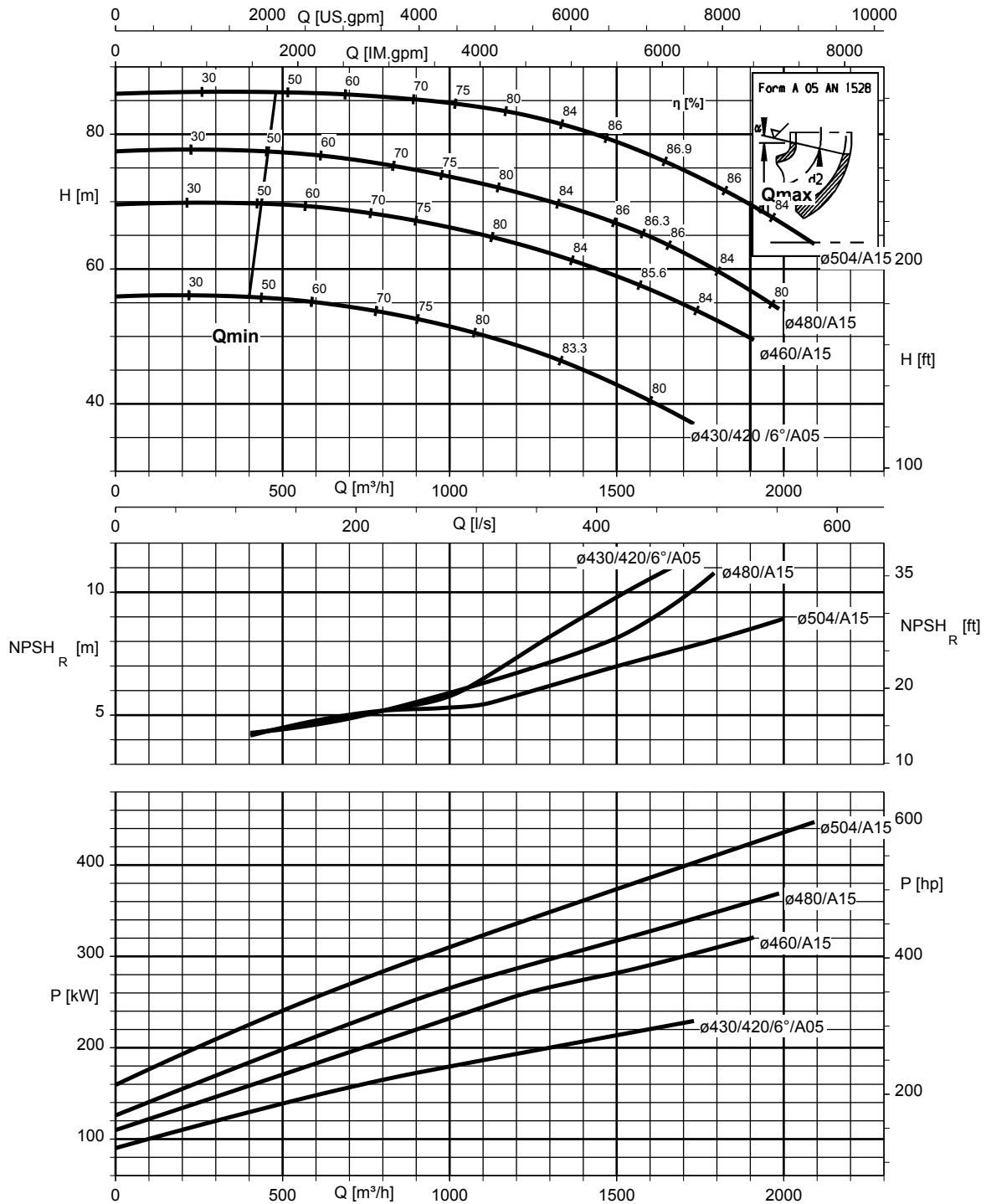
KWP K 300-300-401,  $n = 1450 \text{ min}^{-1}$



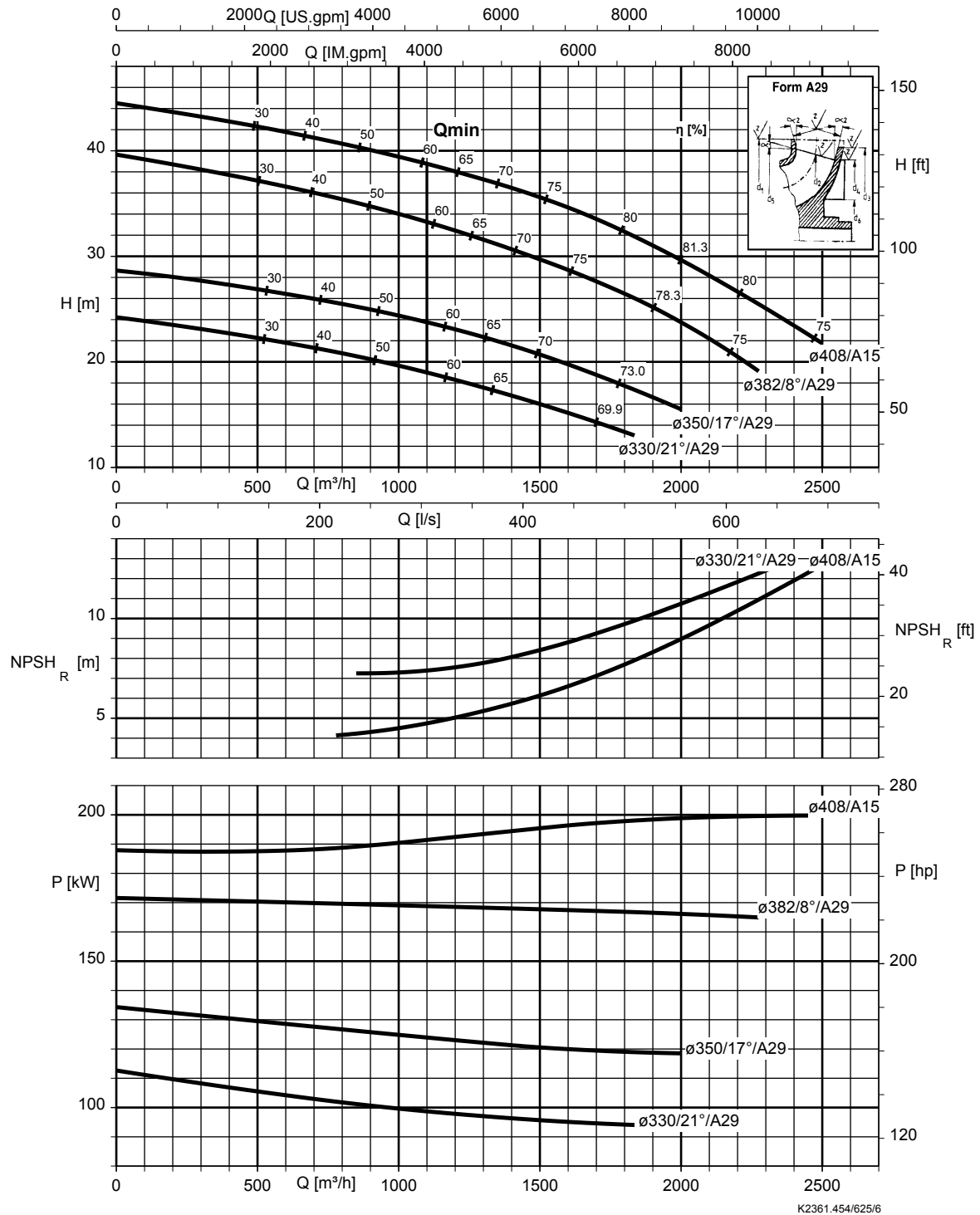
KWP K 300-300-500,  $n = 1450 \text{ min}^{-1}$



KWP K 300-300-503,  $n = 1450 \text{ min}^{-1}$



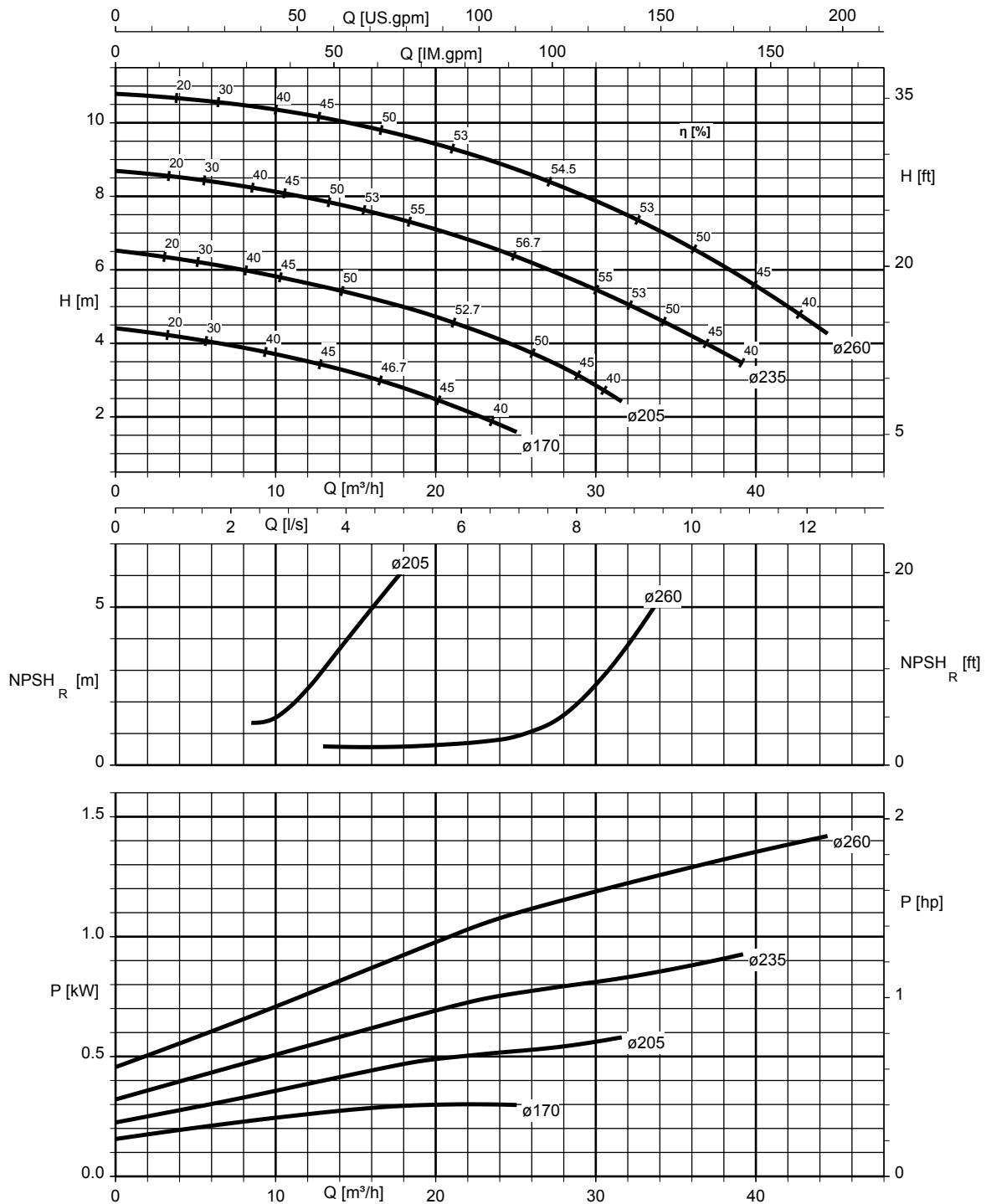
KWP K 350-350-400,  $n = 1450 \text{ min}^{-1}$





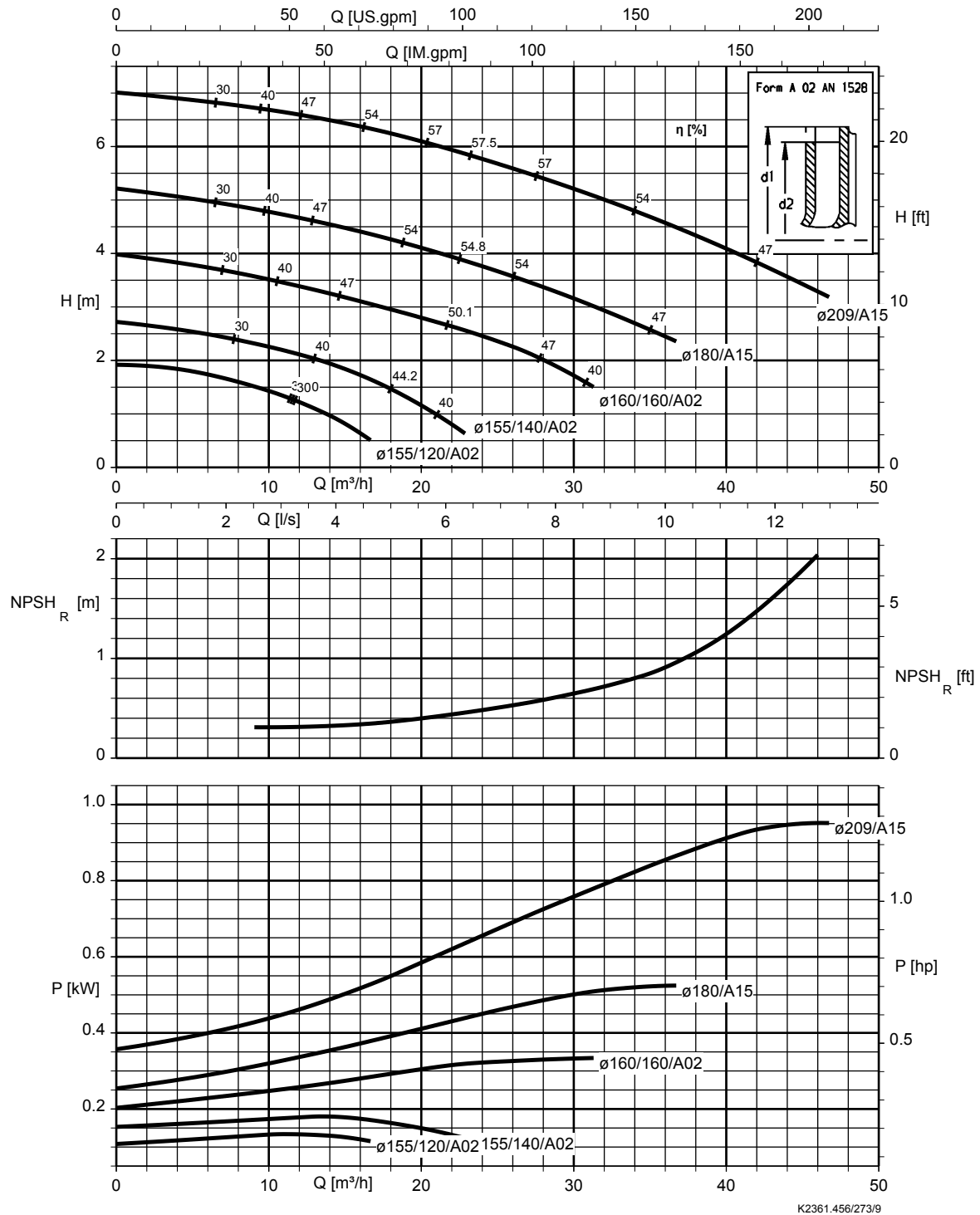
$n = 960 \text{ min}^{-1}$

KWP K 065-040-250,  $n = 960 \text{ min}^{-1}$

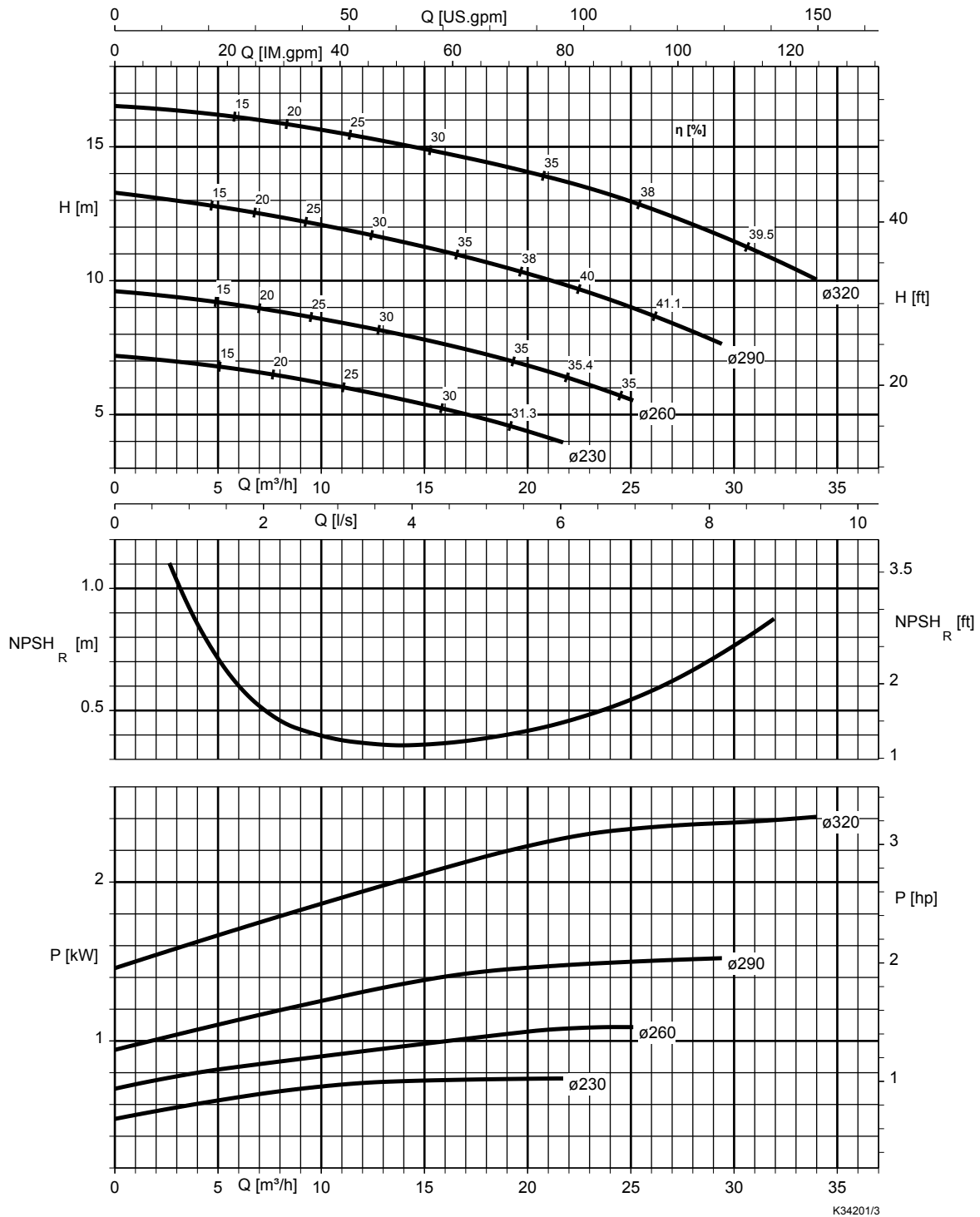


K33892/4

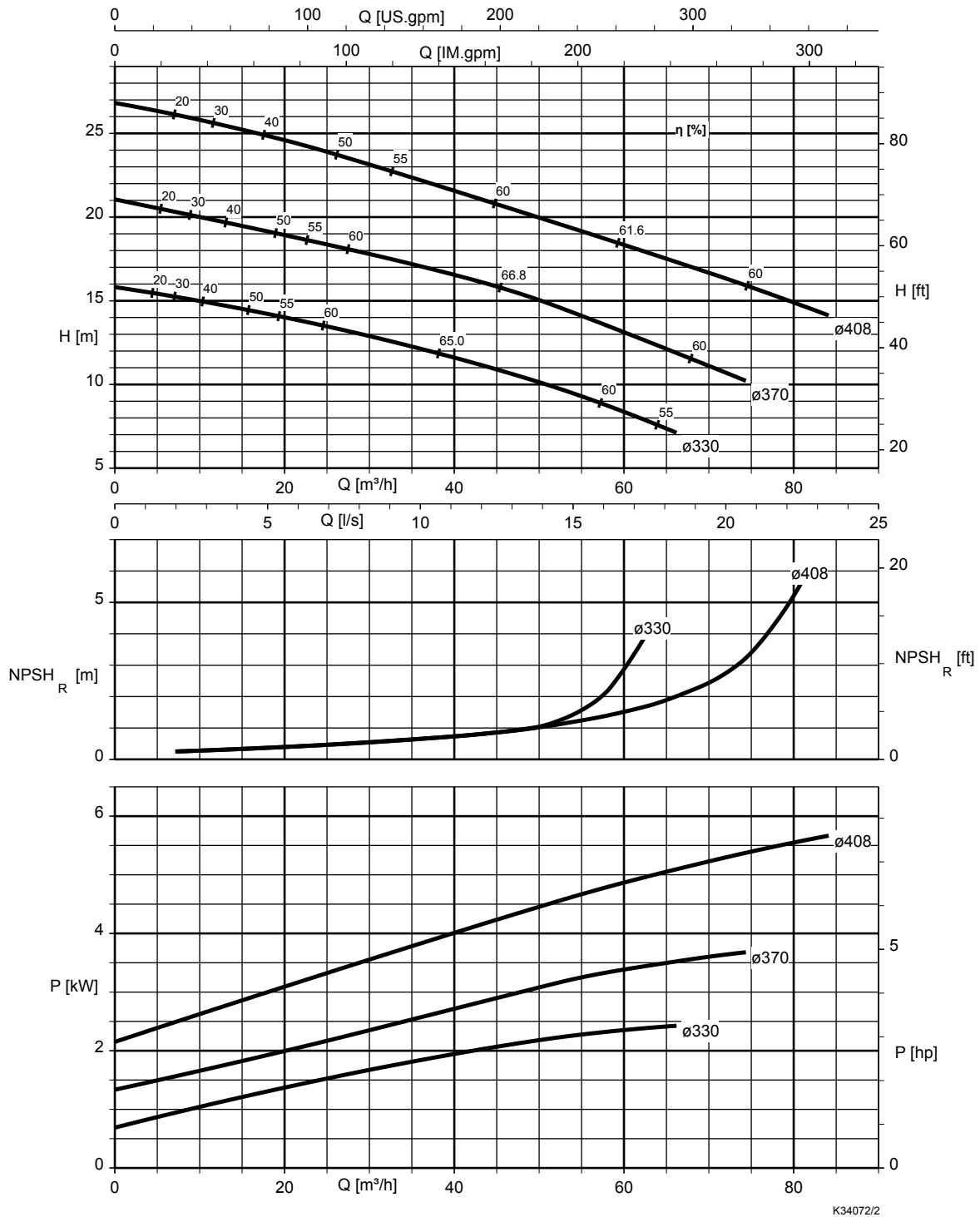
KWP K 065-050-200,  $n = 960 \text{ min}^{-1}$



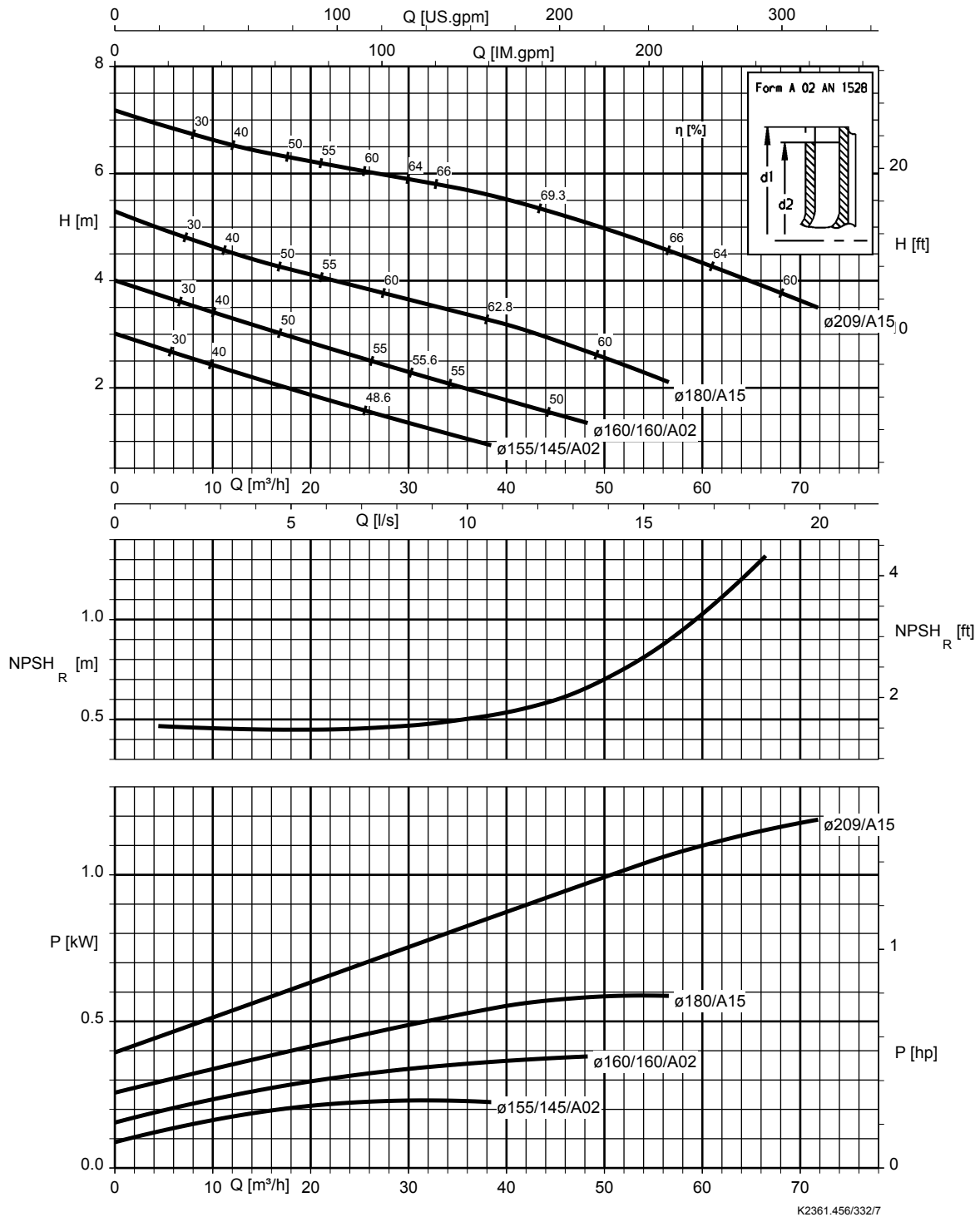
KWP K 080-040-315,  $n = 960 \text{ min}^{-1}$



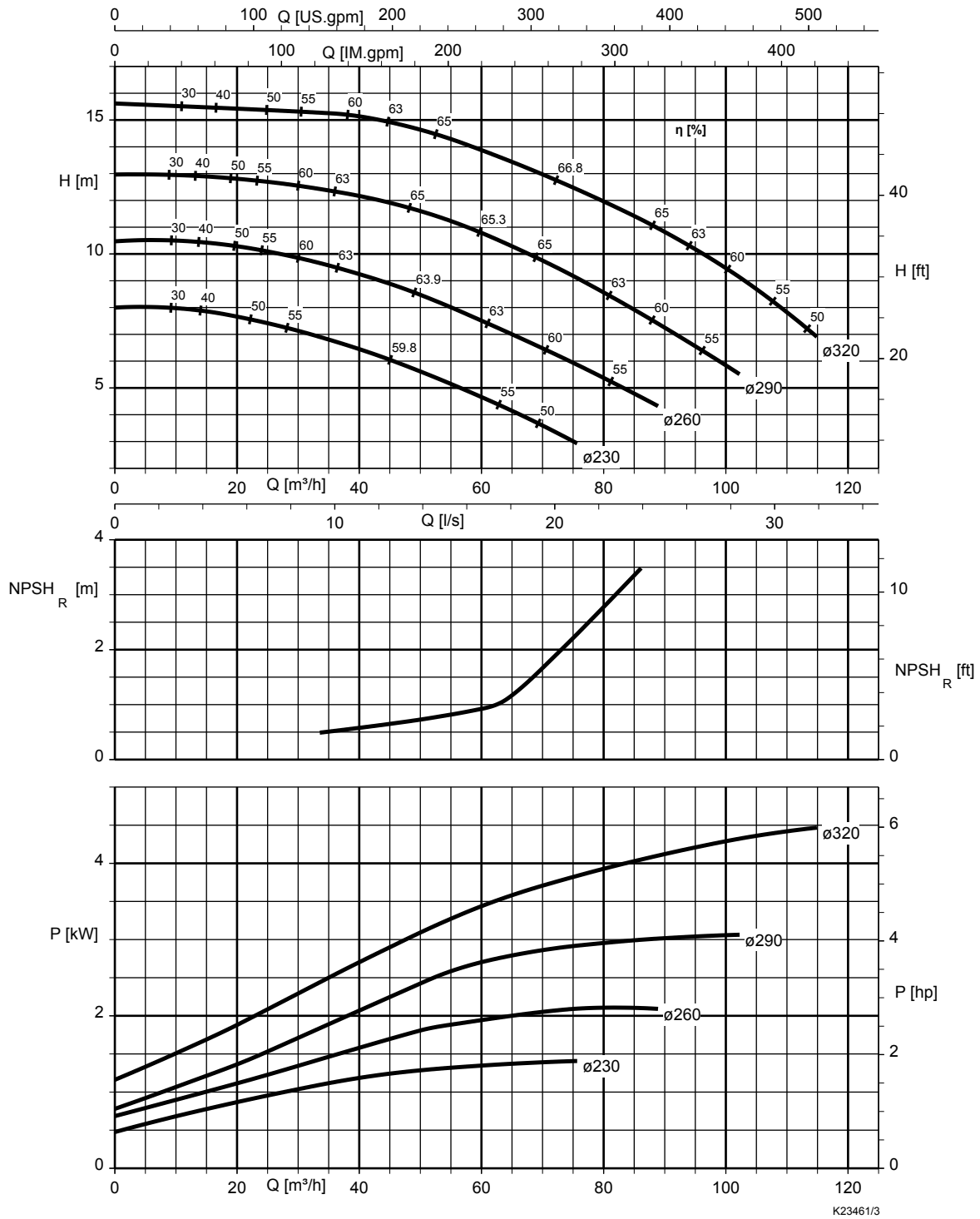
KWP K 080-050-400,  $n = 960 \text{ min}^{-1}$



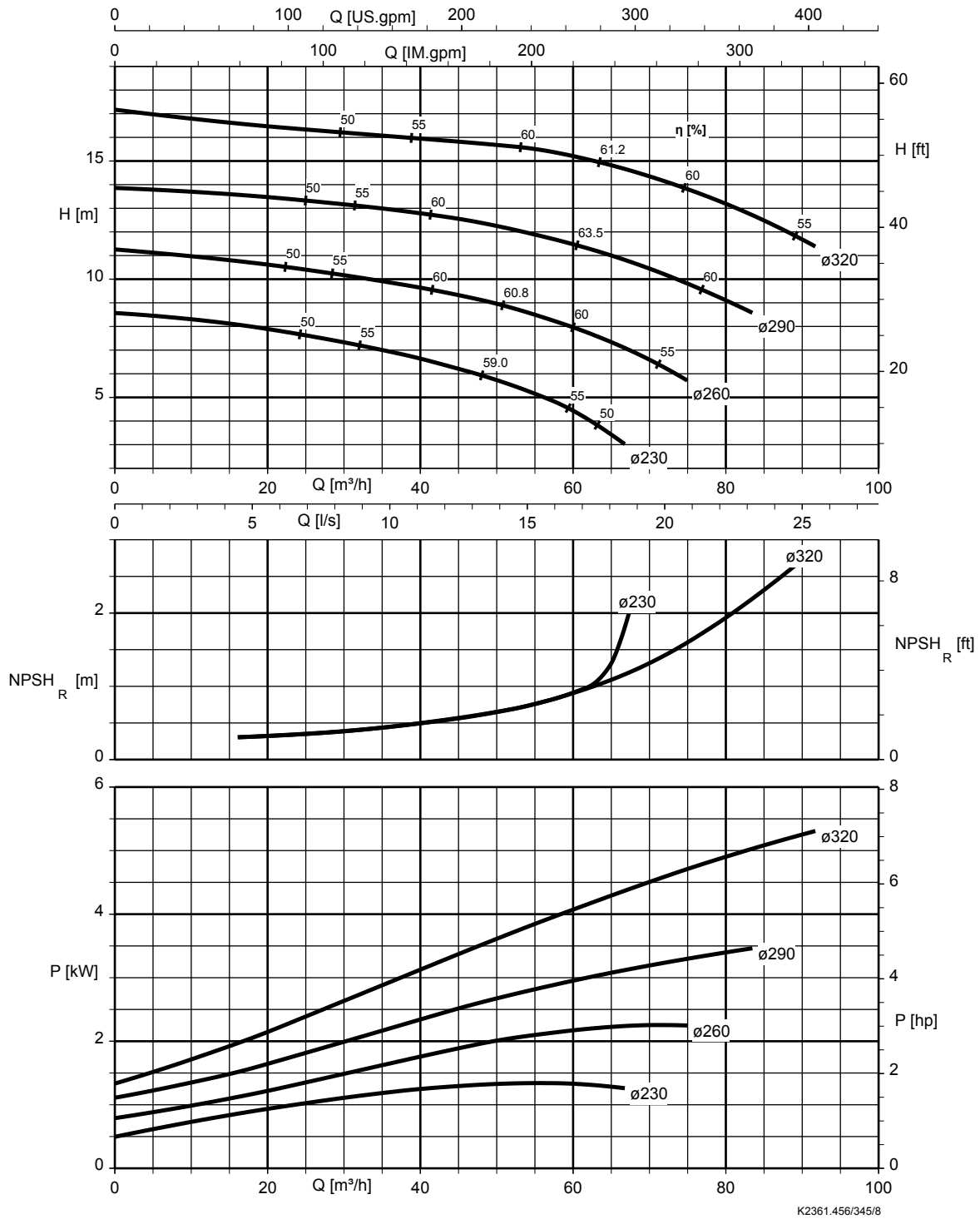
KWP K 080-065-200,  $n = 960 \text{ min}^{-1}$



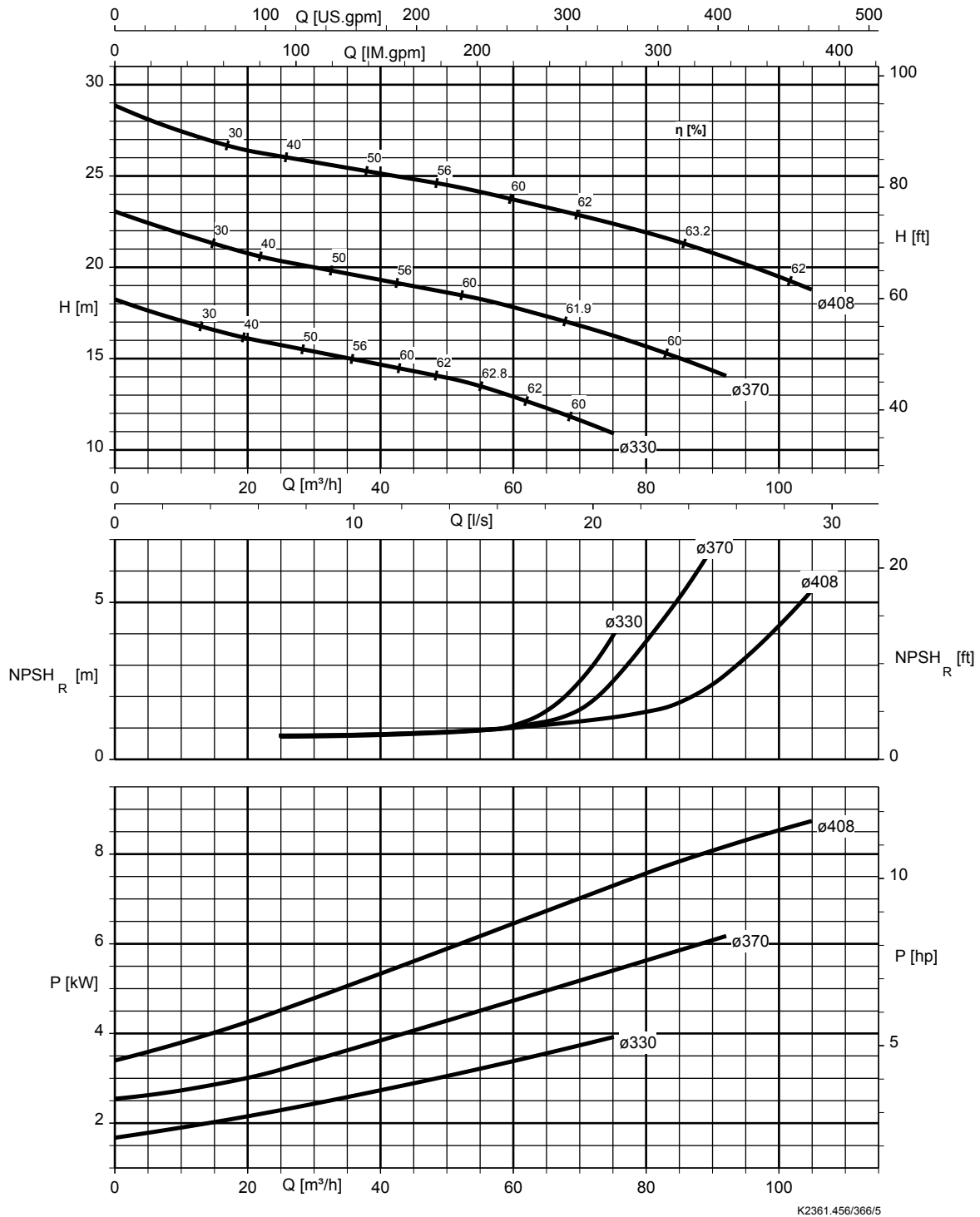
KWP K 080-065-313,  $n = 960 \text{ min}^{-1}$



KWP K 080-065-315,  $n = 960 \text{ min}^{-1}$

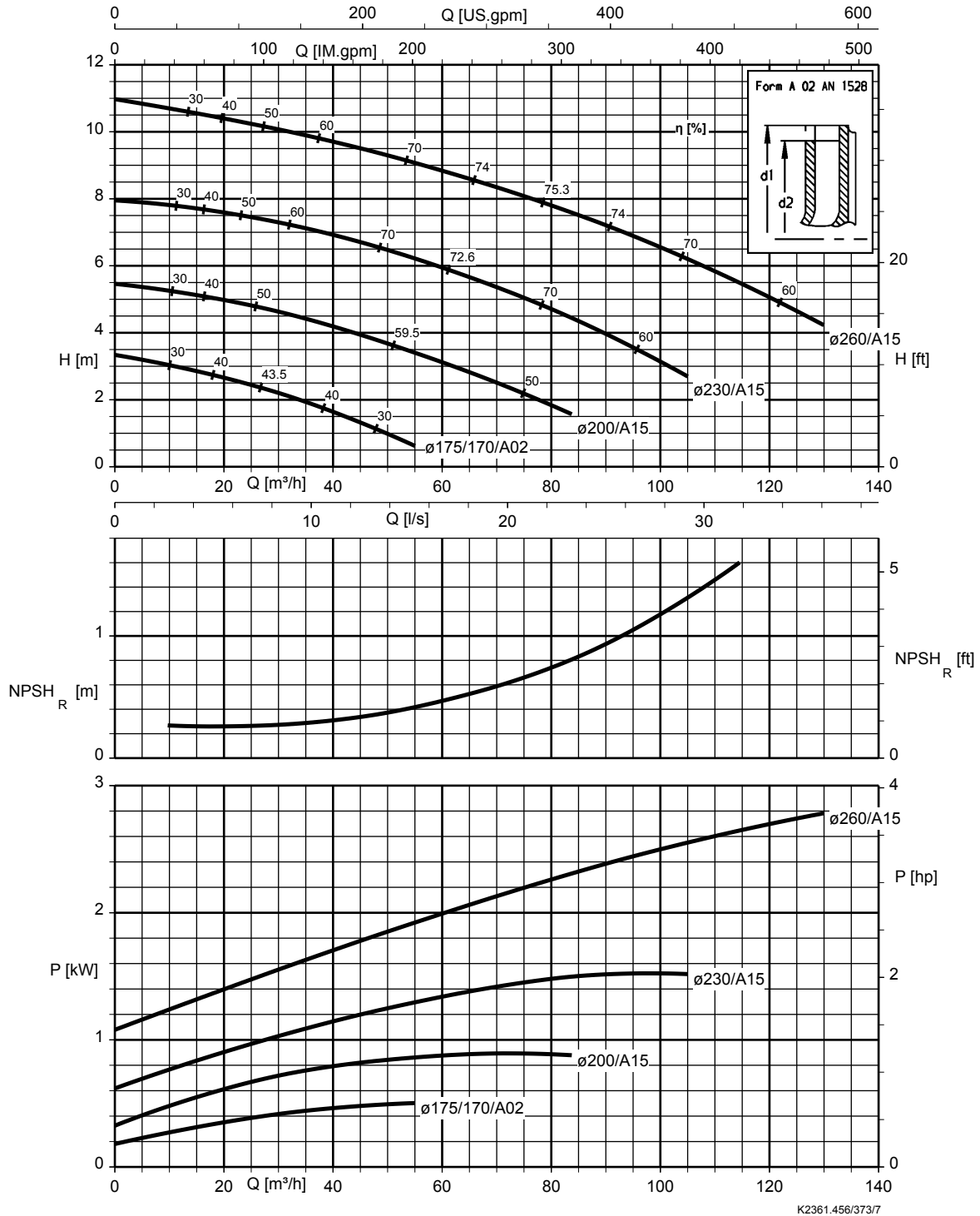


KWP K 080-065-400,  $n = 960 \text{ min}^{-1}$

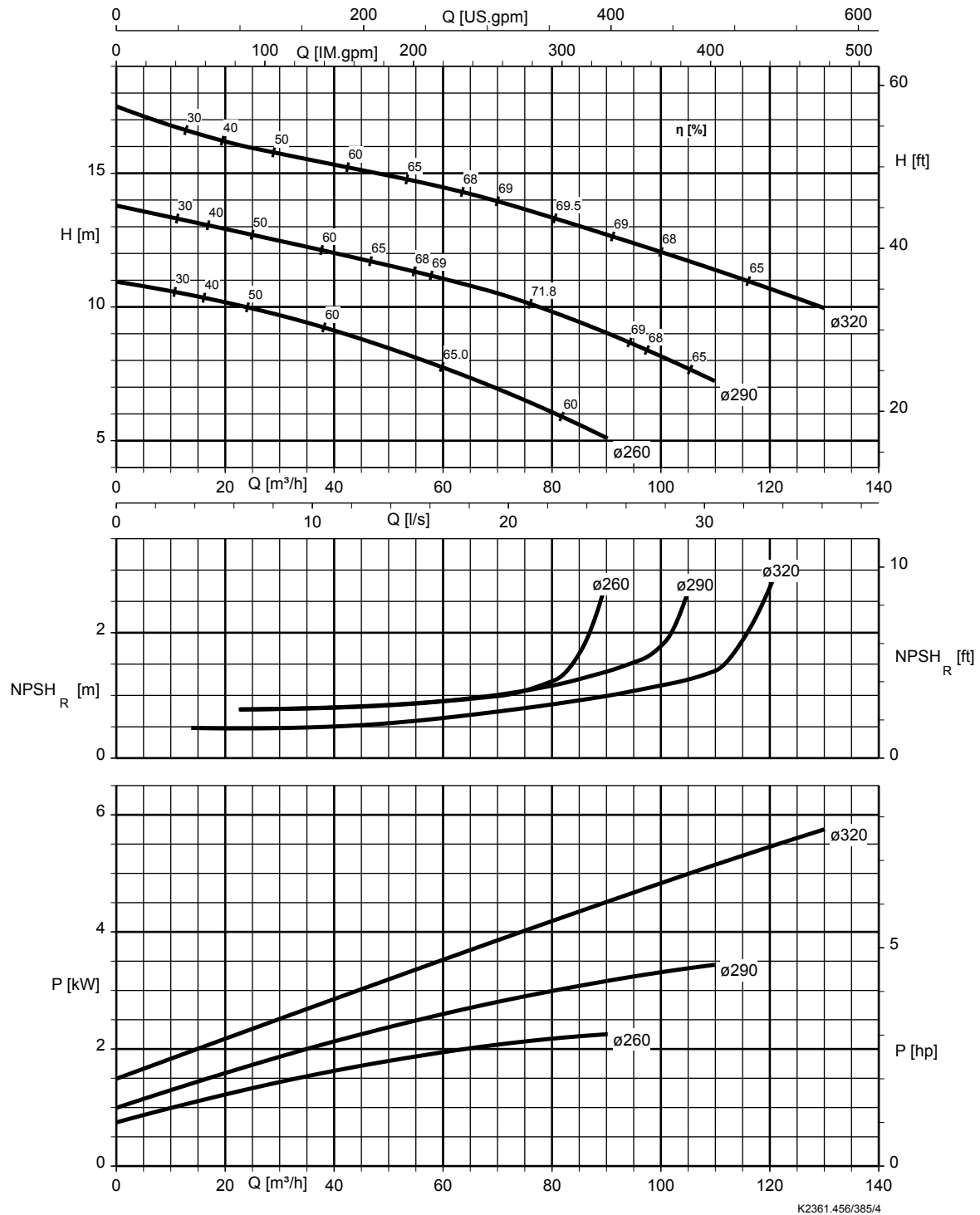




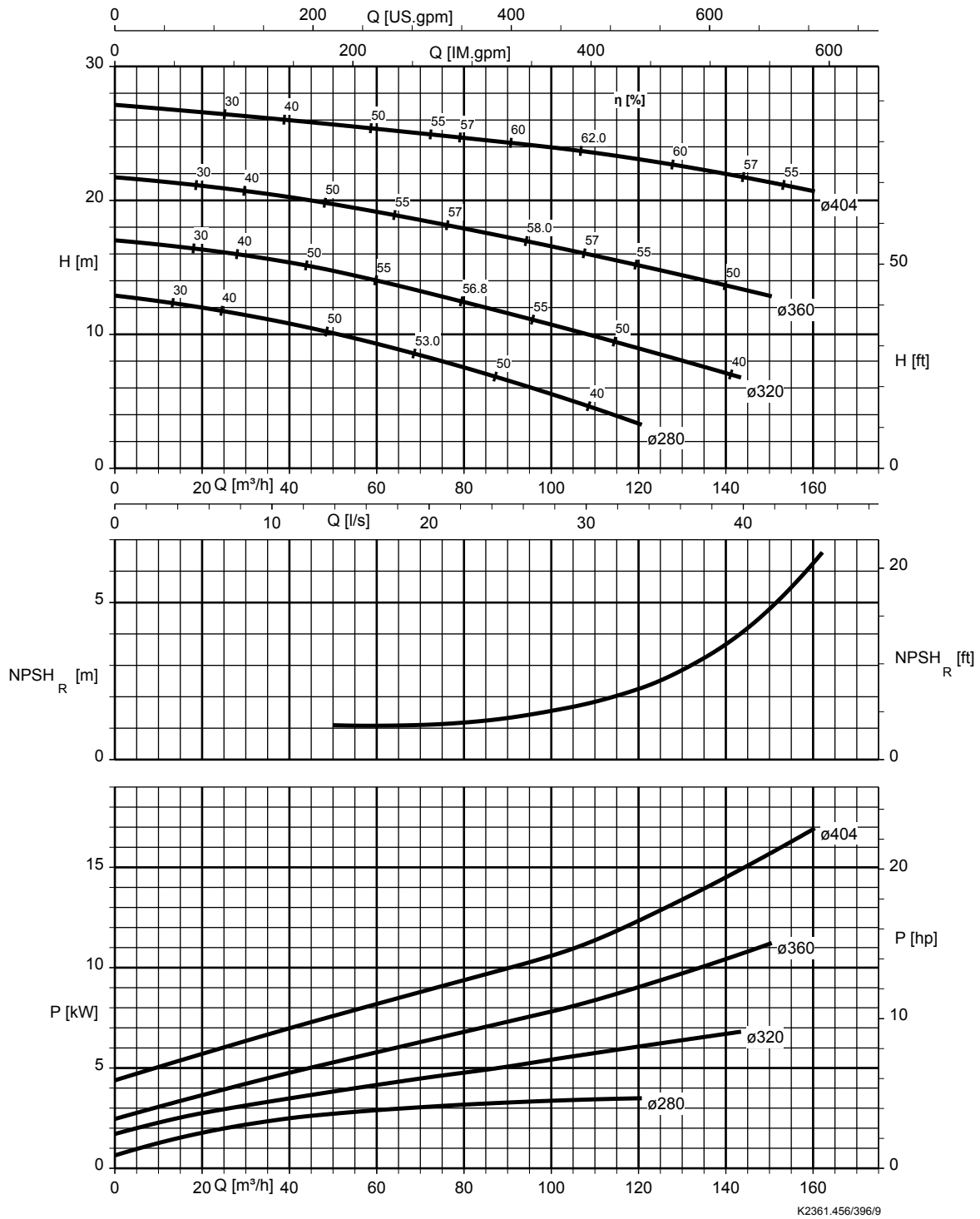
KWP K 100-080-250,  $n = 960 \text{ min}^{-1}$



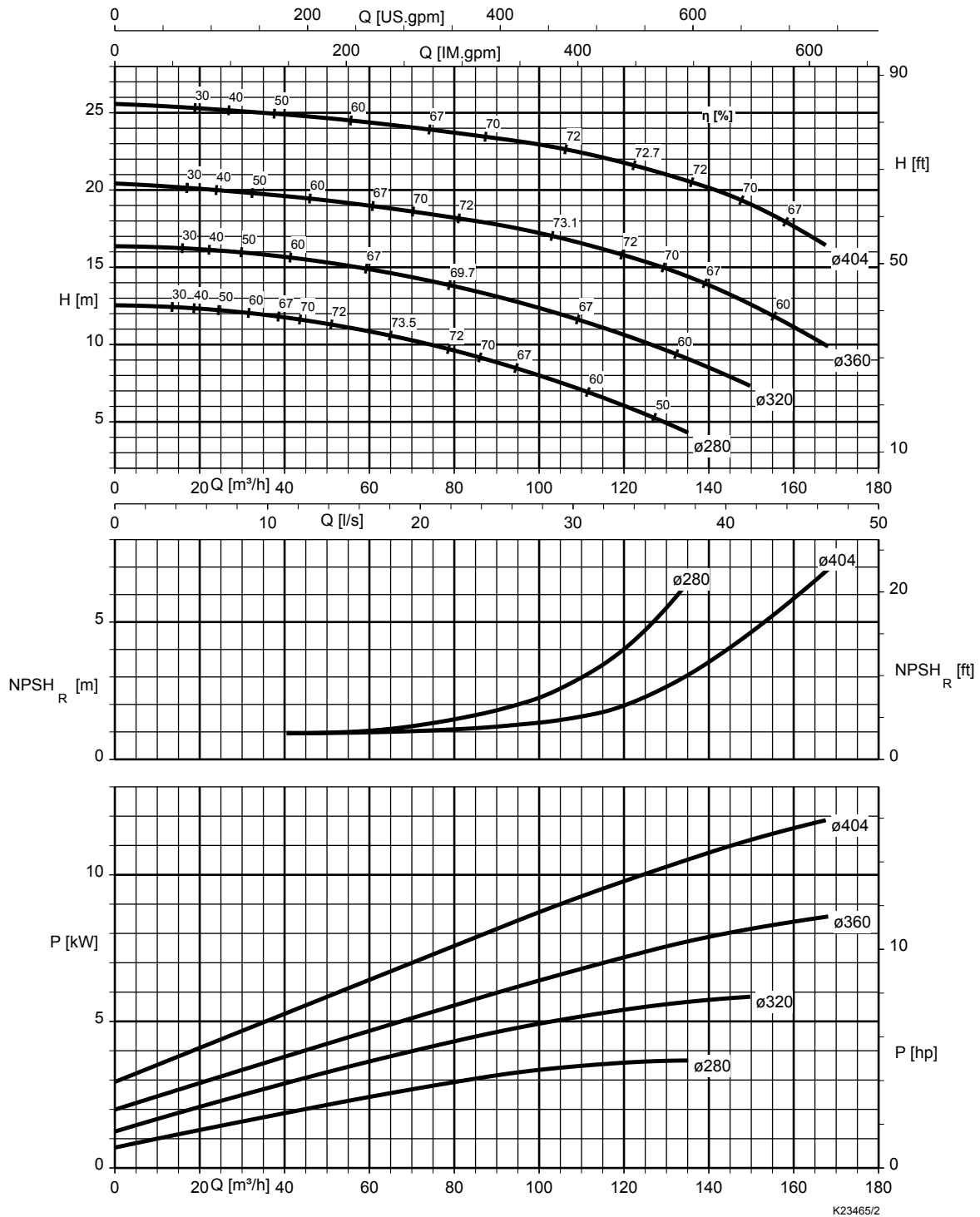
KWP K 100-080-315,  $n = 960 \text{ min}^{-1}$



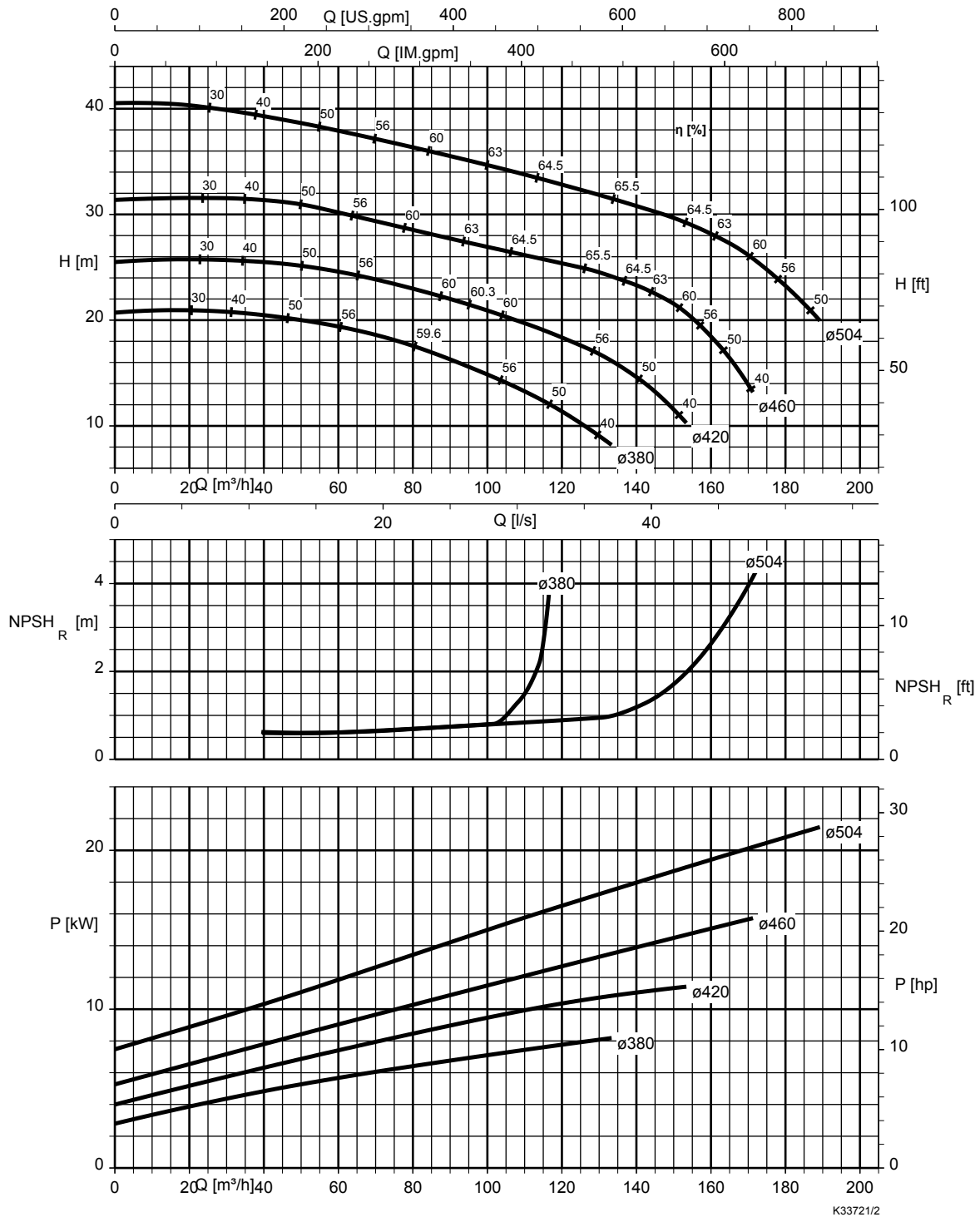
KWP K 100-080-400,  $n = 960 \text{ min}^{-1}$



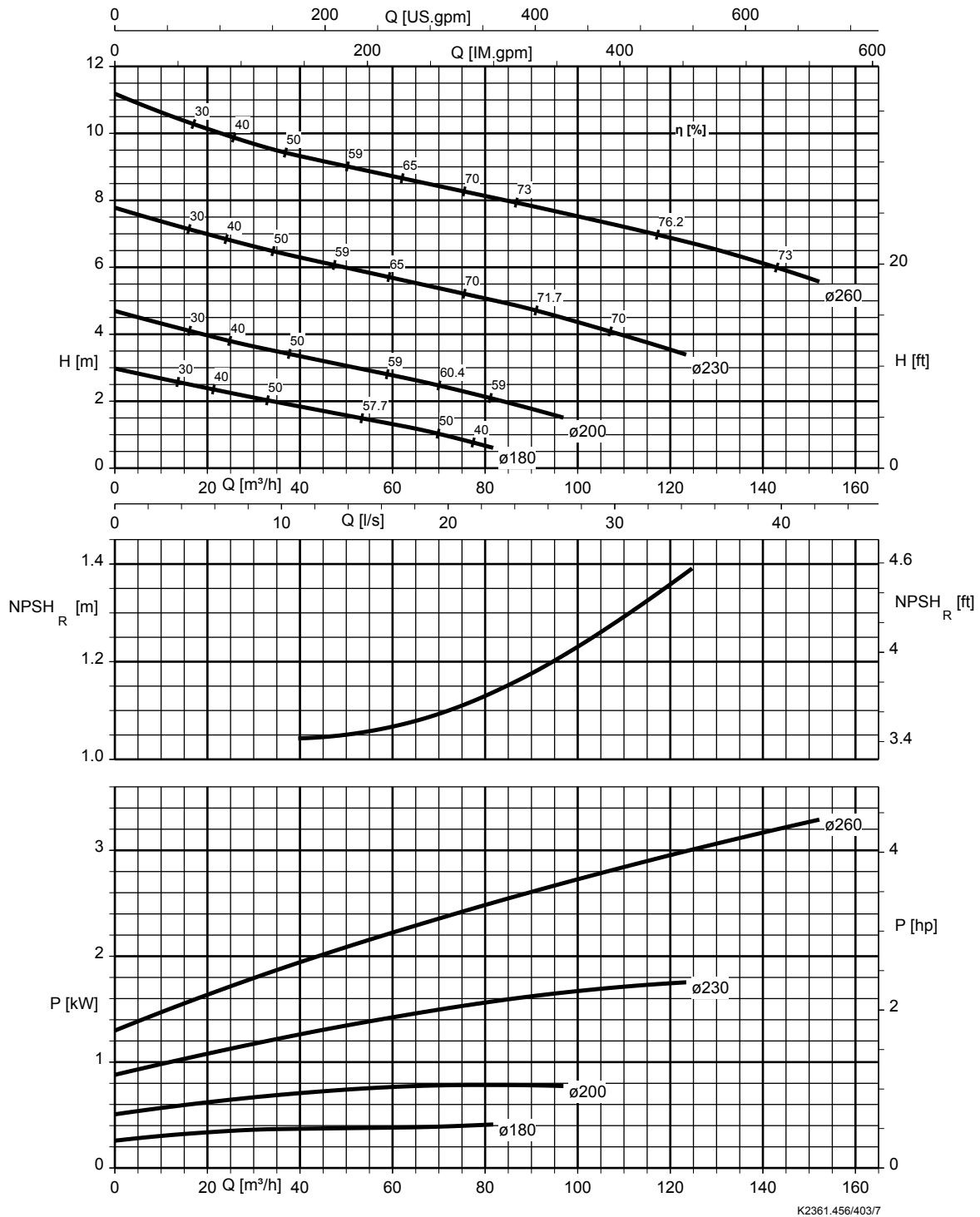
KWP K 100-080-403,  $n = 960 \text{ min}^{-1}$



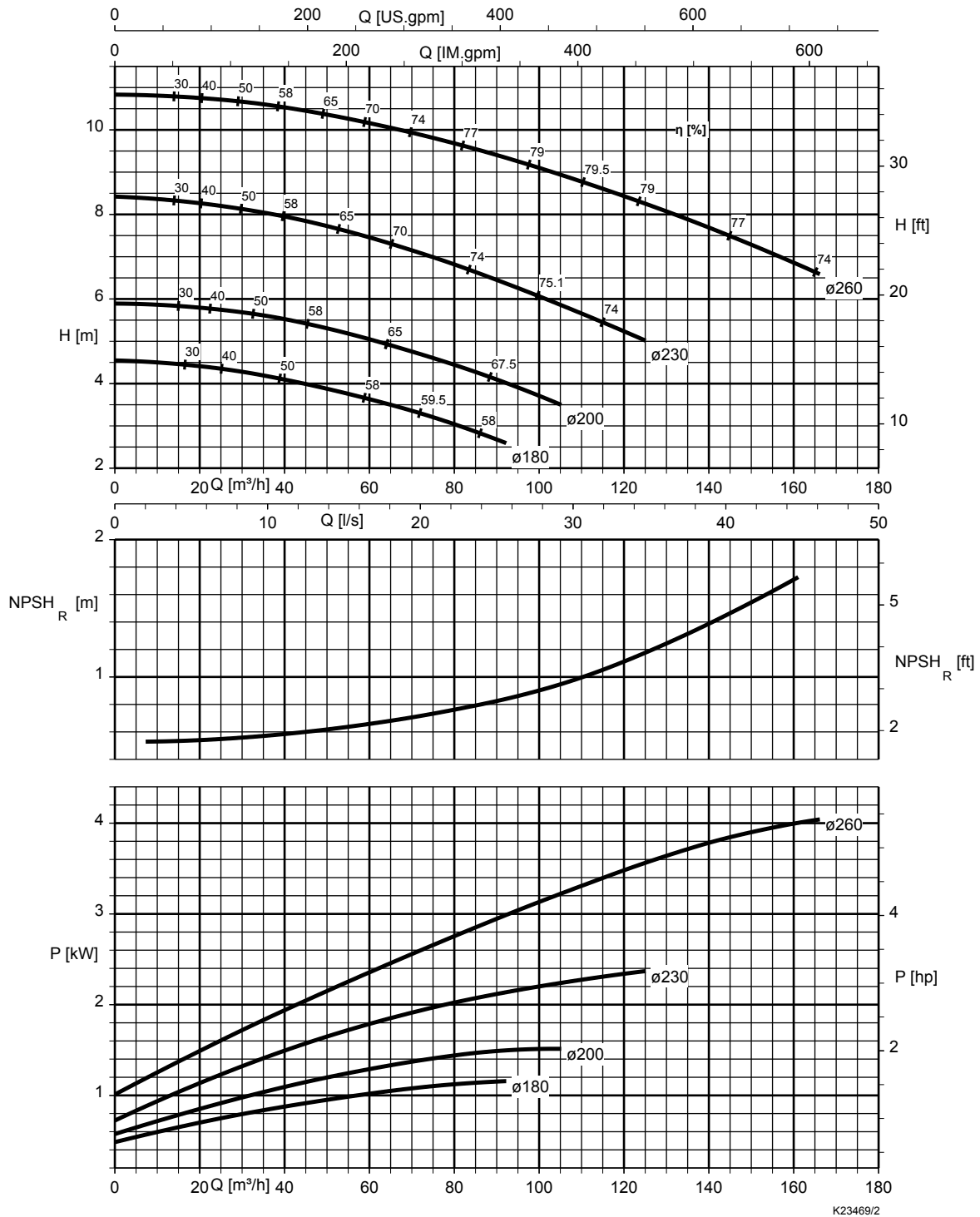
KWP K 125-080-500,  $n = 960 \text{ min}^{-1}$



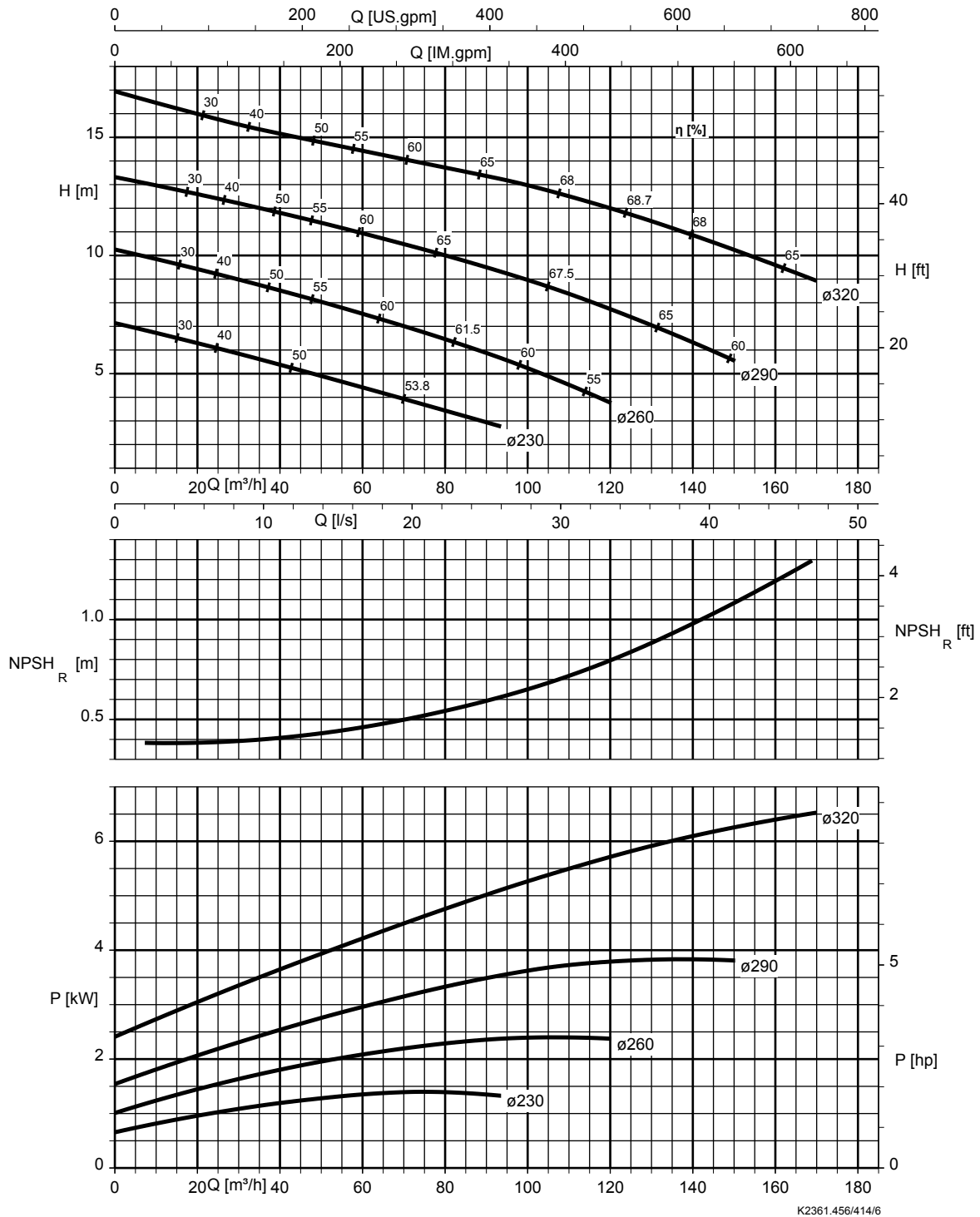
KWP K 125-100-250,  $n = 960 \text{ min}^{-1}$



KWP K 125-100-253,  $n = 960 \text{ min}^{-1}$

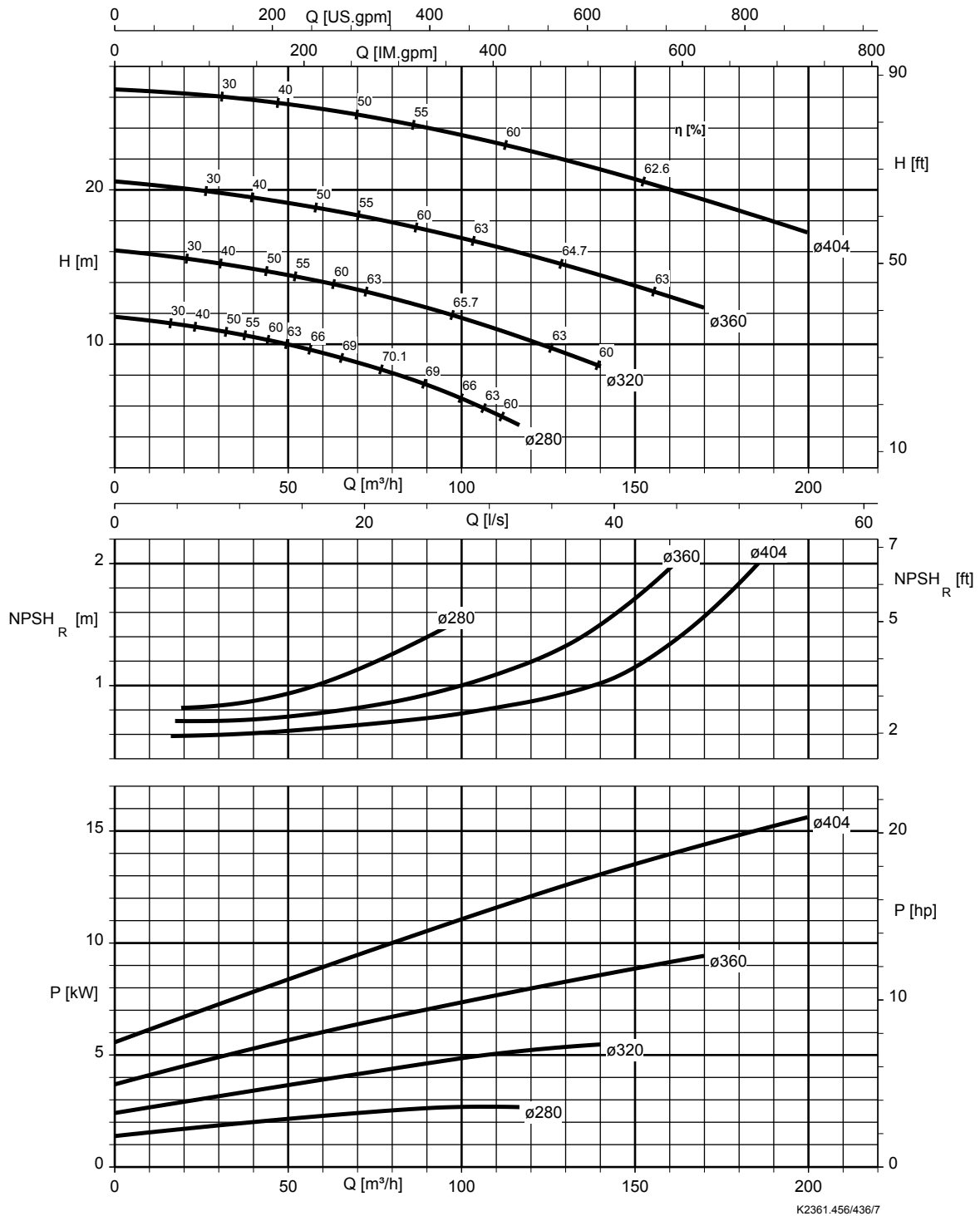


KWP K 125-100-315,  $n = 960 \text{ min}^{-1}$

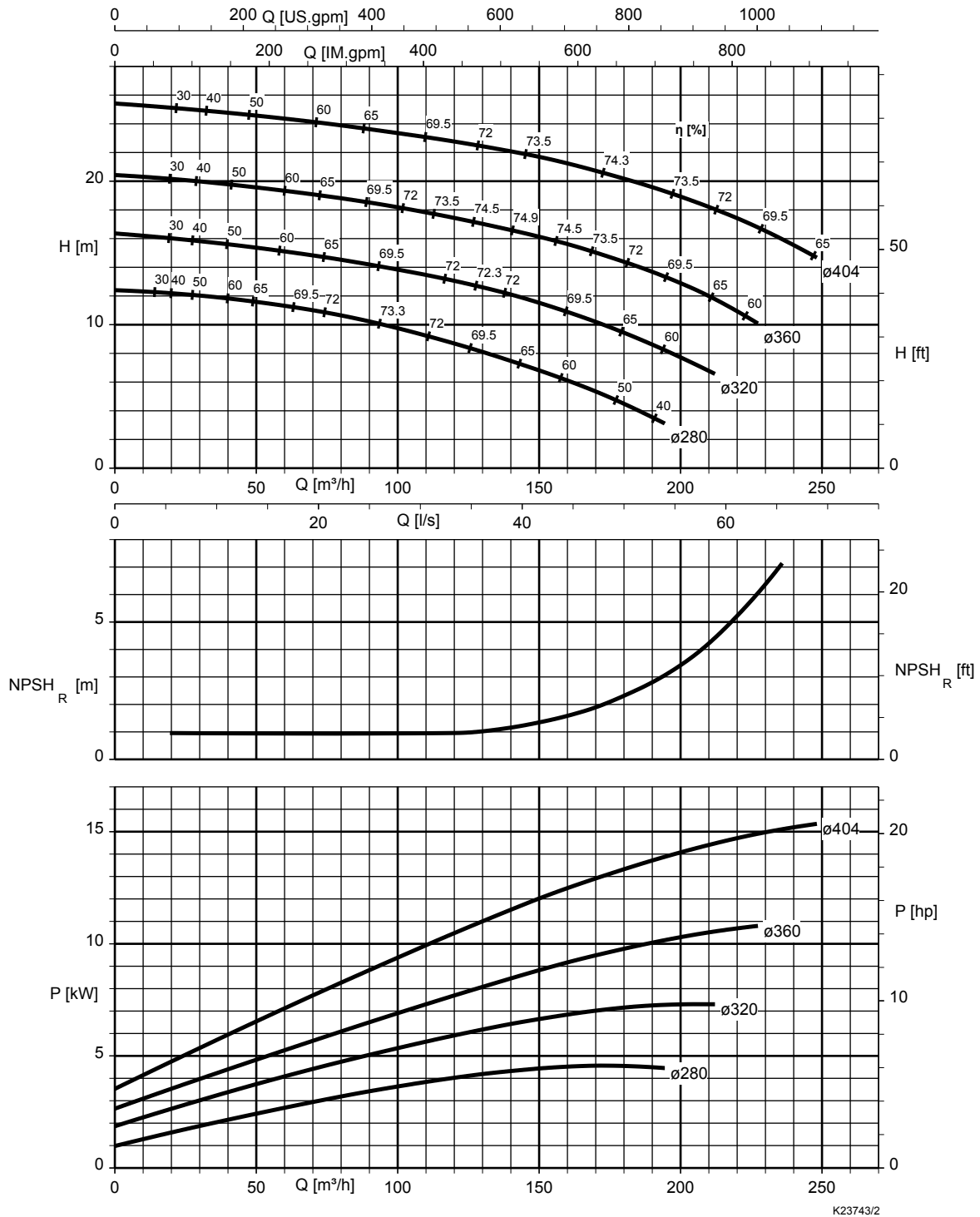




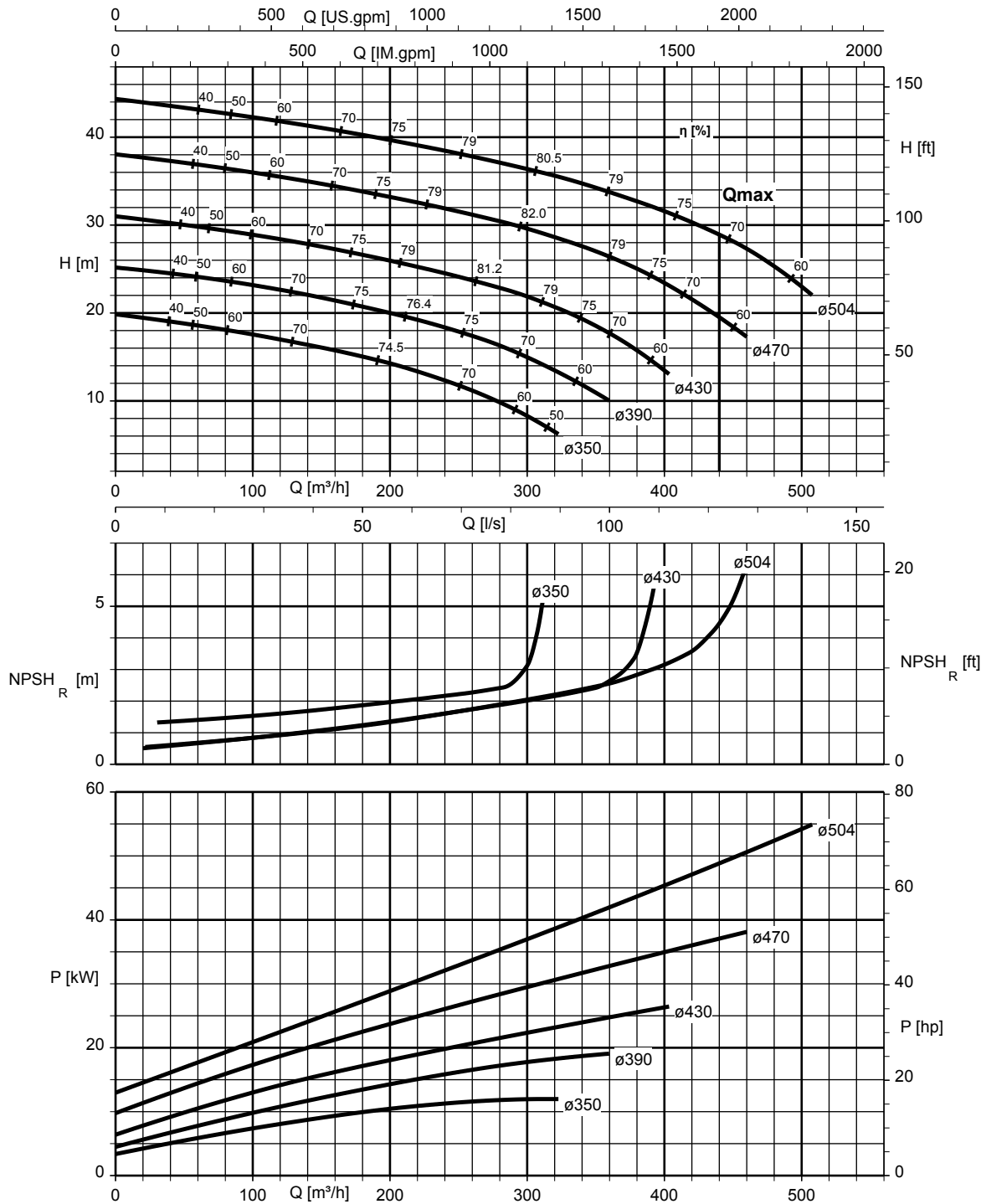
KWP K 125-100-400,  $n = 960 \text{ min}^{-1}$



