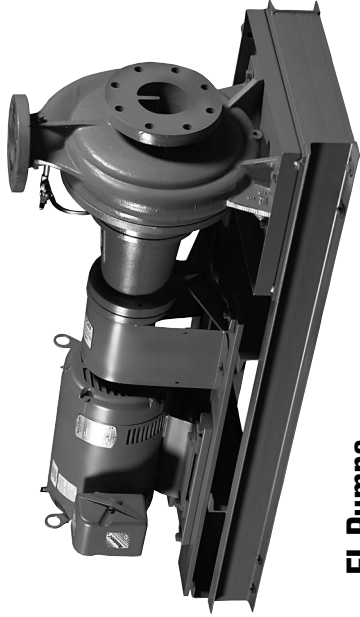
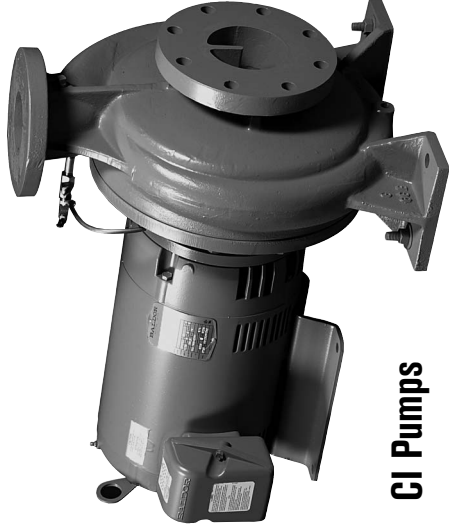


PERFORMANCE CURVES



FI Pumps



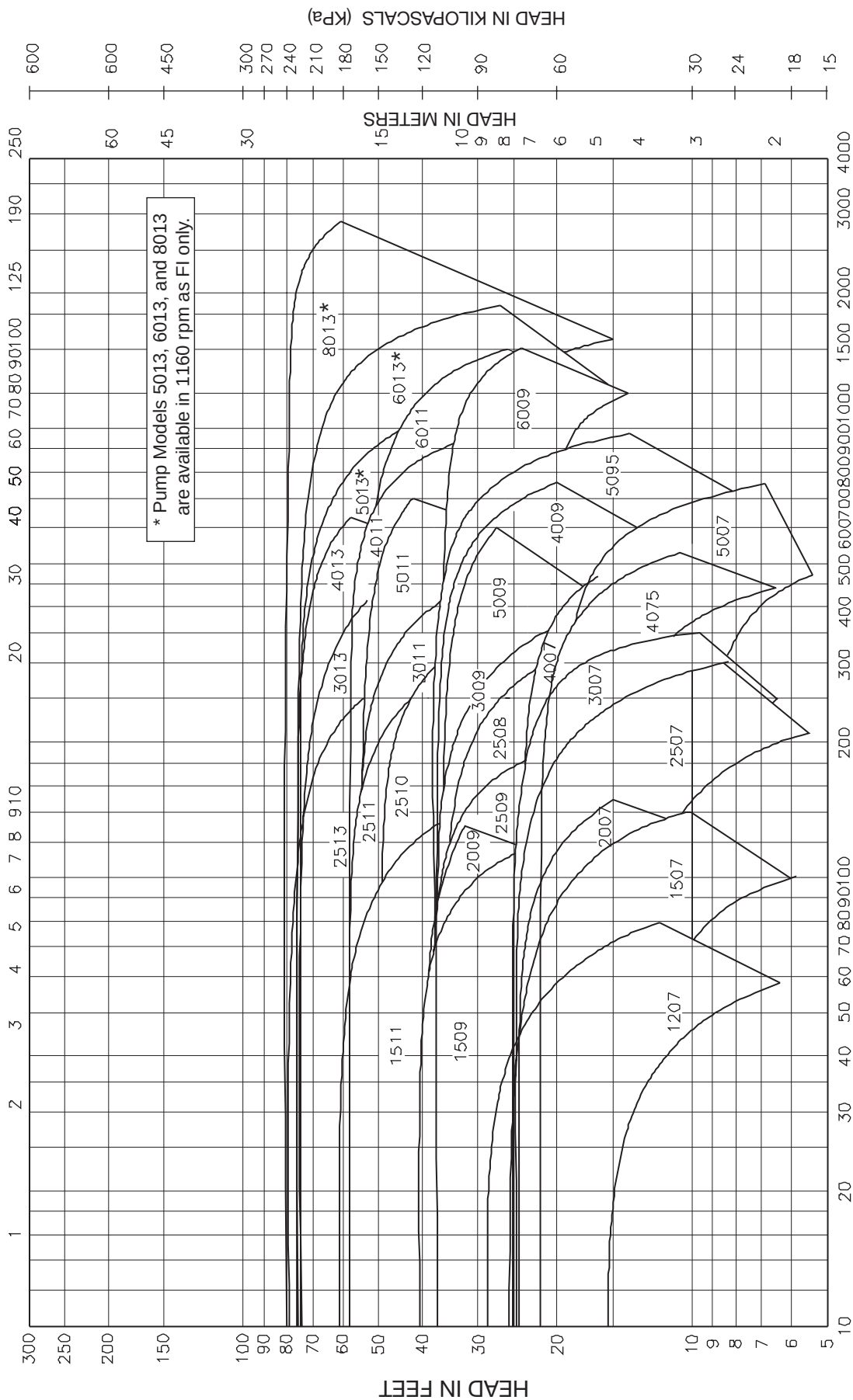
CI Pumps

HYDRONIC COMPONENTS & SYSTEMS

**Do it once.
Do it right.**



CAPACITY IN LITERS/SEC

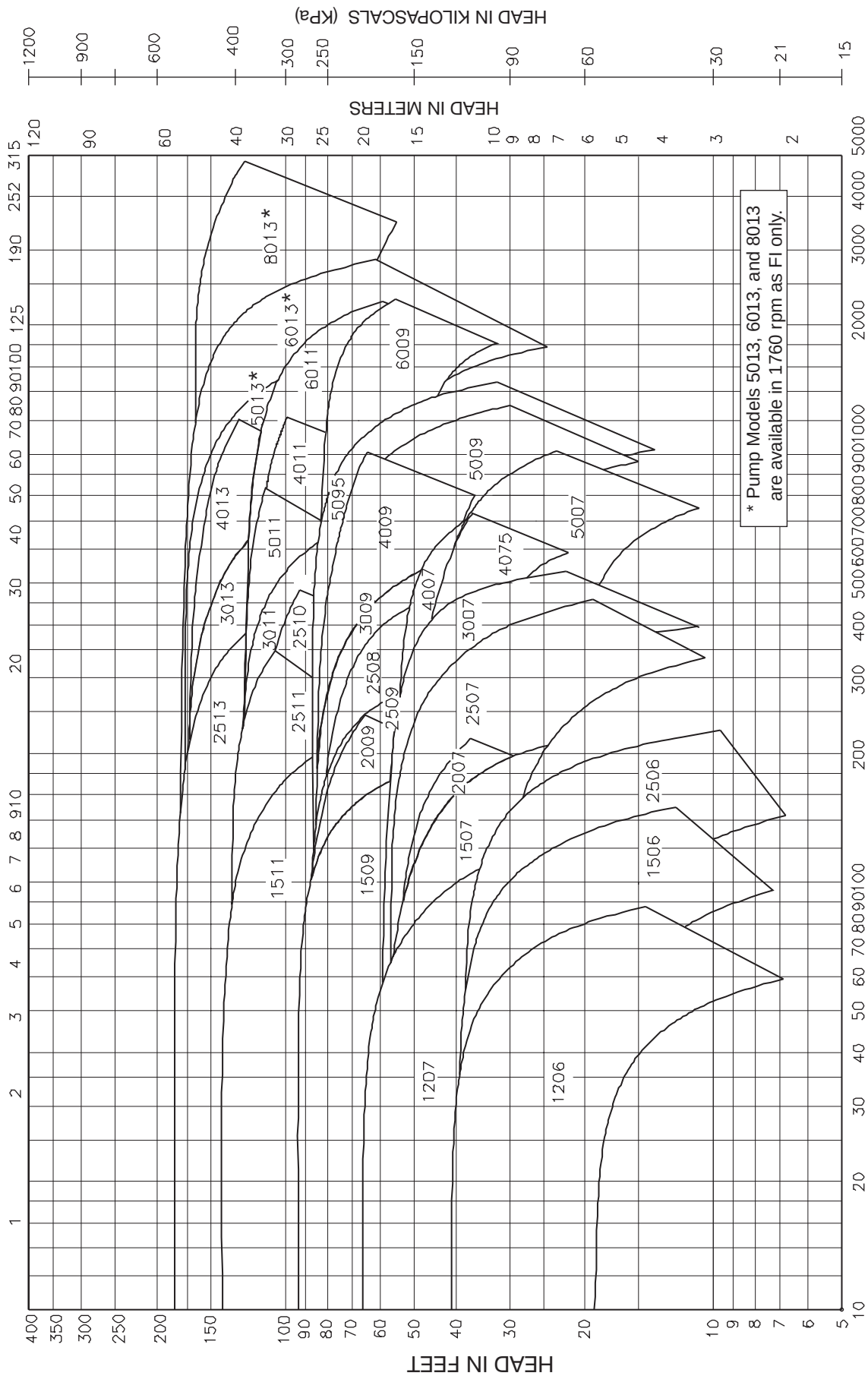


PC-2125 Rev B

FLOW IN GALLONS PER MINUTE

FI/CI Pump Quick Selection Curve 1160 RPM

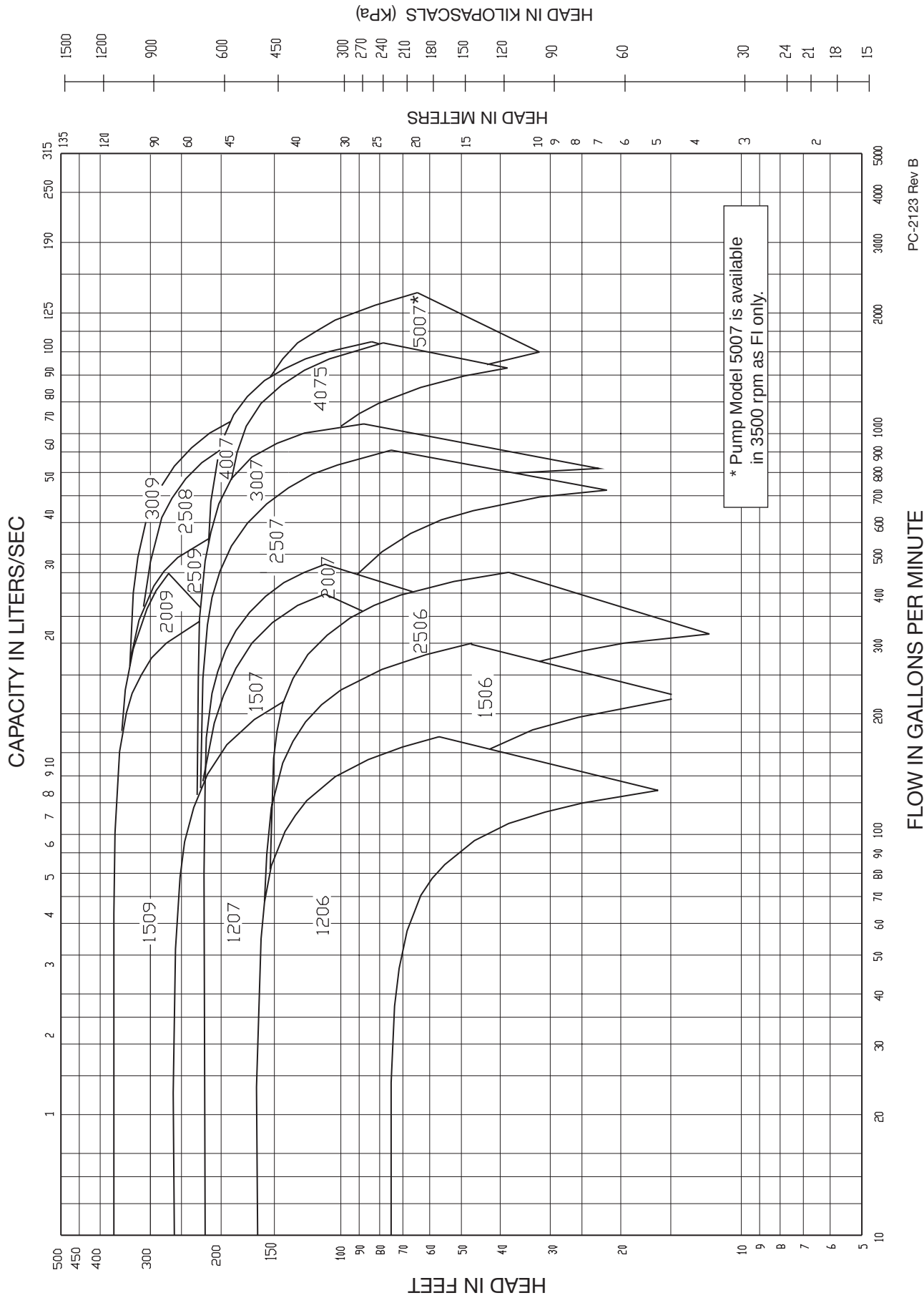
CAPACITY IN LITERS/SEC



PC-2124 Rev D

FLOW IN GALLONS PER MINUTE

FI/CI Pump Quick Selection Curve 1760 RPM



CORRECTION FACTORS FOR OTHER SPEEDS

For speeds other than 1750, hydraulic performance and B.H.P. requirements must be corrected before a selection can be made.

The following multipliers are used to correct performance and B.H.P.

	G.P.M.	Head	B.H.P.
1150 to 1750	1.52	2.31	
1750 to 1150			.28
1450 to 1750	1.21	1.46	
1750 to 1450			.58
2900 to 3450	1.19	1.42	
3450 to 2900			.58

Sizing Procedure

1. Using the proper multipliers correct G.P.M. and head.
2. Make pump selection as usual using corrected performance.
3. Determine max. B.H.P. requirement for pump selected.
4. Correct B.H.P. using multiplier, to lower speed.
5. Select motor based on Step 4. Use service factor if applicable.

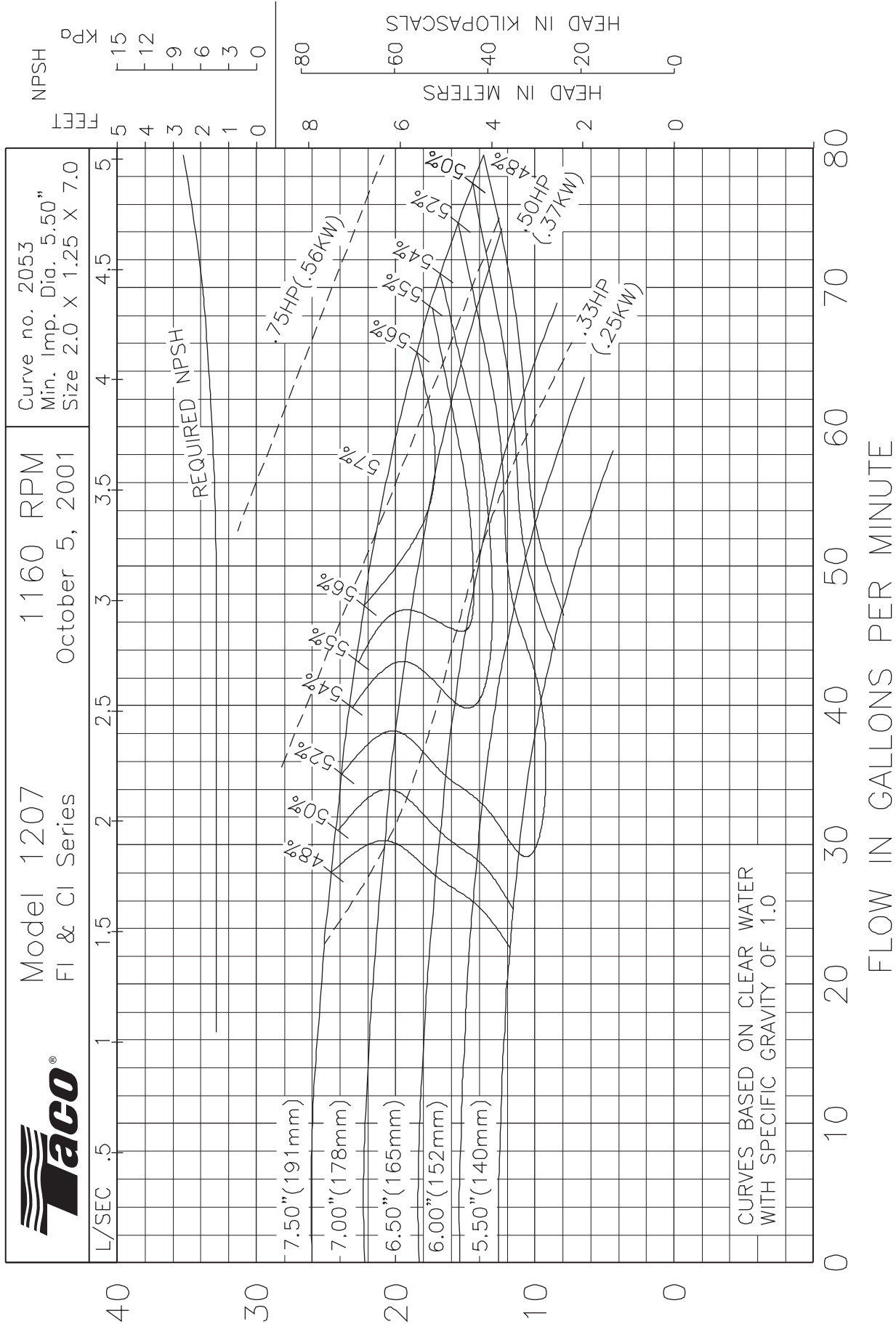
PUMP FORMULAS

Pressure (PSI)	=	$\frac{\text{Head (Feet)} \times \text{Specific Gravity}}{2.31}$
Head (Feet)	=	$\frac{\text{Pressure (PSI)} \times 2.31}{\text{Specific Gravity}}$
Vacuum (Inches of Mercury)	=	Dynamic Suction Lift (Feet) x .883 x Specific Gravity
Horsepower (Brake)	=	$\frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960 \times \text{Pump Efficiency}}$
Horsepower (Water)	=	$\frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960}$
Efficiency (Pump)	=	$\frac{\text{Horsepower (Water)} \times 100 \text{ Per Cent}}{\text{Horsepower (Brake)}}$
NPSH (Available)	=	Positive Factors – Negative Factors

Affinity Laws: Effect of change of speed or impeller diameter on centrifugal pumps.

	GPM Capacity	Ft. Head	BHP
Impeller Diameter Change	$Q_2 = \frac{D_2}{D_1} Q_1$	$H_2 = \left(\frac{D_2}{D_1}\right)^2 H_1$	$P_2 = \left(\frac{D_2}{D_1}\right)^3 P_1$
Speed Change	$Q_2 = \frac{\text{RPM}_2}{\text{RPM}_1} Q_1$	$H_2 = \left(\frac{\text{RPM}_2}{\text{RPM}_1}\right)^2 H_1$	$P_2 = \left(\frac{\text{RPM}_2}{\text{RPM}_1}\right)^3 P_1$

Where Q = GPM, H = Head, P = BHP, D = Impeller Dia., RPM = Pump Speed

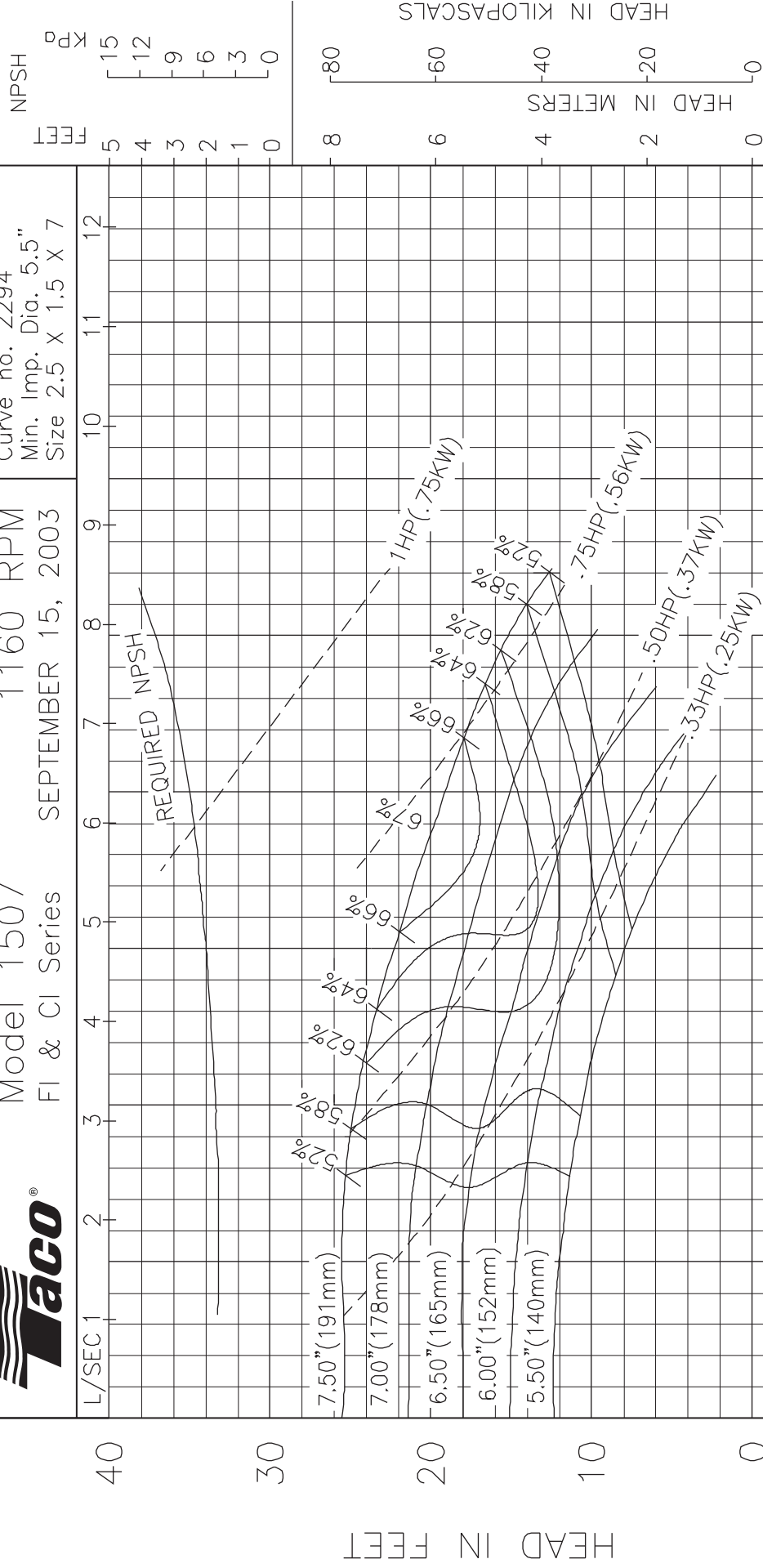




Model 1507
FI & CI Series

1160 RPM
SEPTEMBER 15, 2003

Curve no. 2294
Min. Imp. Dia. 5.5"
Size 2.5 x 1.5 x 7



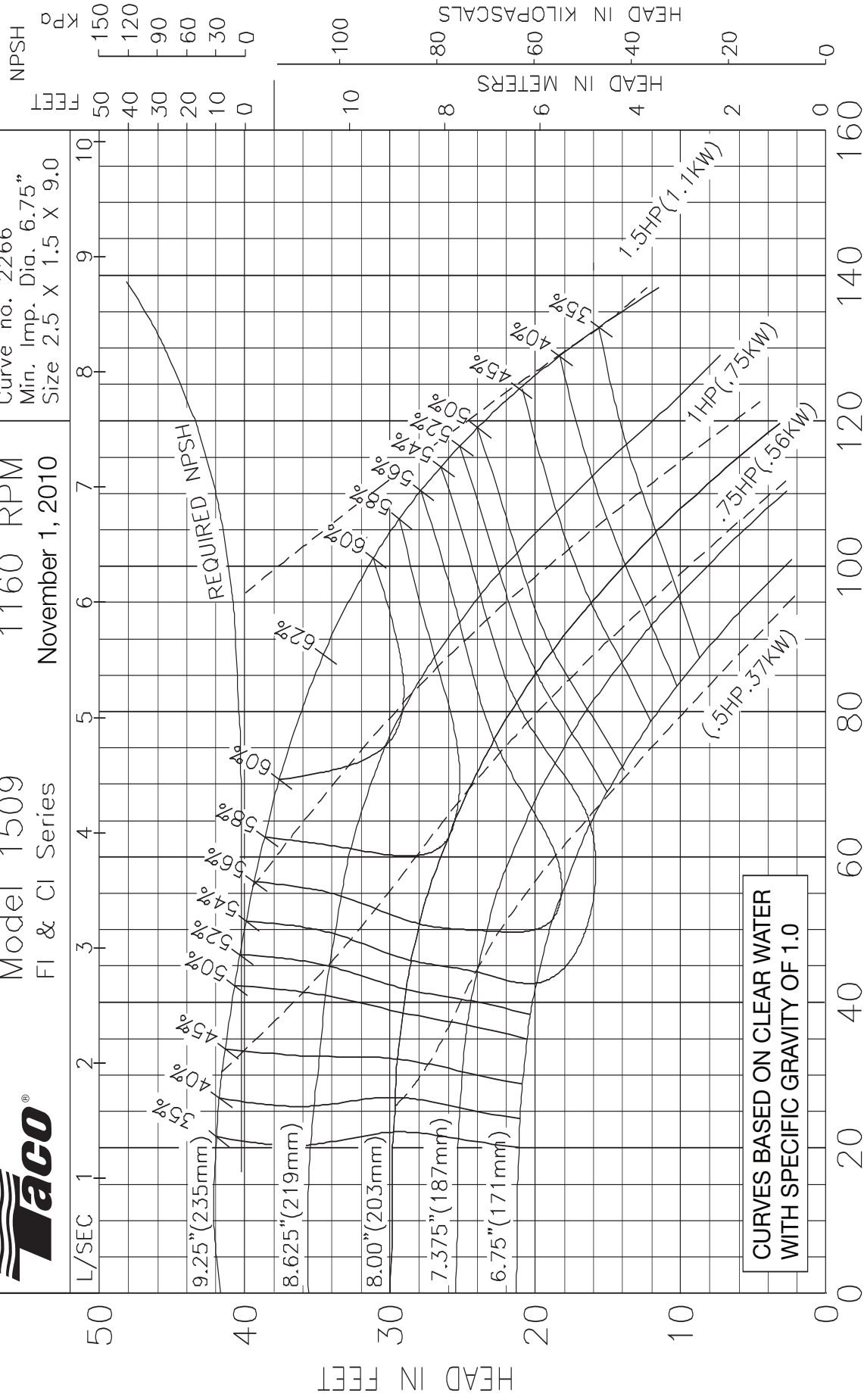
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

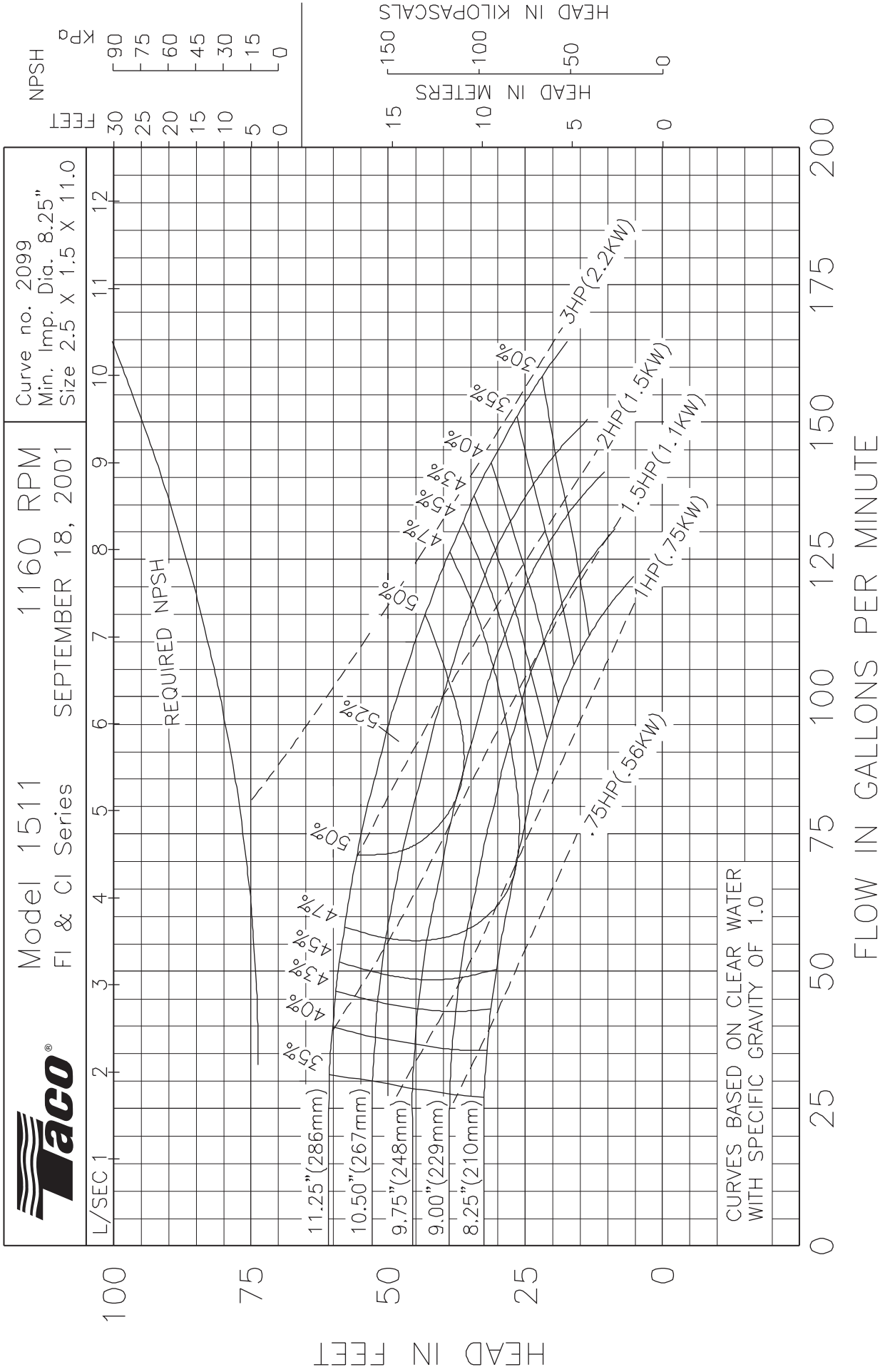


Model 1509
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2266
Min. Imp. Dia. 6.75"
Size 2.5 X 1.5 X 9.0



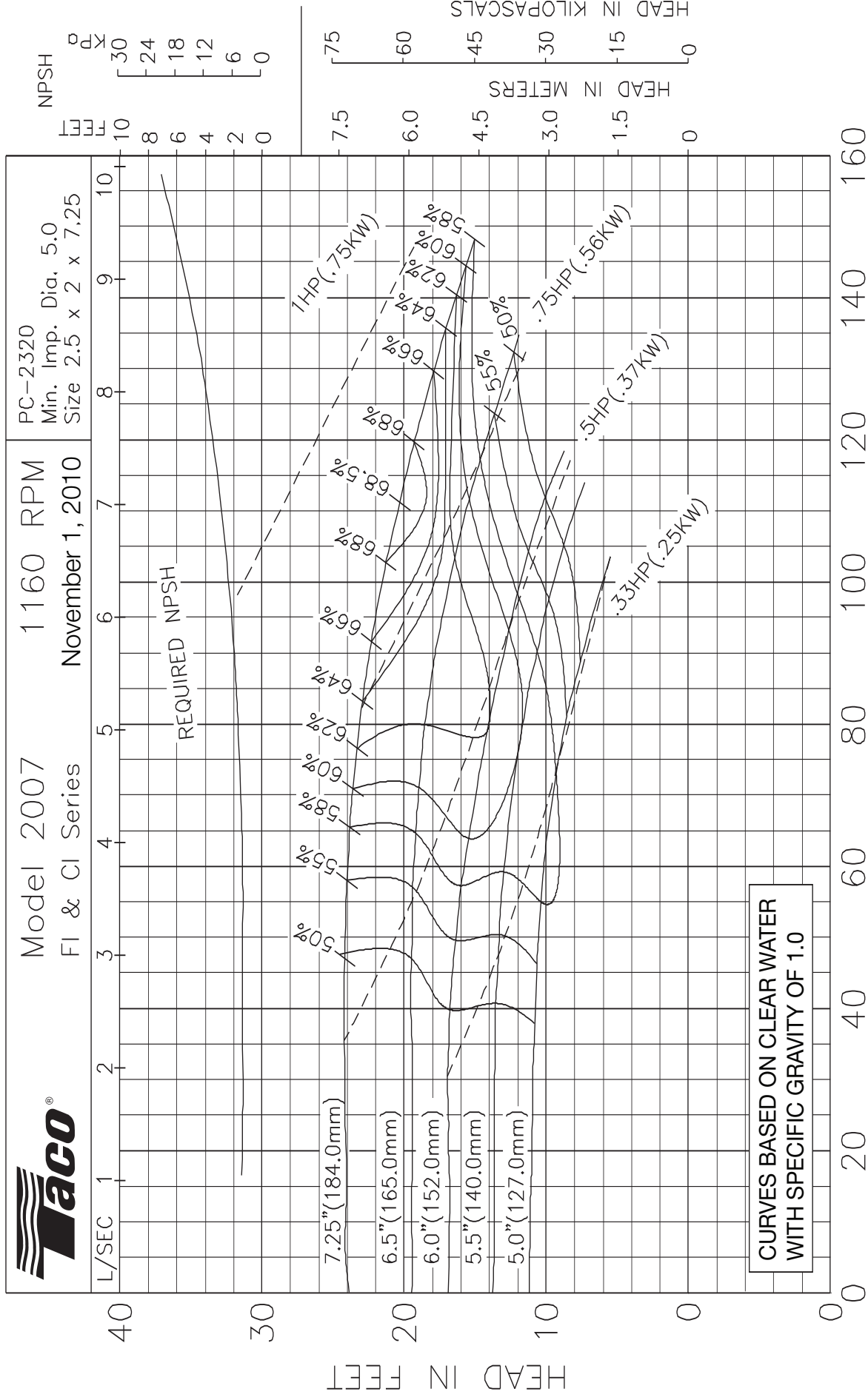




Model 2007
FI & CI Series

1160 RPM
November 1, 2010

PC-2320
Min. Imp. Dia. 5.0
Size 2.5 x 2 x 7.25



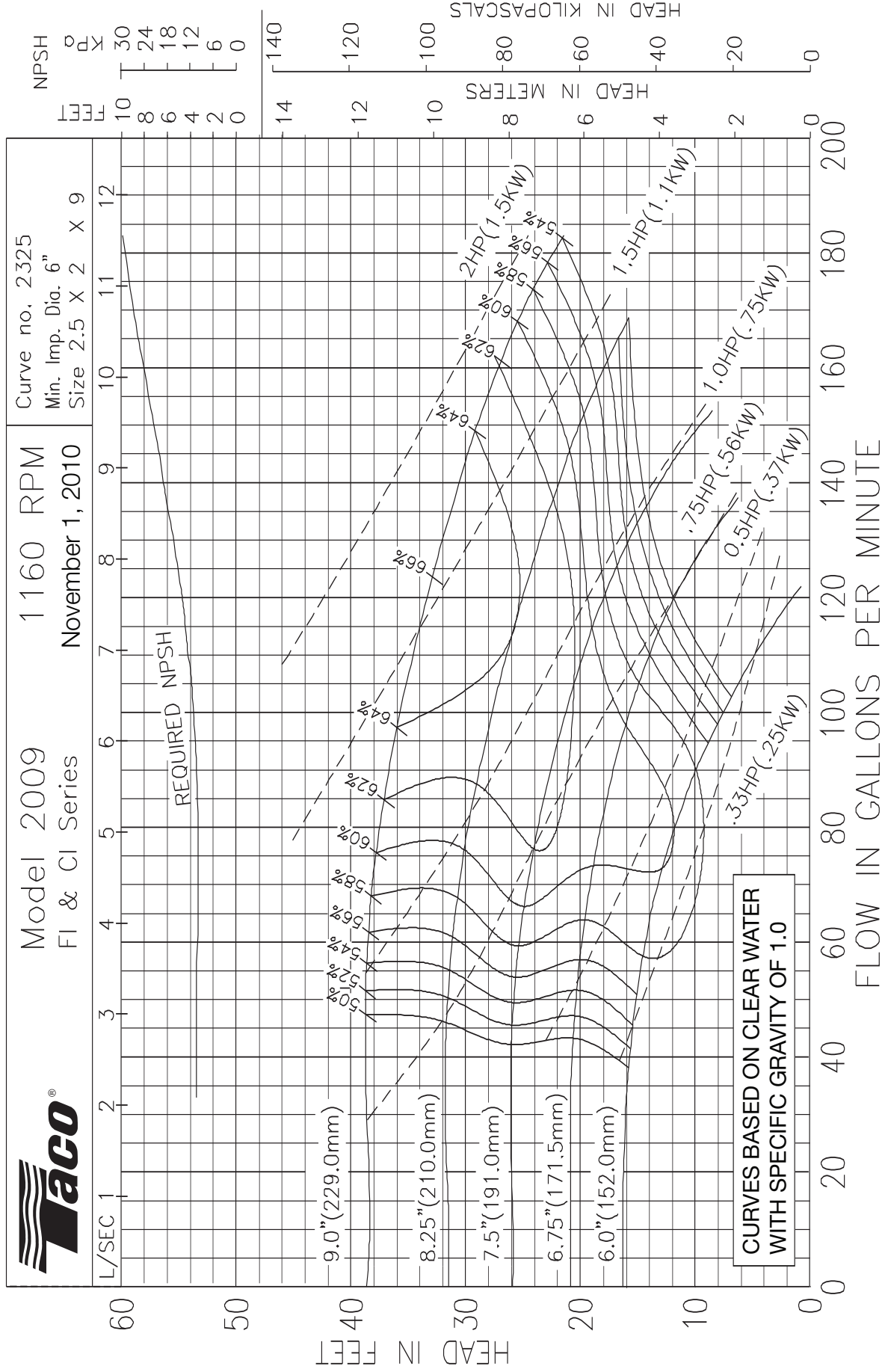
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0



Model 2009
FI & CI Series

1160 RPM
November 1, 2010

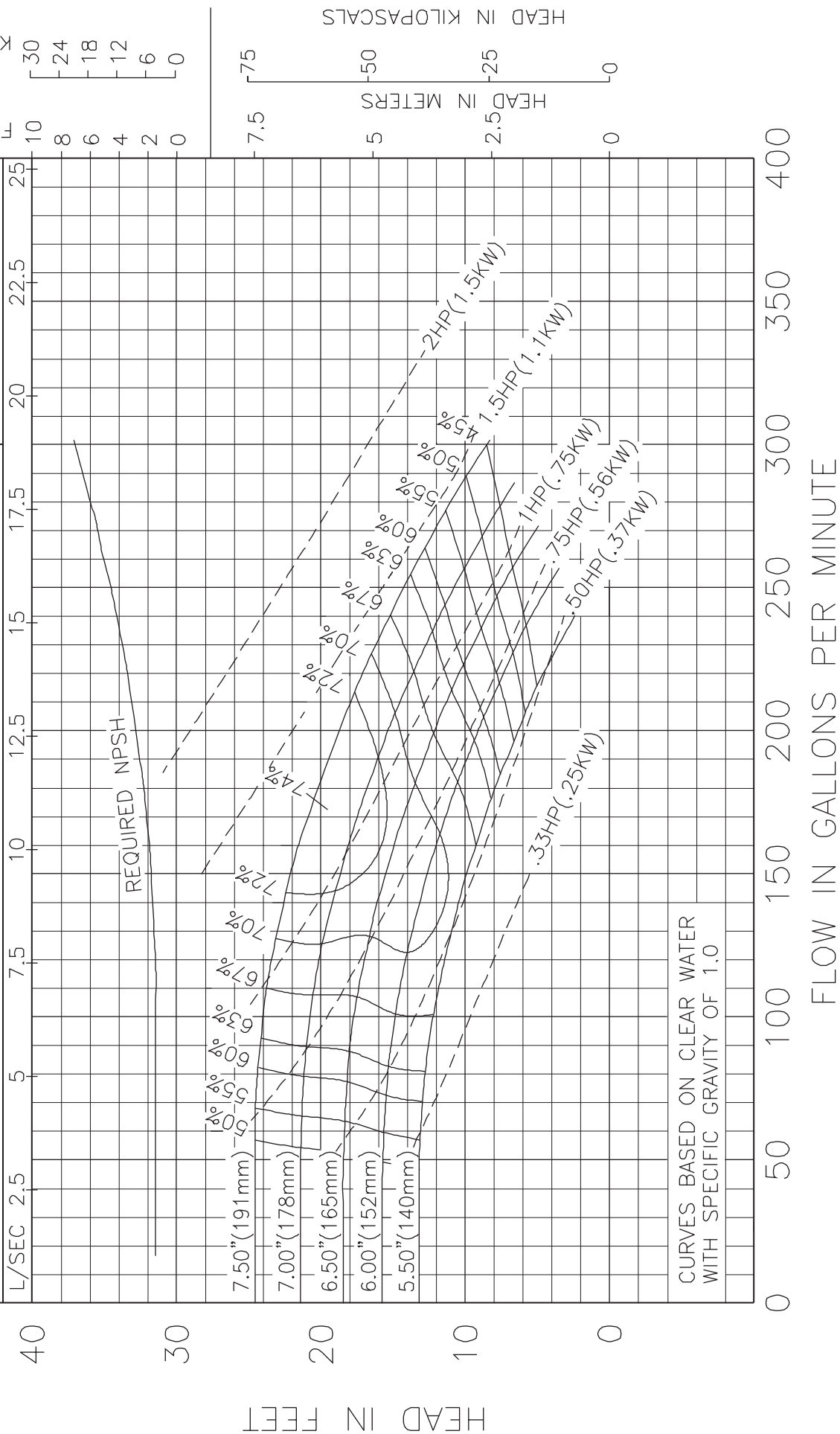
Curve no. 2325
Min. Imp. Dia. 6"
Size 2.5 X 2 X 9

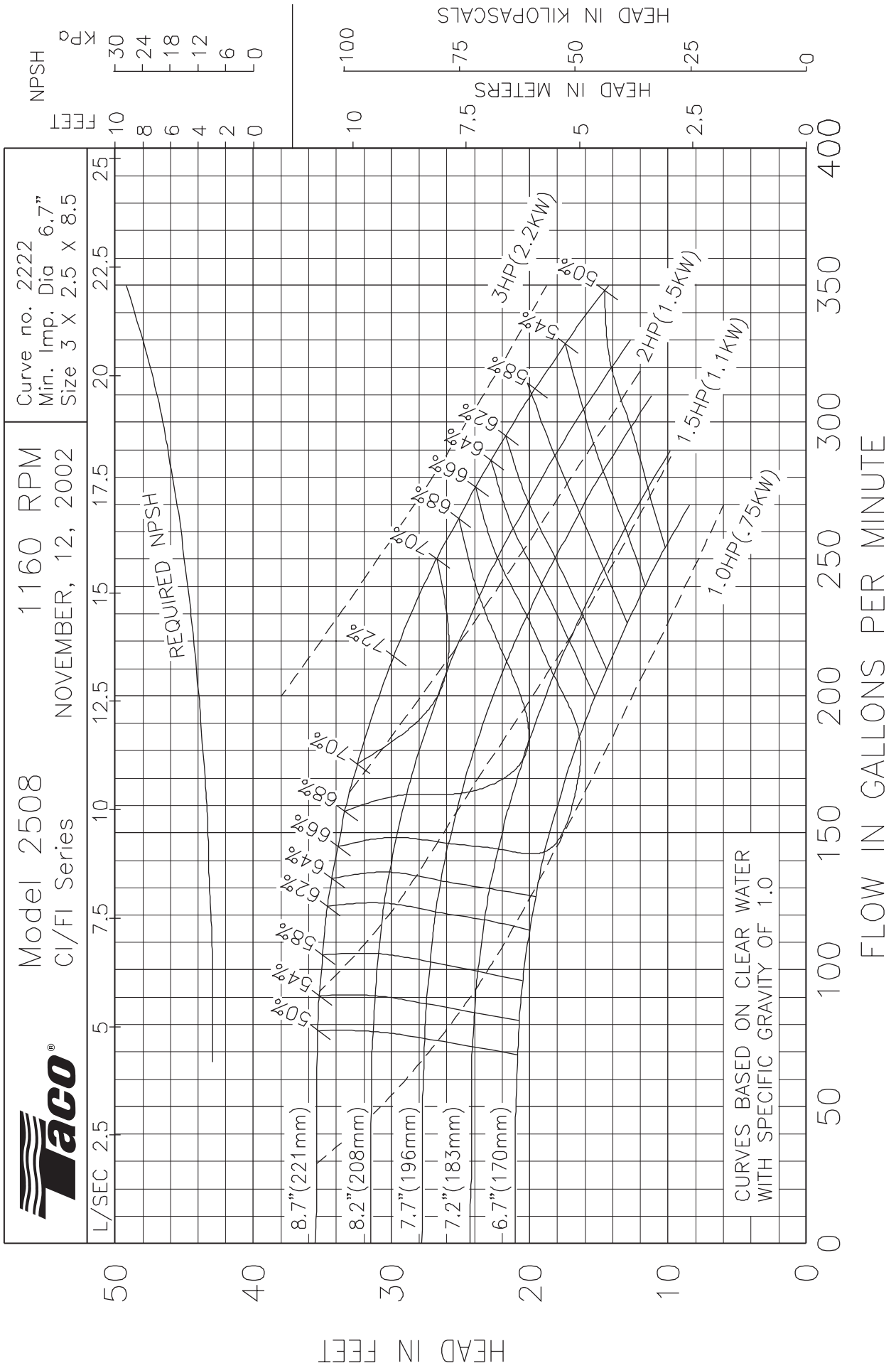


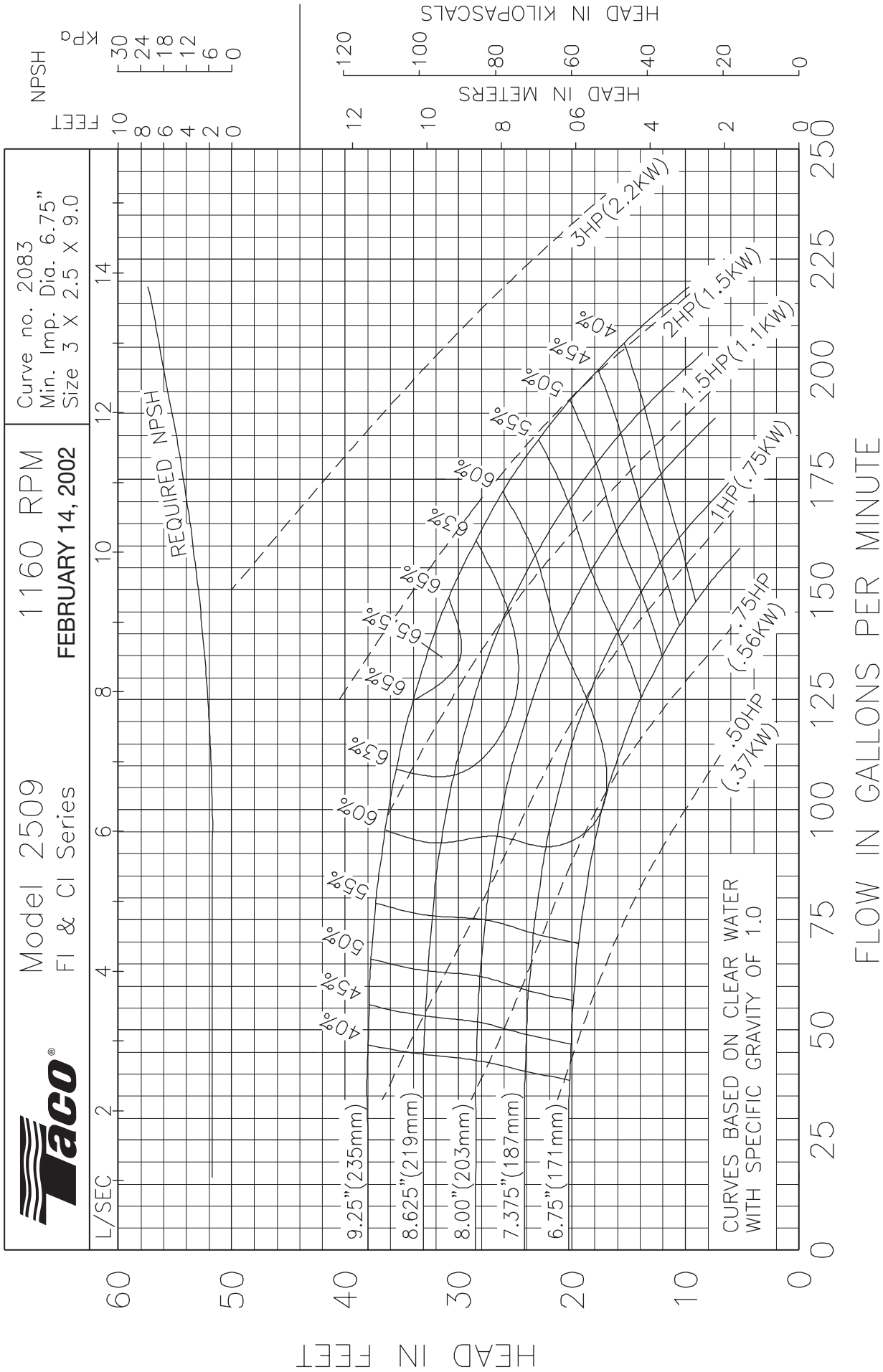
Model 2507 FI & CI Series

1160 RPM
FEBRUARY 15, 2002

Curve no. 2063
Min. Imp. Dia. 5.50"
Size 3 X 2.5 X 7.0



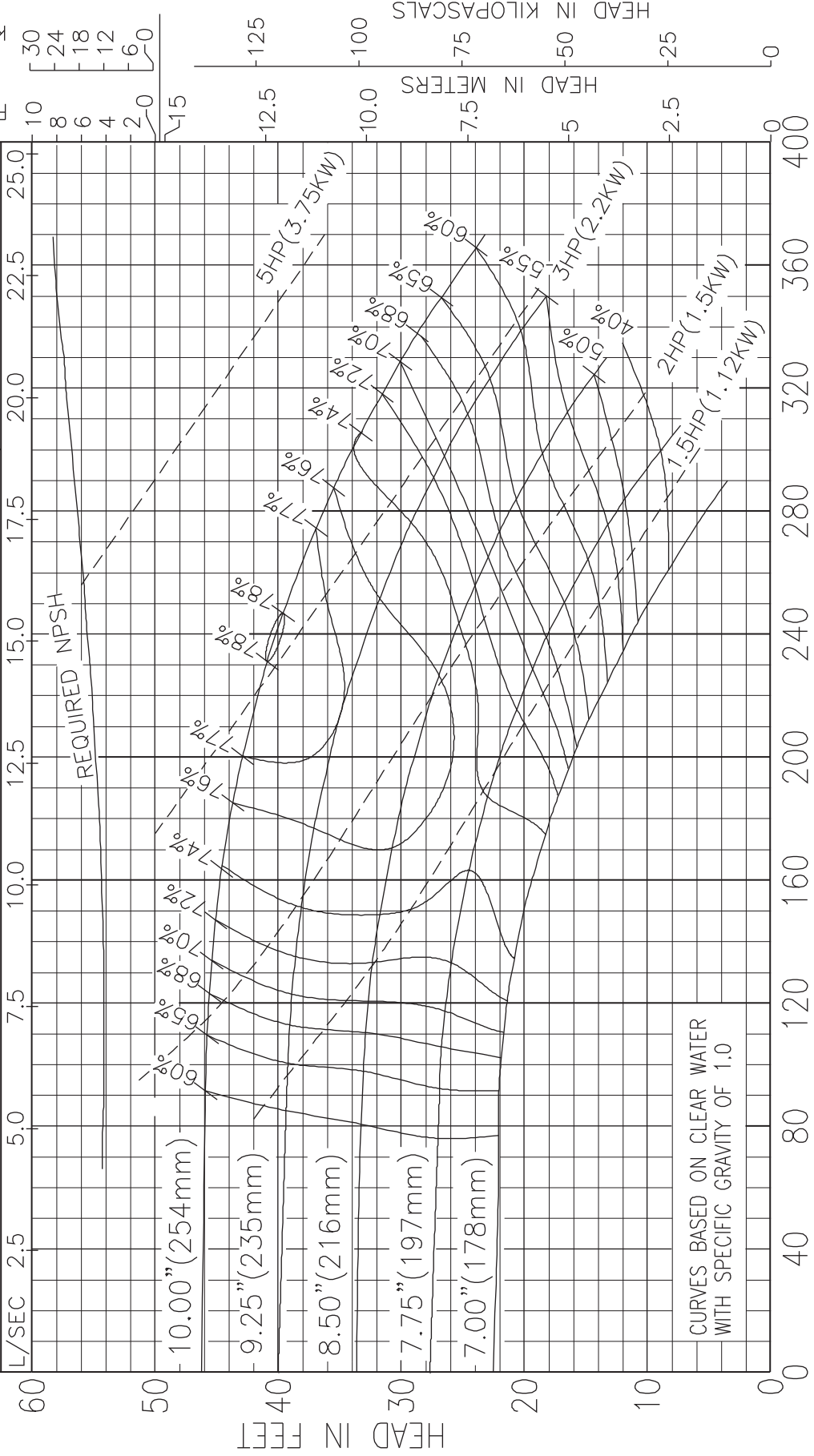




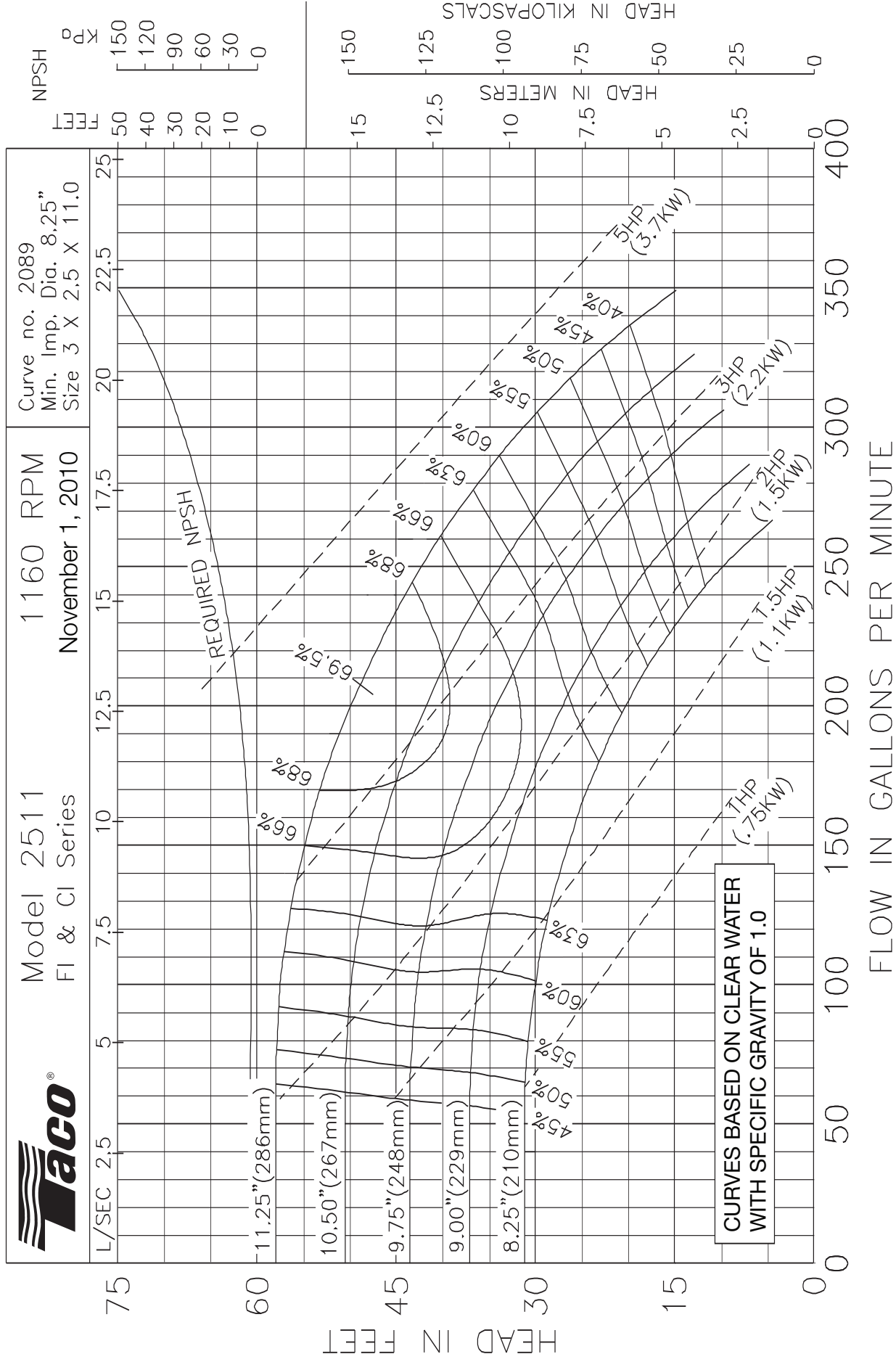
Model 2510C
FI & CI Series

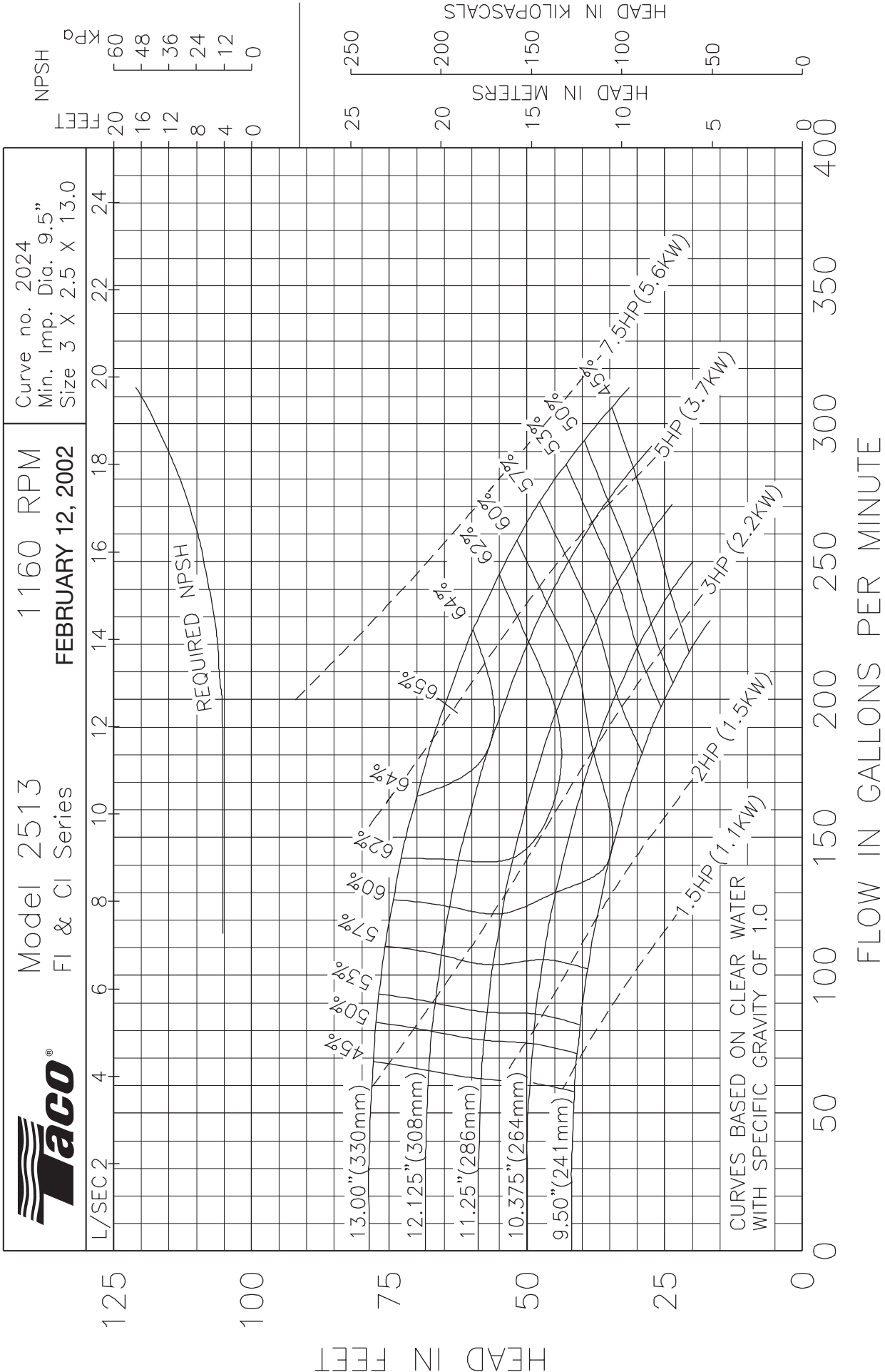
1160 RPM
January 20, 2012

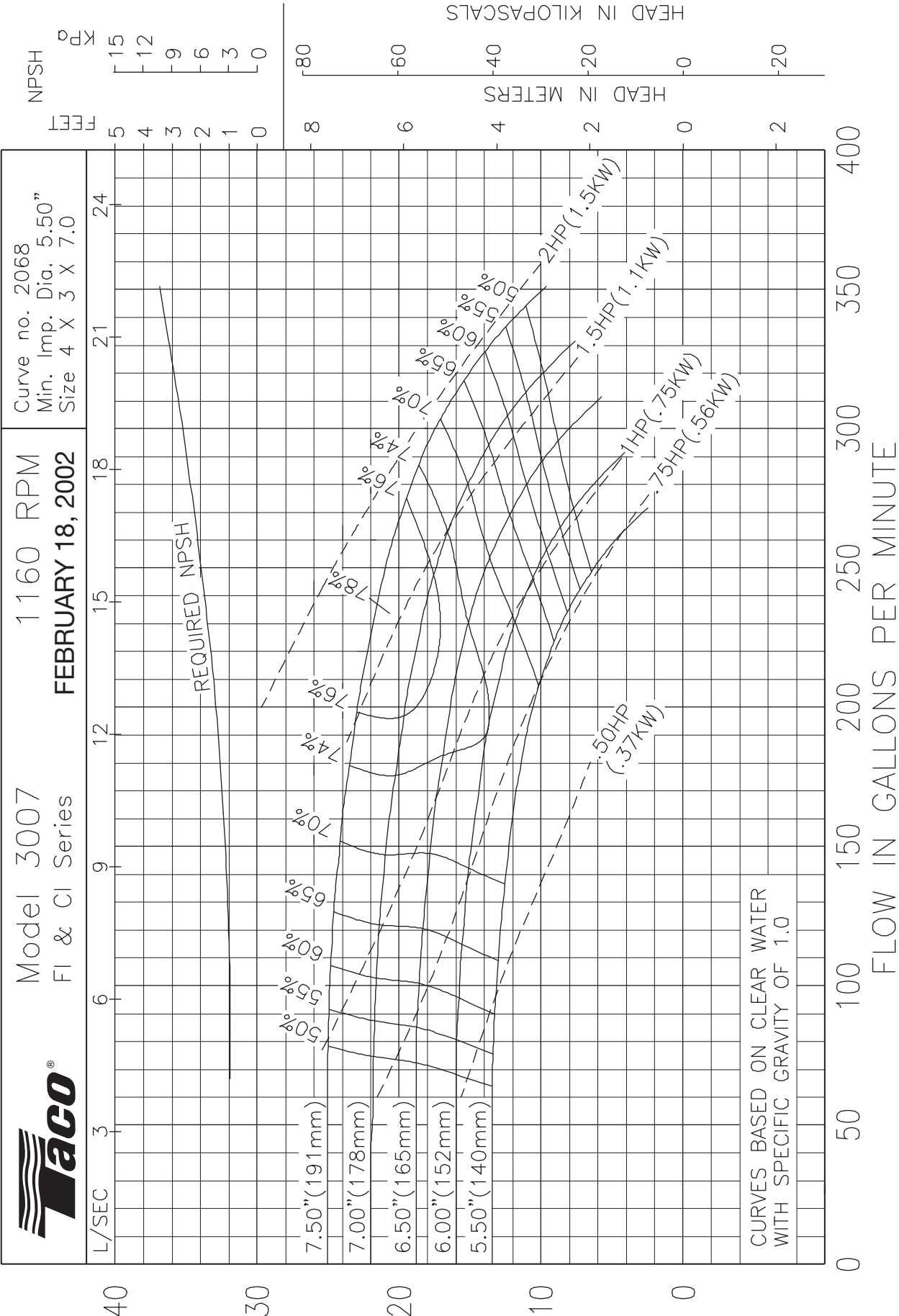
Curve no. 2661
Min. Imp. Dia. 7.00"
Size 3 x 2.5 x 10.0

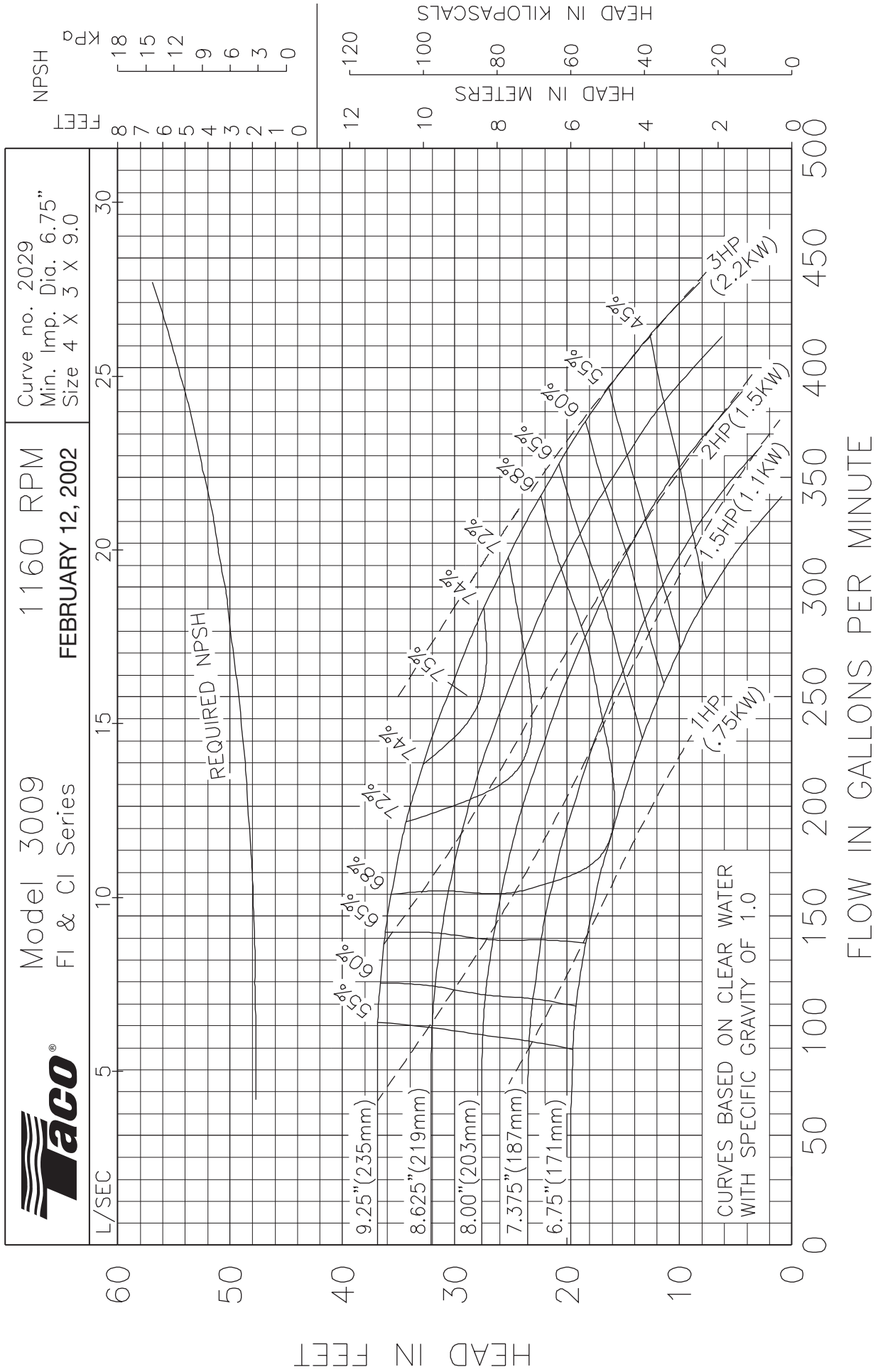


FLOW IN GALLONS PER MINUTE







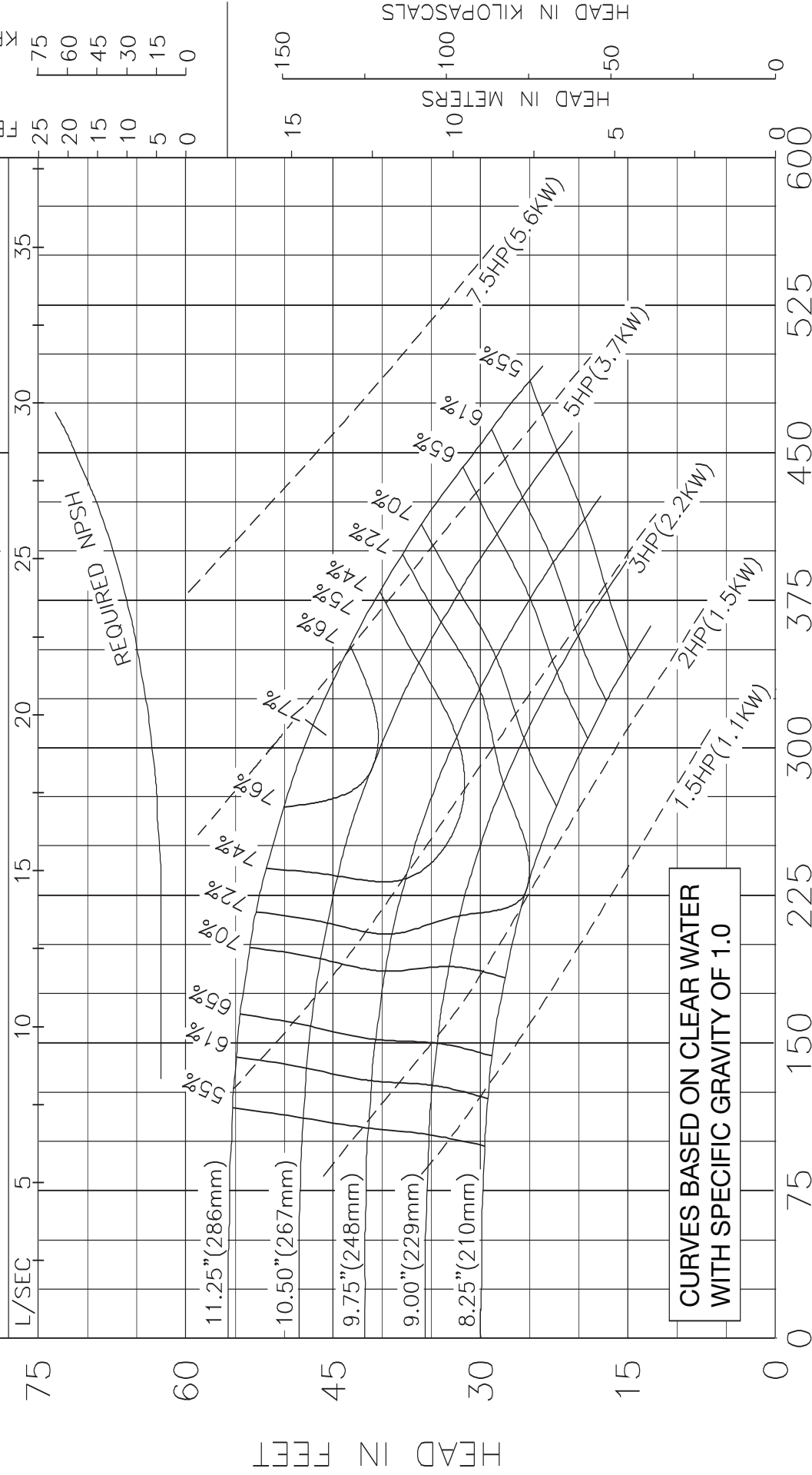




Model 3011
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2092
Min. Imp. Dia. 8.25"
Size 4 X 3 X 11.0



CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

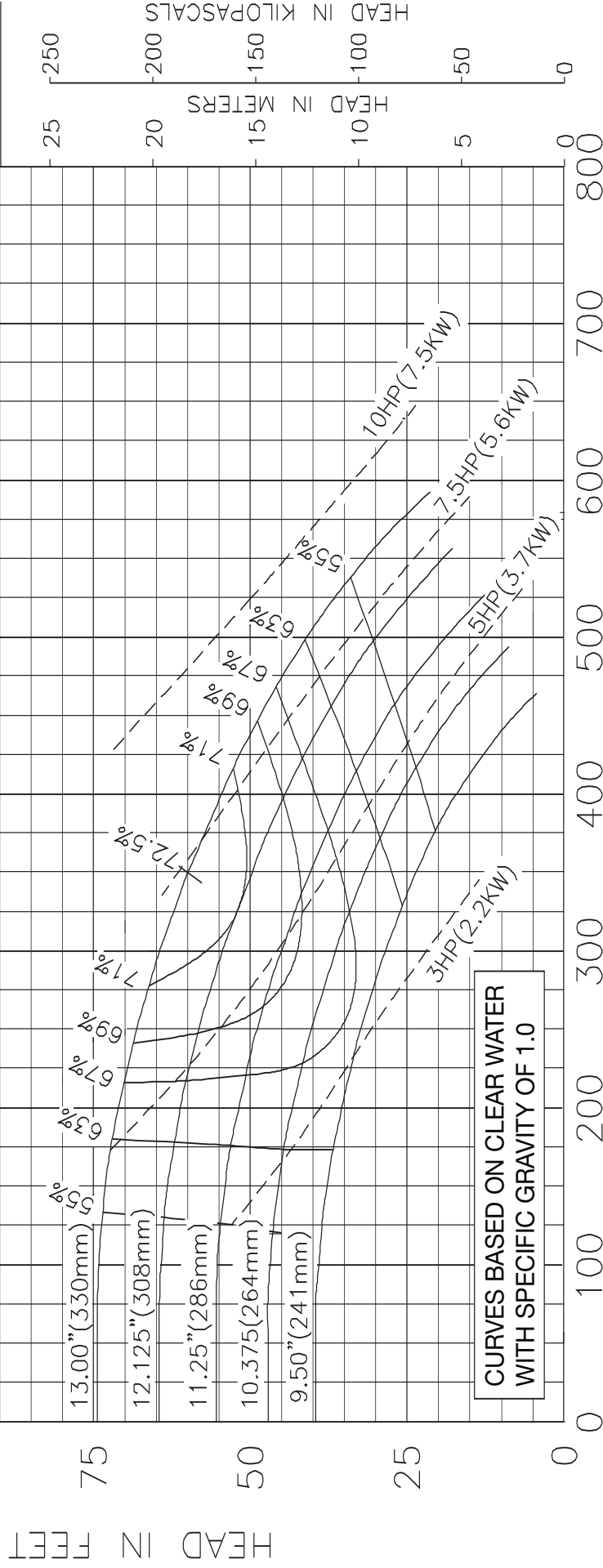


Model 3013
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2031
Min. Imp. Dia. 9.5"
Size 4 X 3 X 13.0

NPSH
FEET
0 4 8 12 16 20 24
METERS
0 1 2 3 4 5



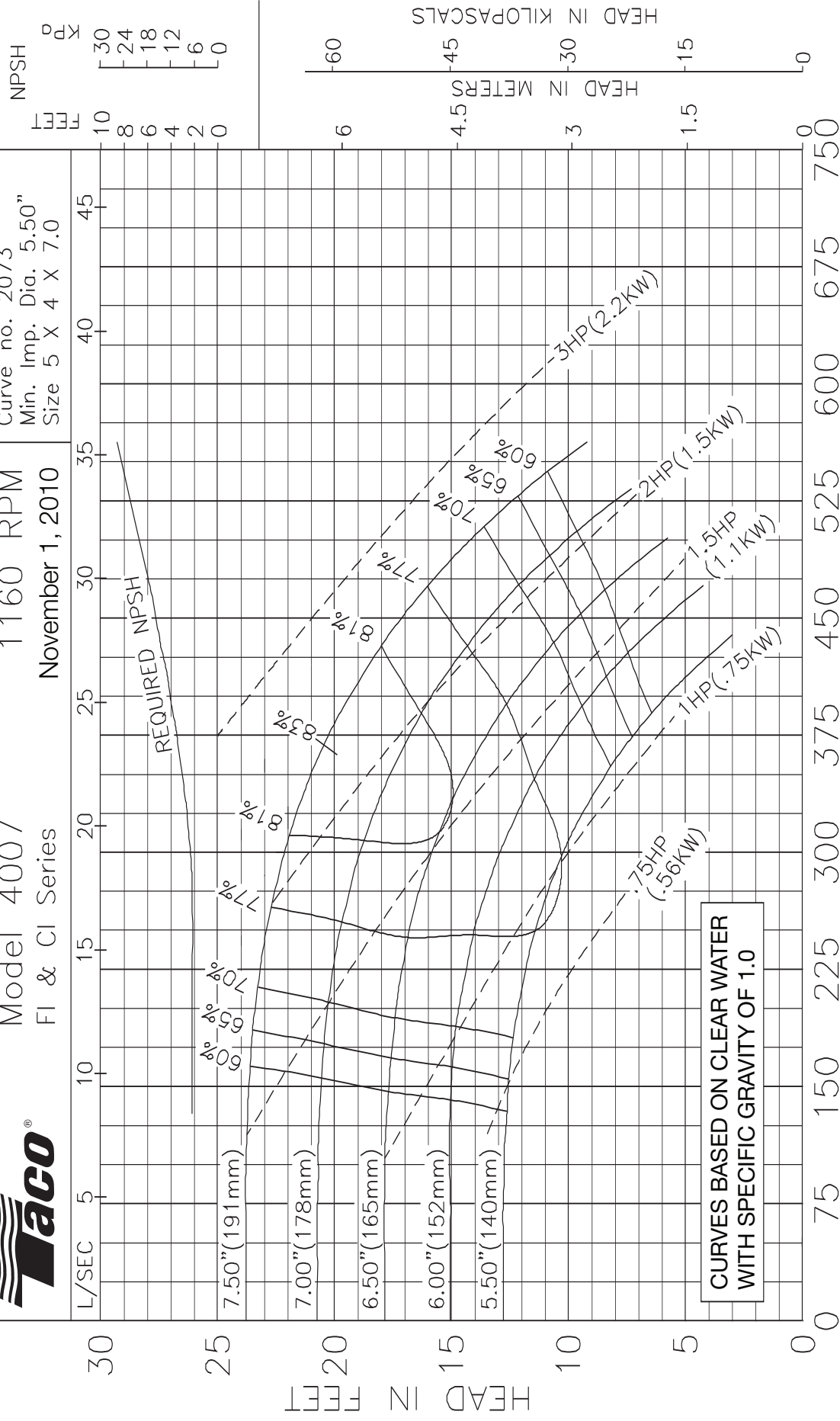
FLOW IN GALLONS PER MINUTE



Model 4007
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2073
Min. Imp. Dia. 5.50"
Size 5 X 4 X 7.0



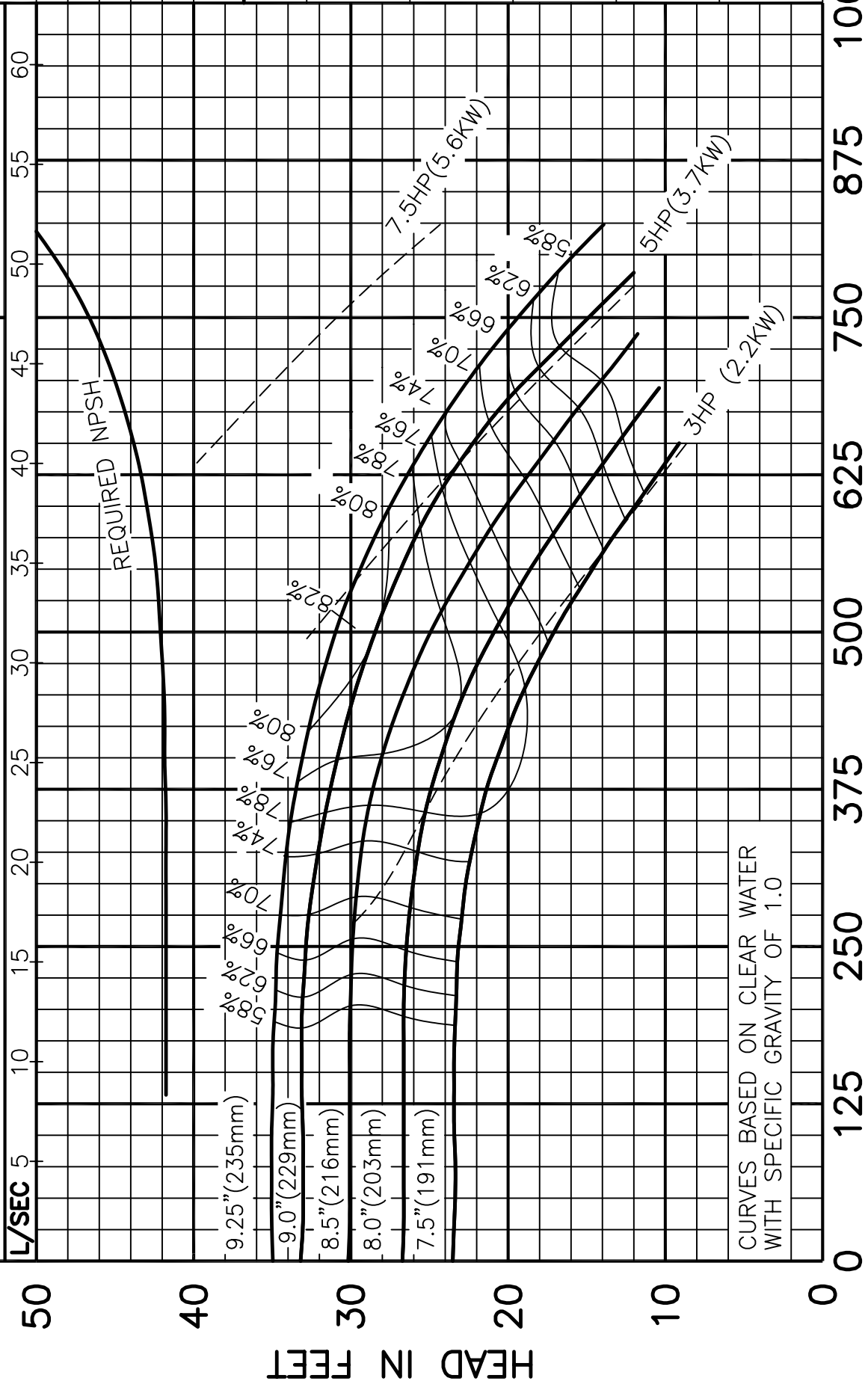
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0



Model 4009
FI & CI Series

1160 RPM
JANUARY, 3 2006

Curve no. 2290
Min. Imp. Dia 7.5"
Size 5 x 4 x 9.25



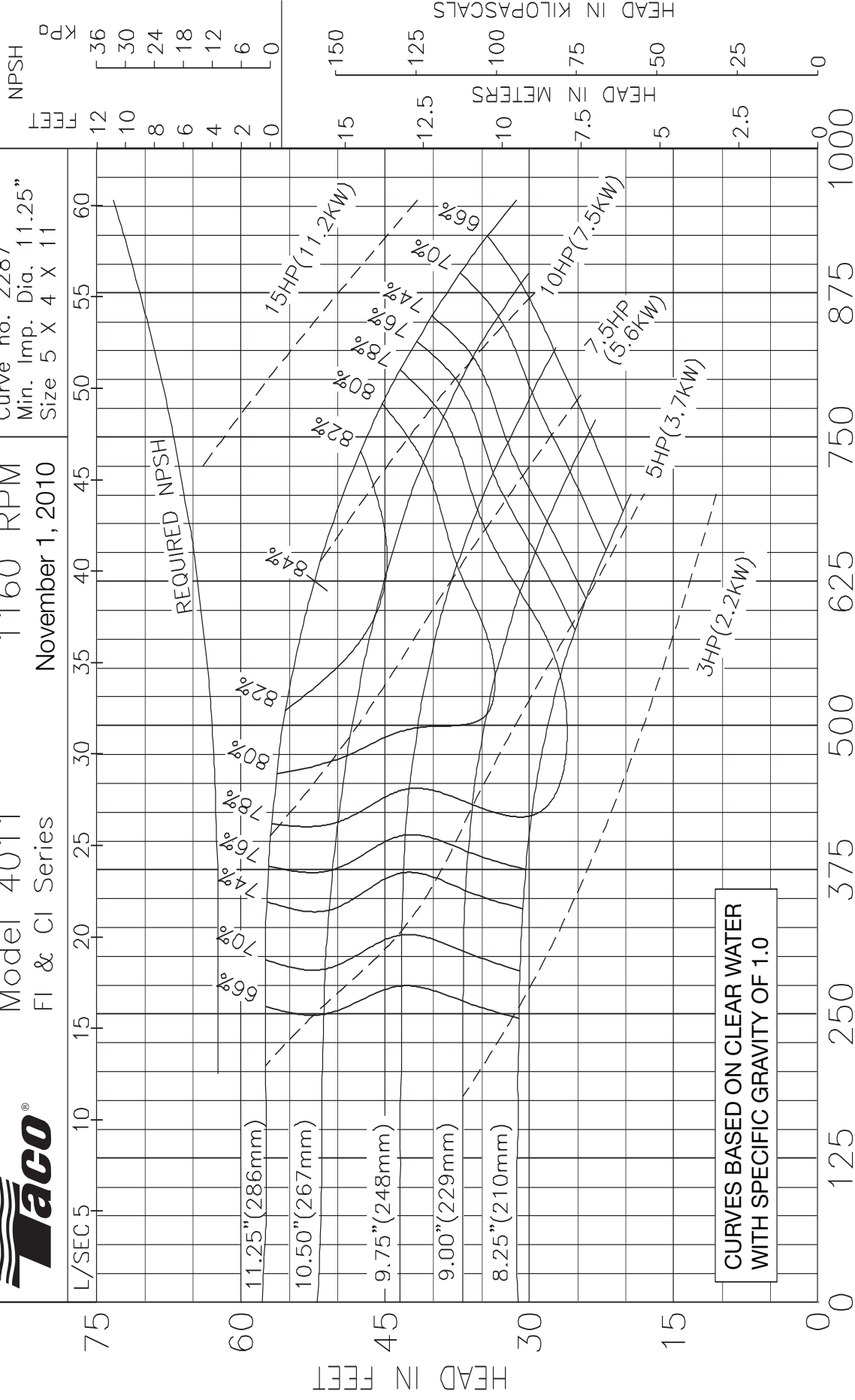
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0



Model 4011
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2287
Min. Imp. Dia. 11.25"
Size 5 X 4 X 11





Model 4013
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2313
Min. Imp. Dia. 6.75"
Size 5 X 4 X 13

NPSH
K_P
FEET

10
8
6
4
2
0

120
100
80
60
40
20
0

REQUIRED NPSH

CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

HEAD IN FEET

12.75" (241.3mm)

11.25" (229mm)

9.75" (216mm)

8.25" (203mm)

6.75" (111mm)

HEAD IN METERS
HEAD IN KILOPASCALS

25
20
15
10
5
0

250
200
150
100
50
0

0

5

10

15

20

25

30

35

40

45

50

55

60

65

70

75

80

85

90

95

100

105

110

115

120

125

130

135

140

145

150

155

160

165

170

175

180

185

190

195

200

205

210

215

220

225

230

235

240

245

250

255

260

265

270

275

280

285

290

295

300

305

310

315

320

325

330

335

340

345

350

355

360

365

370

375

380

385

390

395

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405

410

415

420

425

430

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705

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715

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725

730

735

740

745

750

755

760

765

770

775

780

785

790

795

800

805

810

815

820

825

830

835

840

845

850

855

860

865

870

875

880

885

890

895

900

905

910

915

920

925

930

935

940

945

950

955

960

965

970

975

980

985

990

995

1000

1005

1010

1015

1020

1025

1030

1035

1040

1045

1050

1055

1060

1065

1070

1075

1080

1085

1090

1095

1100

1105

1110

1115

1120

1125

1130

1135

1140

1145

1150

1155

1160

1165

1170

1175

1180

1185

1190

1195

1200

1205

1210

1215

1220

1225

1230

1235

1240

1245

1250

1255

1260

1265

1270

1275

1280

1285

1290

1295

1300

1305

1310

1315

1320

1325

1330

1335

1340

1345

1350

1355

1360

1365

1370

1375

1380

1385

1390

1395

1400

1405

1410

1415

1420

1425

1430

1435

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1460

1465

1470

1475

1480

1485

1490

1495

1500

1505

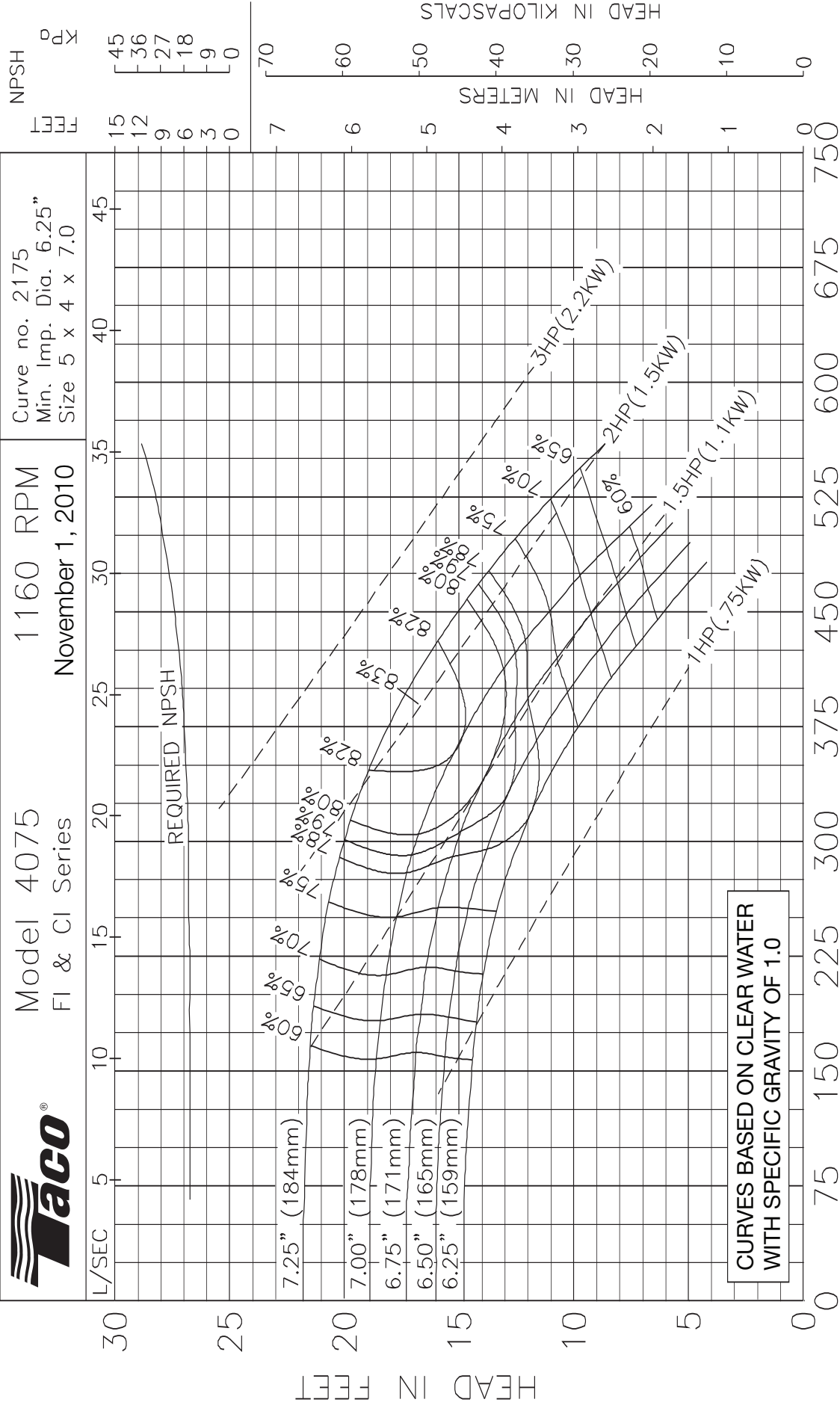
1510



Model 4075
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2175
Min. Imp. Dia. 6.25"
Size 5 x 4 x 7.0

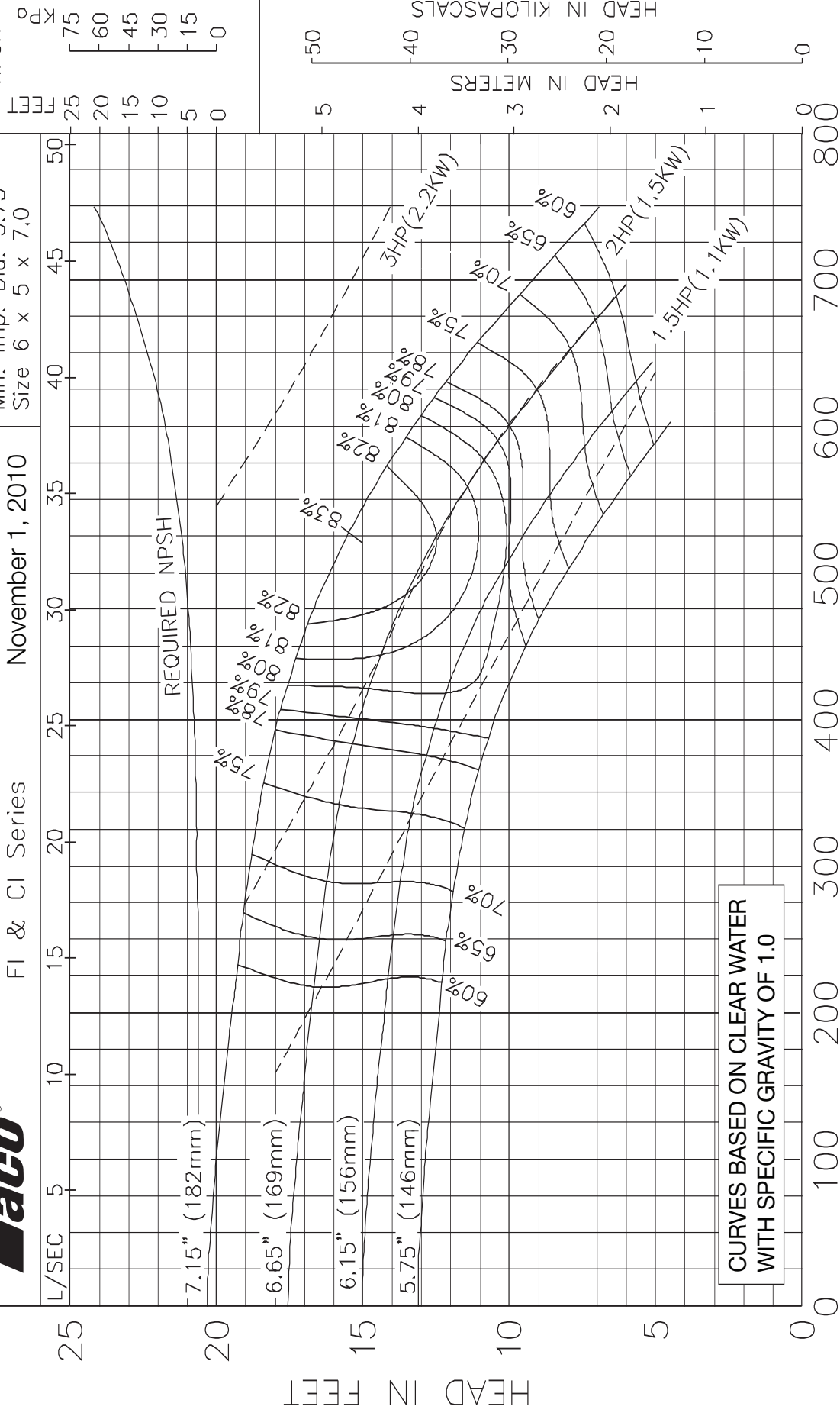


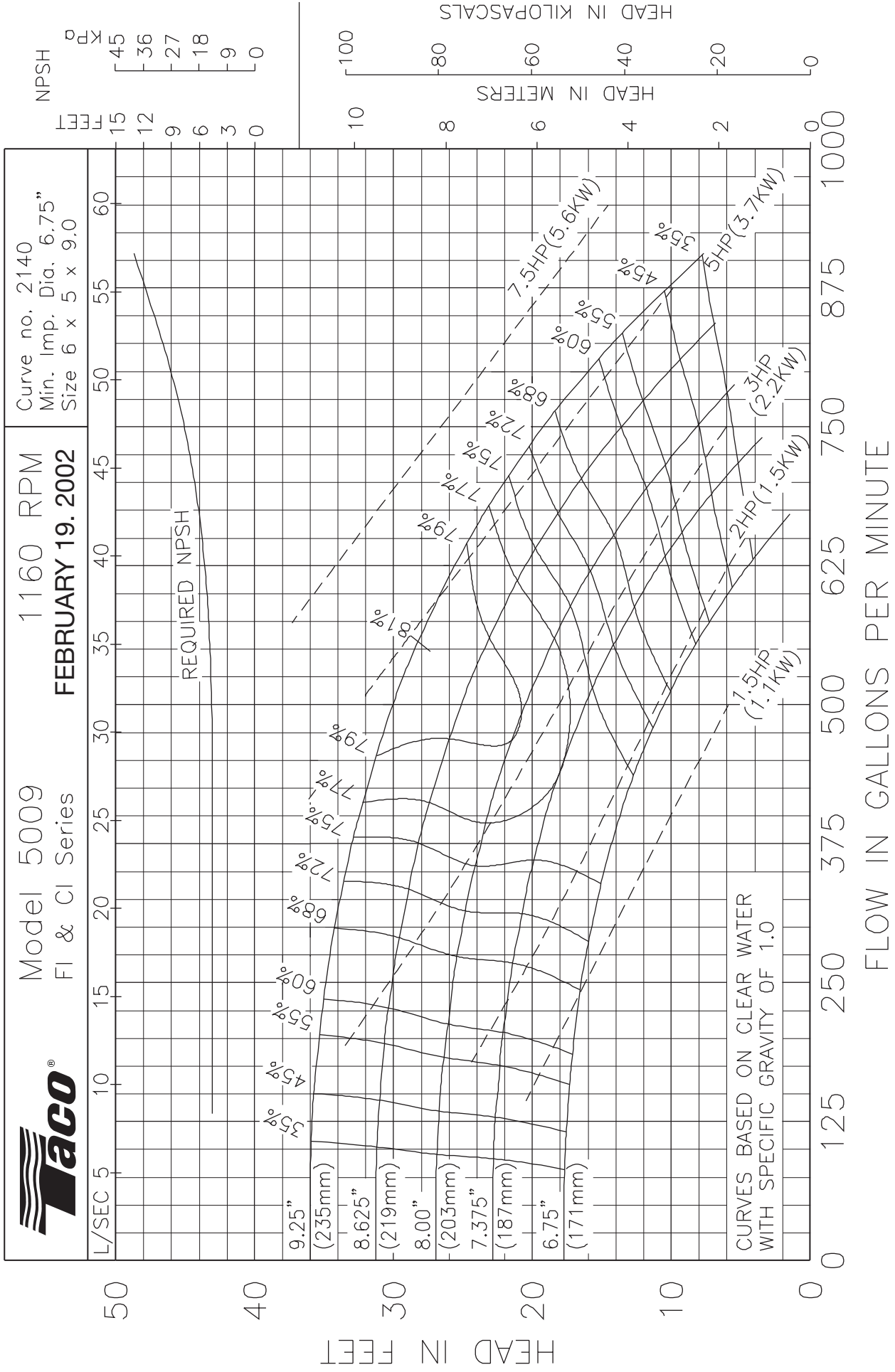


Model 5007
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2169
Min. Imp. Dia. 5.75"
Size 6 x 5 x 7.0



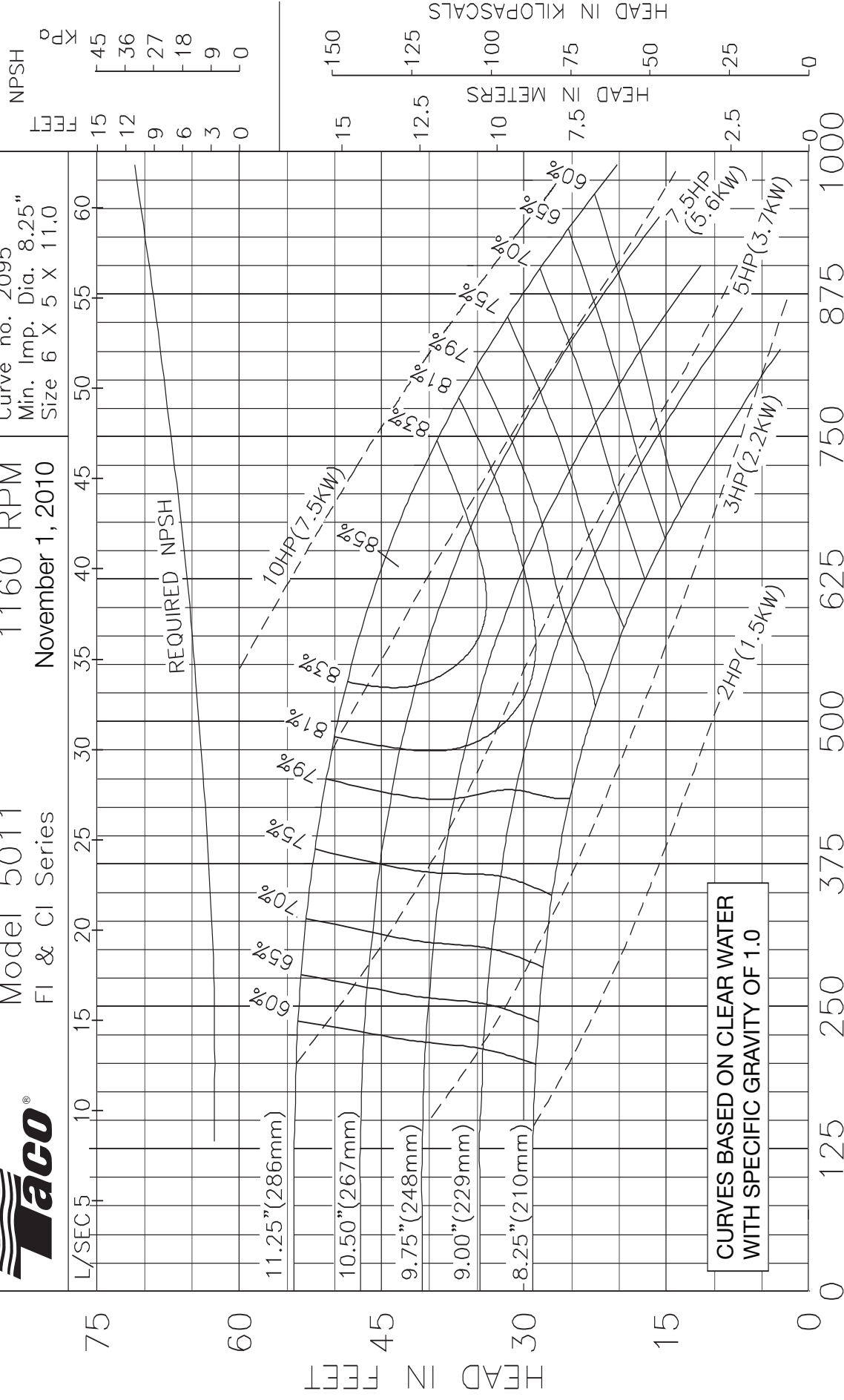




Model 5011
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2095
Min. Imp. Dia. 8.25"
Size 6 X 5 X 11.0