KWP K 125-100-403,  $n = 960 \text{ min}^{-1}$

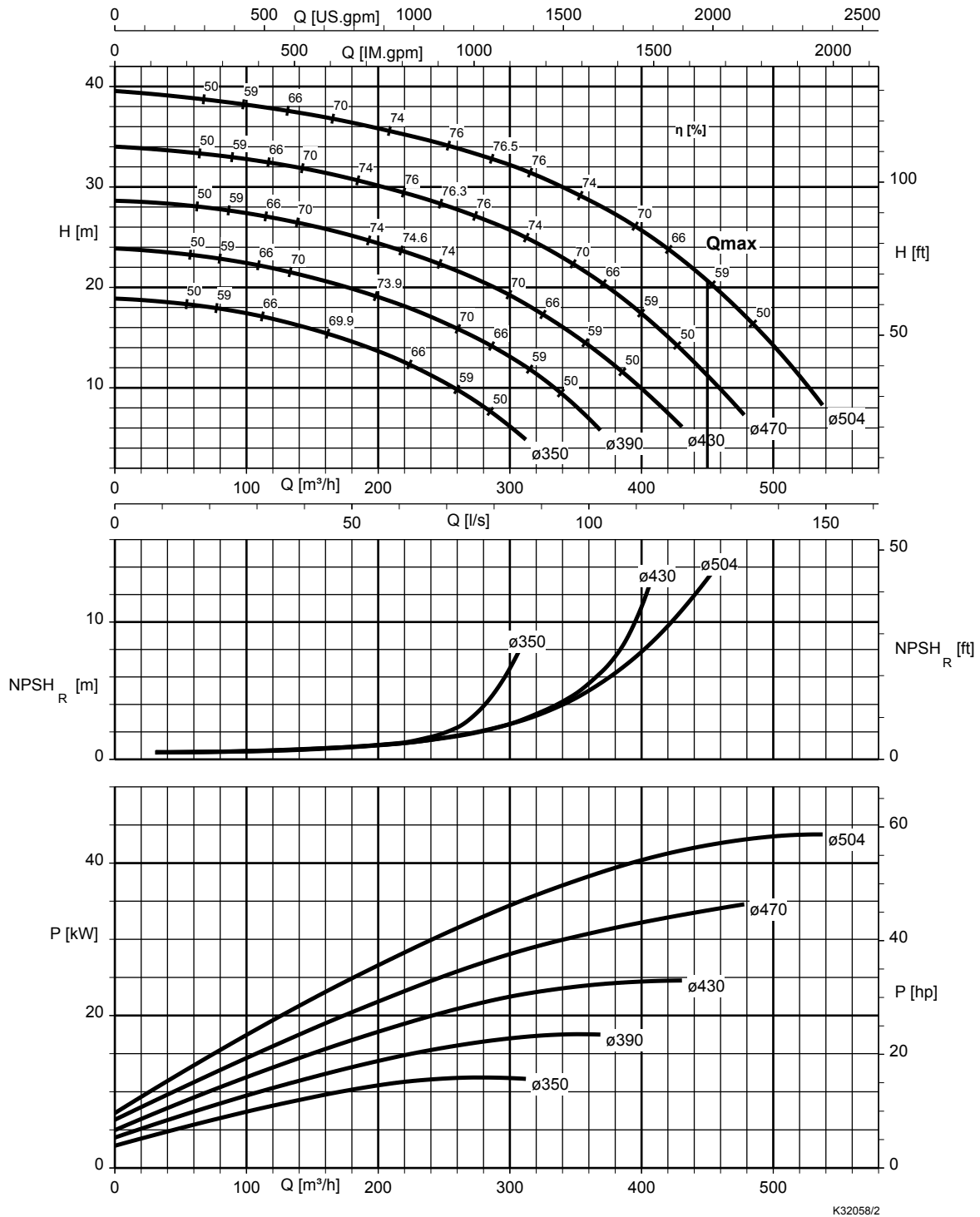


KWP K 150-125-500,  $n = 960 \text{ min}^{-1}$

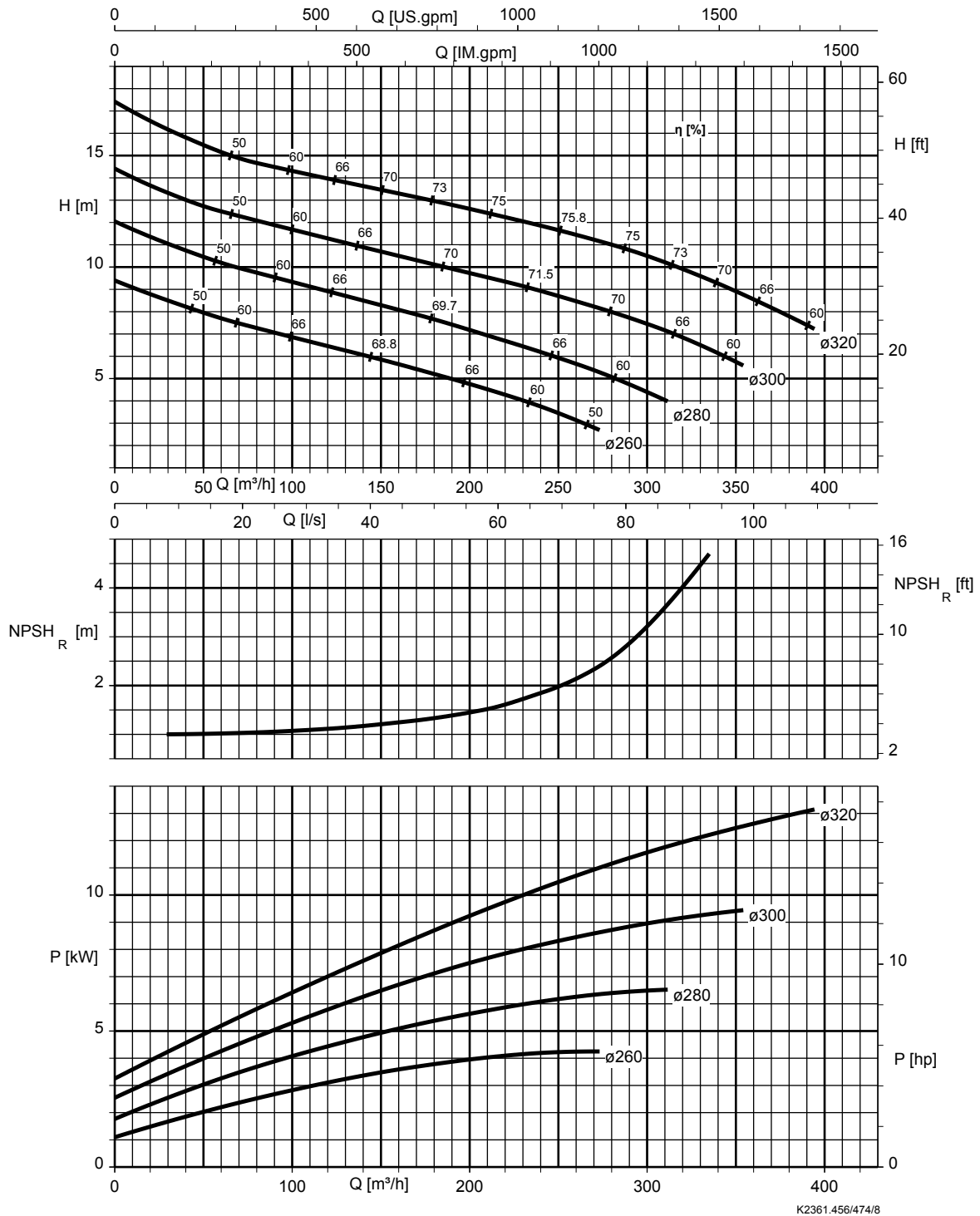


K33984/3

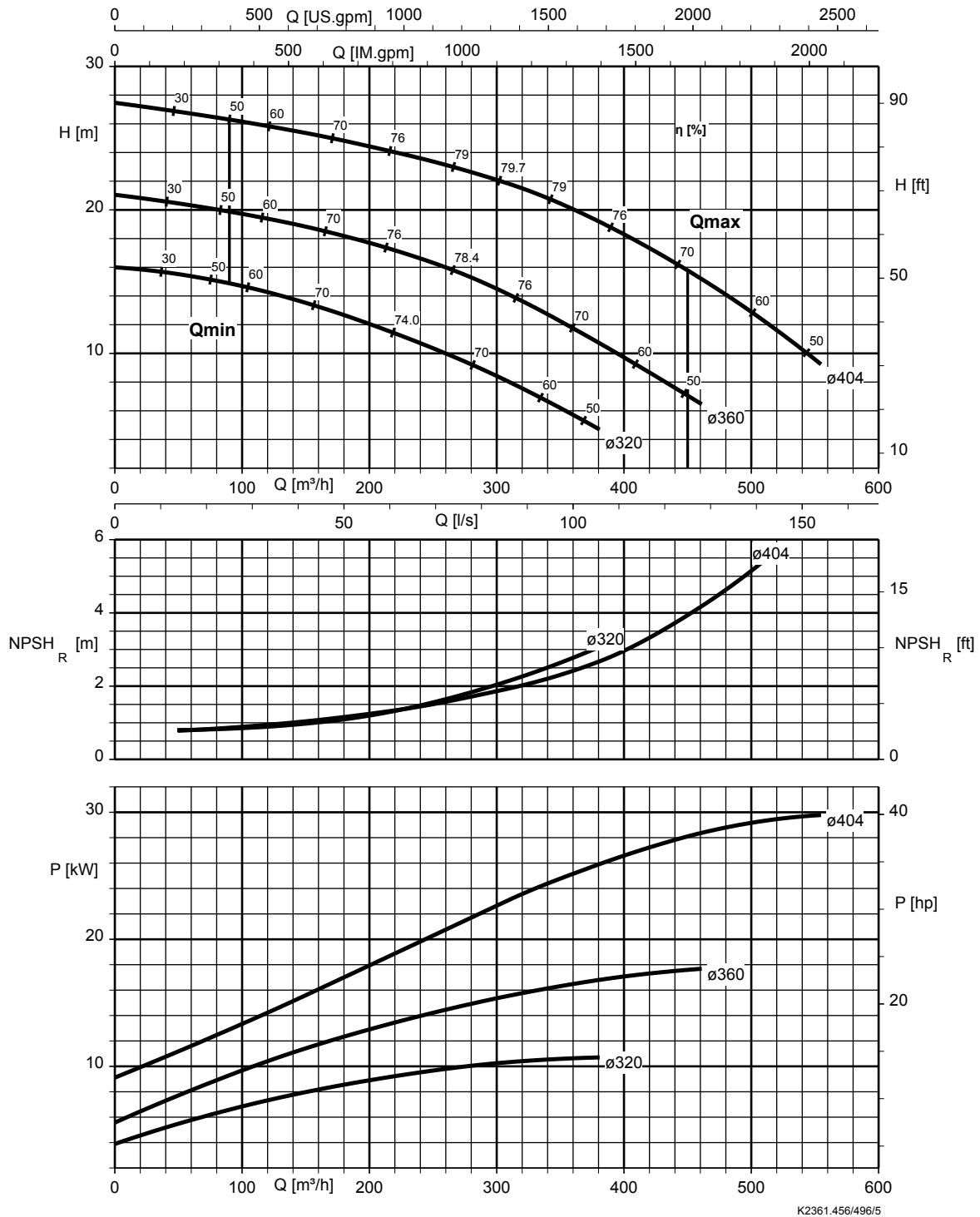
KWP K 150-125-503,  $n = 960 \text{ min}^{-1}$



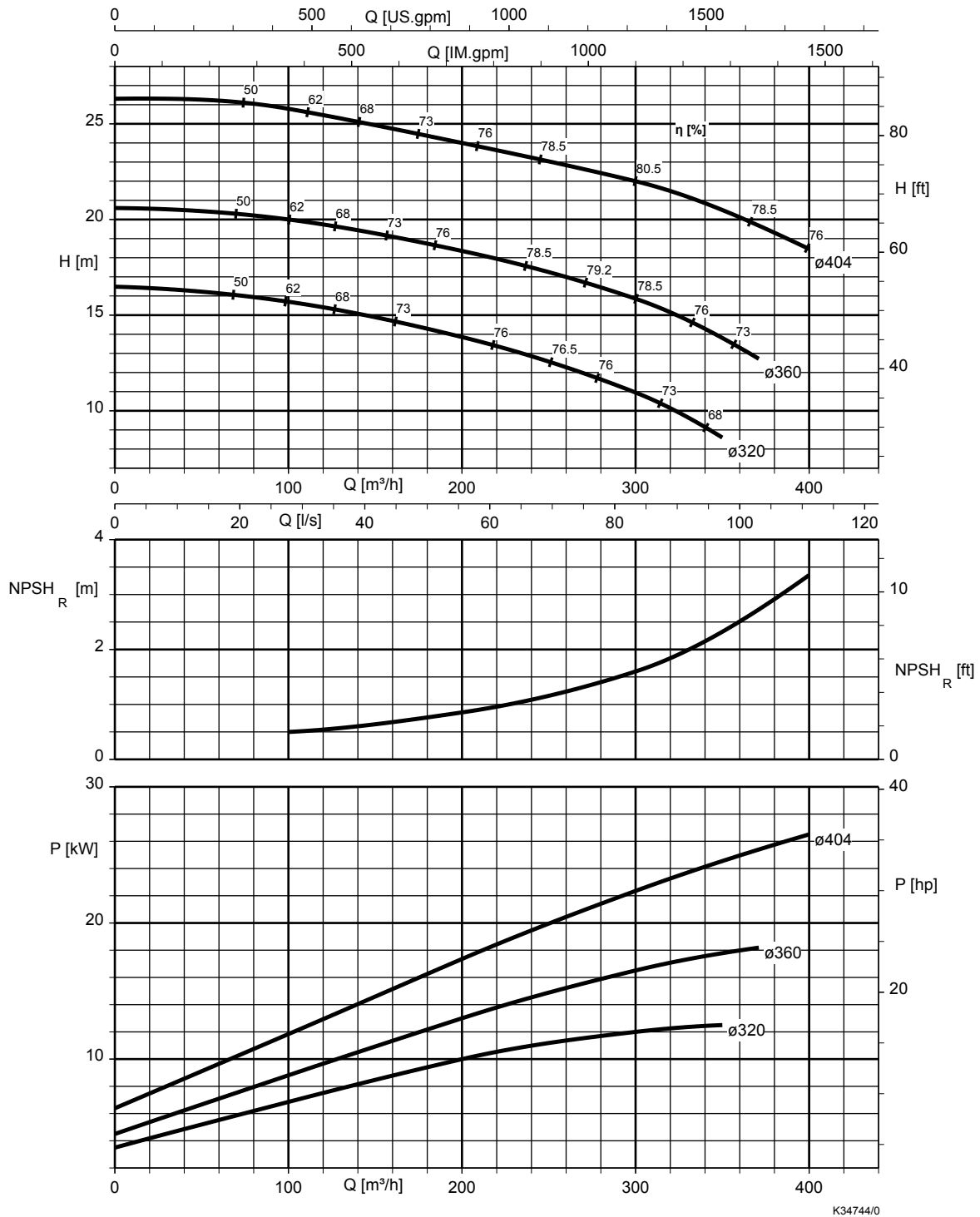
KWP K 150-150-315,  $n = 960 \text{ min}^{-1}$



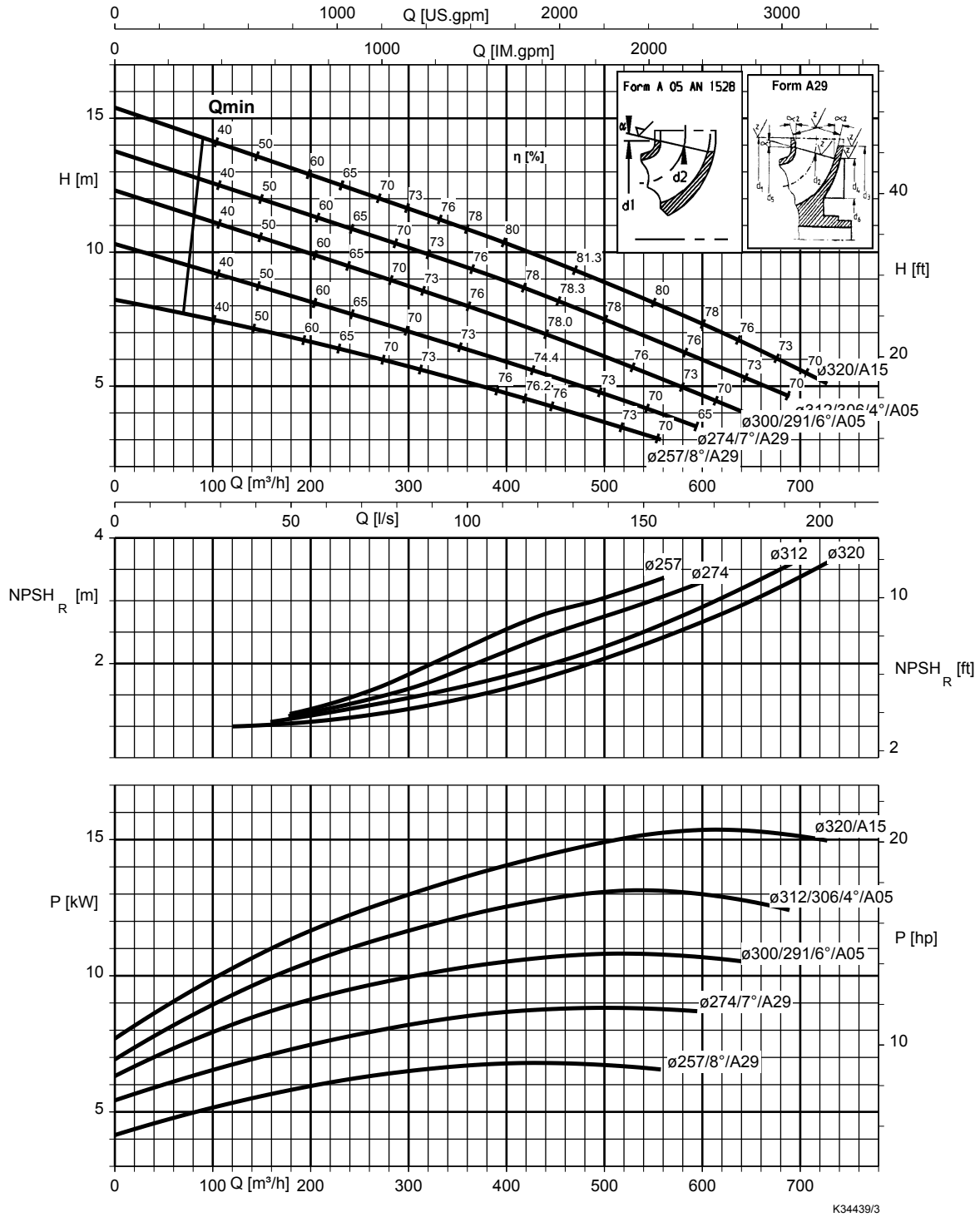
KWP K 150-150-400,  $n = 960 \text{ min}^{-1}$



KWP K 150-150-403,  $n = 960 \text{ min}^{-1}$

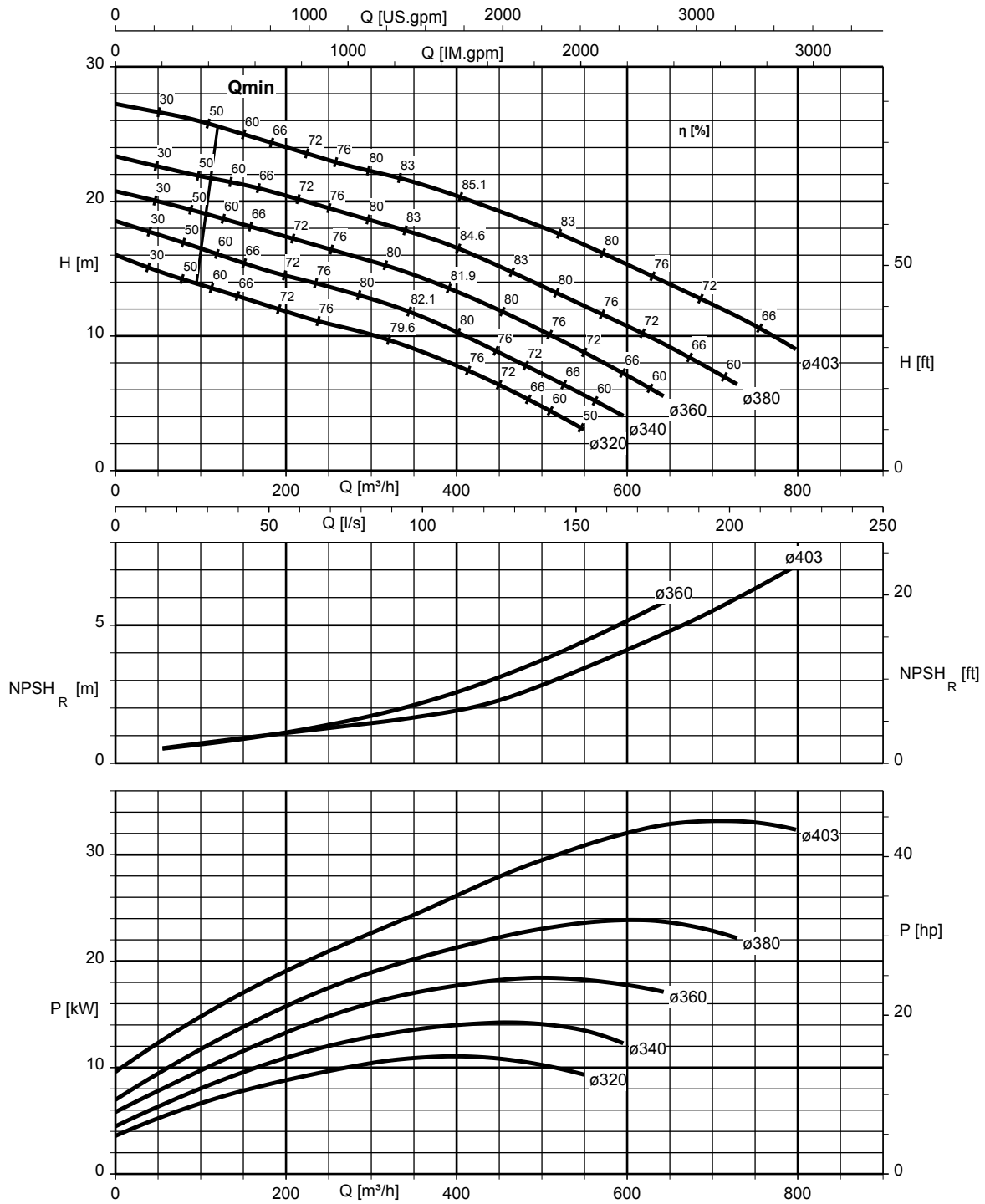


KWP K 200-200-320,  $n = 960 \text{ min}^{-1}$



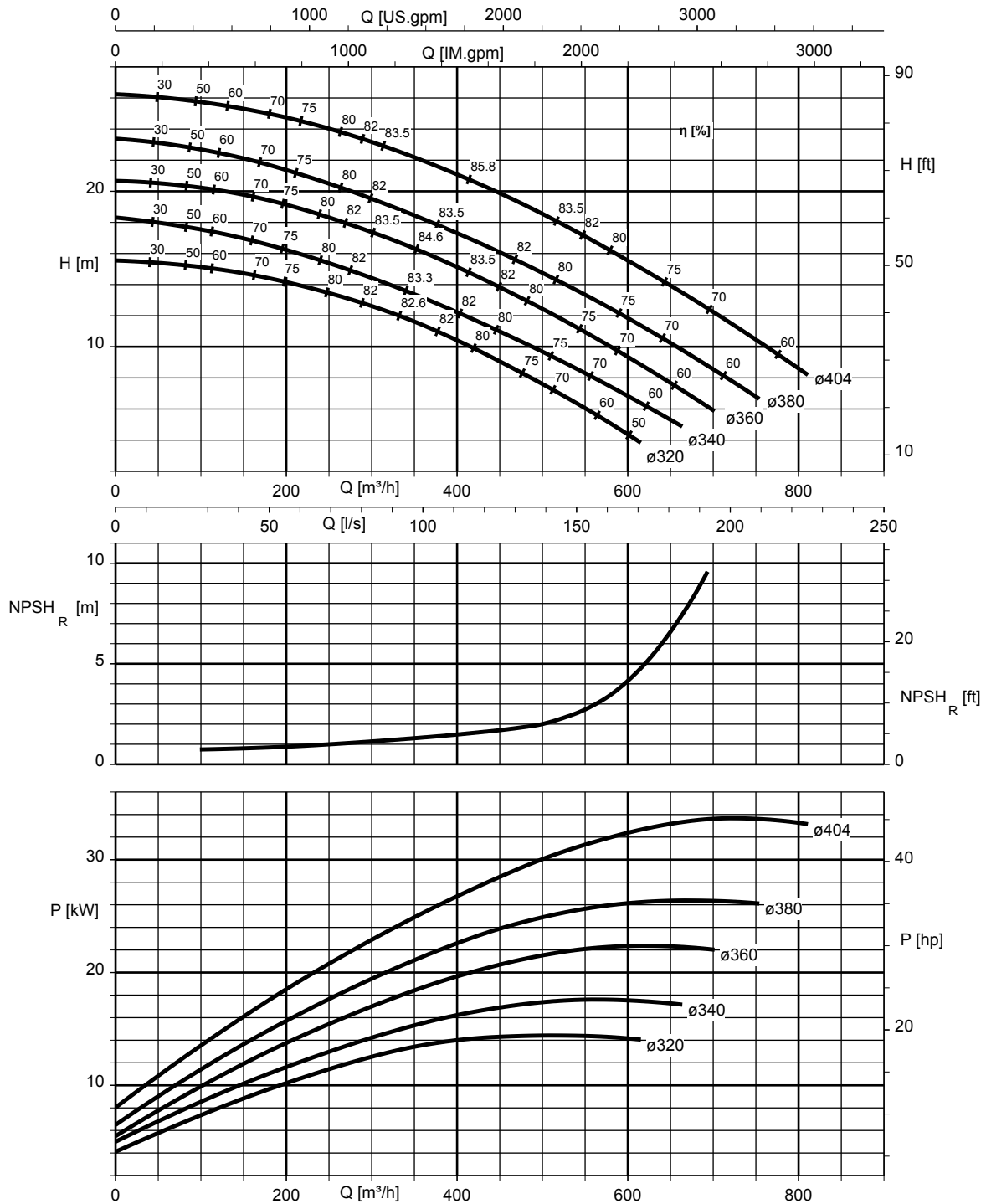


KWP K 200-200-400,  $n = 960 \text{ min}^{-1}$



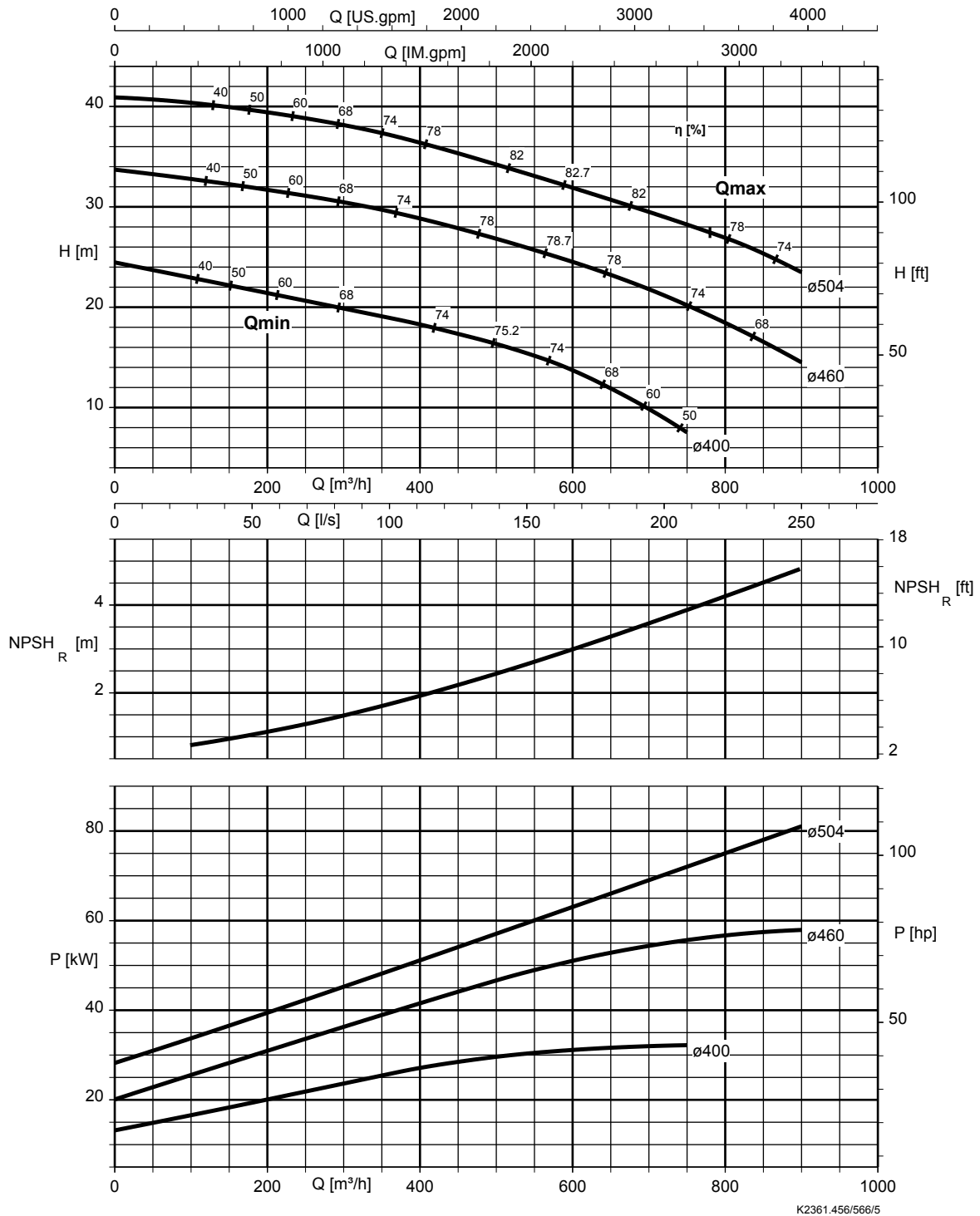
K33783/3

KWP K 200-200-403,  $n = 960 \text{ min}^{-1}$

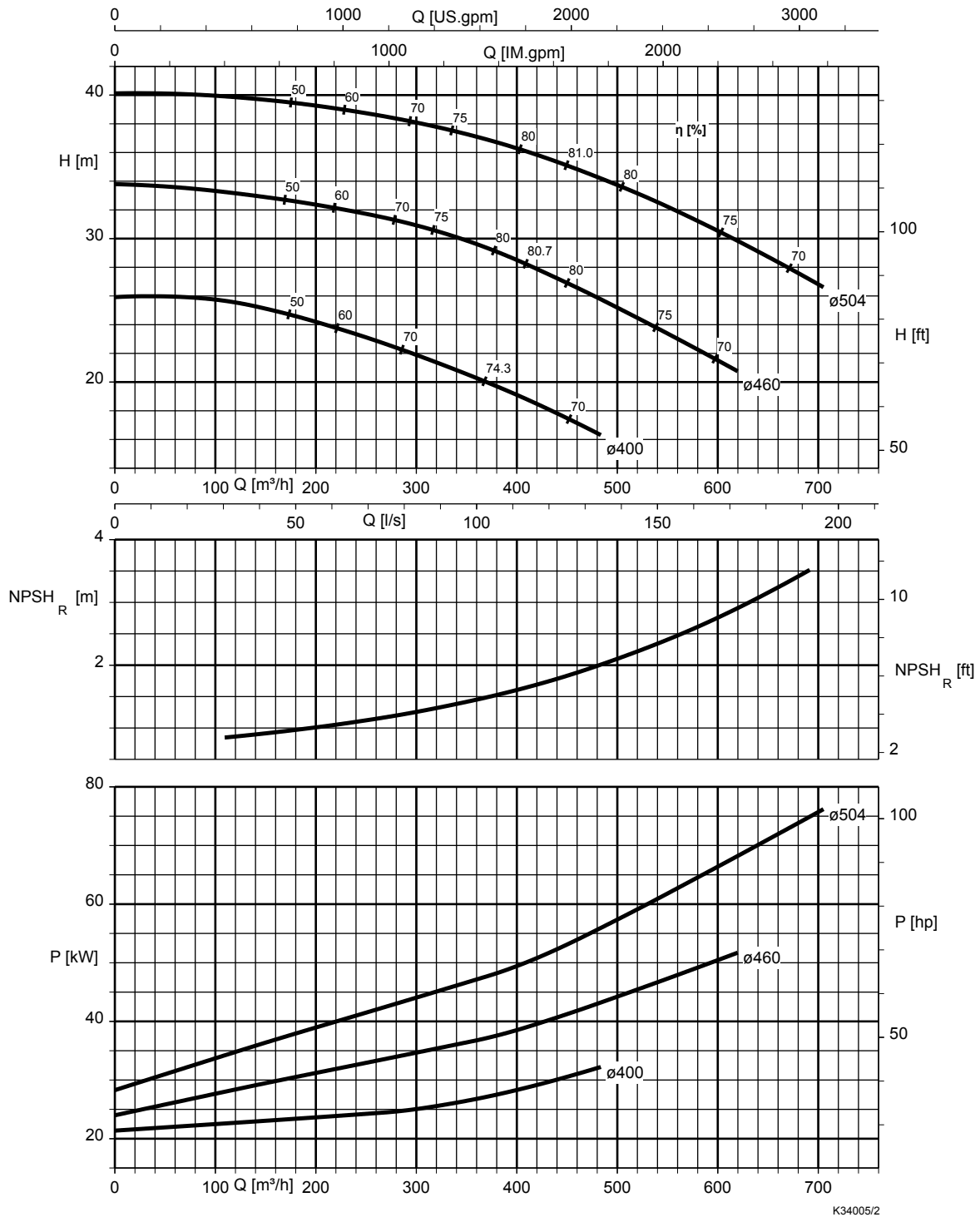


K31960/2

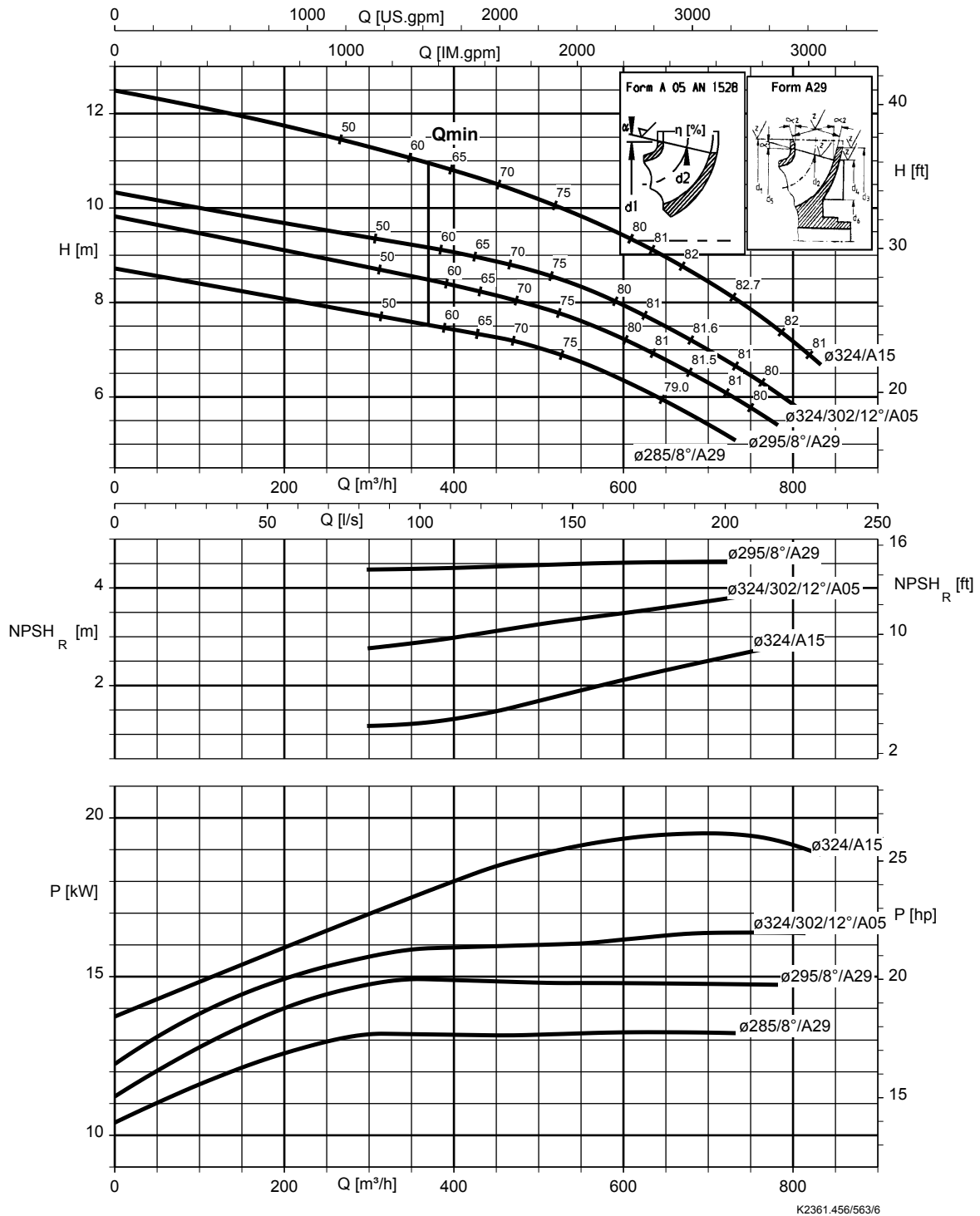
KWP K 200-200-501,  $n = 960 \text{ min}^{-1}$



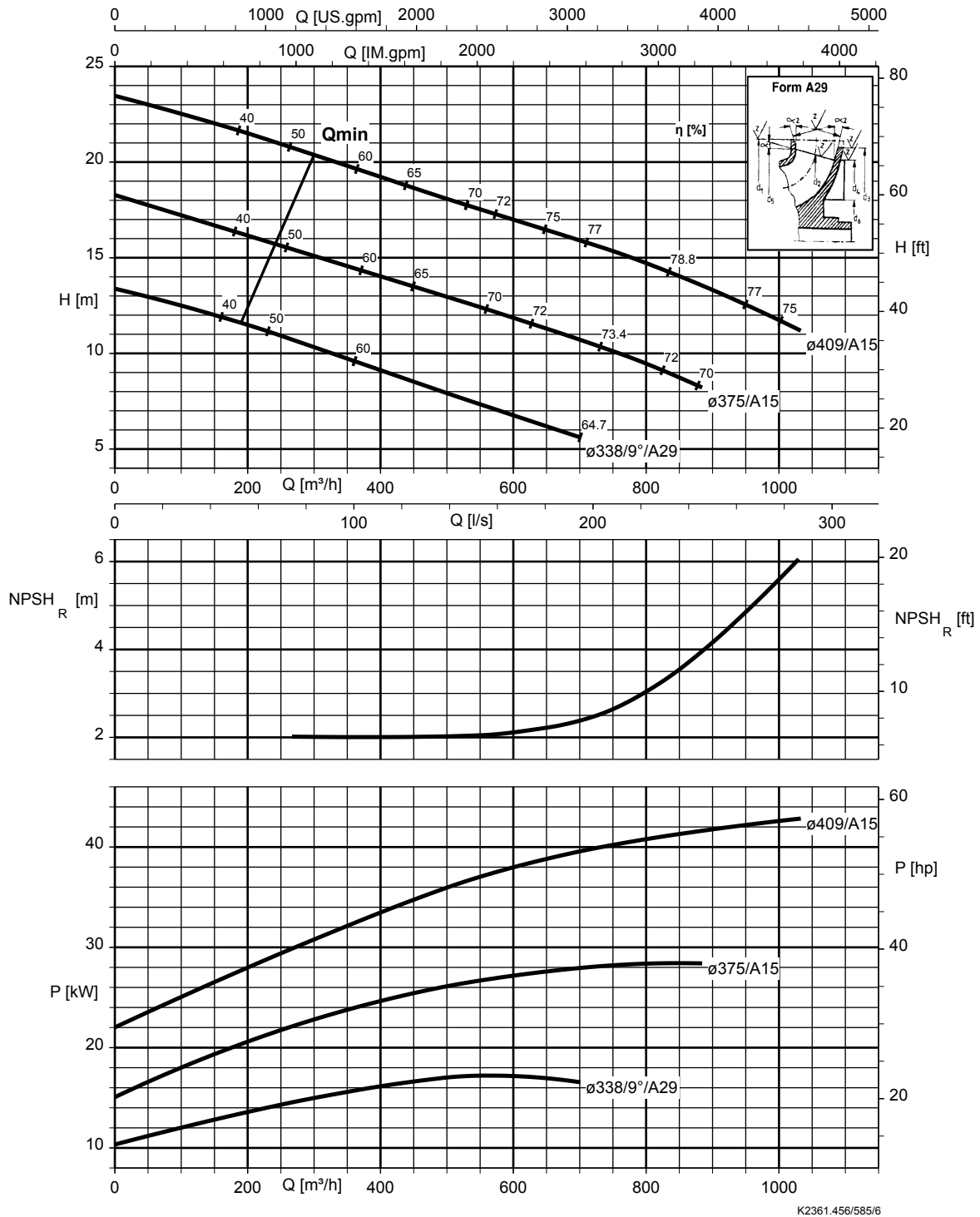
KWP K 200-200-503,  $n = 960 \text{ min}^{-1}$



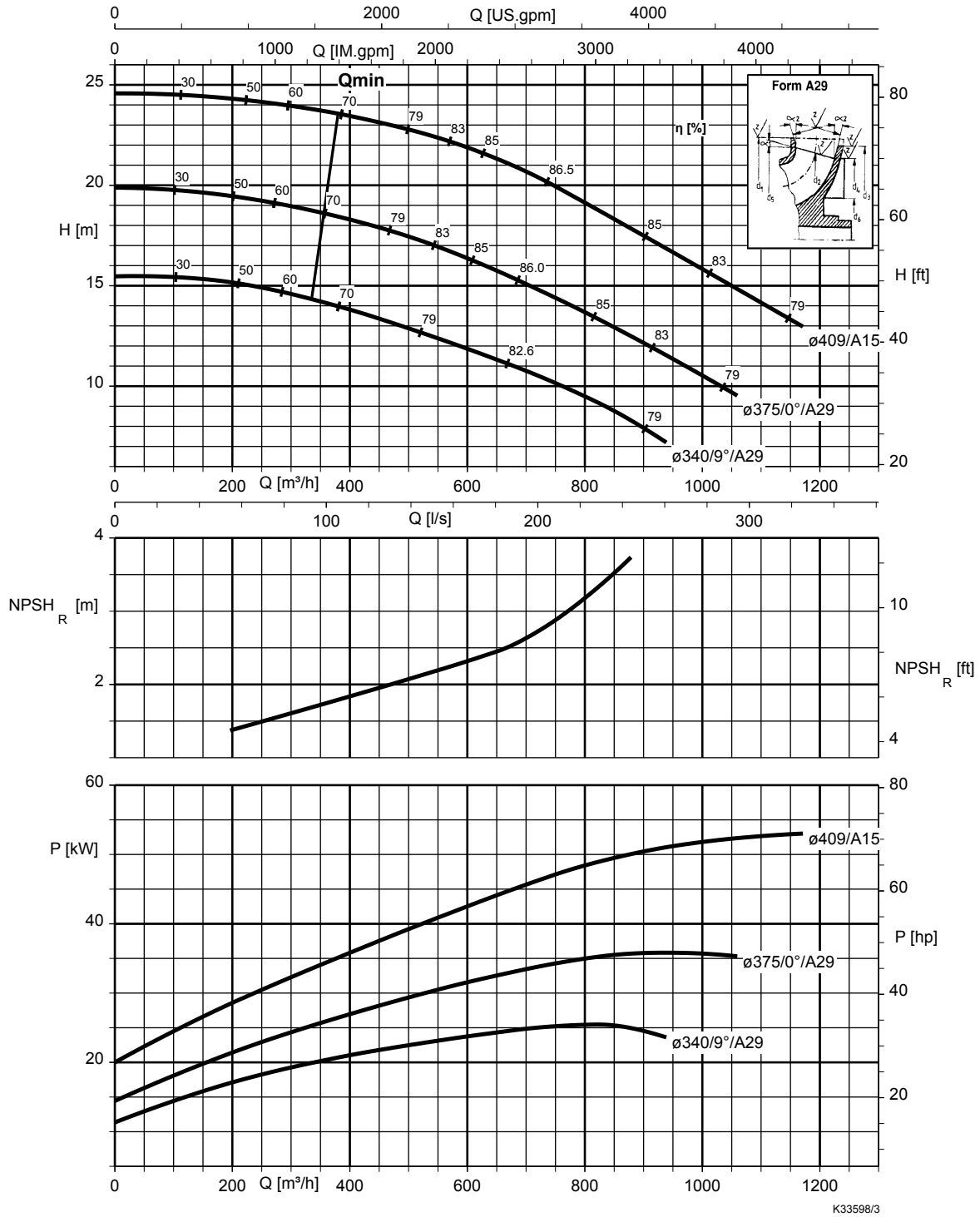
KWP K 250-250-315,  $n = 960 \text{ min}^{-1}$



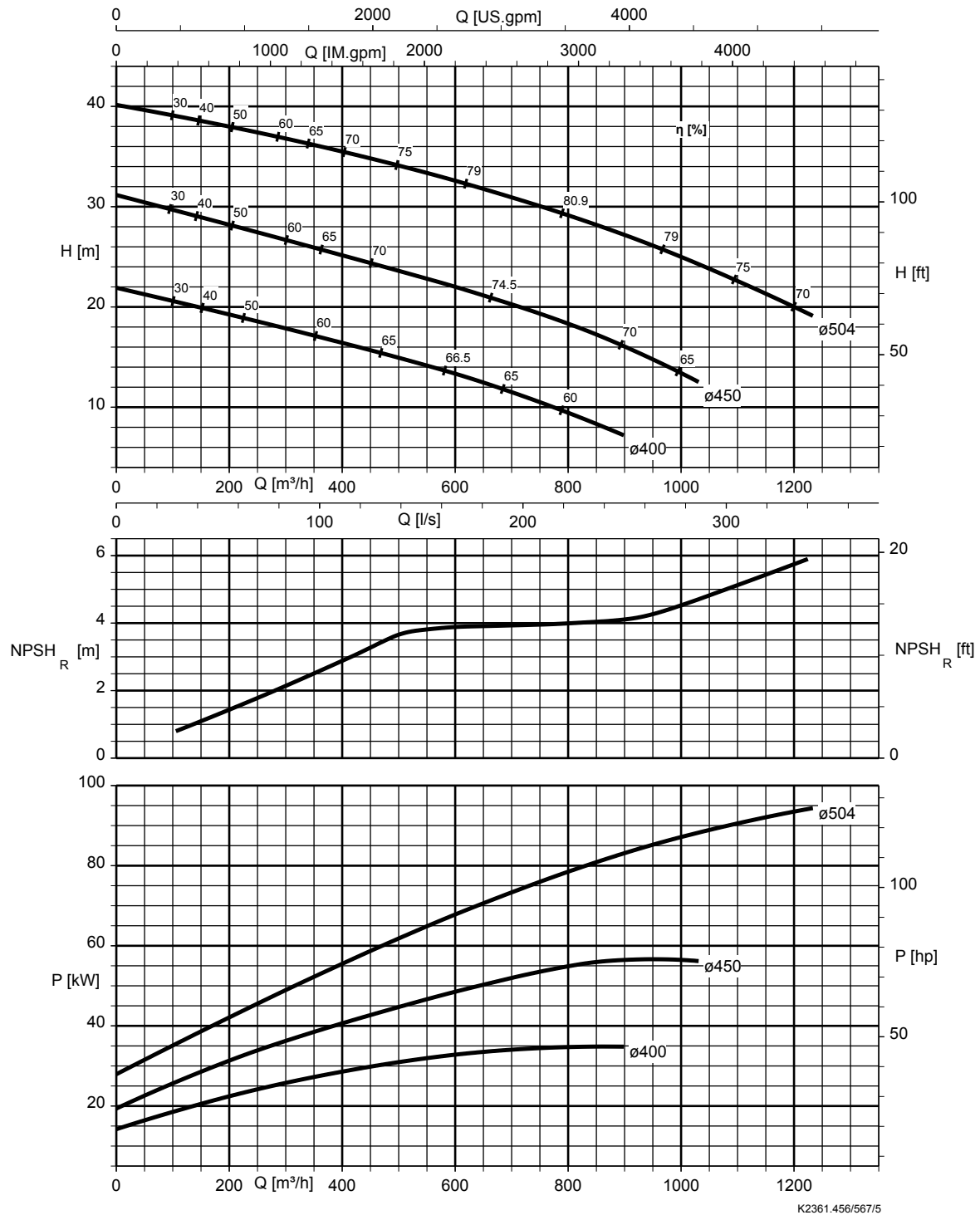
KWP K 250-250-400,  $n = 960 \text{ min}^{-1}$



KWP K 250-250-403,  $n = 960 \text{ min}^{-1}$

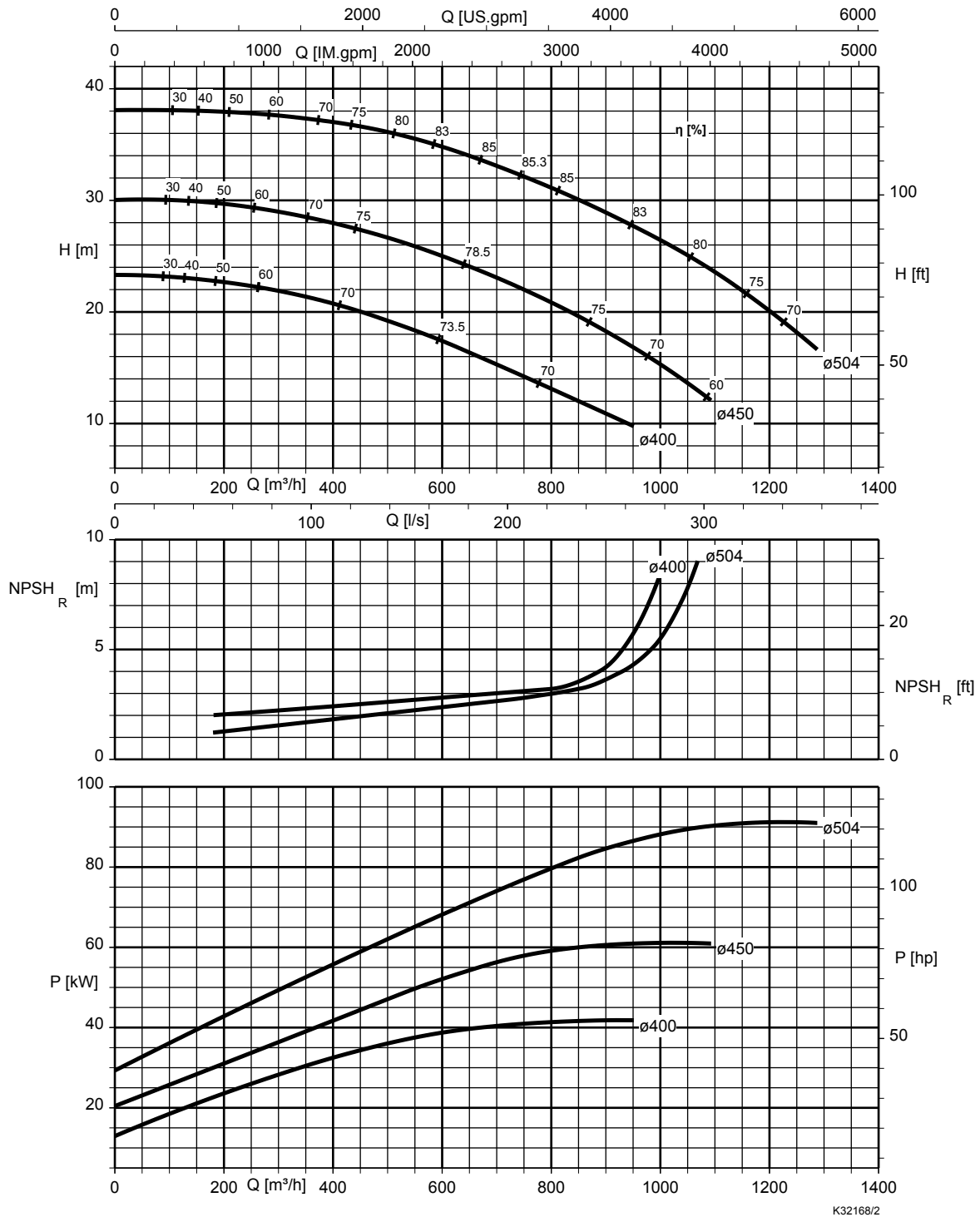


KWP K 250-250-500,  $n = 960 \text{ min}^{-1}$

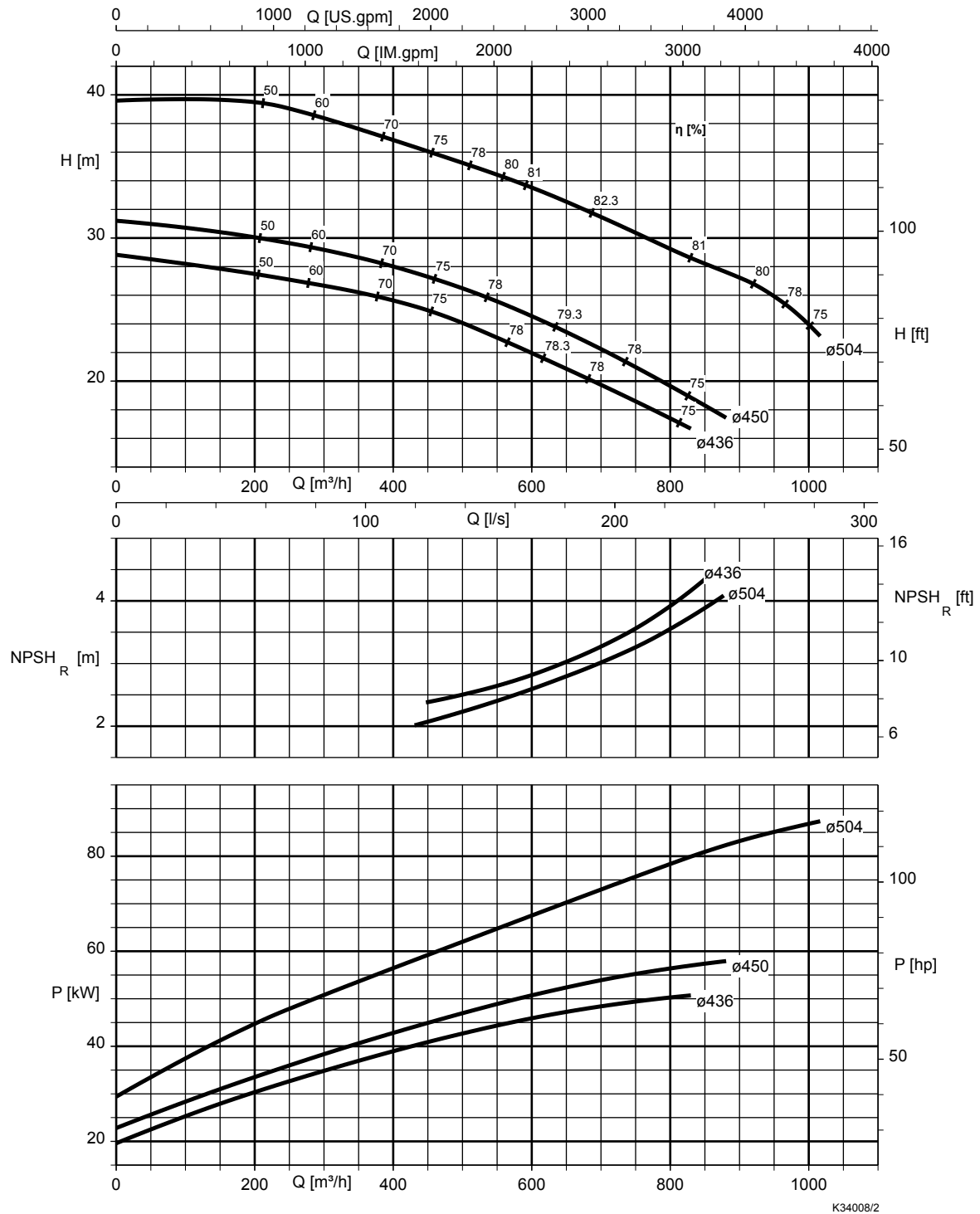




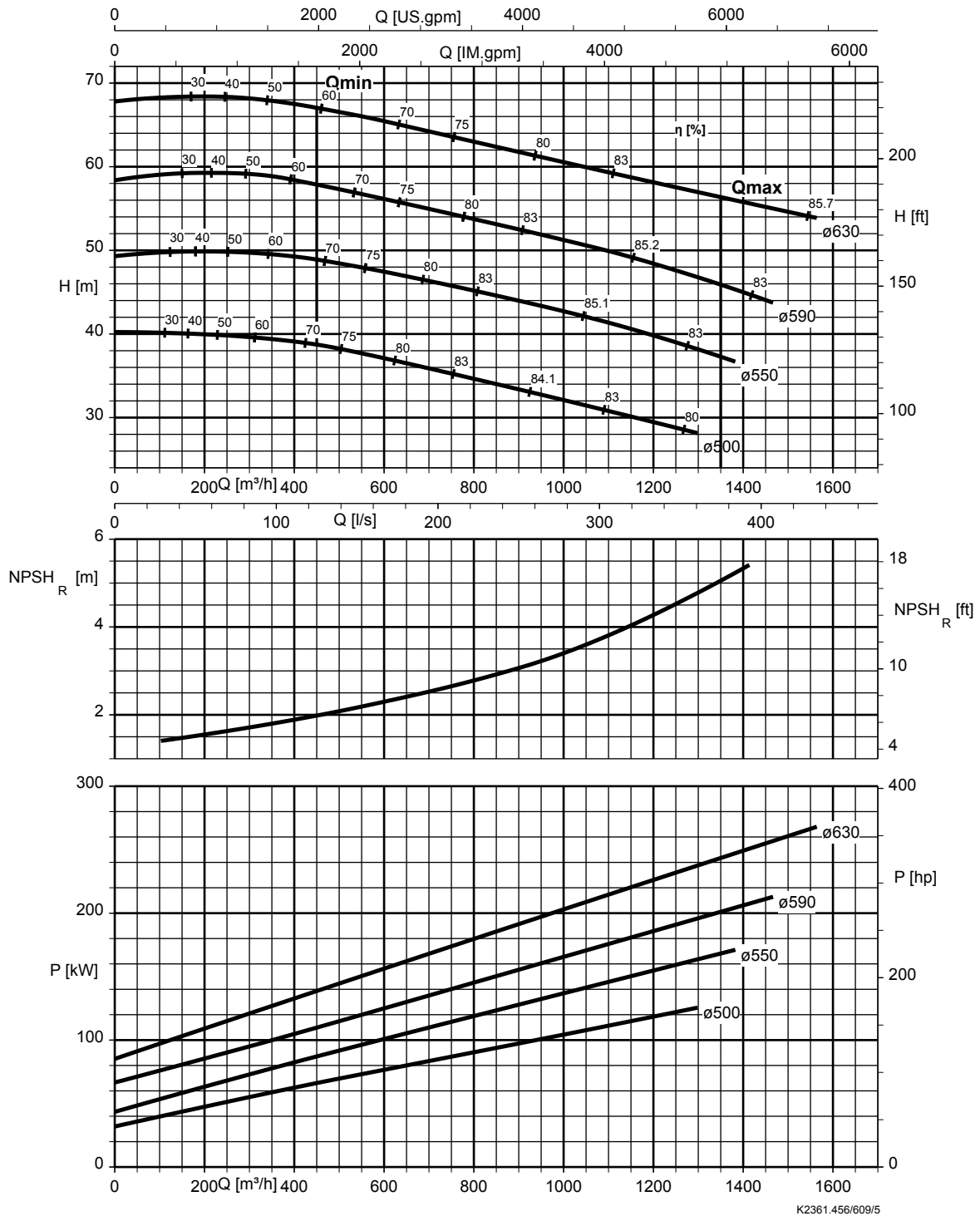
KWP K 250-250-503,  $n = 960 \text{ min}^{-1}$



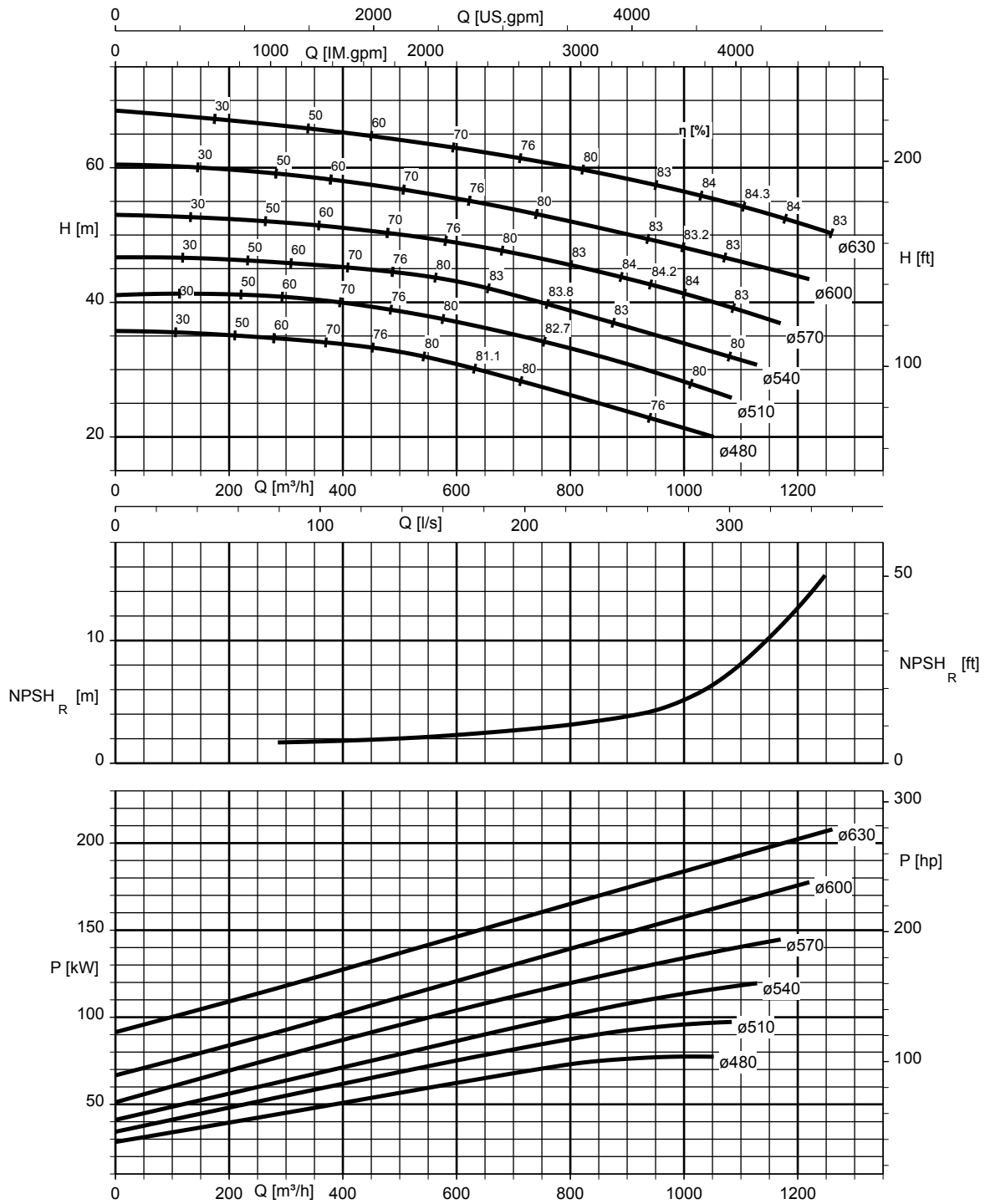
KWP K 250-250-505,  $n = 960 \text{ min}^{-1}$



KWP K 250-250-630,  $n = 960 \text{ min}^{-1}$

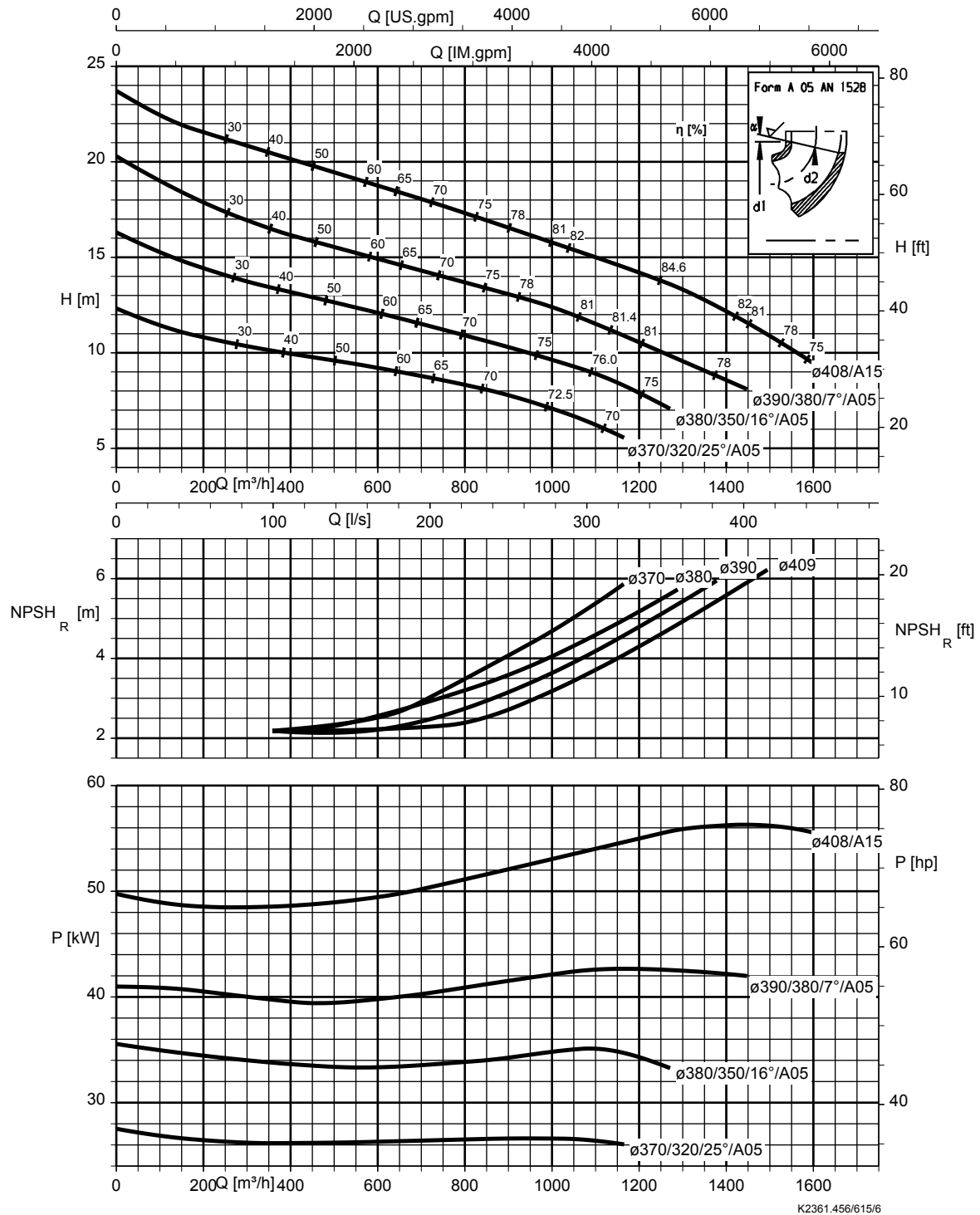


KWP K 250-250-634,  $n = 960 \text{ min}^{-1}$

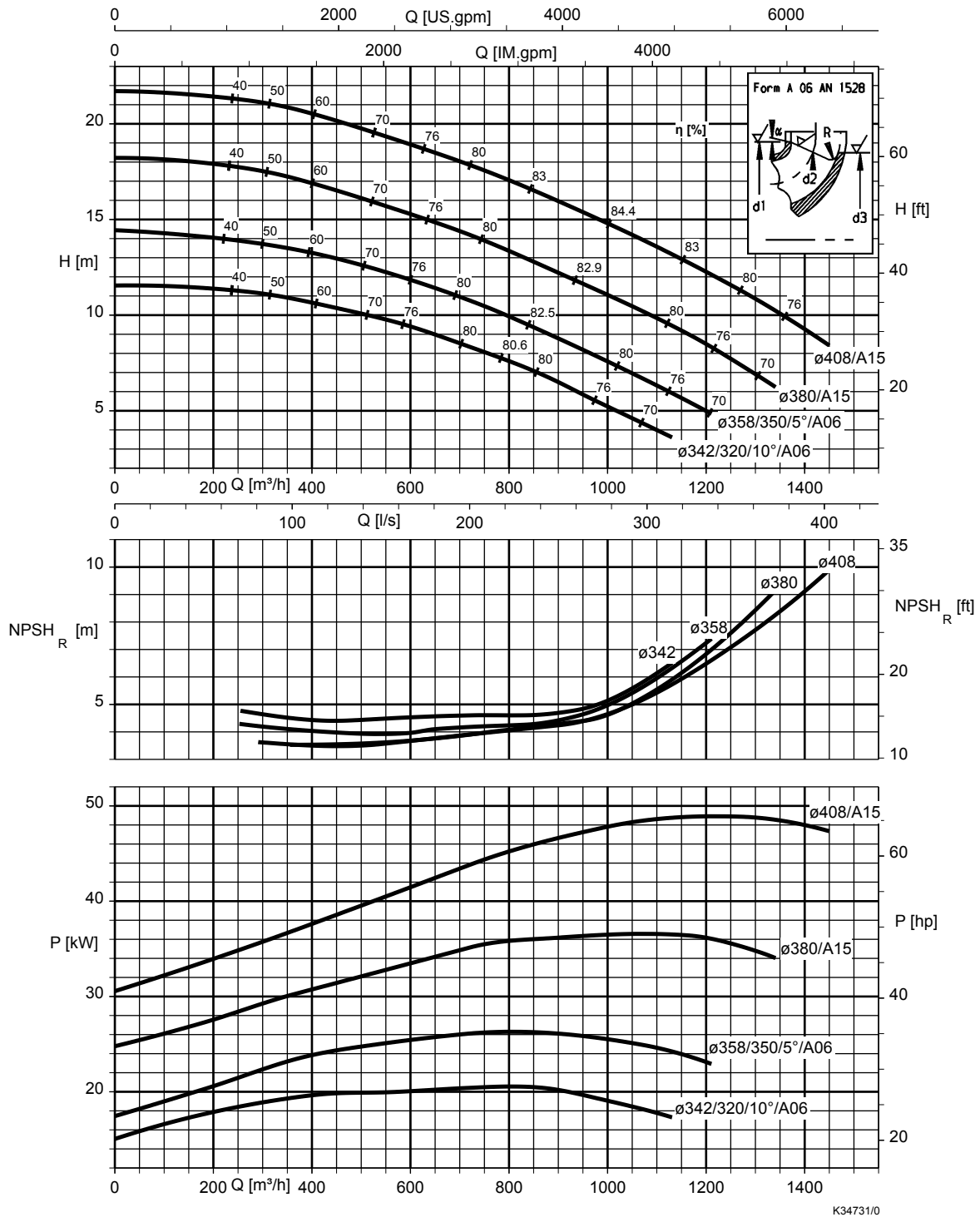


K34042/2

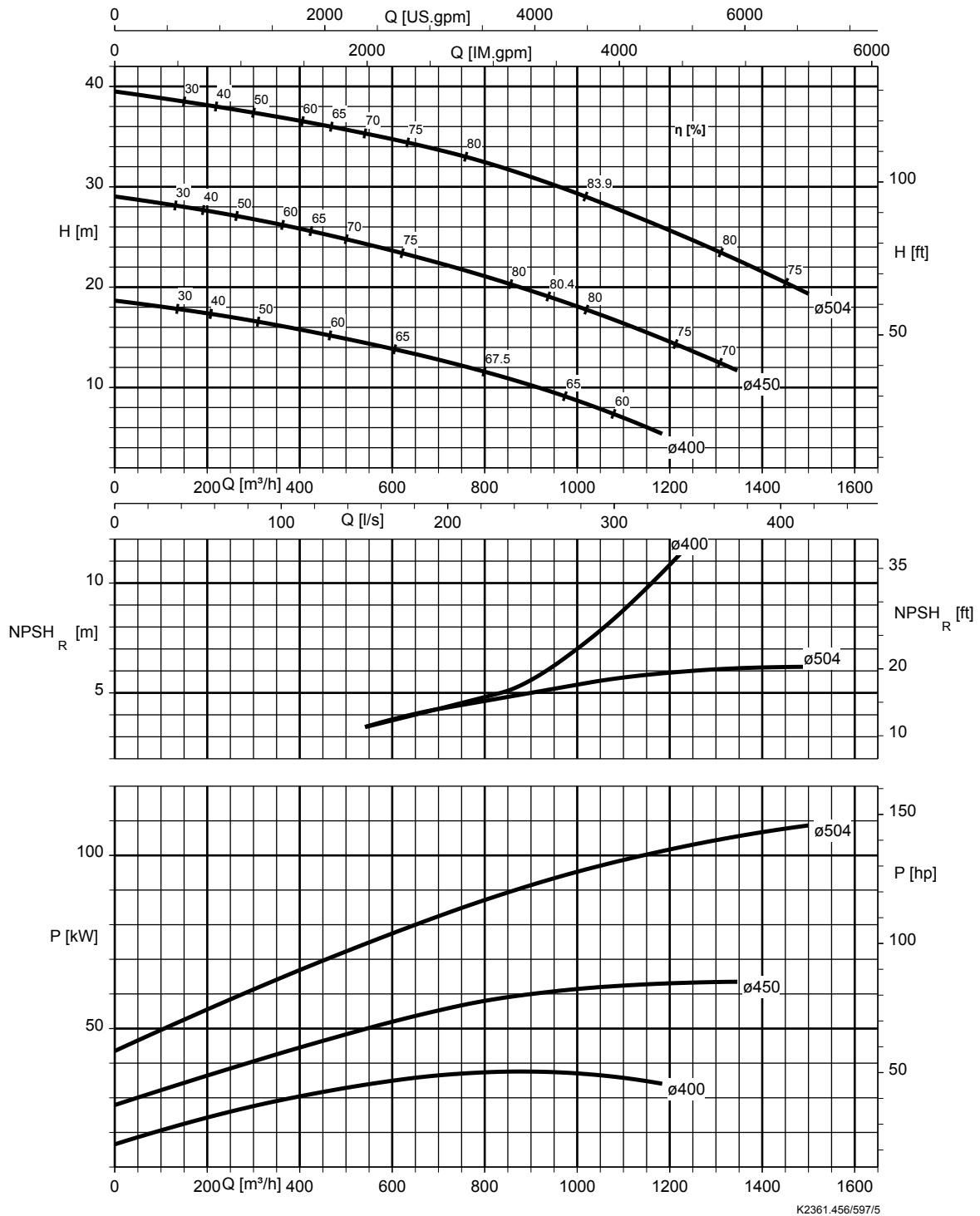
KWP K 300-300-400,  $n = 960 \text{ min}^{-1}$



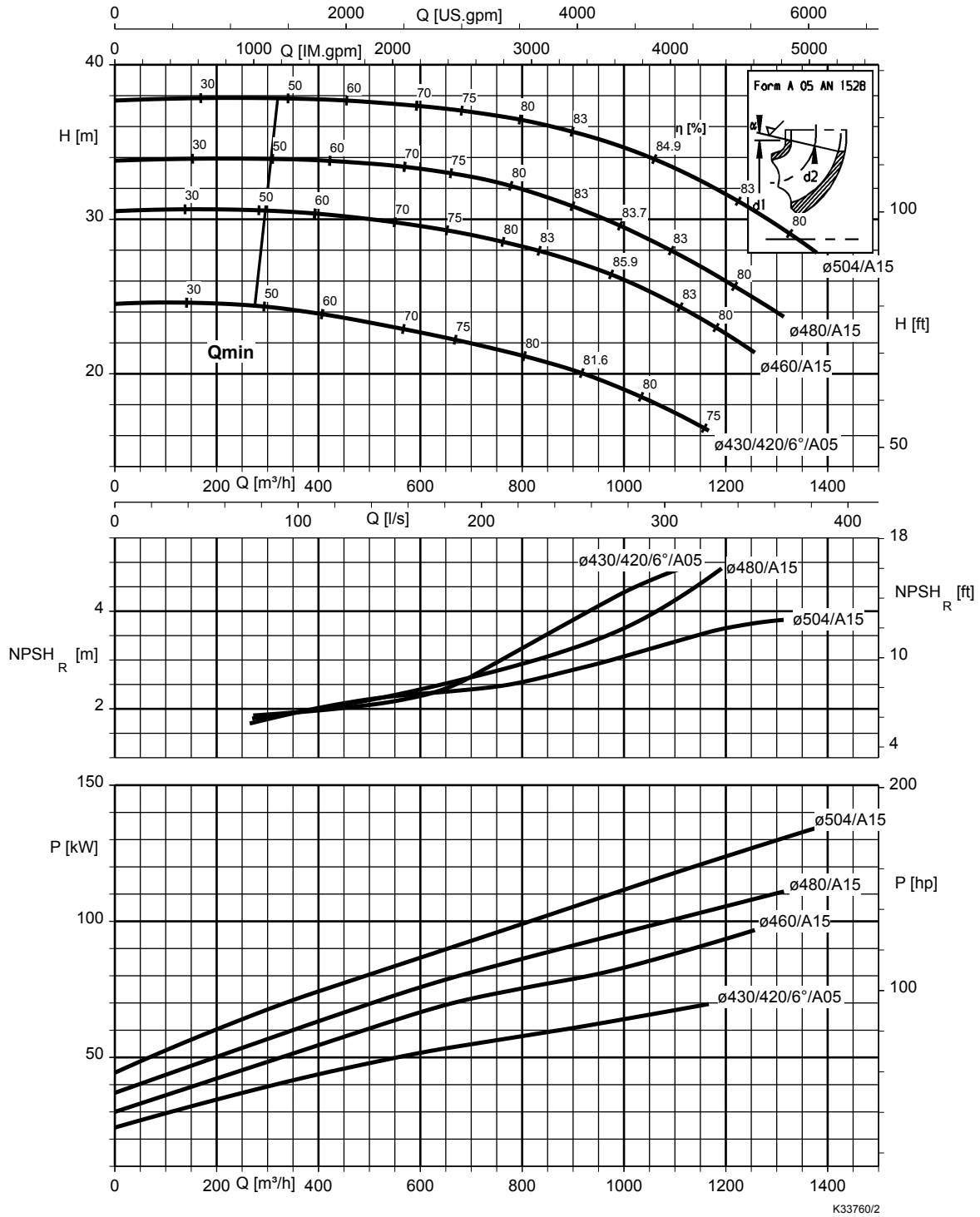
KWP K 300-300-401,  $n = 960 \text{ min}^{-1}$



KWP K 300-300-500,  $n = 960 \text{ min}^{-1}$

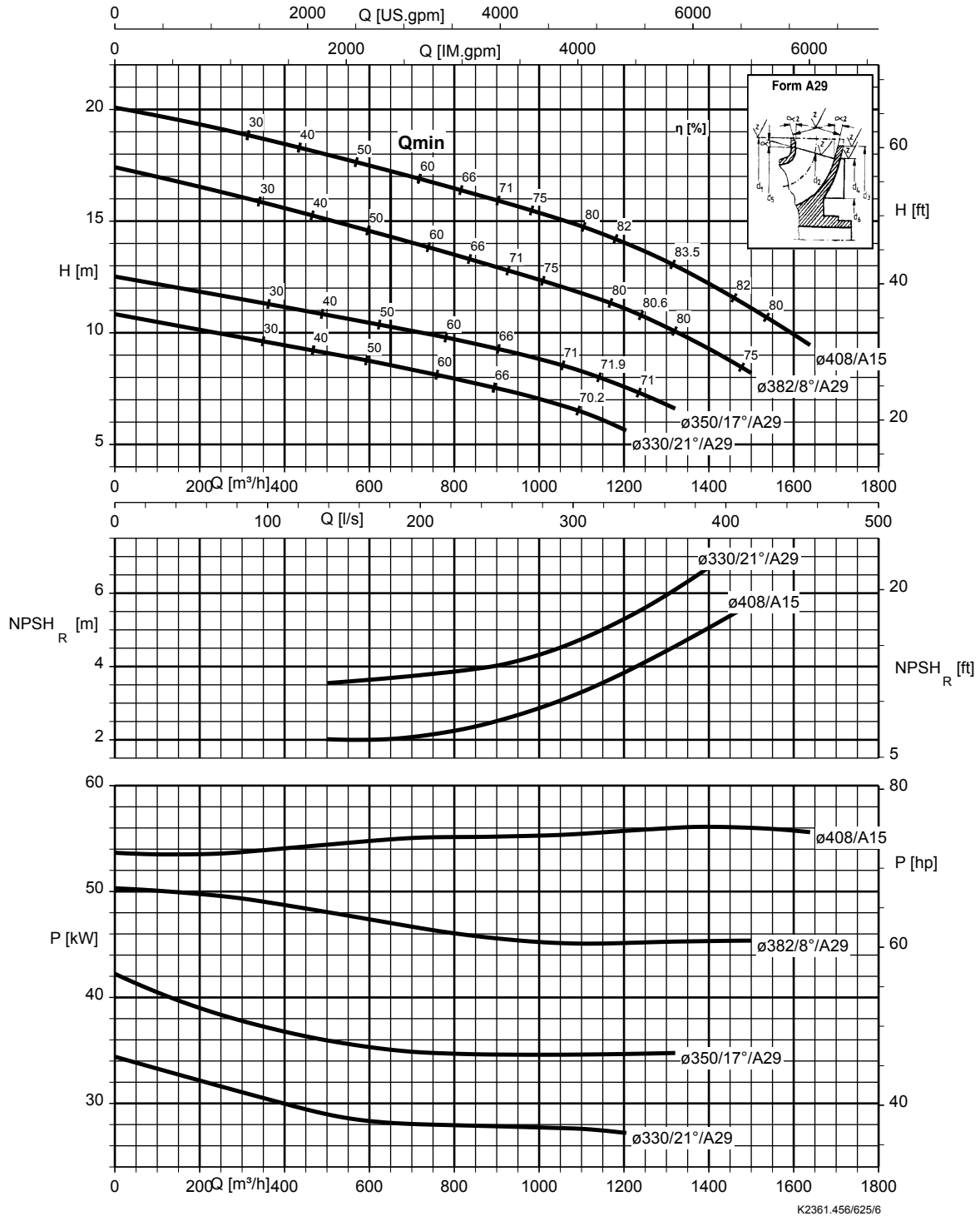


KWP K 300-300-503,  $n = 960 \text{ min}^{-1}$

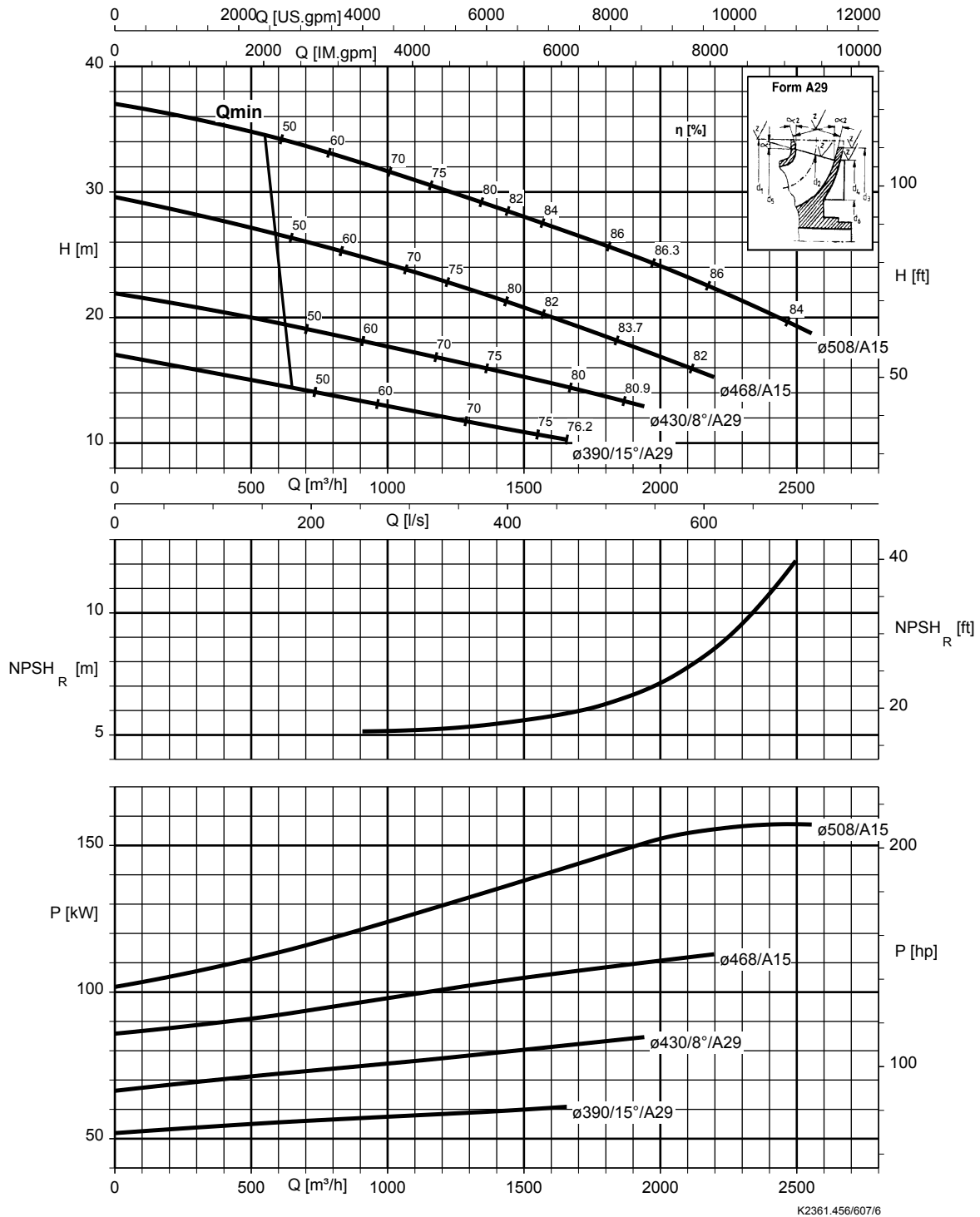




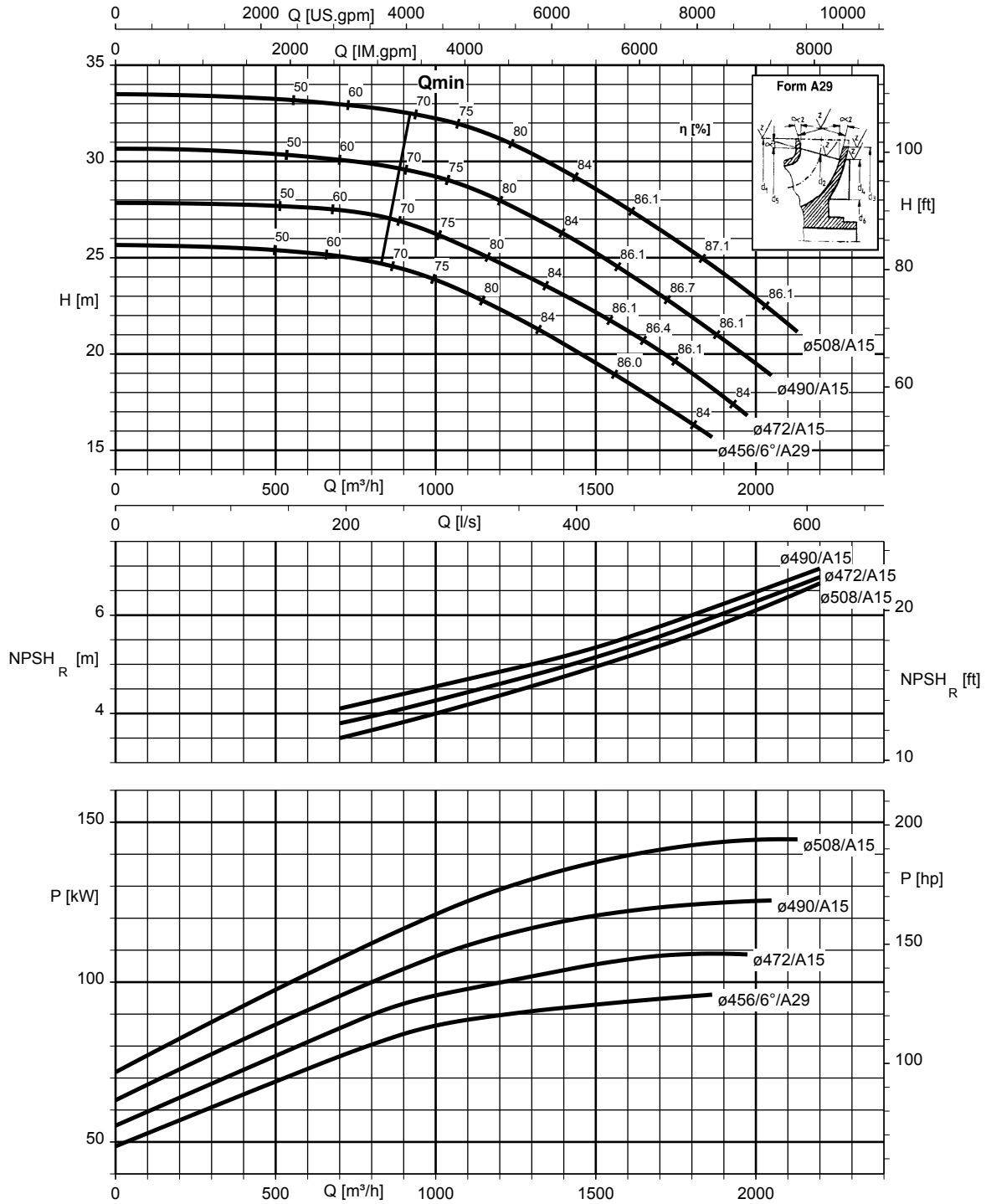
KWP K 350-350-400,  $n = 960 \text{ min}^{-1}$



KWP K 350-350-500,  $n = 960 \text{ min}^{-1}$

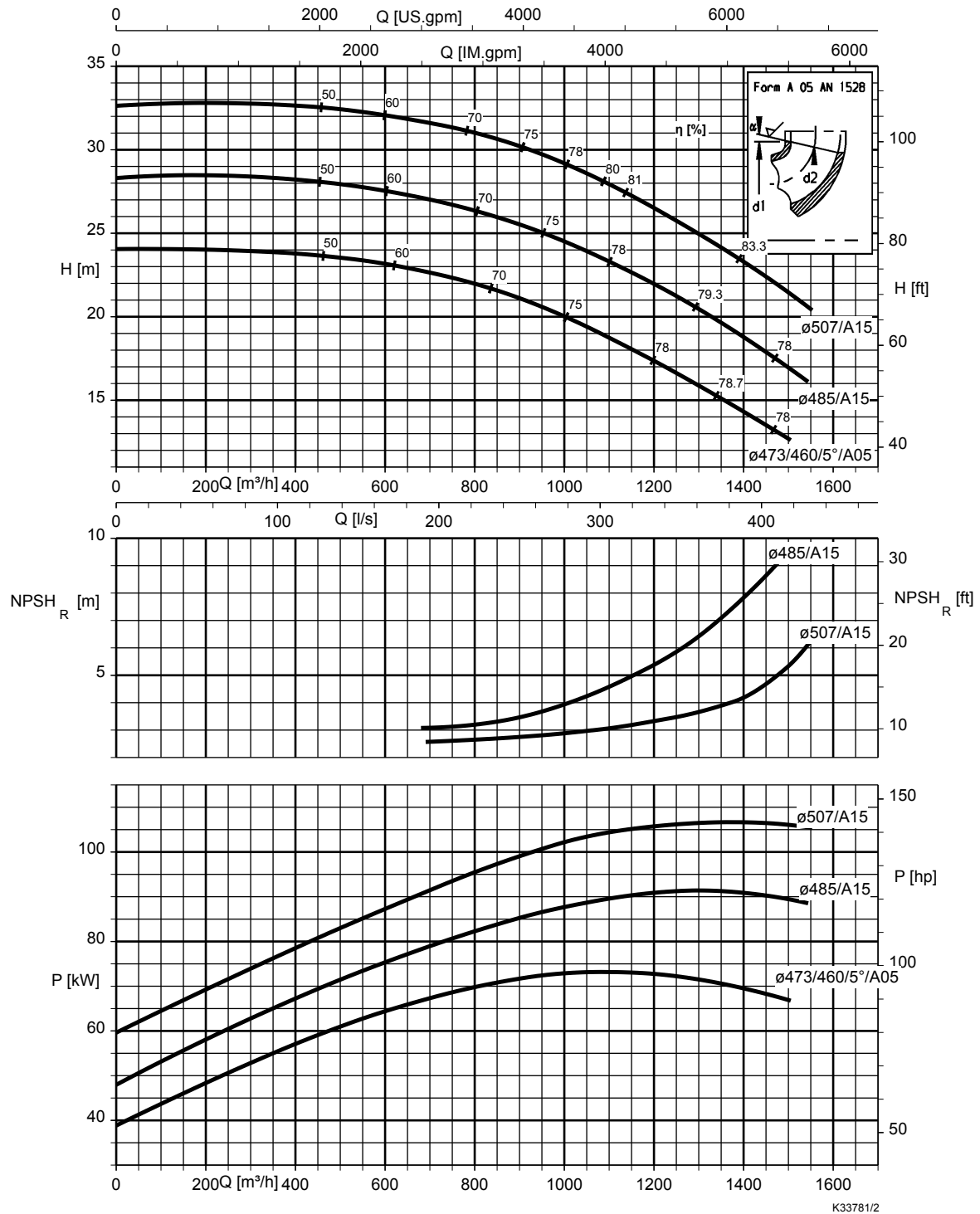


KWP K 350-350-503,  $n = 960 \text{ min}^{-1}$

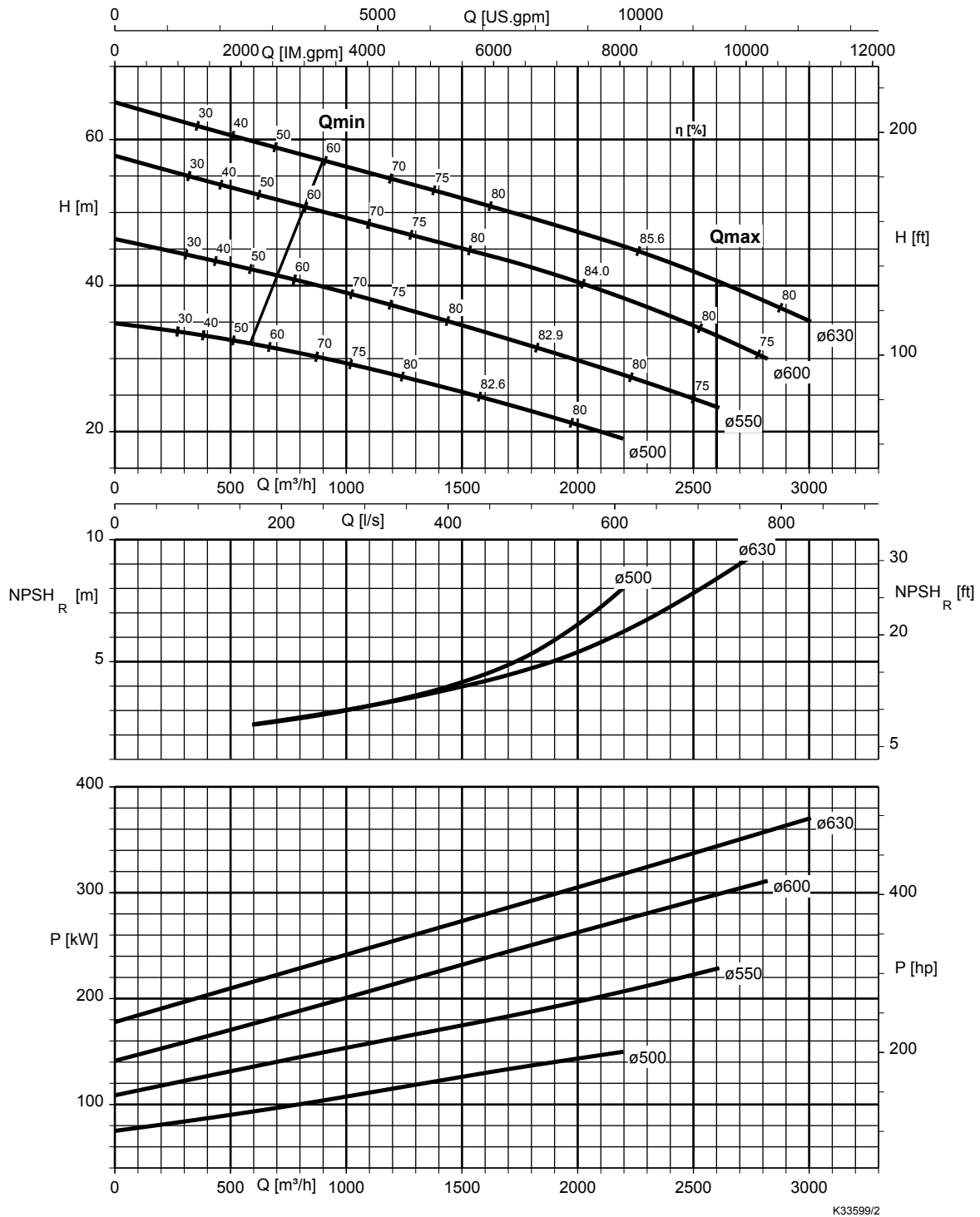


K33765/4

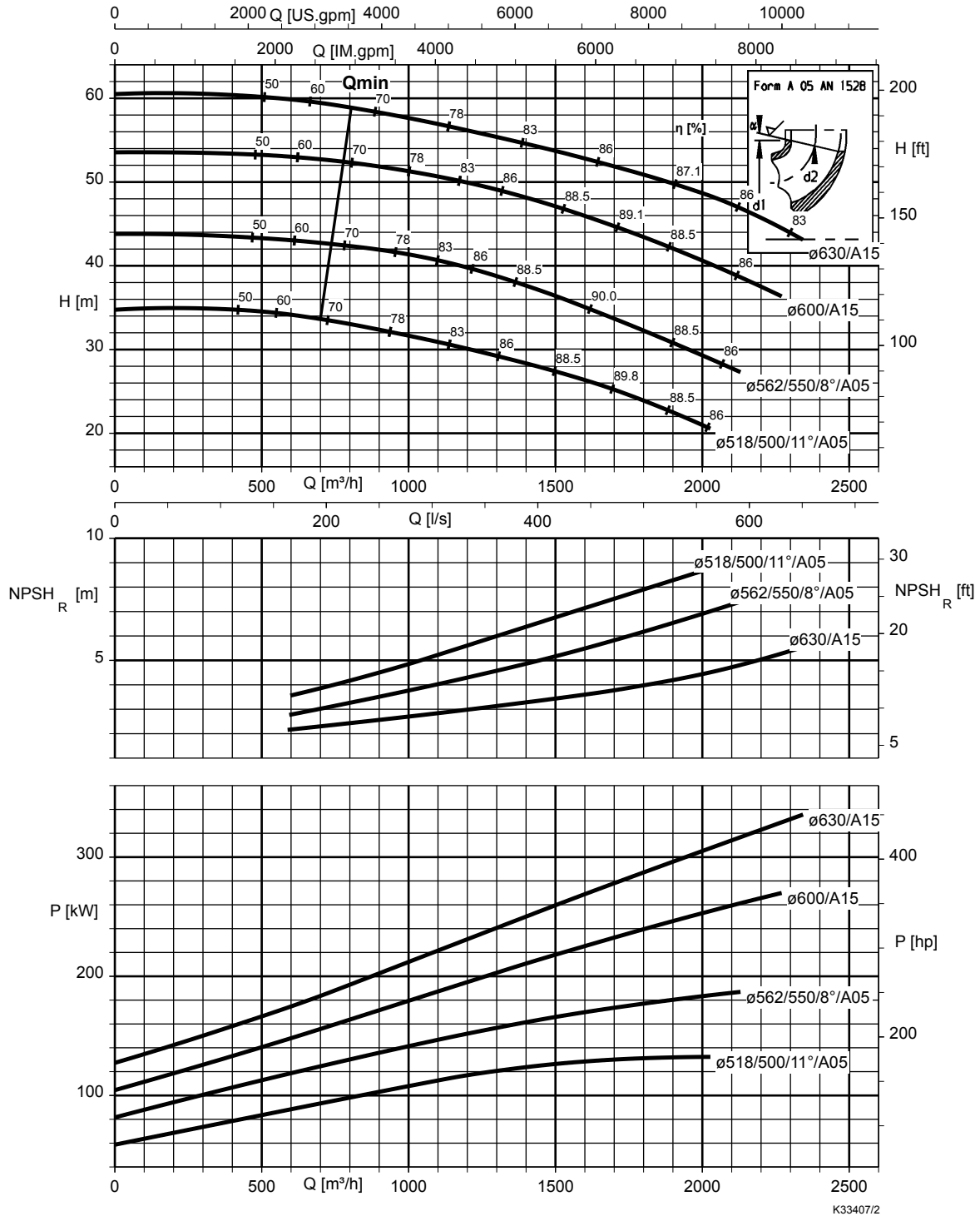
KWP K 350-350-504,  $n = 960 \text{ min}^{-1}$



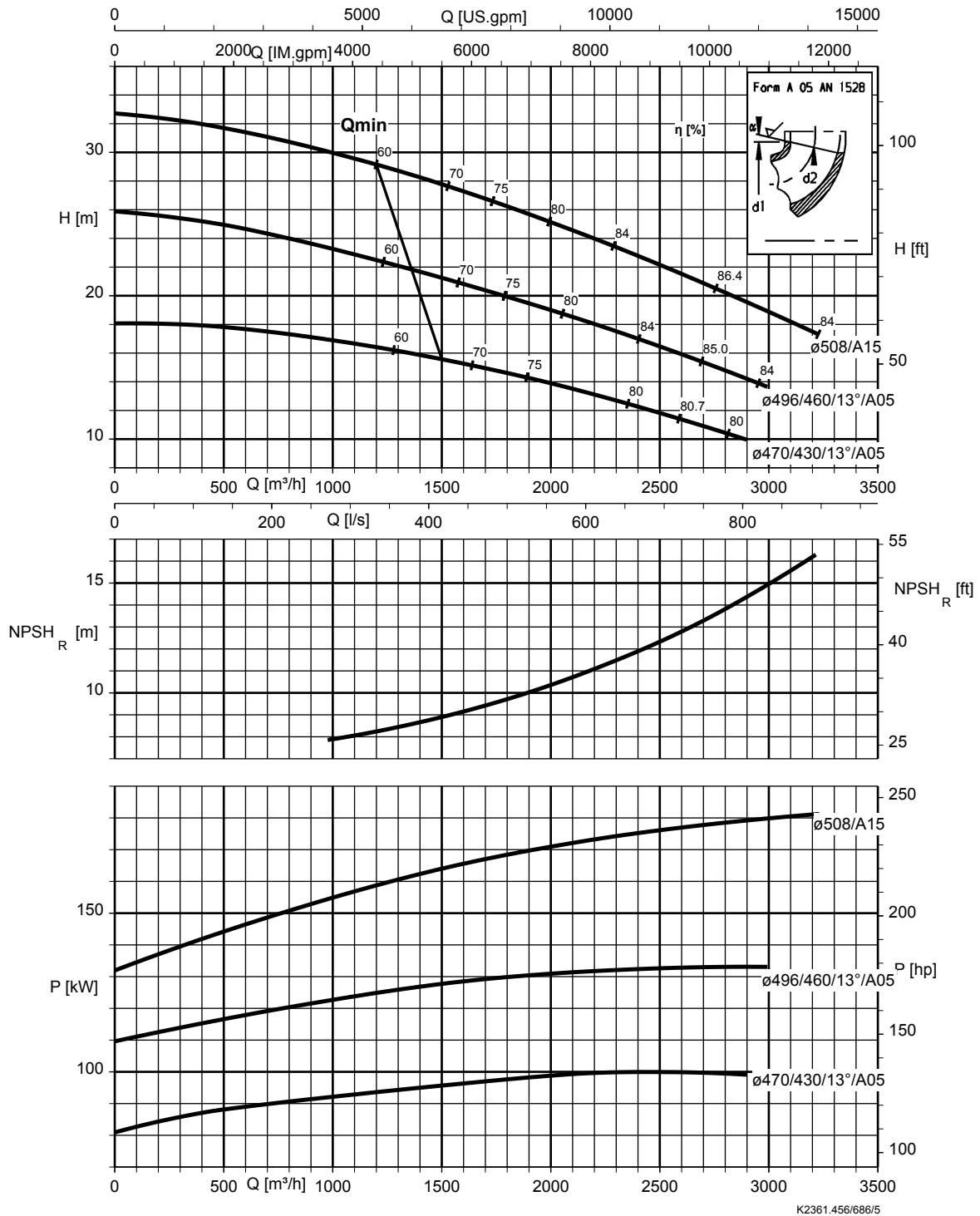
KWP K 350-350-630,  $n = 960 \text{ min}^{-1}$



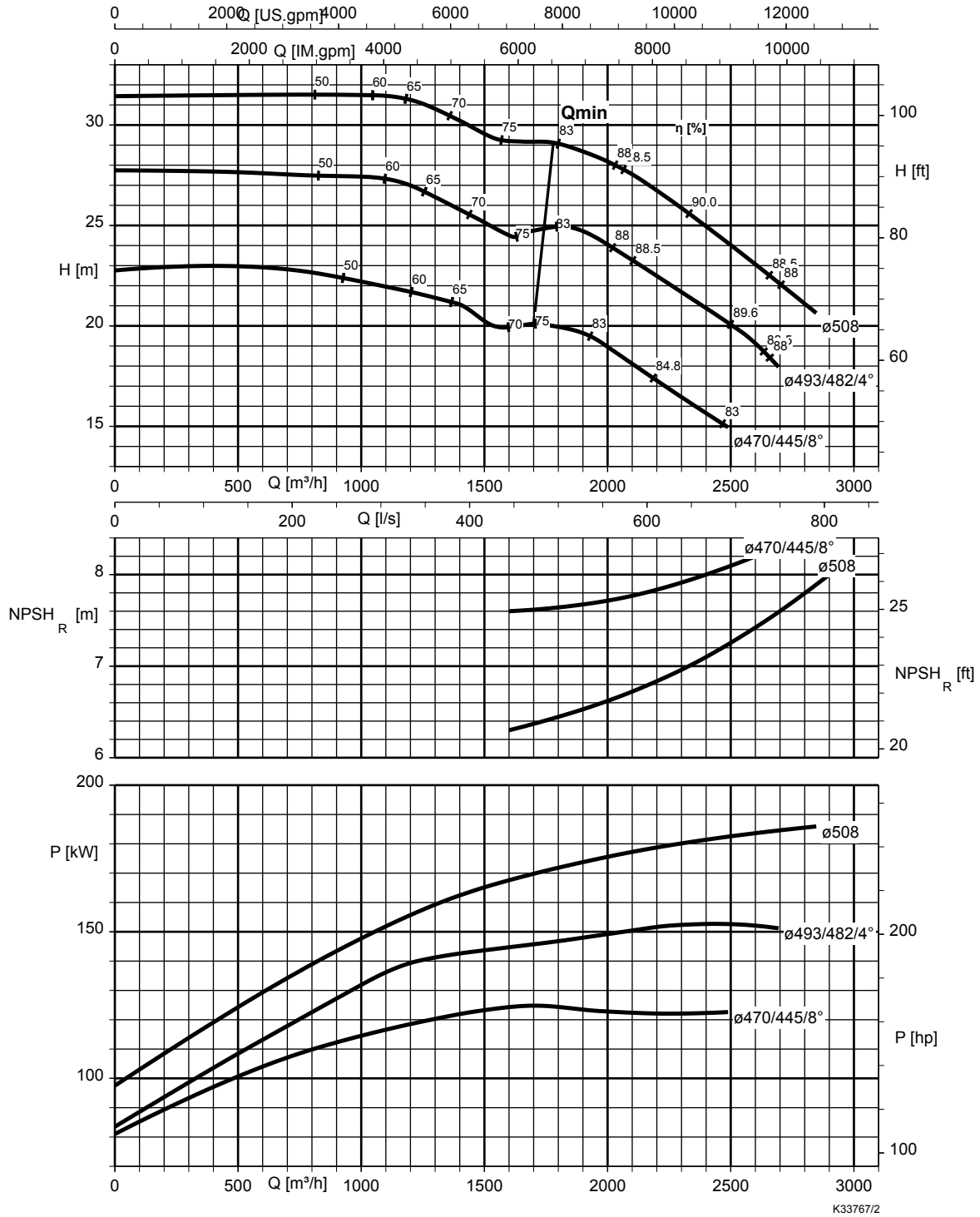
KWP K 350-350-633,  $n = 960 \text{ min}^{-1}$



KWP K 400-400-500,  $n = 960 \text{ min}^{-1}$

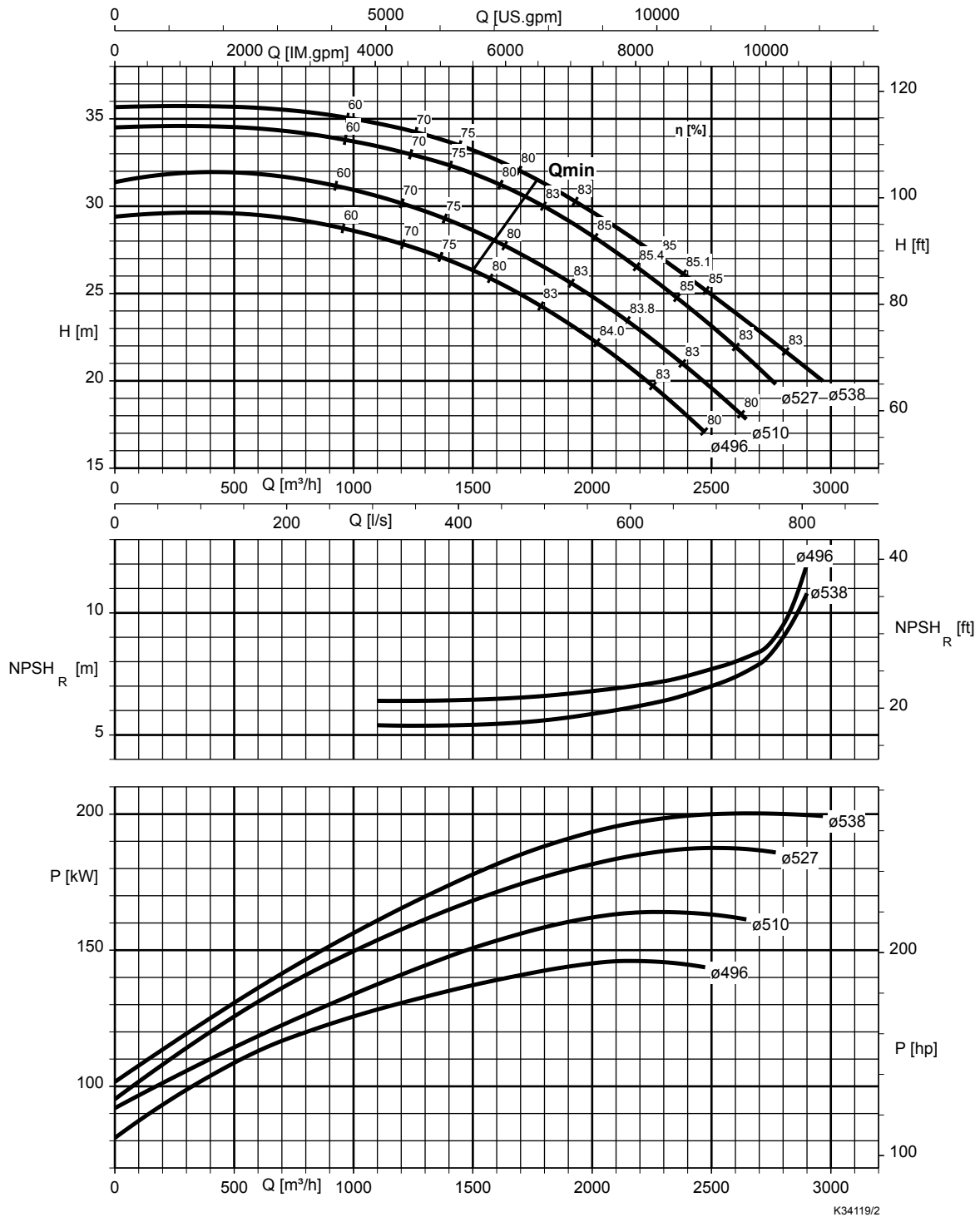


KWP K 400-400-503,  $n = 960 \text{ min}^{-1}$

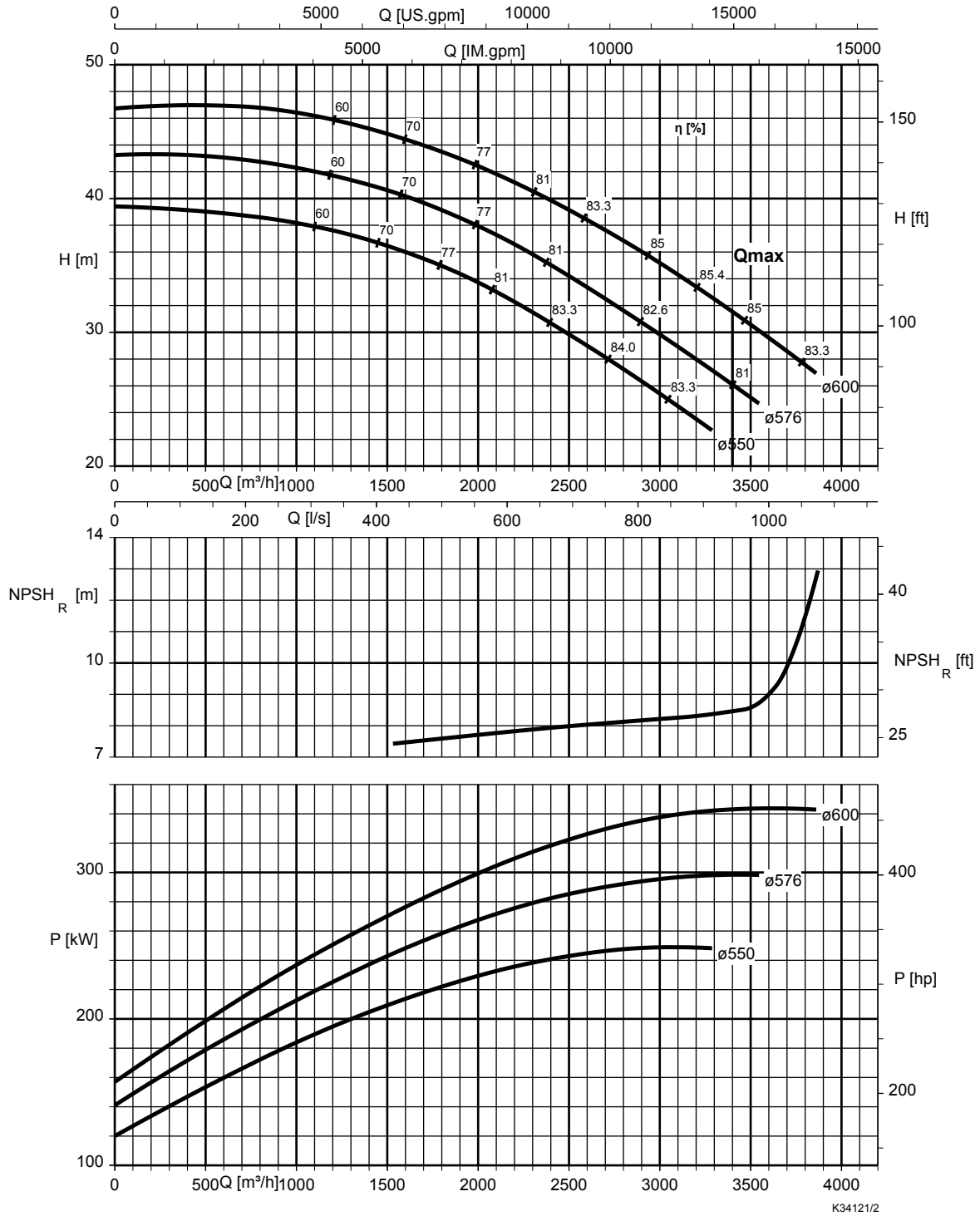




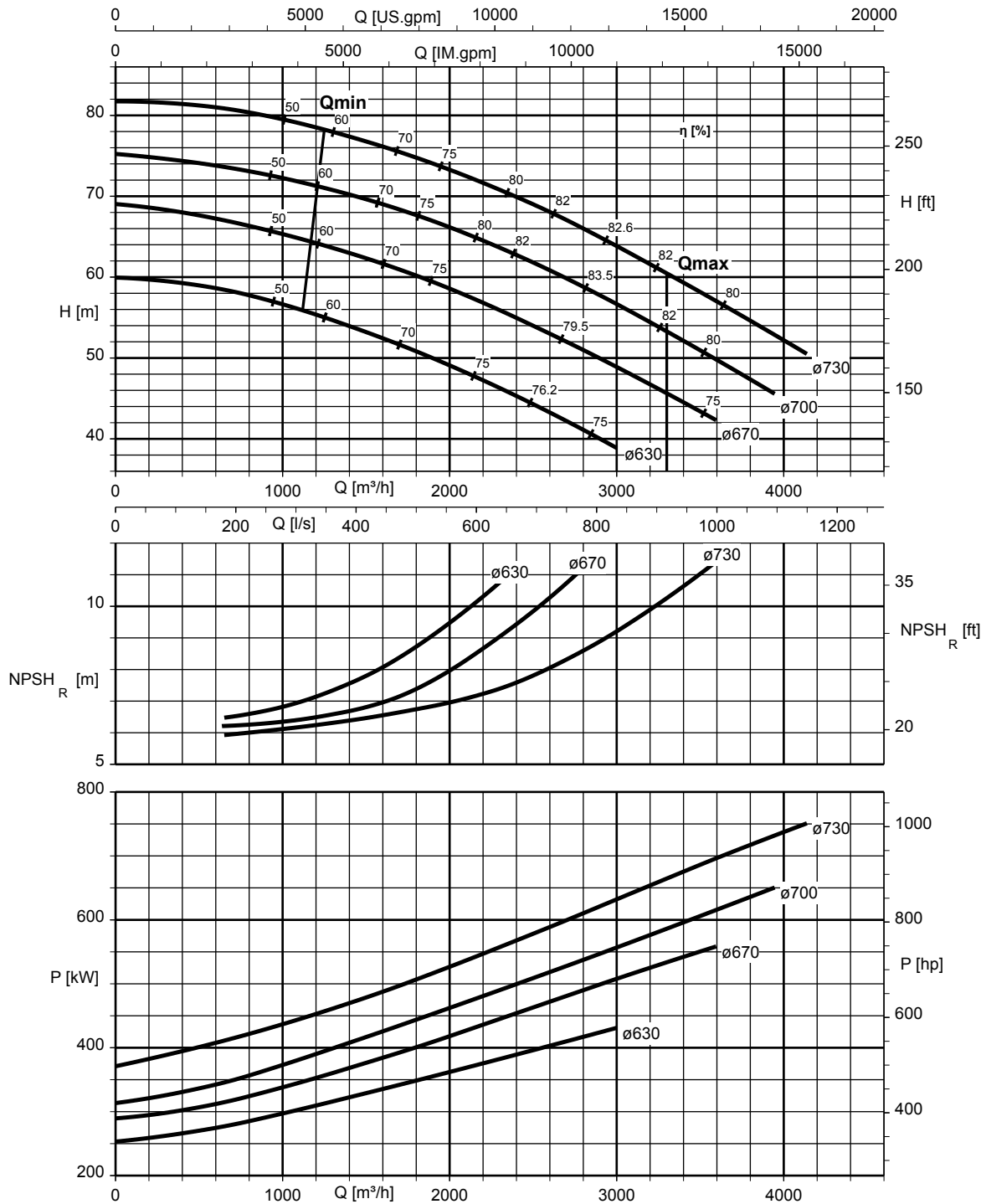
KWP K 400-400-533,  $n = 960 \text{ min}^{-1}$



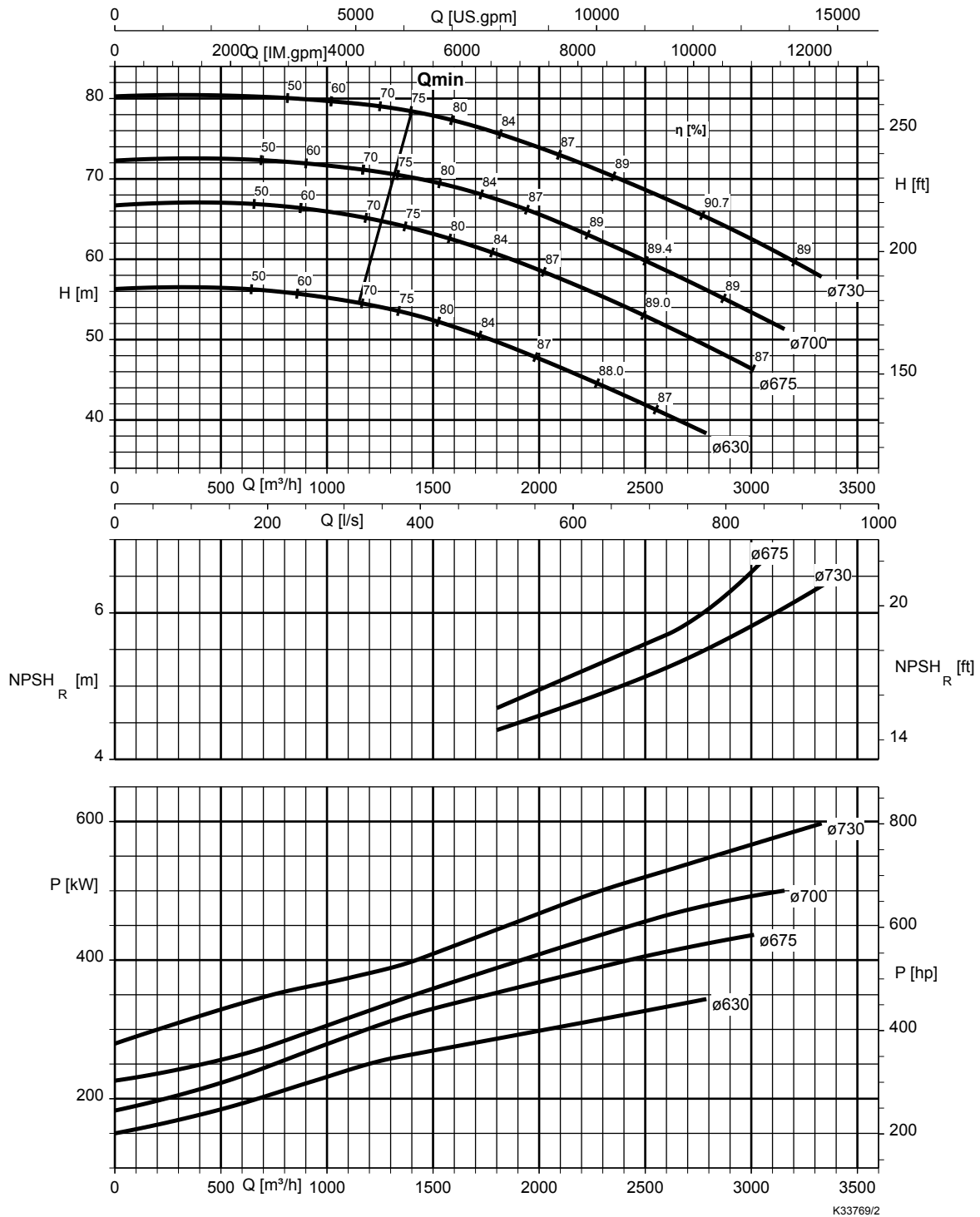
KWP K 400-400-583,  $n = 960 \text{ min}^{-1}$



KWP K 500-400-710,  $n = 960 \text{ min}^{-1}$

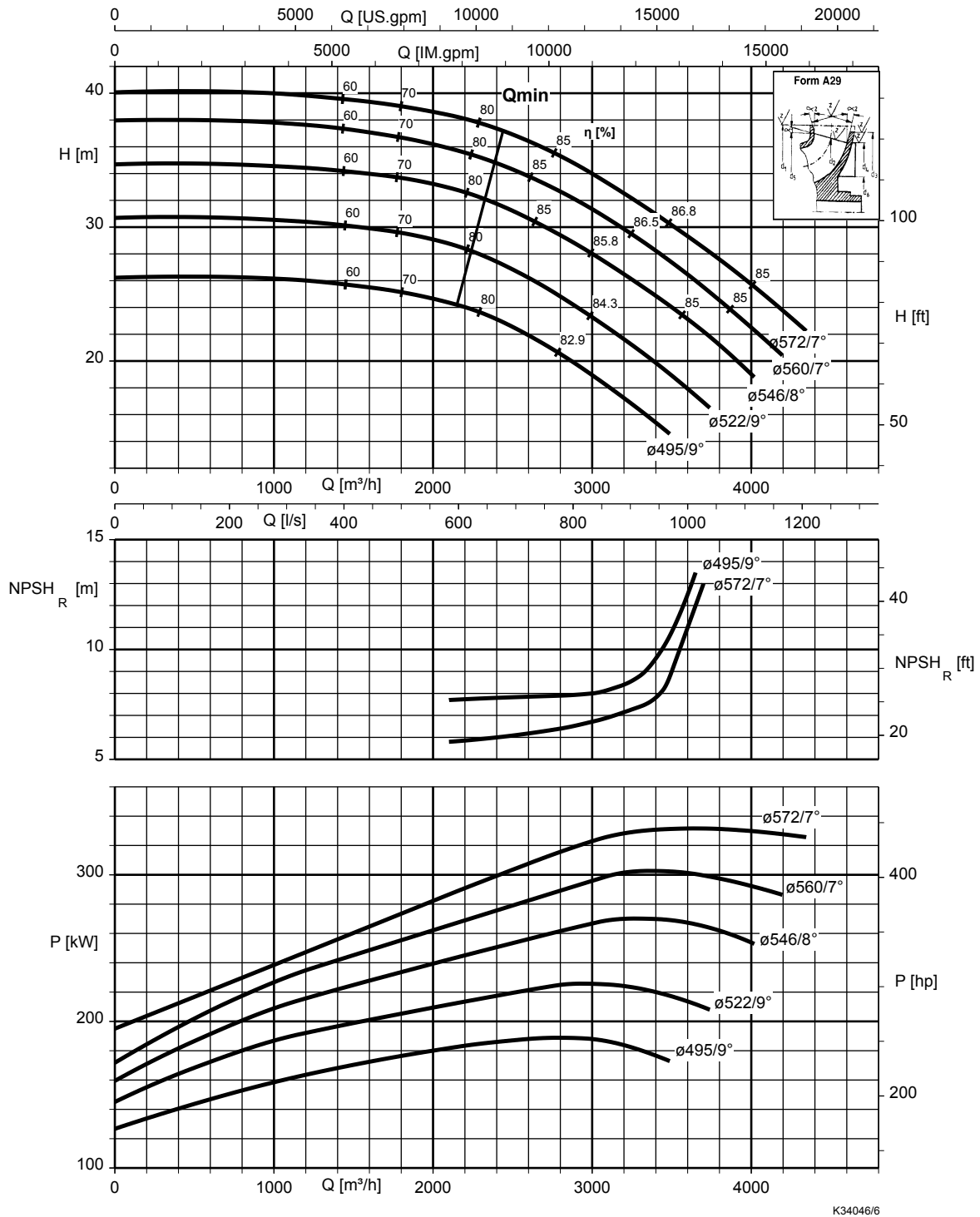


KWP K 500-400-713,  $n = 960 \text{ min}^{-1}$

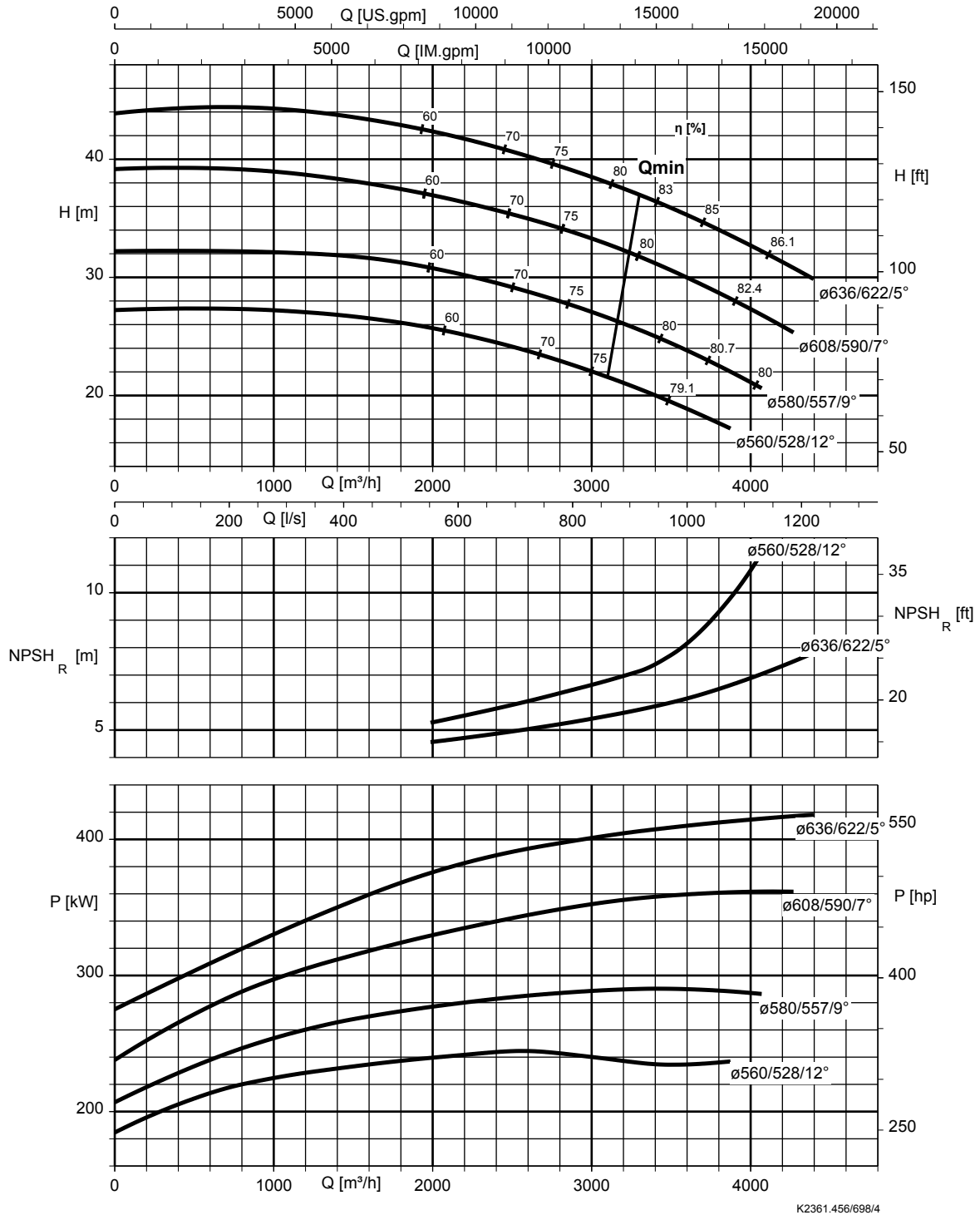


K33769/2

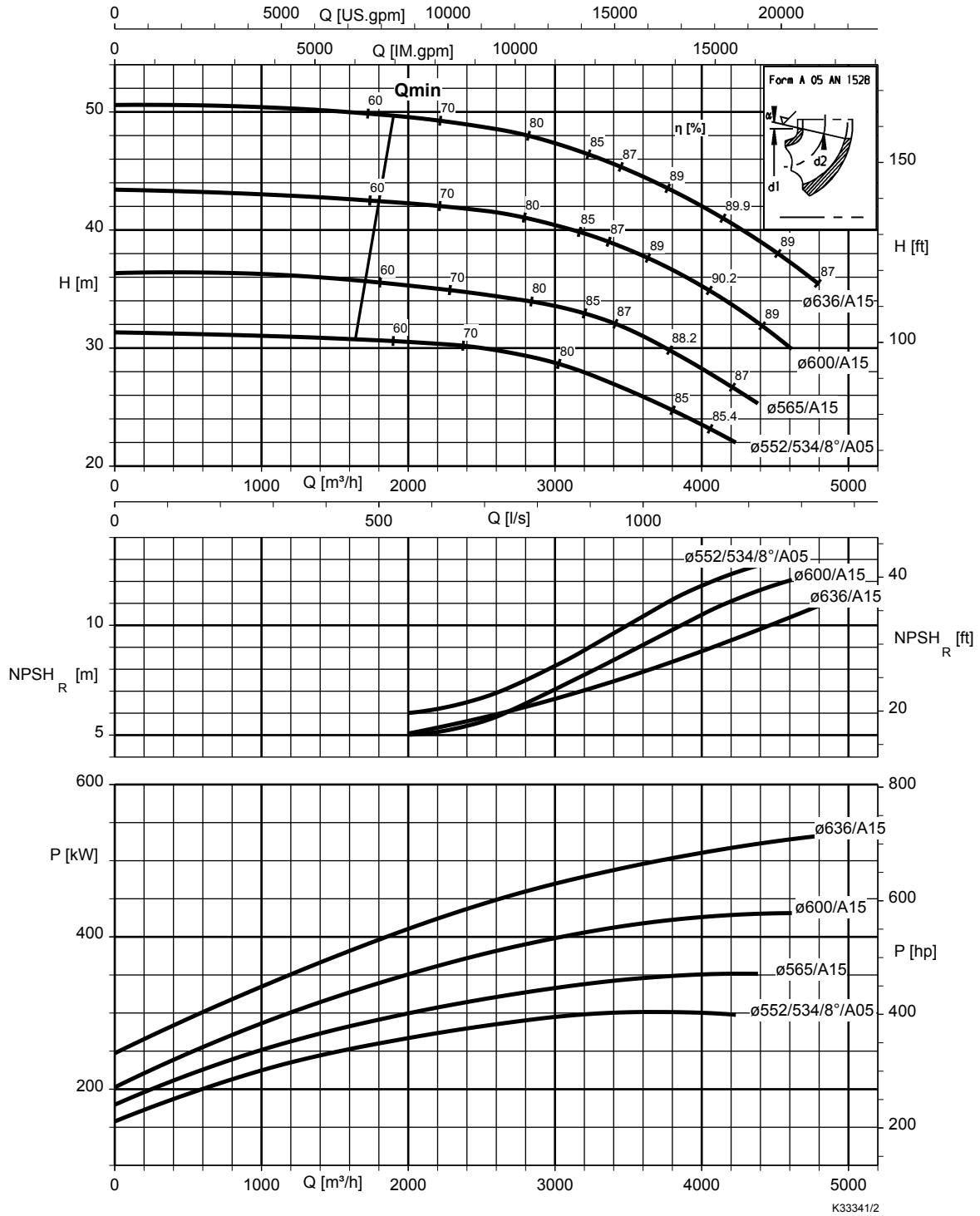
KWP K 500-500-544,  $n = 960 \text{ min}^{-1}$



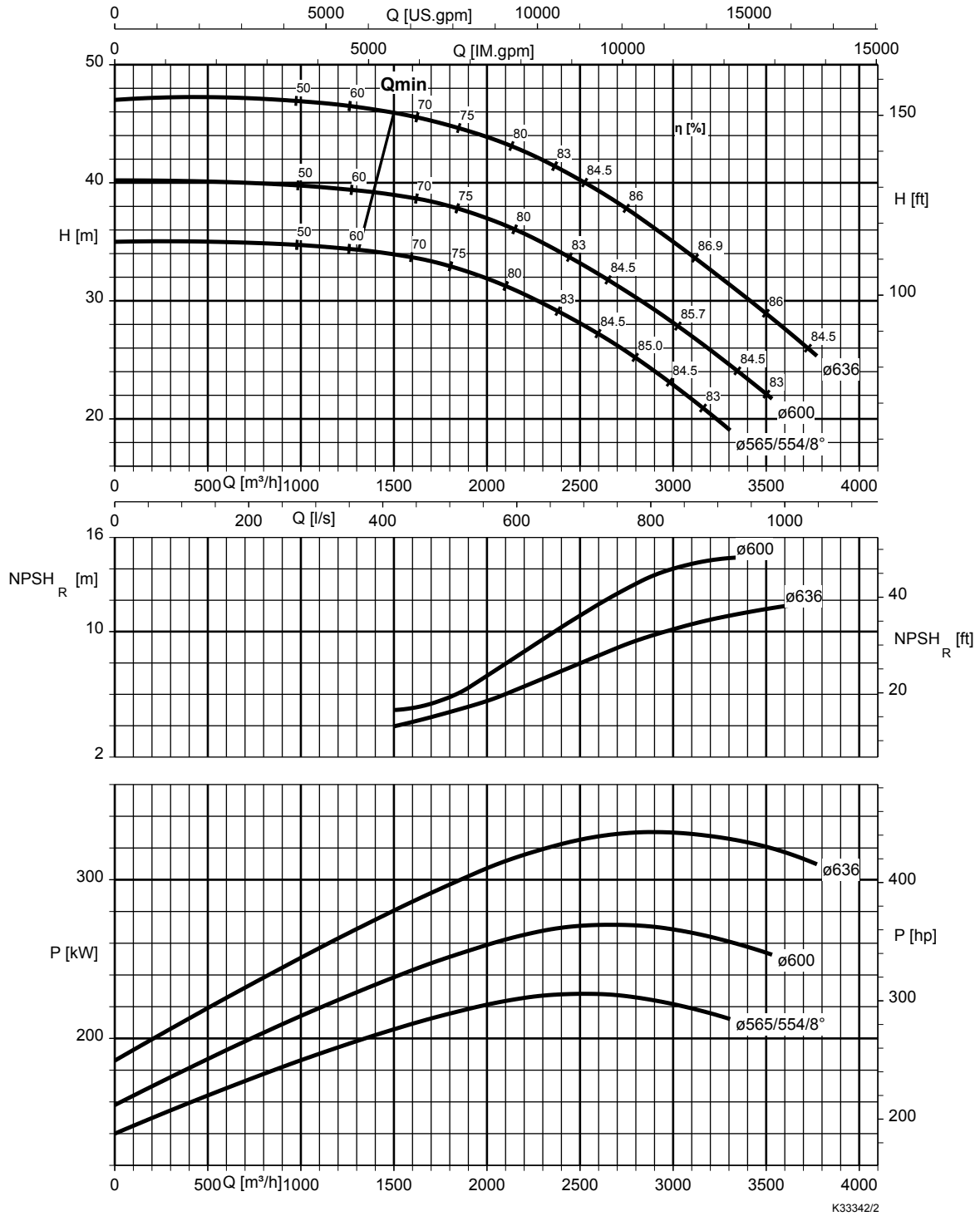
KWP K 500-500-630,  $n = 960 \text{ min}^{-1}$