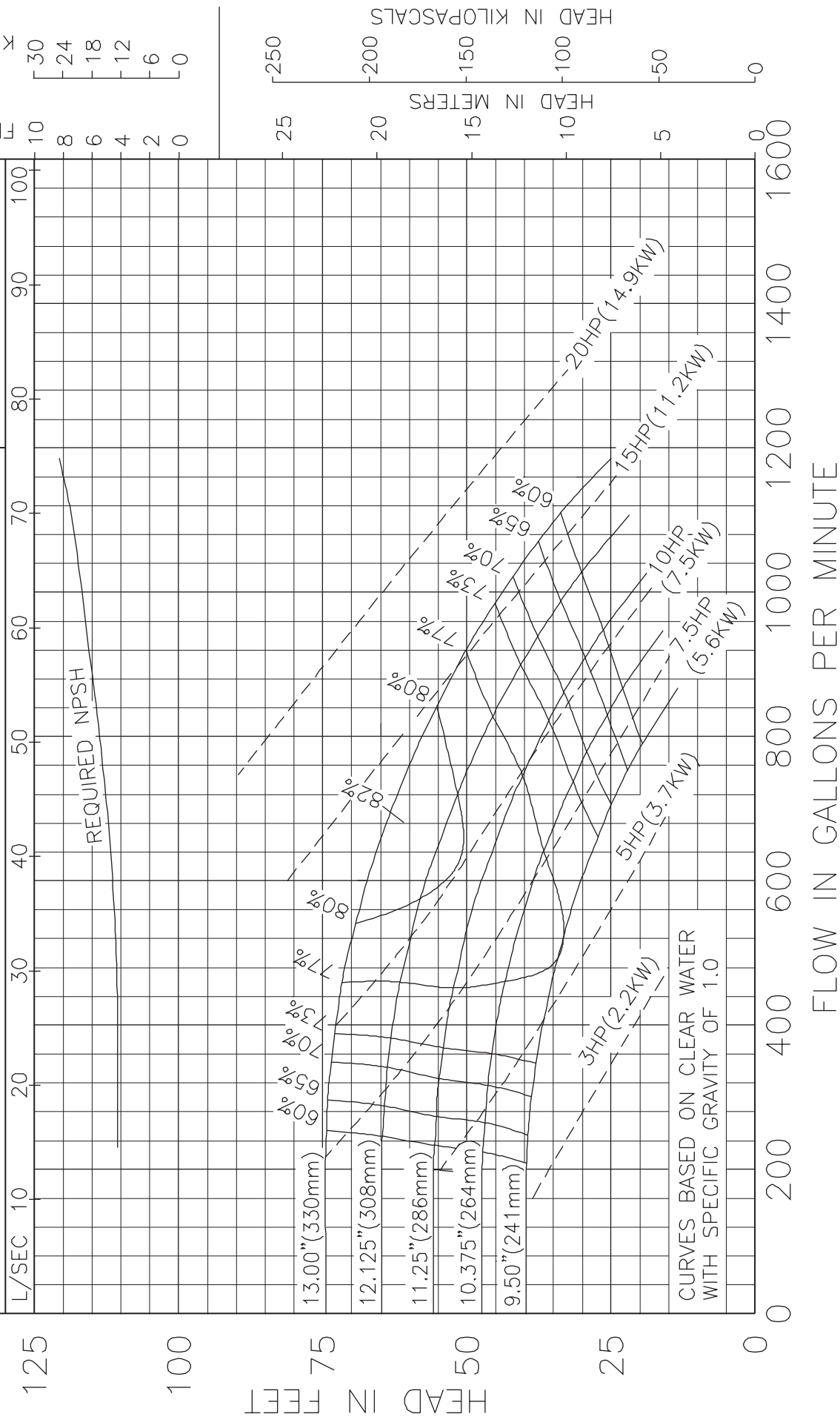


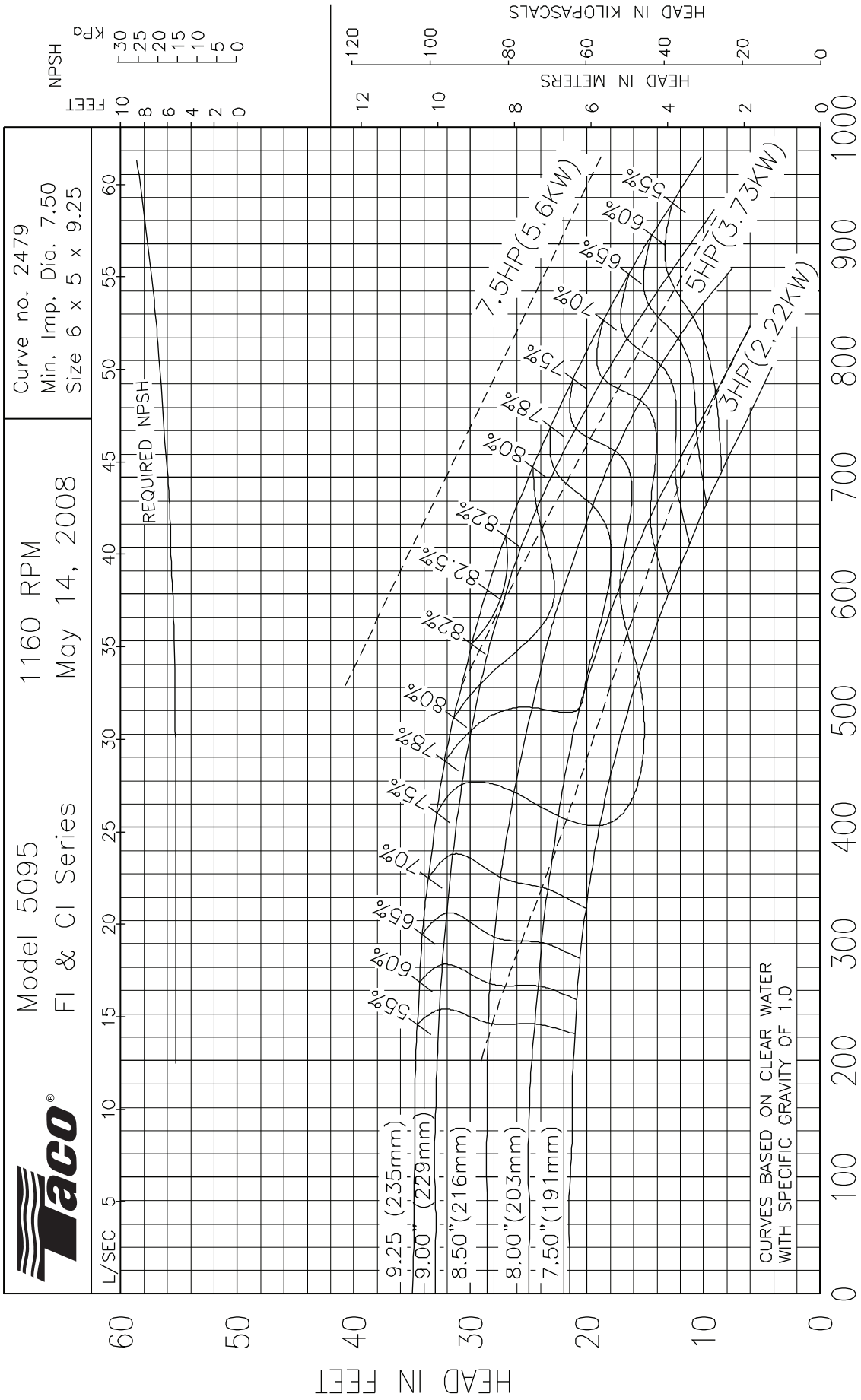
File Series

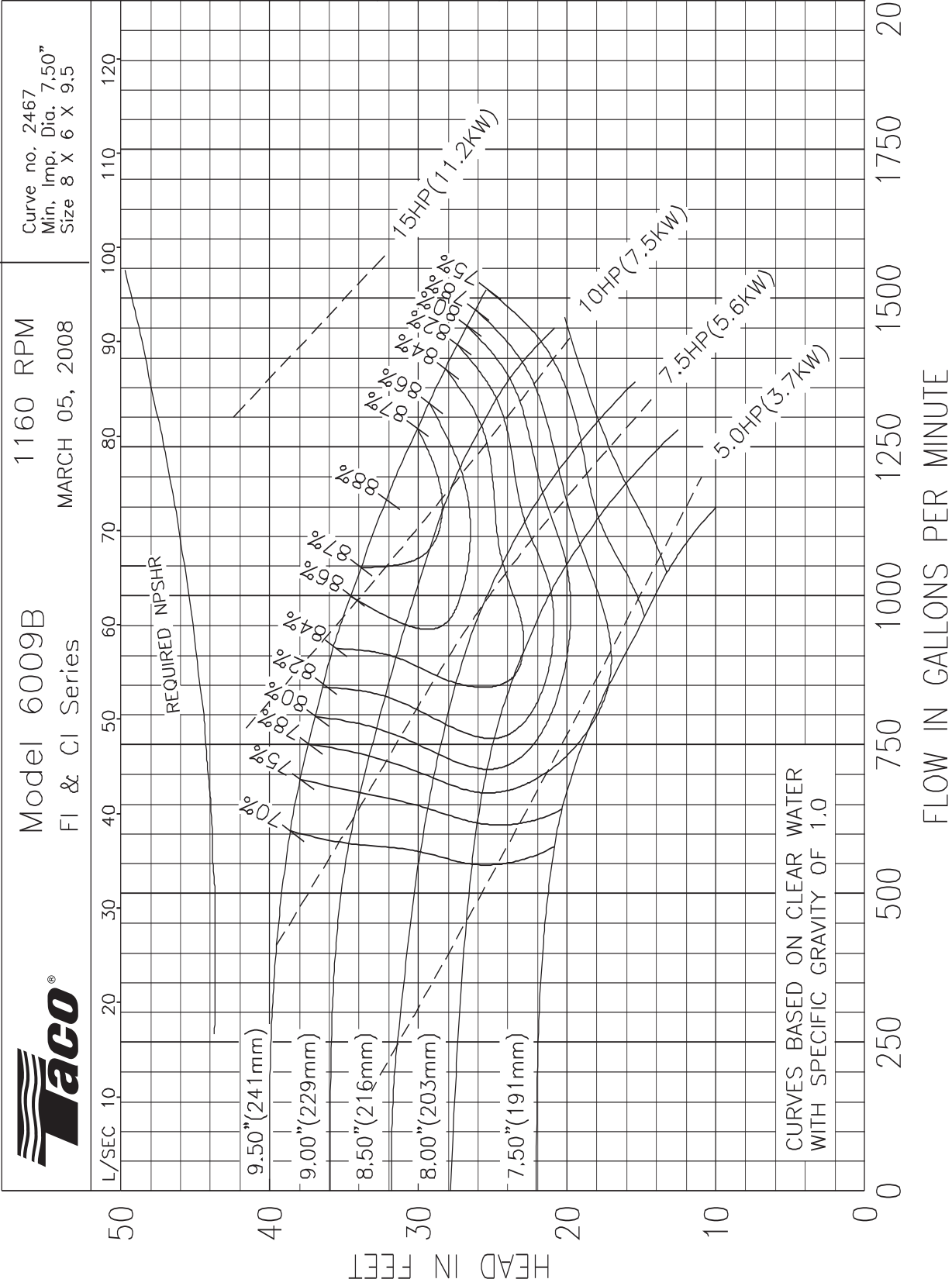
1160 RPM

FEBRUARY 21, 2002

Curve no. 2105
Min. Imp. Dia. 9.50"
Size 6 X 5 X 13.0





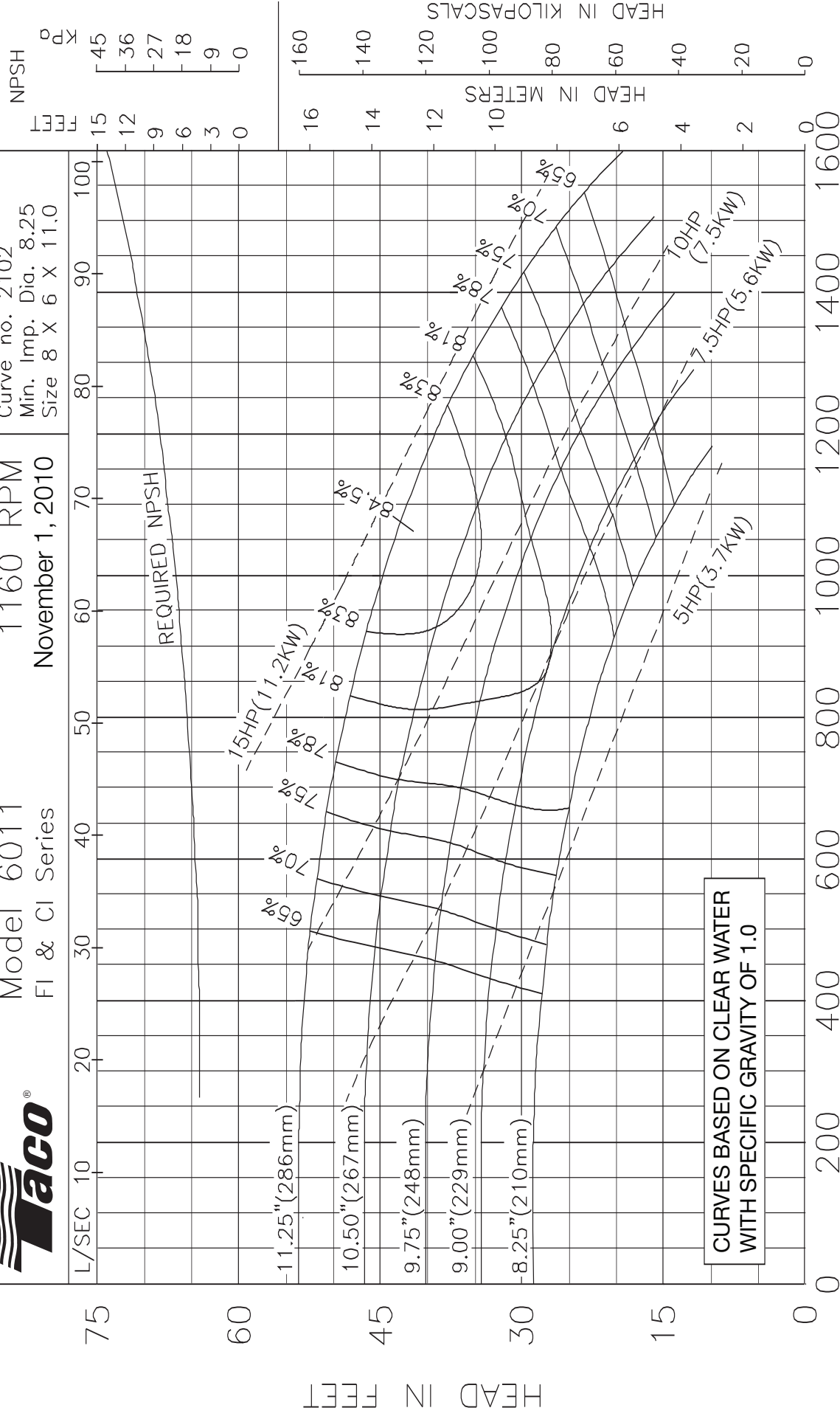




Model 6011
FI & CI Series

1160 RPM
November 1, 2010

Curve no. 2102
Min. Imp. Dia. 8.25
Size 8 X 6 X 11.0

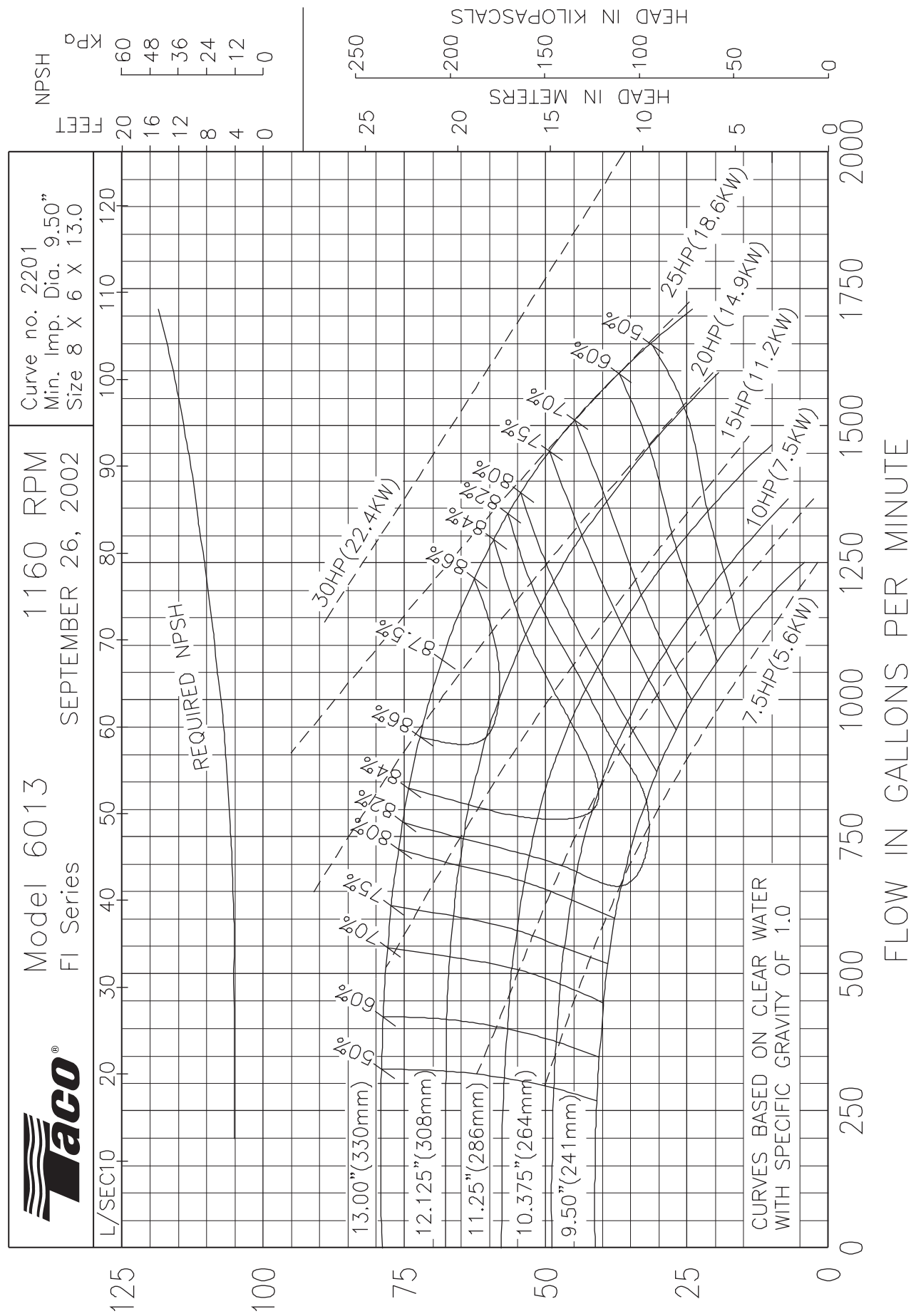


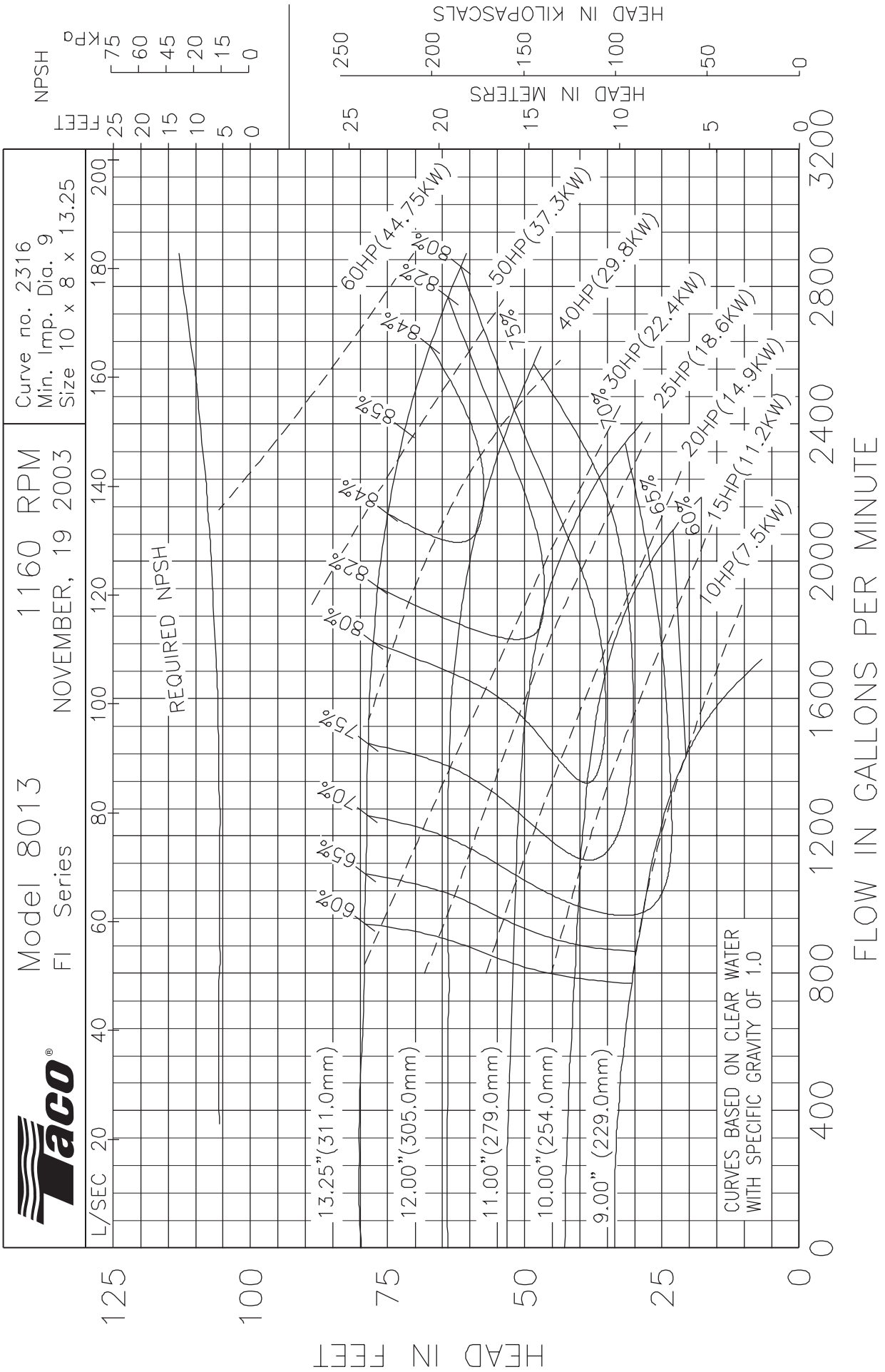
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

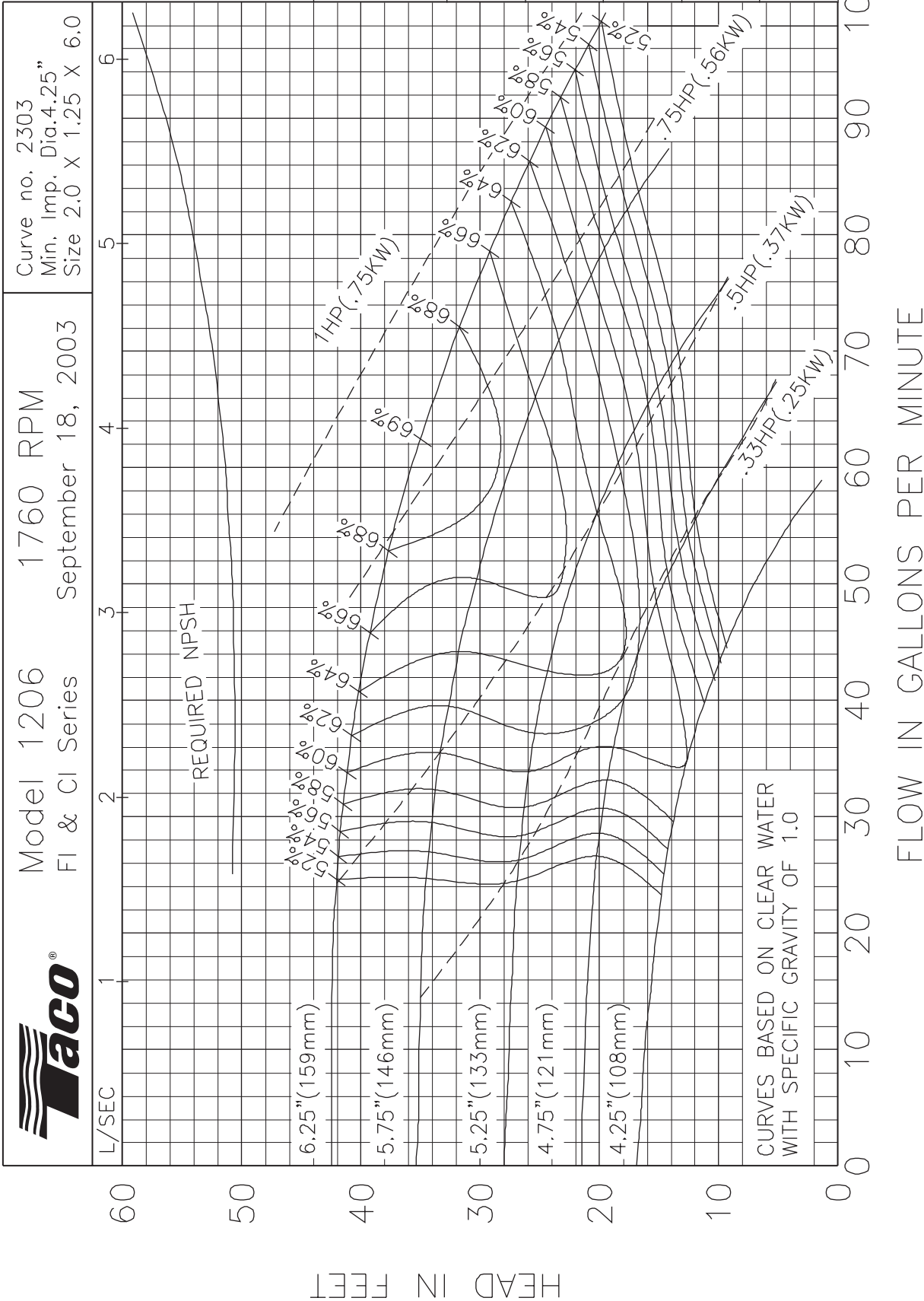
Fl Series

SEPTEMBER 26, 2002

Curve no. 2201
Min. Imp. Dia. 9.50"
Size 8 X 6 X 13.0





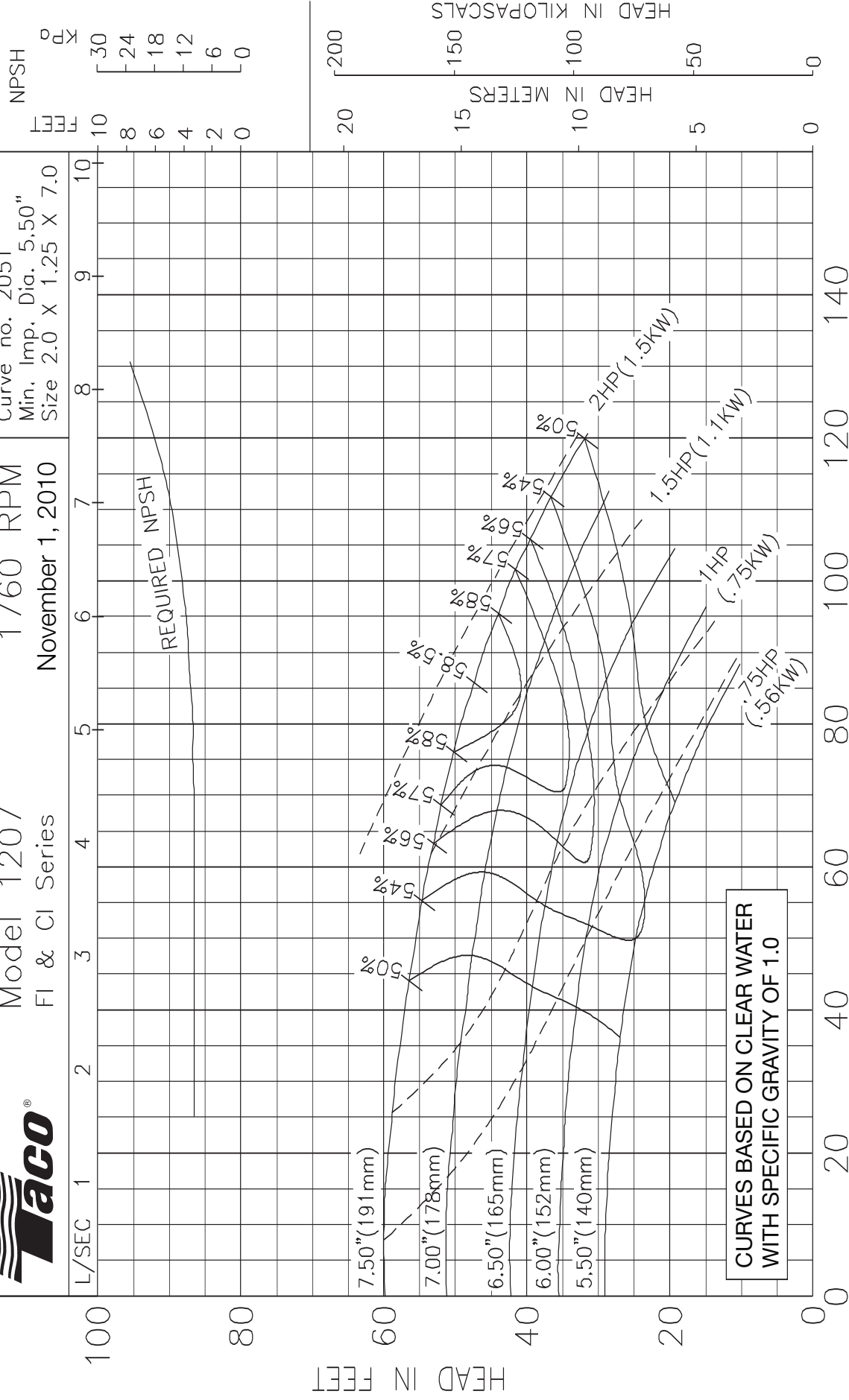




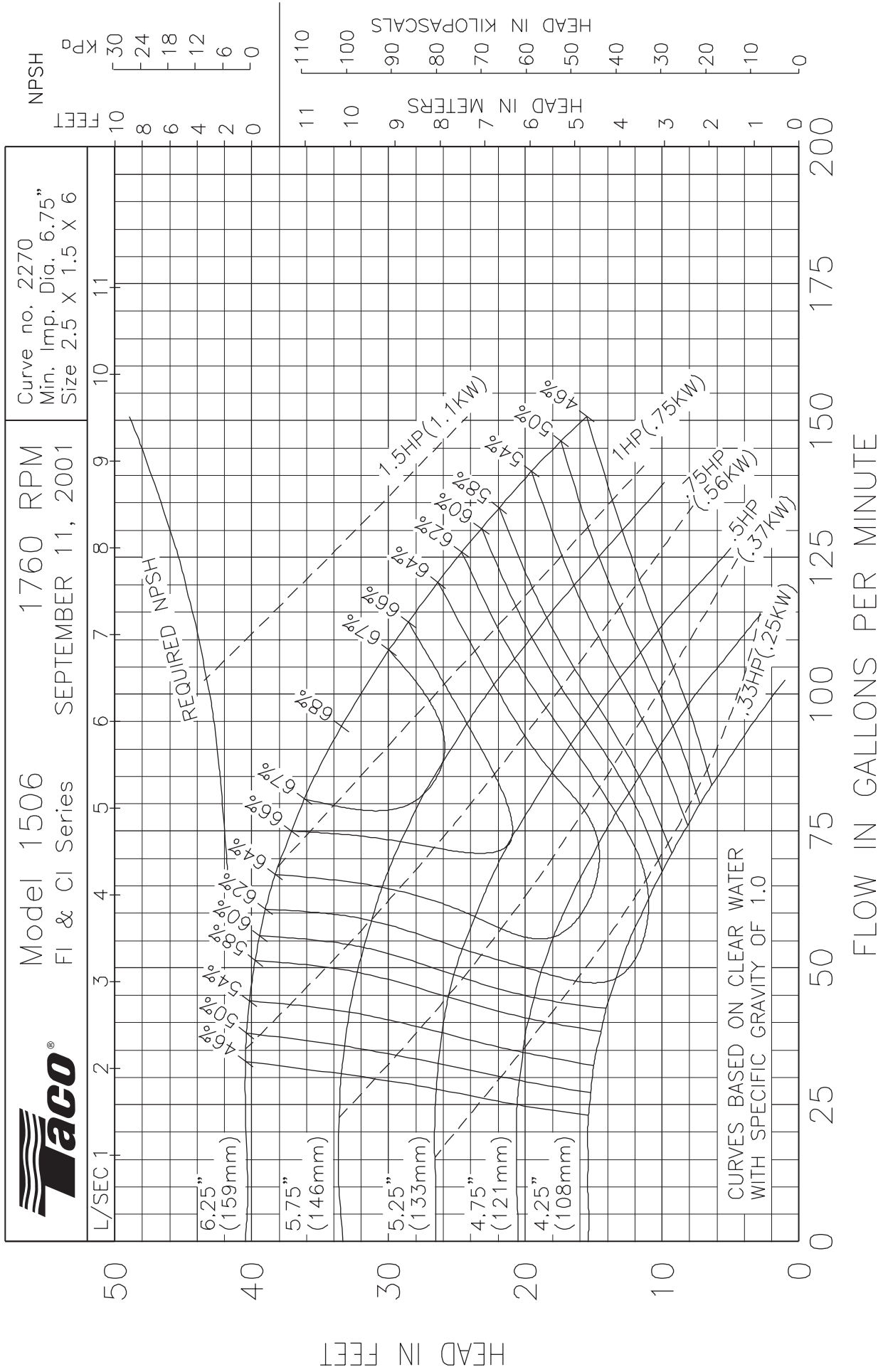
Model 1207
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2051
Min. Imp. Dia. 5.50"
Size 2.0 X 1.25 X 7.0



CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

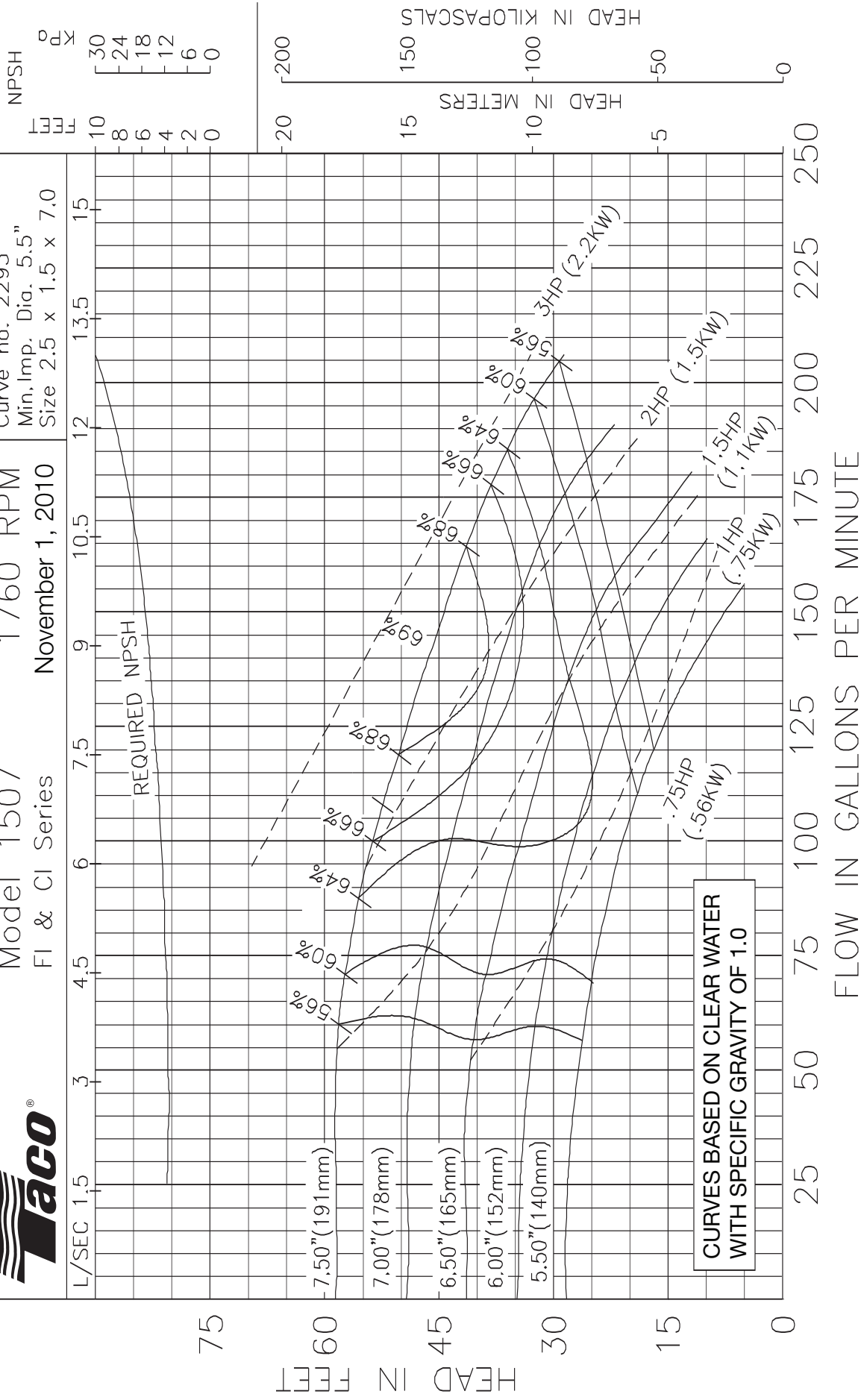




Model 1507
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2293
Min. Imp. Dia. 5.5"
Size 2.5 x 1.5 x 7.0

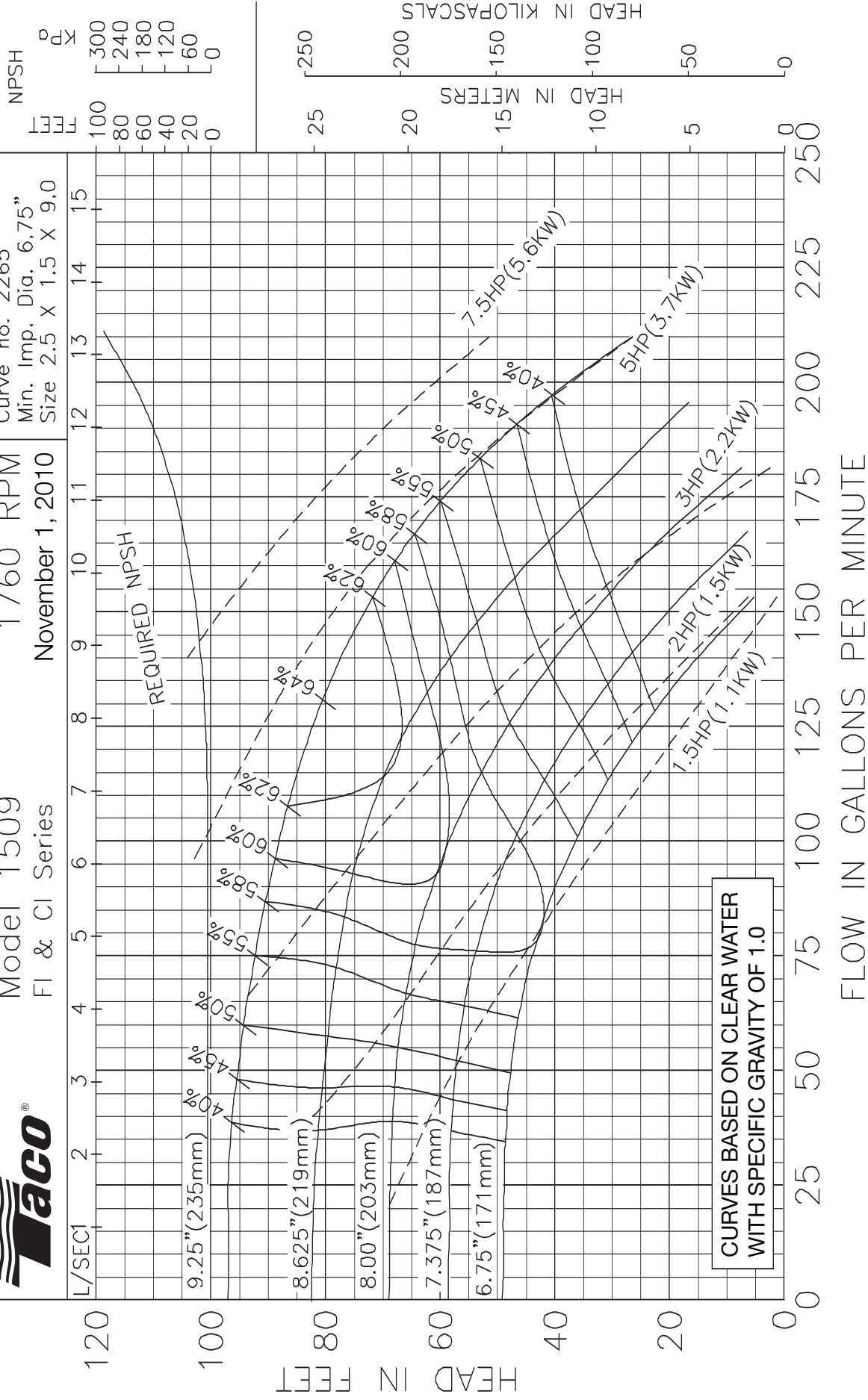


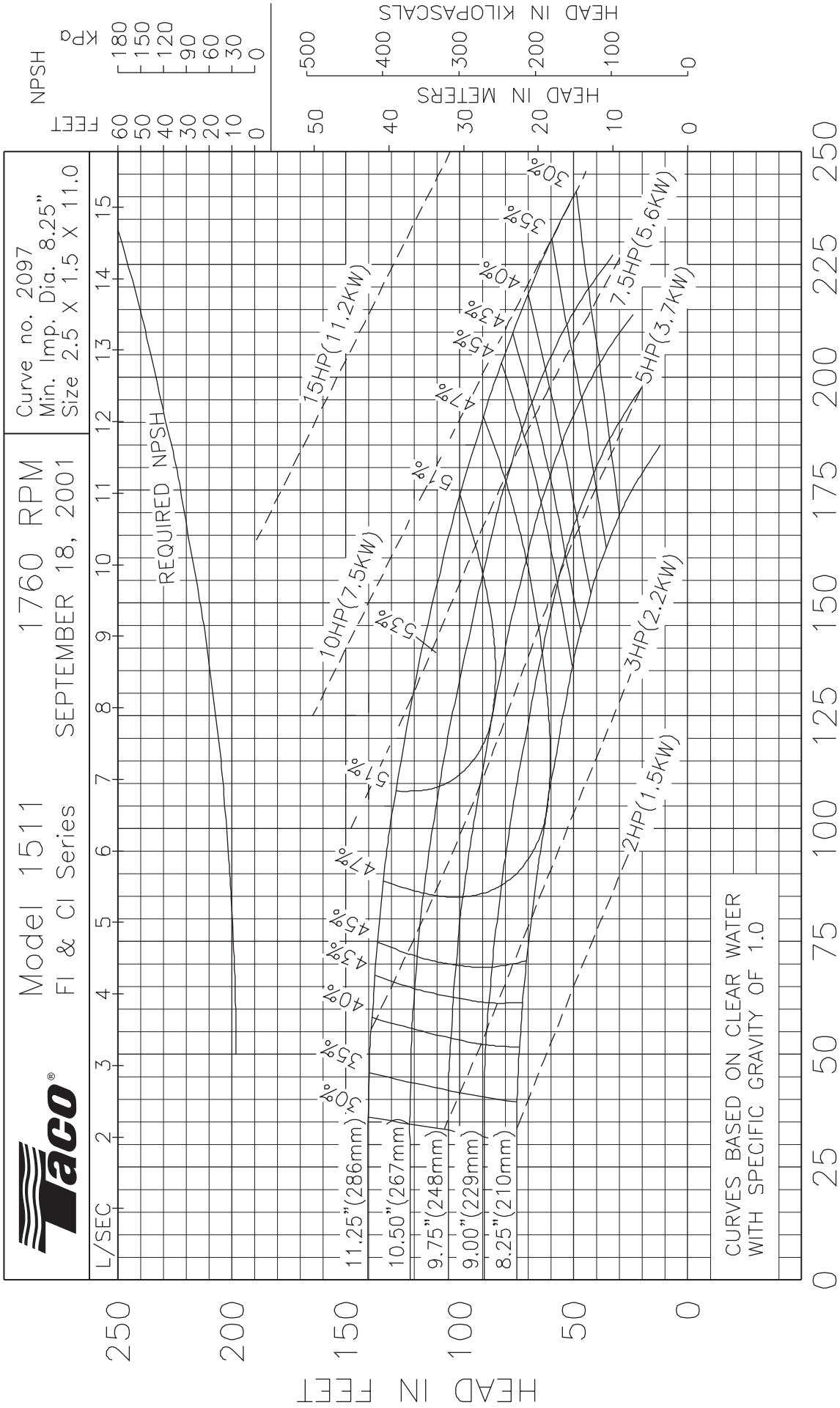


Model 1509
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2265
Min. Imp. Dia. 6.75"
Size 2.5 x 1.5 x 9.0