KWP K 500-500-633,  $n = 960 \text{ min}^{-1}$

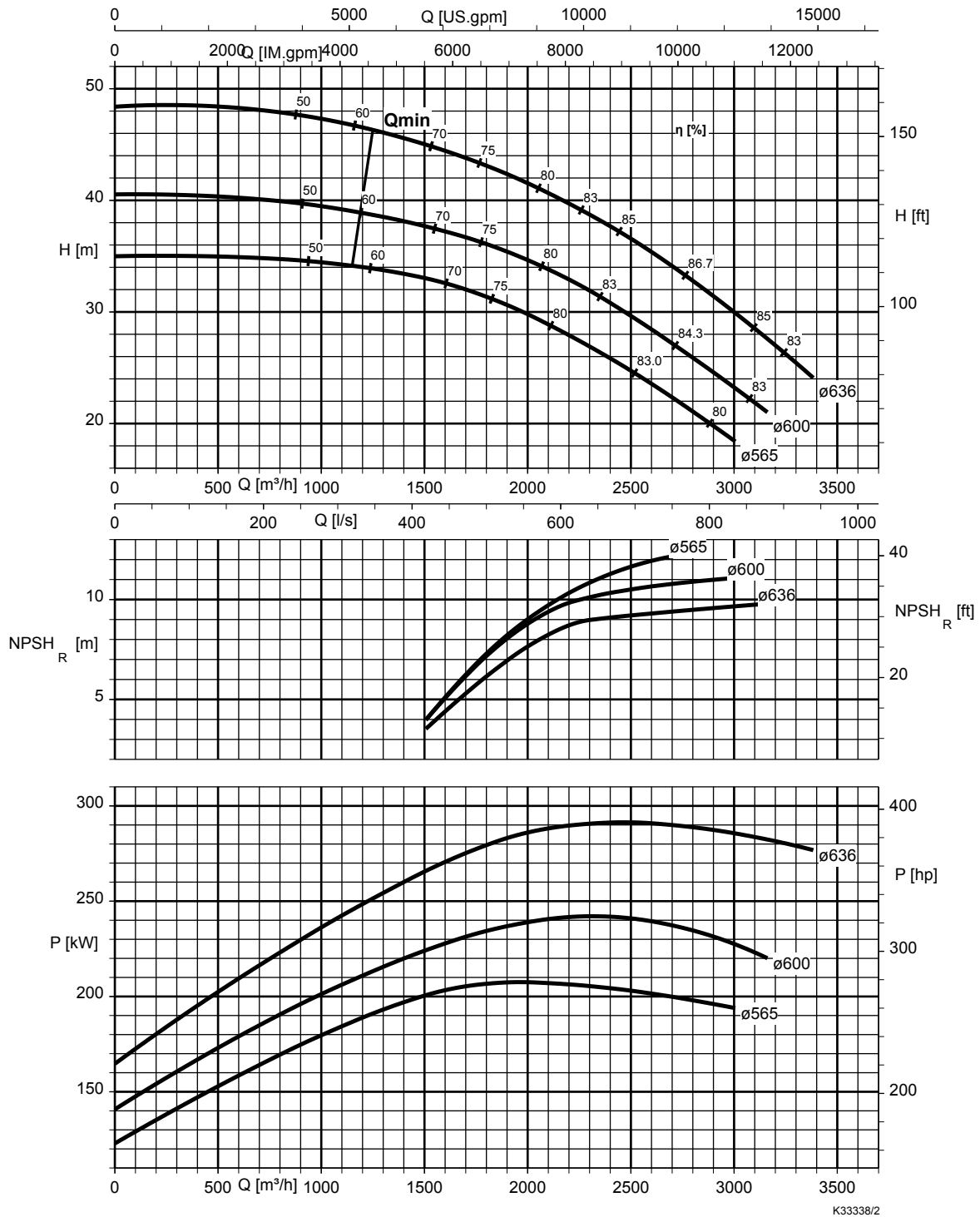


KWP K 500-500-634,  $n = 960 \text{ min}^{-1}$

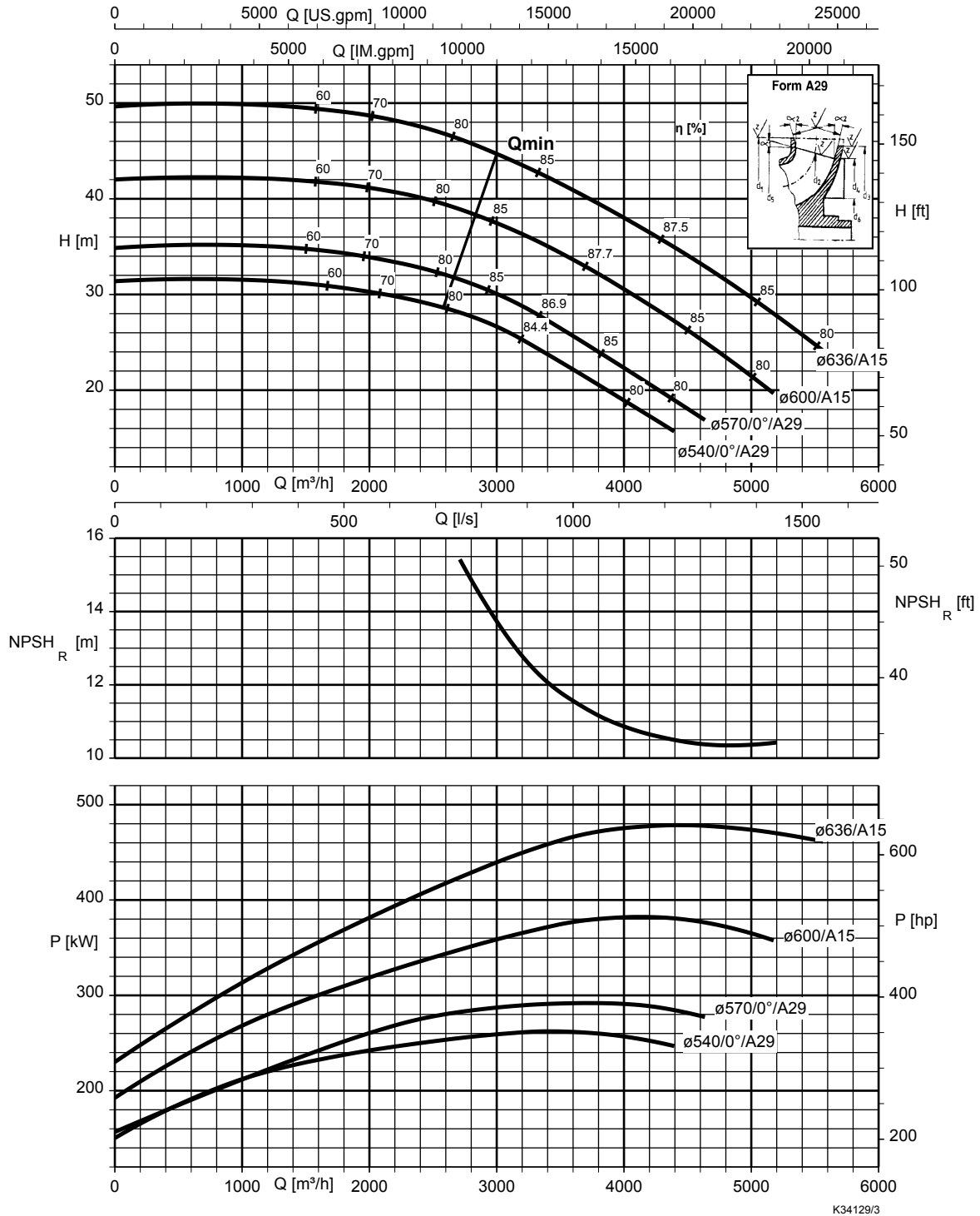




KWP K 500-500-635,  $n = 960 \text{ min}^{-1}$

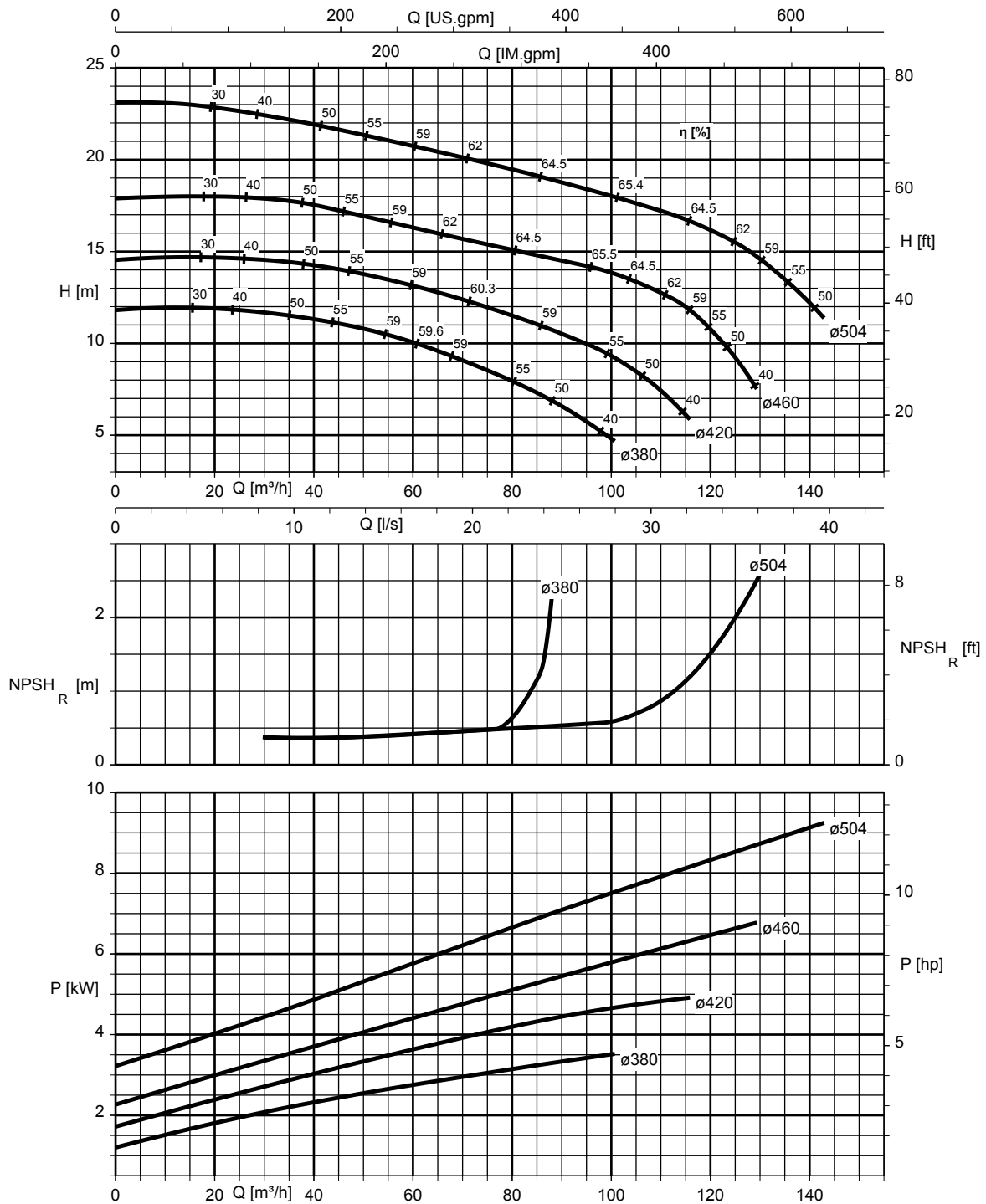


KWP K 500-500-637,  $n = 960 \text{ min}^{-1}$



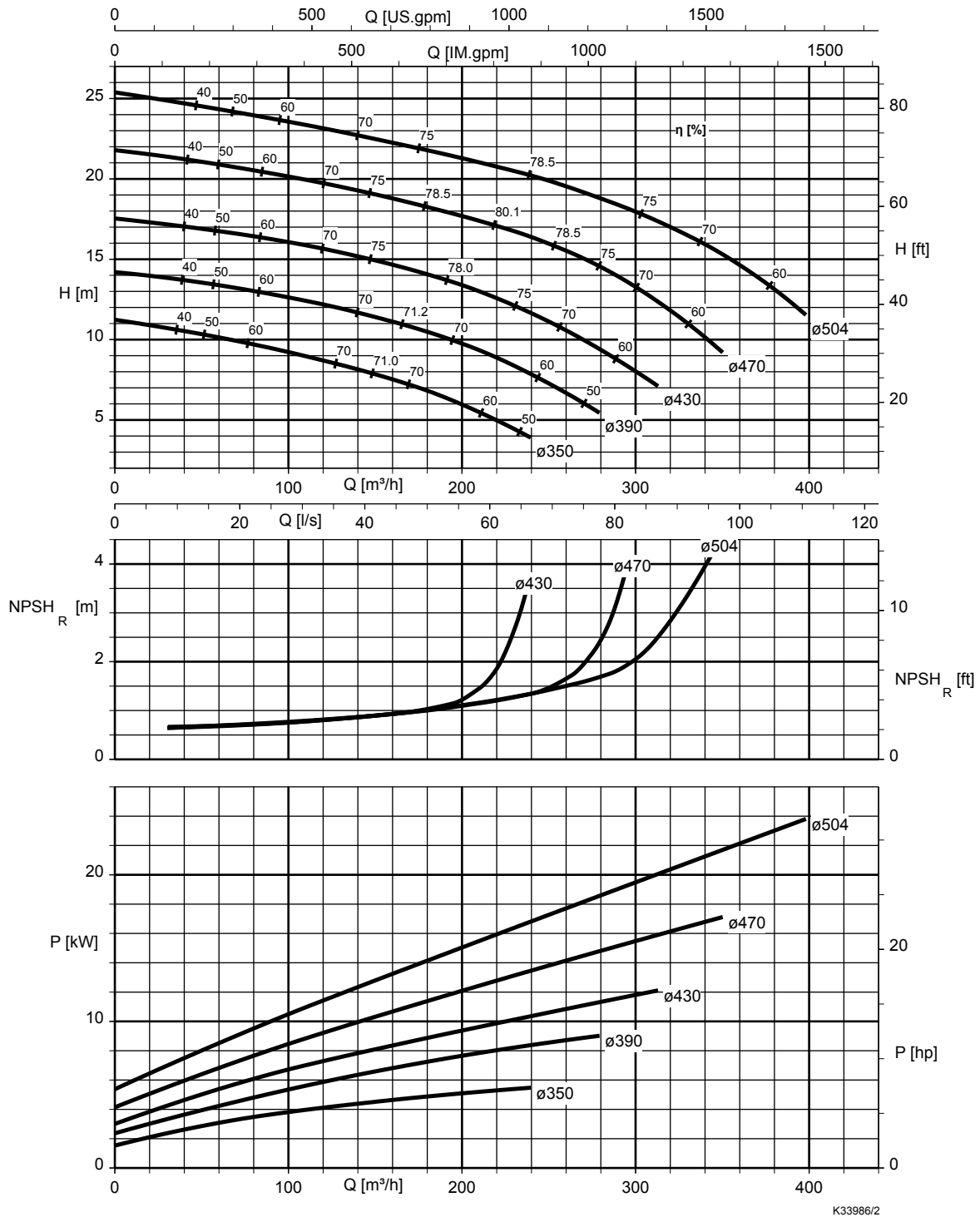
$n = 725 \text{ min}^{-1}$

KWP K 125-080-500,  $n = 725 \text{ min}^{-1}$

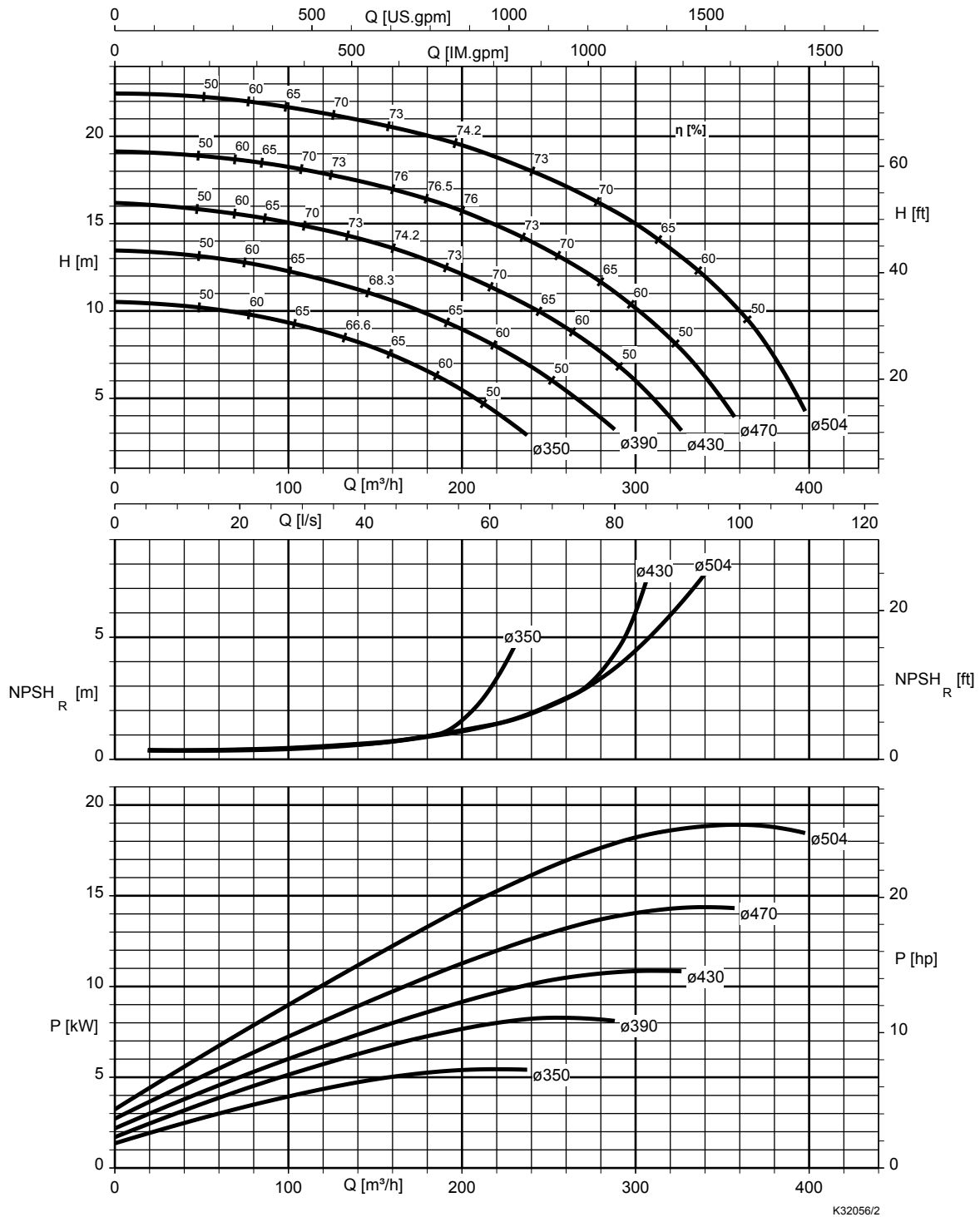


K33954/2

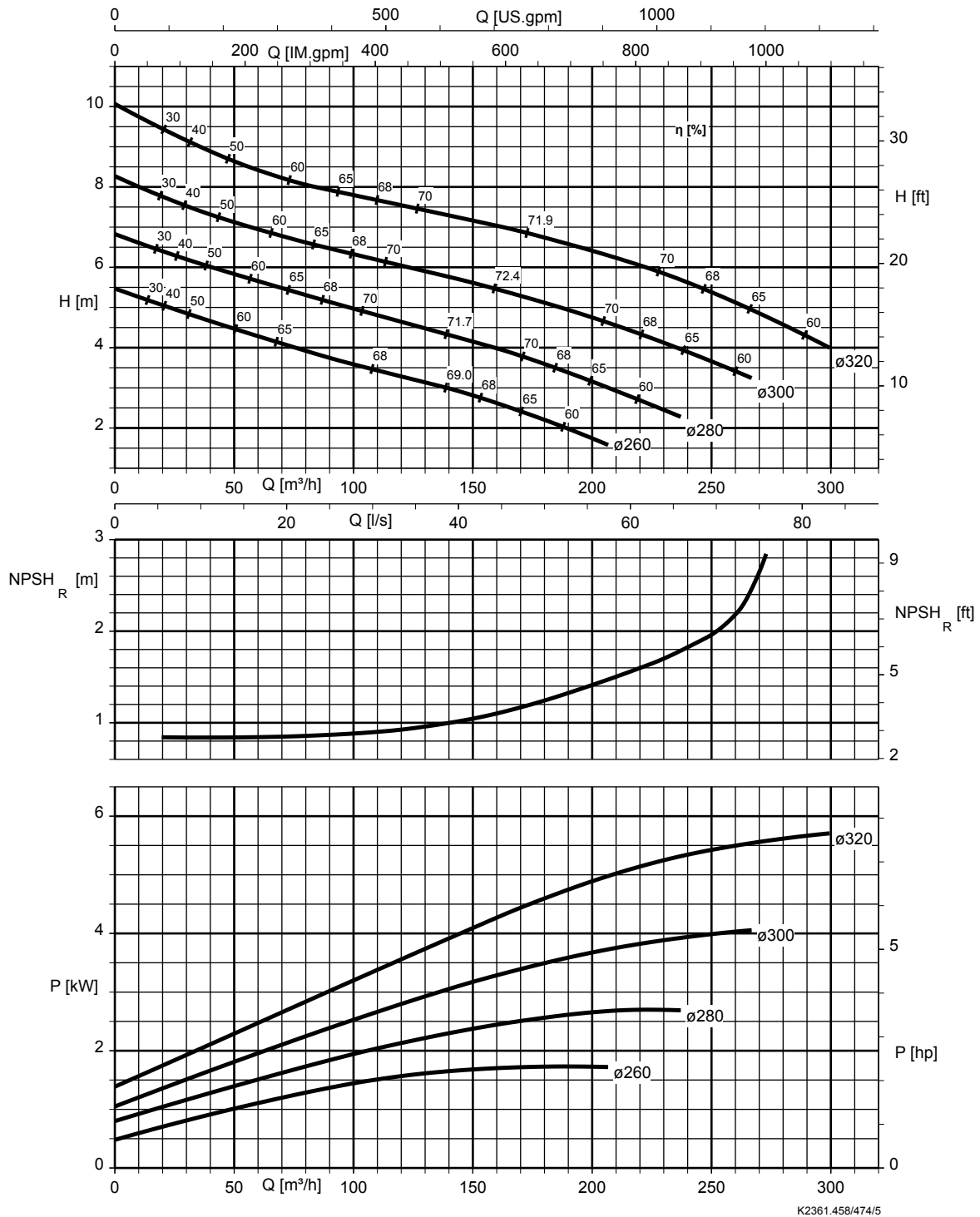
KWP K 150-125-500,  $n = 725 \text{ min}^{-1}$



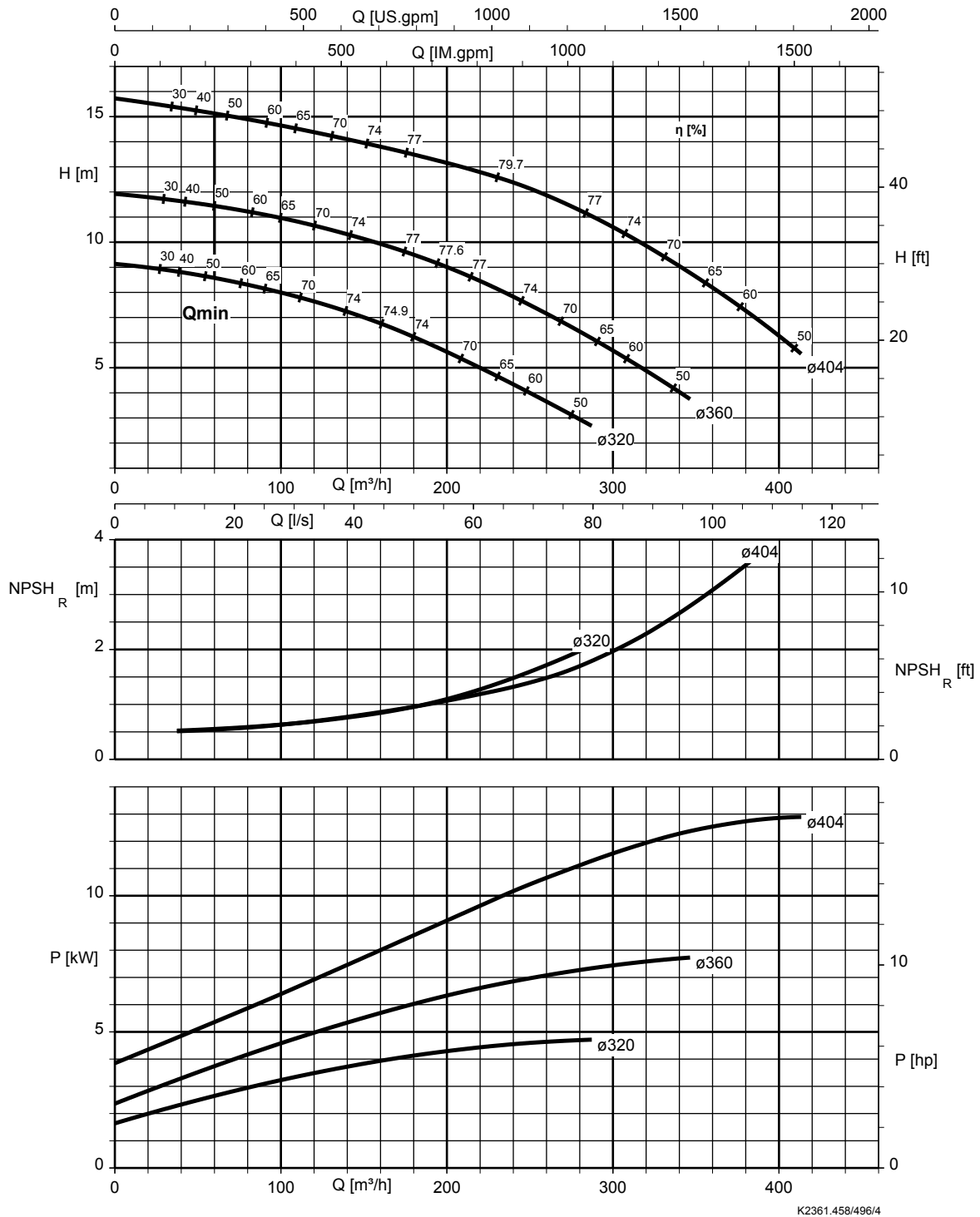
KWP K 150-125-503,  $n = 725 \text{ min}^{-1}$



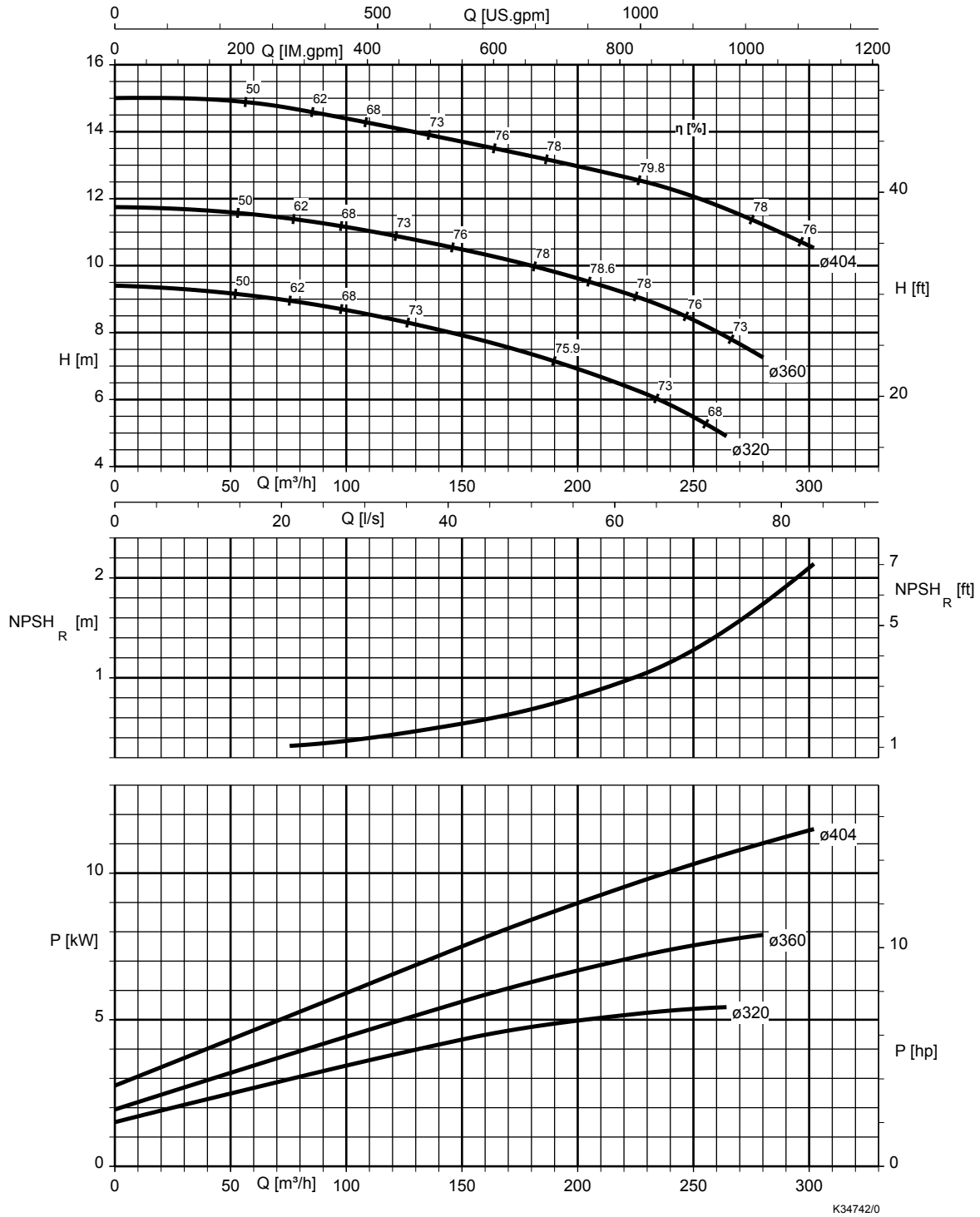
KWP K 150-150-315,  $n = 725 \text{ min}^{-1}$



KWP K 150-150-400,  $n = 725 \text{ min}^{-1}$

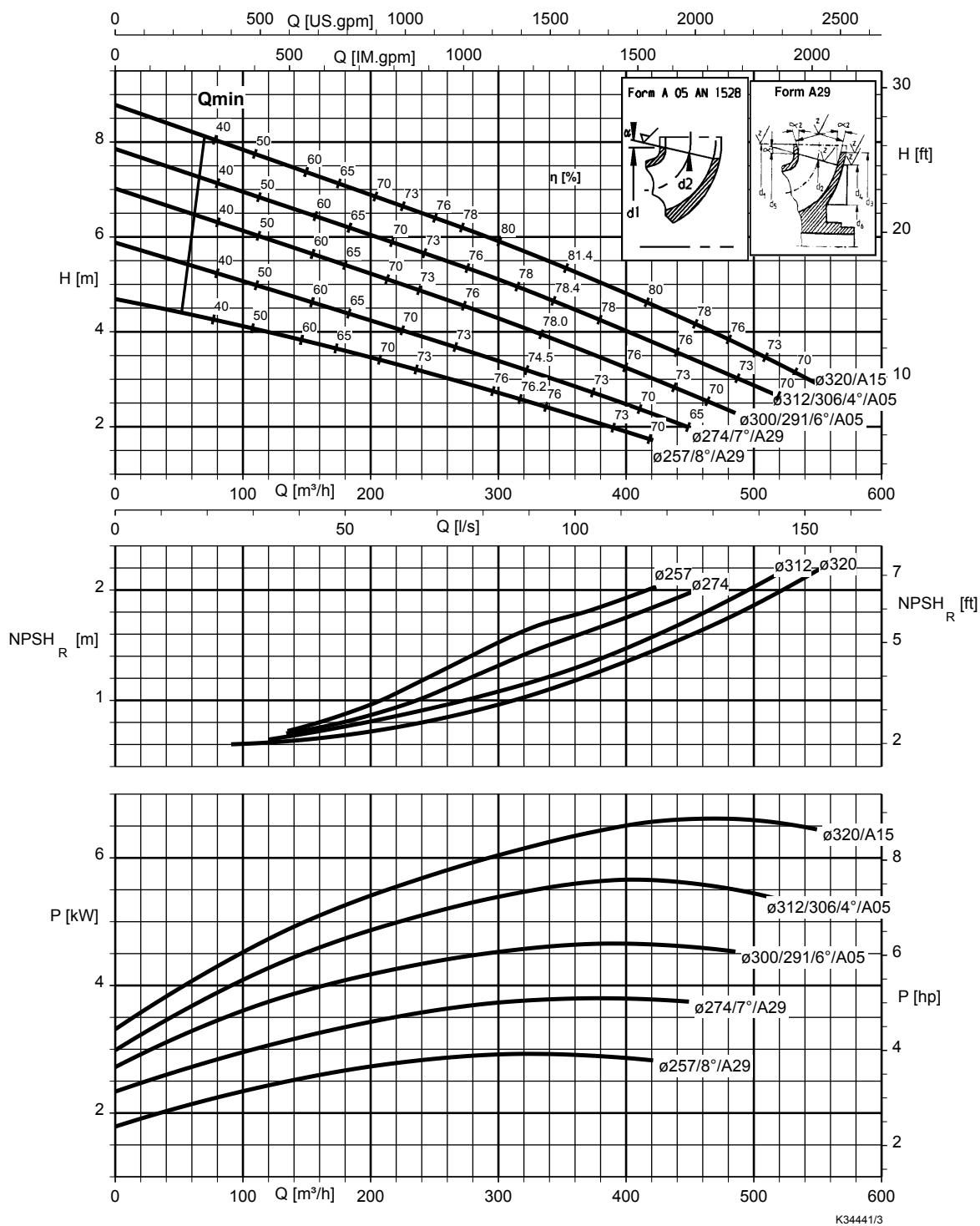


KWP K 150-150-403,  $n = 725 \text{ min}^{-1}$

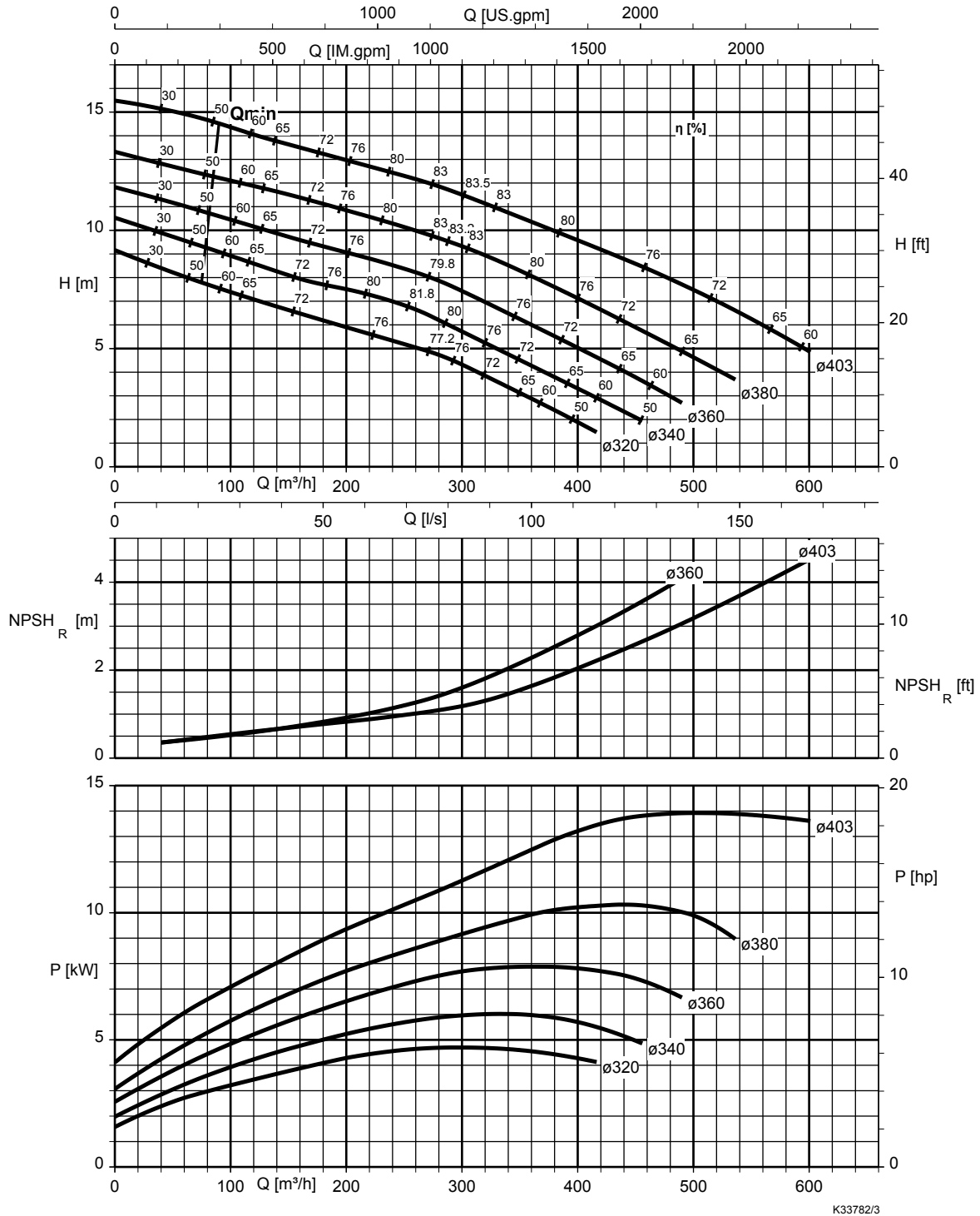




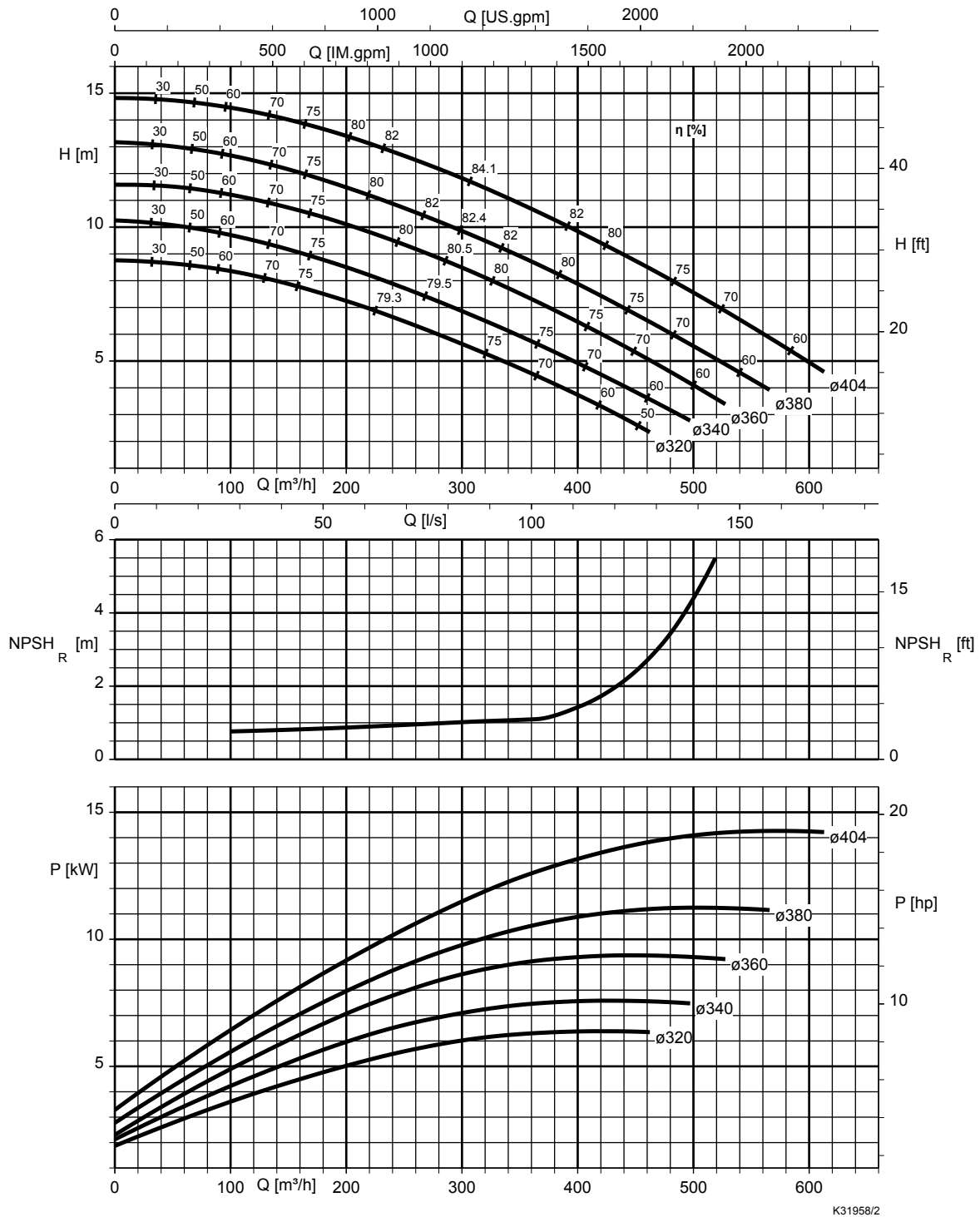
KWP K 200-200-320,  $n = 725 \text{ min}^{-1}$



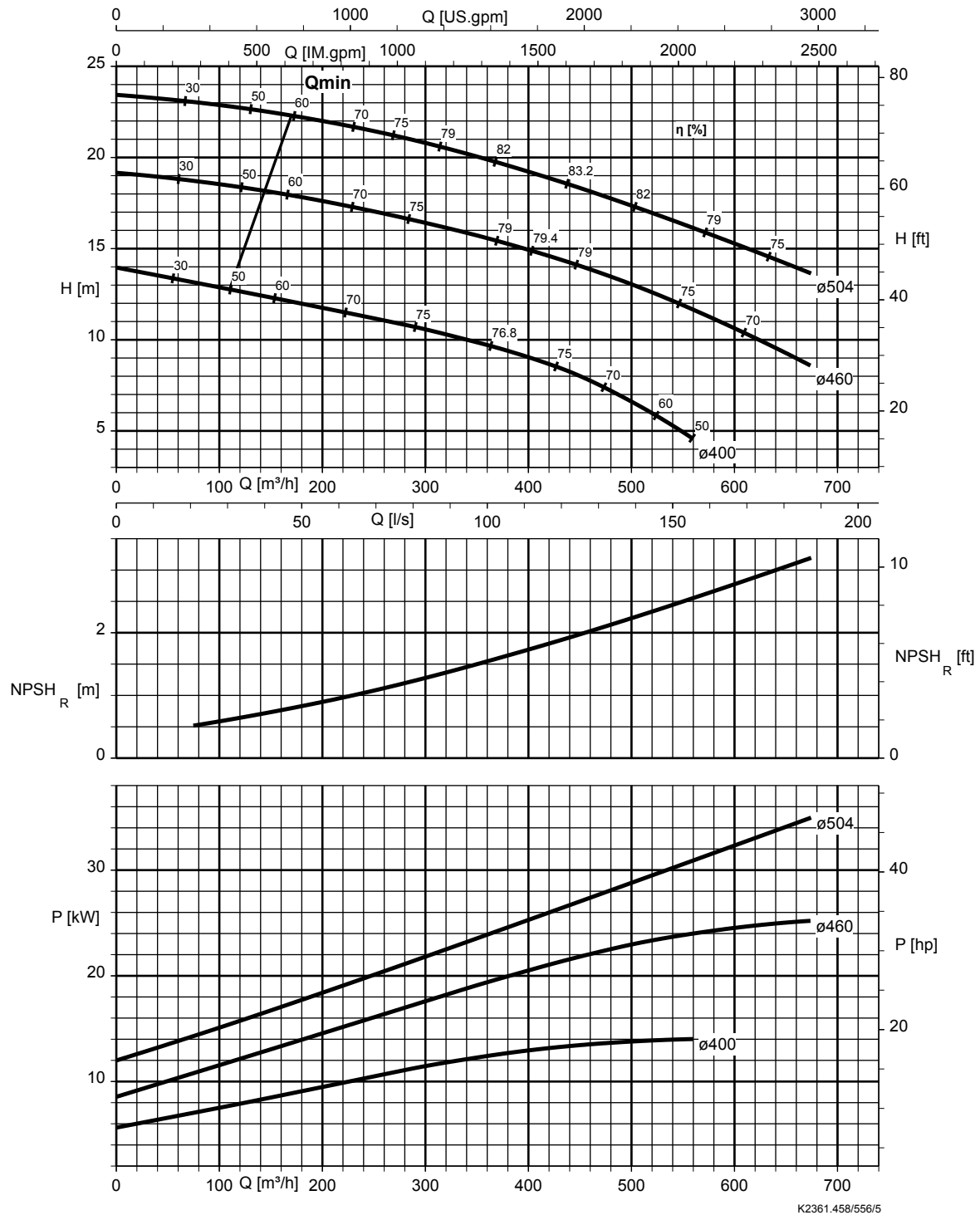
KWP K 200-200-400,  $n = 725 \text{ min}^{-1}$



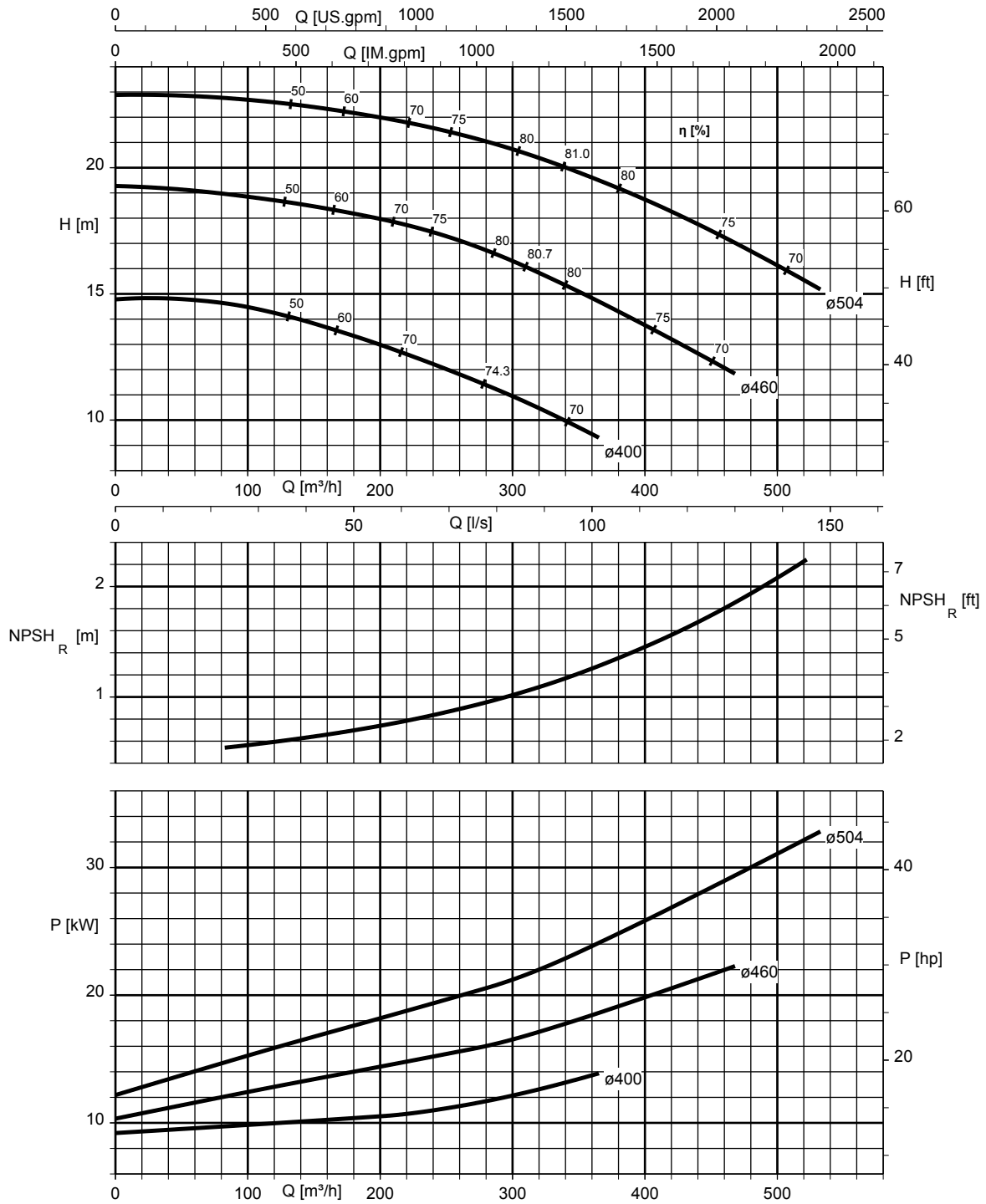
KWP K 200-200-403,  $n = 725 \text{ min}^{-1}$



KWP K 200-200-501,  $n = 725 \text{ min}^{-1}$

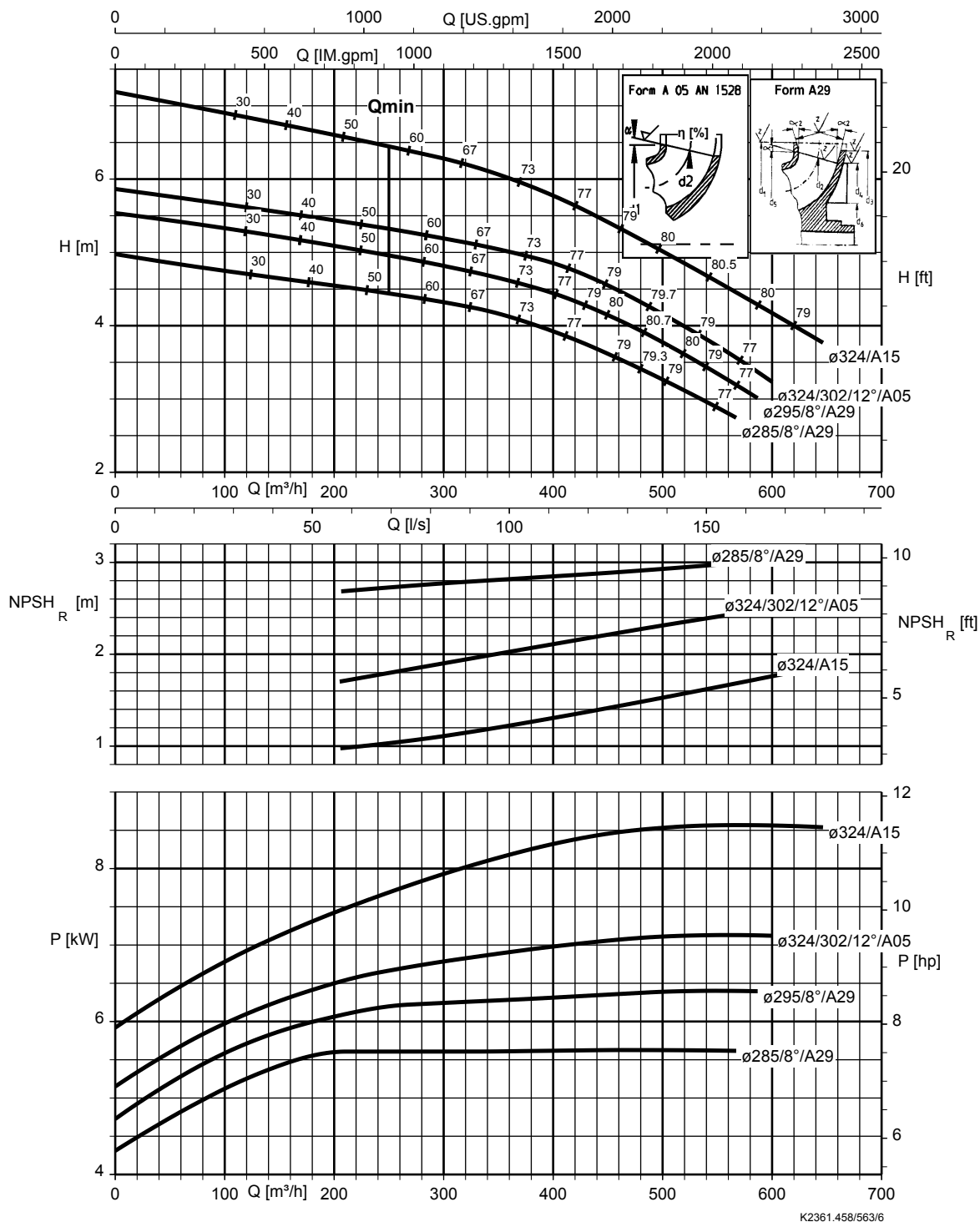


KWP K 200-200-503,  $n = 725 \text{ min}^{-1}$

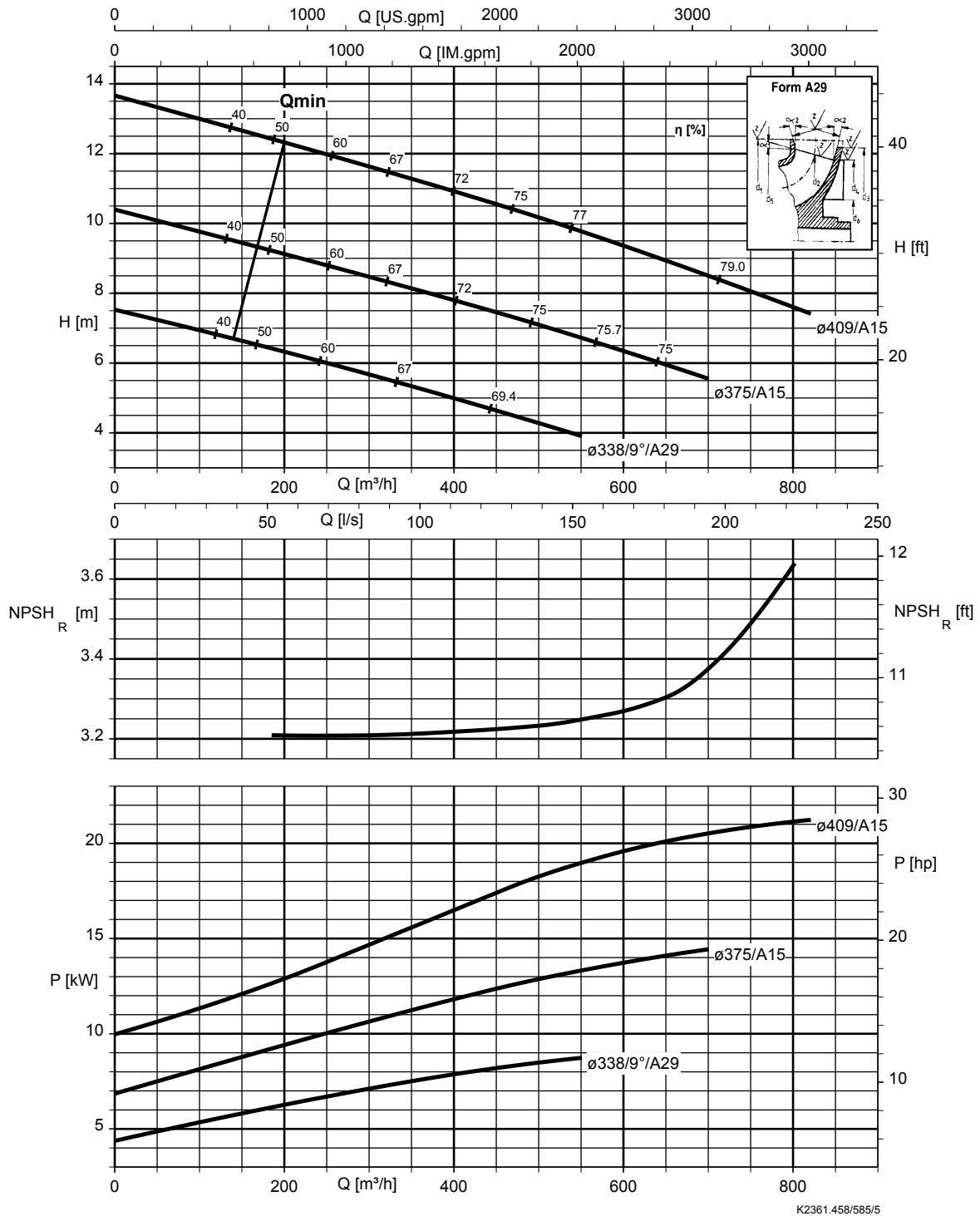


K34115/2

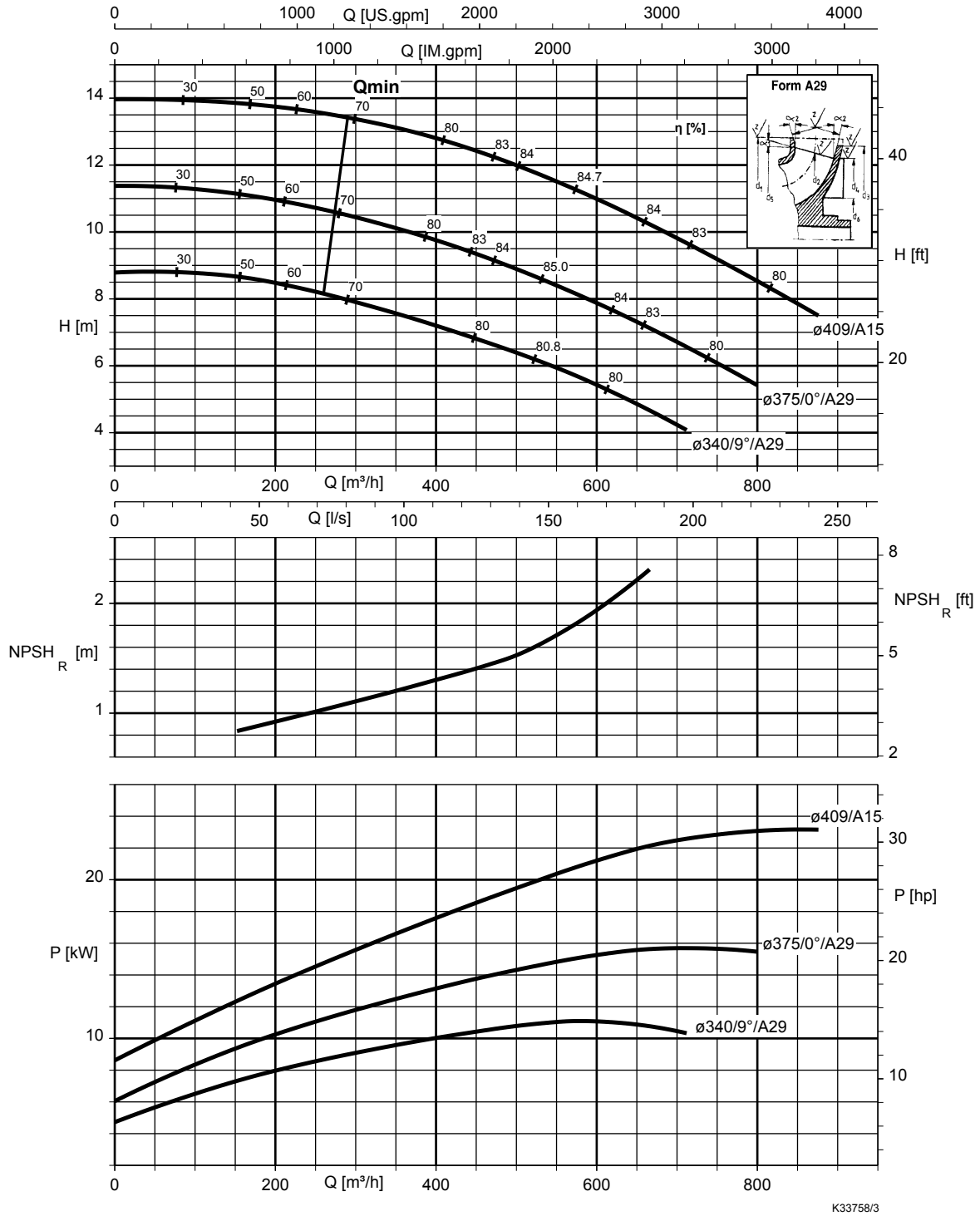
KWP K 250-250-315,  $n = 725 \text{ min}^{-1}$



KWP K 250-250-400,  $n = 725 \text{ min}^{-1}$

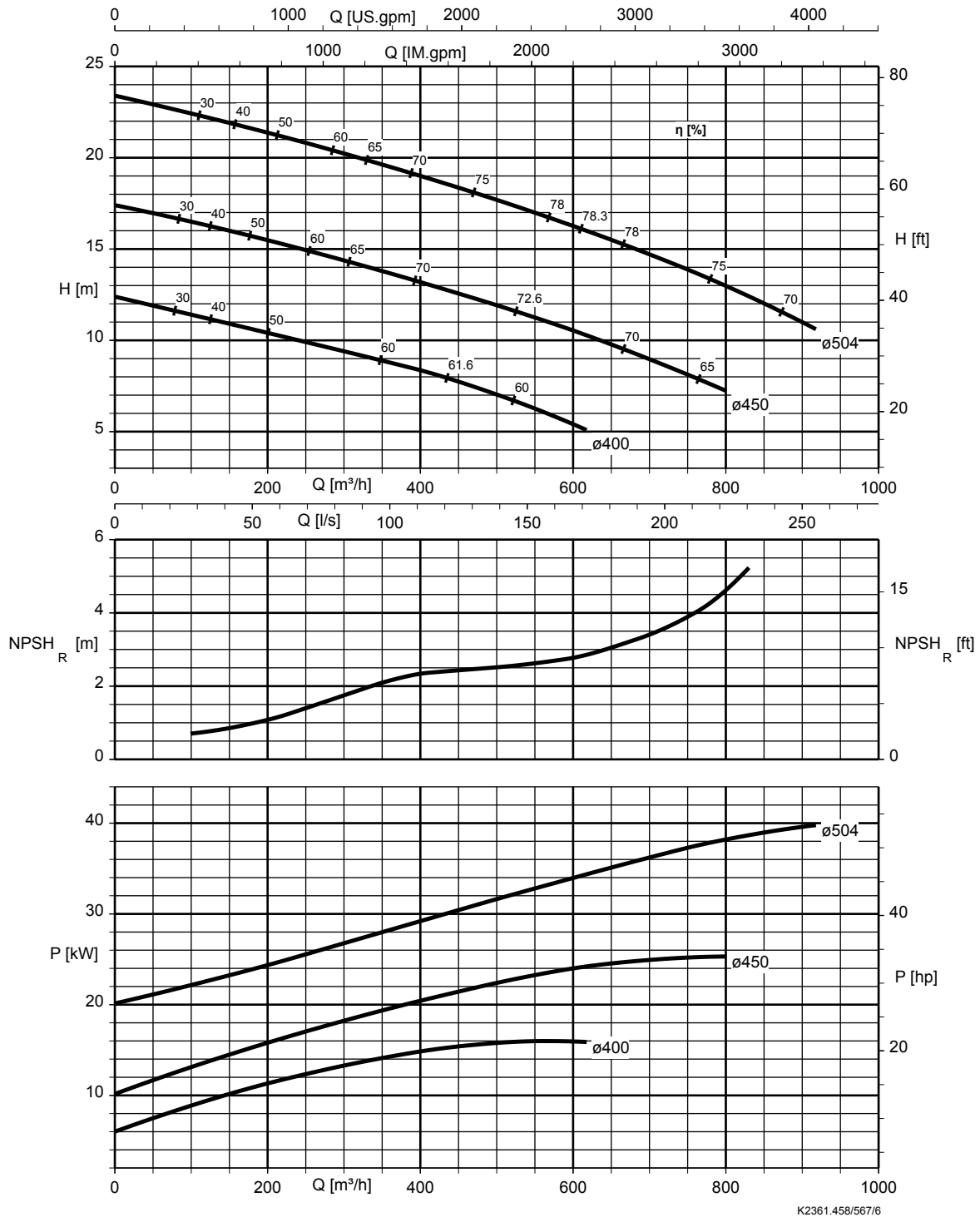


KWP K 250-250-403,  $n = 725 \text{ min}^{-1}$

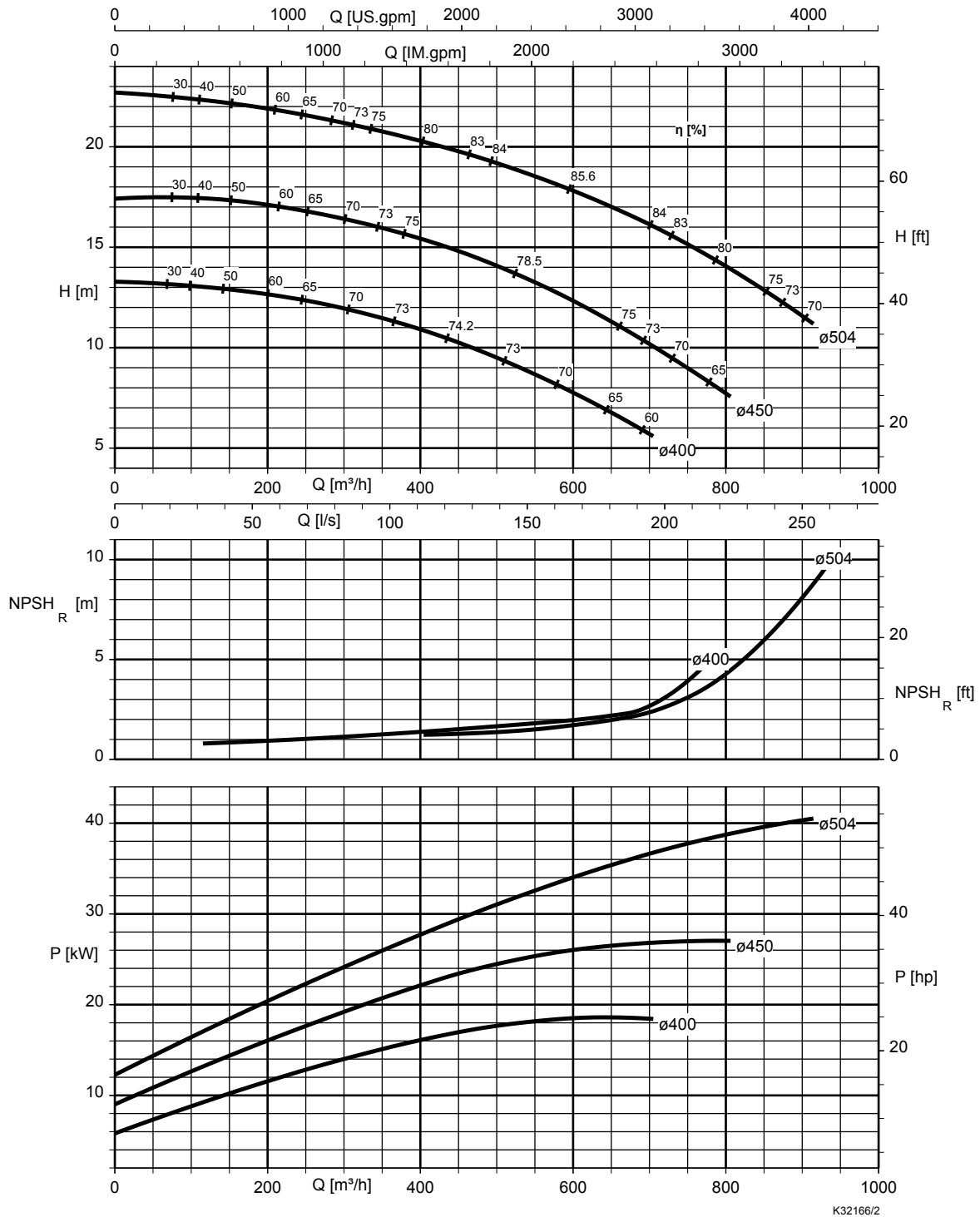




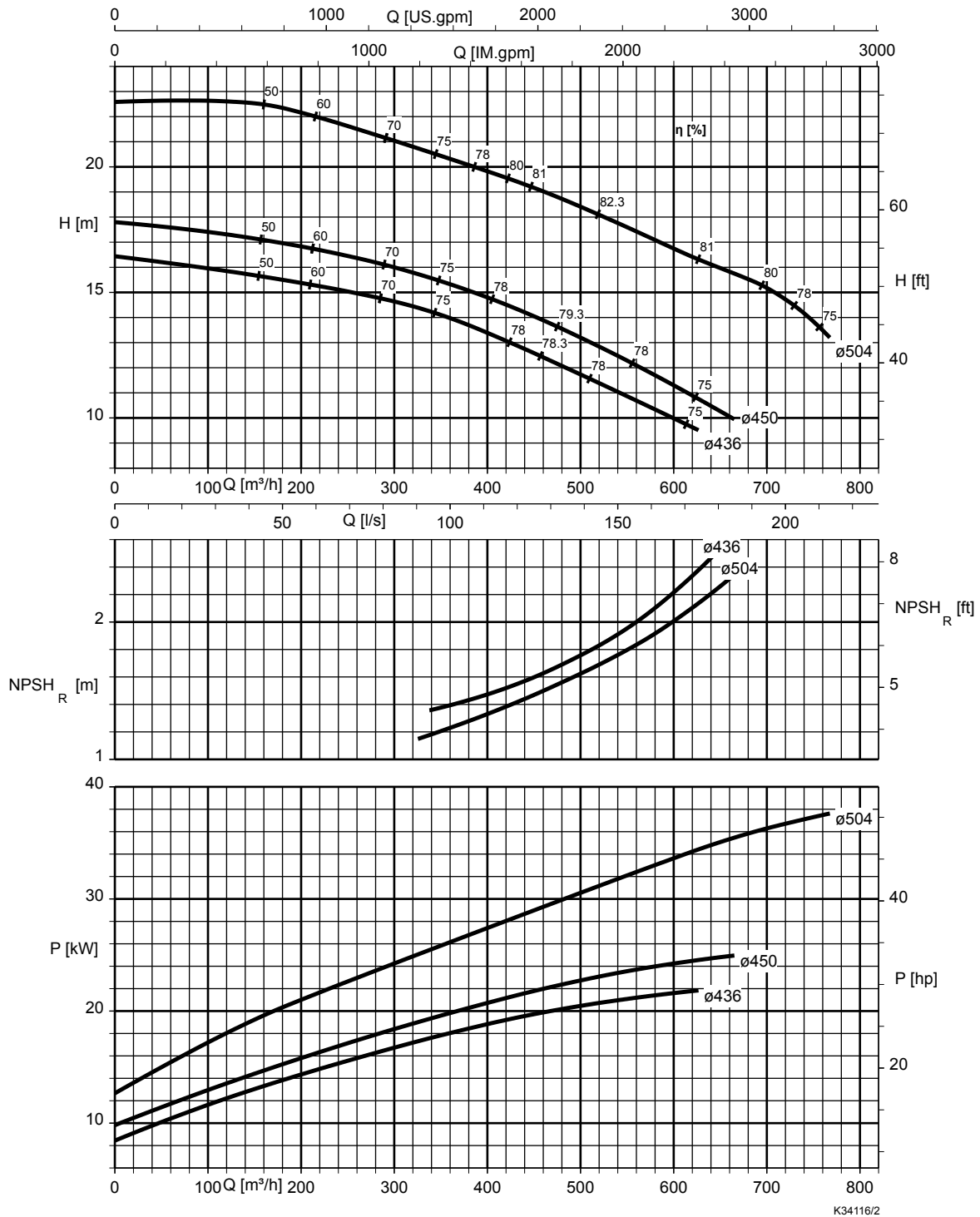
KWP K 250-250-500,  $n = 725 \text{ min}^{-1}$



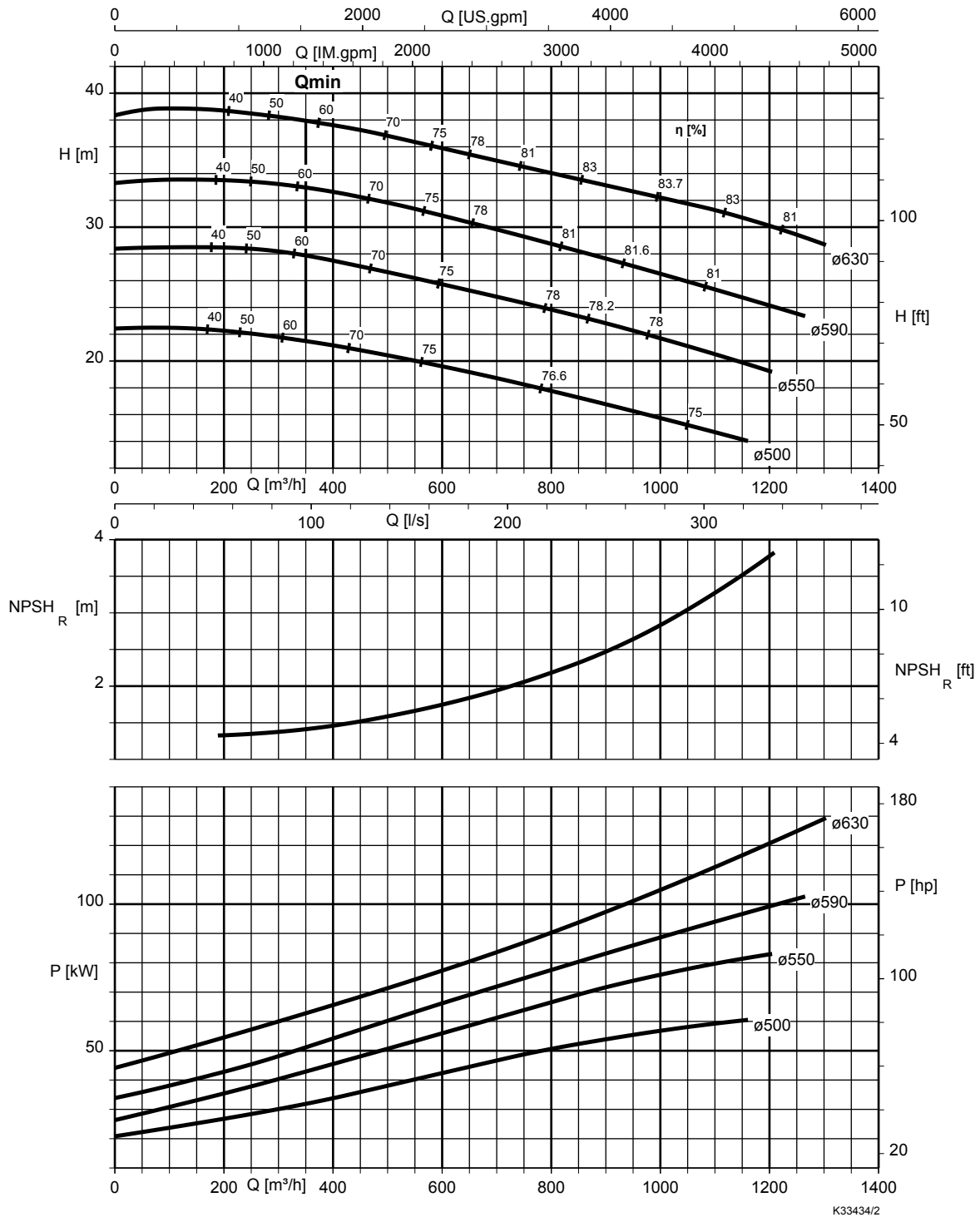
KWP K 250-250-503,  $n = 725 \text{ min}^{-1}$



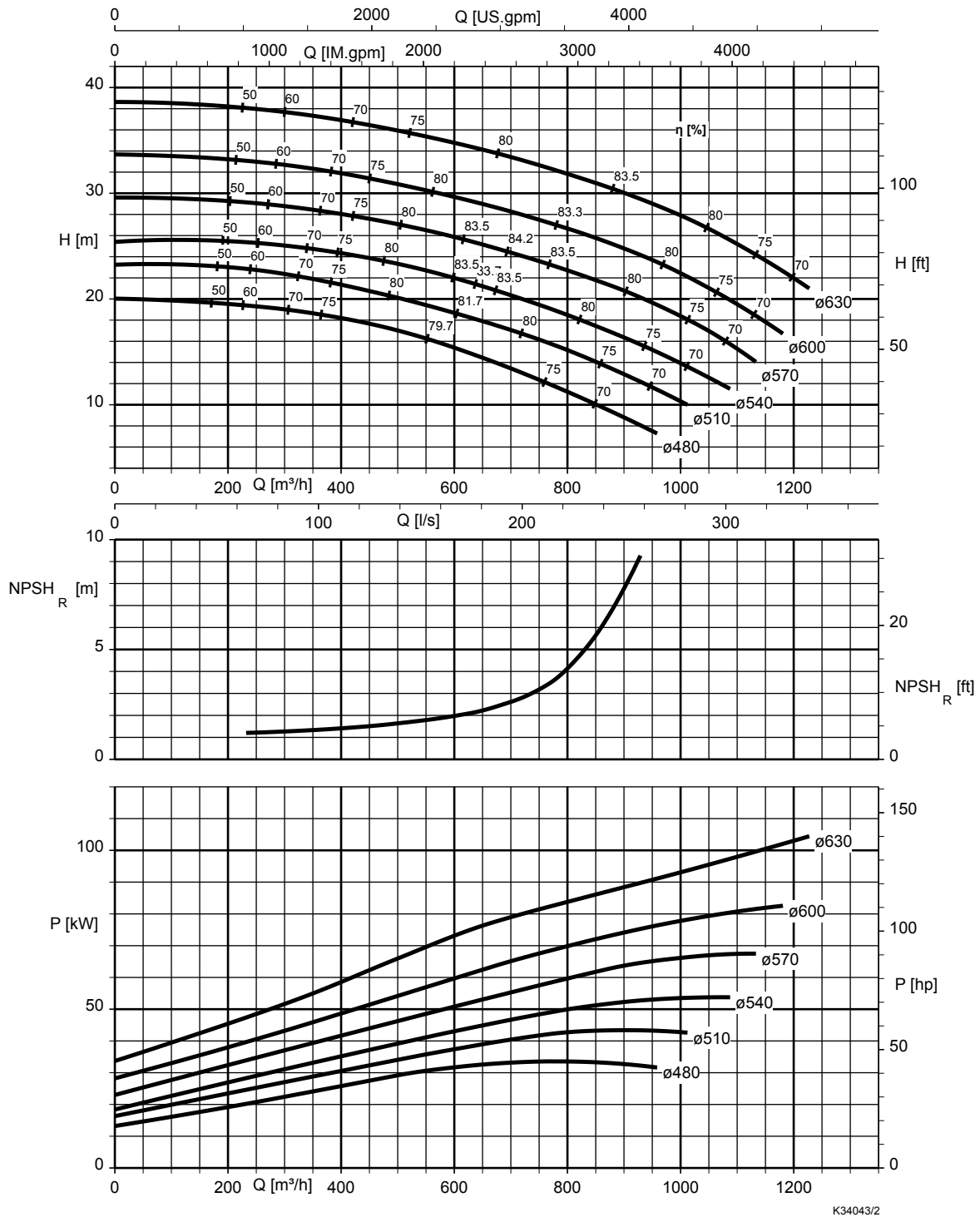
KWP K 250-250-505,  $n = 725 \text{ min}^{-1}$



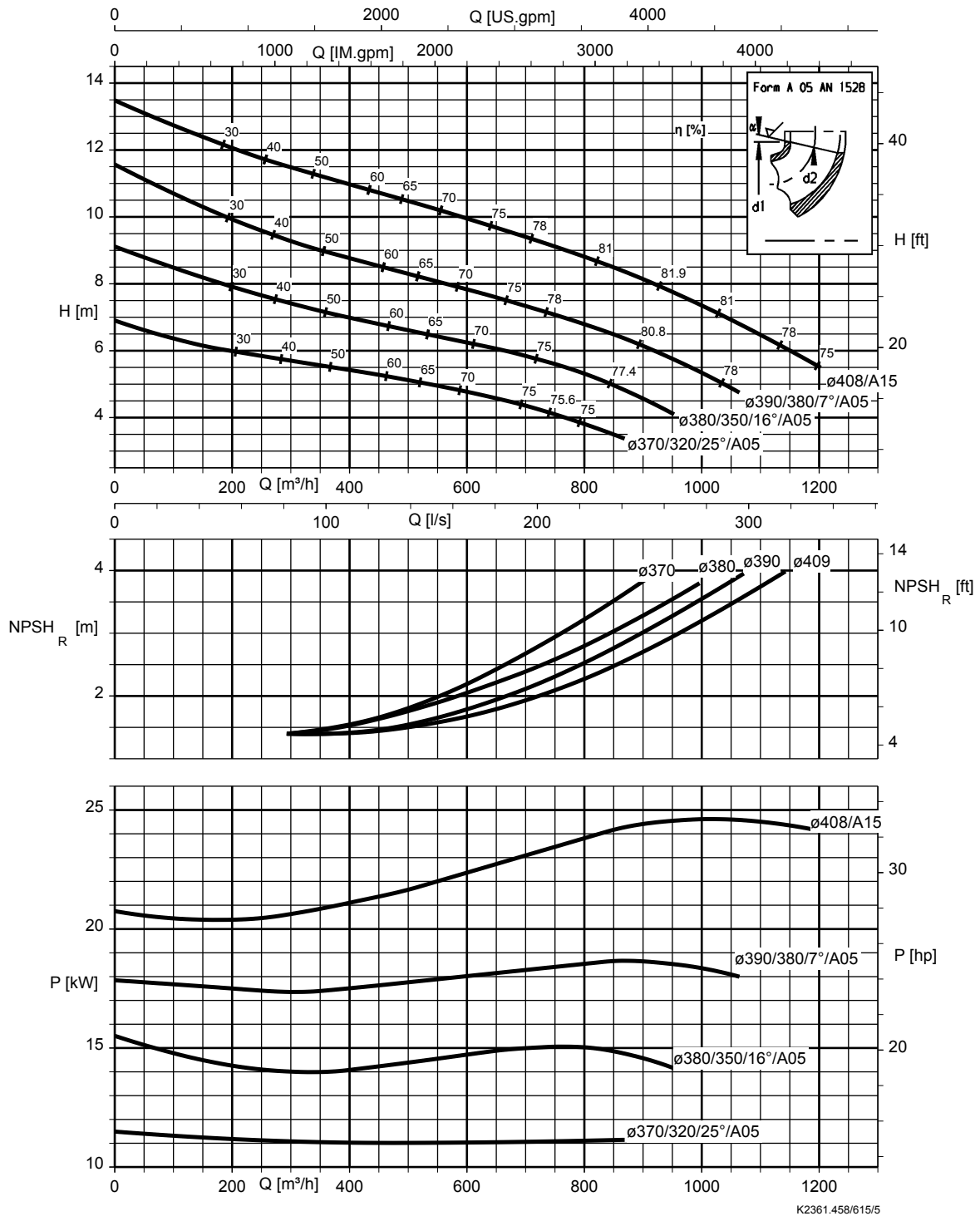
KWP K 250-250-630,  $n = 725 \text{ min}^{-1}$



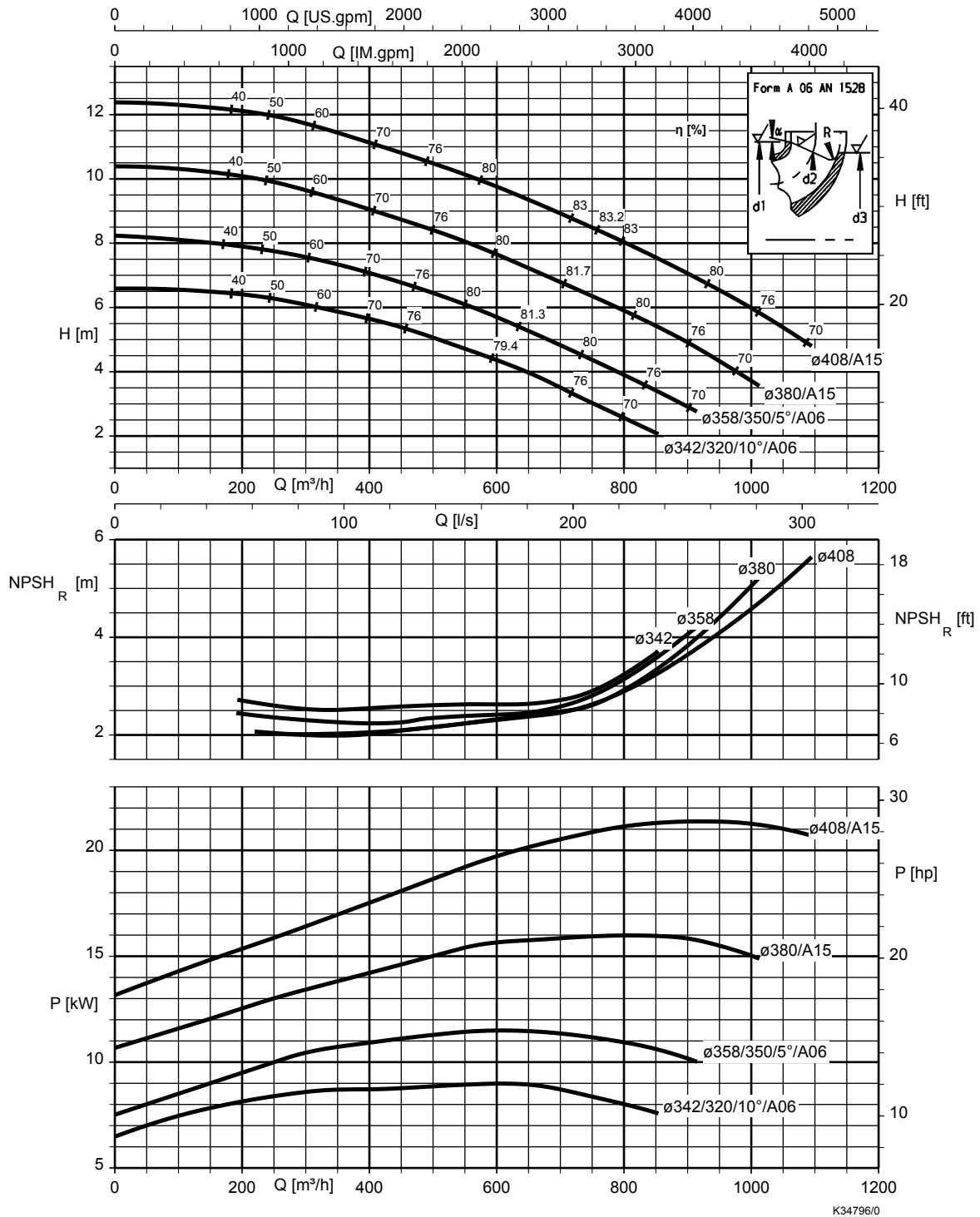
KWP K 250-250-634,  $n = 725 \text{ min}^{-1}$