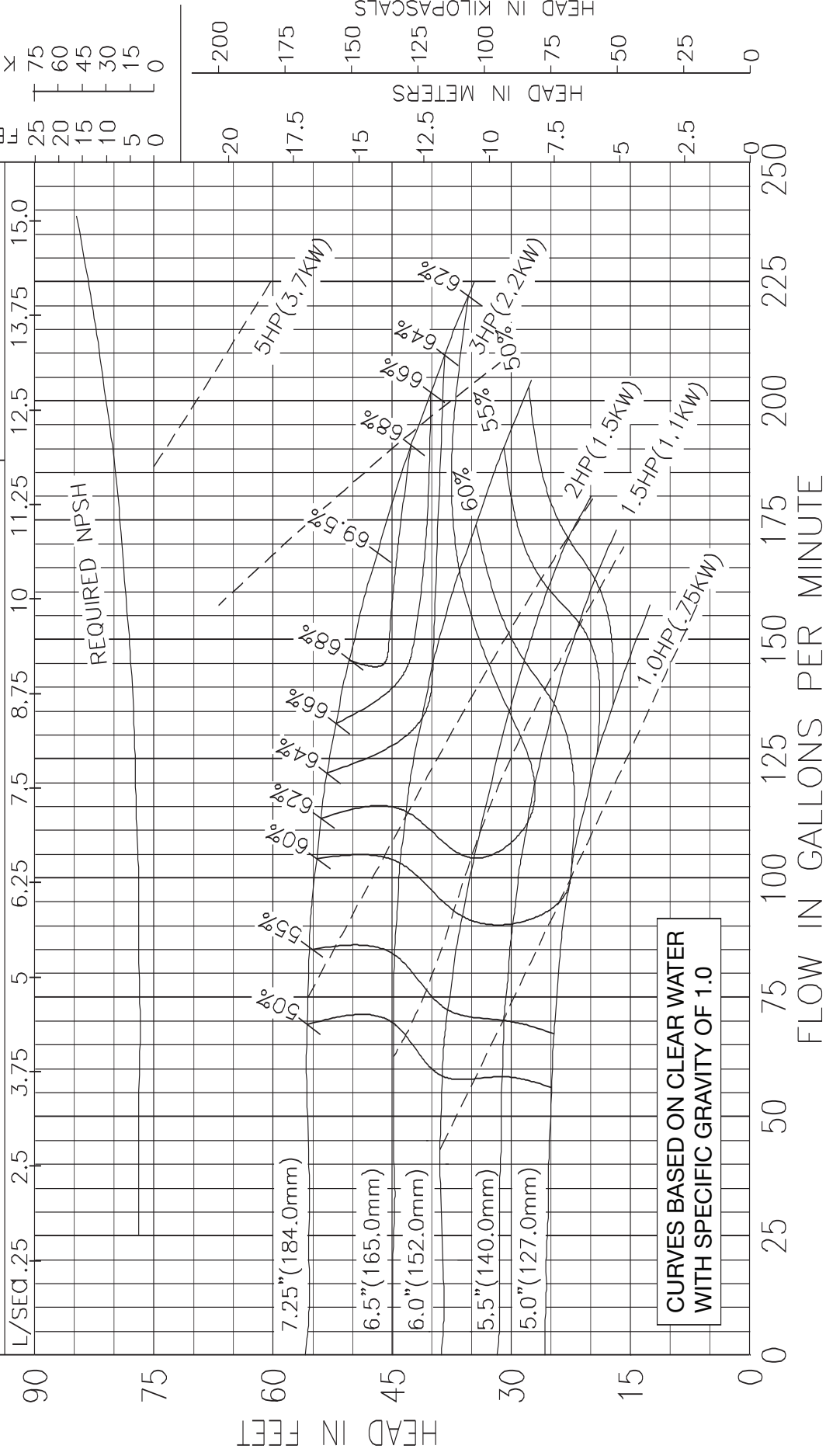


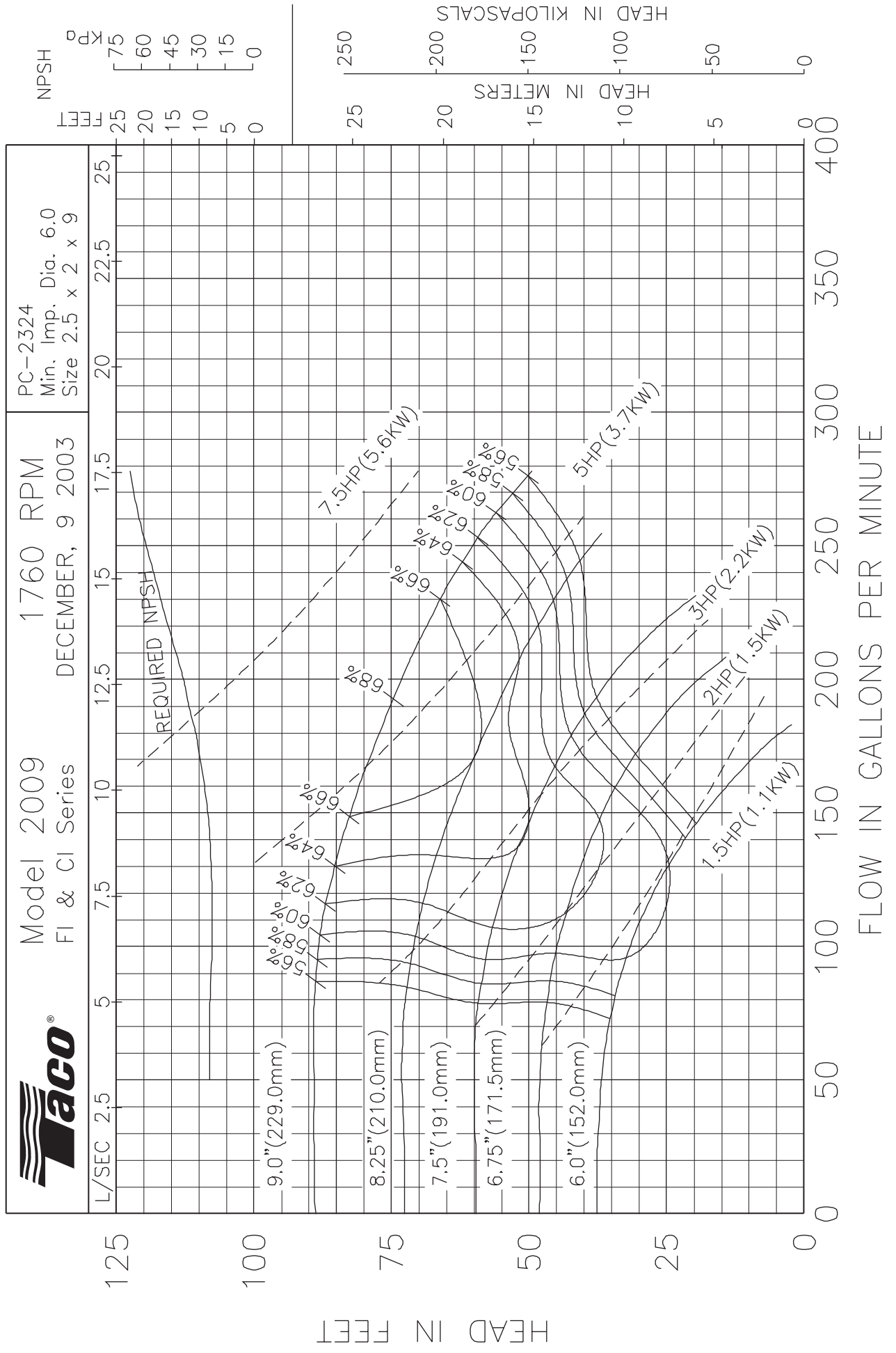
Model 2007
CI FI Series

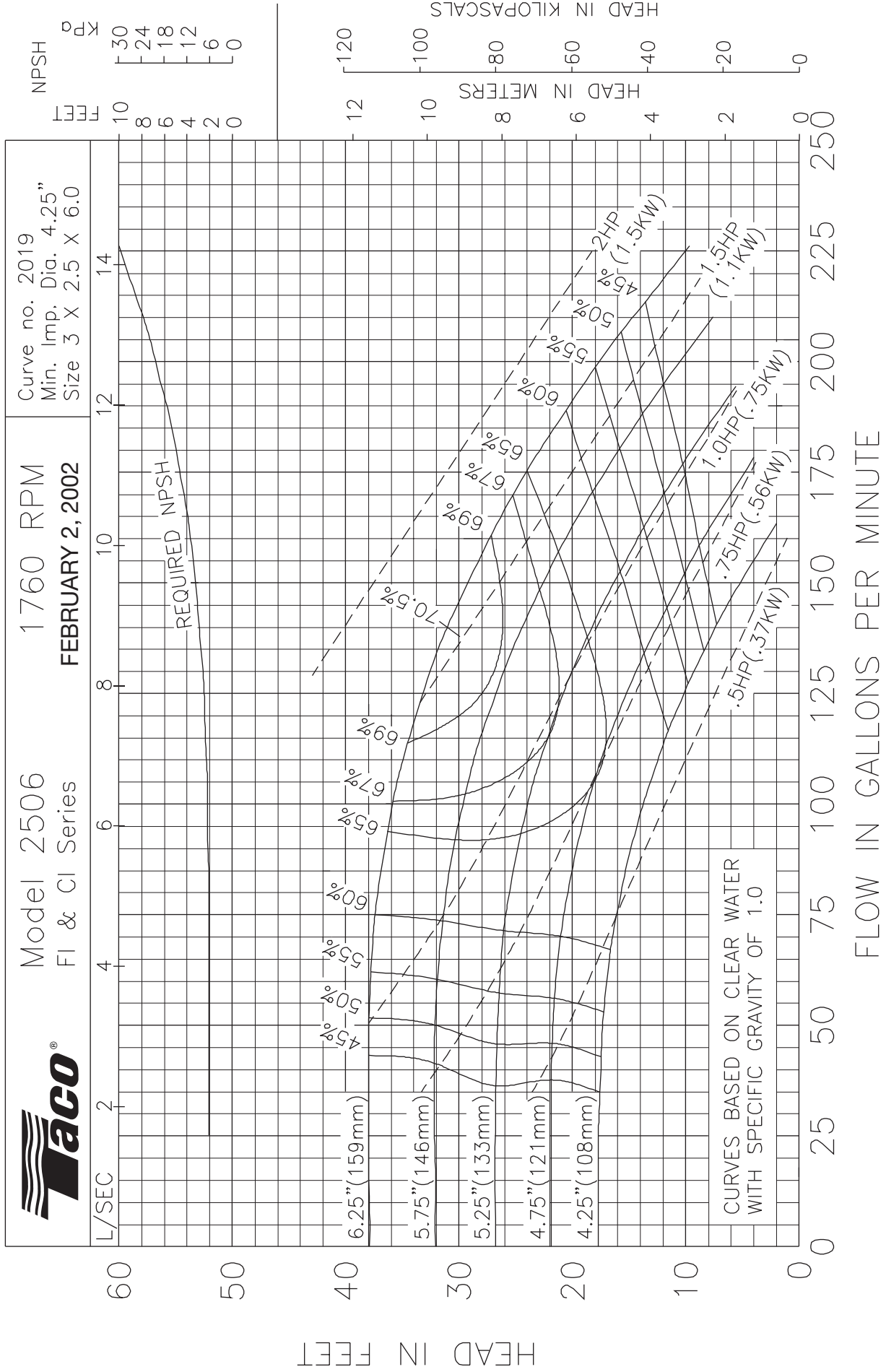
1760 RPM
November 1, 2010

Curve no. 2319

Min. Imp. Dia. 5.0"
Size 2.5 X 2 X 7.25







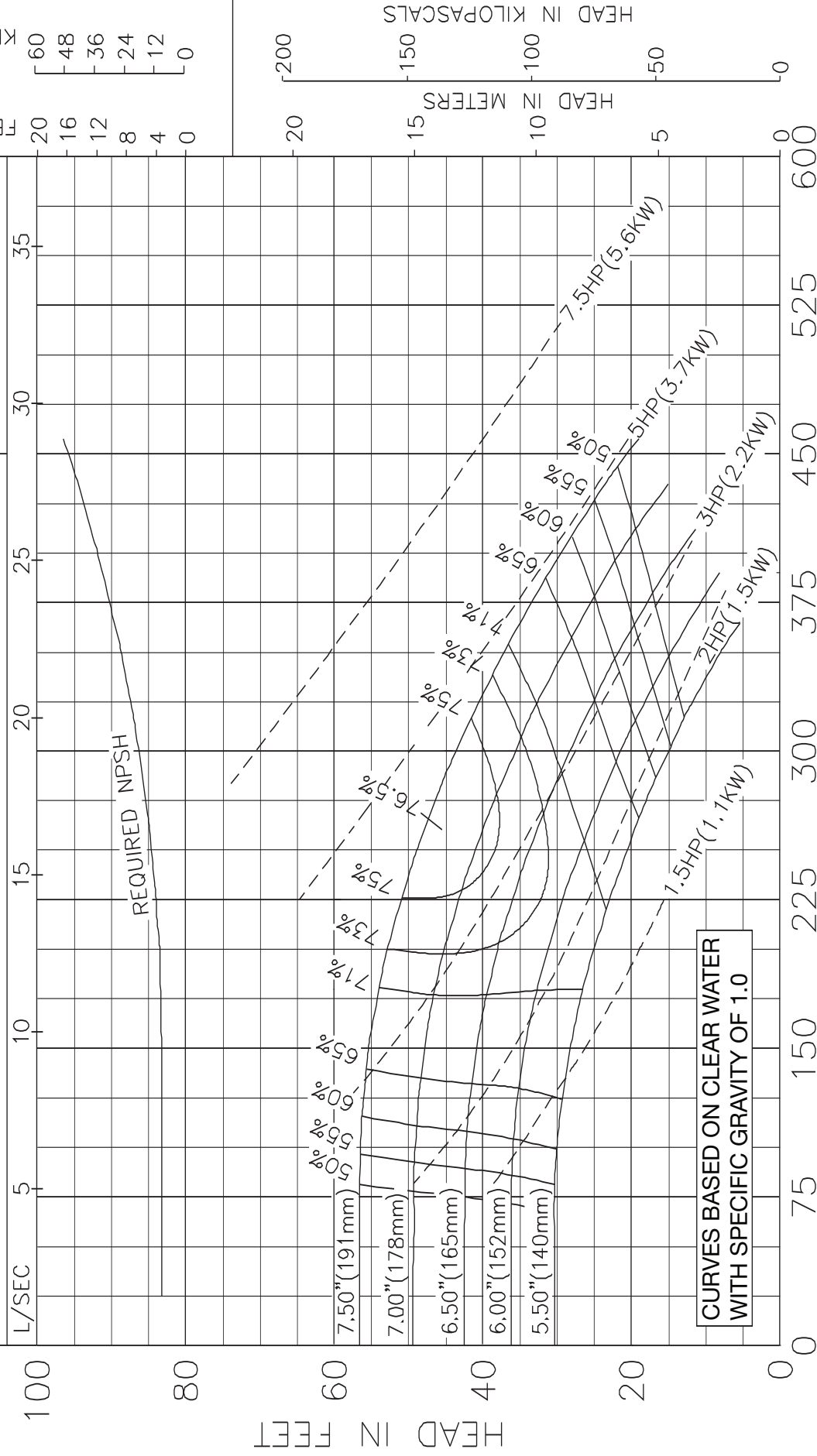


Model 2507
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2061
Min. Imp. Dia. 5.50"
Size 3 X 2.5 X 7.0

NPSH
FEET
0 4 8 12 16 20
METERS
0 1 2 3 4 5



CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

FLOW IN GALLONS PER MINUTE

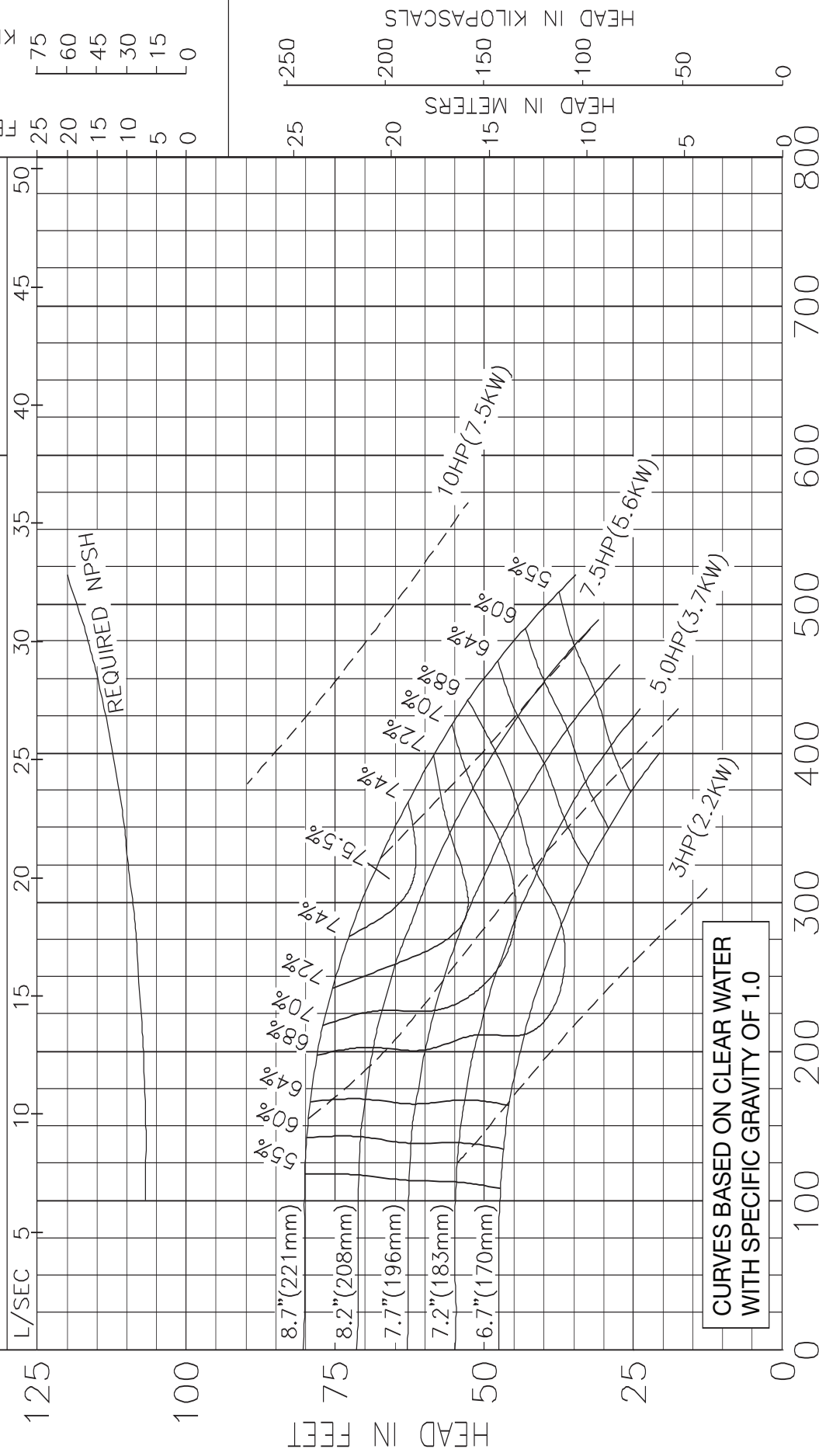


Model 2508
FI & CI Series

1760 RPM
November 1, 2010

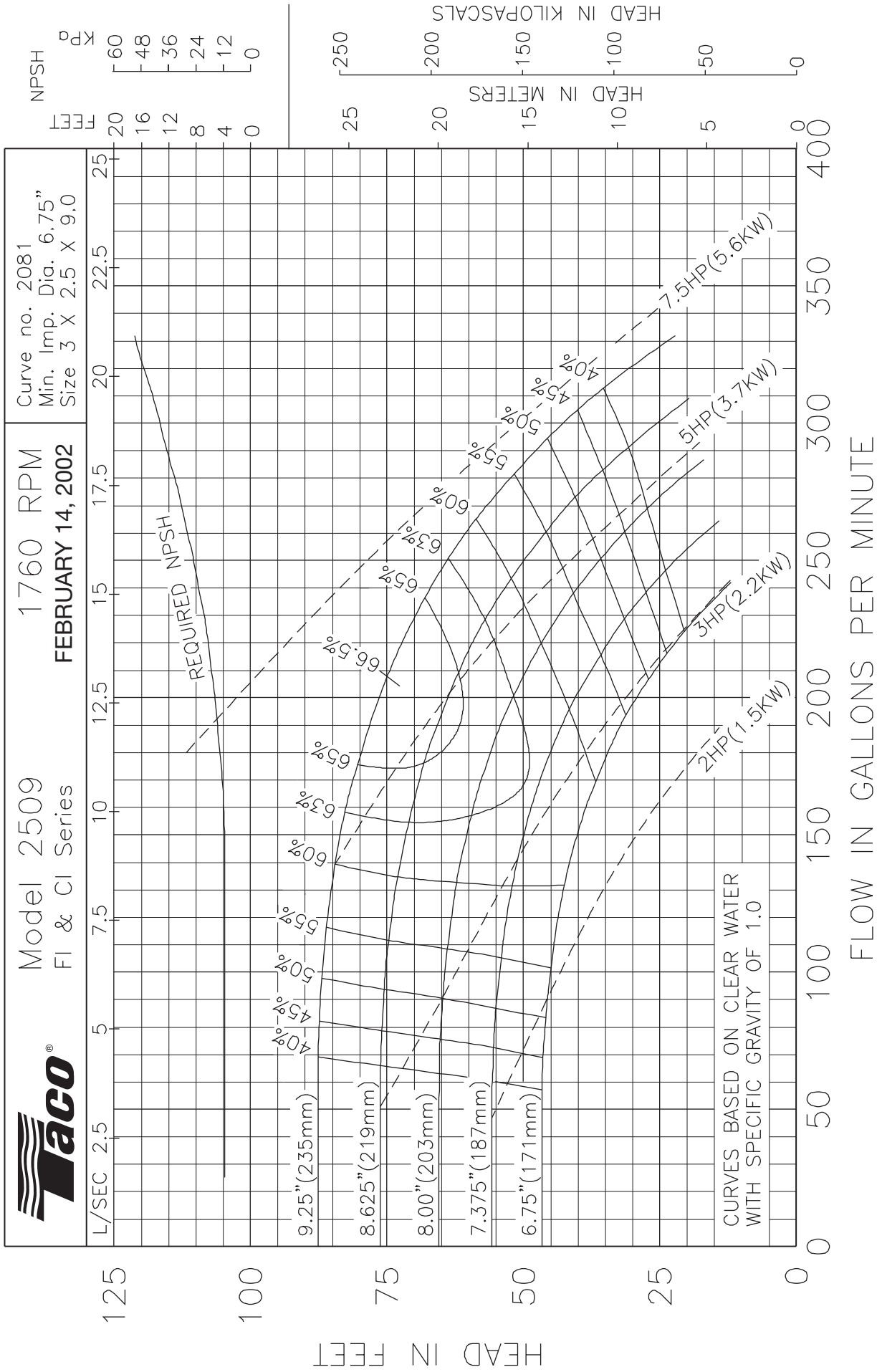
Curve no. 2221
Min. Imp. Dia
Size 3 X 2.5 X 8.5
6.7"

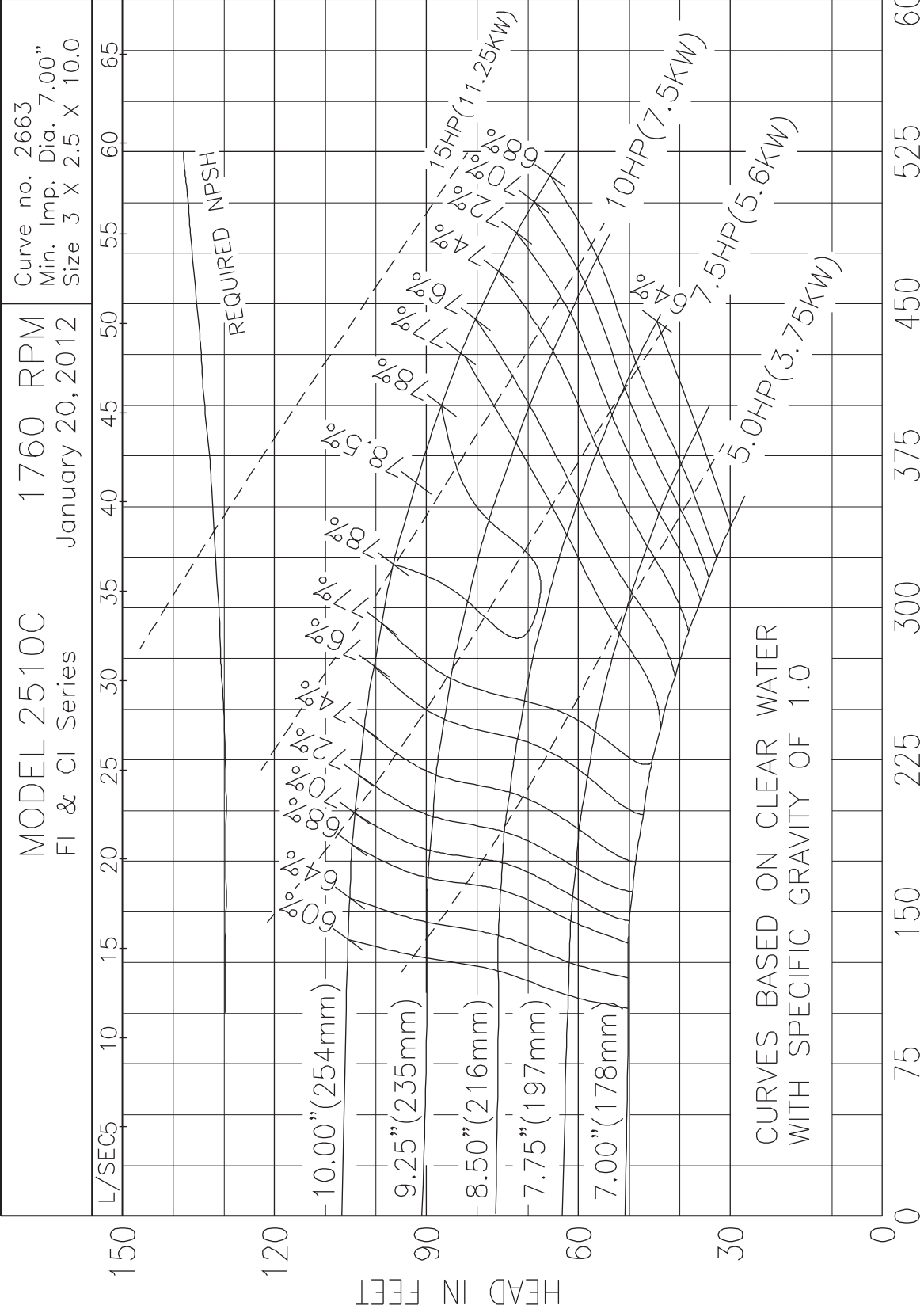
NPSH
Feet
0 5 10 15 20 25
0 15 30 45 60 75
Meters



CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

FLOW IN GALLONS PER MINUTE



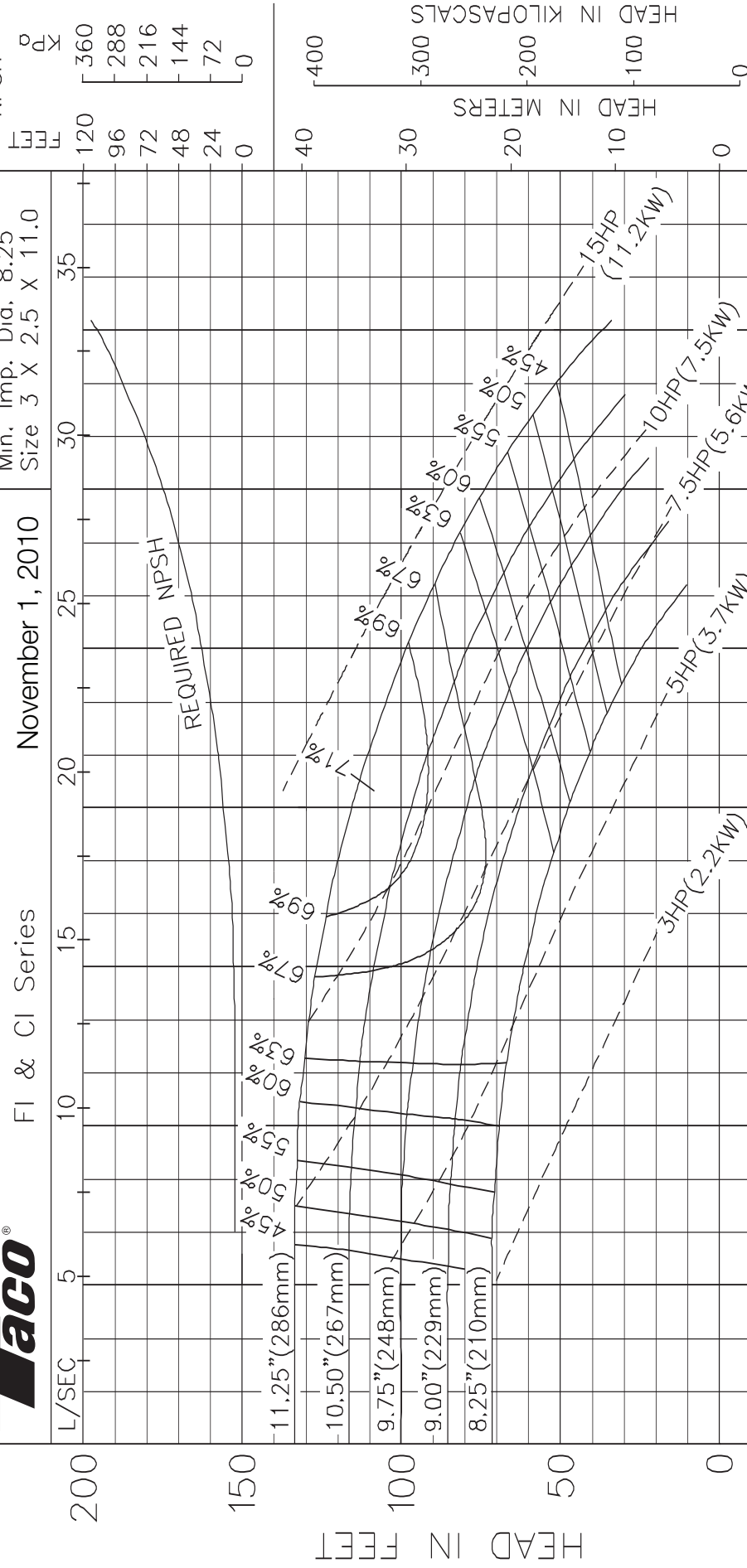




Model 2511
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2087
Min. Imp. Dia. 8.25"
Size 3 X 2.5 X 11.0



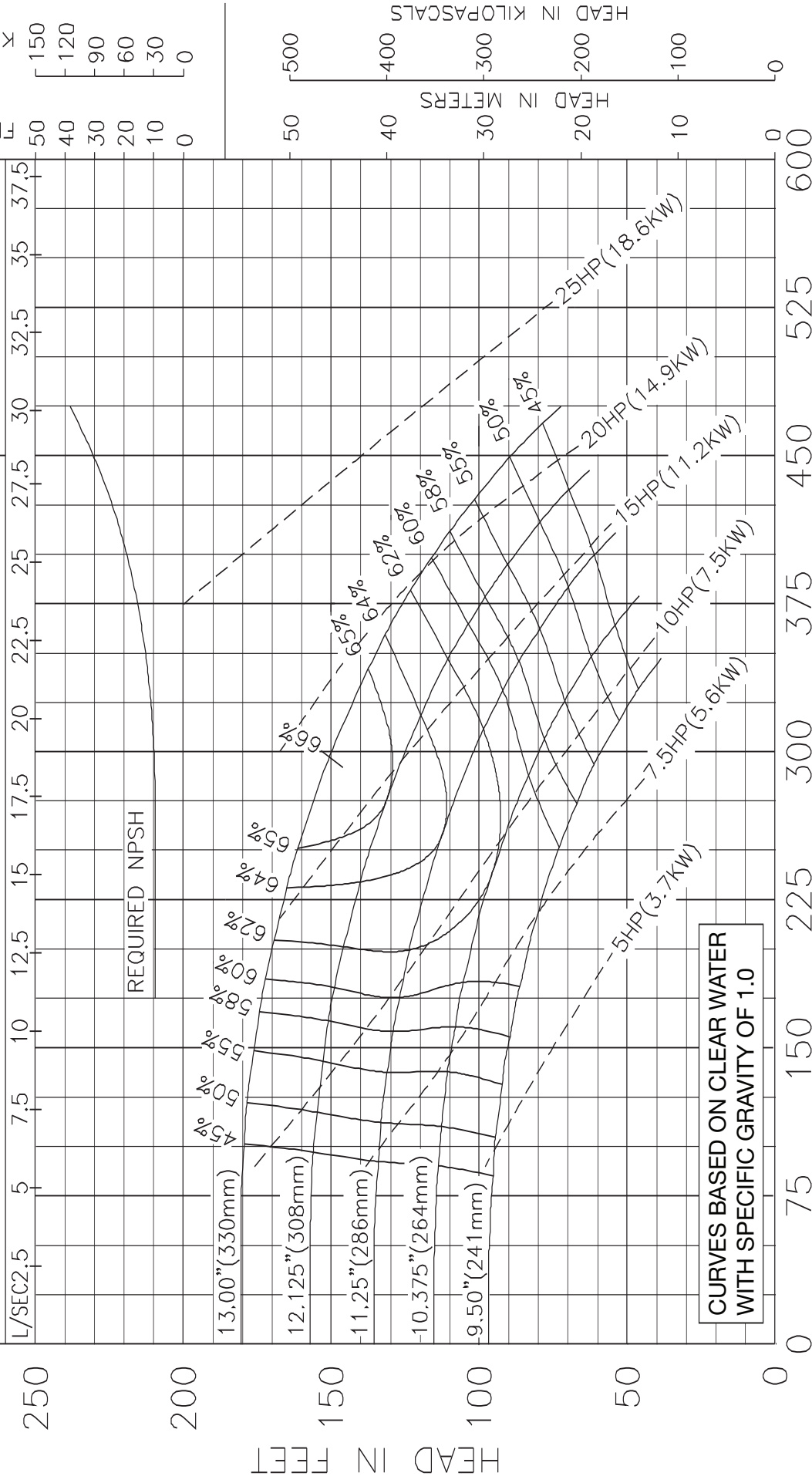
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0



Model 2513
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2022
Min. Imp. Dia. 9.5"
Size 3 X 2.5 x 13.0

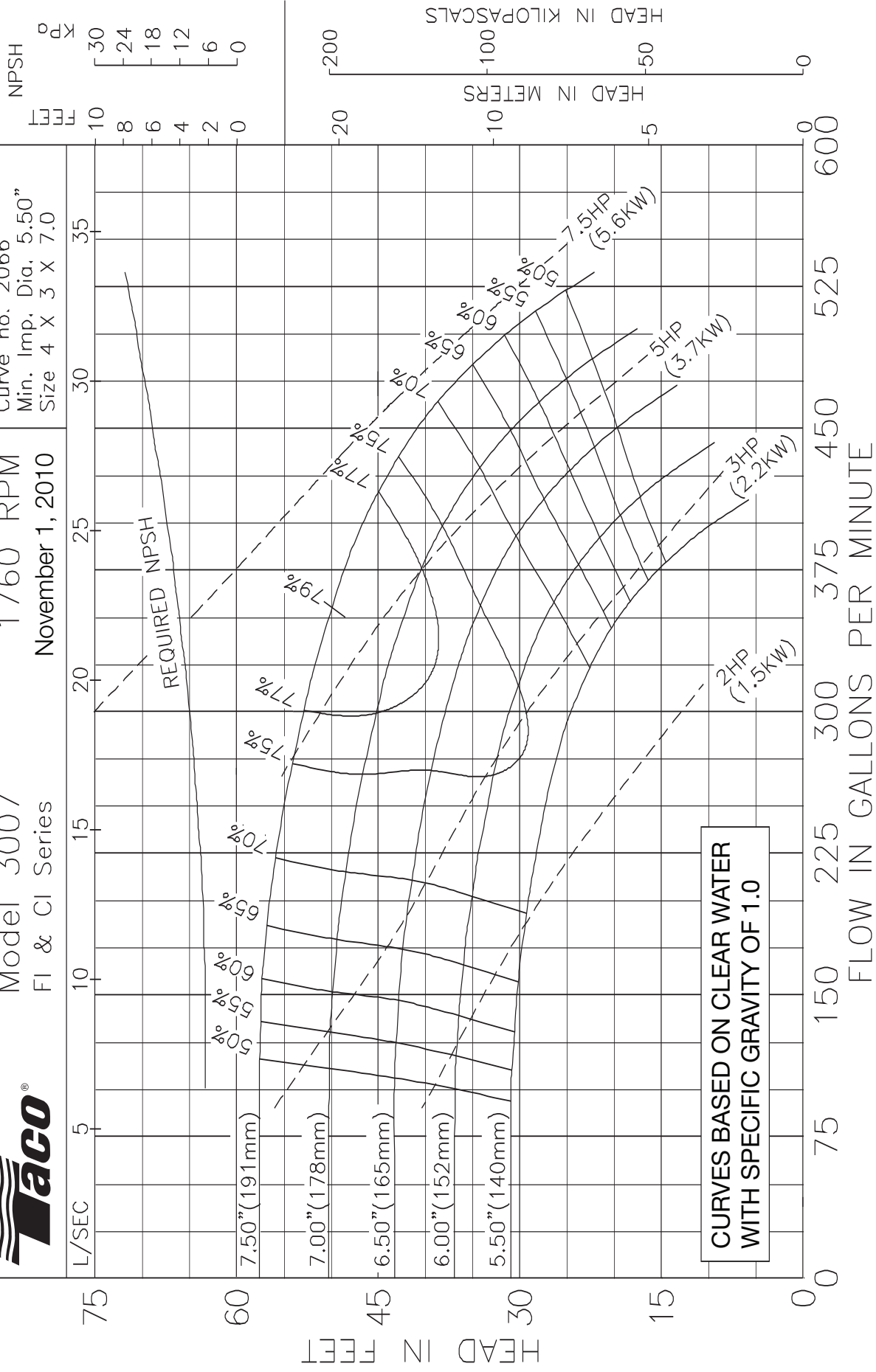




Model 3007
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2066
Min. Imp. Dia. 5.50"
Size 4 x 3 x 7.0



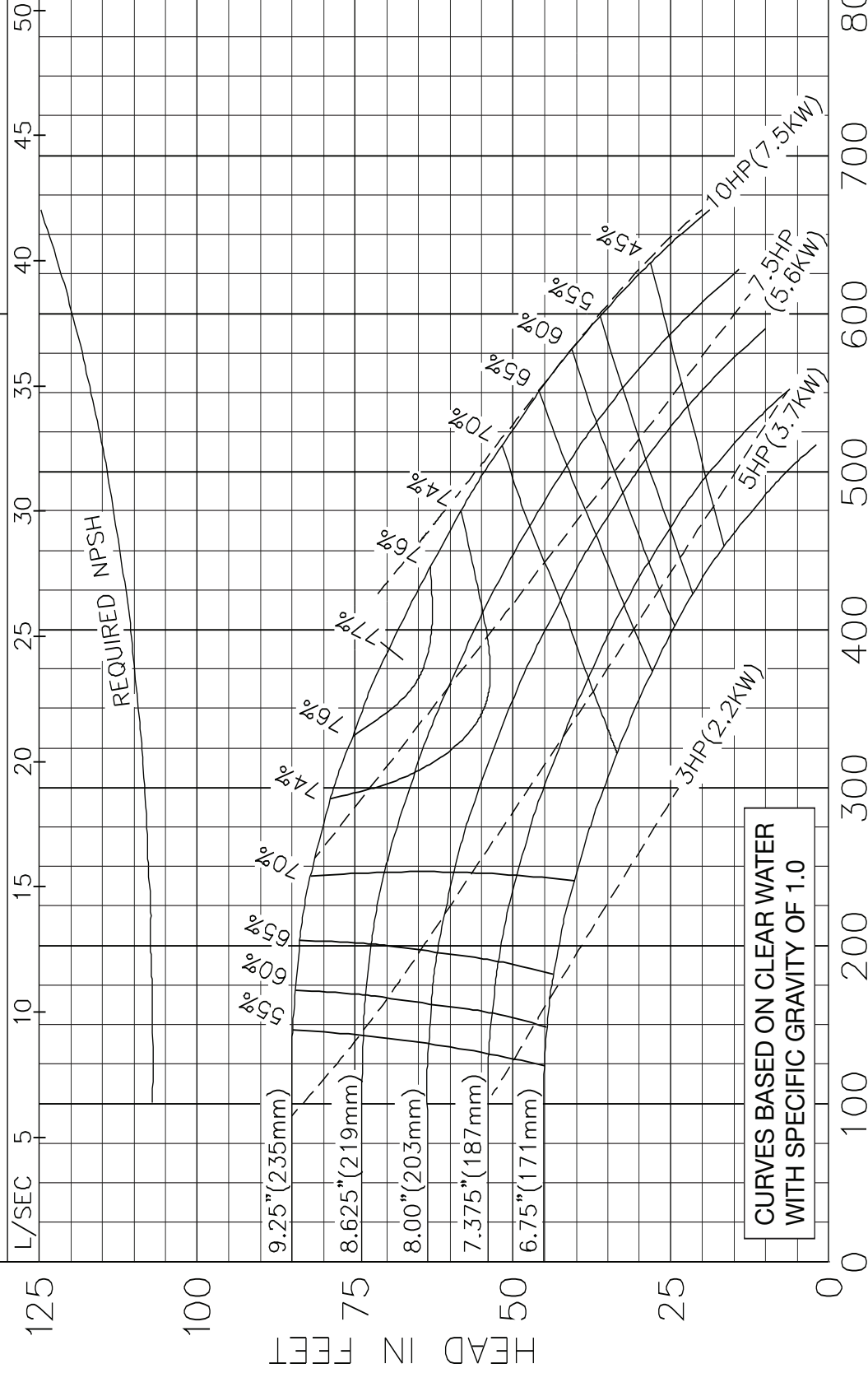


Model 3009
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2027
Min. Imp. Dia. 6.75"
Size 4 X 3 X 9.0

NPSH
D
K
F
E
E
T
15
12
9
6
3
0

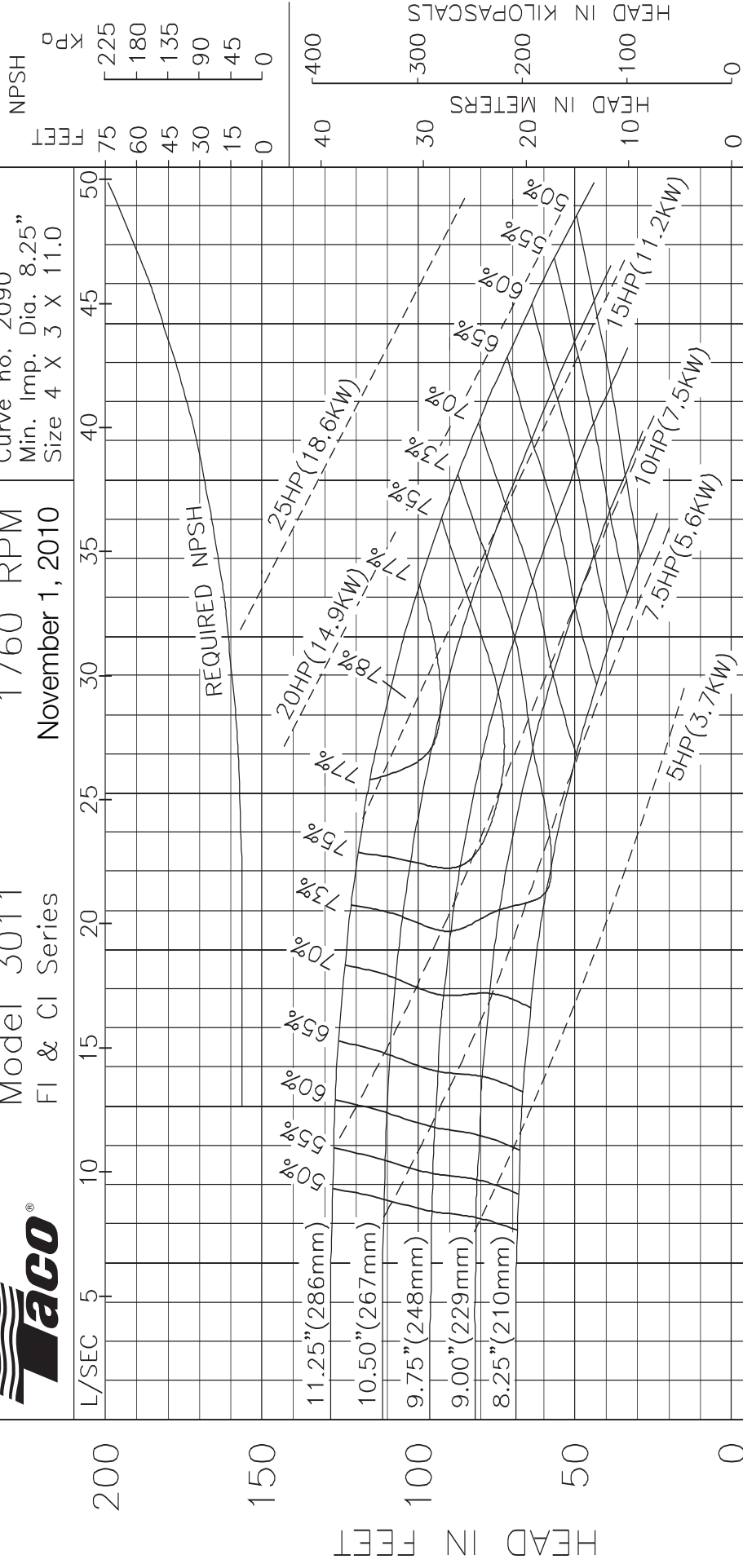




Model 3011
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2090
Min. Imp. Dia. 8.25"
Size 4 X 3 X 11.0



CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

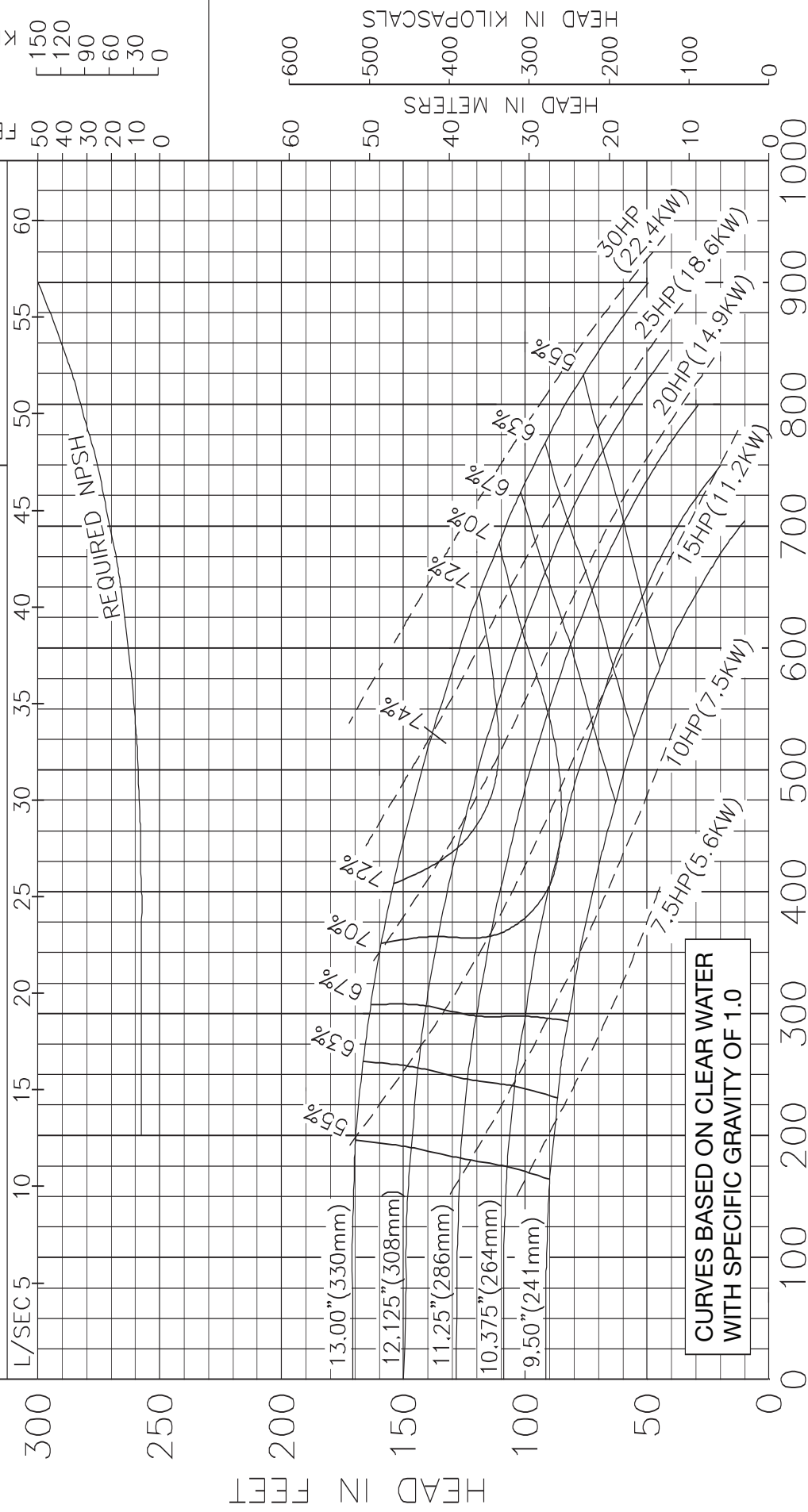


Model 3013
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2032
Min. Imp. Dia. 9.50"
Size 4 X 3 X 13.0

NPSH
K_P
Feet
0
10
20
30
40
50
60
90
120
150

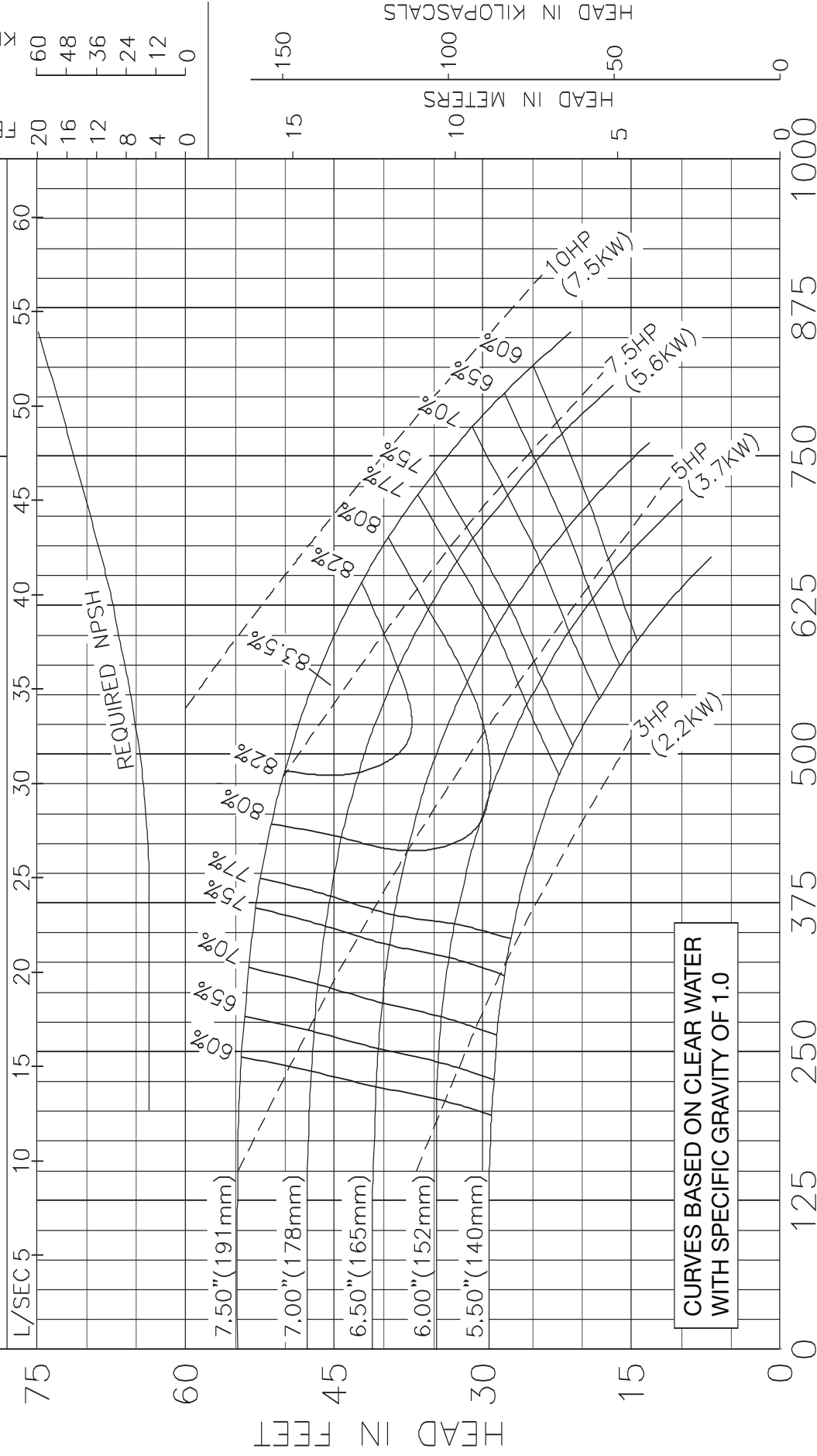




Model 4007
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2071
Min. Imp. Dia. 5.50"
Size 5 X 4 X 7.0



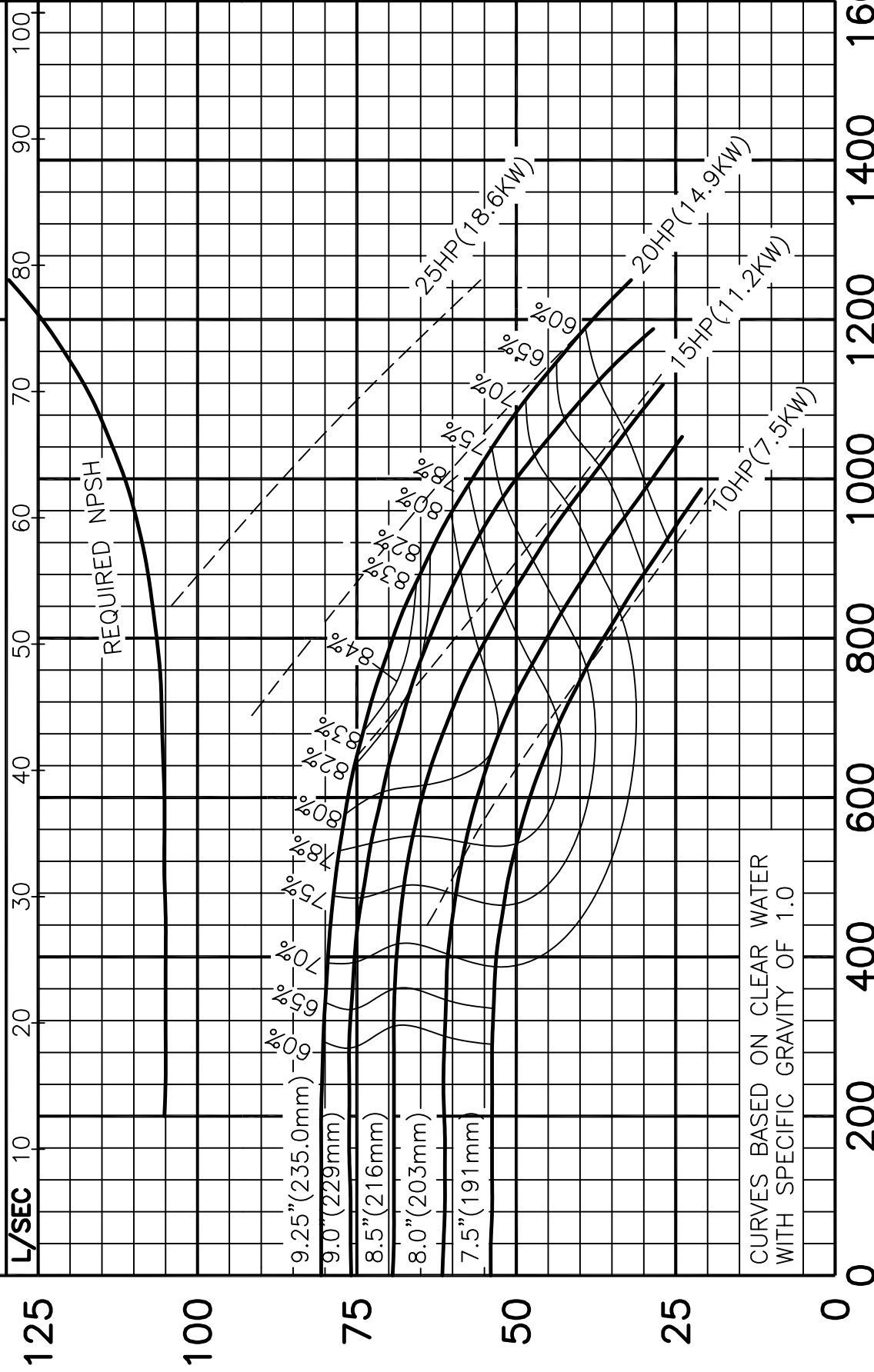
FLOW IN GALLONS PER MINUTE



Model 4009
FI & CI Series

1760 RPM
JANUARY, 3 2006

Curve no. 2289
Min. Imp. Dia. 7.5
Size 5 x 4 x 9.25

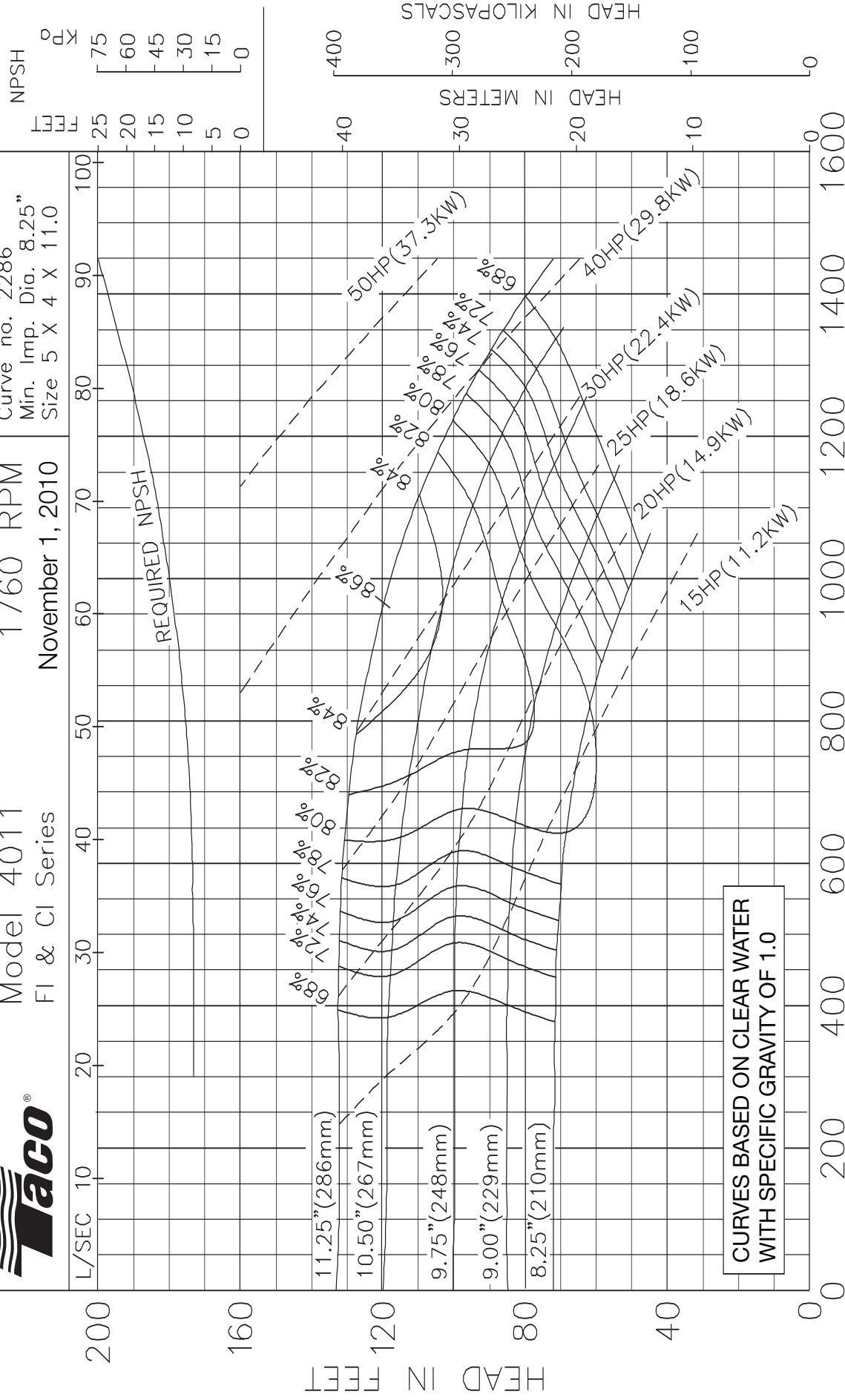




Model 4011
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2286
Min. Imp. Dia. 8.25"
Size 5 X 4 X 11.0



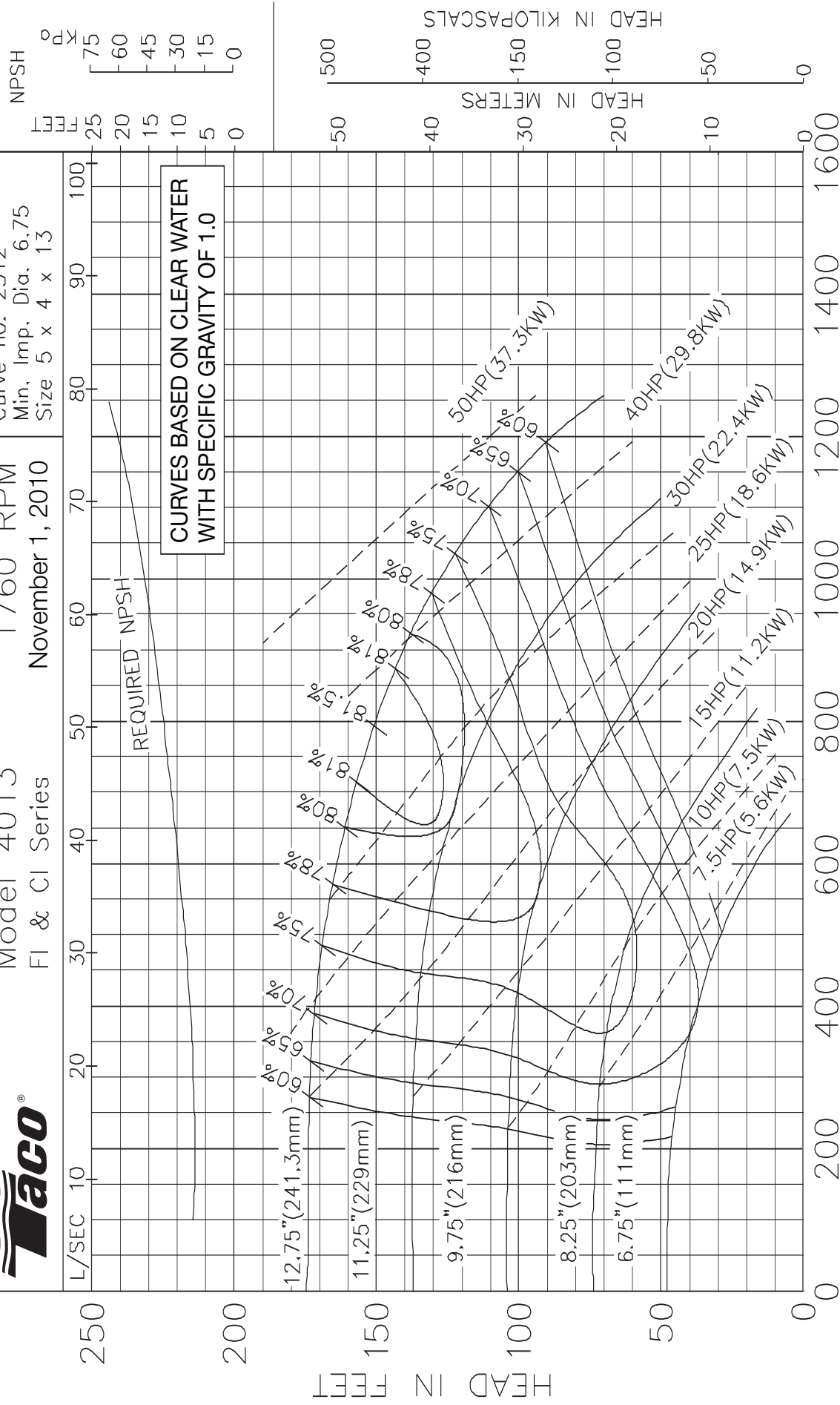
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0



Model 4013
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2312
Min. Imp. Dia. 6.75
Size 5 x 4 x 13

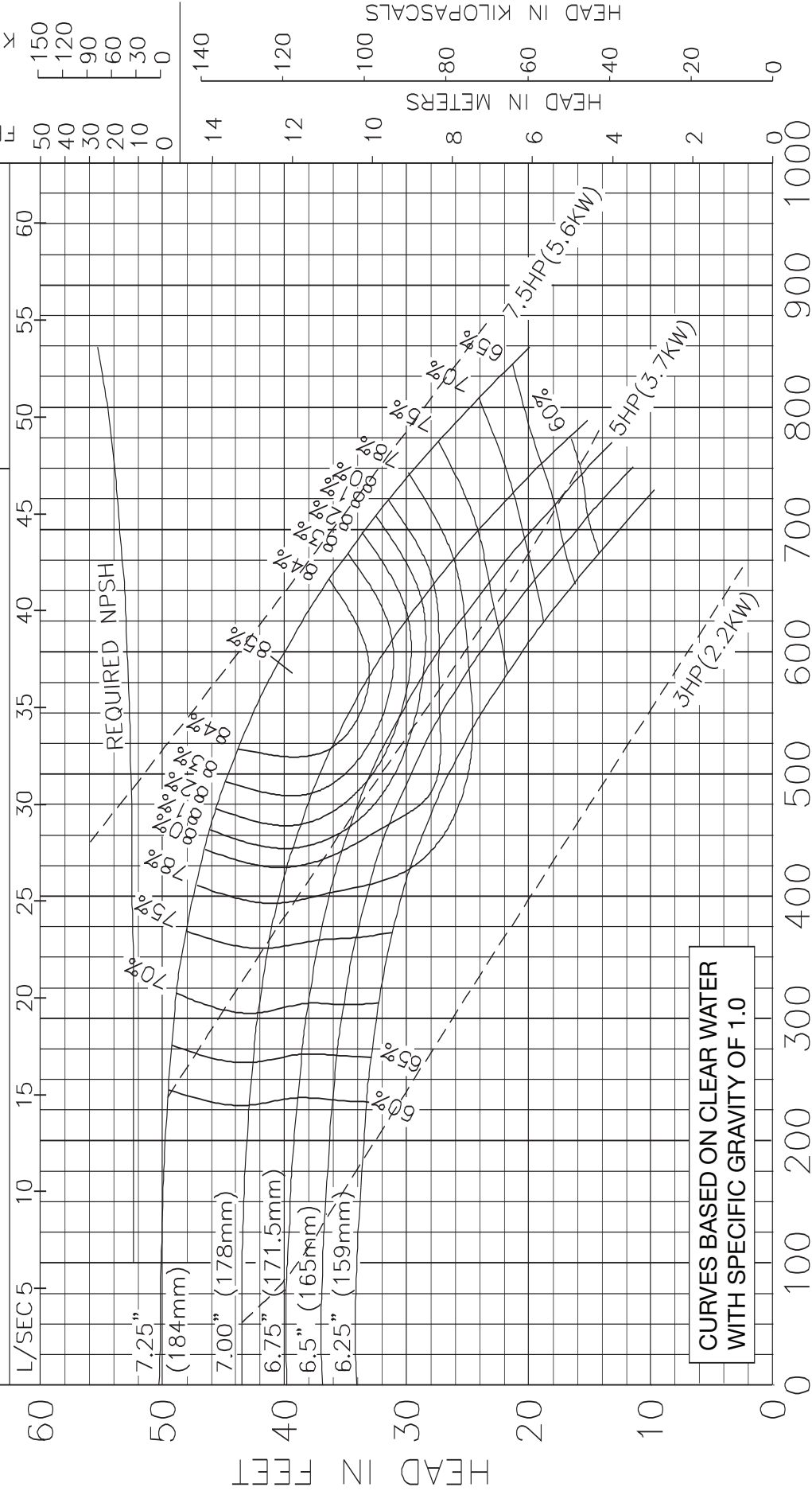




Model 4075
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2174
Min. Imp. Dia. 6.25"
Size 5 x 4 x 7.0



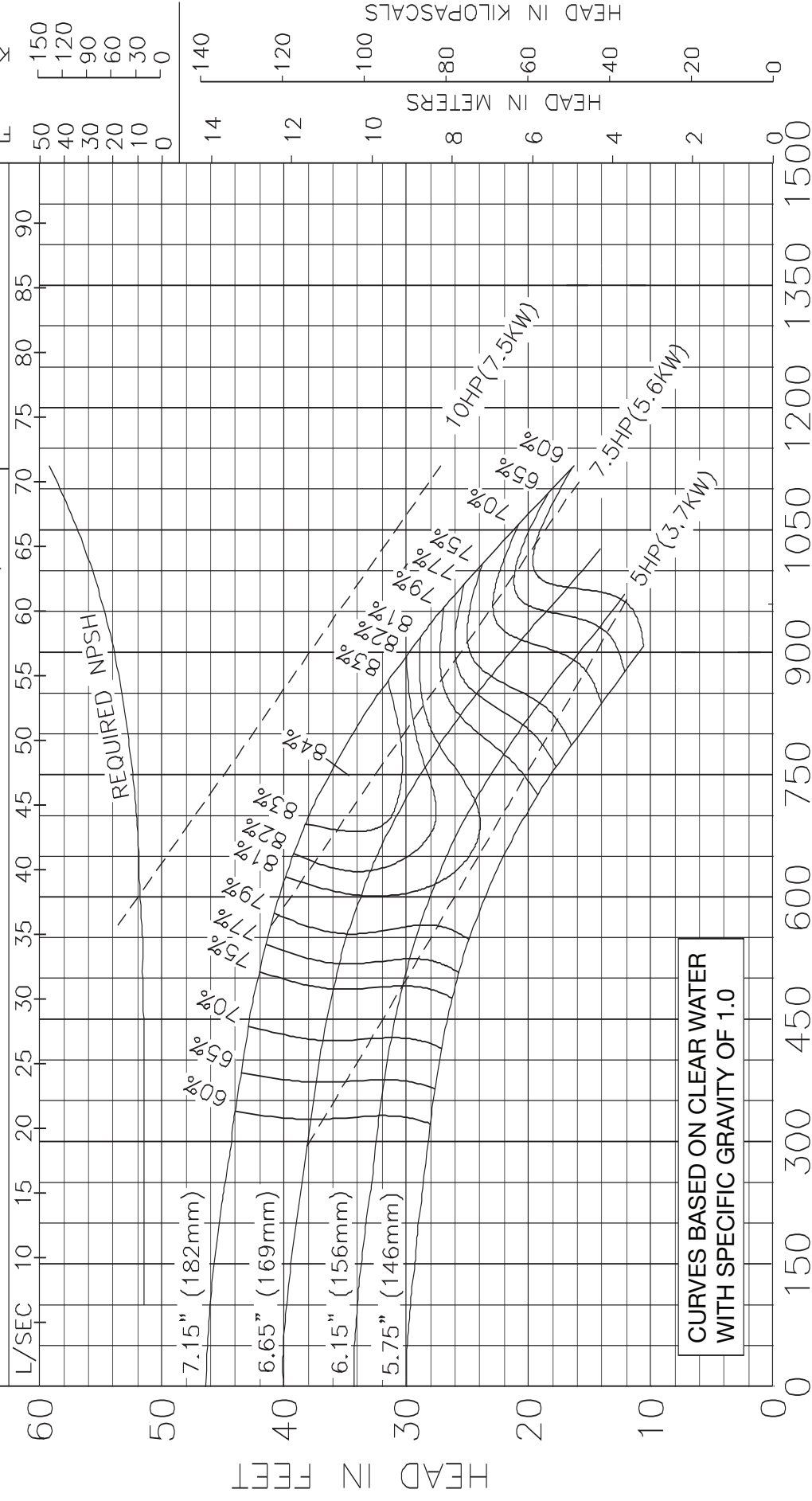
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0