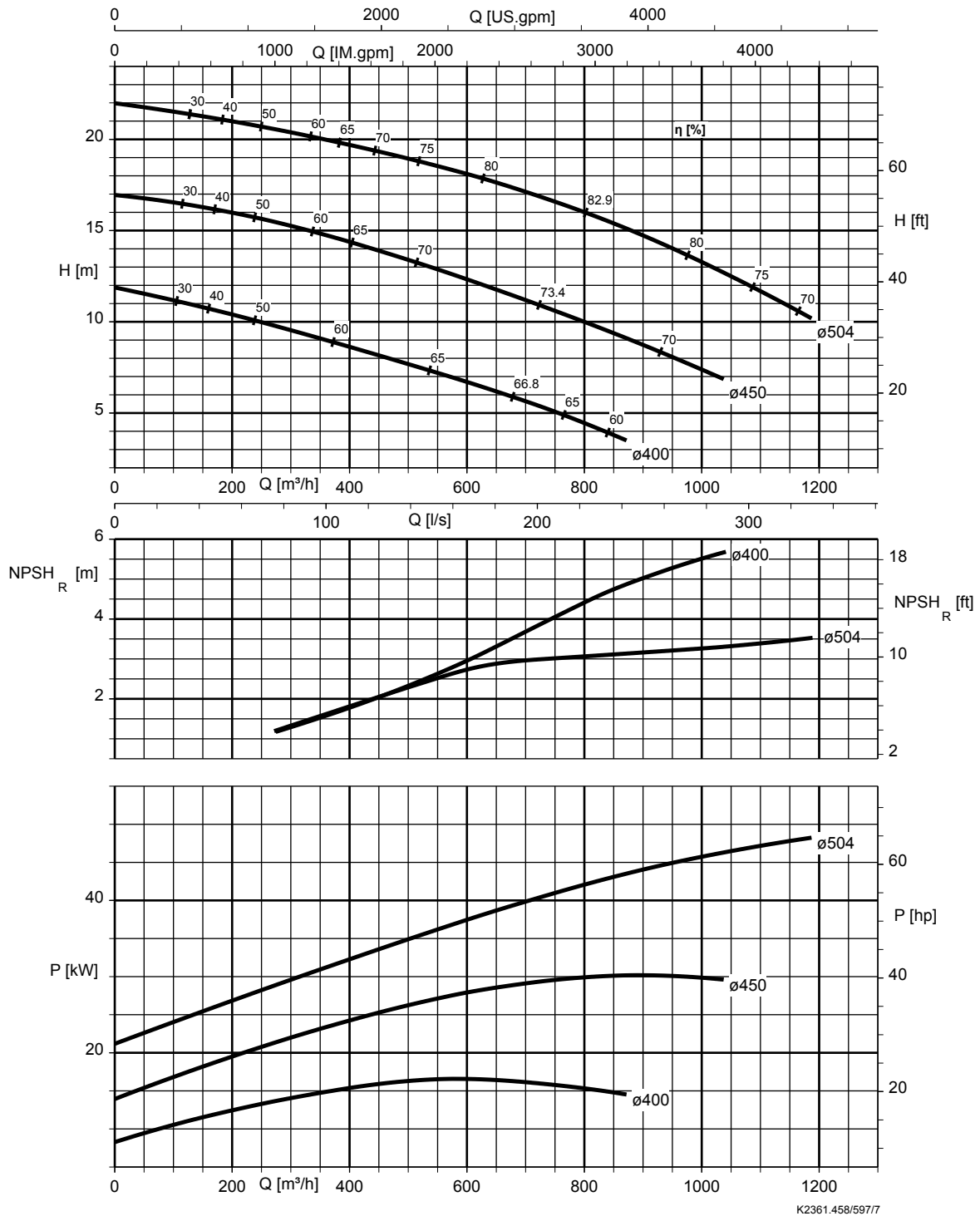
KWP K 300-300-400,  $n = 725 \text{ min}^{-1}$



KWP K 300-300-401,  $n = 725 \text{ min}^{-1}$

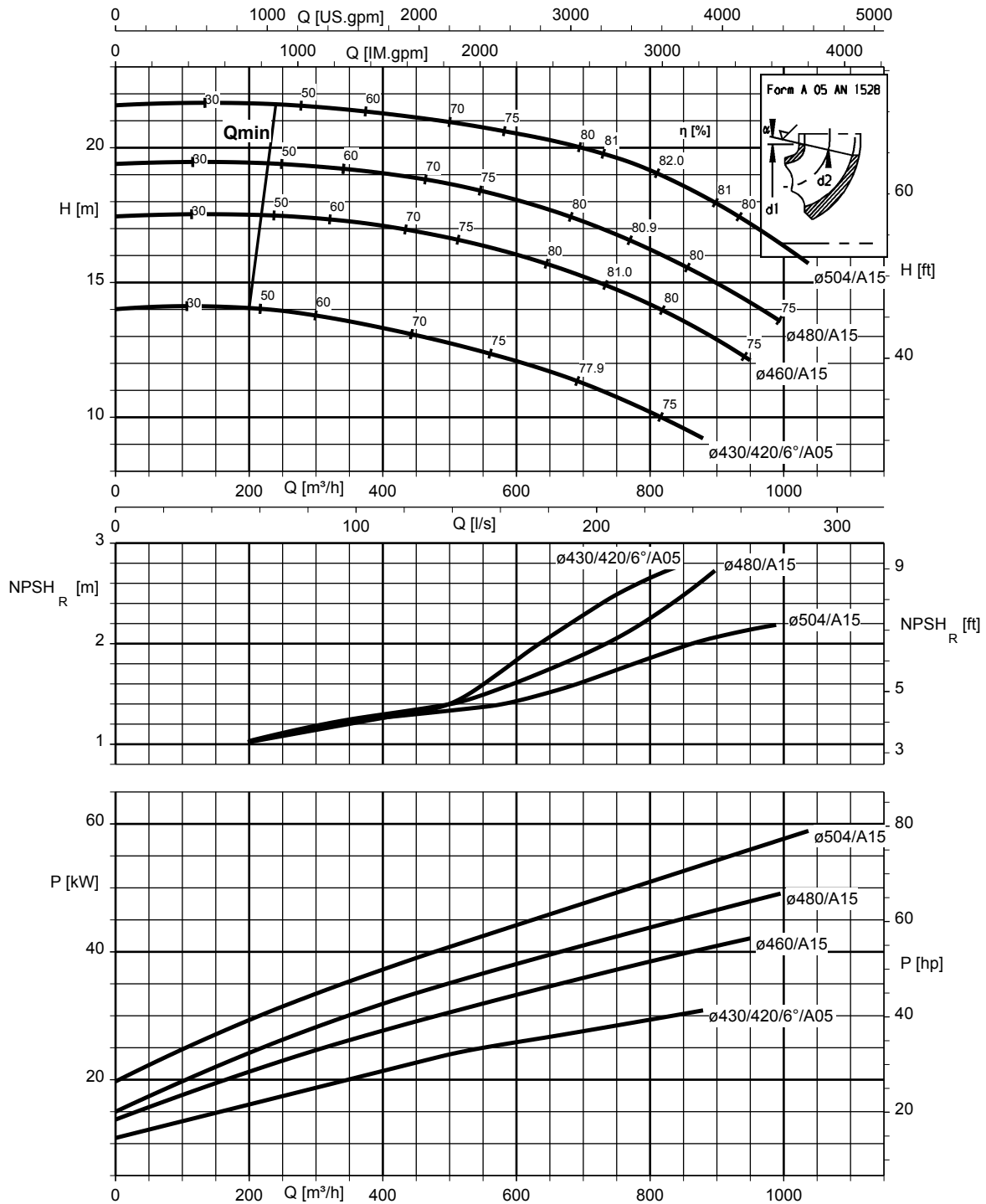


KWP K 300-300-500,  $n = 725 \text{ min}^{-1}$



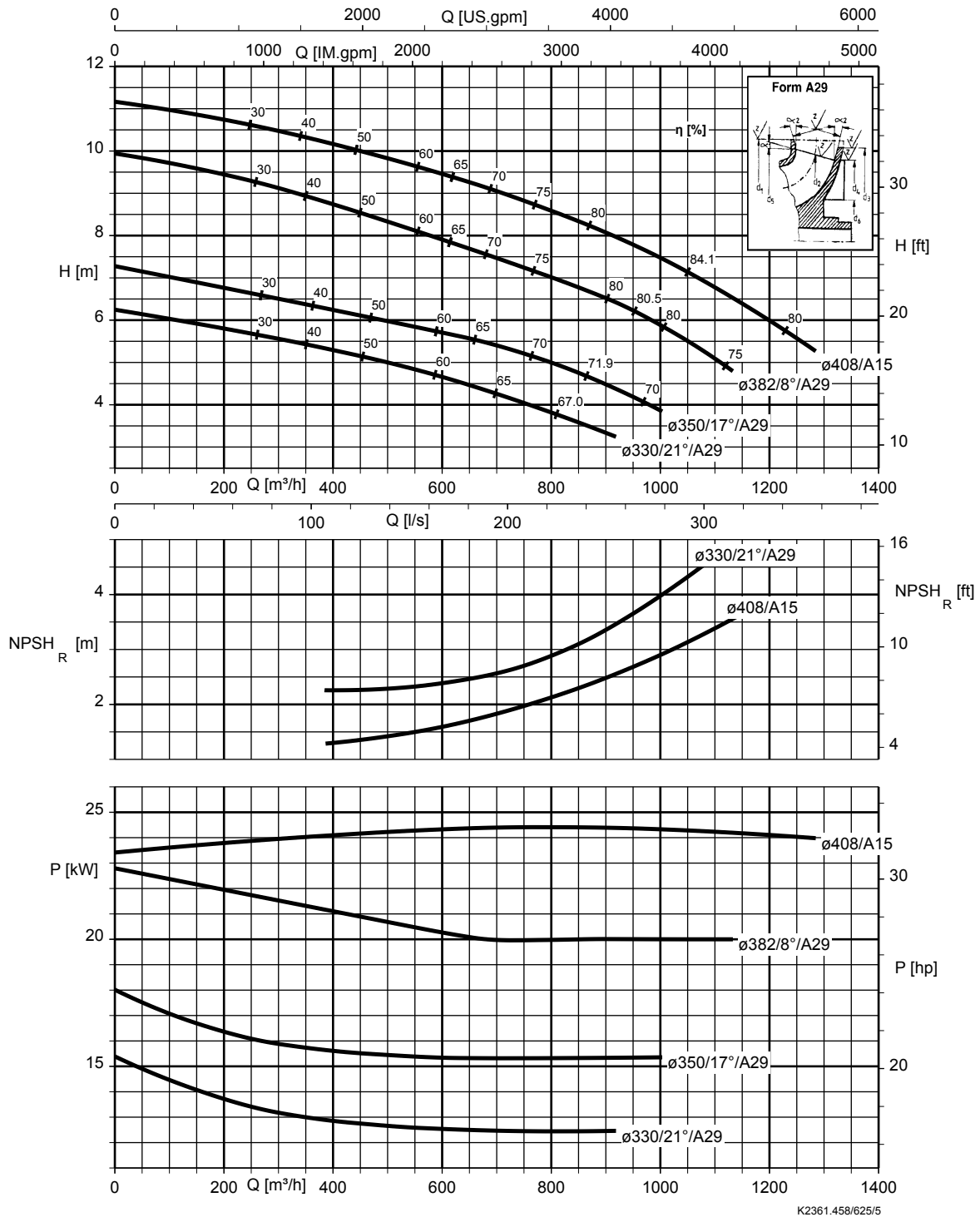


KWP K 300-300-503,  $n = 725 \text{ min}^{-1}$

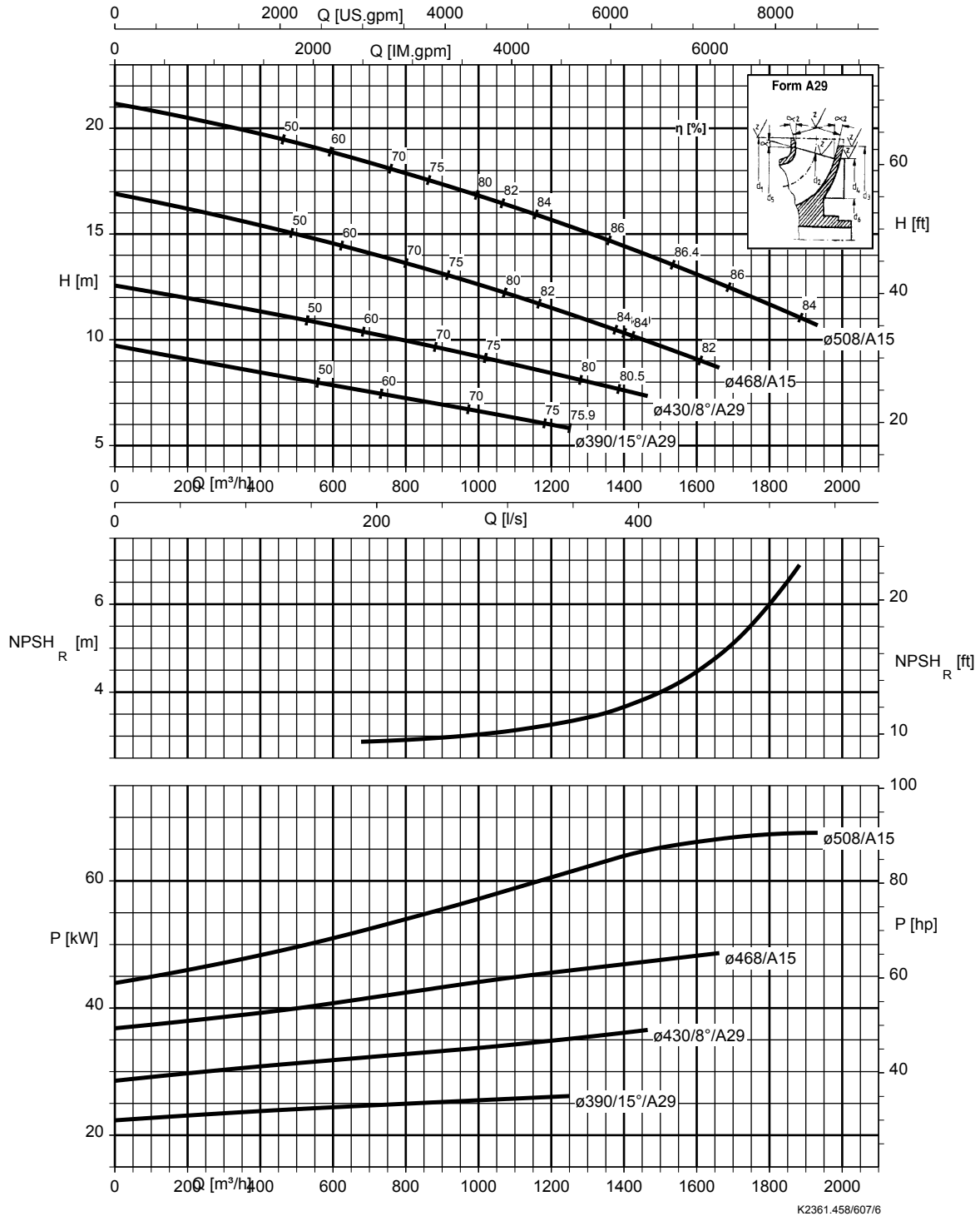


K33761/2

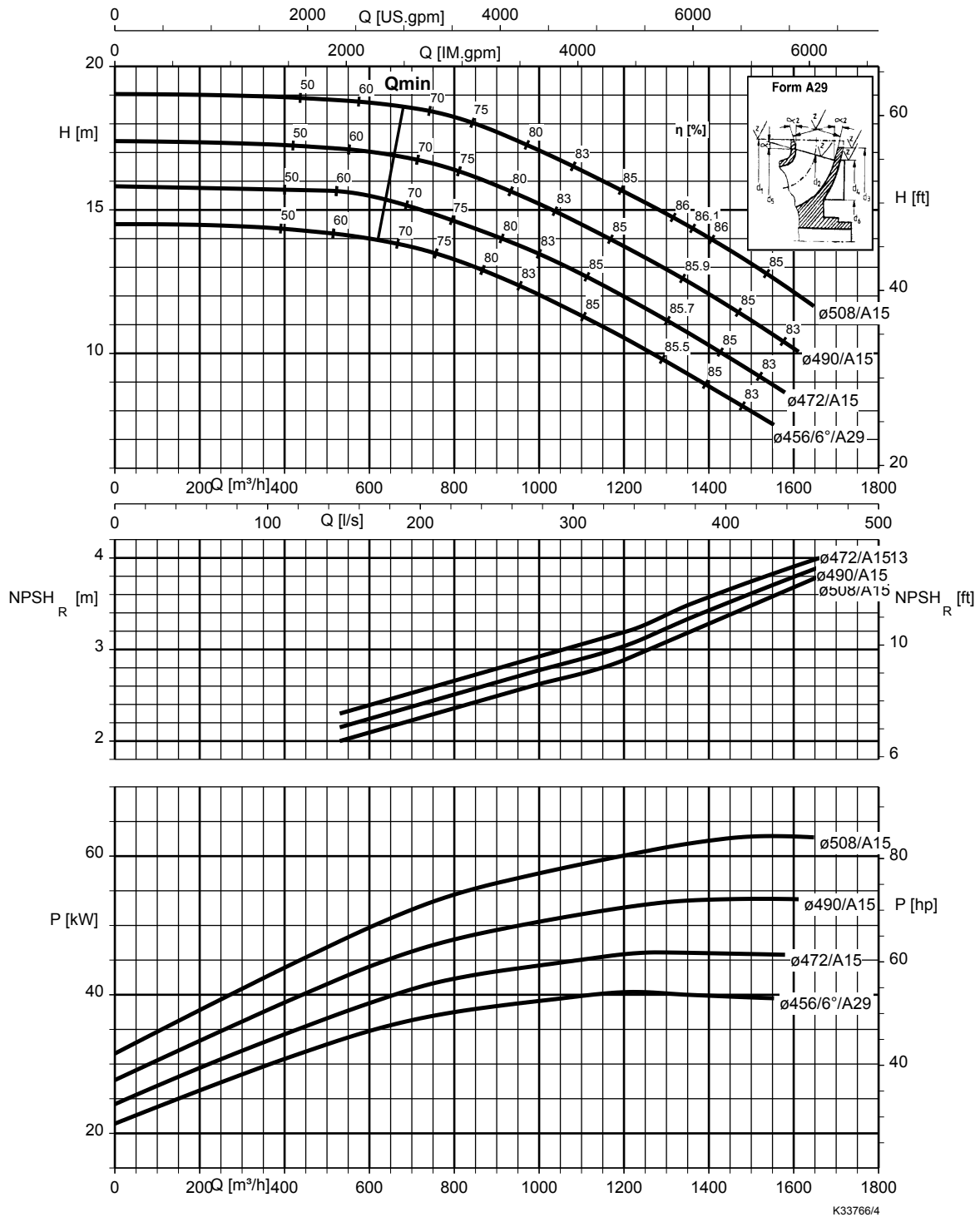
KWP K 350-350-400,  $n = 725 \text{ min}^{-1}$



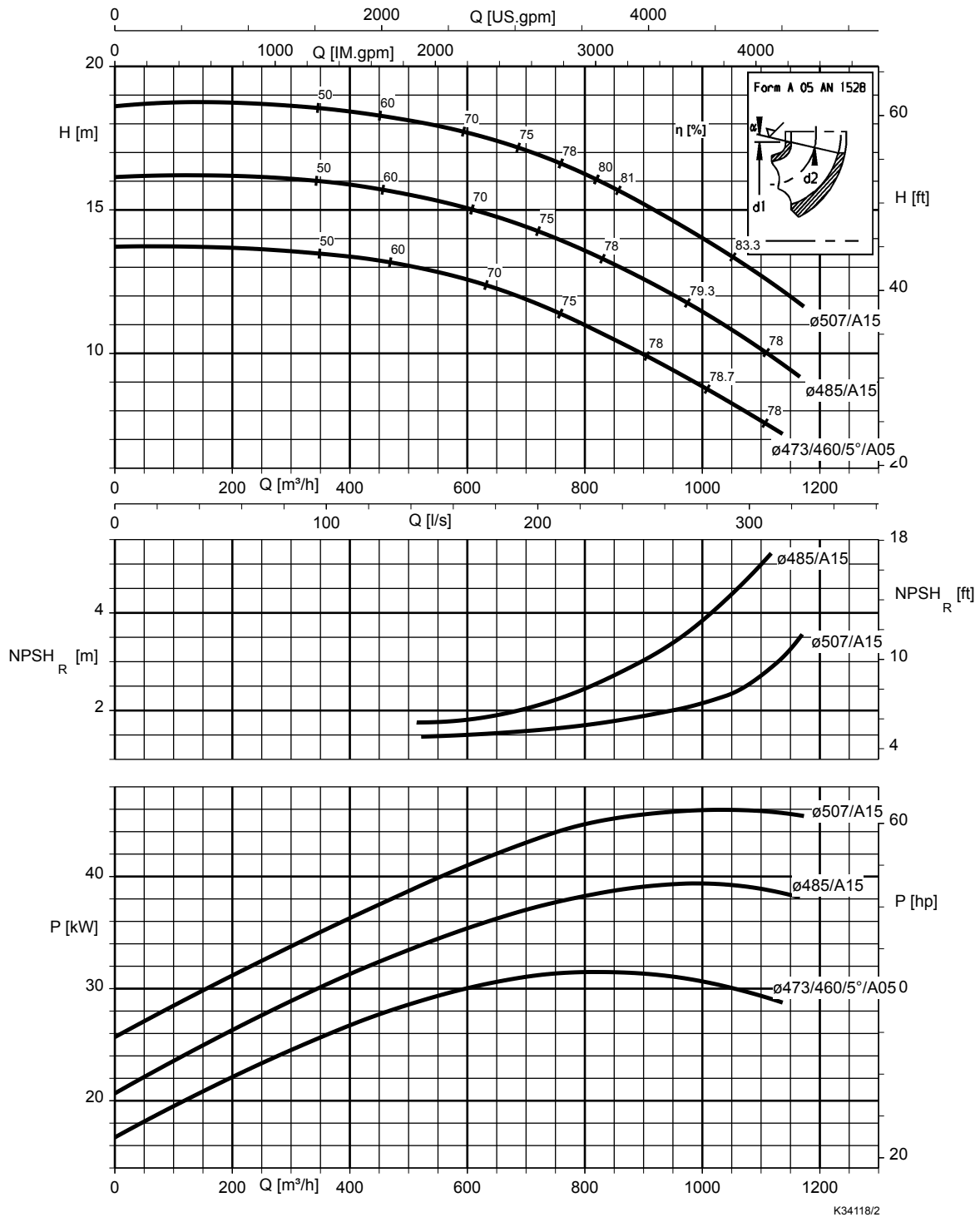
KWP K 350-350-500,  $n = 725 \text{ min}^{-1}$



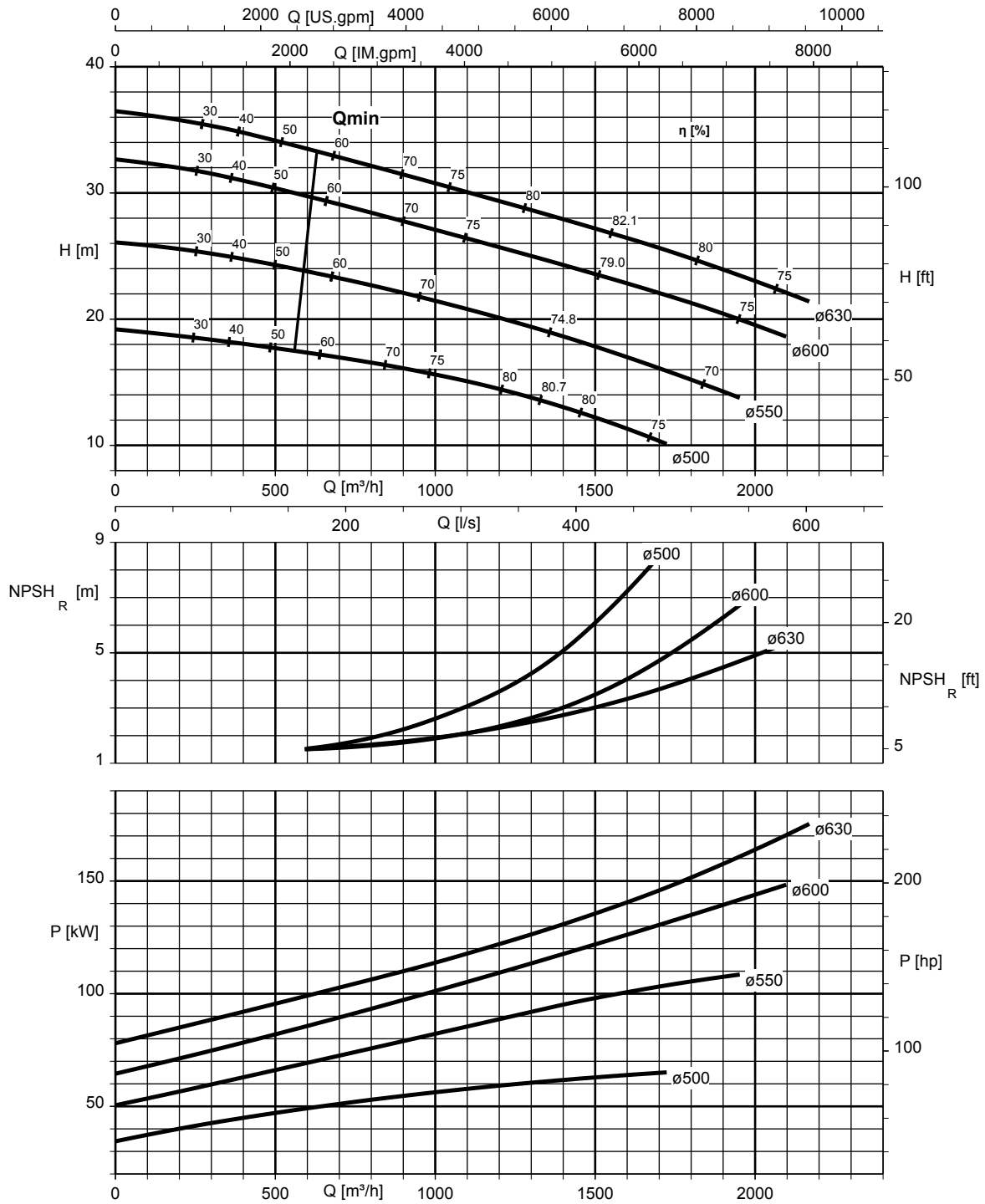
KWP K 350-350-503,  $n = 725 \text{ min}^{-1}$



KWP K 350-350-504,  $n = 725 \text{ min}^{-1}$

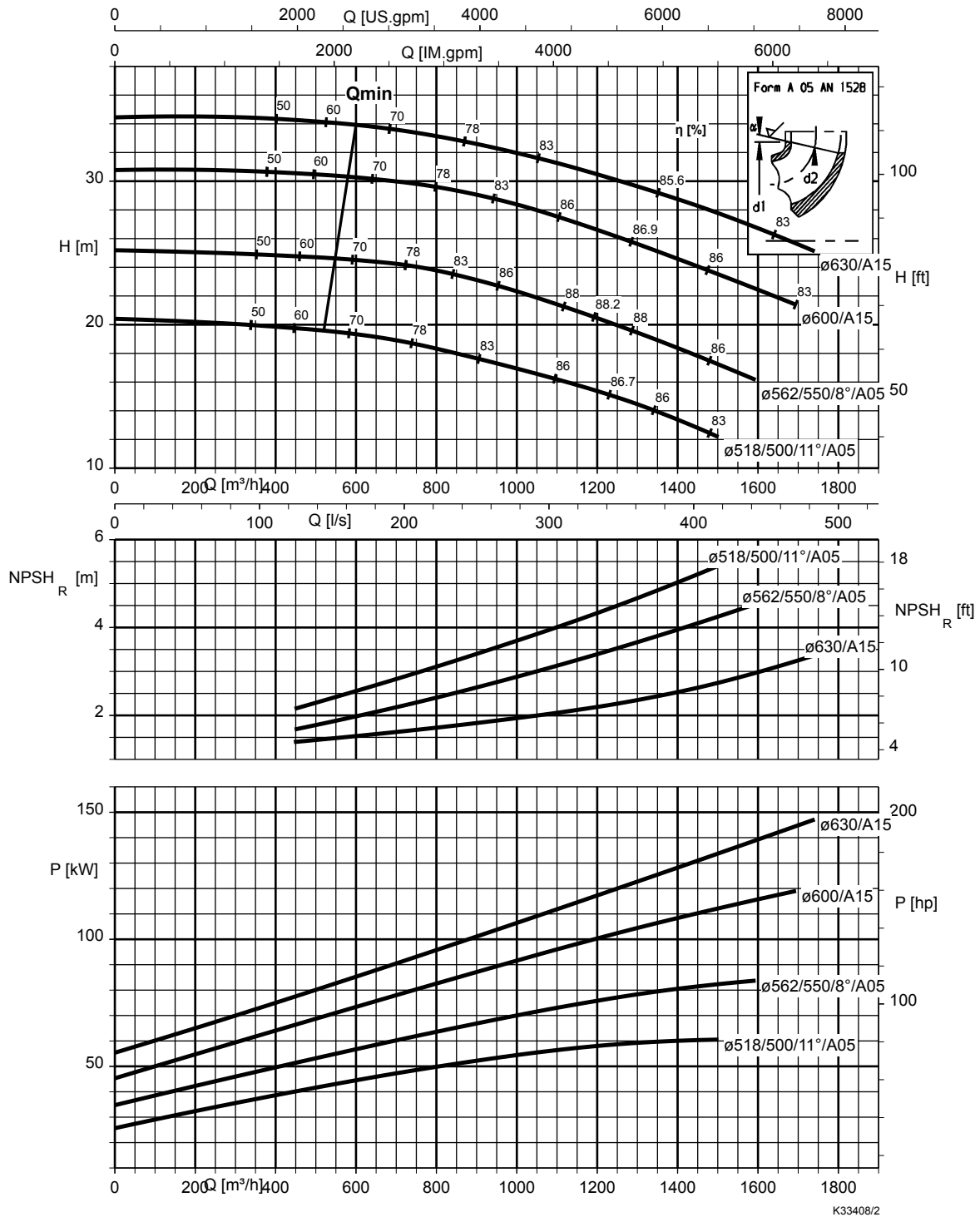


KWP K 350-350-630,  $n = 725 \text{ min}^{-1}$

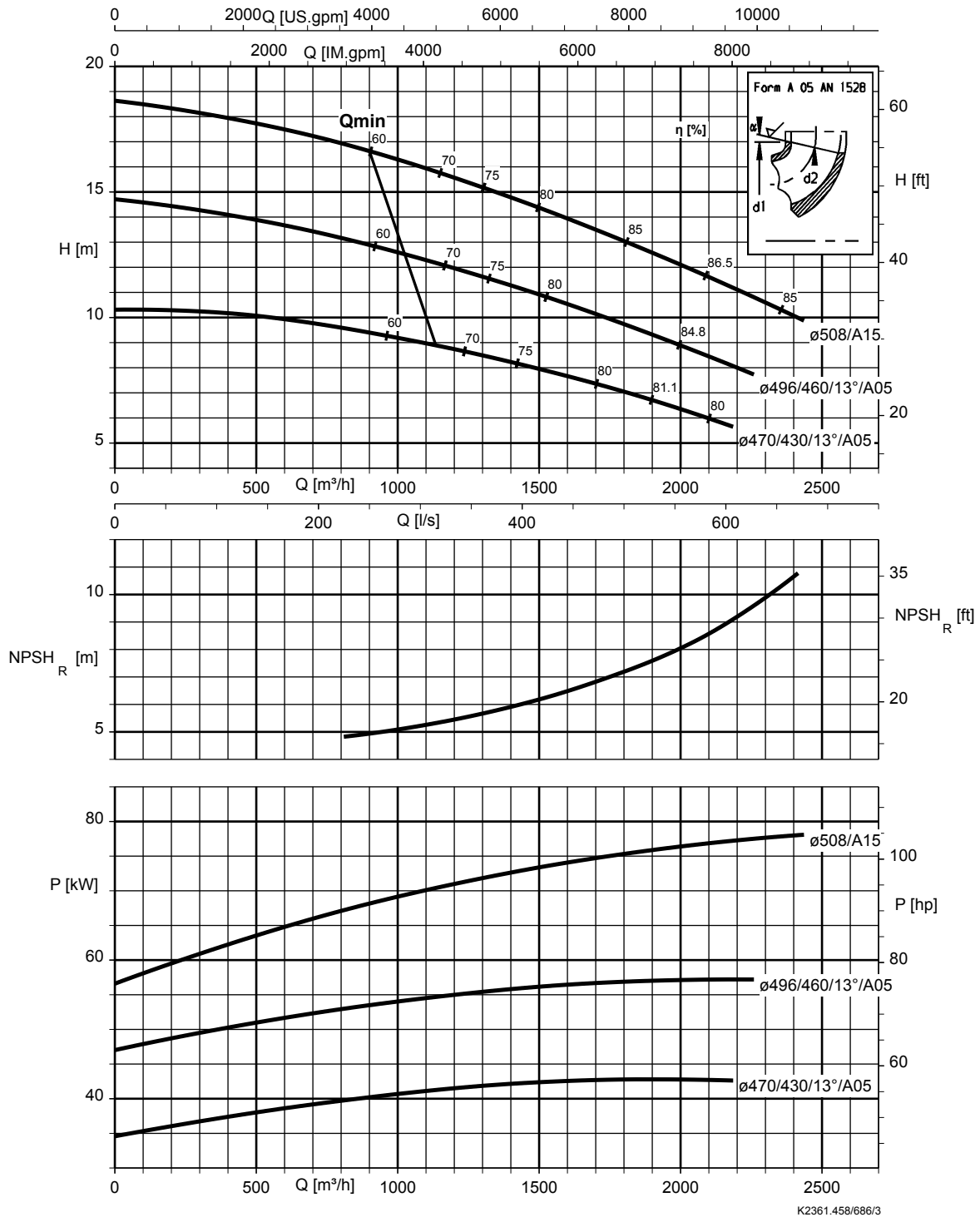


K33600/2

KWP K 350-350-633,  $n = 725 \text{ min}^{-1}$

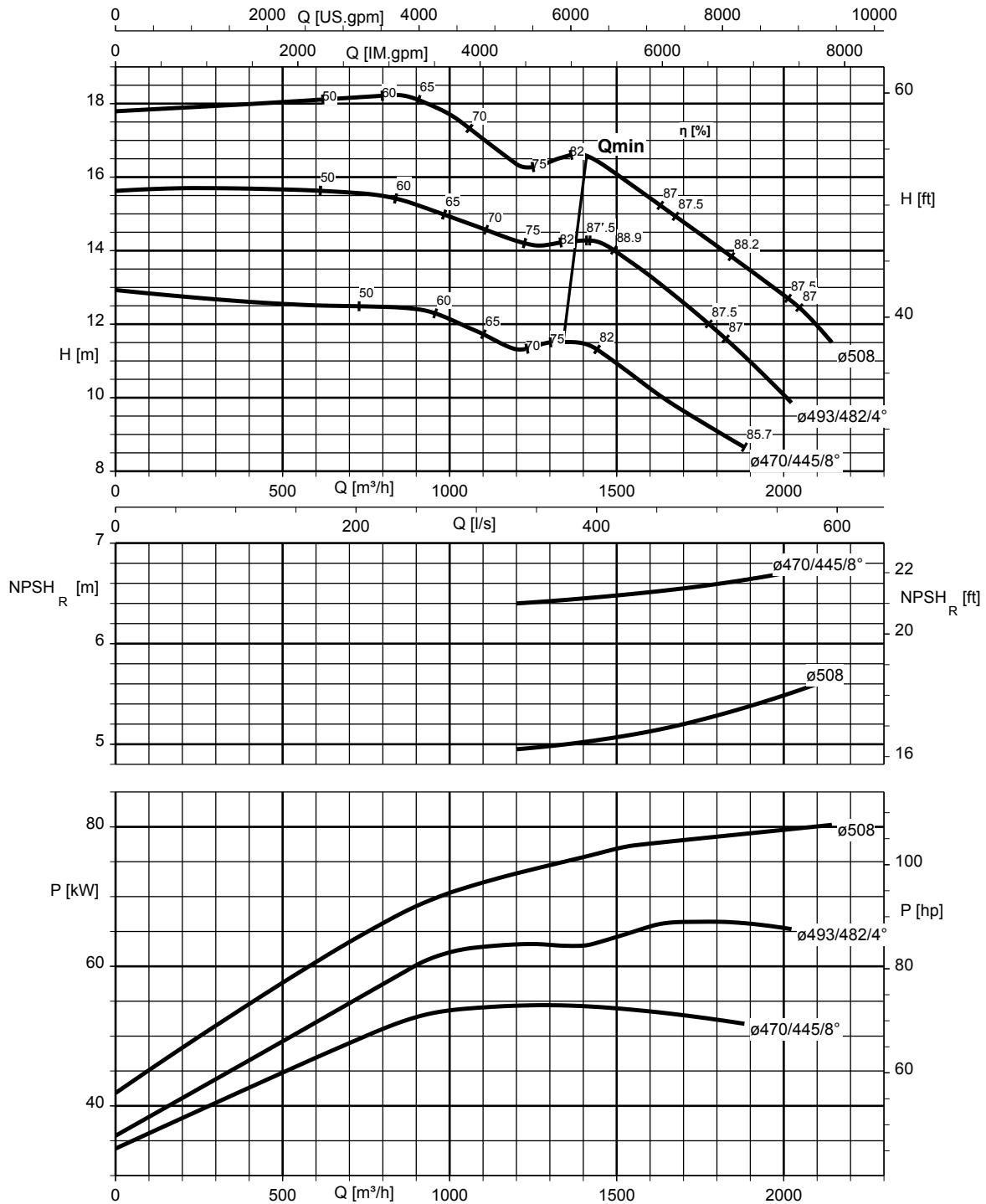


KWP K 400-400-500,  $n = 725 \text{ min}^{-1}$



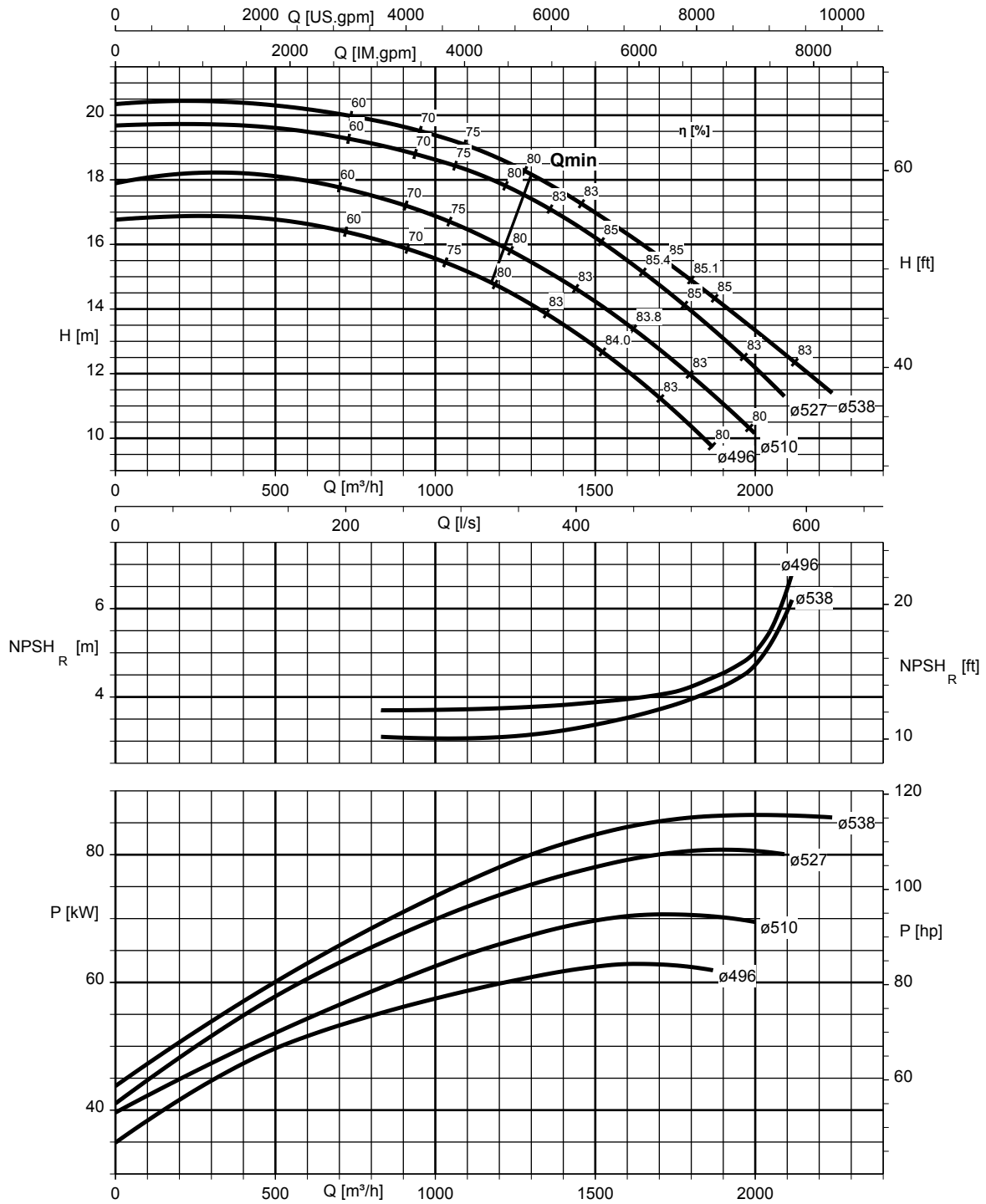


KWP K 400-400-503,  $n = 725 \text{ min}^{-1}$



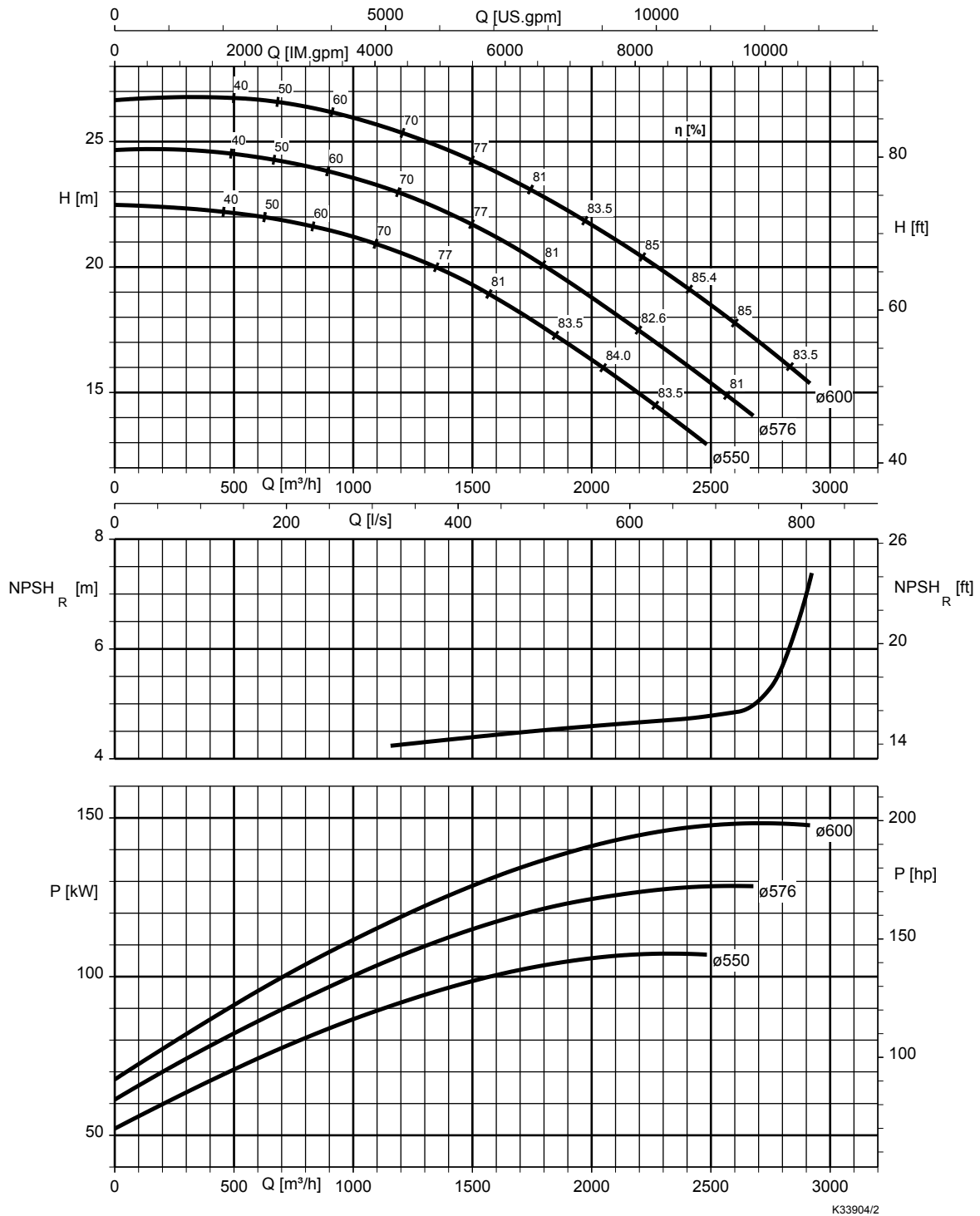
K33768/2

KWP K 400-400-533,  $n = 725 \text{ min}^{-1}$

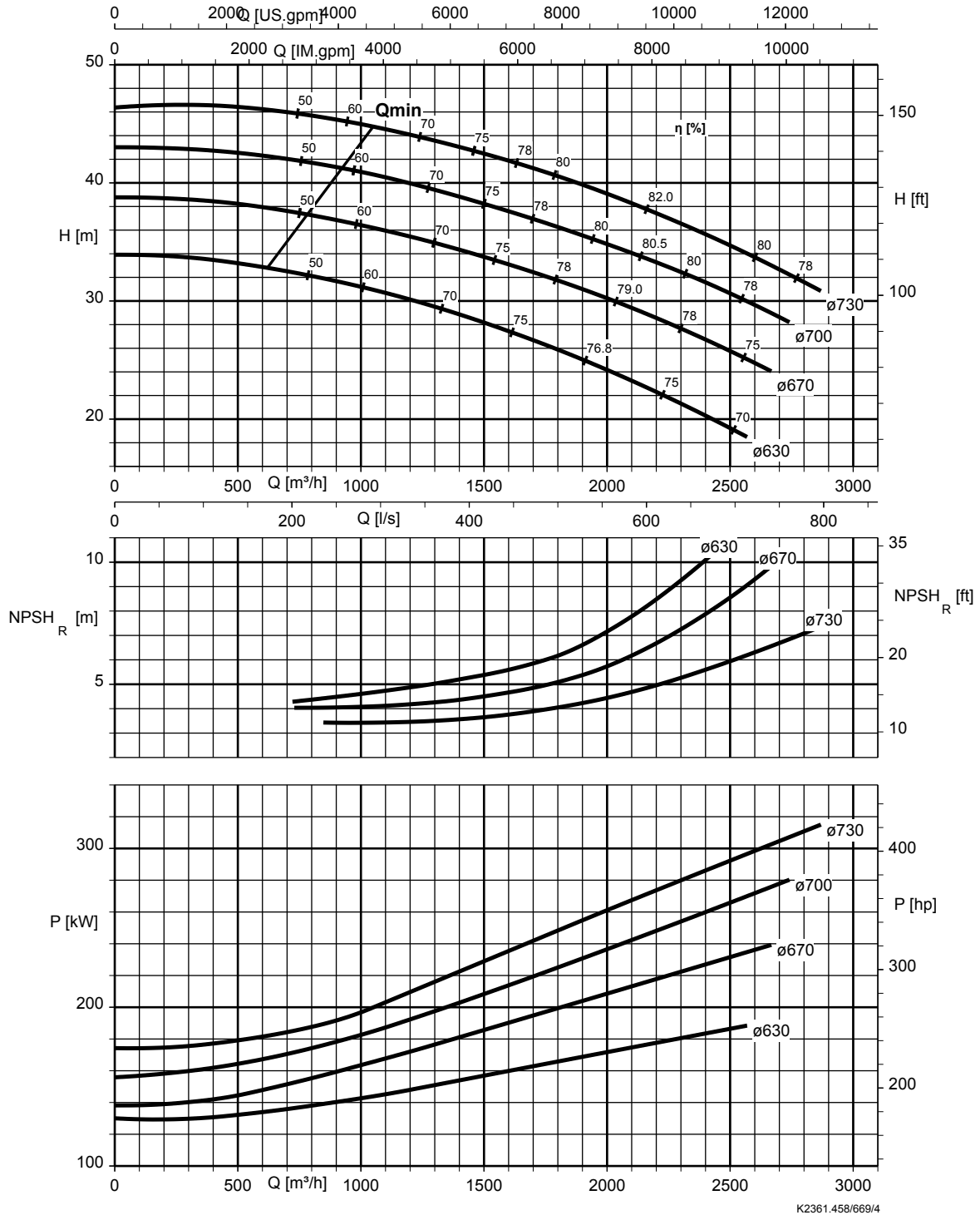


K63079/2

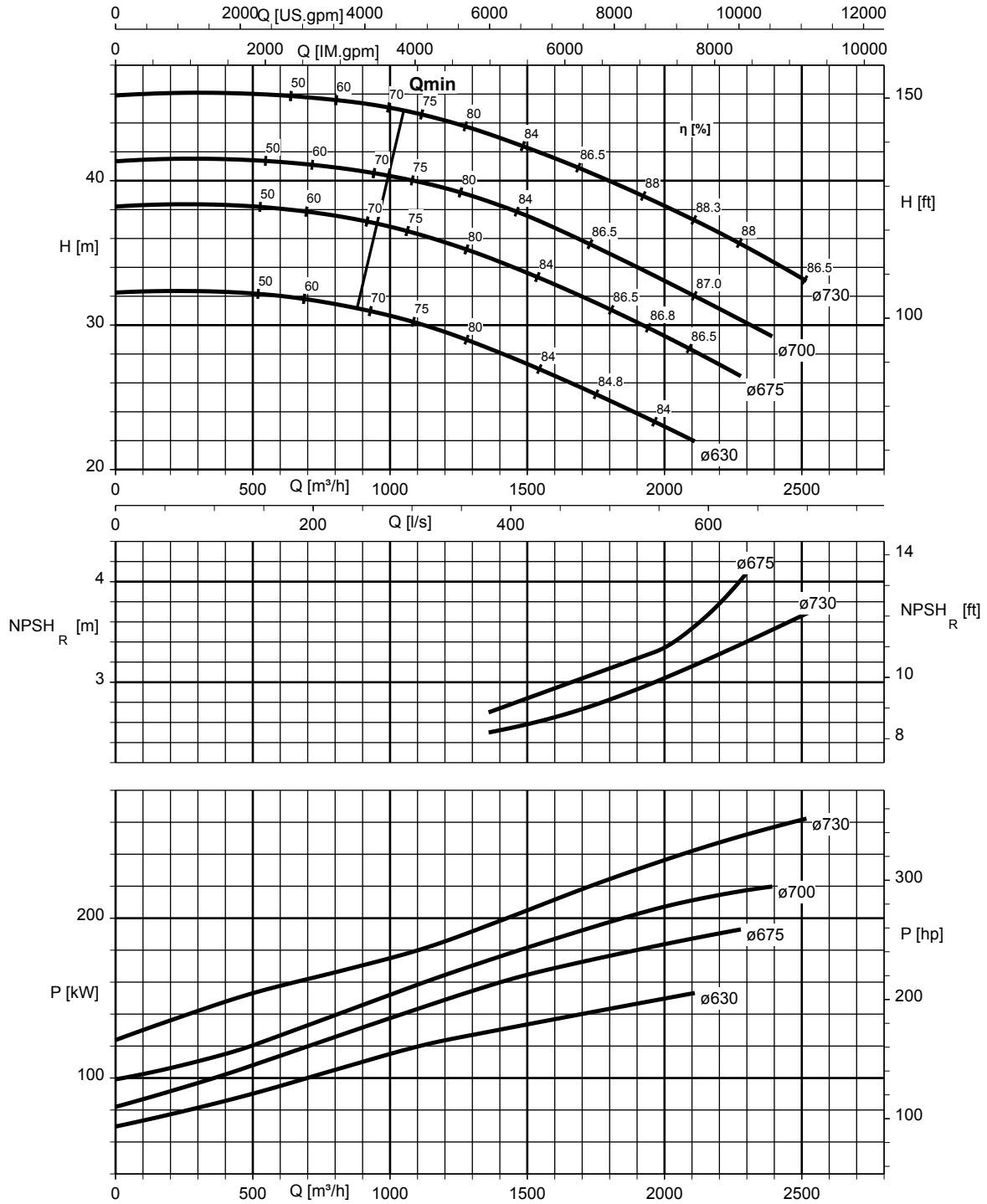
KWP K 400-400-583,  $n = 725 \text{ min}^{-1}$



KWP K 500-400-710,  $n = 725 \text{ min}^{-1}$

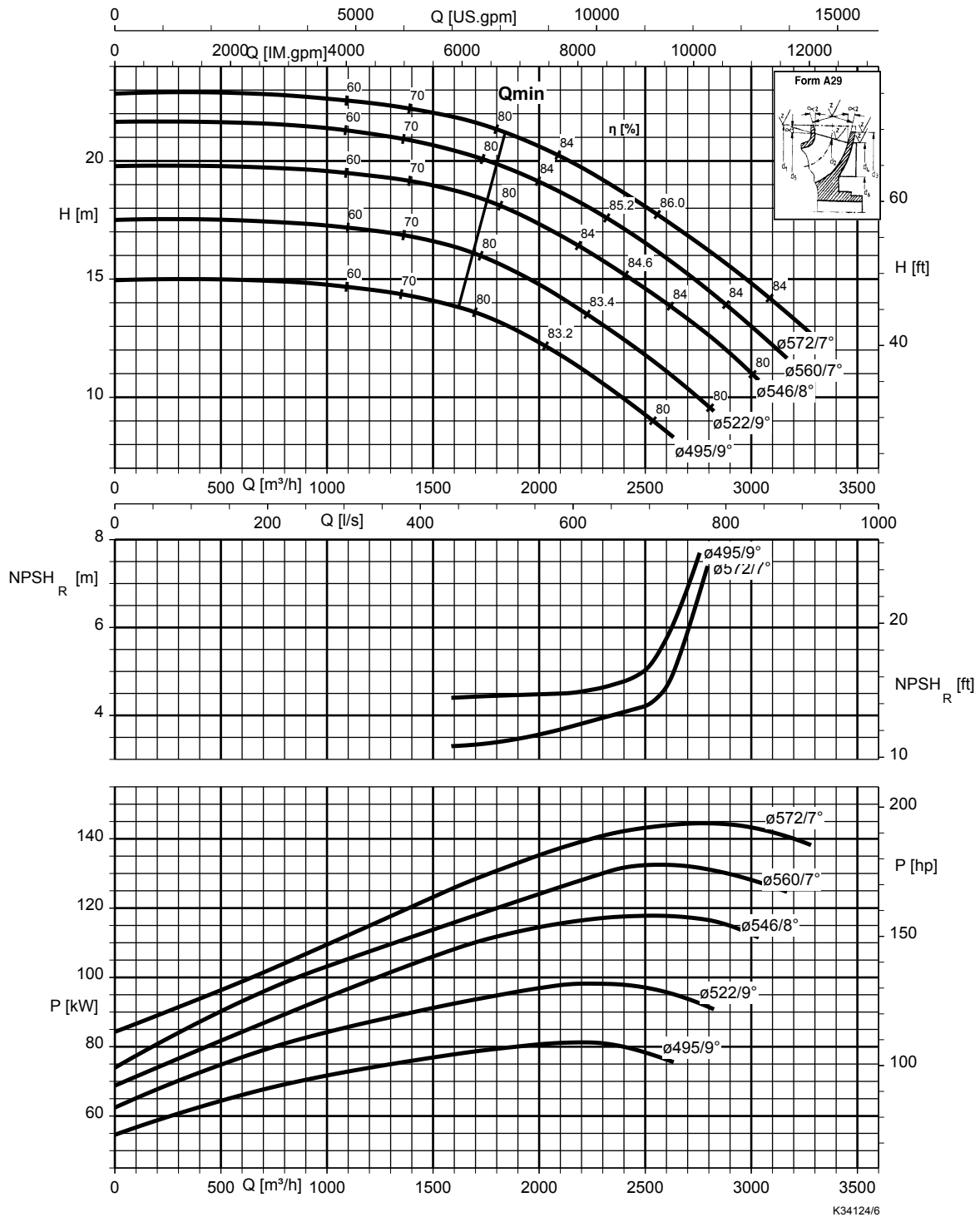


KWP K 500-400-713,  $n = 725 \text{ min}^{-1}$

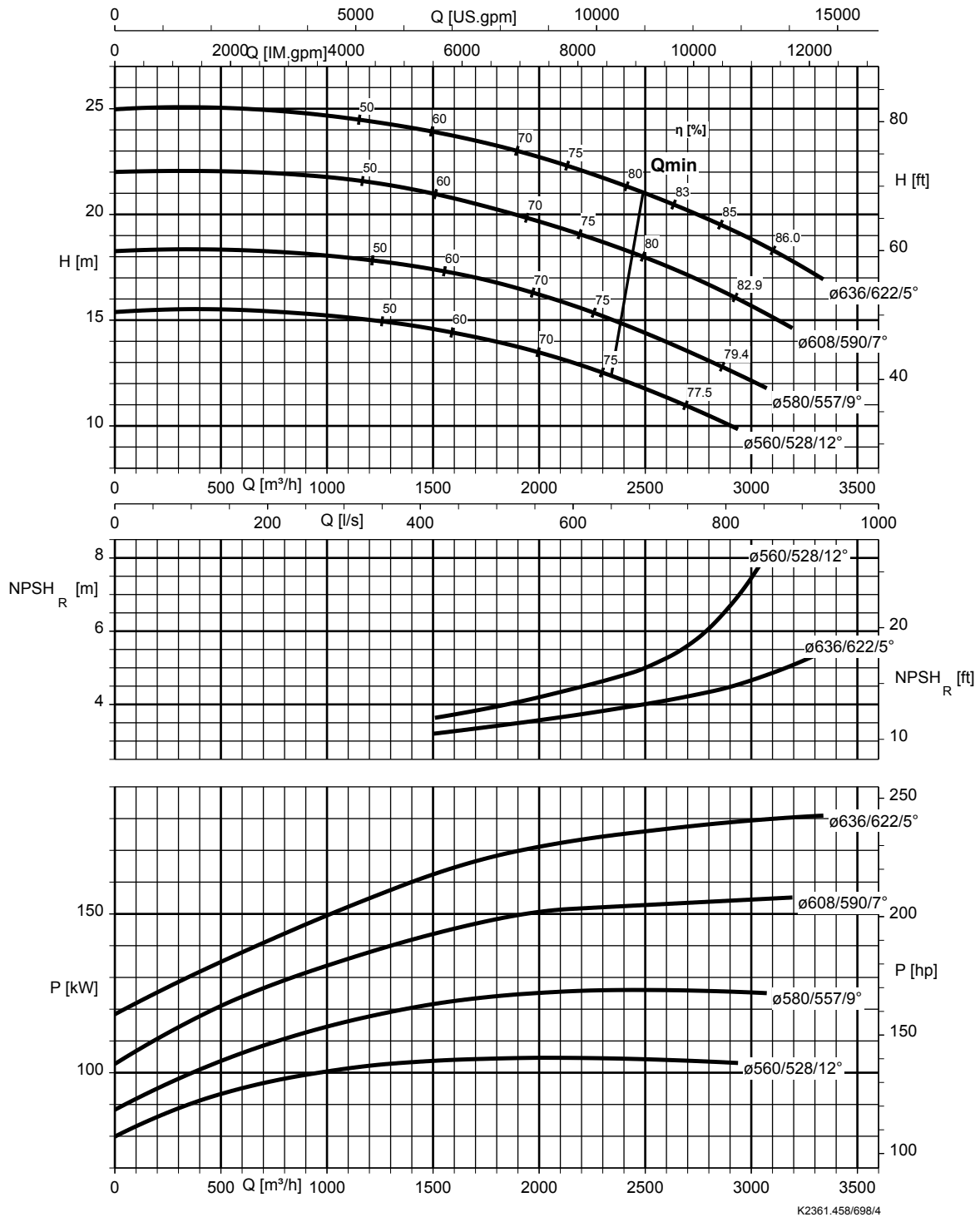


K33770/2

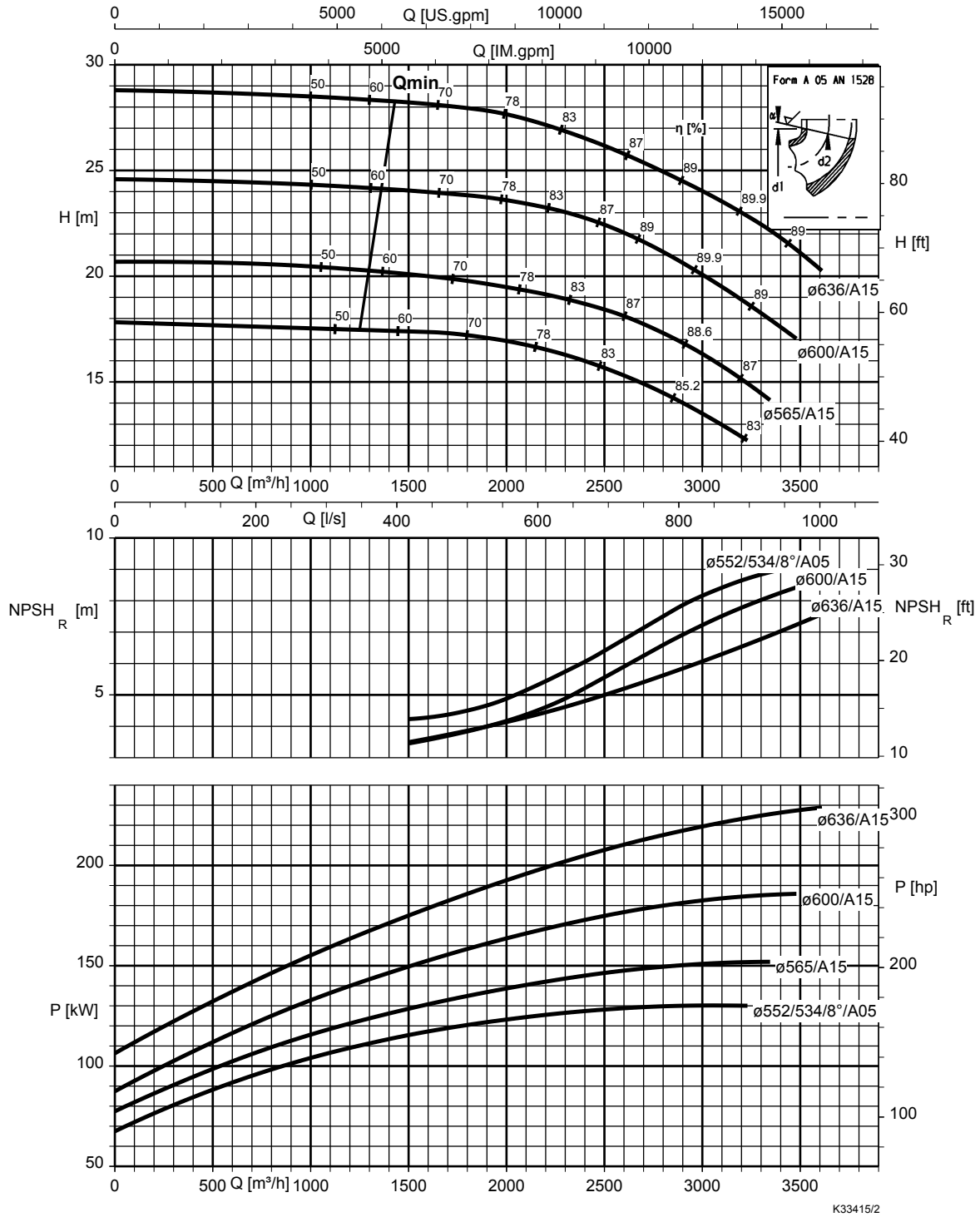
KWP K 500-500-544,  $n = 725 \text{ min}^{-1}$



KWP K 500-500-630,  $n = 725 \text{ min}^{-1}$

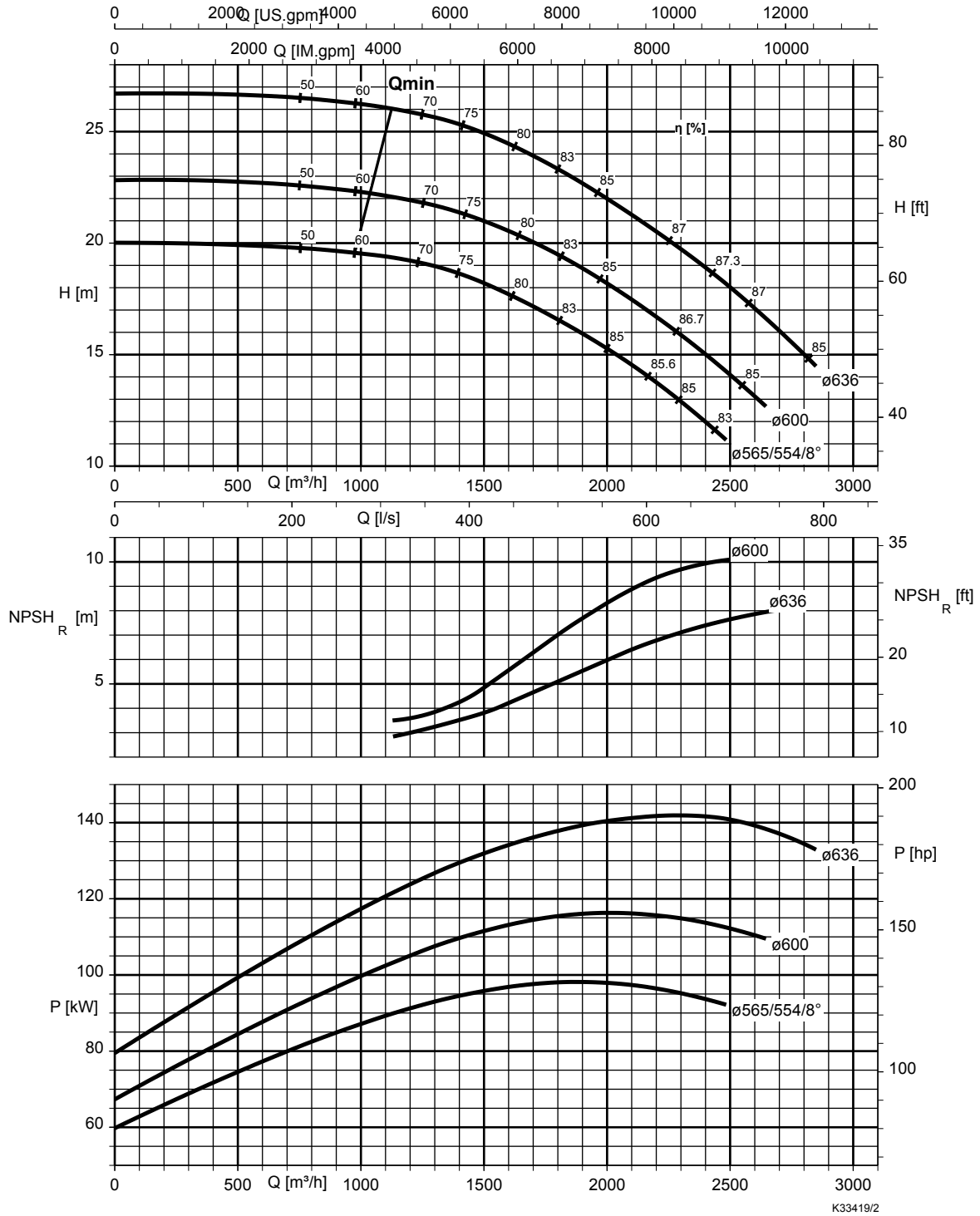


KWP K 500-500-633,  $n = 725 \text{ min}^{-1}$

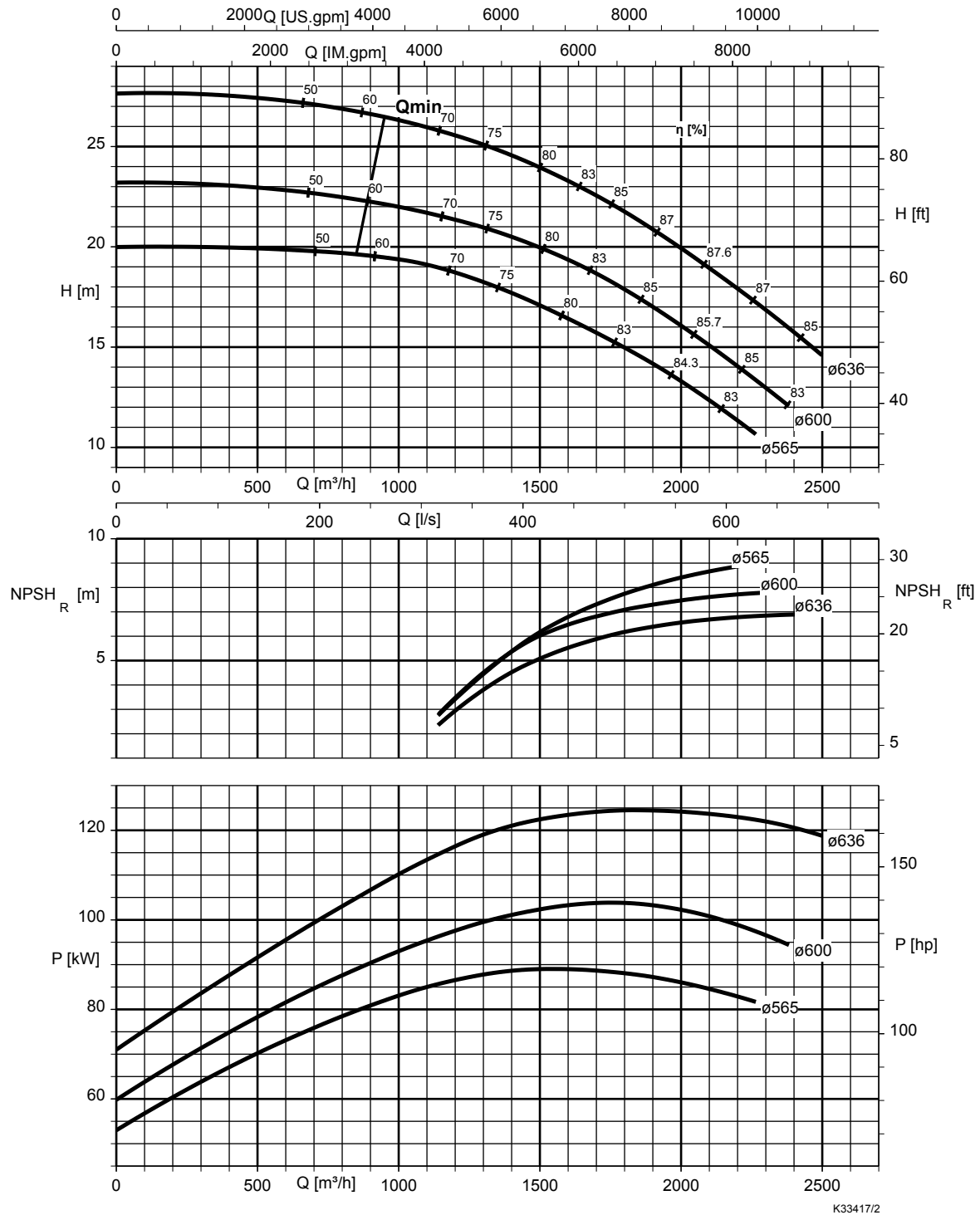




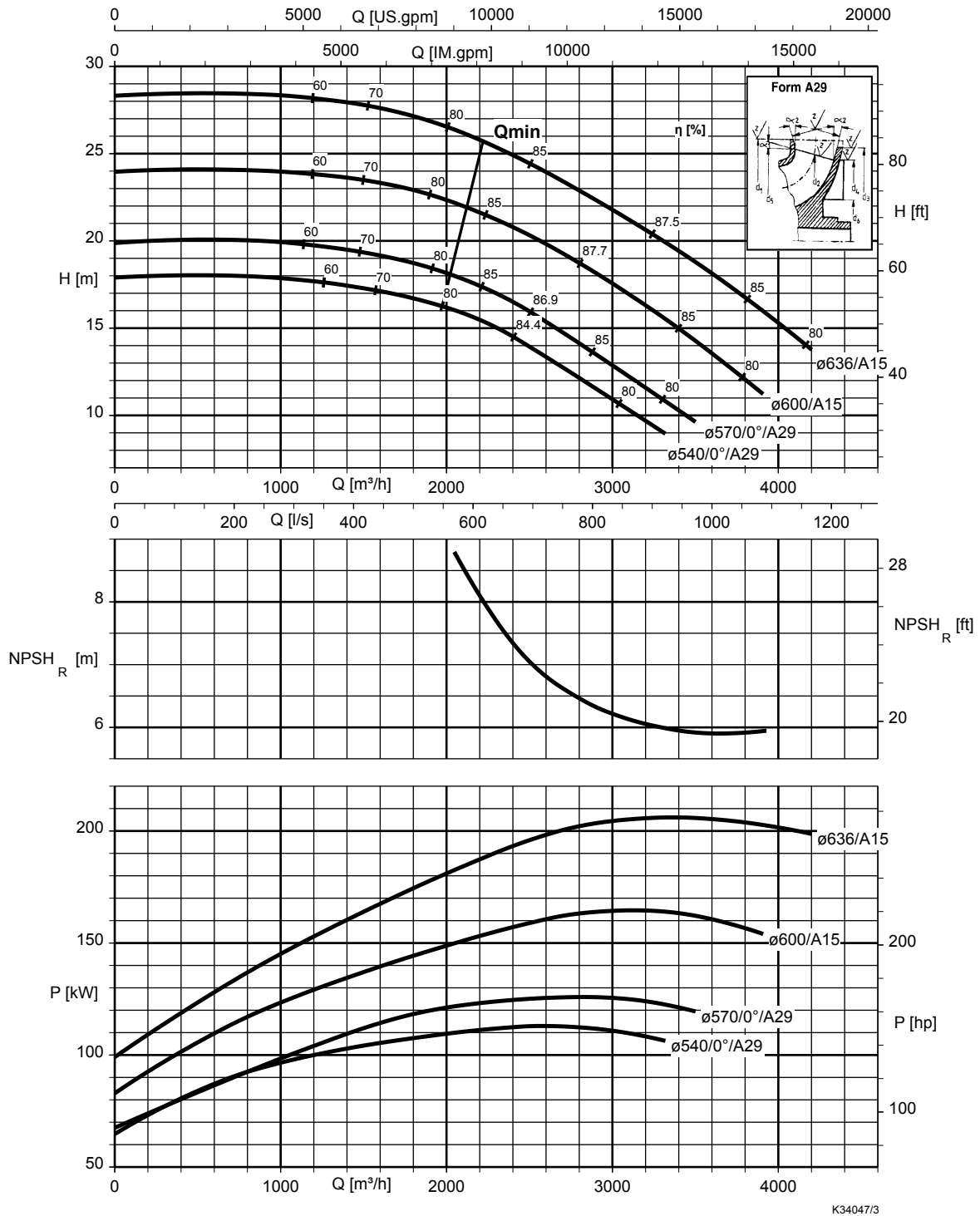
KWP K 500-500-634,  $n = 725 \text{ min}^{-1}$



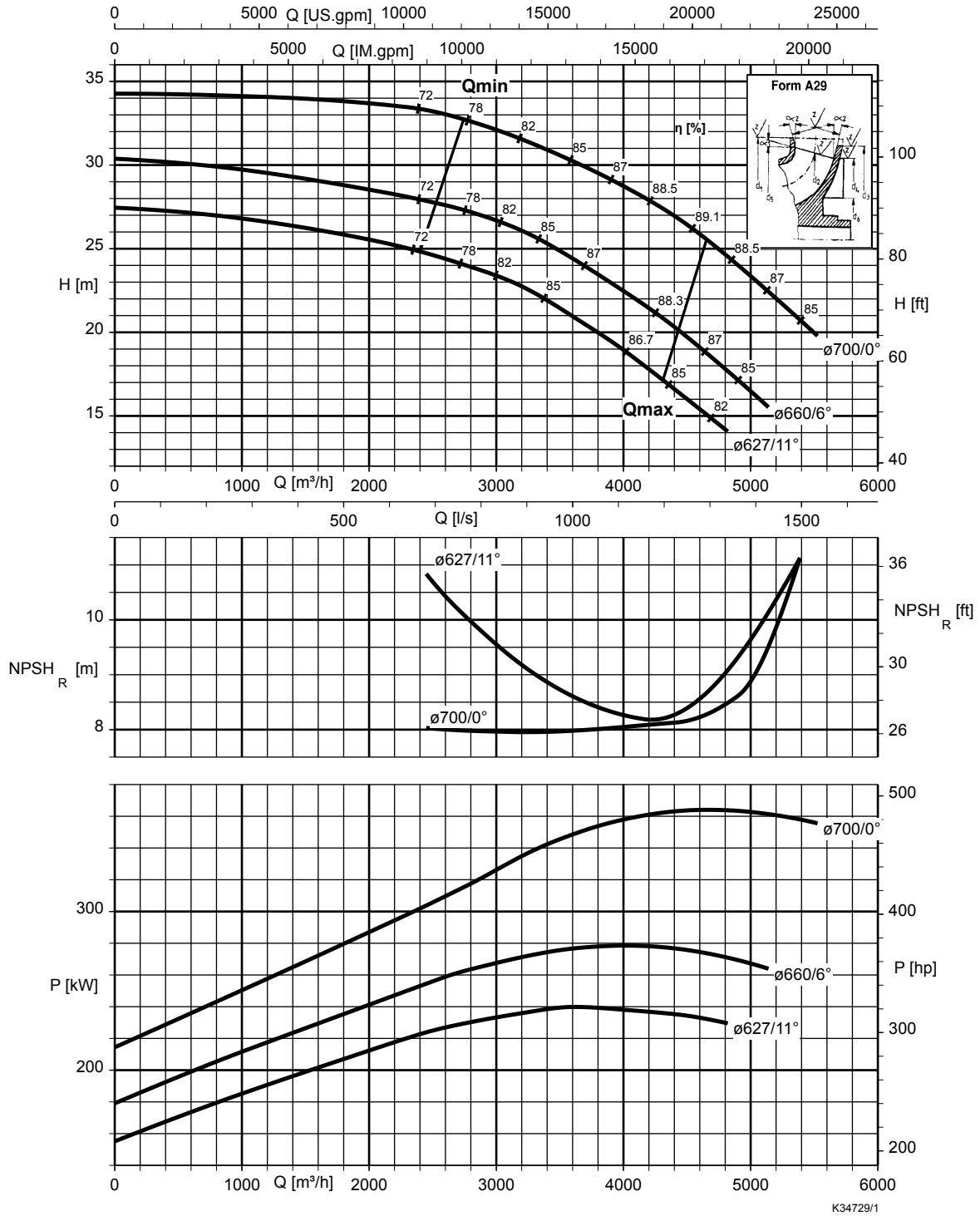
KWP K 500-500-635,  $n = 725 \text{ min}^{-1}$



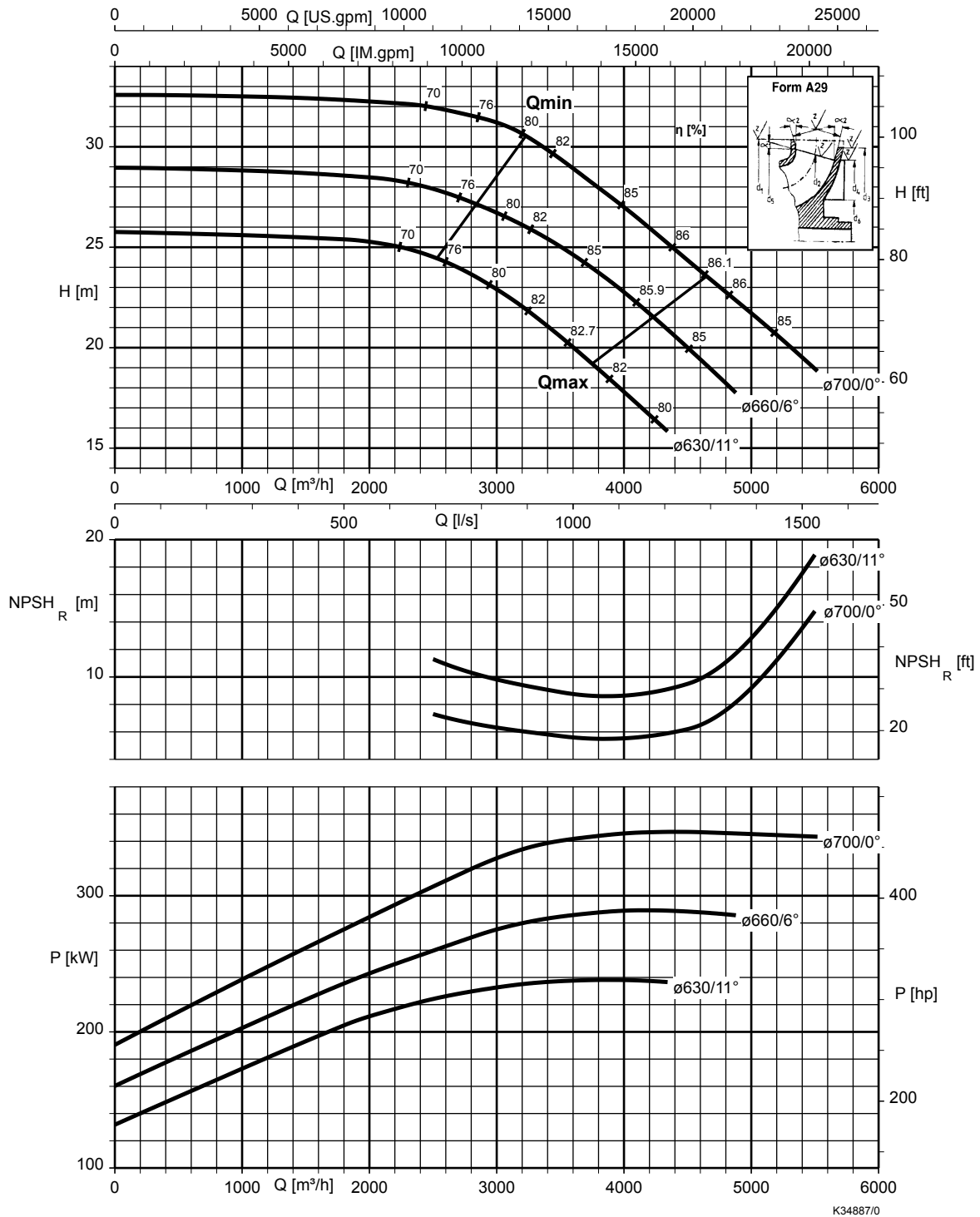
KWP K 500-500-637,  $n = 725 \text{ min}^{-1}$



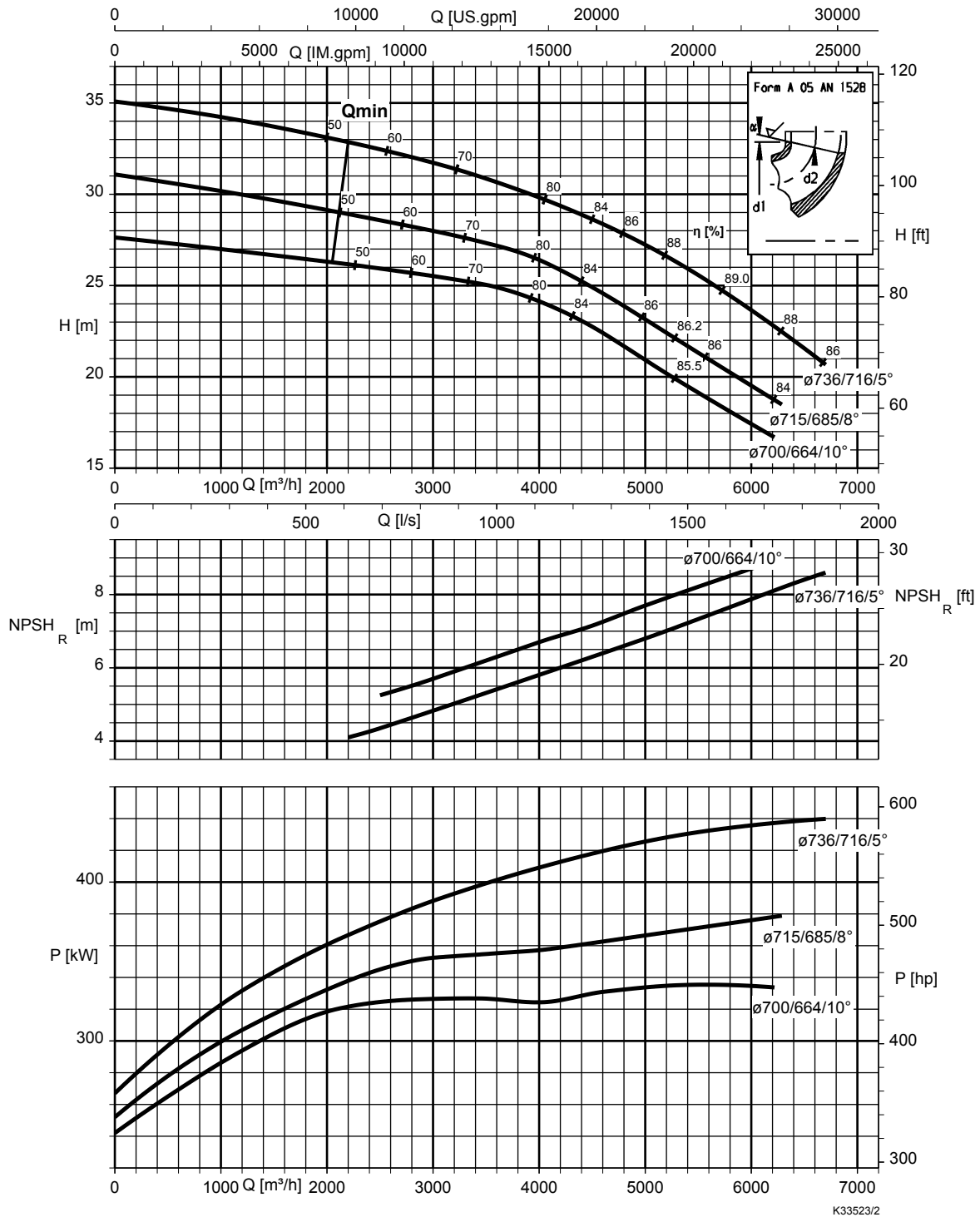
KWP K 600-600-663,  $n = 725 \text{ min}^{-1}$



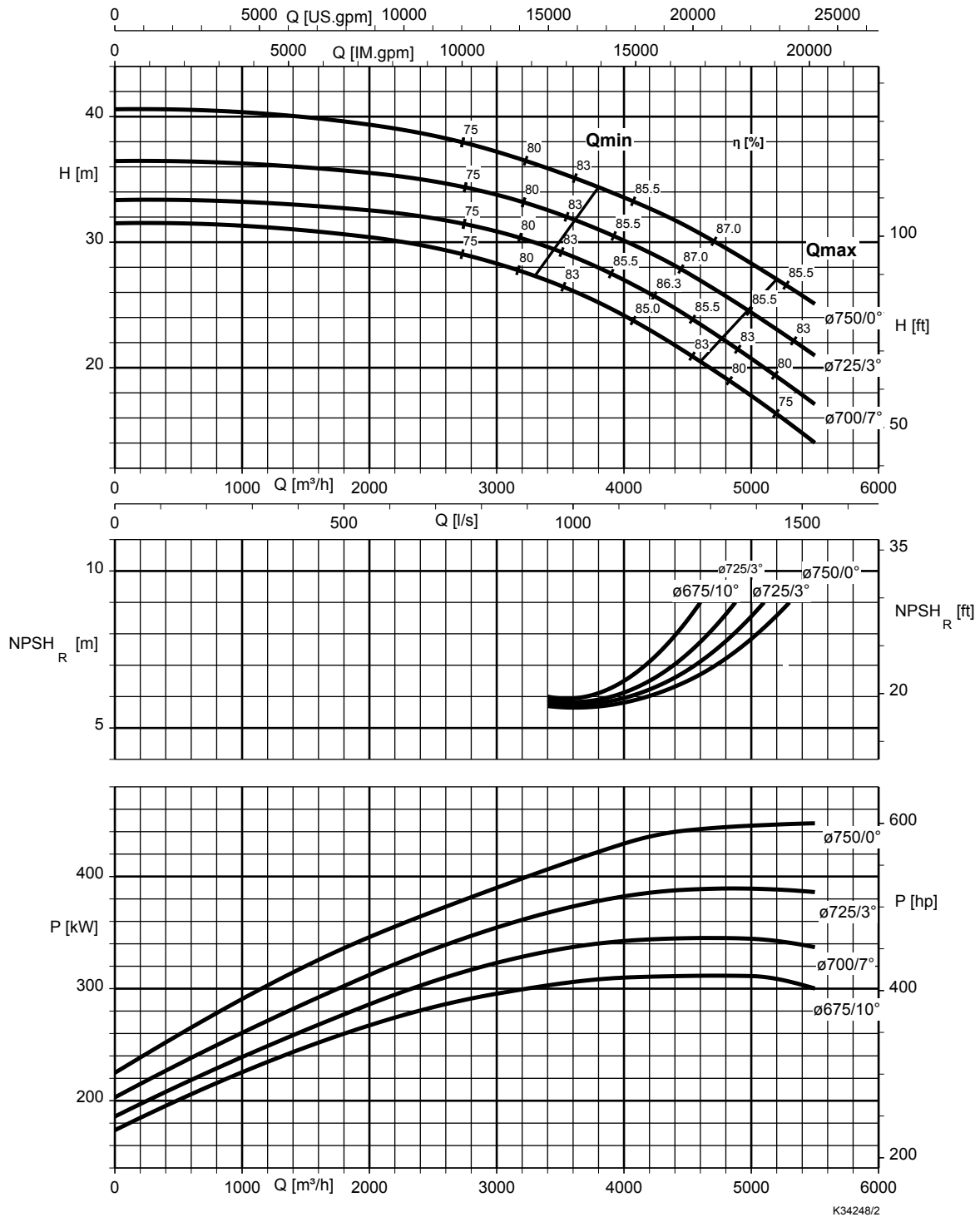
KWP K 600-600-669,  $n = 725 \text{ min}^{-1}$



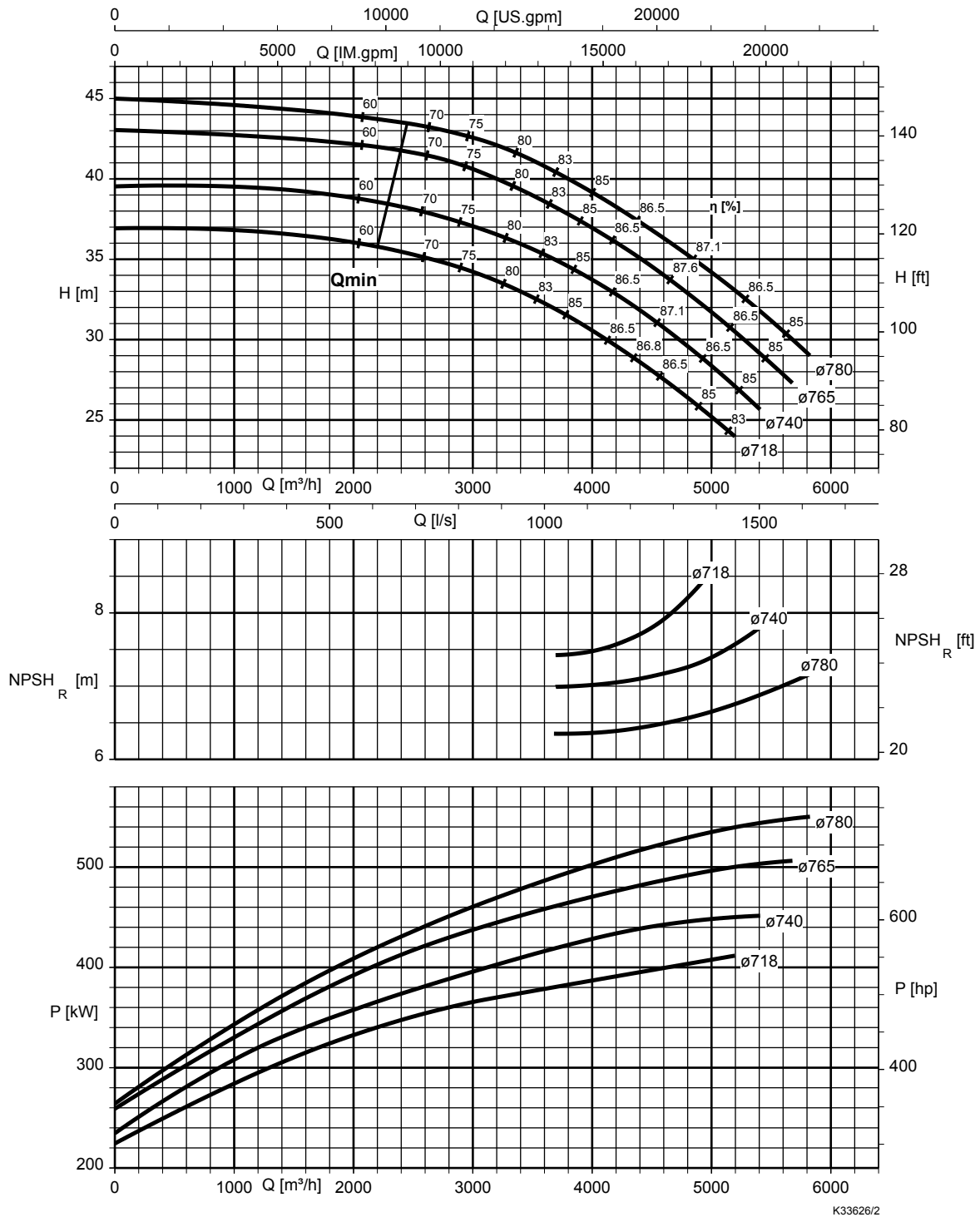
KWP K 600-600-710,  $n = 725 \text{ min}^{-1}$



KWP K 600-600-753,  $n = 725 \text{ min}^{-1}$

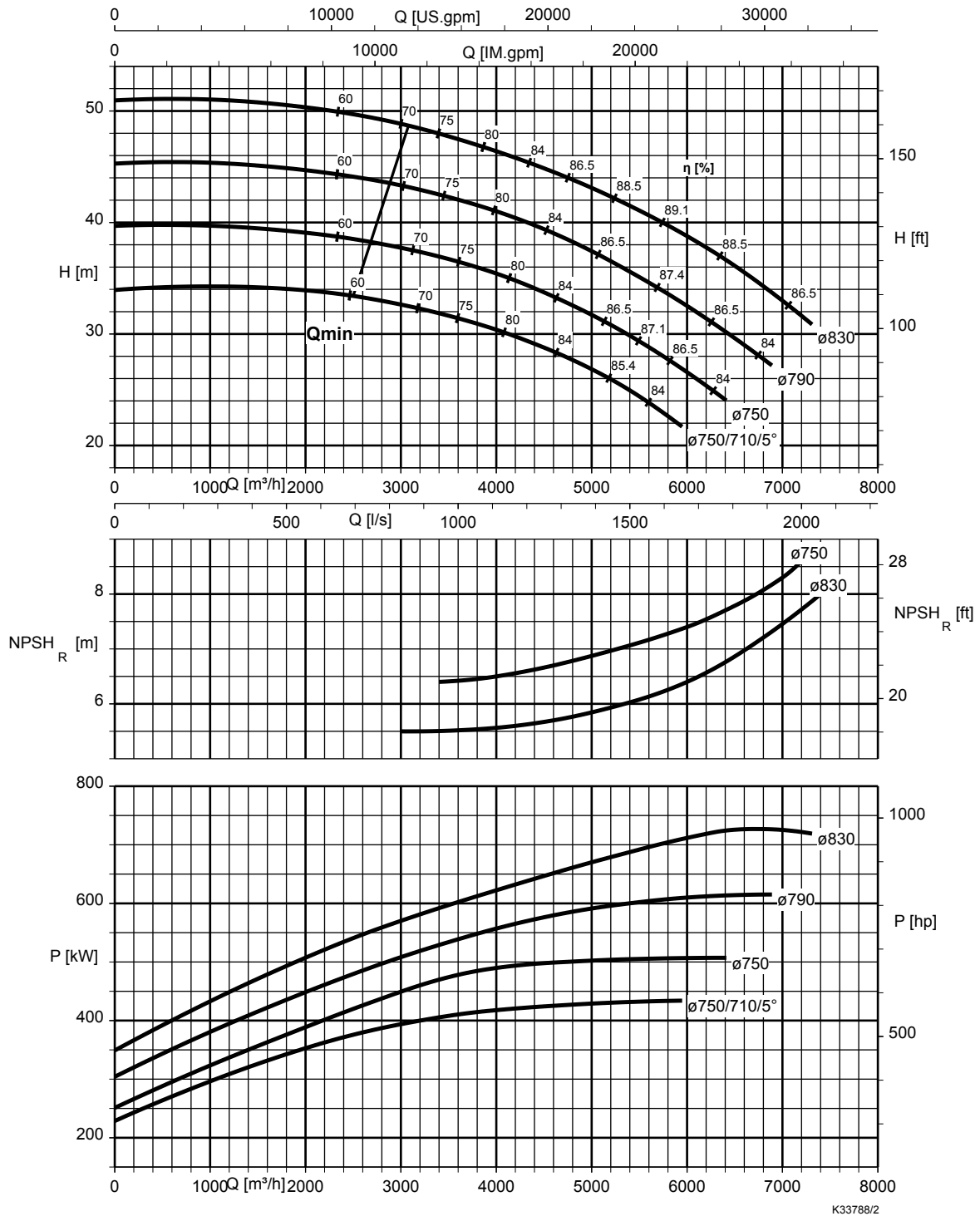


KWP K 600-600-803,  $n = 725 \text{ min}^{-1}$

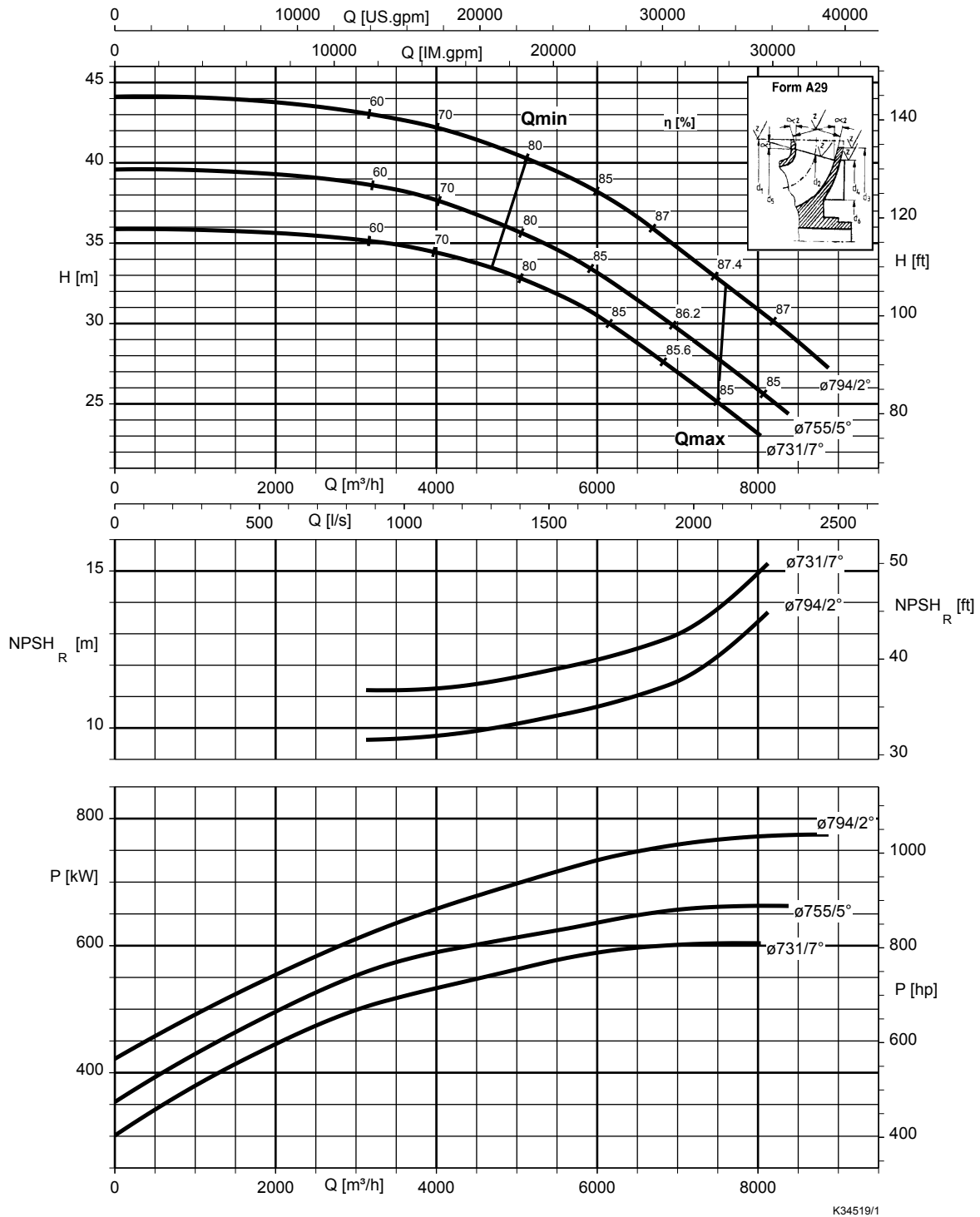




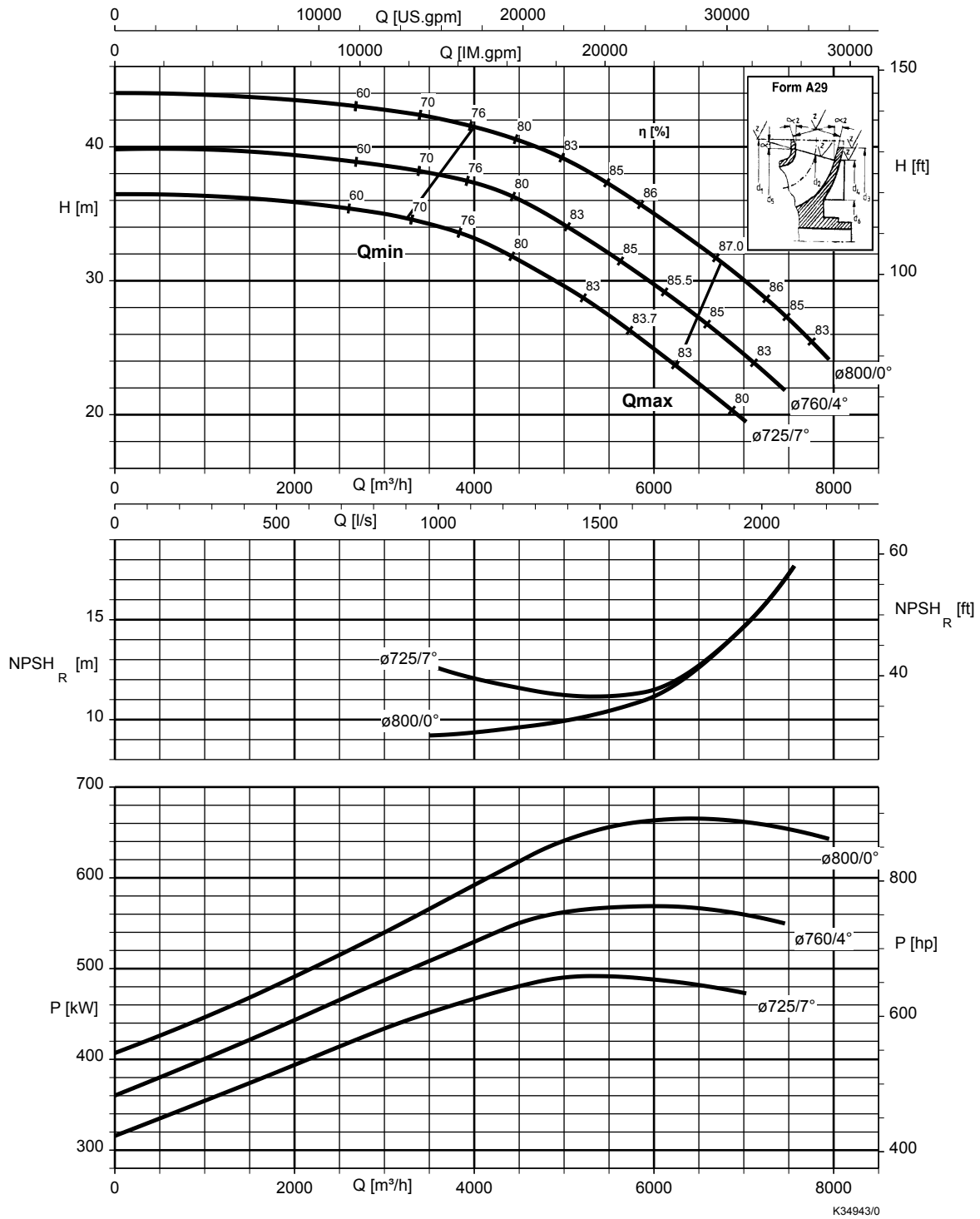
**KWP K 600-600-813,  $n = 725 \text{ min}^{-1}$**



KWP K 600-600-824,  $n = 725 \text{ min}^{-1}$

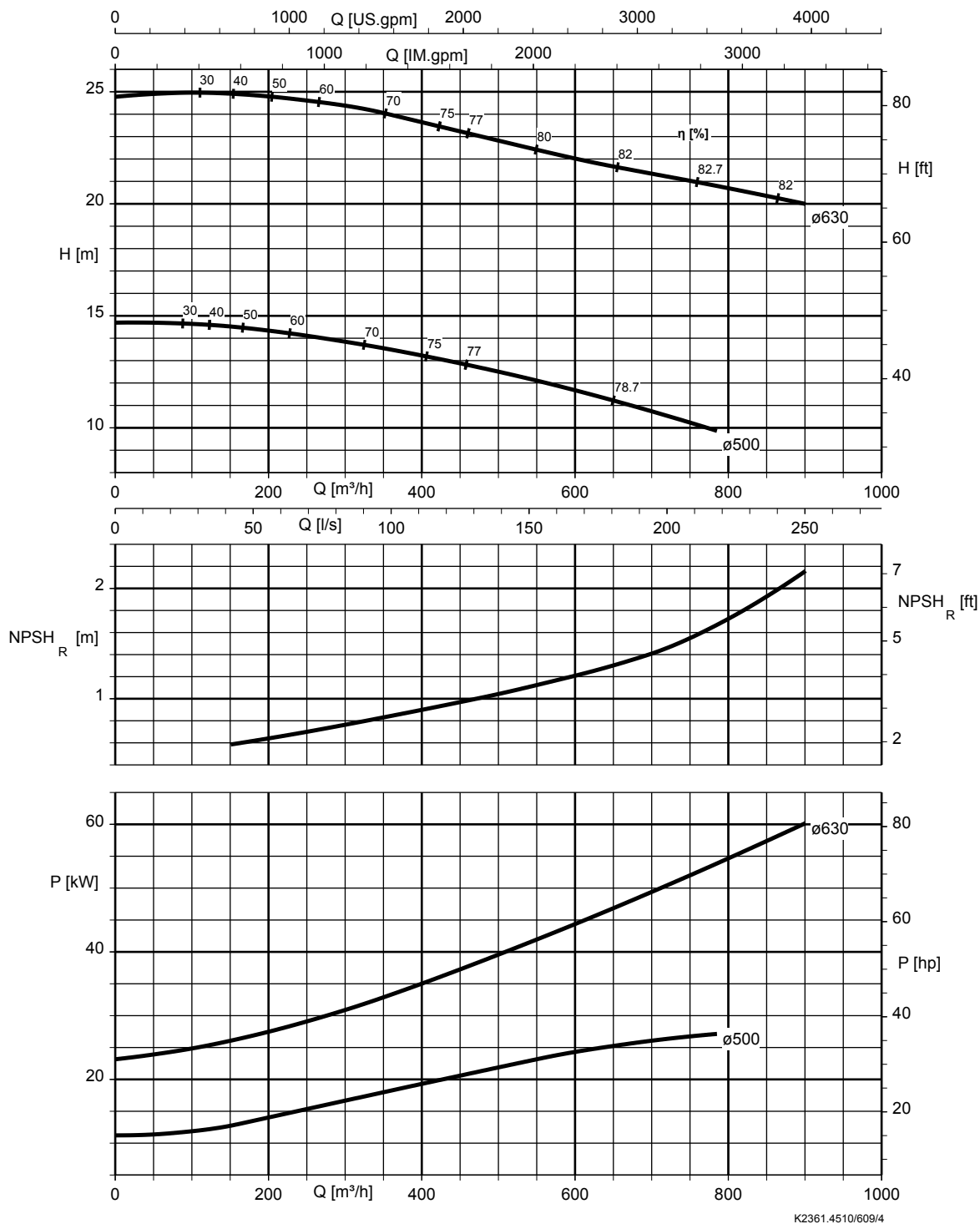


KWP K 600-600-825,  $n = 725 \text{ min}^{-1}$

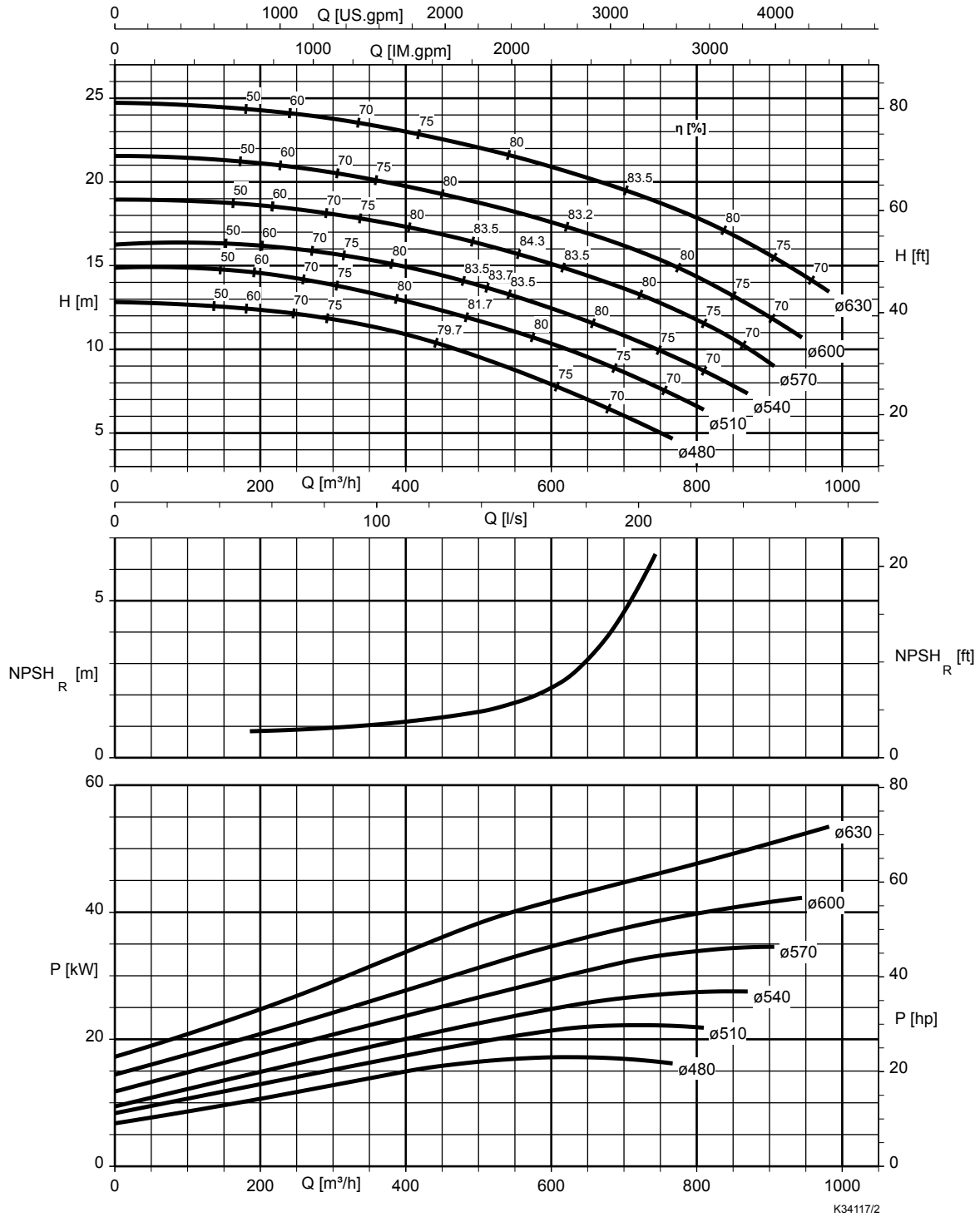


$n = 580 \text{ min}^{-1}$

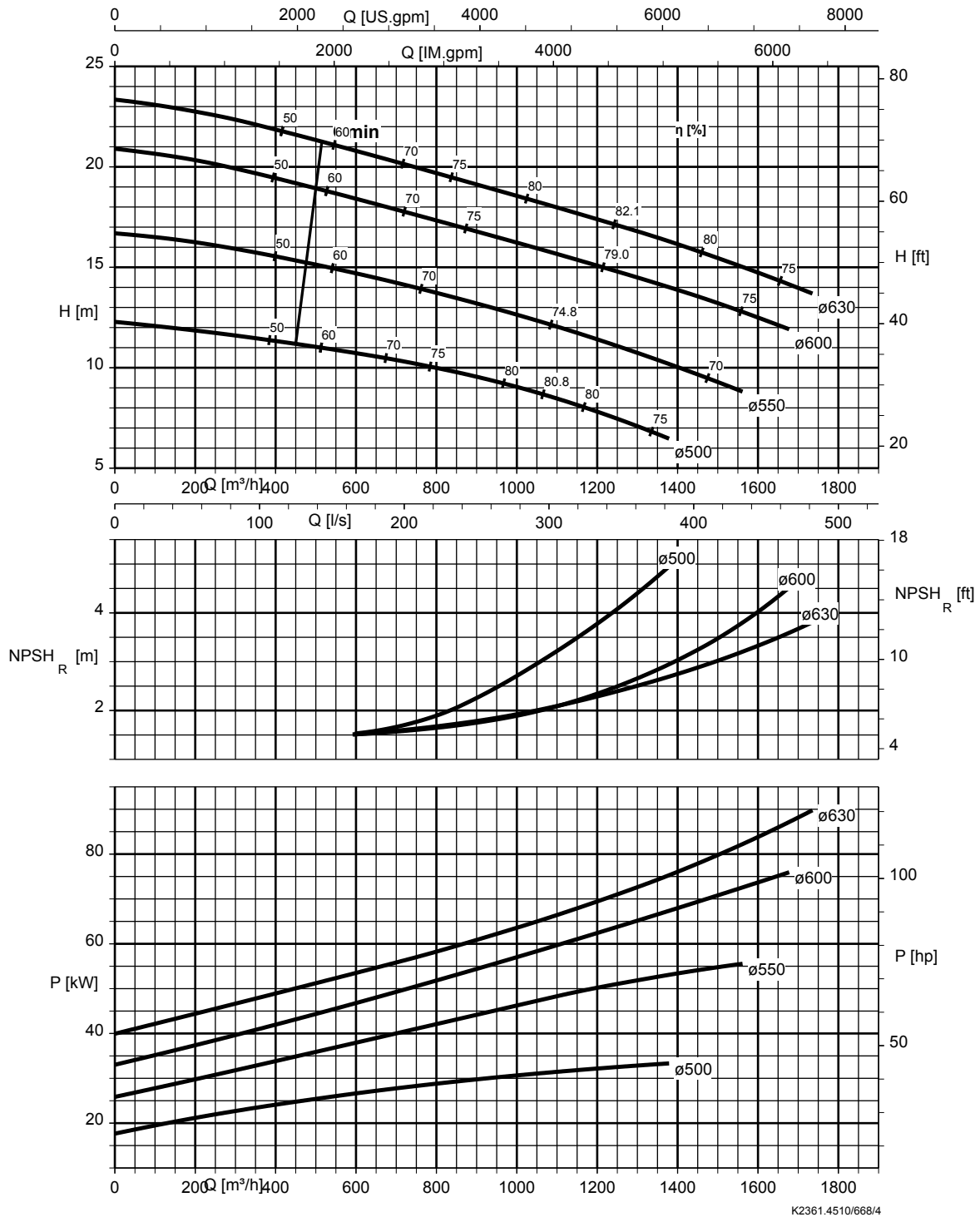
KWP K 250-250-630,  $n = 580 \text{ min}^{-1}$



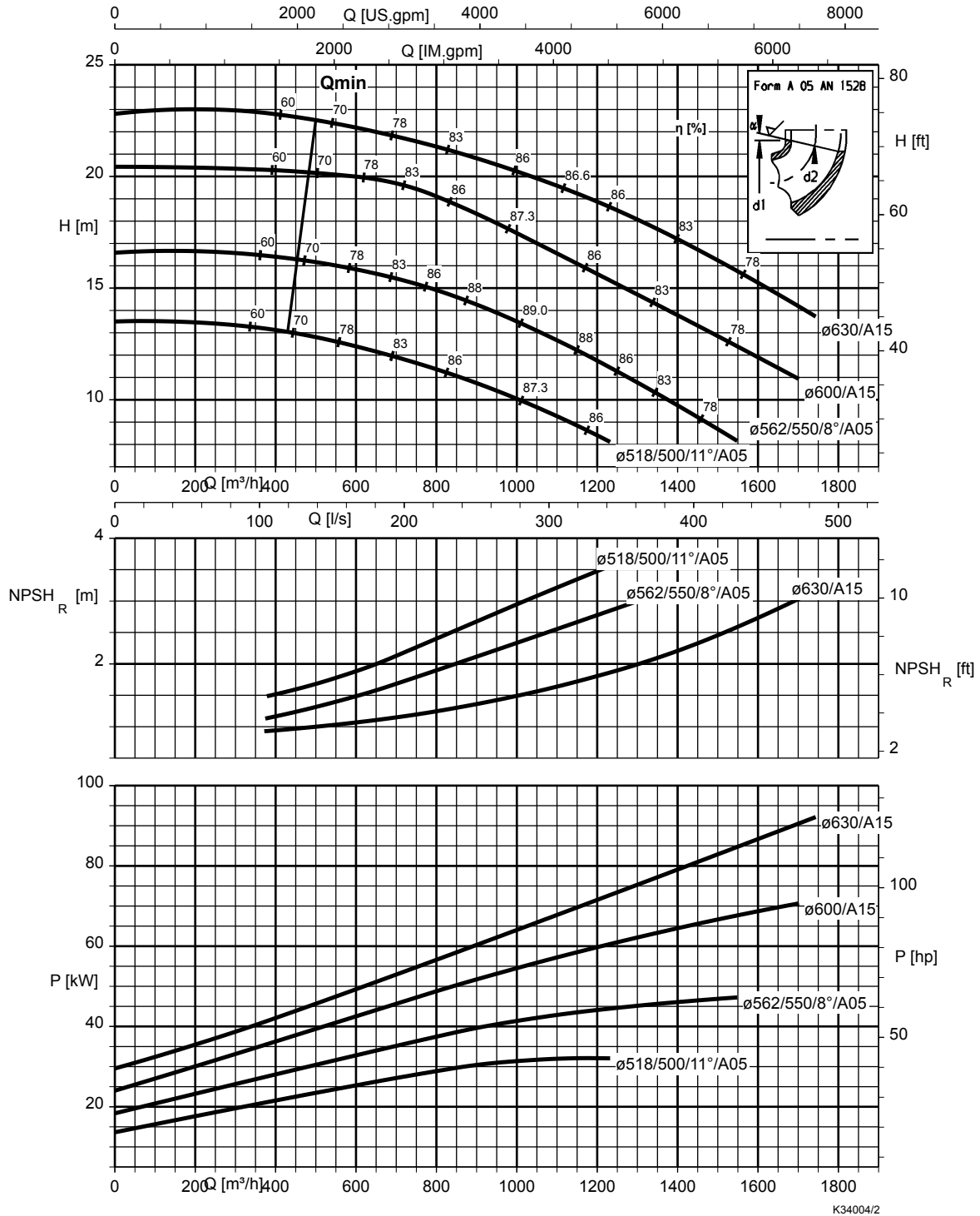
KWP K 250-250-634,  $n = 580 \text{ min}^{-1}$



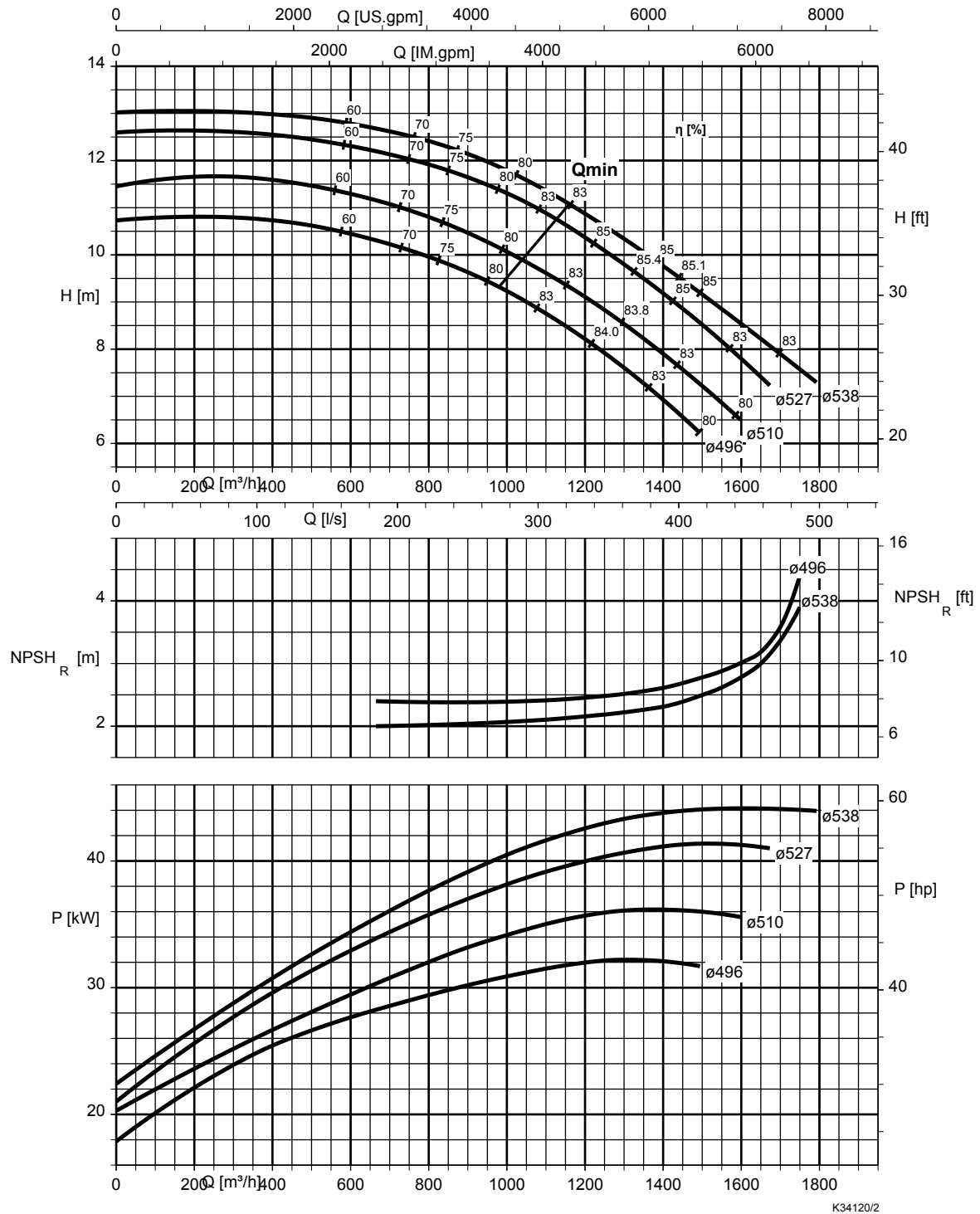
KWP K 350-350-630,  $n = 580 \text{ min}^{-1}$



KWP K 350-350-633,  $n = 580 \text{ min}^{-1}$

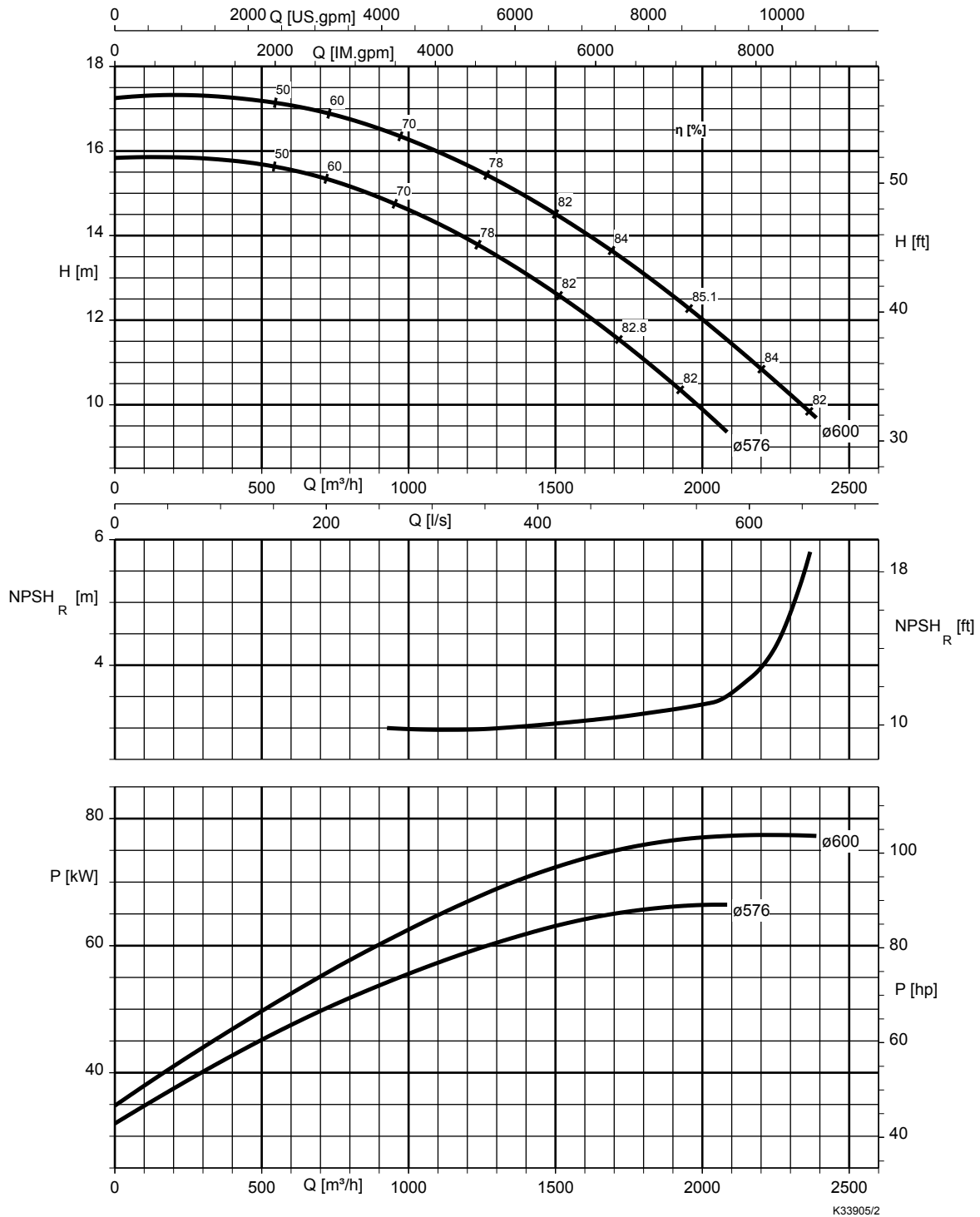


**KWP K 400-400-533,  $n = 580 \text{ min}^{-1}$**

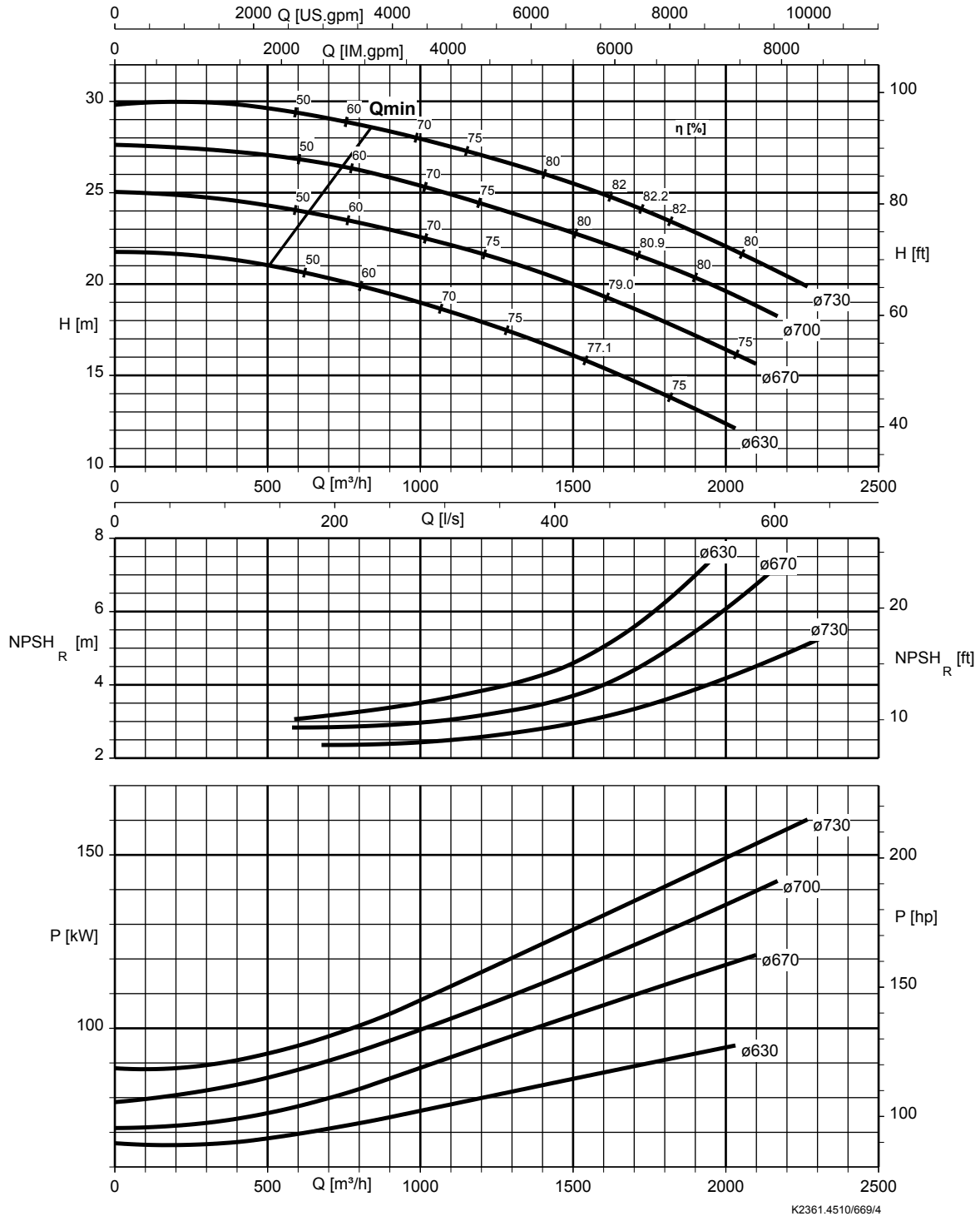




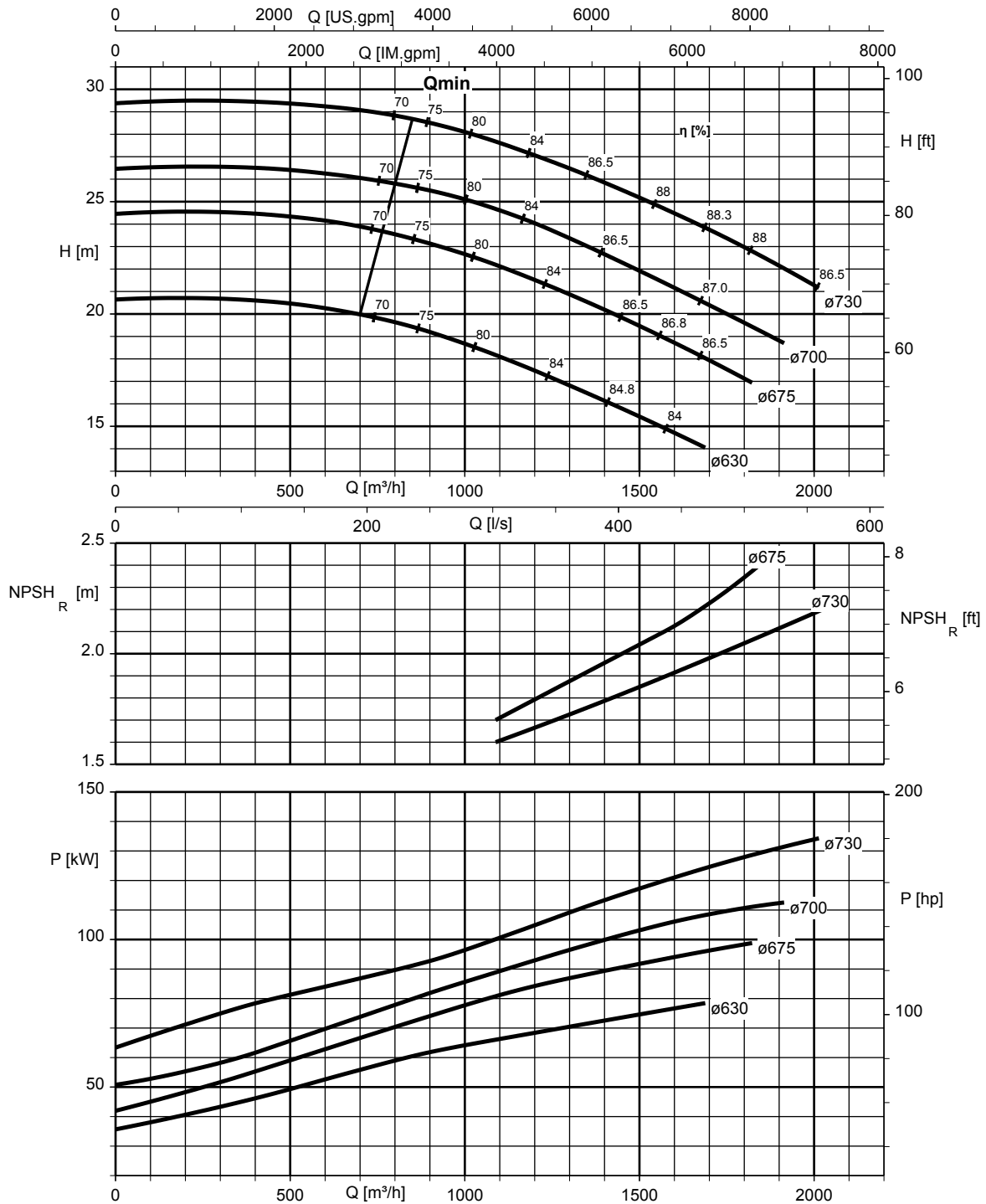
KWP K 400-400-583,  $n = 580 \text{ min}^{-1}$



KWP K 500-400-710,  $n = 580 \text{ min}^{-1}$

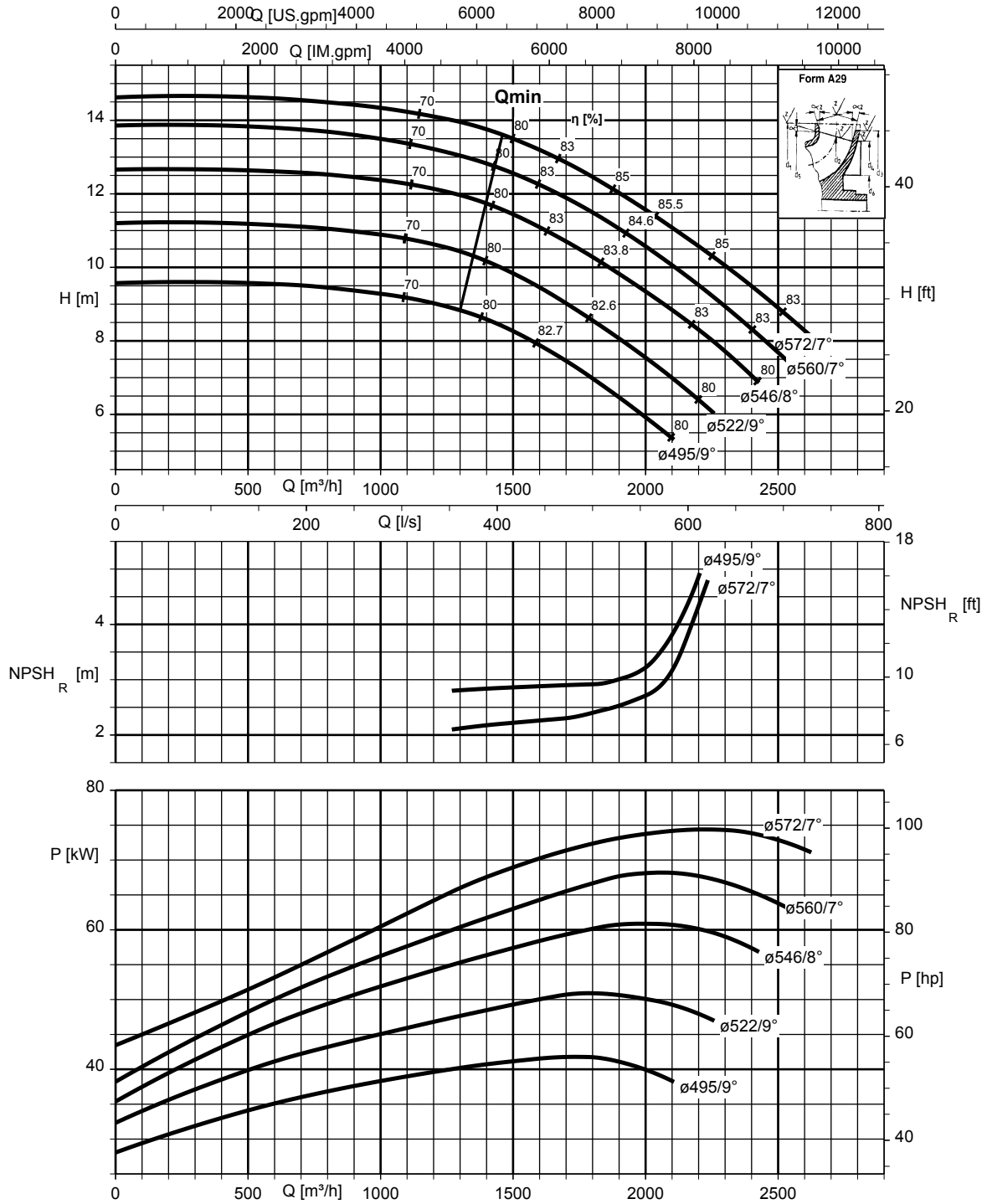


KWP K 500-400-713,  $n = 580 \text{ min}^{-1}$



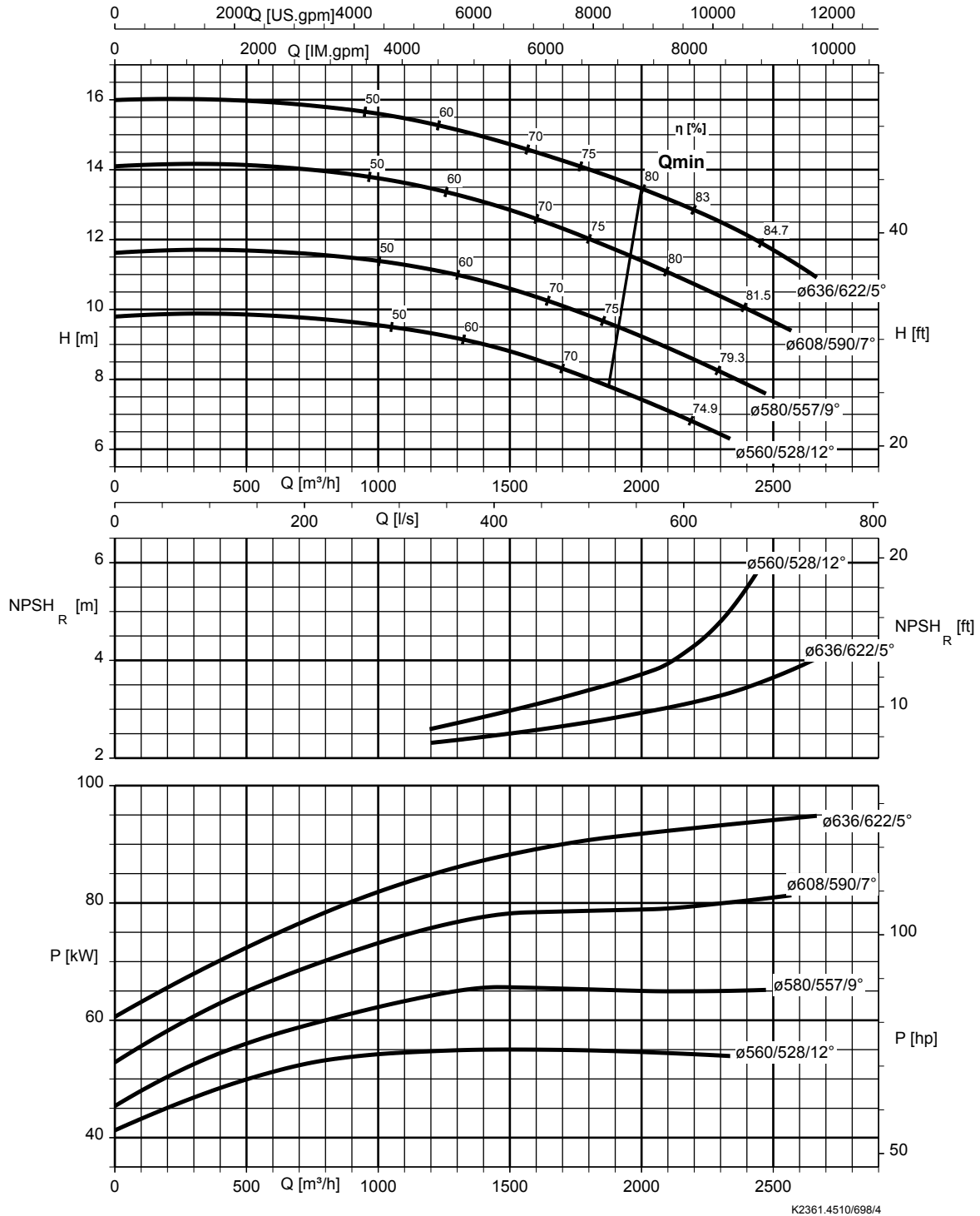
K34122/2

KWP K 500-500-544,  $n = 580 \text{ min}^{-1}$

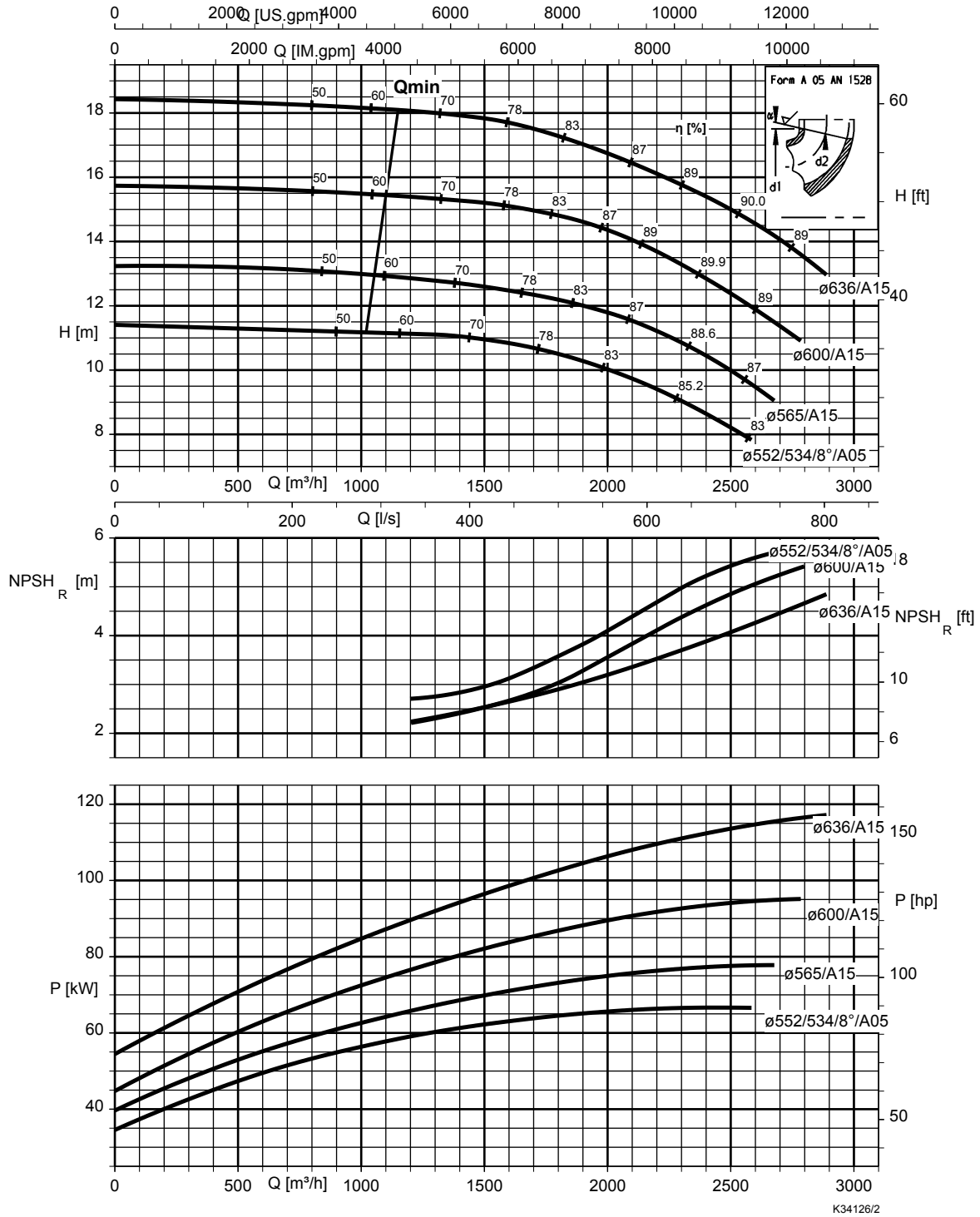


K34125/6

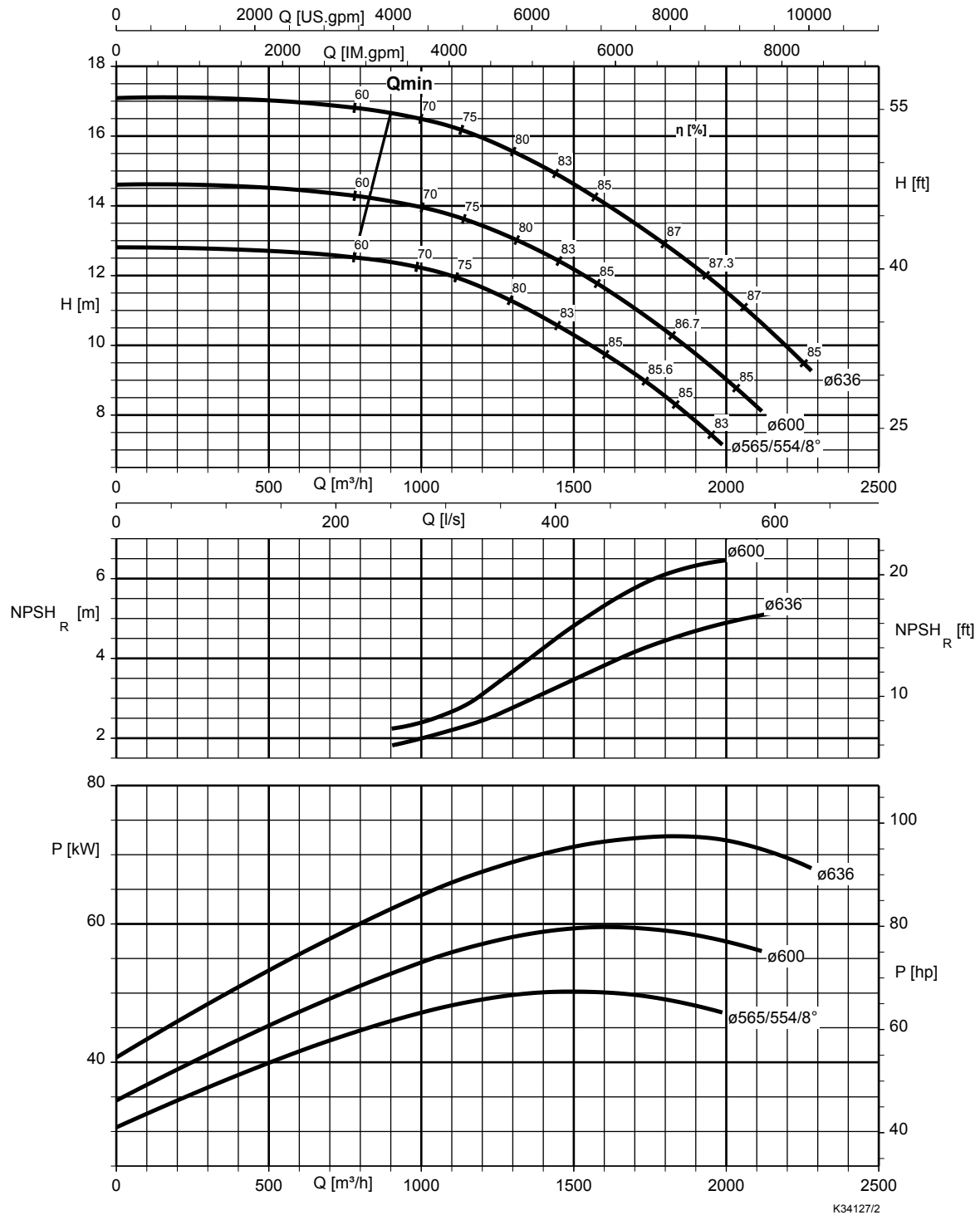
KWP K 500-500-630,  $n = 580 \text{ min}^{-1}$



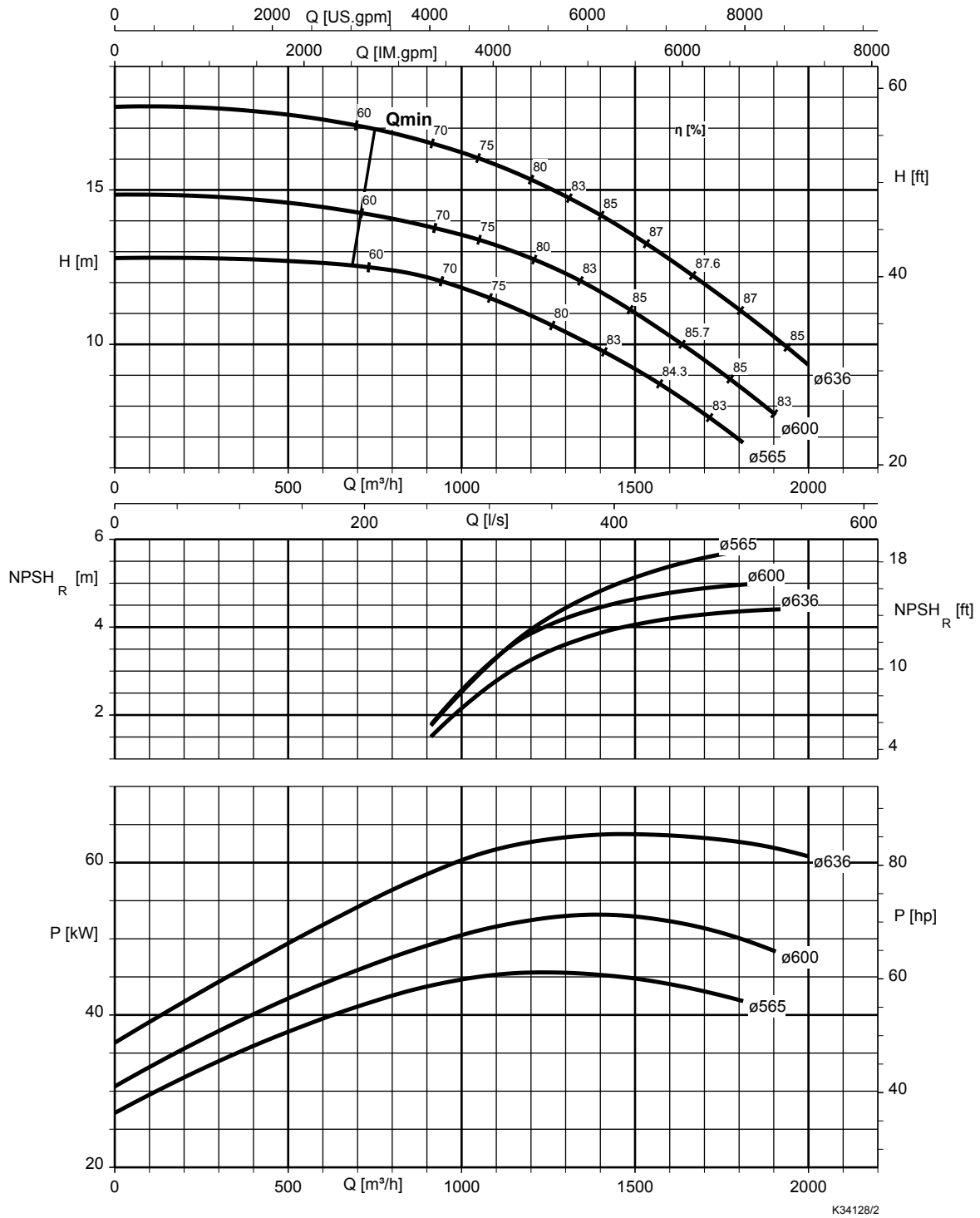
KWP K 500-500-633,  $n = 580 \text{ min}^{-1}$