Model 5007
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2168
Min. Imp. Dia. 5.75"
Size 6 x 5 x 7.0

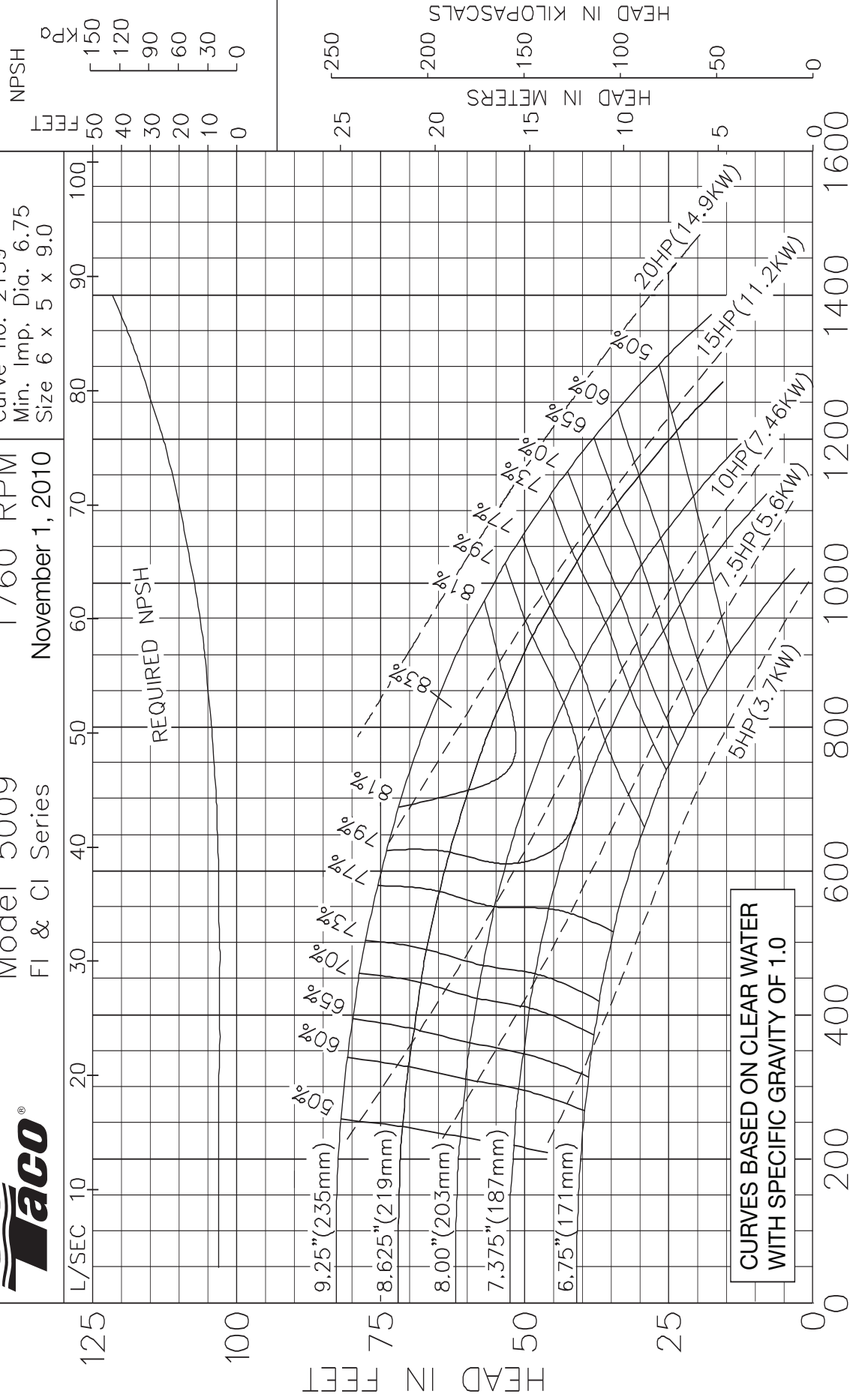




Model 5009
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2139
Min. Imp. Dia. 6.75
Size 6 x 5 x 9.0

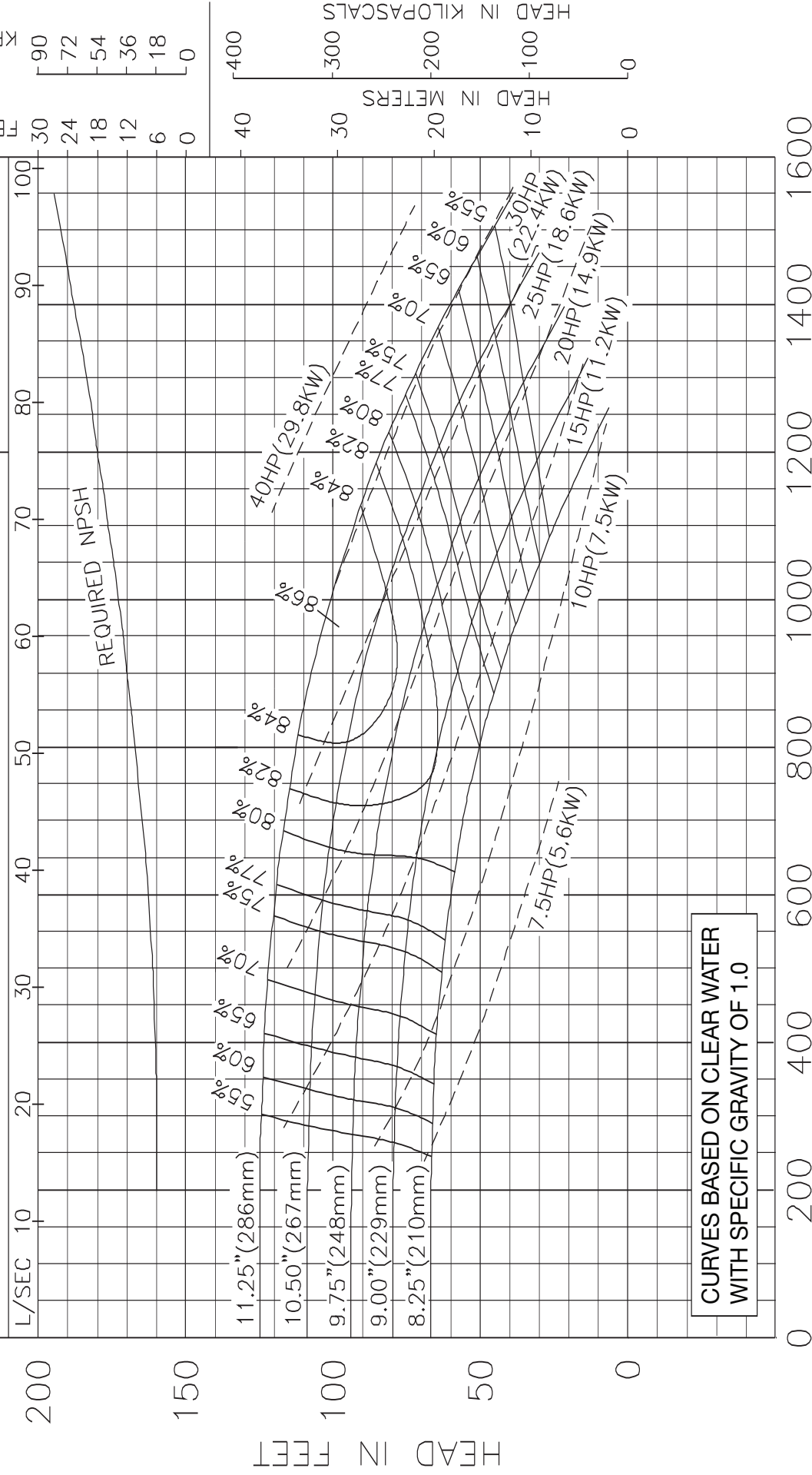




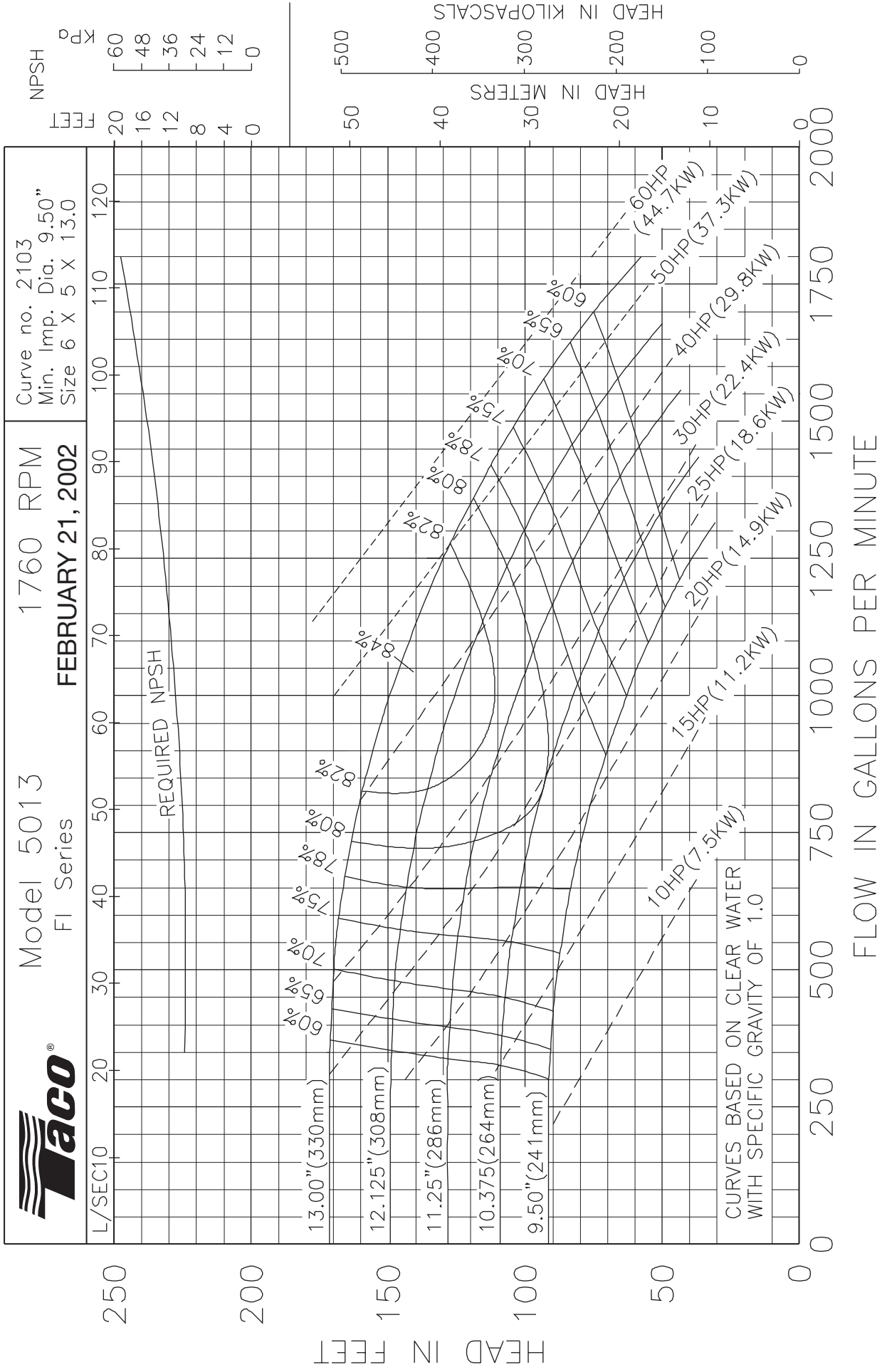
Model 5011
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2093
Min. Imp. Dia. 8.25"
Size 6 X 5 X 11.0