KWP K 500-500-634,  $n = 580 \text{ min}^{-1}$

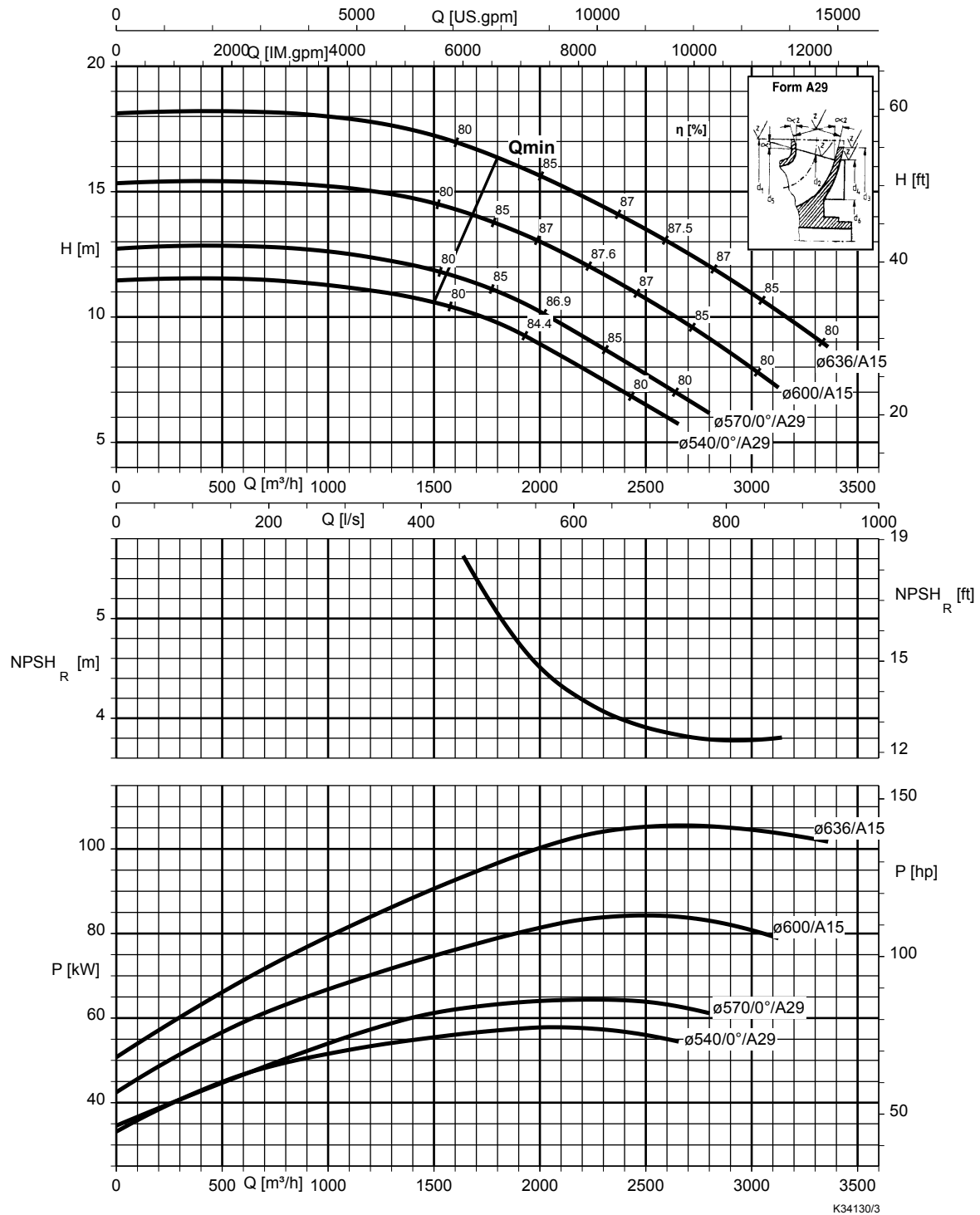


KWP K 500-500-635,  $n = 580 \text{ min}^{-1}$

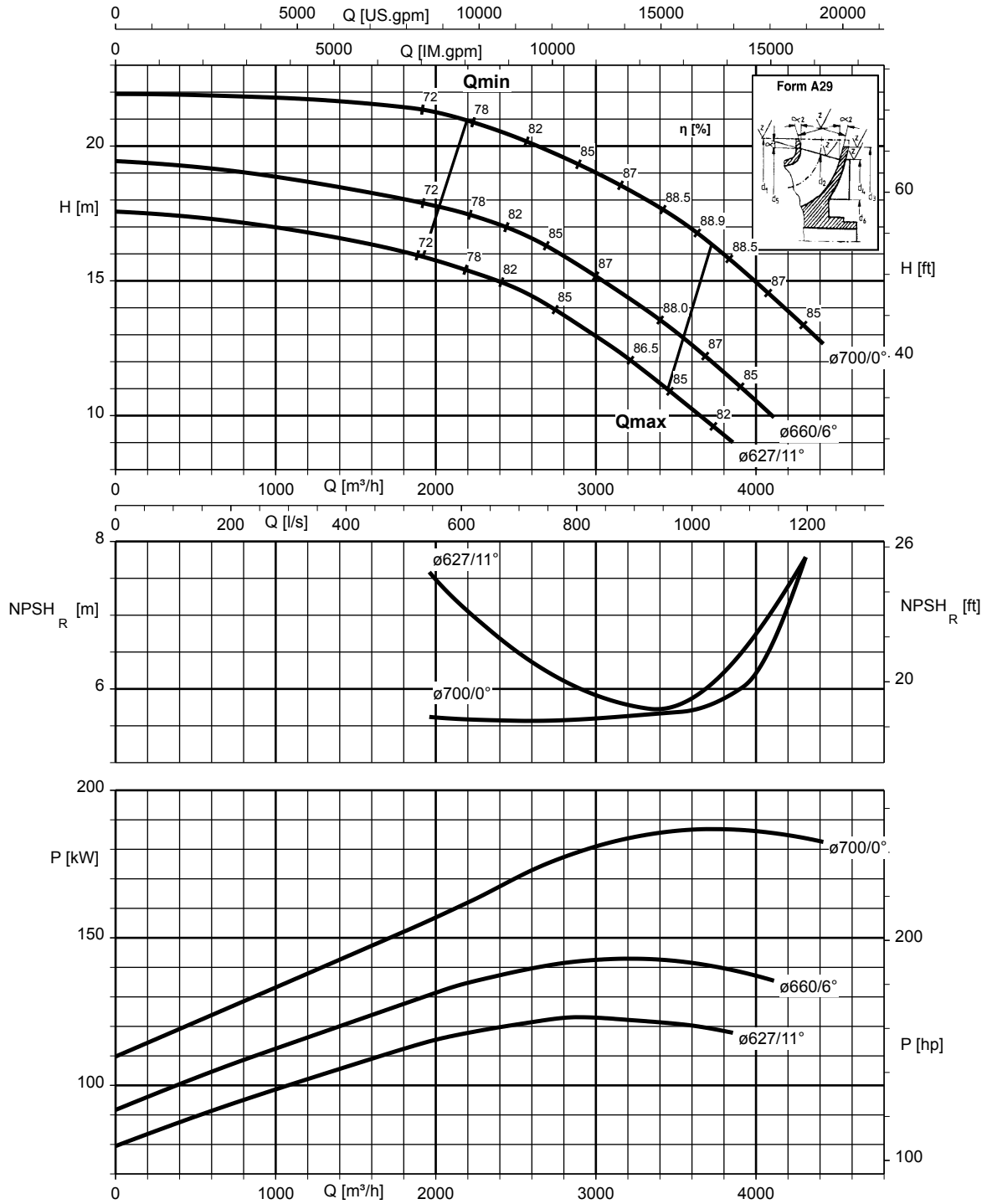




**KWP K 500-500-637,  $n = 580 \text{ min}^{-1}$**

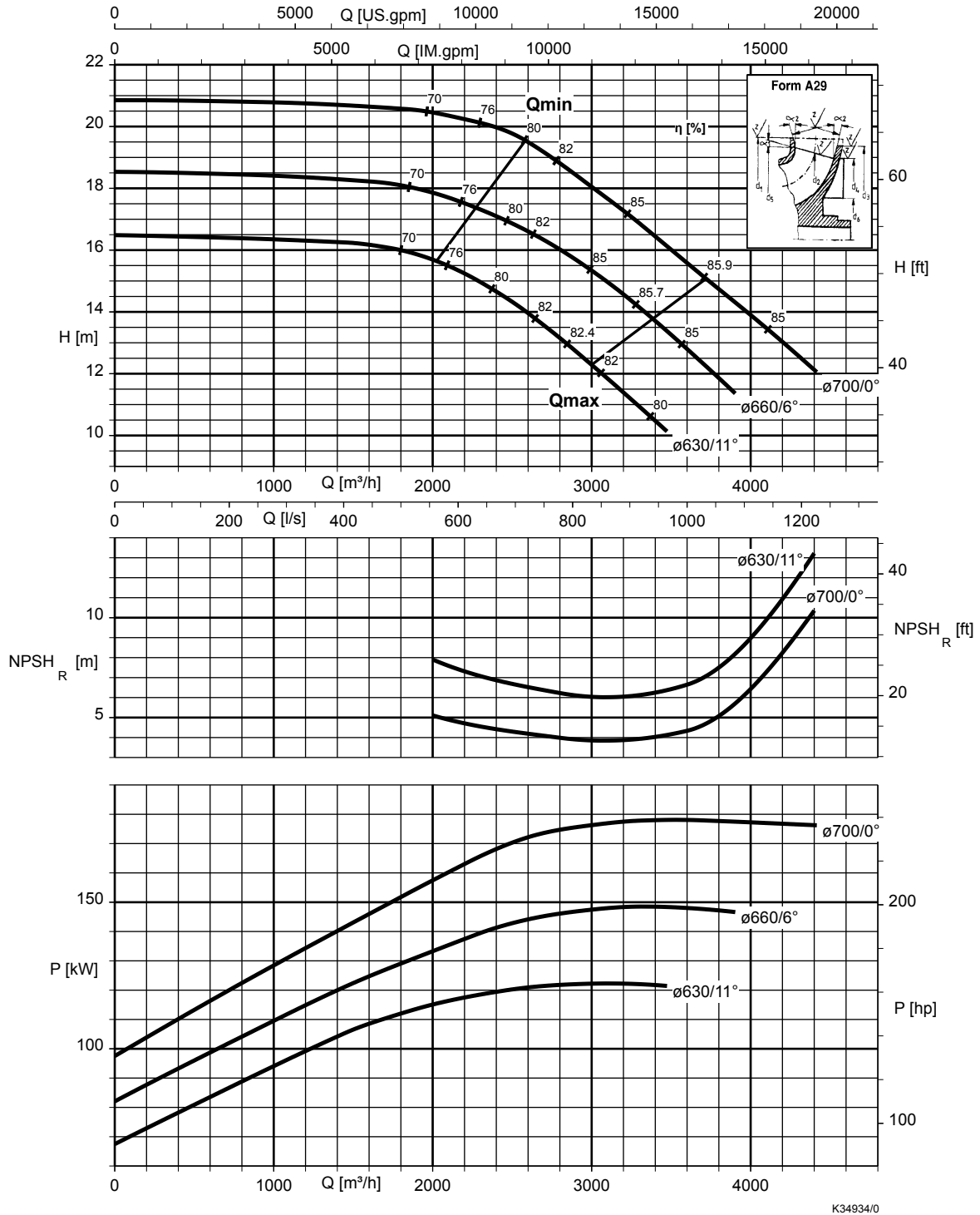


KWP K 600-600-663,  $n = 580 \text{ min}^{-1}$

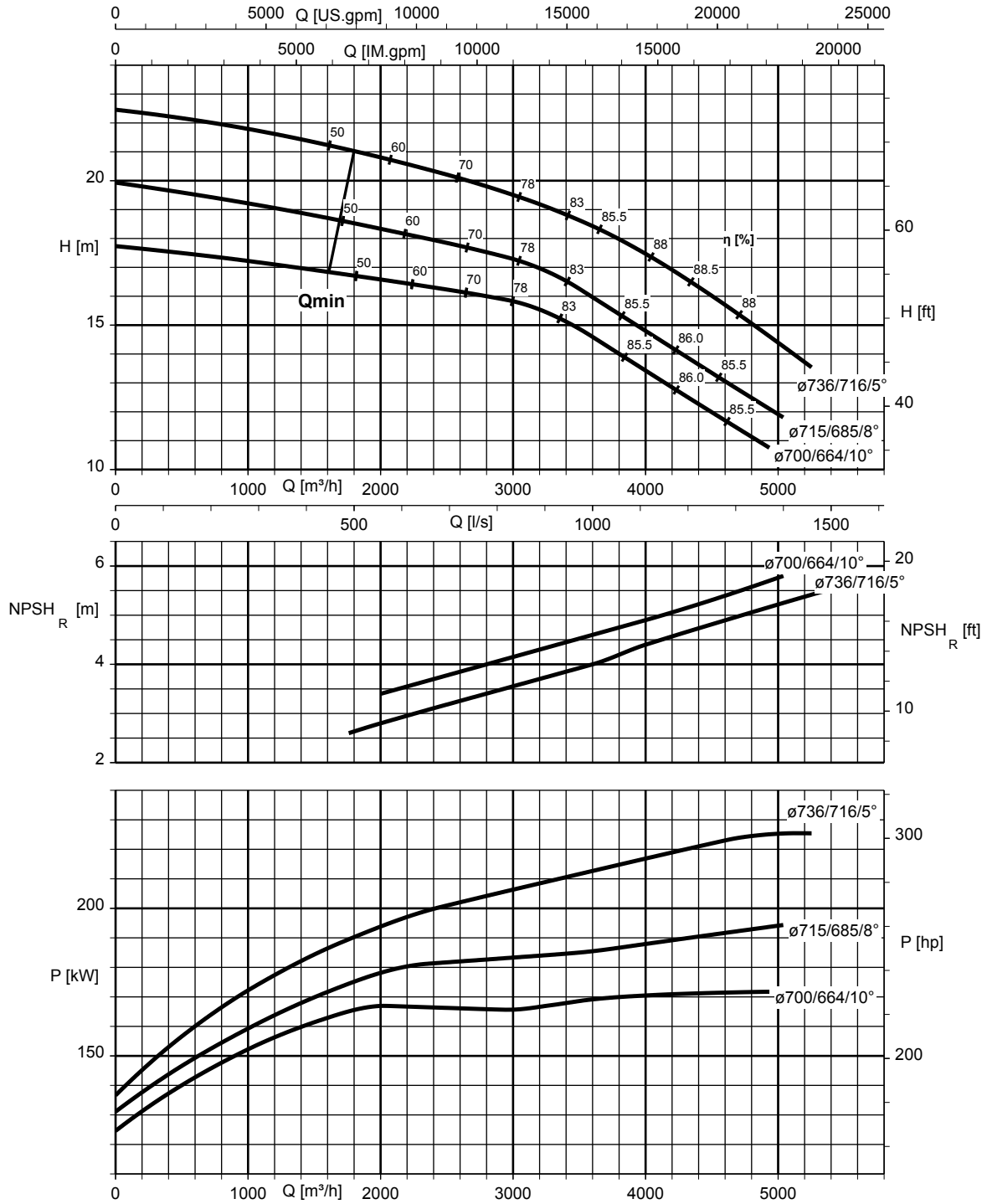


K34931/0

KWP K 600-600-669,  $n = 580 \text{ min}^{-1}$

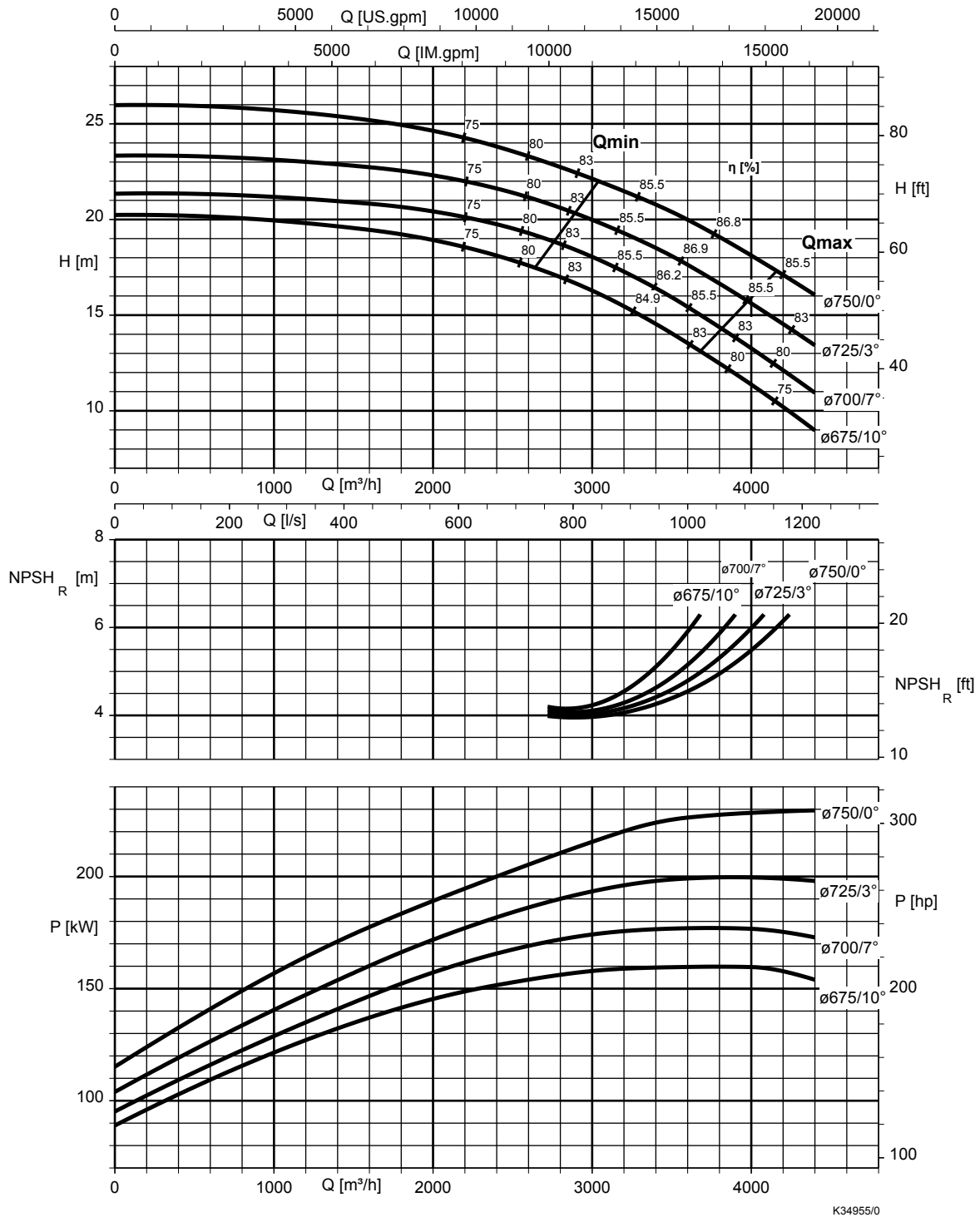


KWP K 600-600-710,  $n = 580 \text{ min}^{-1}$

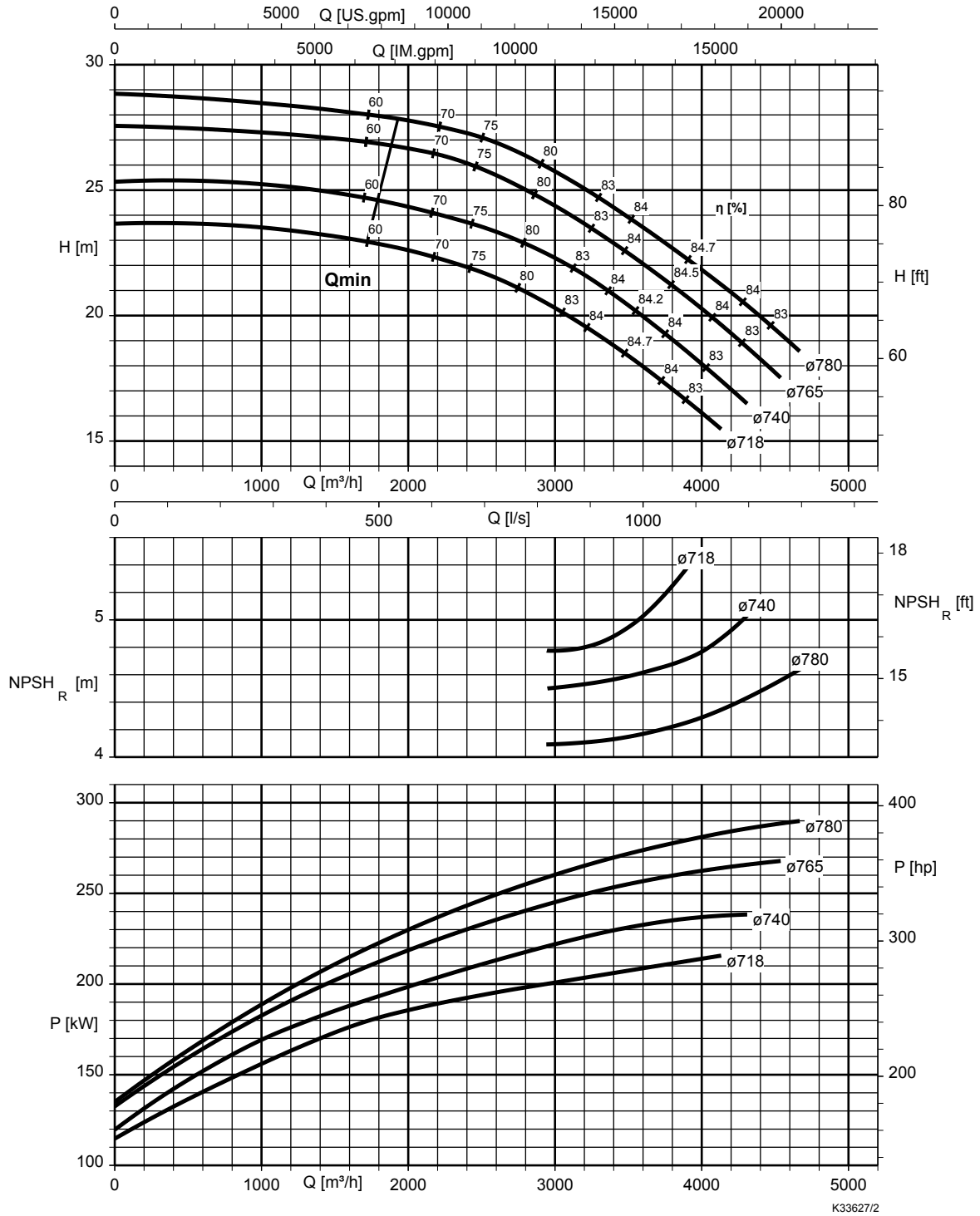


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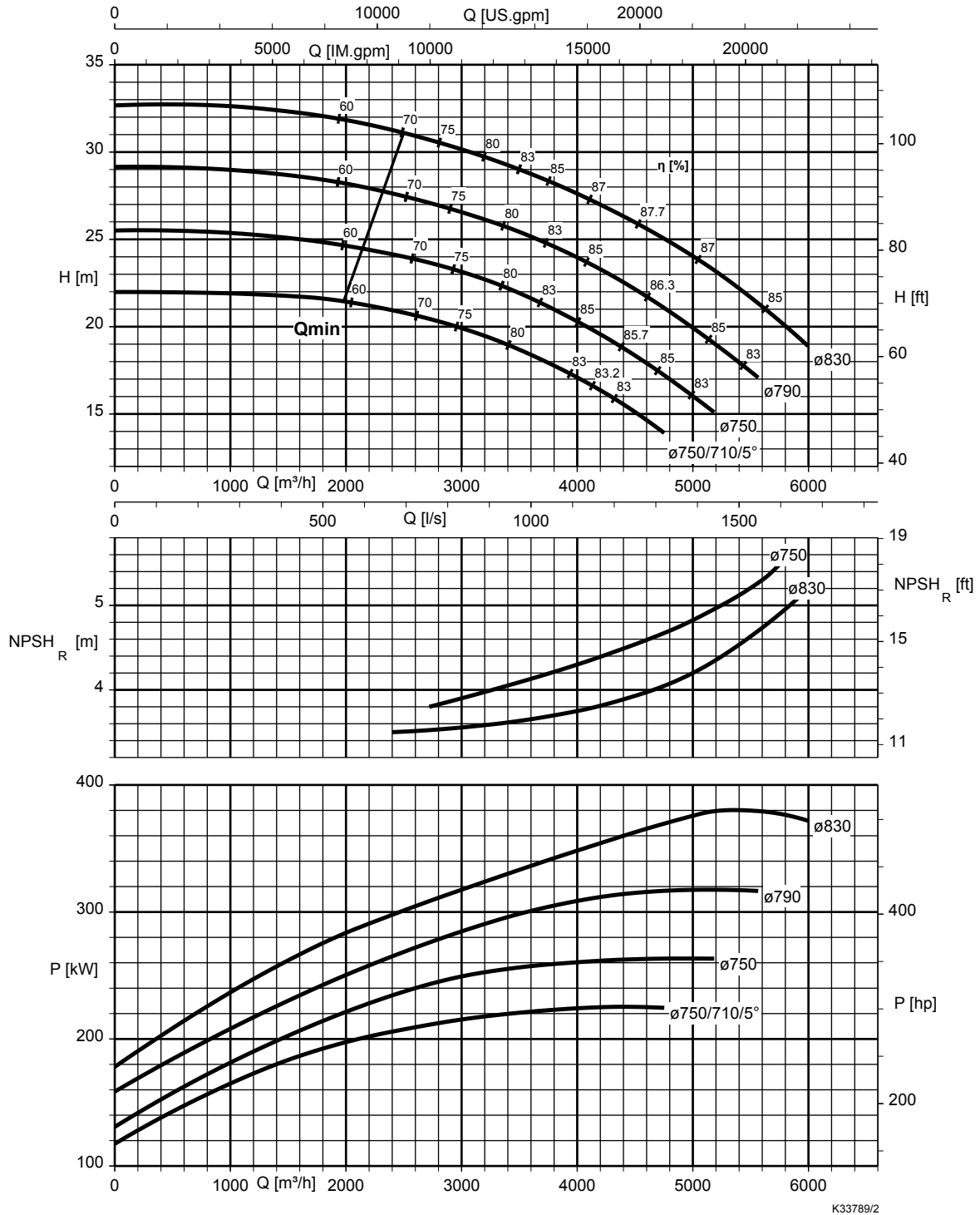
KWP K 600-600-753,  $n = 580 \text{ min}^{-1}$



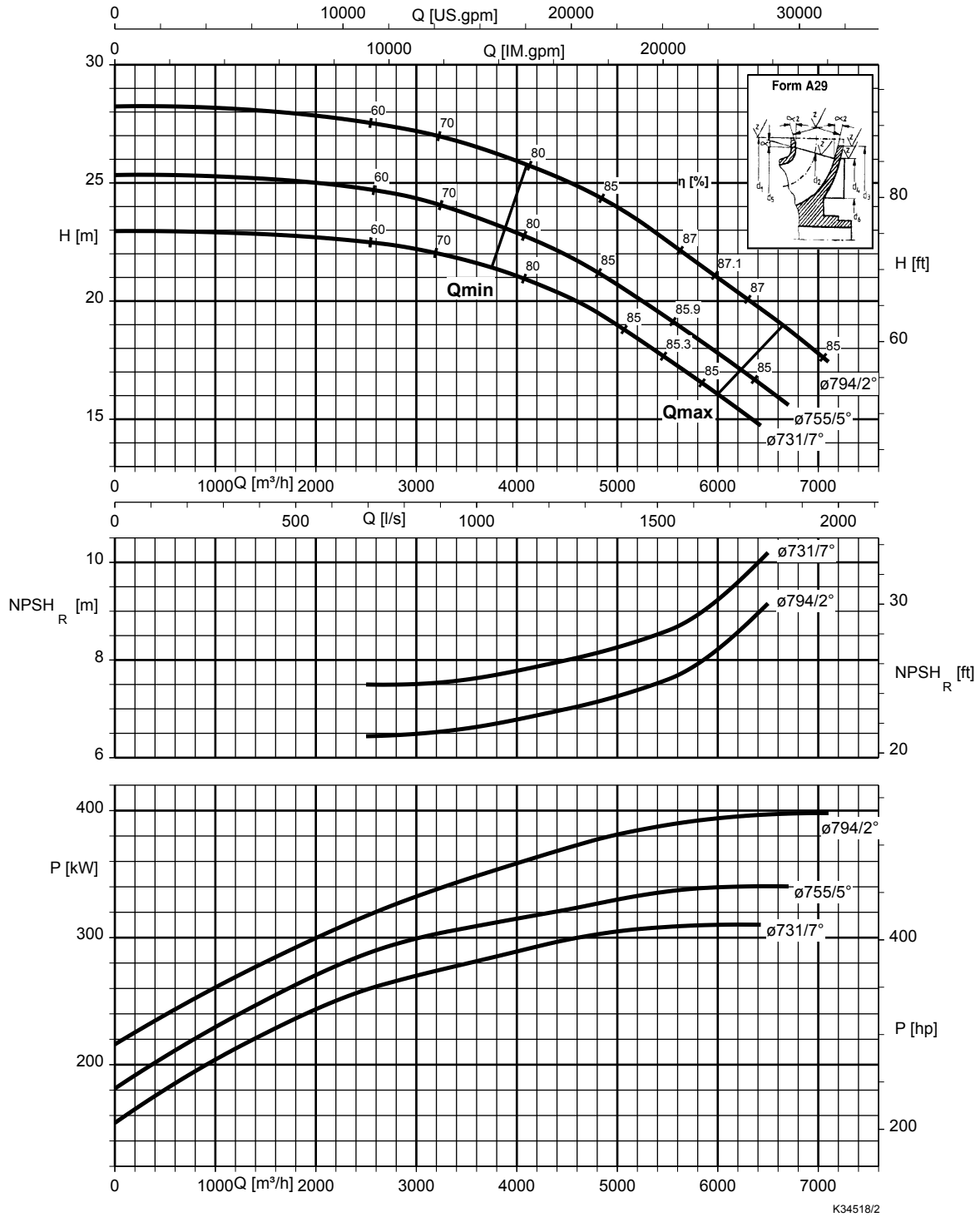
KWP K 600-600-803,  $n = 580 \text{ min}^{-1}$



KWP K 600-600-813,  $n = 580 \text{ min}^{-1}$

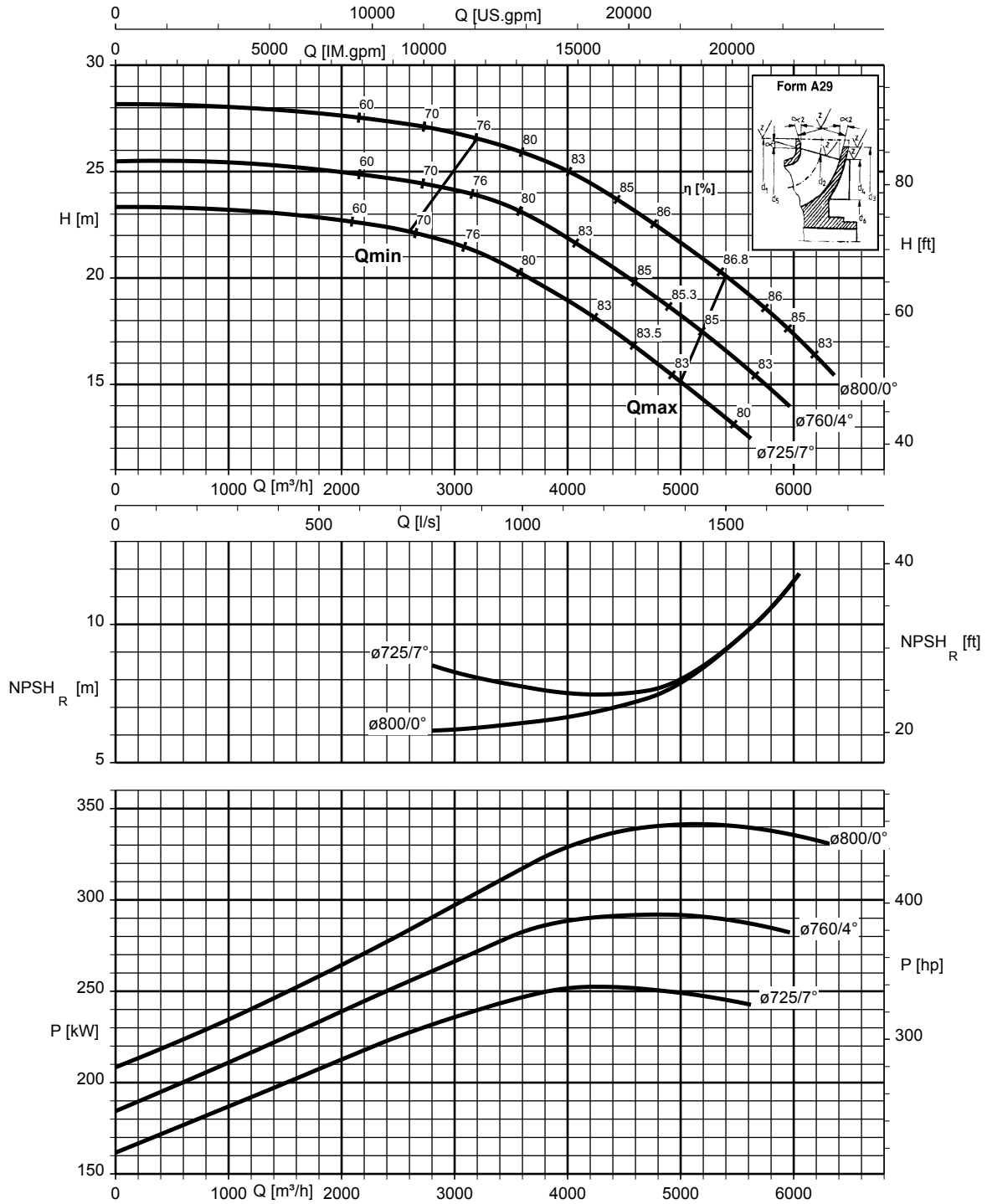


KWP K 600-600-824,  $n = 580 \text{ min}^{-1}$



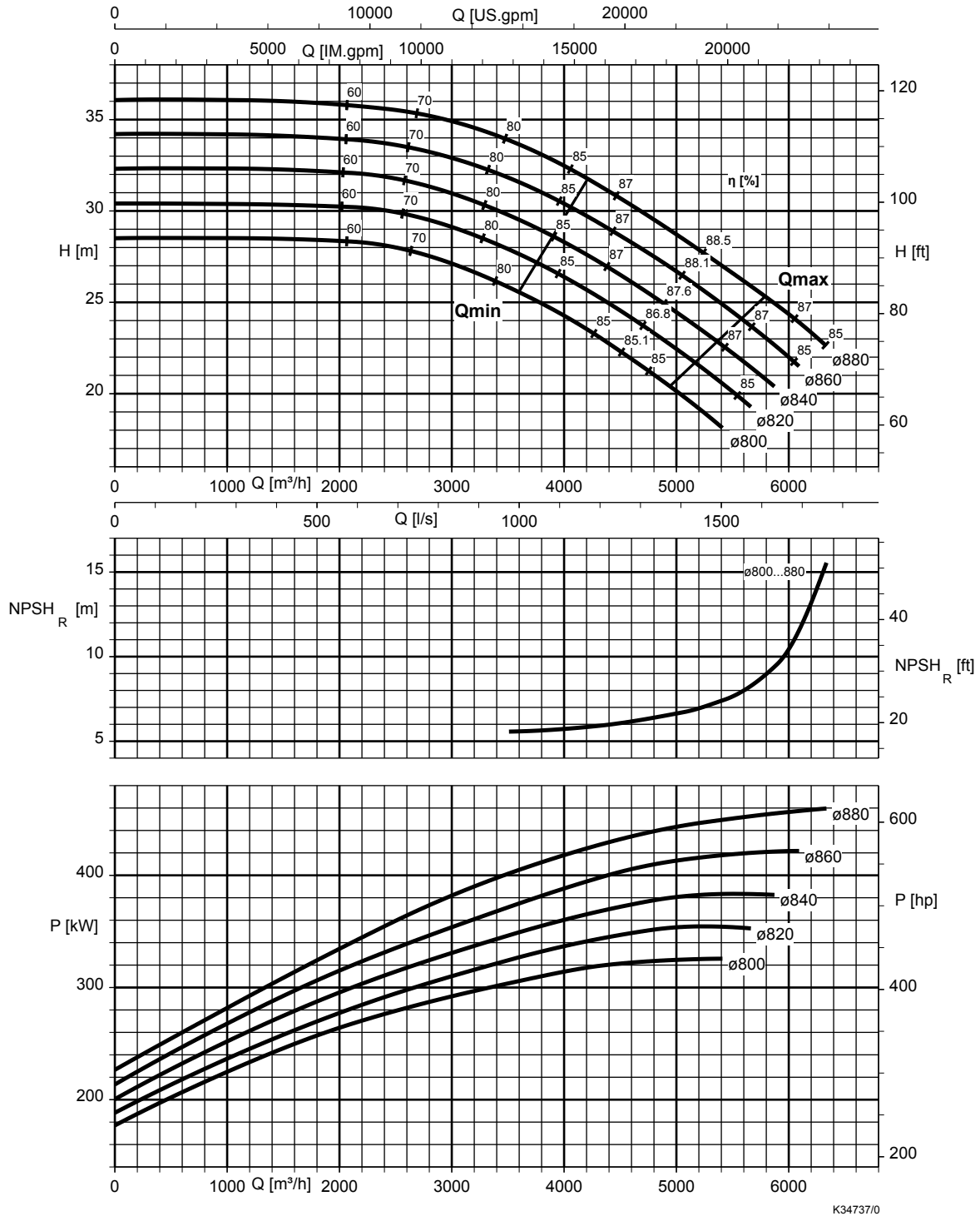


KWP K 600-600-825,  $n = 580 \text{ min}^{-1}$

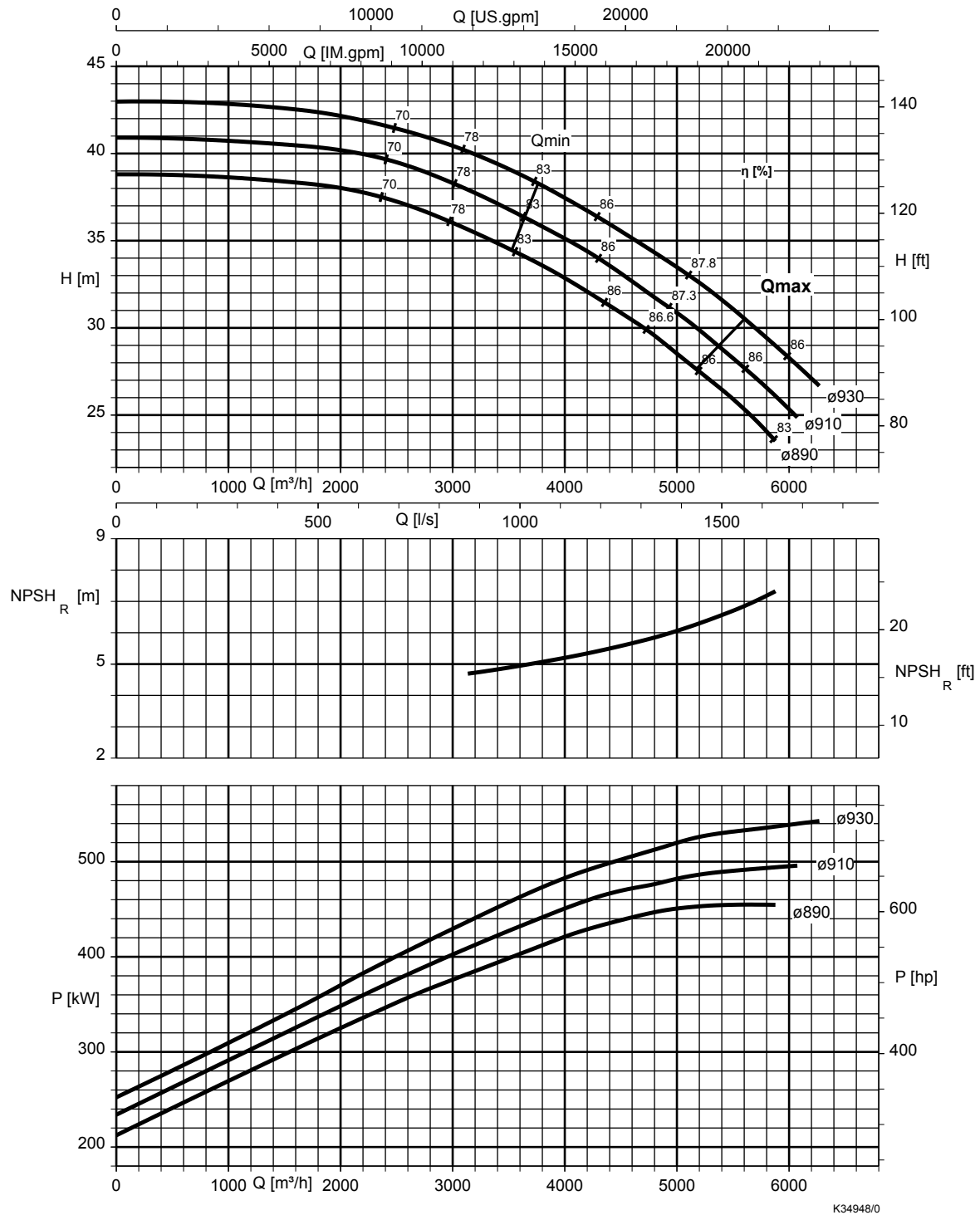


K34736/1

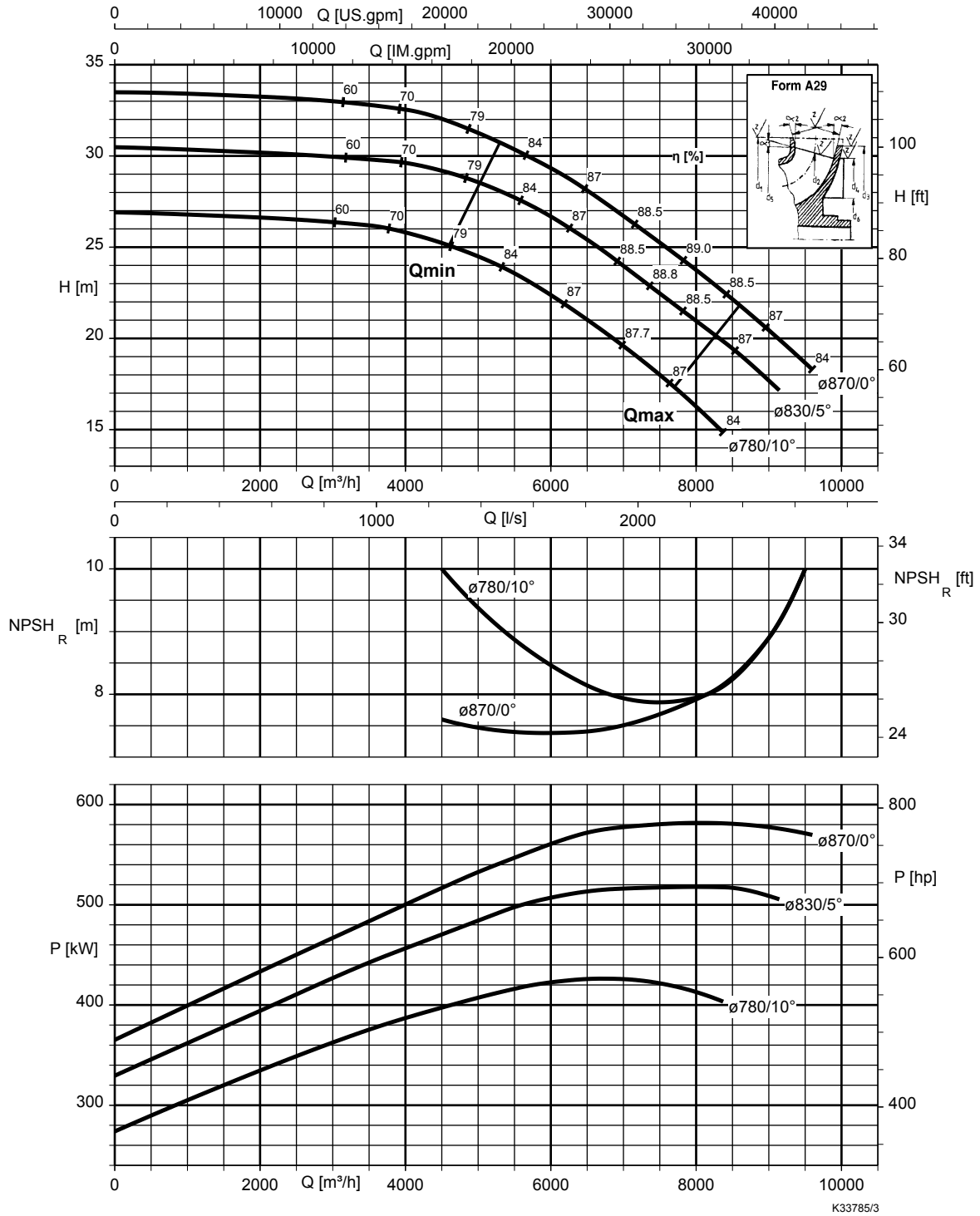
KWP K 600-600-873,  $n = 580 \text{ min}^{-1}$



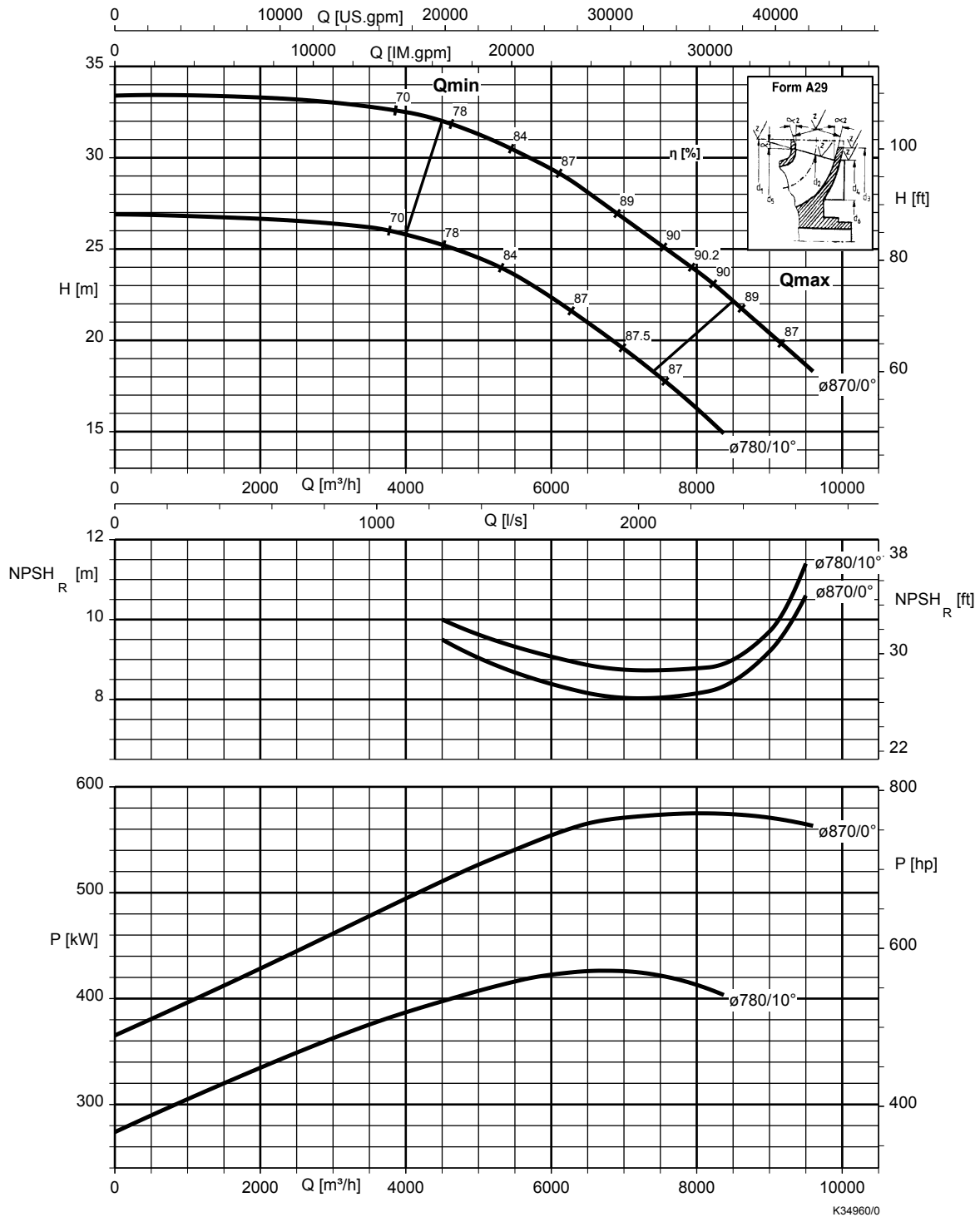
**KWP K 600-600-923,  $n = 580 \text{ min}^{-1}$**



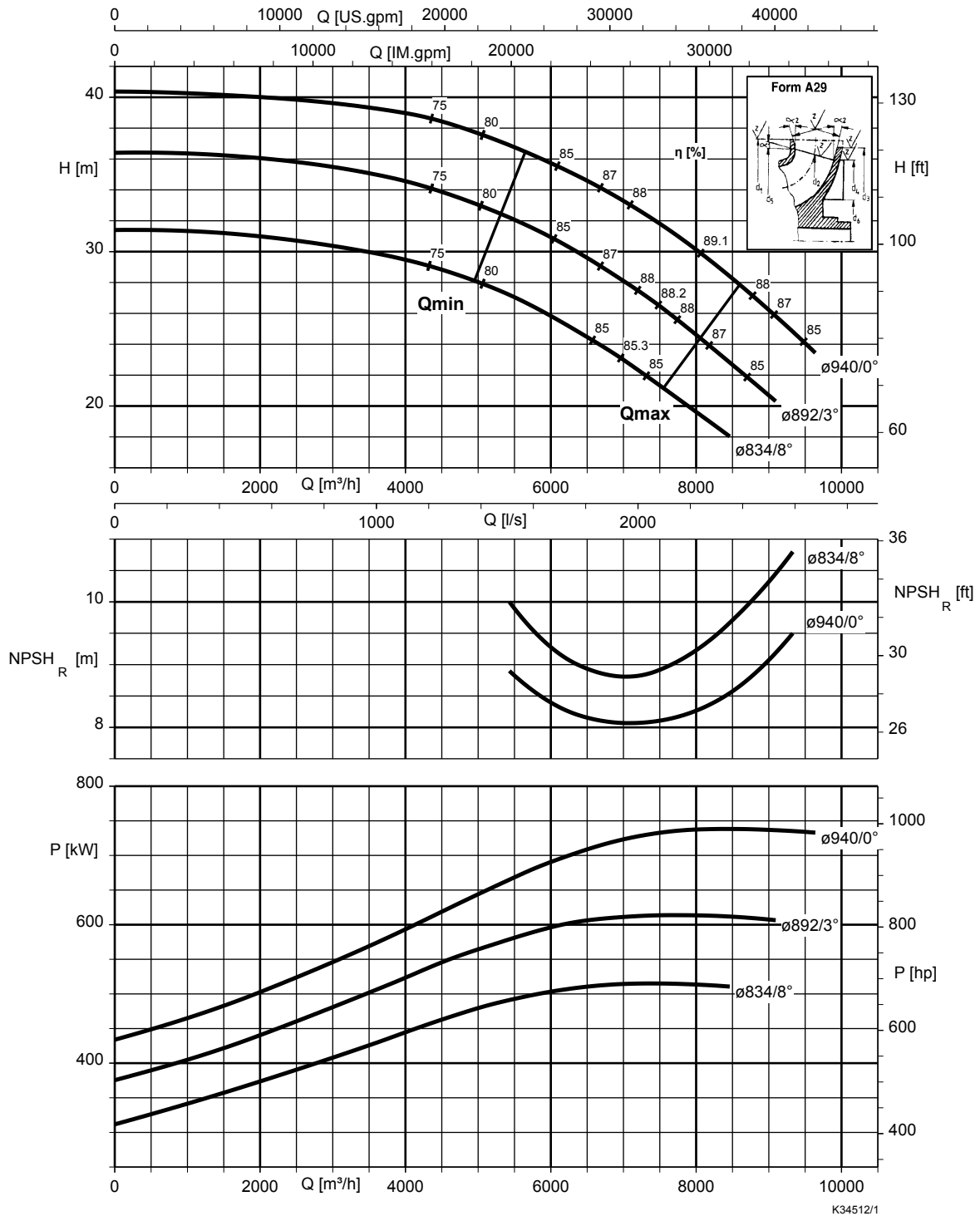
KWP K 700-700-923,  $n = 580 \text{ min}^{-1}$



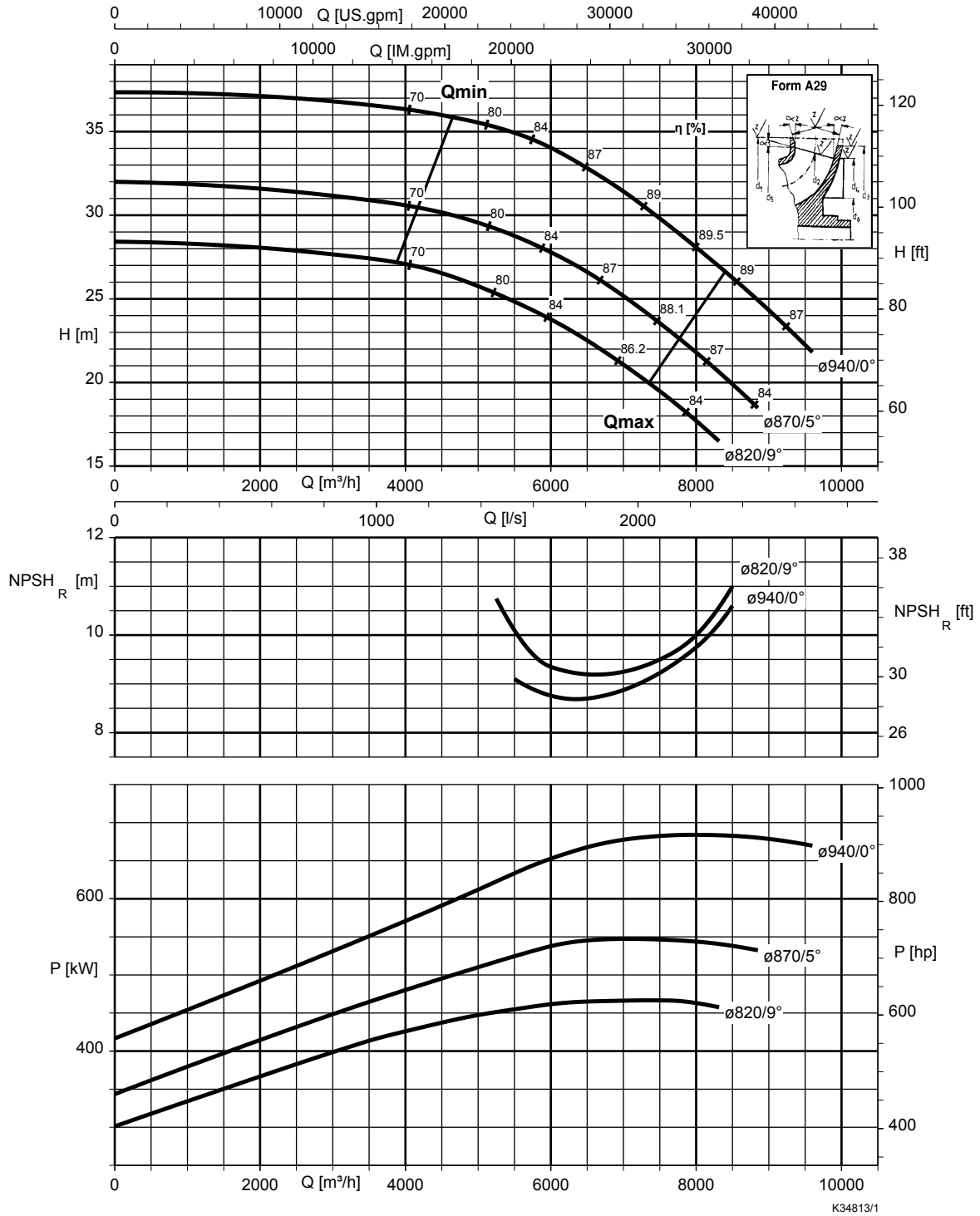
KWP K 700-700-929,  $n = 580 \text{ min}^{-1}$



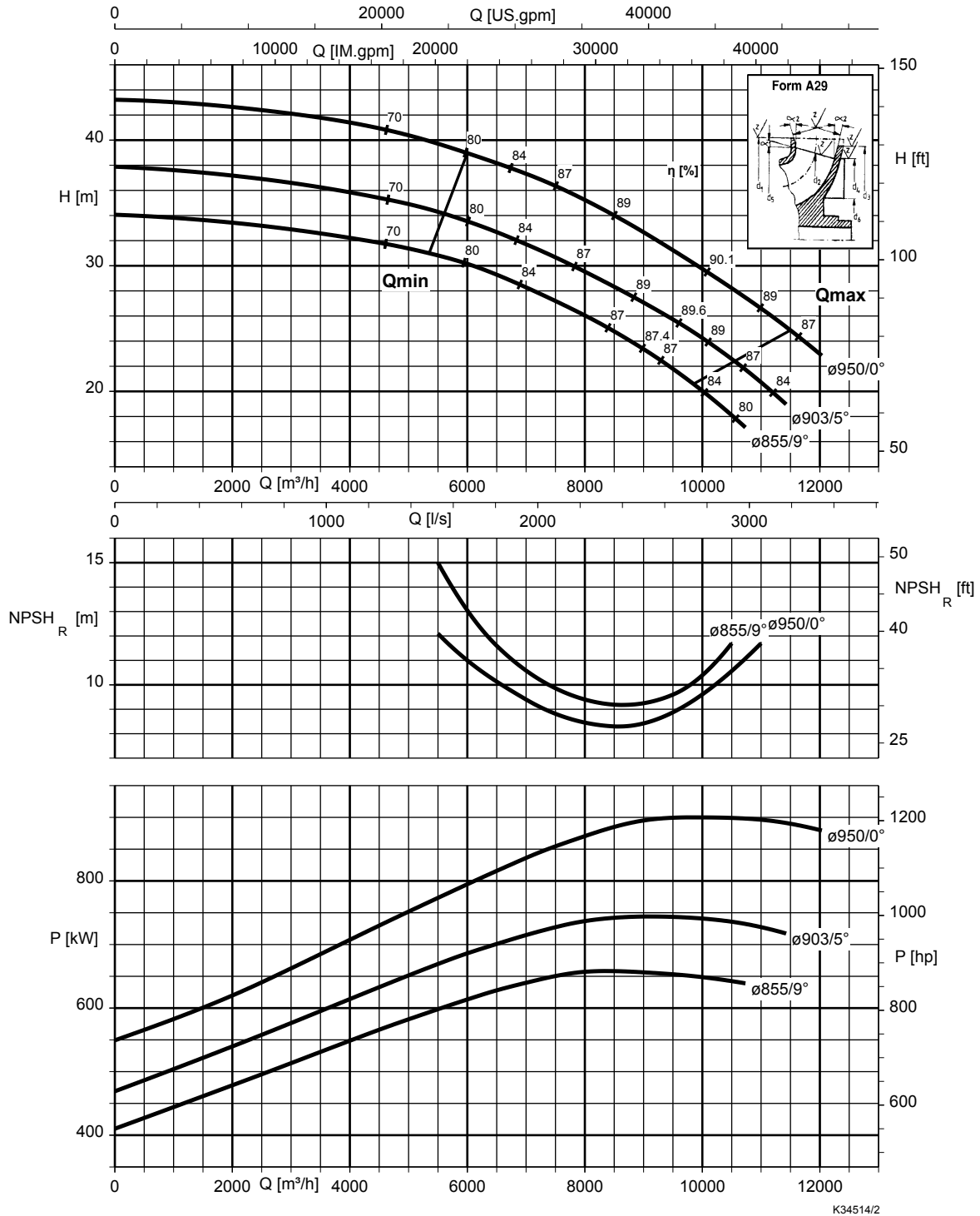
KWP K 800-700-953,  $n = 580 \text{ min}^{-1}$



KWP K 800-700-959,  $n = 580 \text{ min}^{-1}$

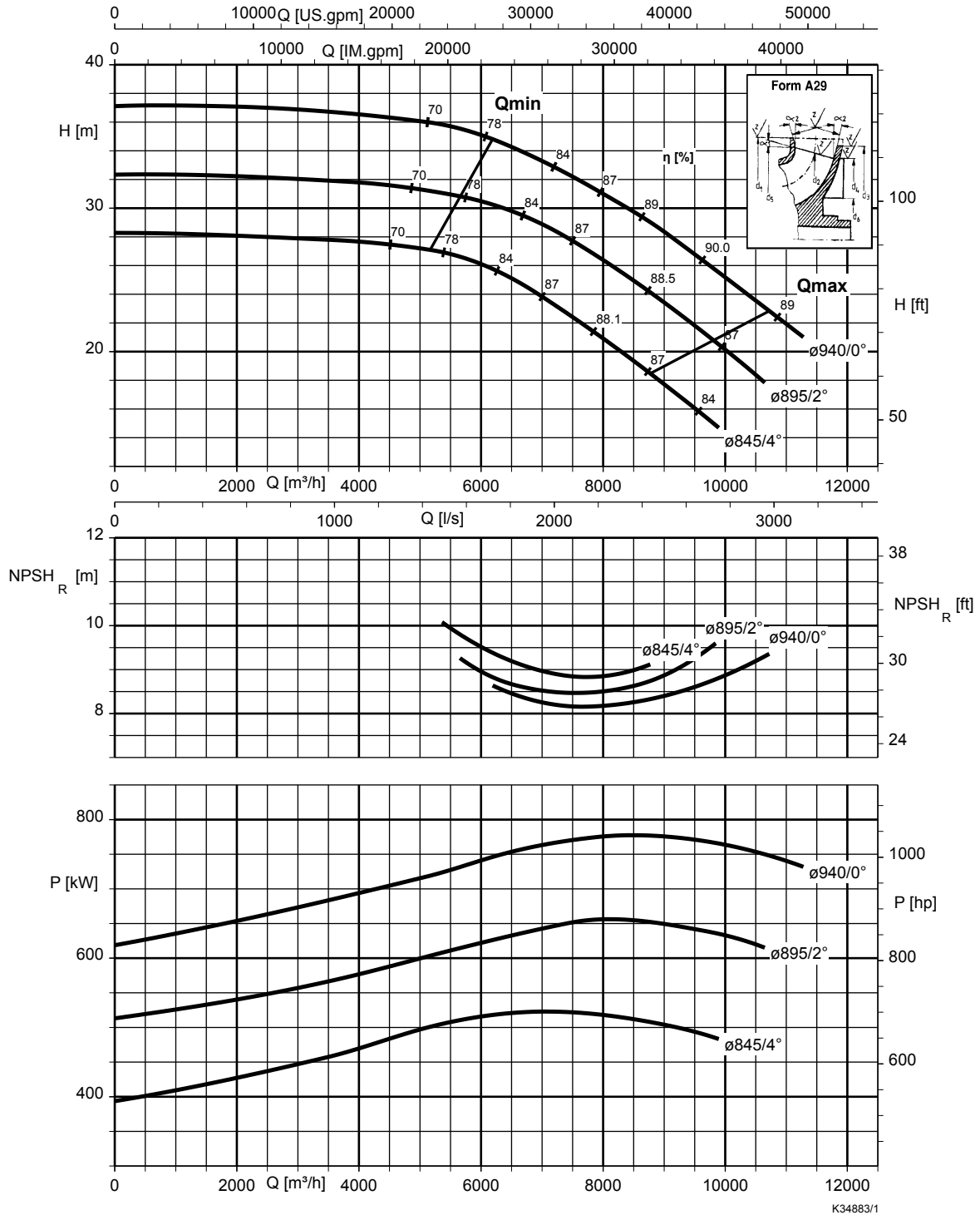


KWP K 800-800-934,  $n = 580 \text{ min}^{-1}$

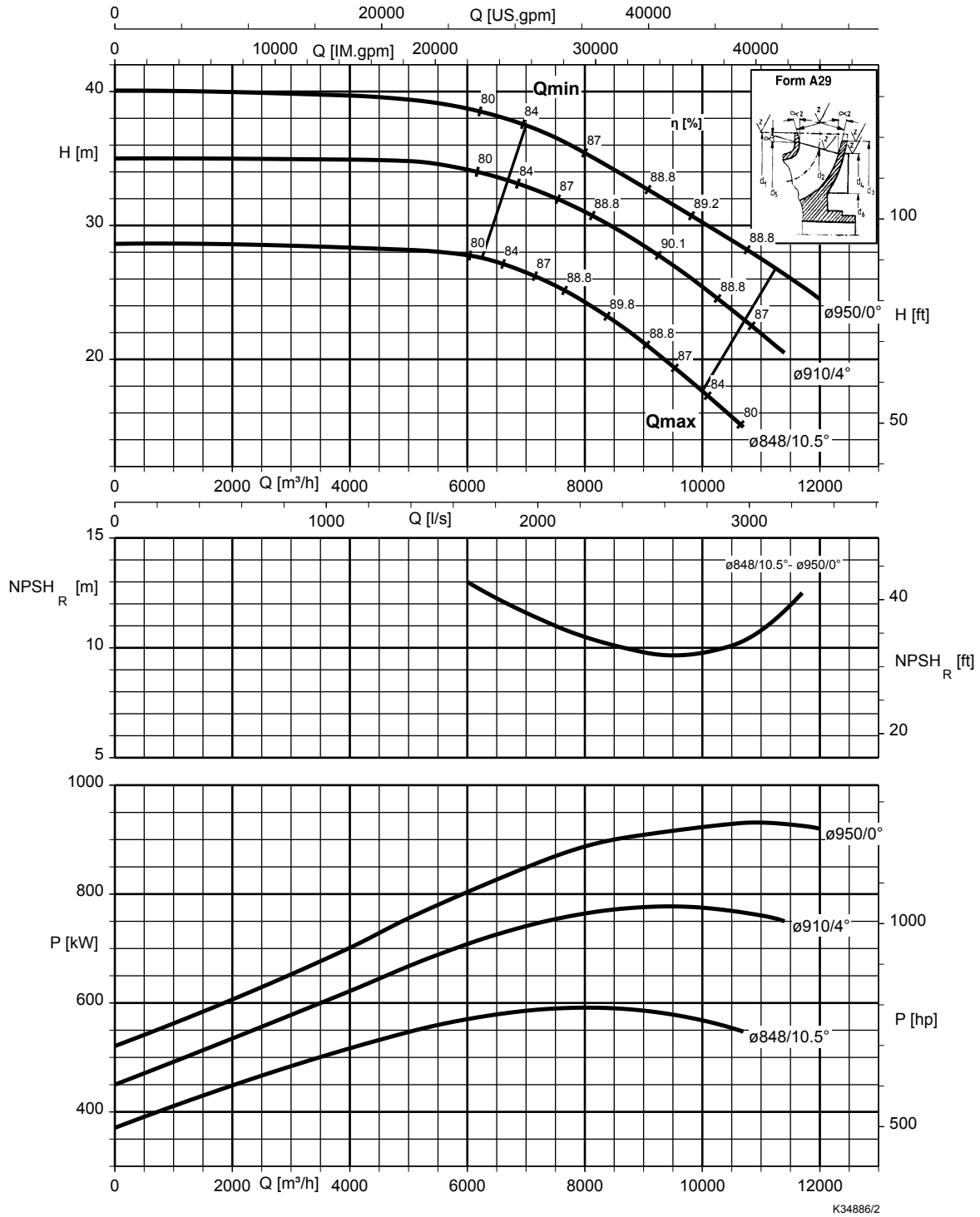




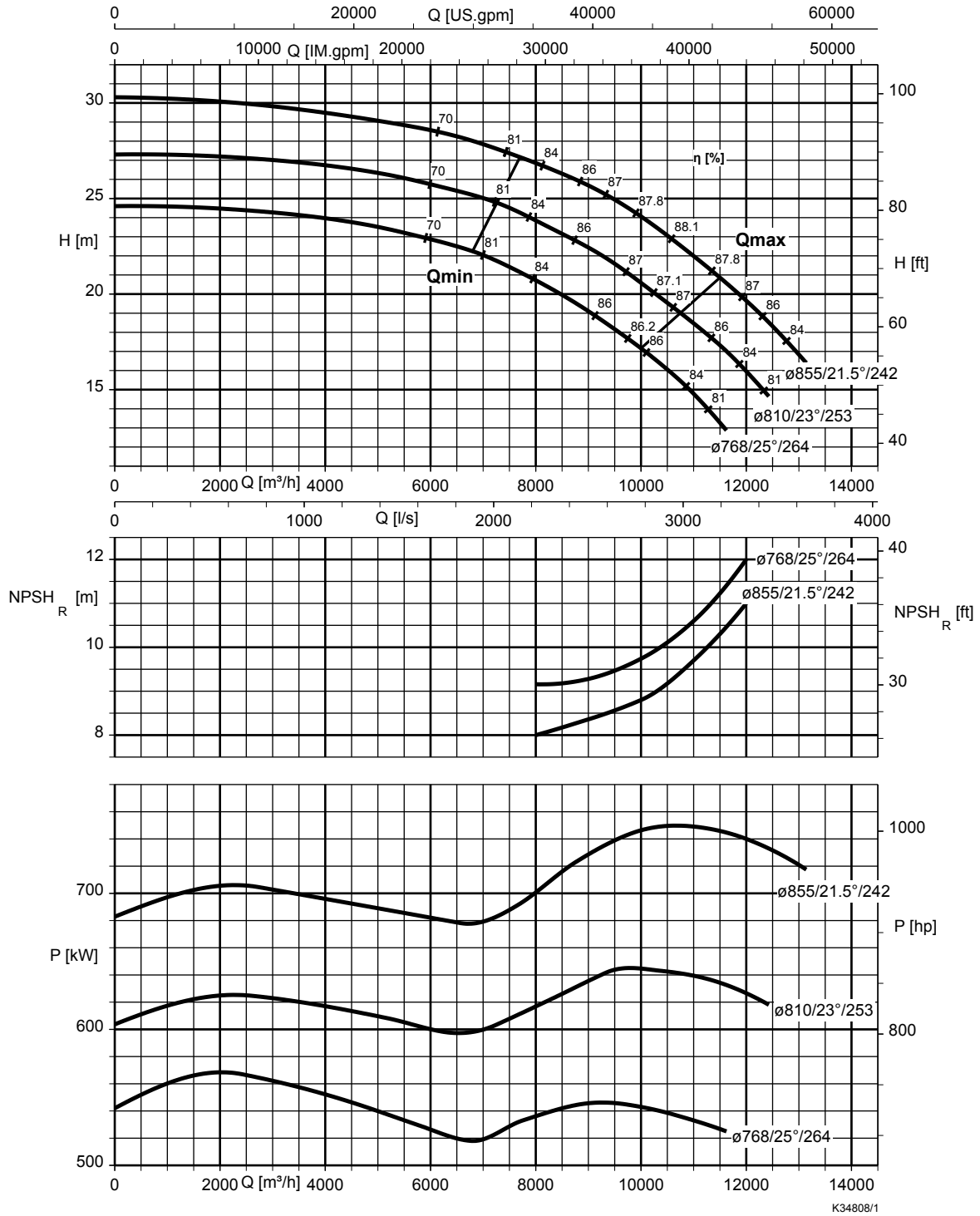
KWP K 800-800-935,  $n = 580 \text{ min}^{-1}$



KWP K 800-800-939,  $n = 580 \text{ min}^{-1}$

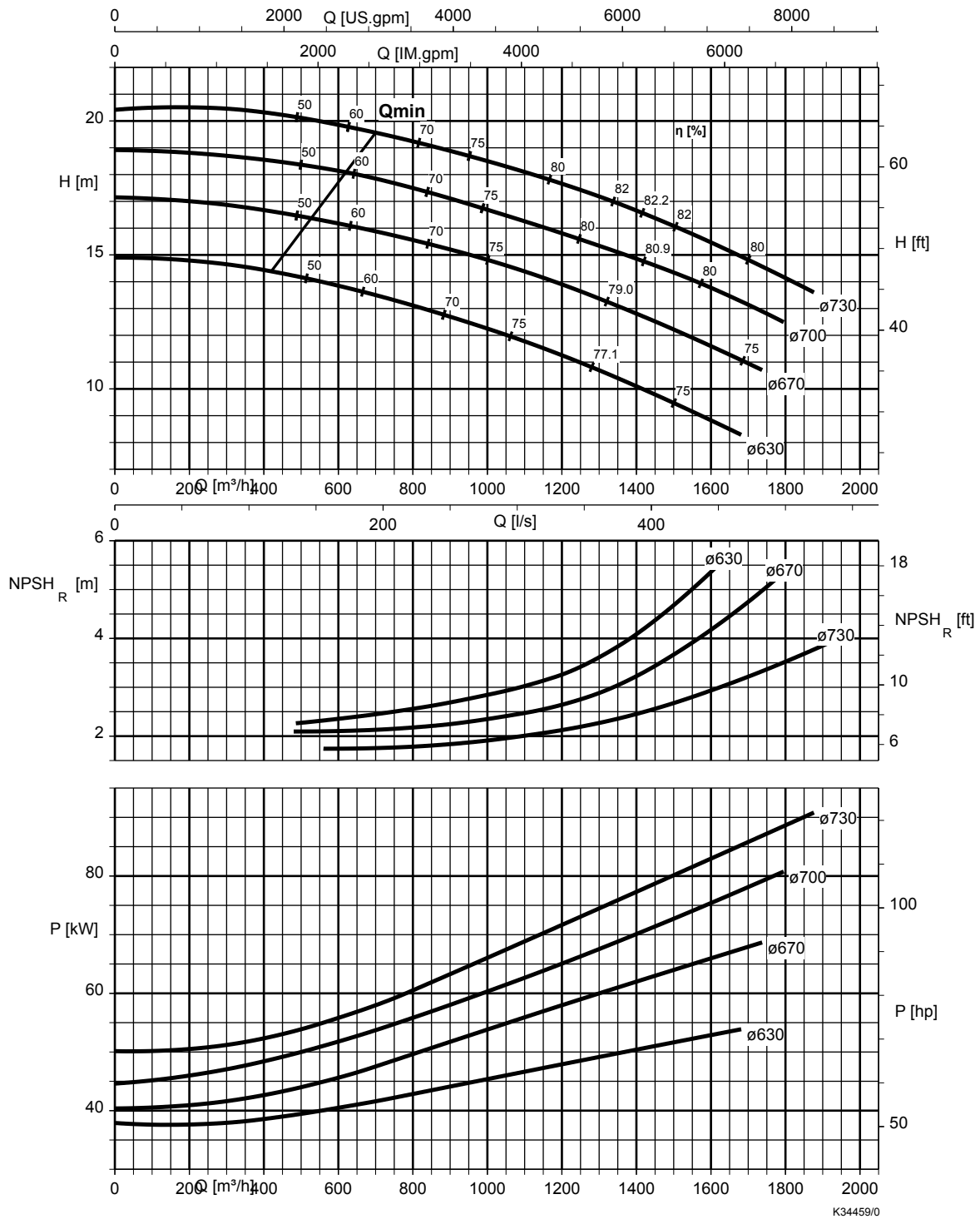


KWP K 800-900-883,  $n = 580 \text{ min}^{-1}$

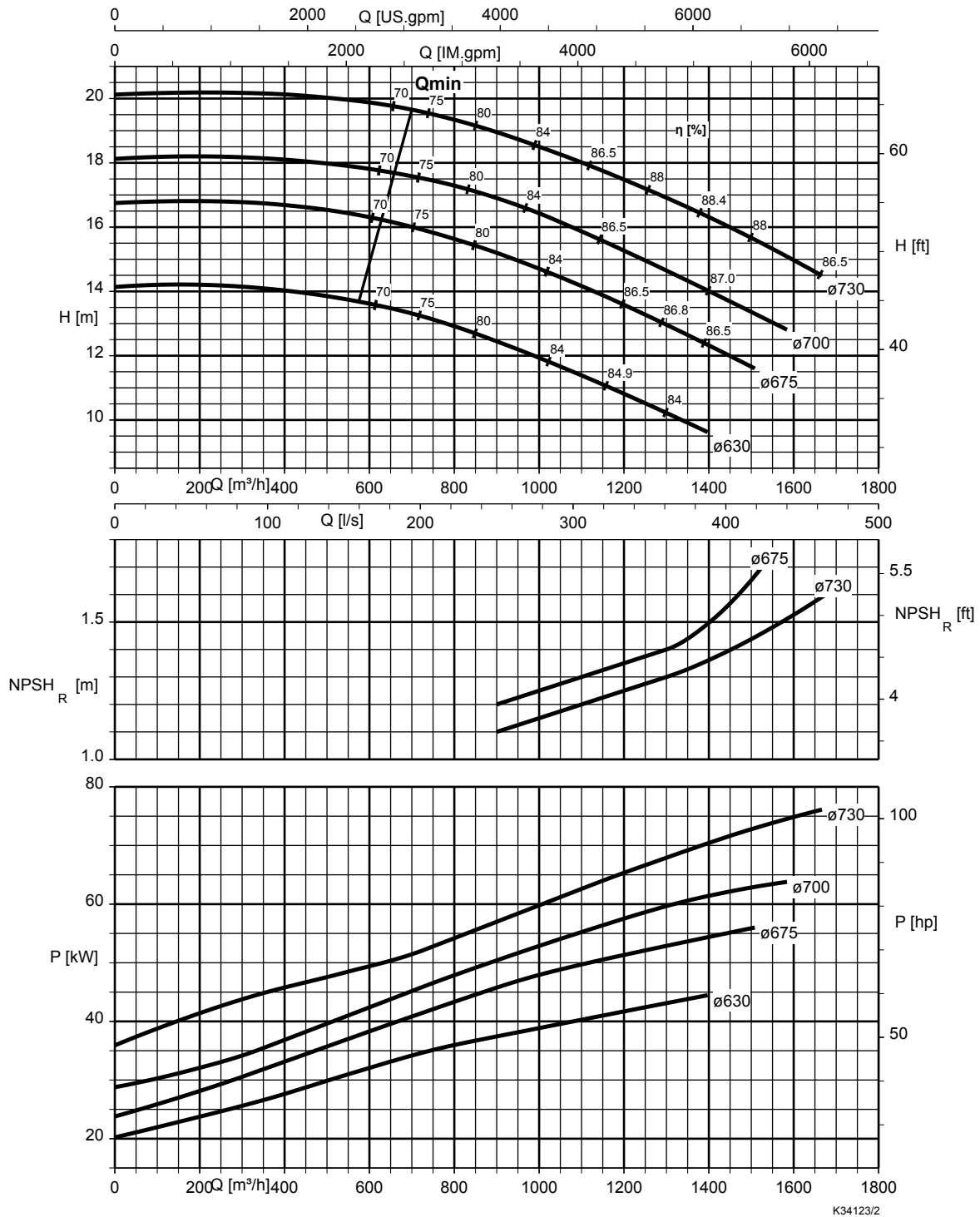


$n = 480 \text{ min}^{-1}$

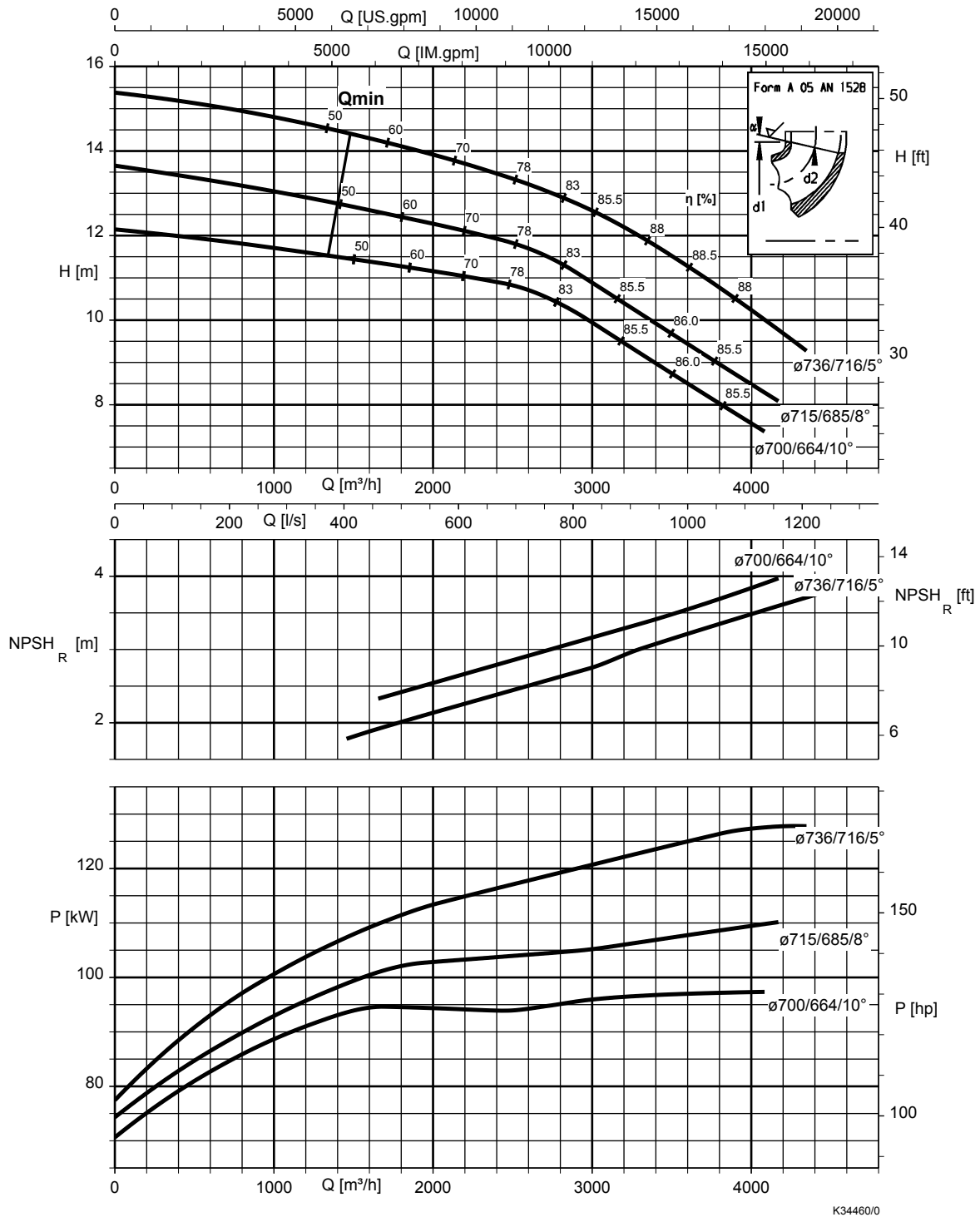
KWP K 500-400-710,  $n = 480 \text{ min}^{-1}$



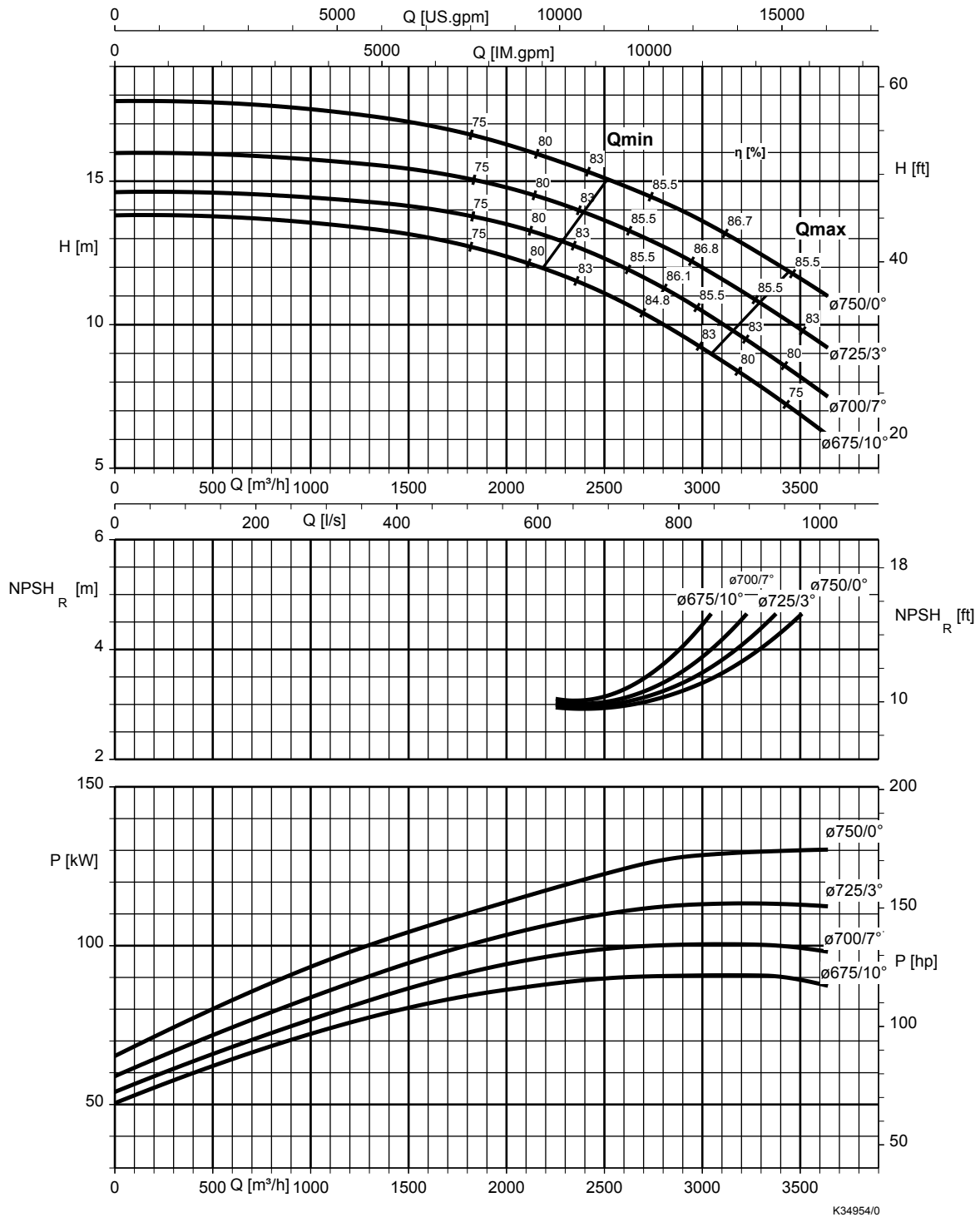
KWP K 500-400-713,  $n = 480 \text{ min}^{-1}$



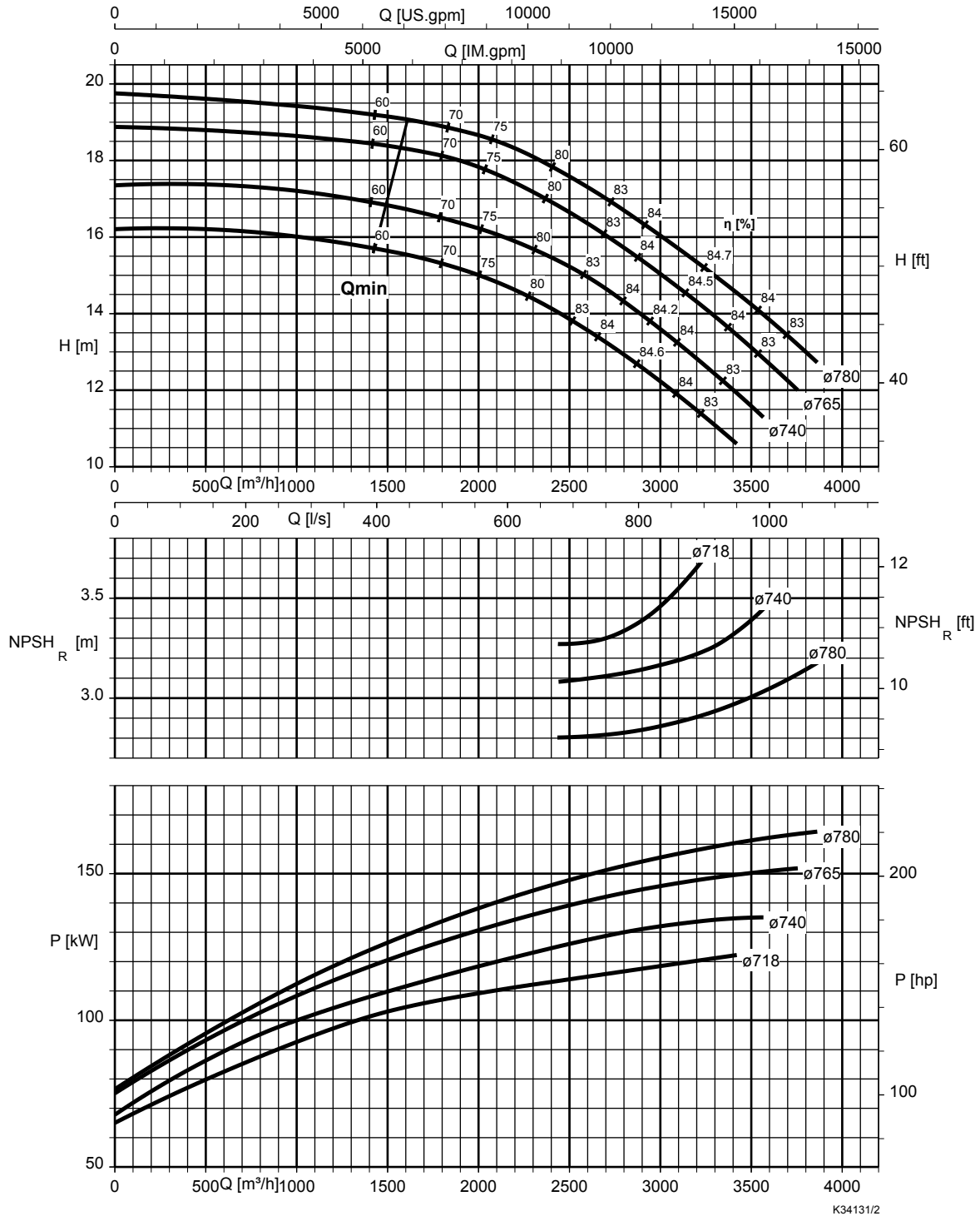
KWP K 600-600-710,  $n = 480 \text{ min}^{-1}$



KWP K 600-600-753,  $n = 480 \text{ min}^{-1}$



KWP K 600-600-803,  $n = 480 \text{ min}^{-1}$

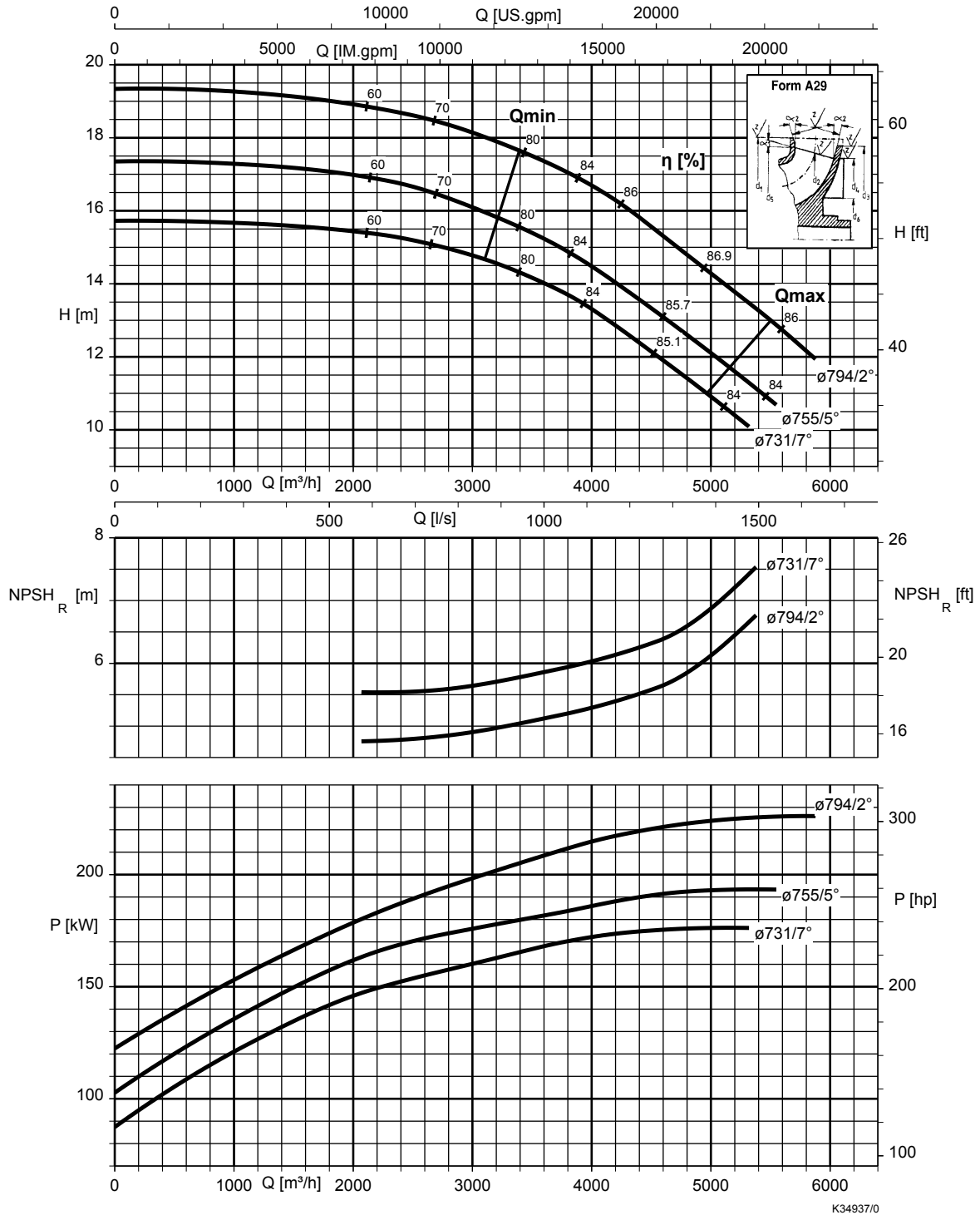




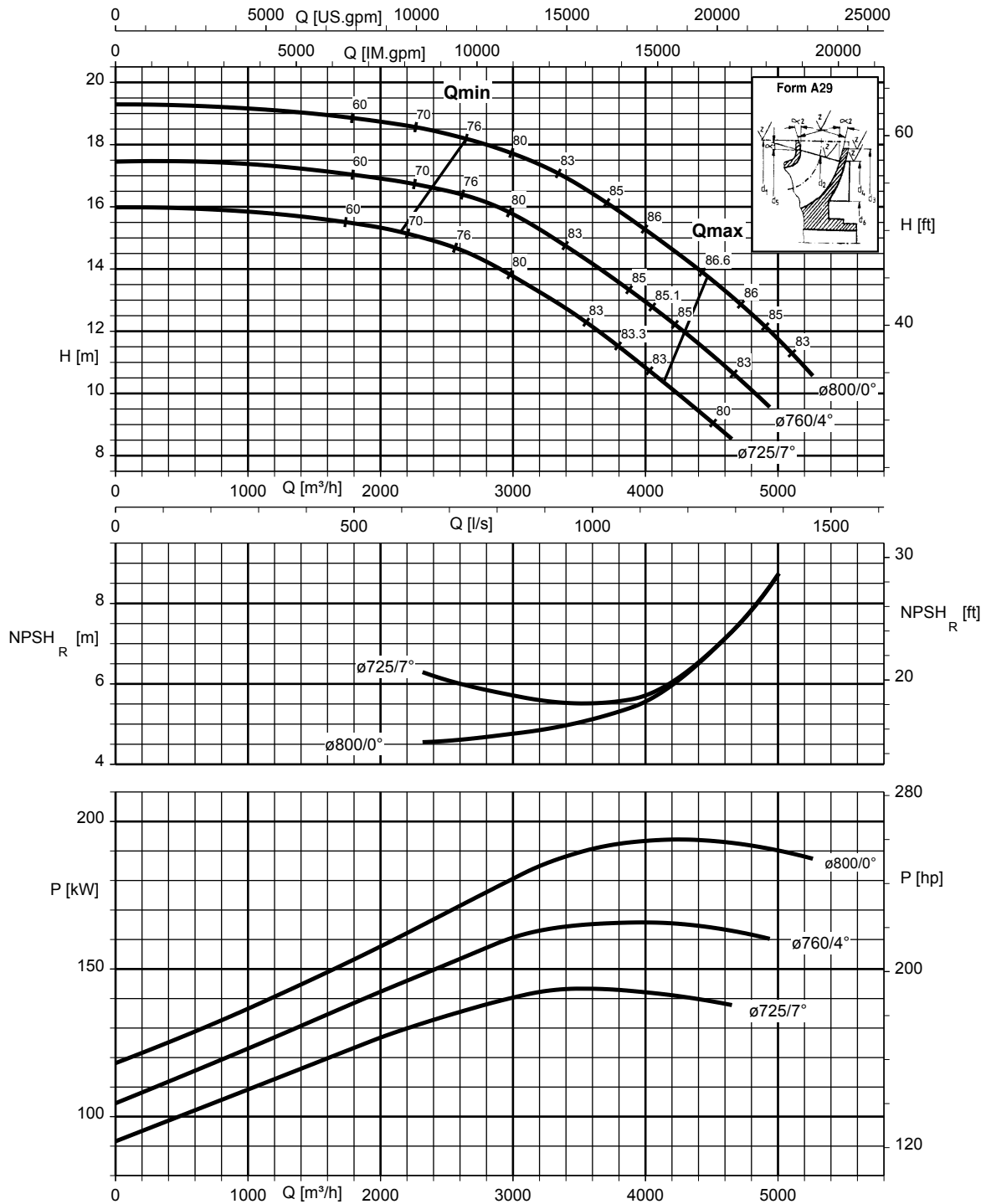
The figure consists of three vertically stacked graphs sharing a common x-axis representing flow rate (Q) in m³/h, ranging from 0 to 5000.

- Top Graph: Total Head (H) vs. Flow Rate (Q)**
  - Left y-axis: H [m] (10 to 20)
  - Right y-axis: H [ft] (40 to 60)
  - Top x-axis: Q [US.gpm] (0 to 20000)
  - Bottom x-axis: Q [l/s] (0 to 1500)
  - Curves: Total head for diameters  $\phi 830$ ,  $\phi 790$ ,  $\phi 750$ , and  $\phi 750/710/5^\circ$ .
  - Efficiency points ( $\eta$  [%]) are marked on the curves, ranging from 60 to 87.8.
  - A minimum flow rate (Qmin) is indicated for the  $\phi 750$  curve at approximately 1500 m³/h.
- Middle Graph: Required NPSH vs. Flow Rate (Q)**
  - Left y-axis:  $H_R$  [m] (3 to 4)
  - Right y-axis: NPSH<sub>R</sub> [ft] (8 to 13)
  - Curves: Required NPSH for diameters  $\phi 750$  and  $\phi 830$ .
- Bottom Graph: Power vs. Flow Rate (Q)**
  - Left y-axis: P [kW] (50 to 200)
  - Right y-axis: P [hp] (100 to 300)
  - Curves: Power consumption for diameters  $\phi 830$ ,  $\phi 790$ ,  $\phi 750$ , and  $\phi 750/710/5^\circ$ .

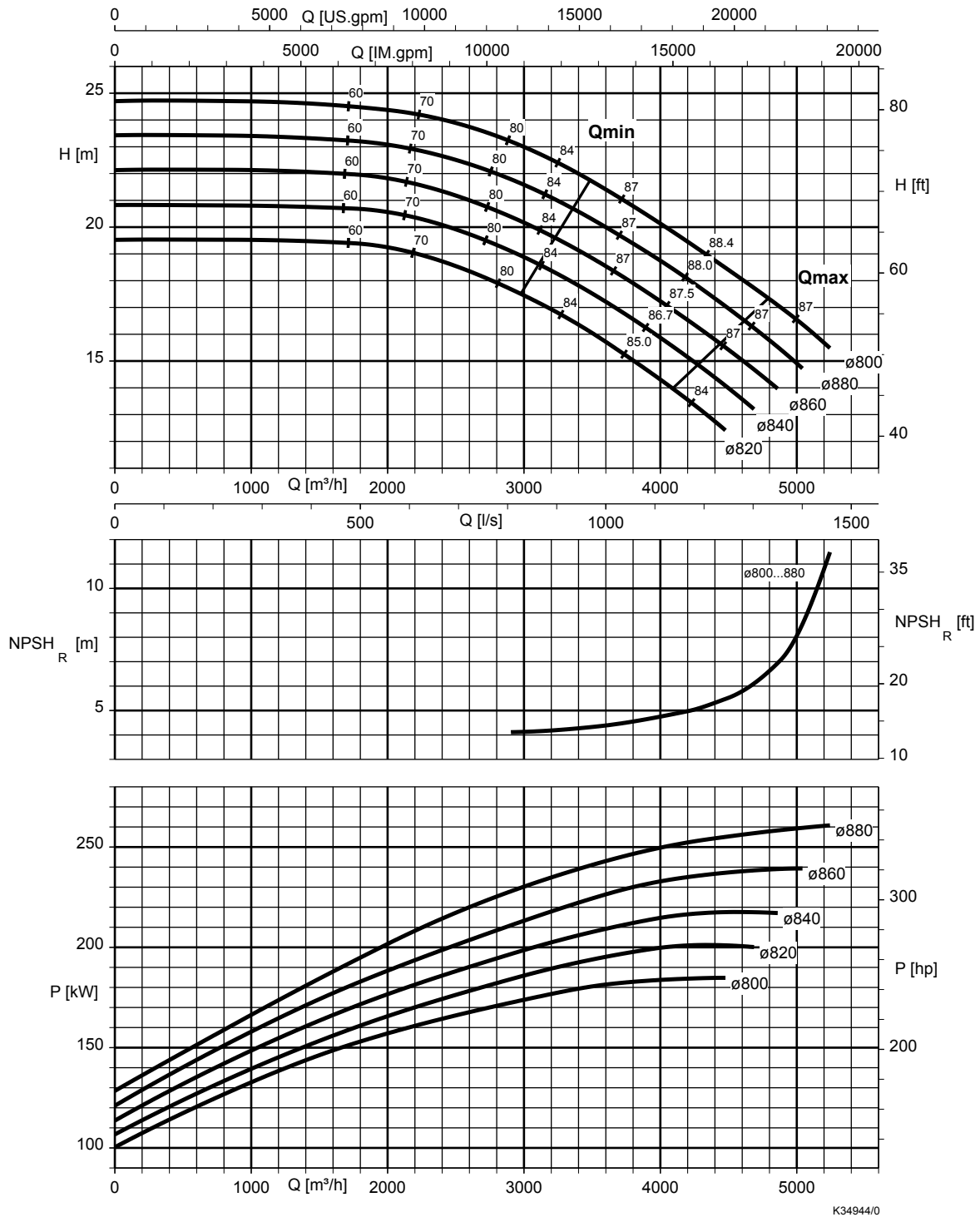
KWP K 600-600-824,  $n = 480 \text{ min}^{-1}$



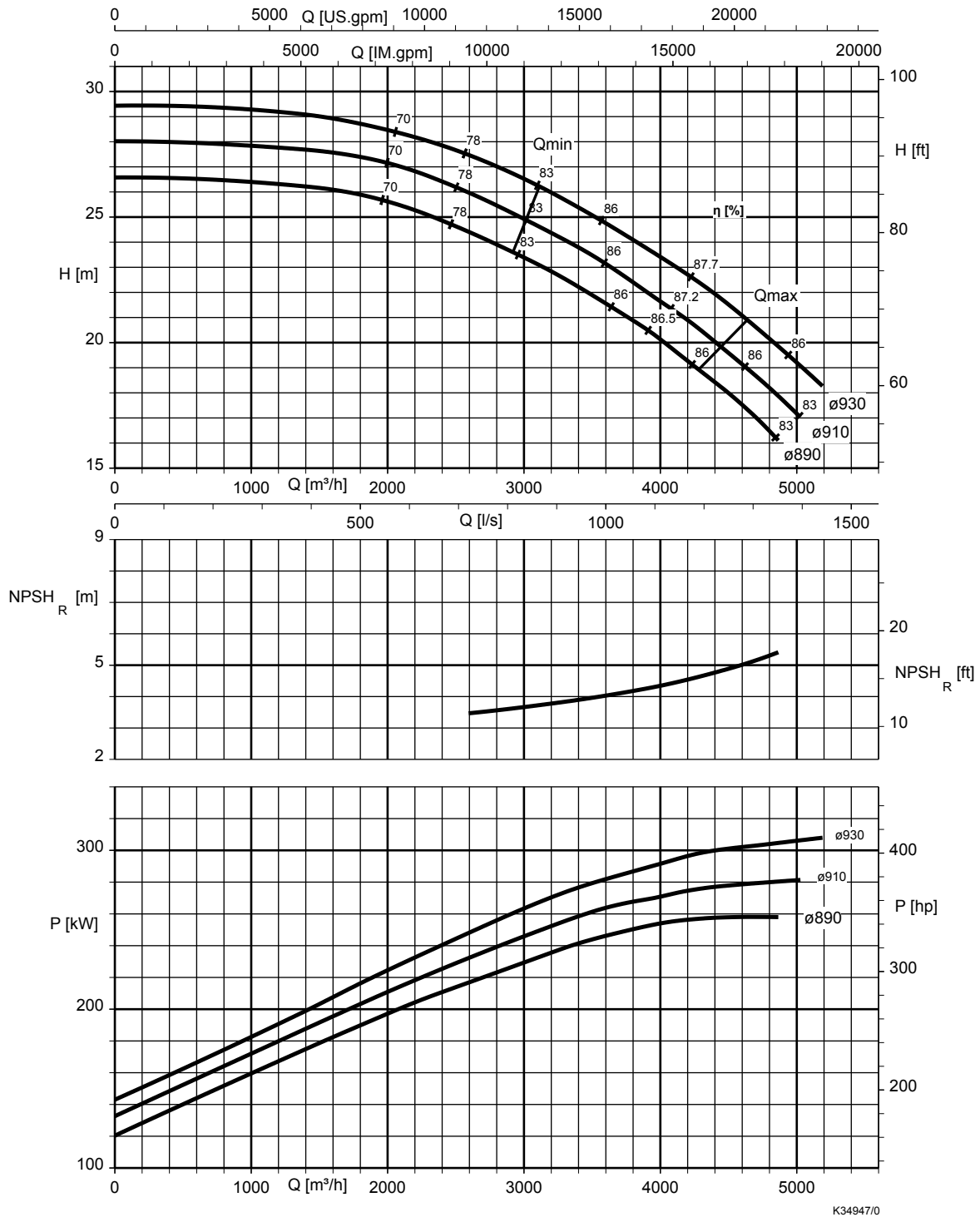
KWP K 600-600-825,  $n = 480 \text{ min}^{-1}$



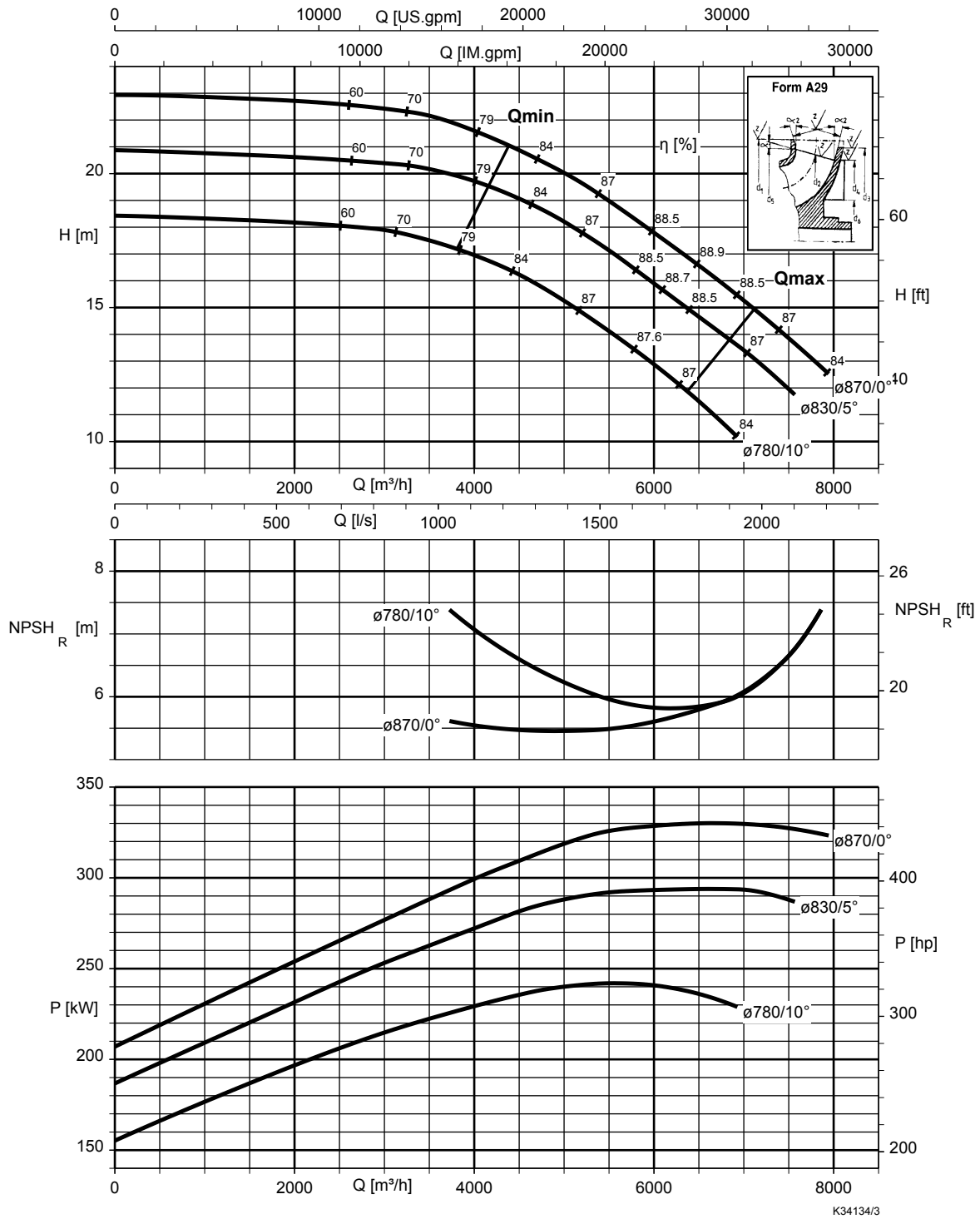
KWP K 600-600-873,  $n = 480 \text{ min}^{-1}$



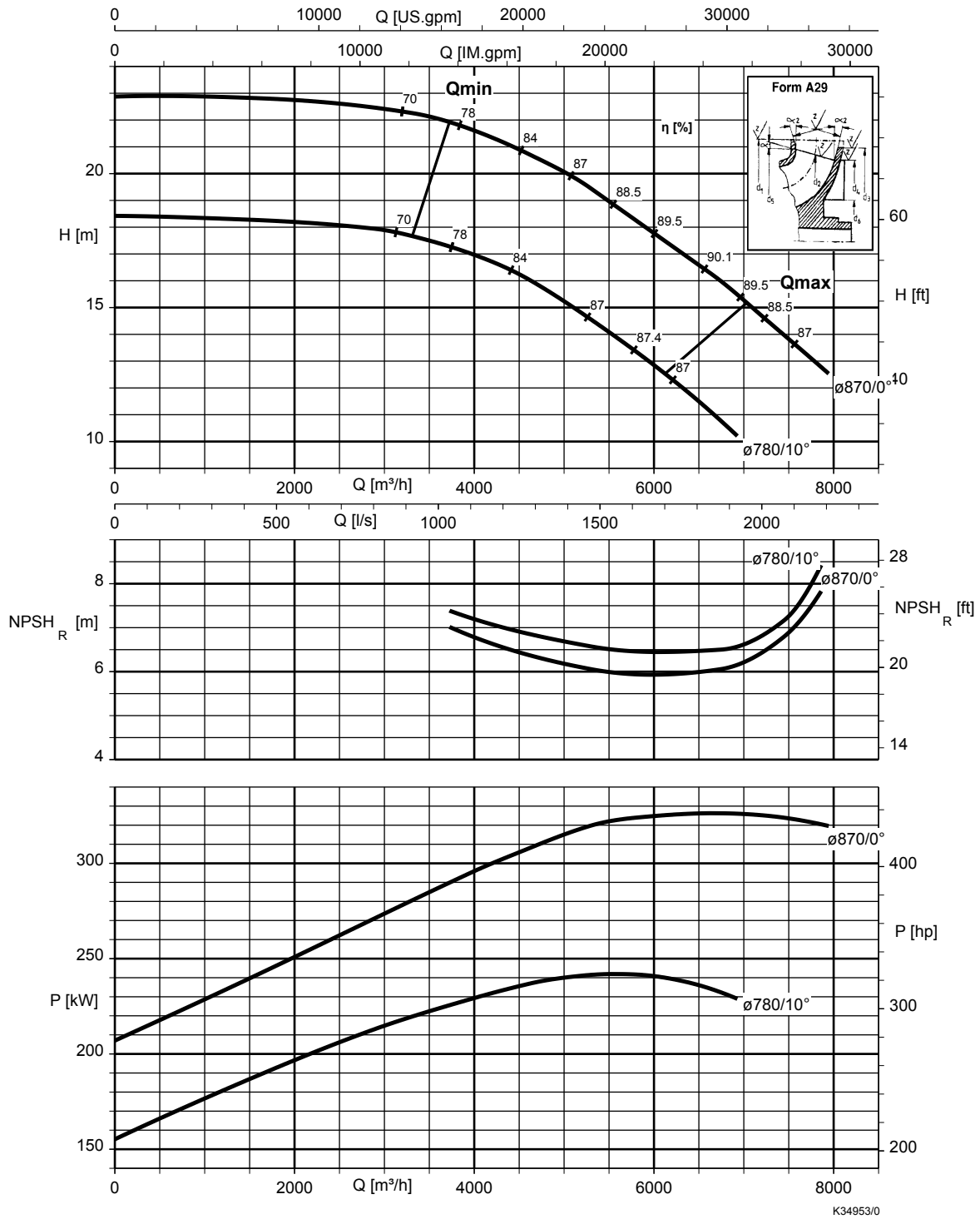
KWP K 600-600-923,  $n = 480 \text{ min}^{-1}$



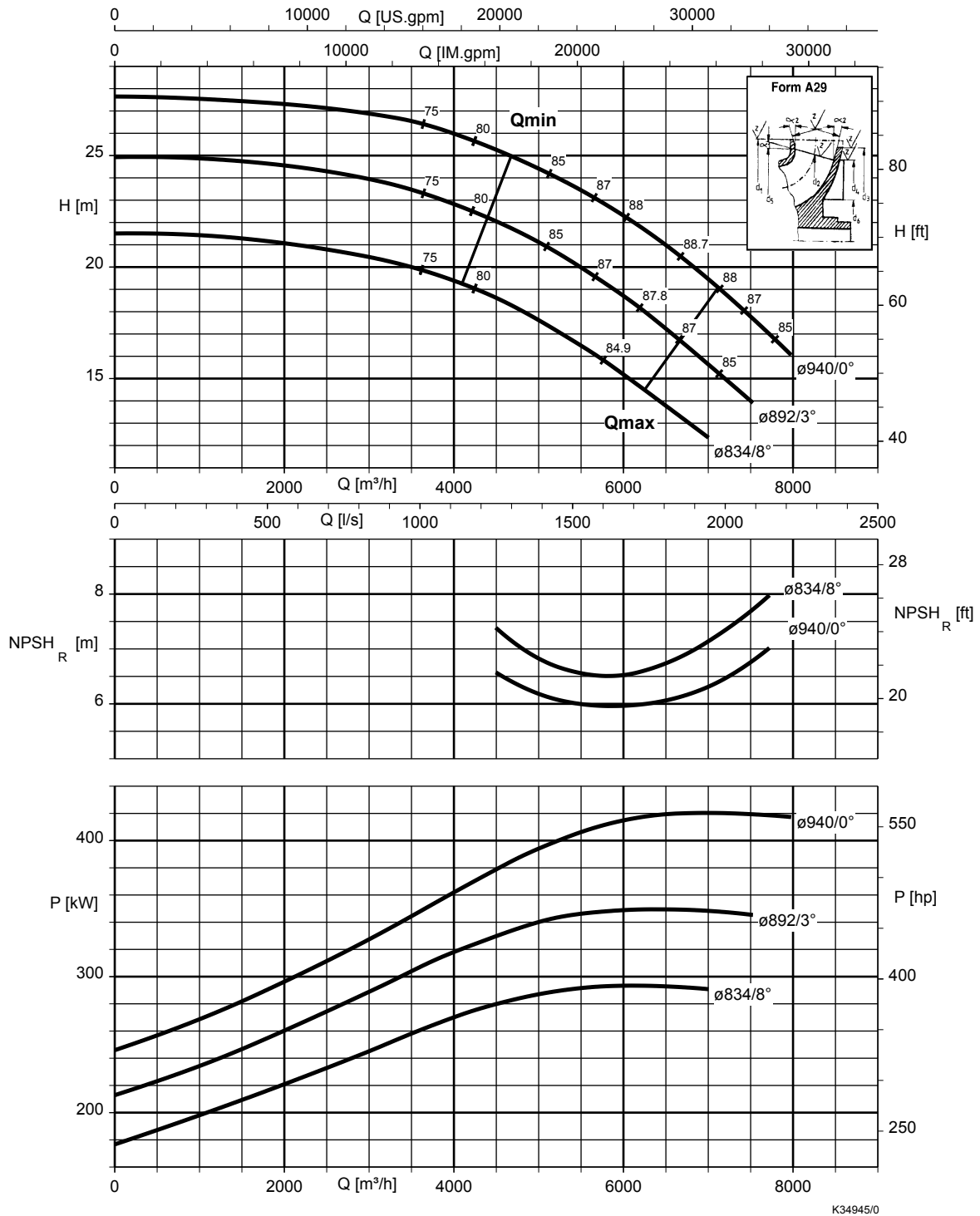
KWP K 700-700-923 ,  $n = 480 \text{ min}^{-1}$



KWP K 700-700-929,  $n = 480 \text{ min}^{-1}$

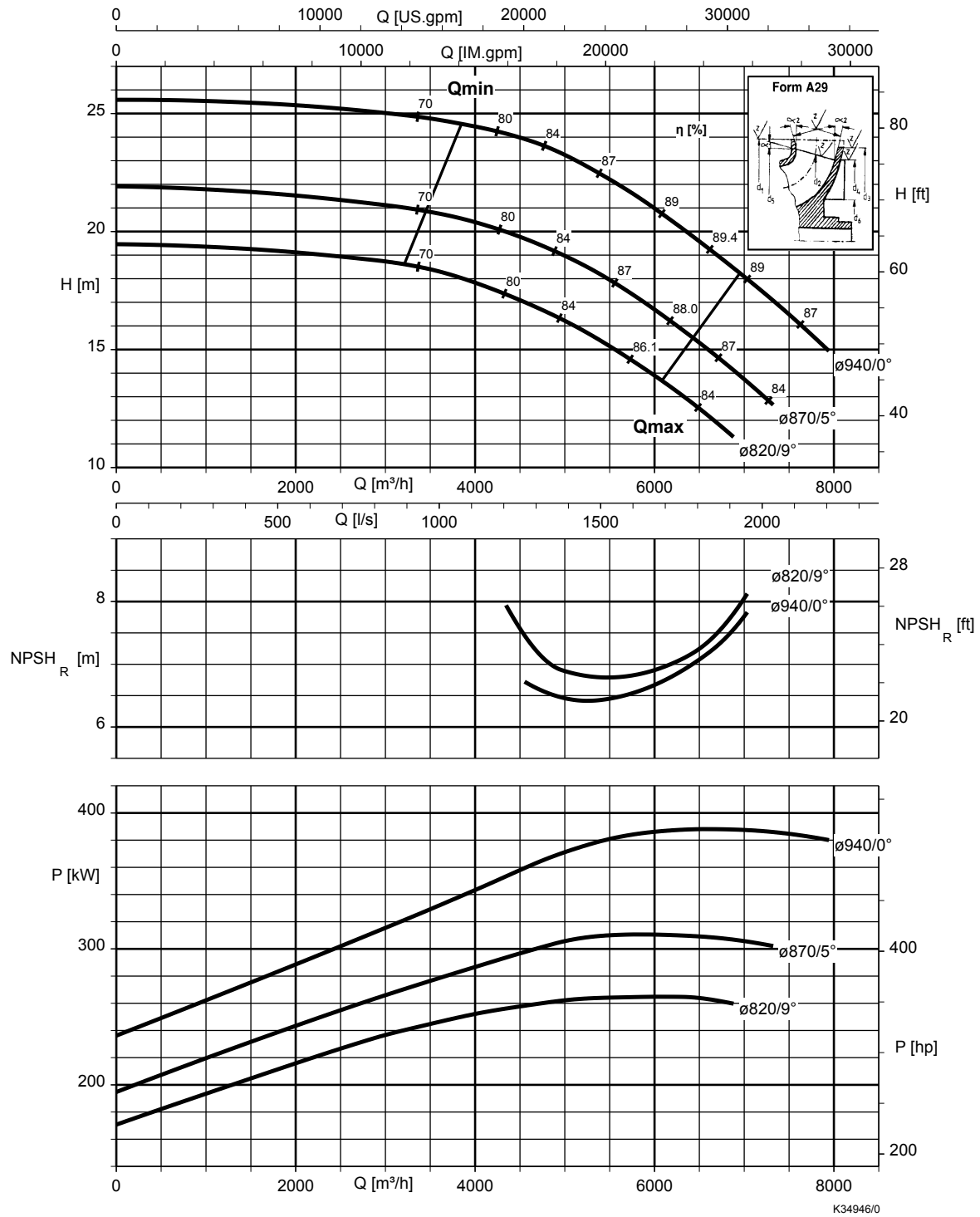


KWP K 800-700-953,  $n = 480 \text{ min}^{-1}$

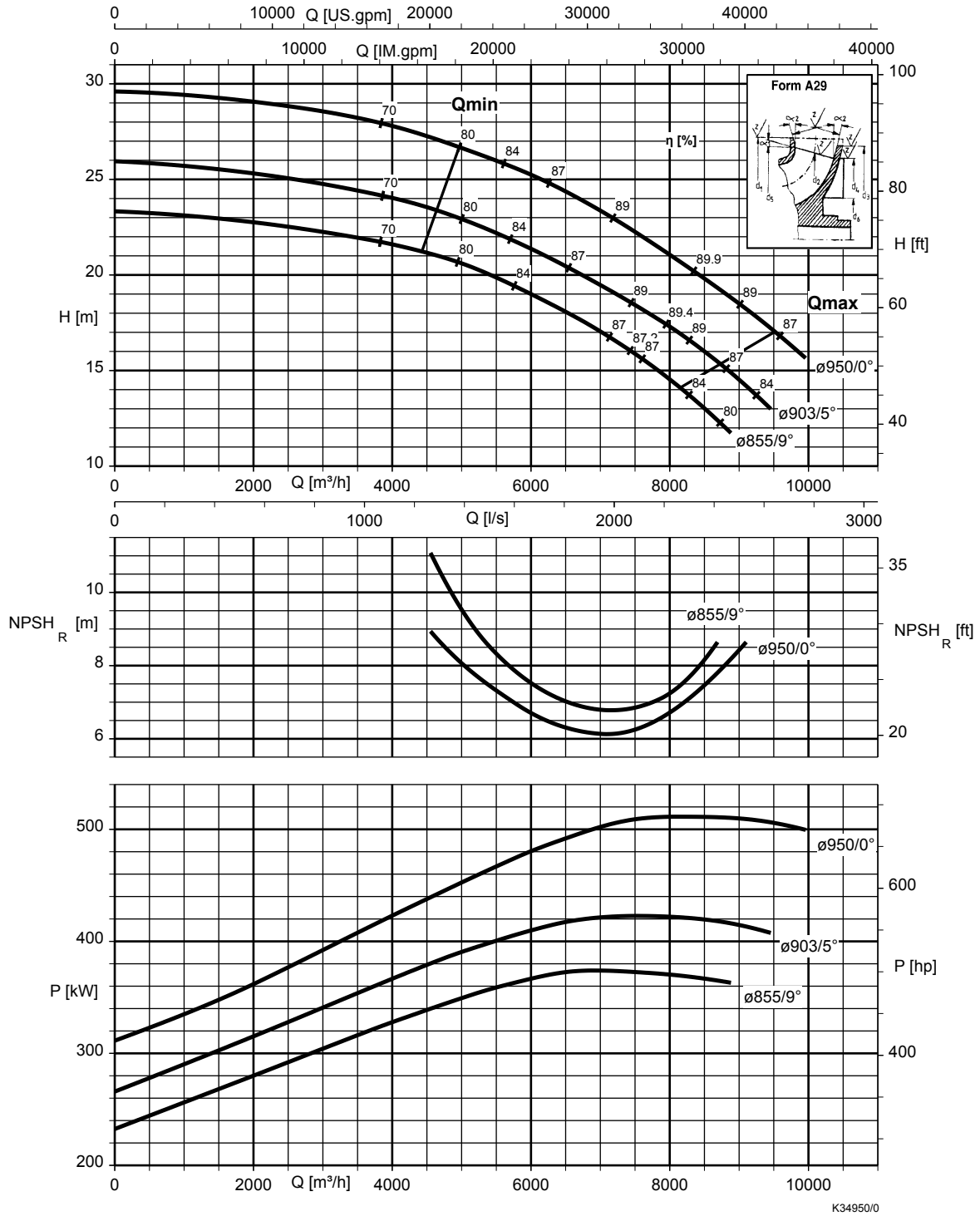




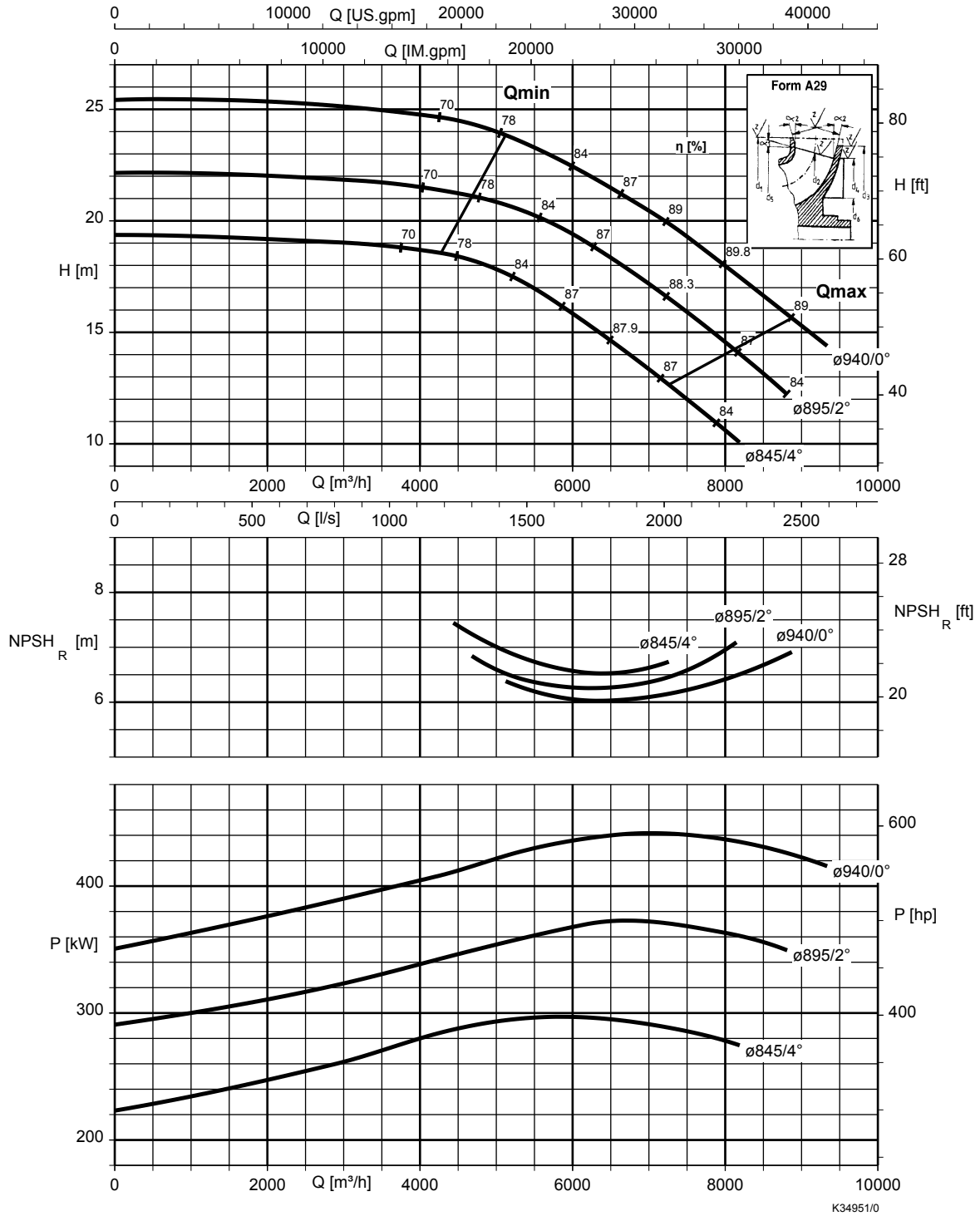
KWP K 800-700-959,  $n = 480 \text{ min}^{-1}$



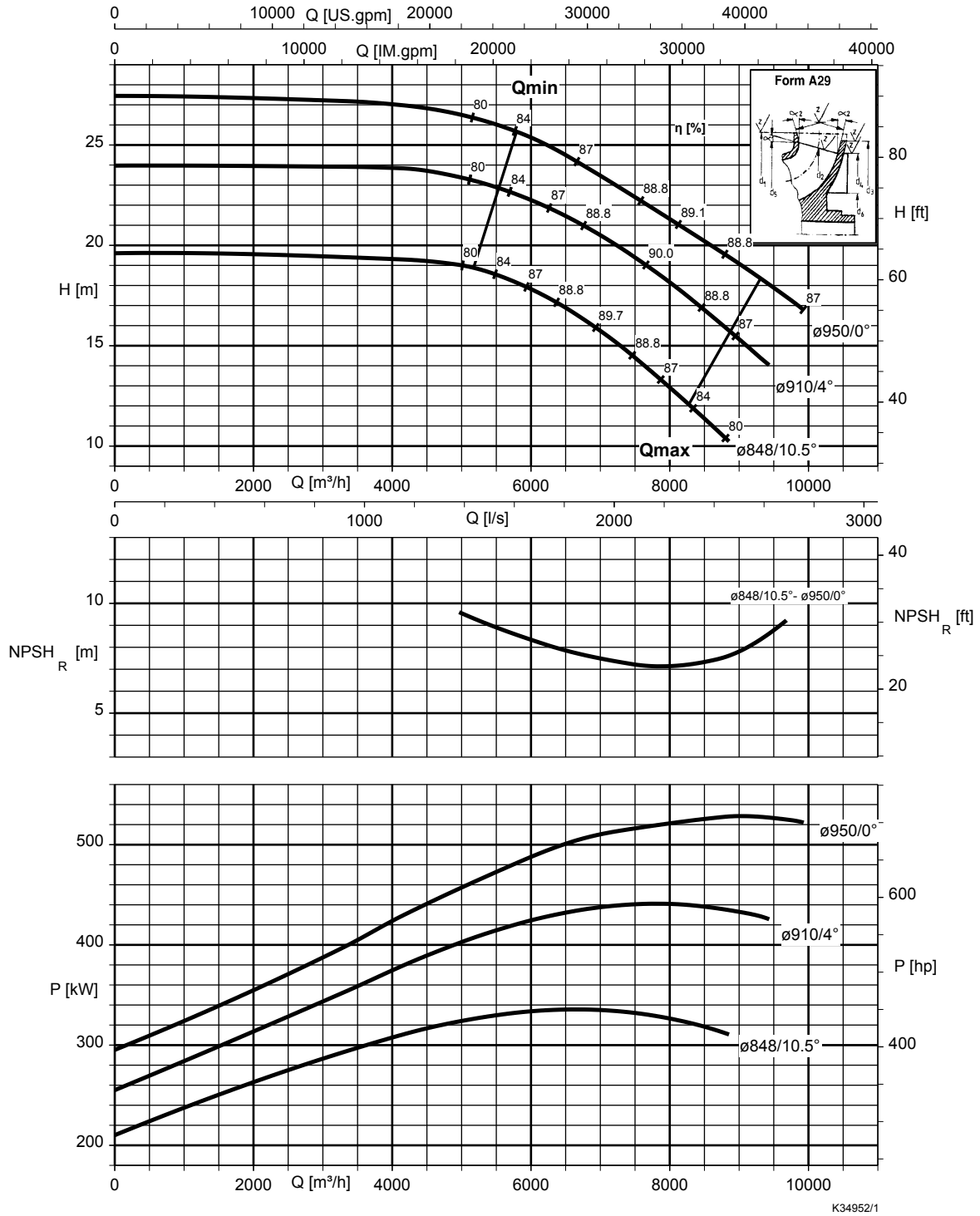
KWP K 800-800-934,  $n = 480 \text{ min}^{-1}$



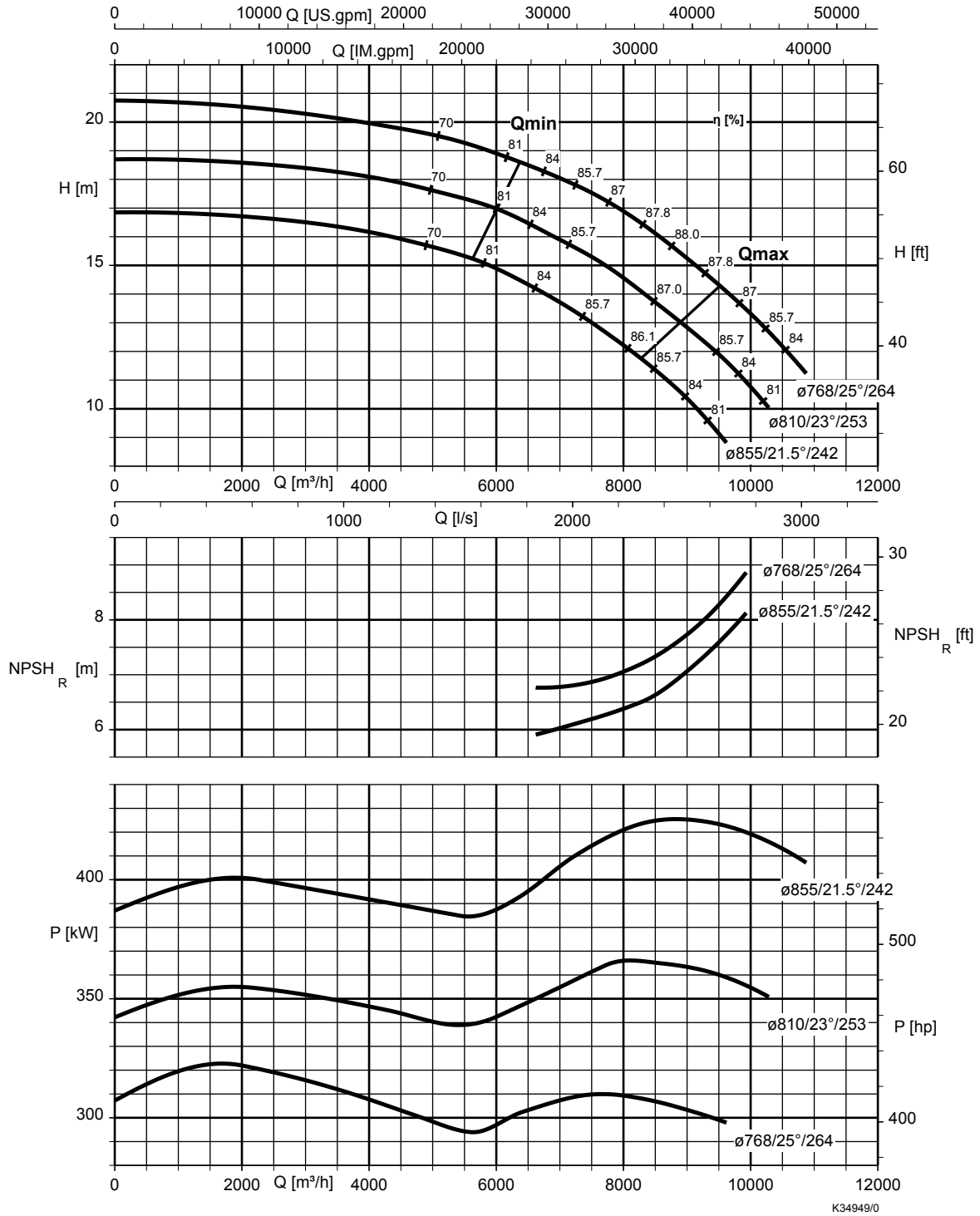
KWP K 800-800-935,  $n = 480 \text{ min}^{-1}$



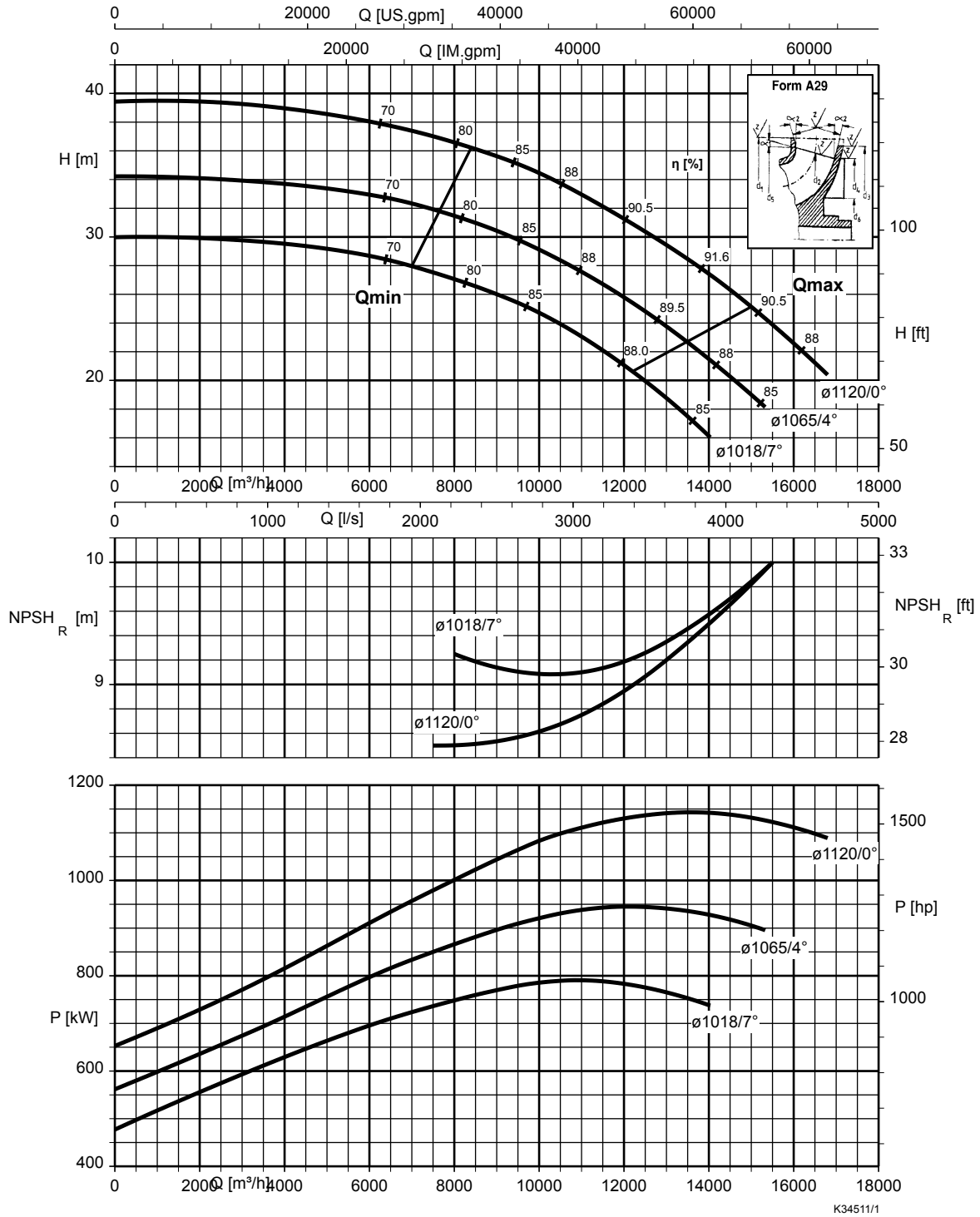
KWP K 800-800-939,  $n = 480 \text{ min}^{-1}$



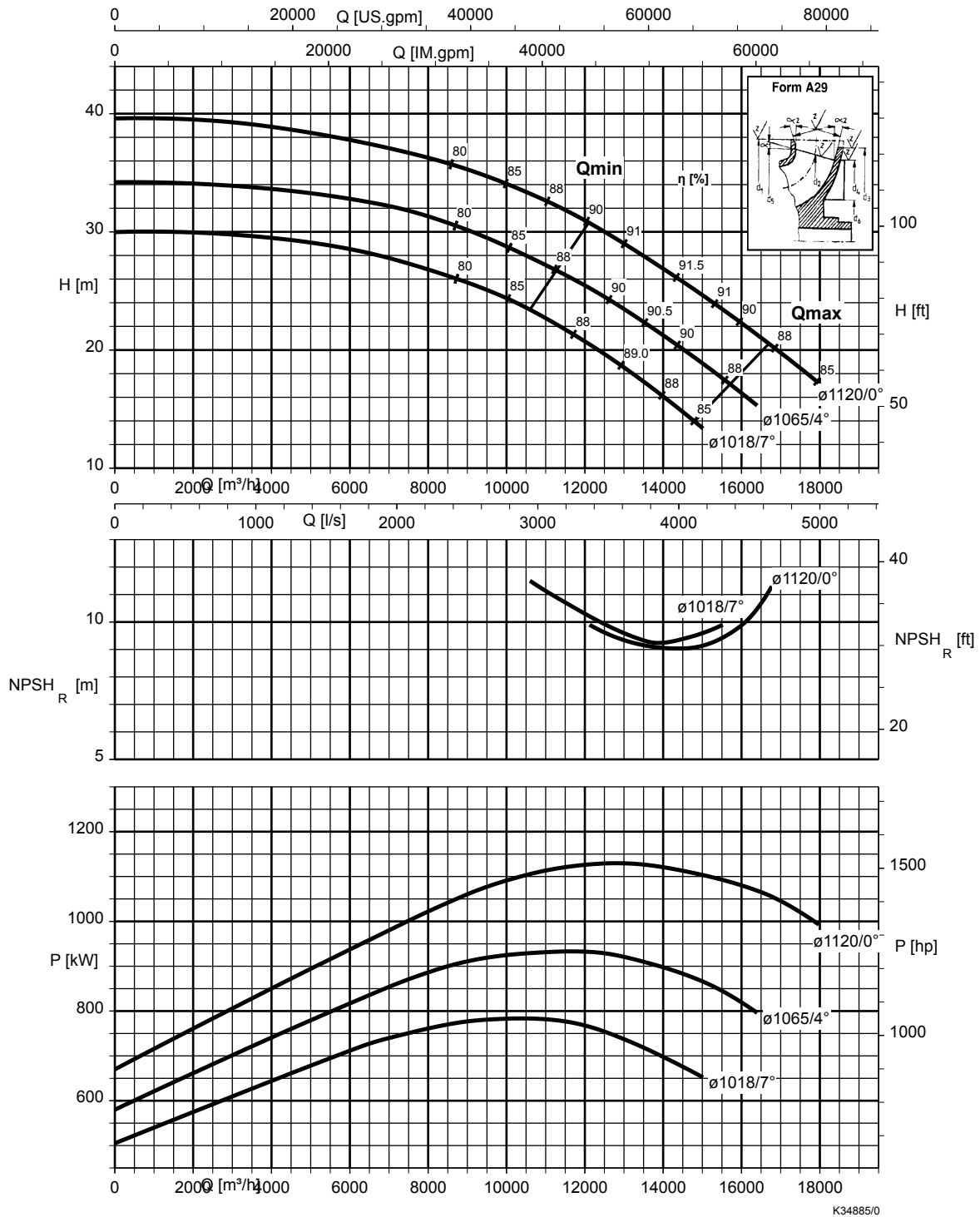
KWP K 800-900-883,  $n = 480 \text{ min}^{-1}$



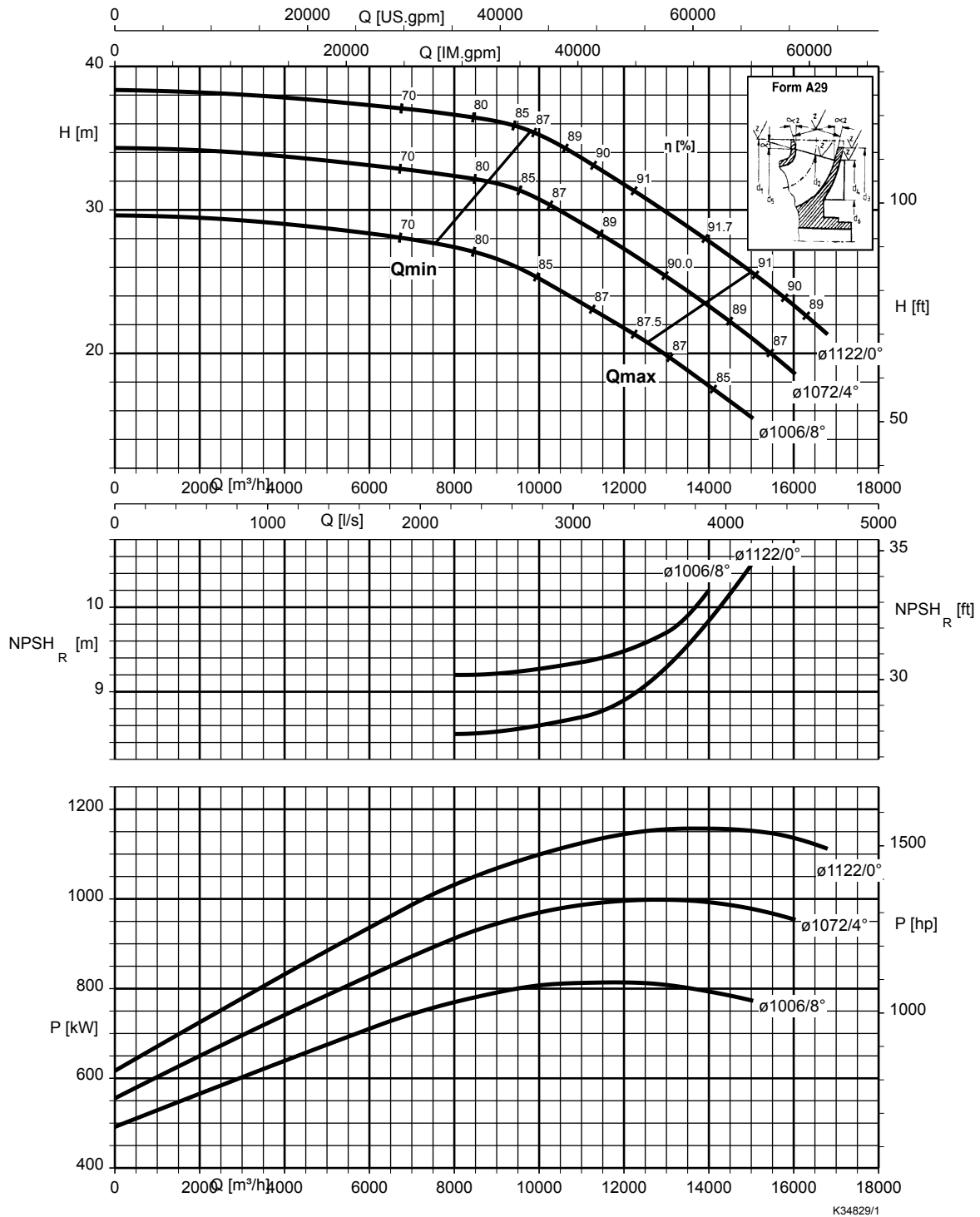
KWP K 900-900-1133,  $n = 480 \text{ min}^{-1}$



KWP K 900-900-1134,  $n = 480 \text{ min}^{-1}$

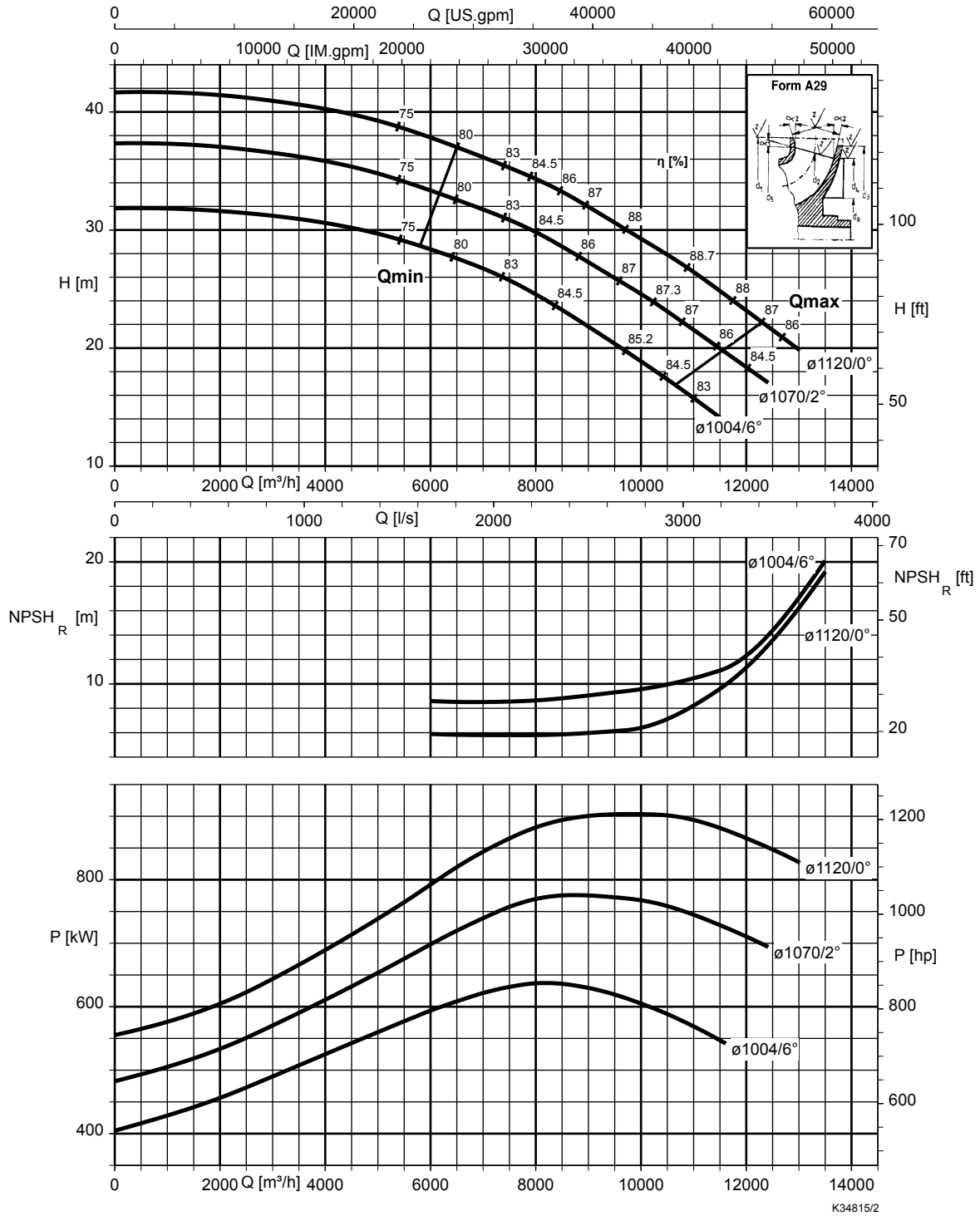


KWP K 900-900-1138,  $n = 480 \text{ min}^{-1}$





KWP K 900-900-1139,  $n = 480 \text{ min}^{-1}$









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