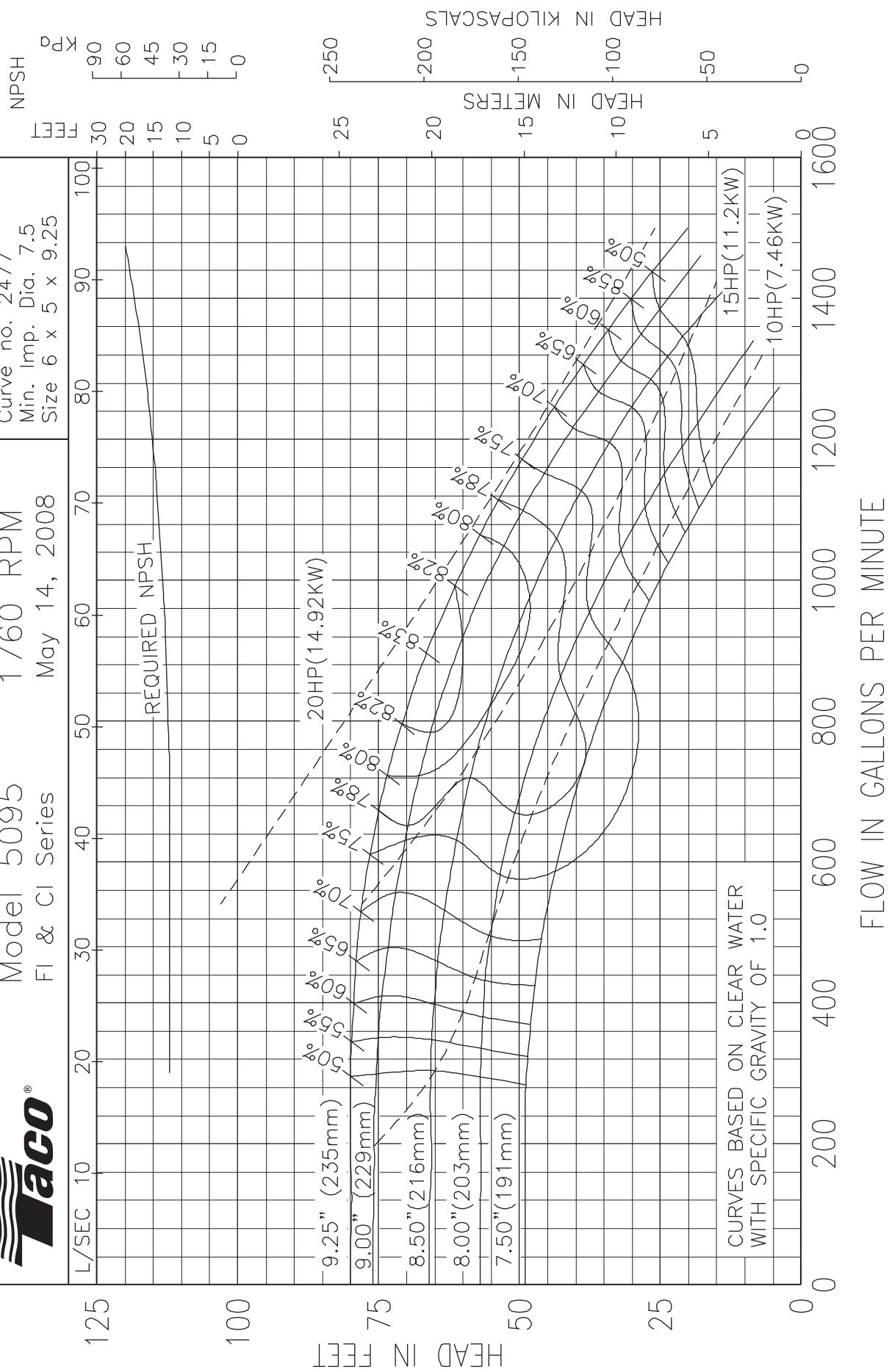


CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0



1760 RPM
May 14, 2008

Curve no. 2477
Min. Imp. Dia. 7.5
Size 6 x 5 x 9.25

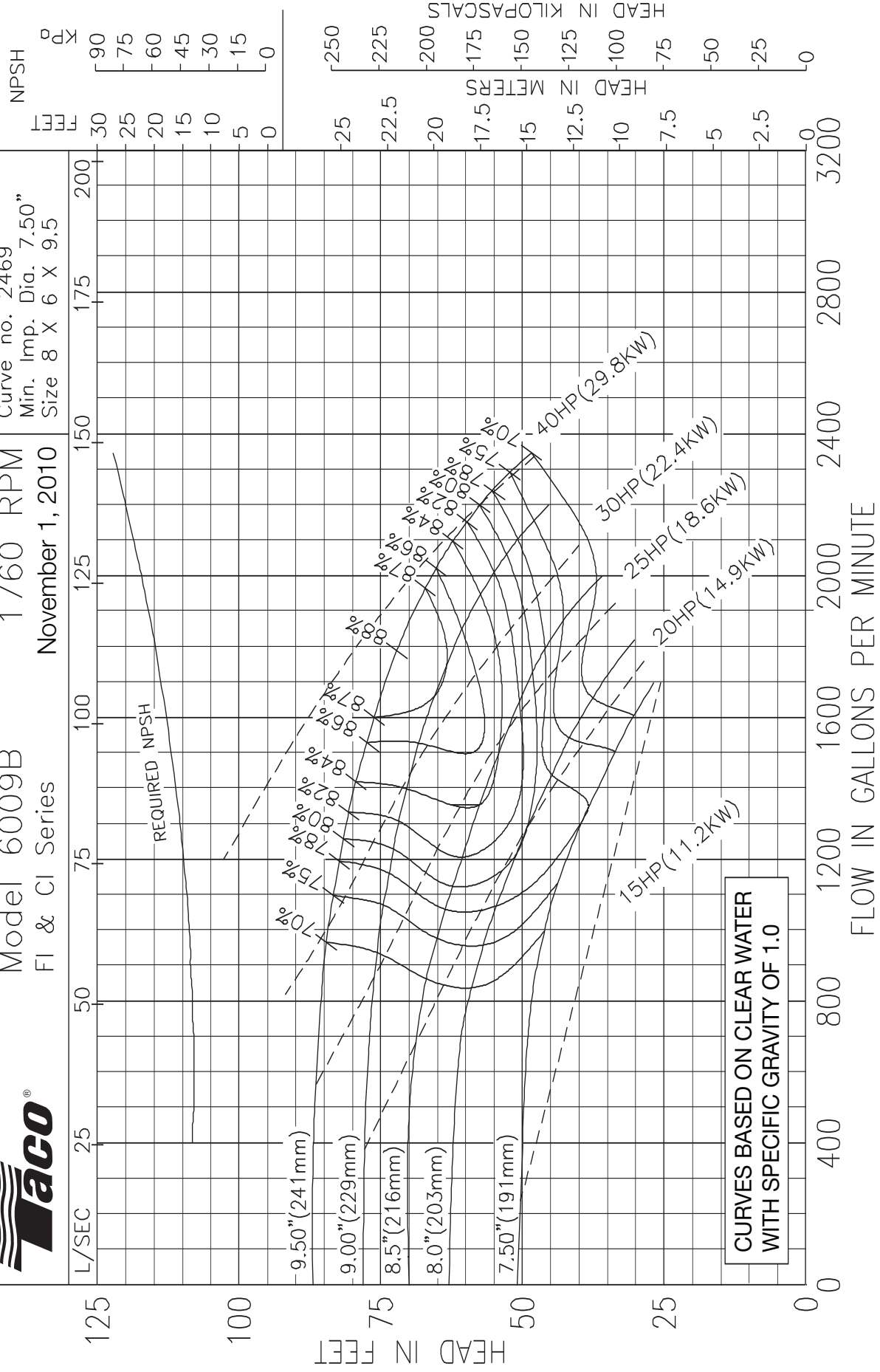




Model 6009B
FI & CI Series

1760 RPM
November 1, 2010

Curve no. 2469
Min. Imp. Dia. 7.50"
Size 8 X 6 X 9.5

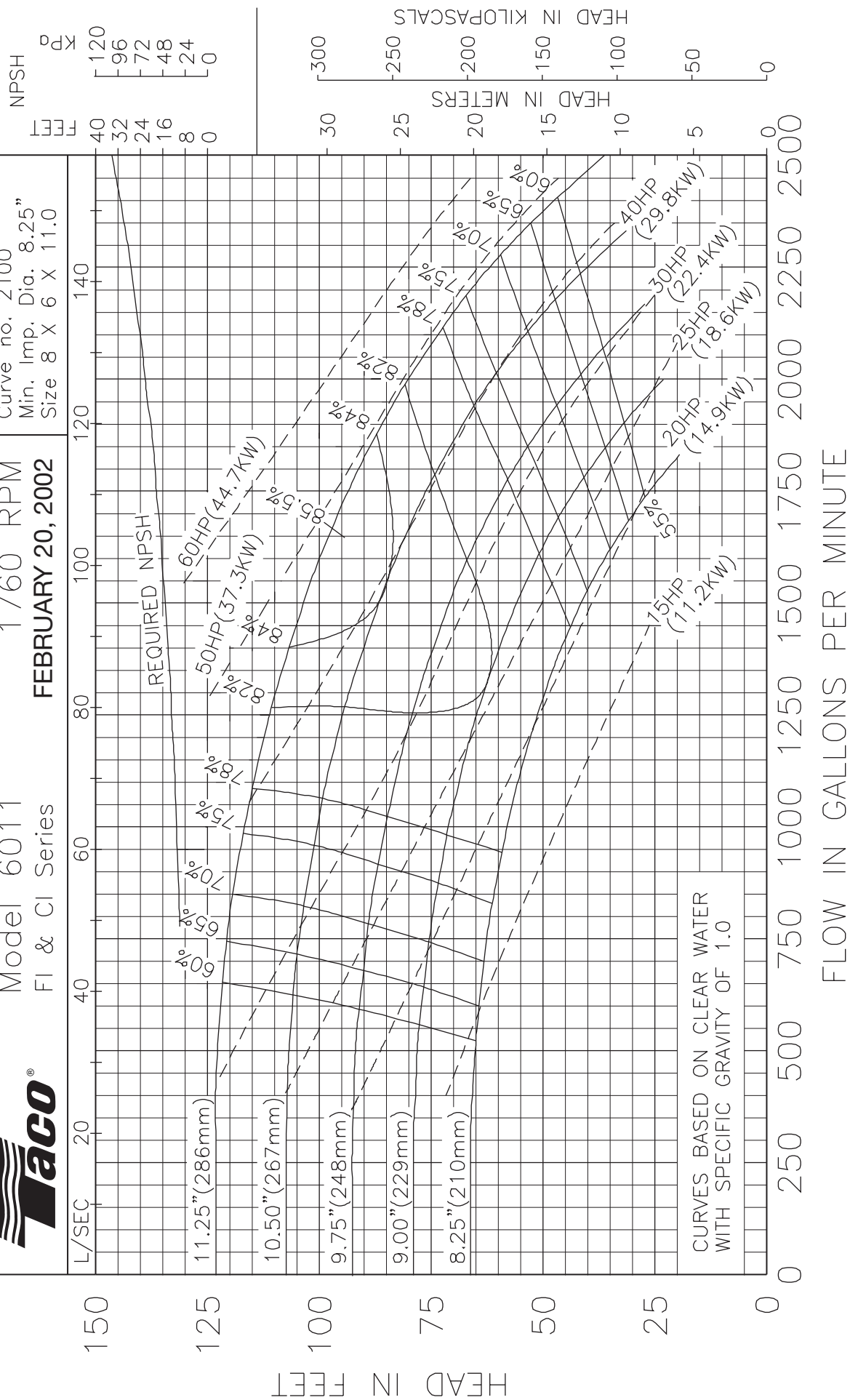


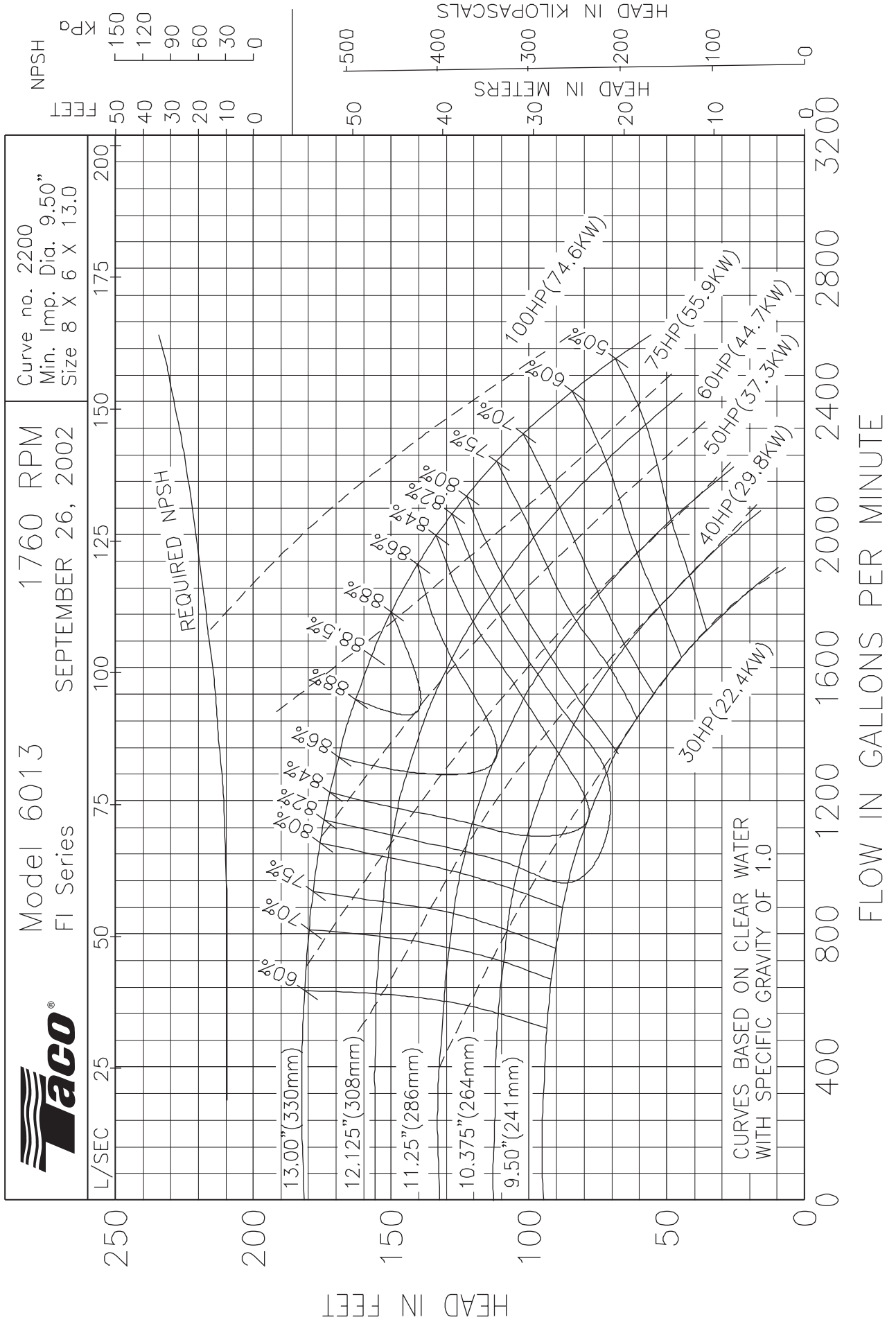
Model 6011

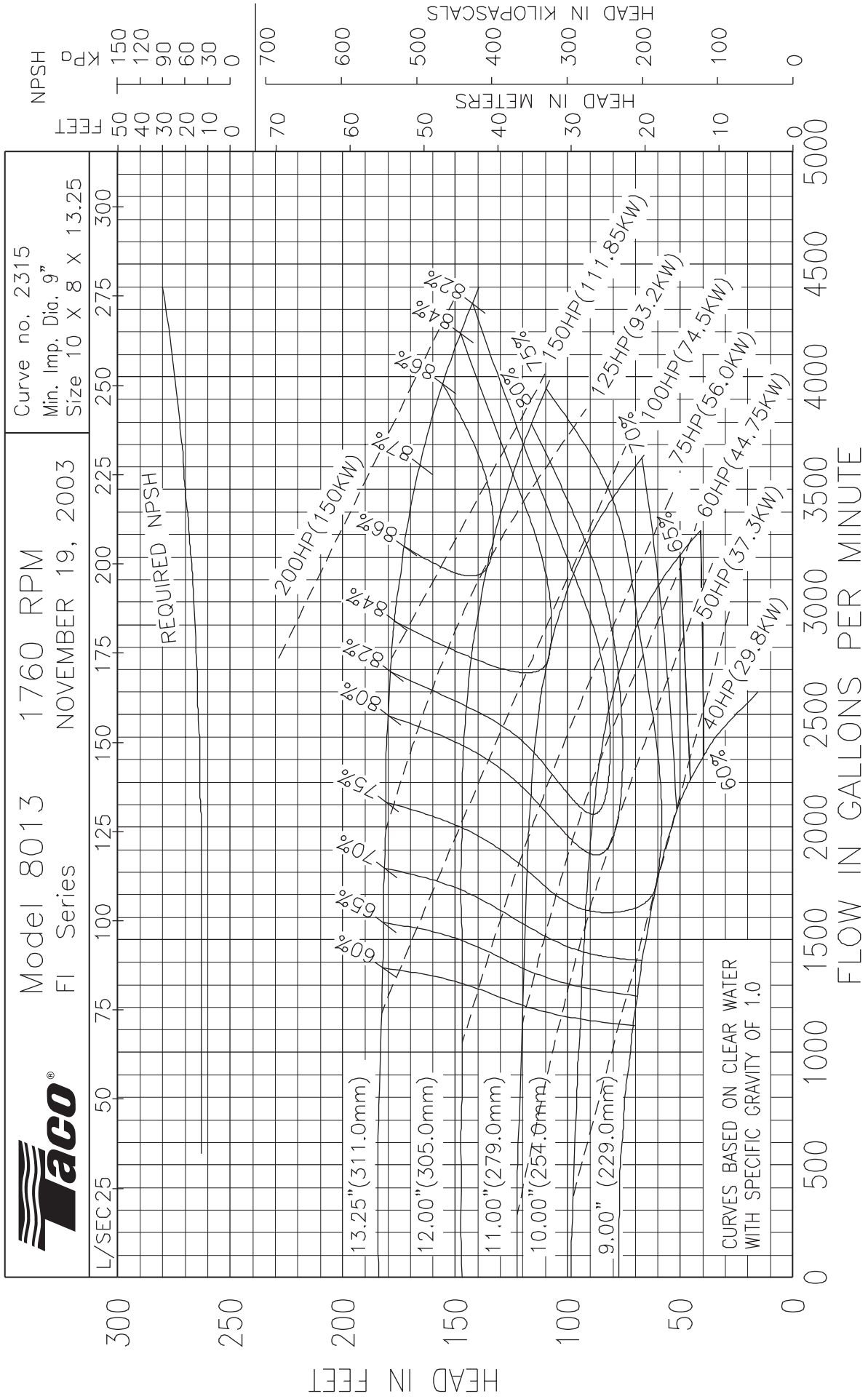
FI & CI Series

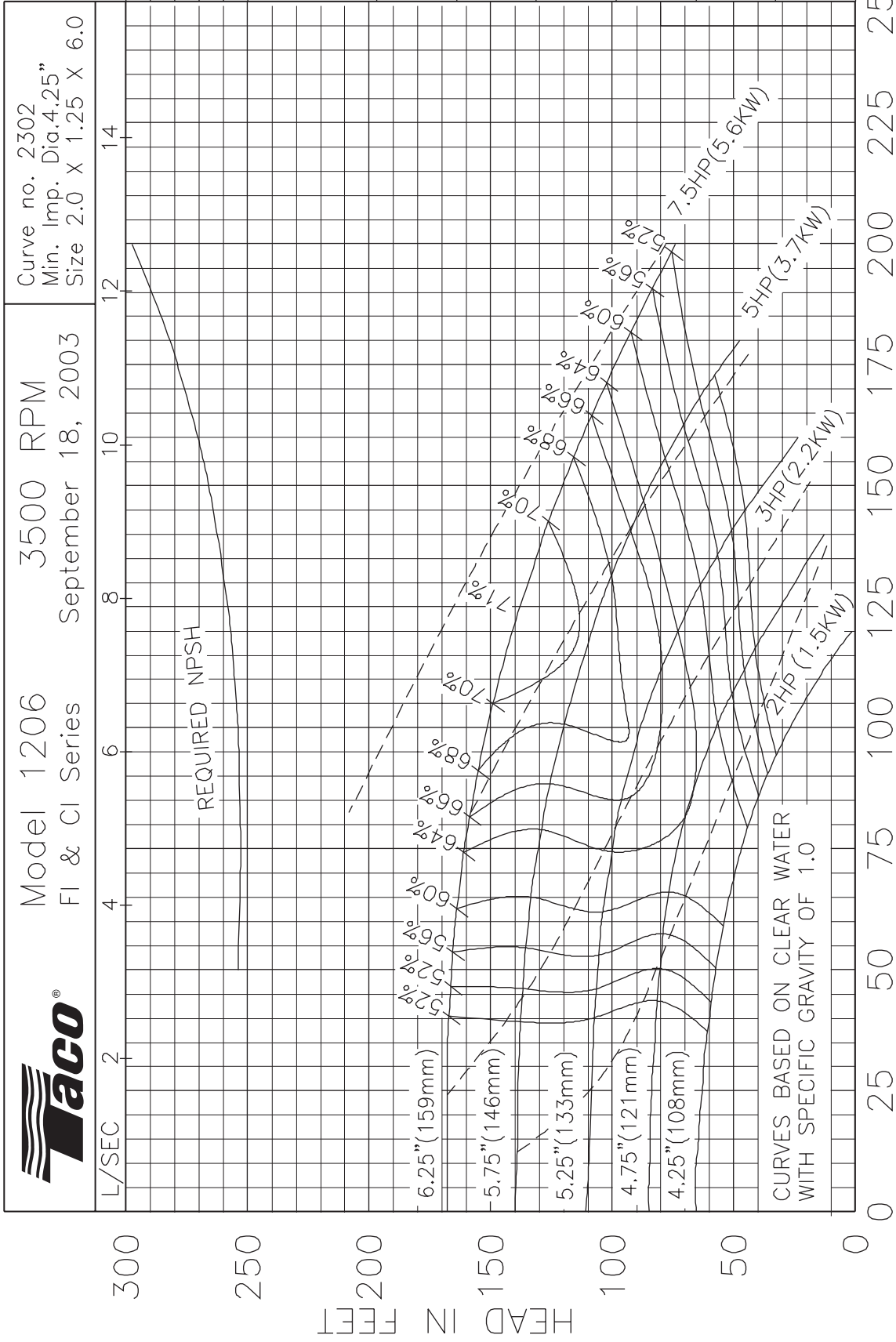
1760 RPM
FEBRUARY 20, 2002

Curve no. 2100
Min. Imp. Dia. 8.25"
Size 8 X 6 X 11.0







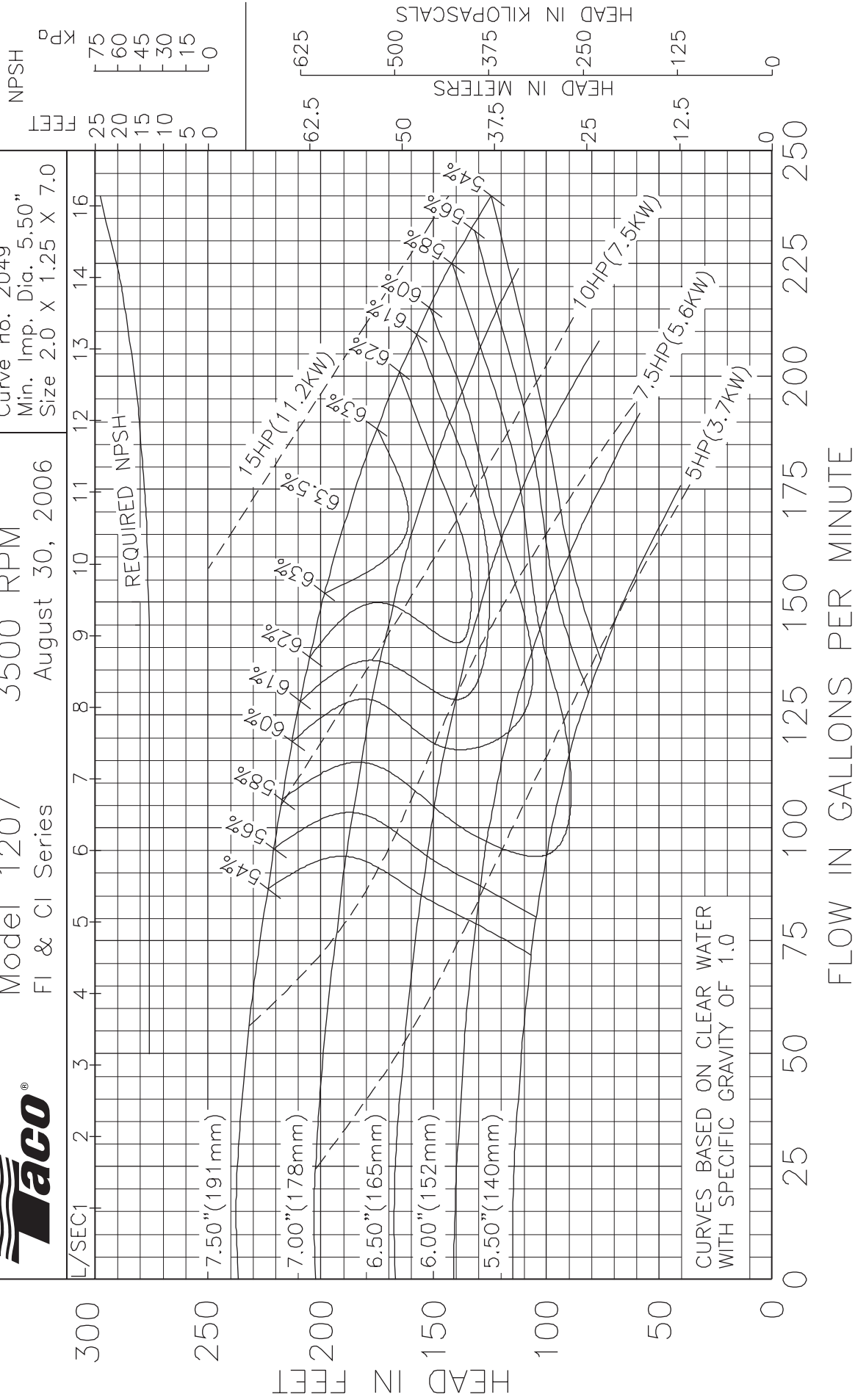


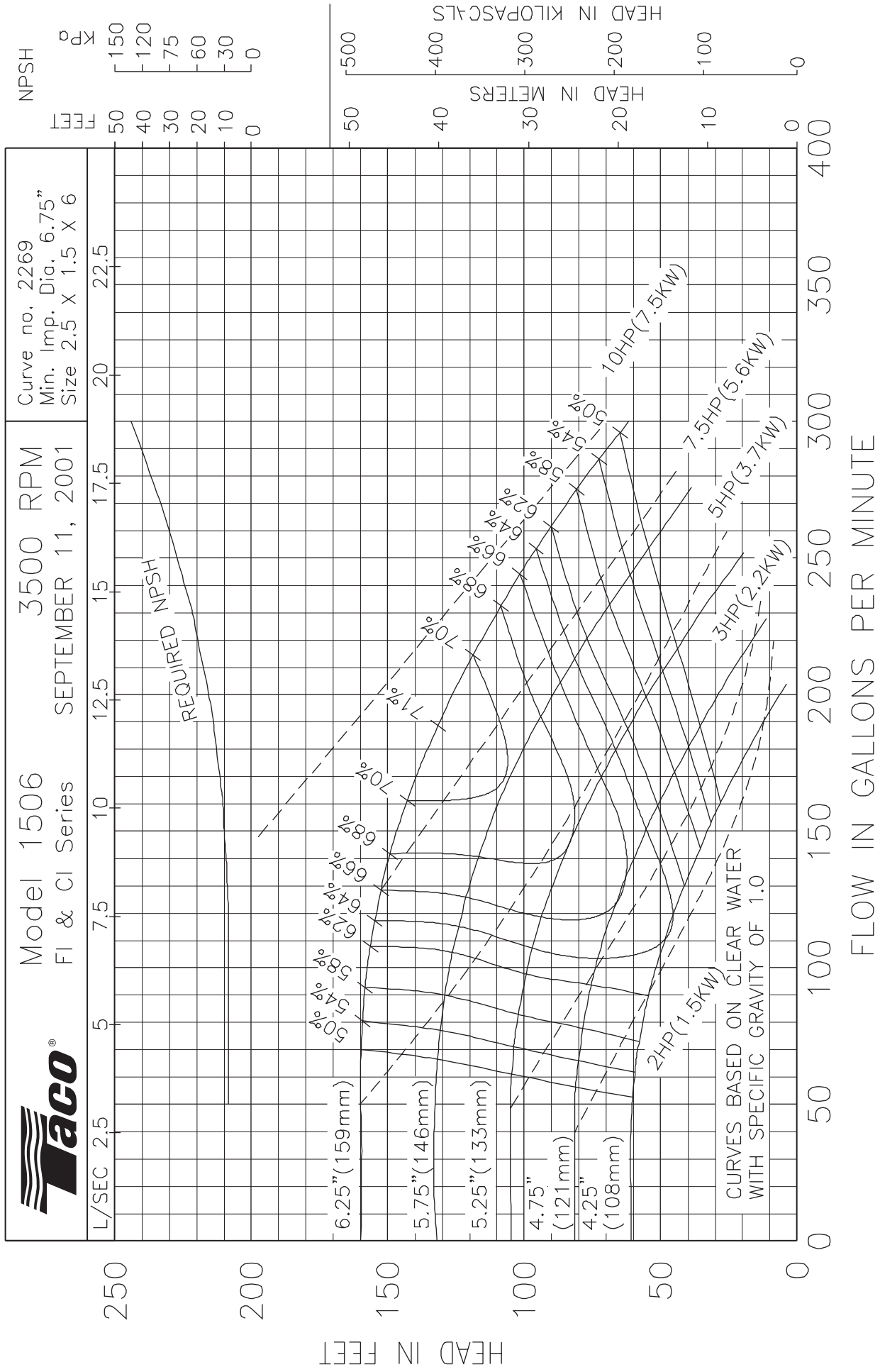


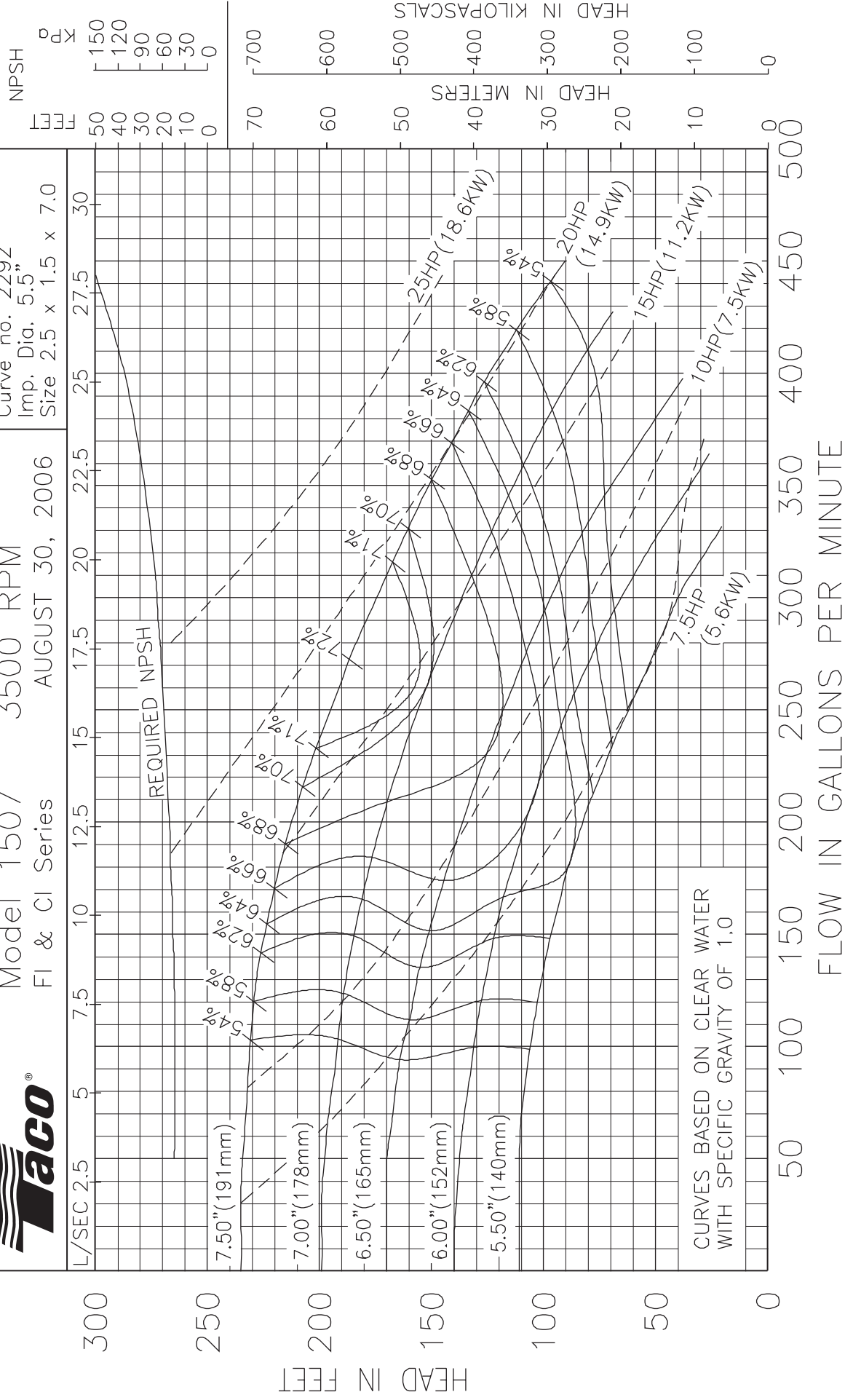
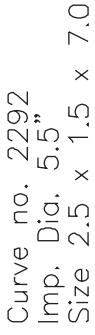
Model 1207
FI & CI Series

3500 RPM
August 30, 2006

Curve no. 2049
Min. Imp. Dia. 5.50"
Size 2.0 X 1.25 X 7.0





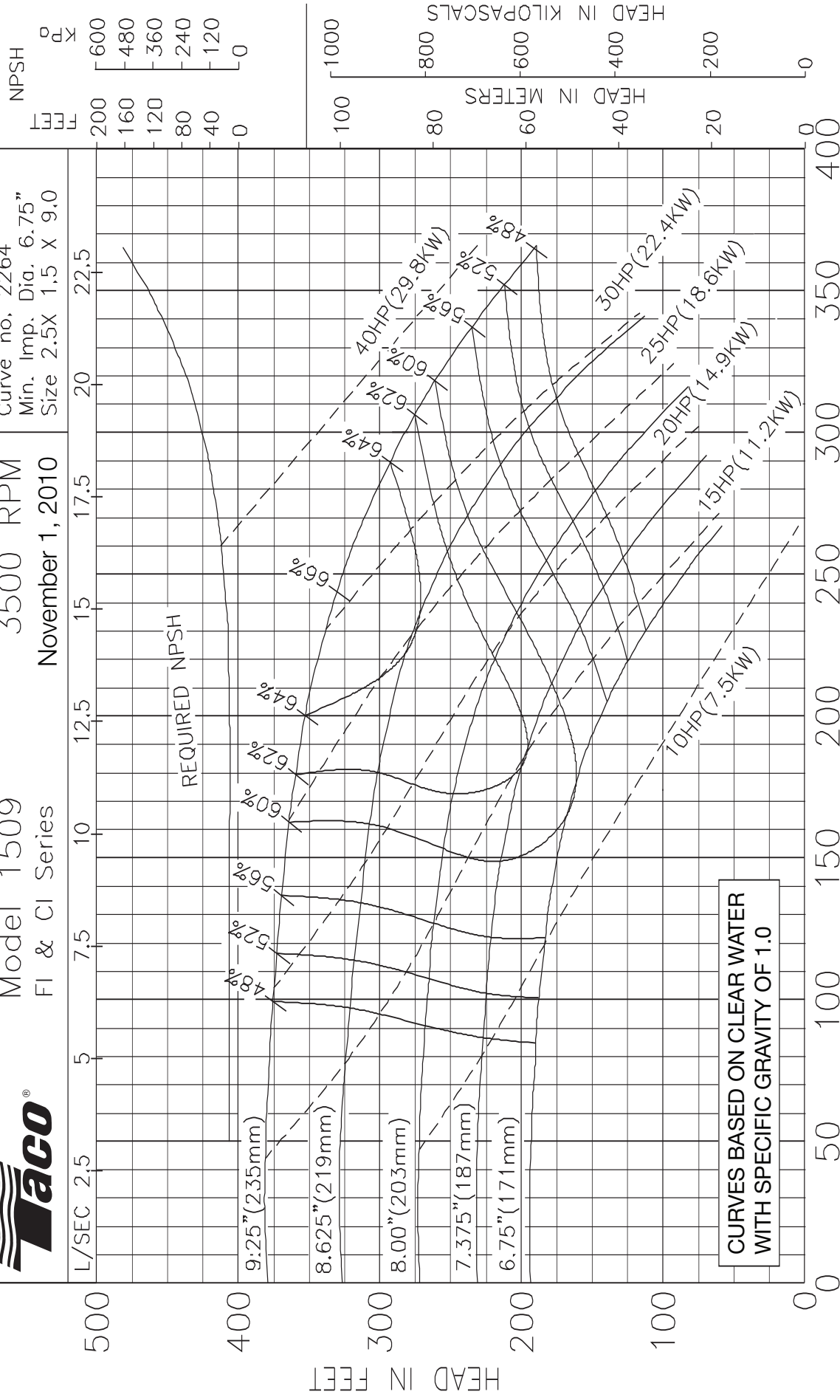




Model 1509
FI & CI Series

3500 RPM
November 1, 2010

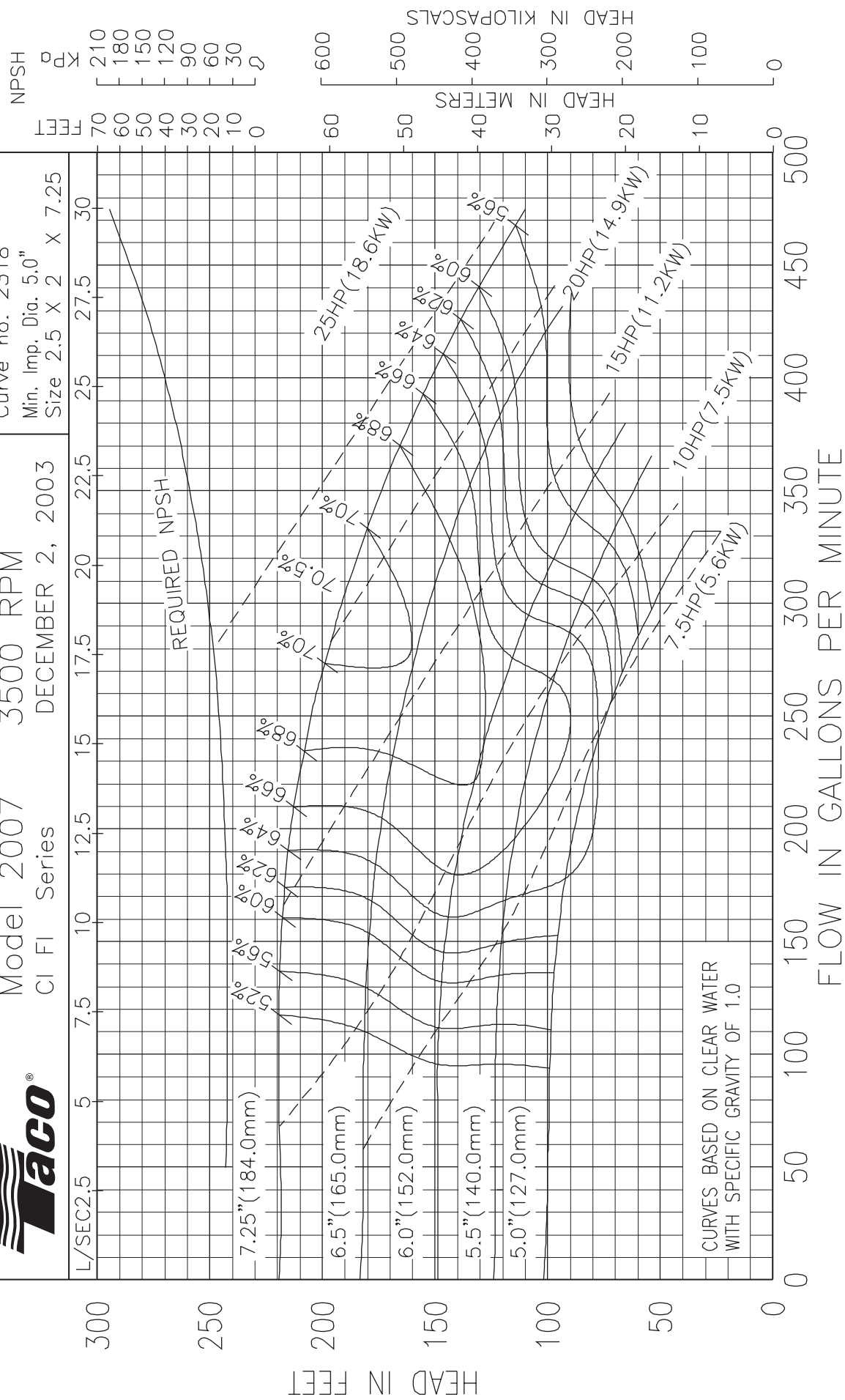
Curve no, 2264
Min. Imp. Dia. 6.75"
Size 2.5X 1.5 X 9.0

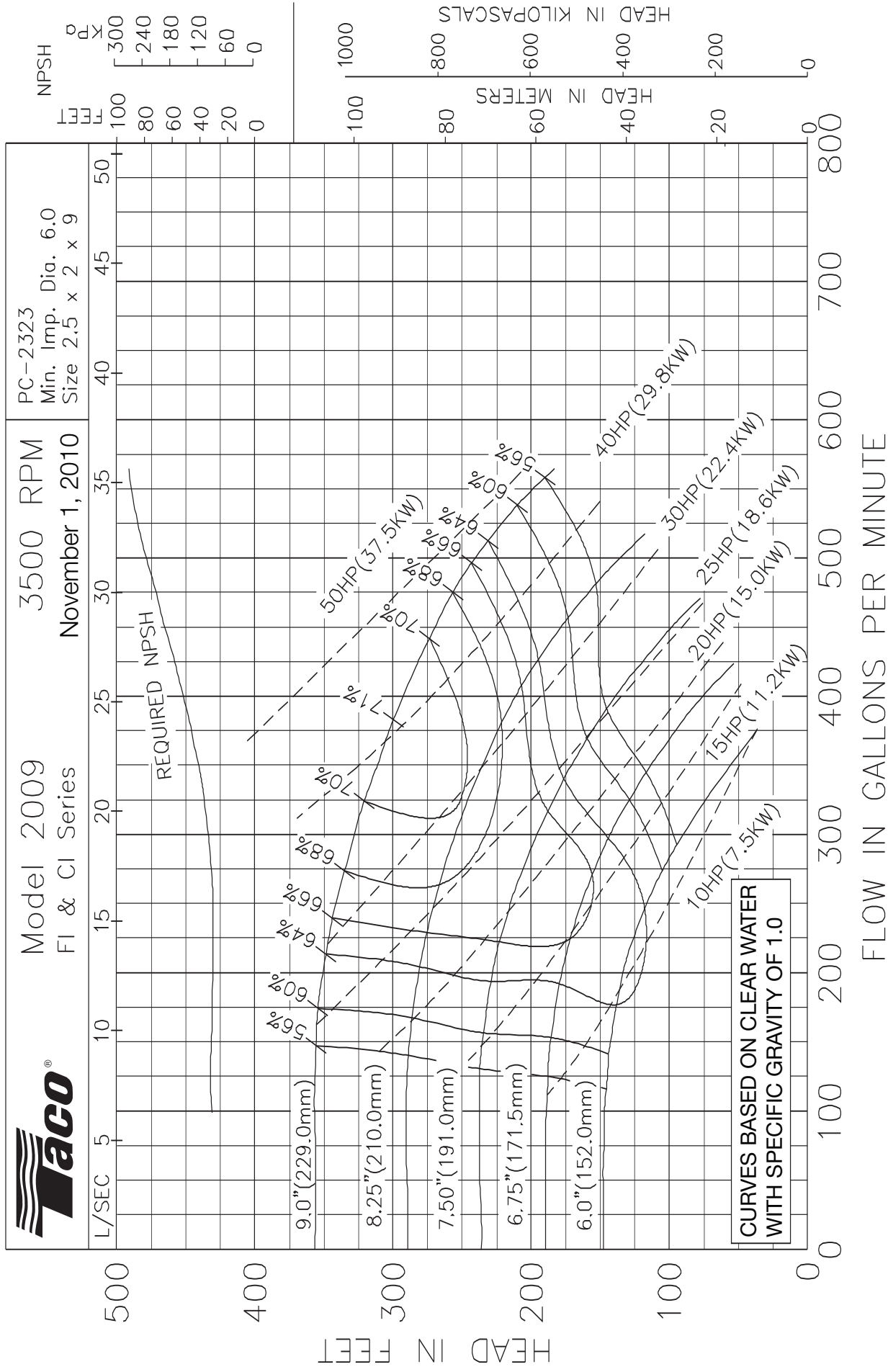
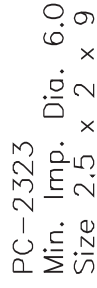


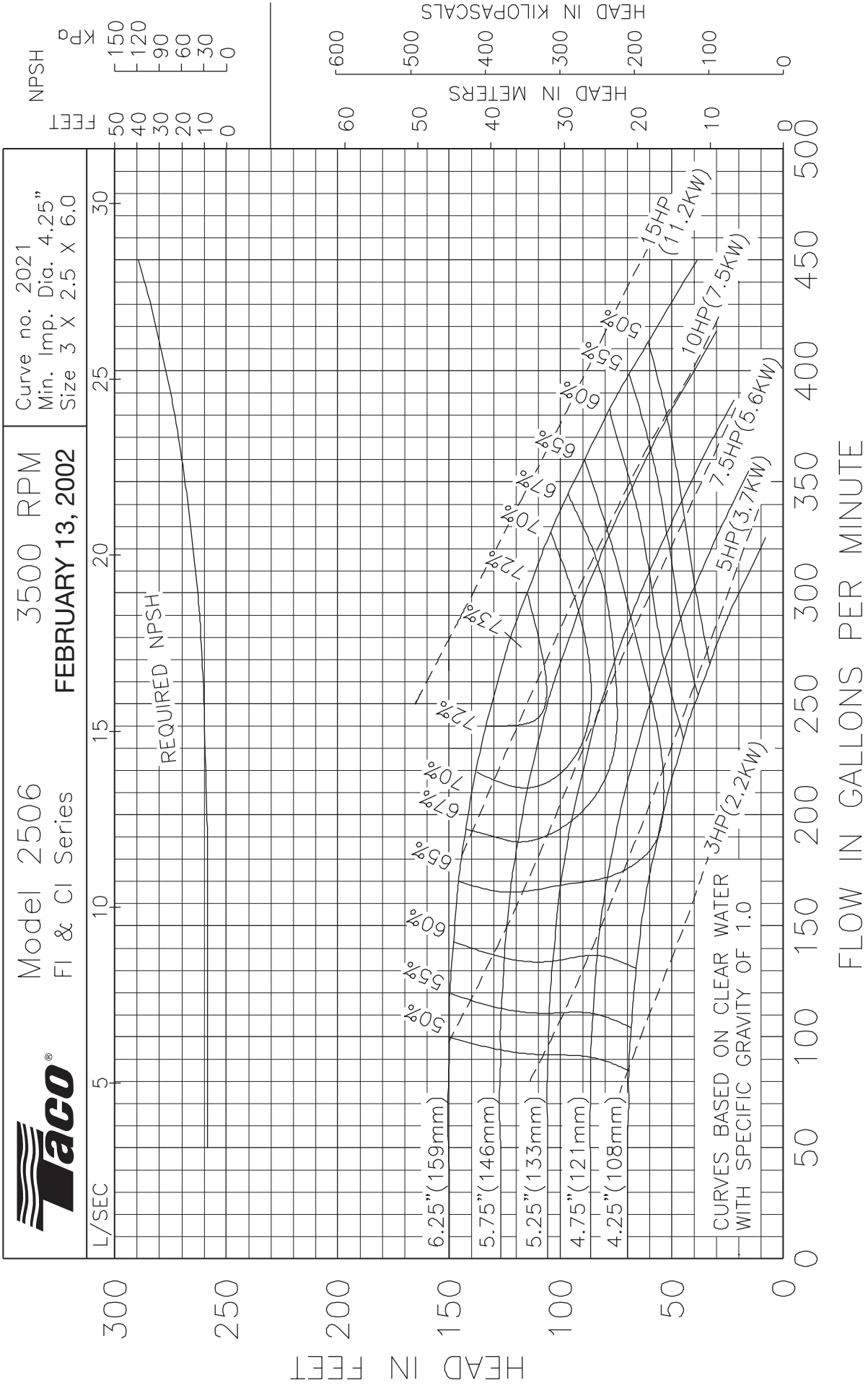
Model 2007
CI FI Series

3500 RPM
DECEMBER 2, 2003

Curve no.	2318
Min. Imp. Dia.	5.0"
Size	2.5 X 2 X 7.25





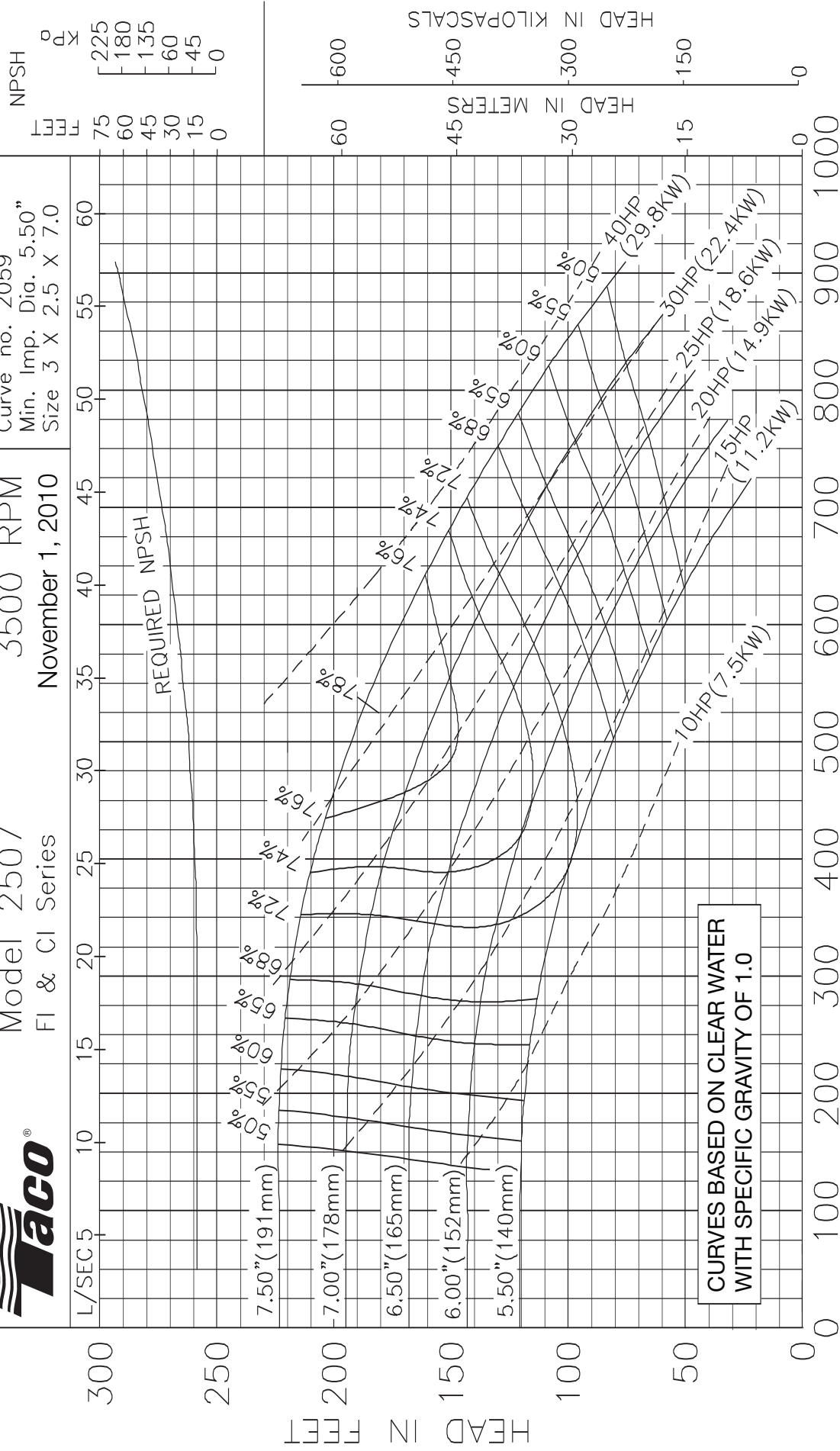




Model 2507
FI & CI Series

3500 RPM
November 1, 2010

Curve no. 2059
Min. Imp. Dia. 5.50"
Size 3 X 2.5 X 7.0



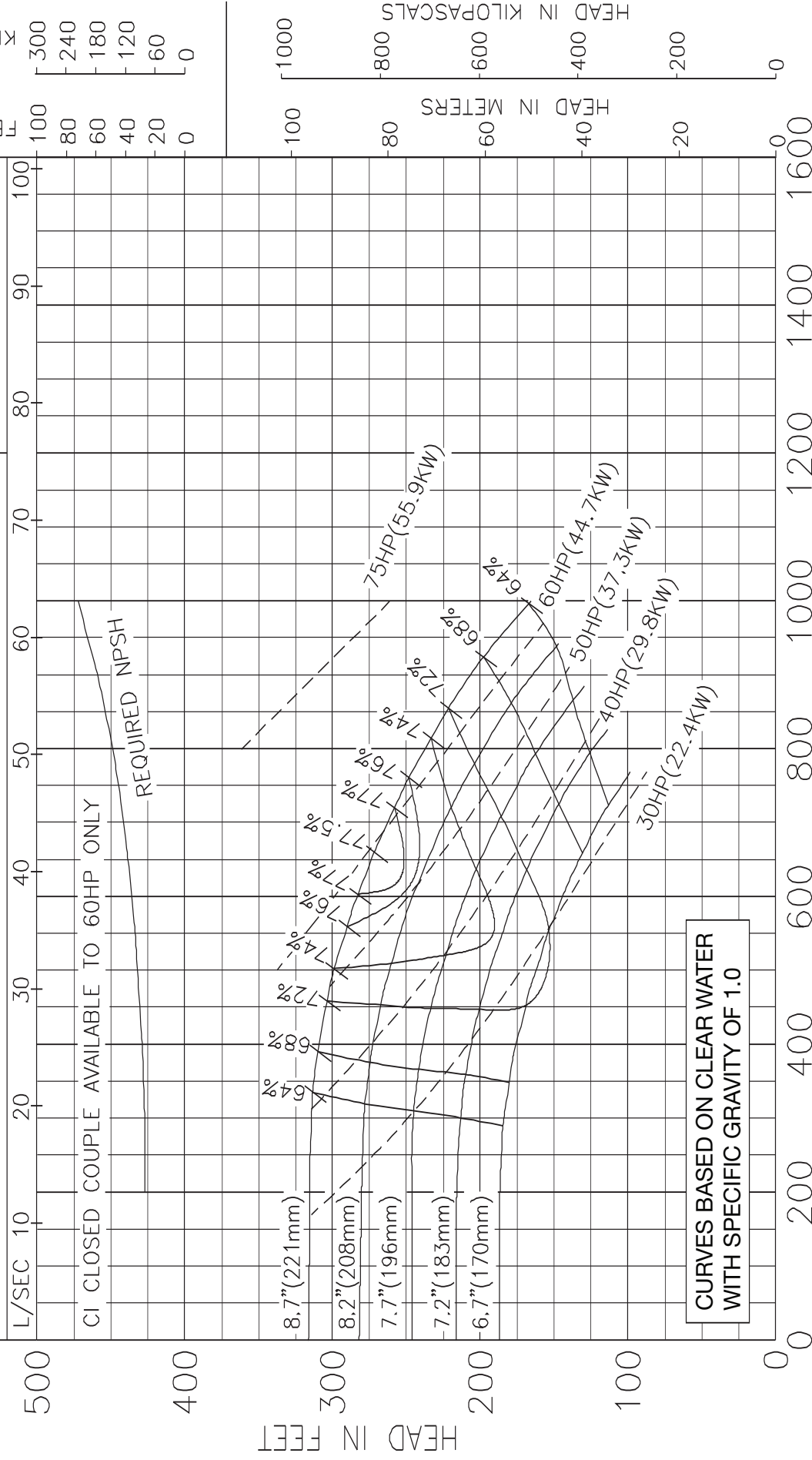
CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0



Model 2508
CI & FI Series

3500 RPM
November 1, 2010

Curve no. 2220
Min. Imp. Dia 6.7"
Size 3 X 2.5 X 8.5

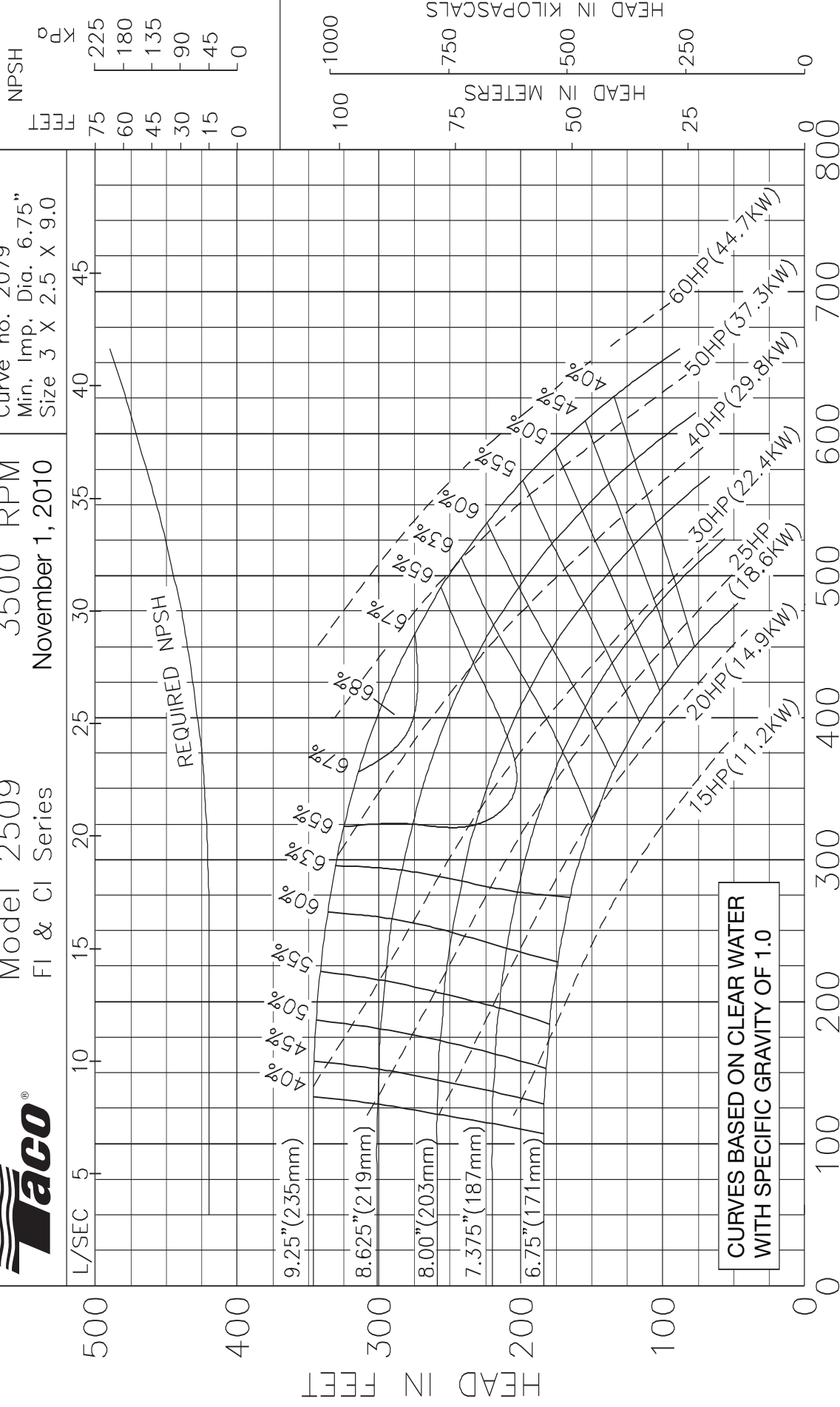




Model 2509
FI & CI Series

3500 RPM
November 1, 2010

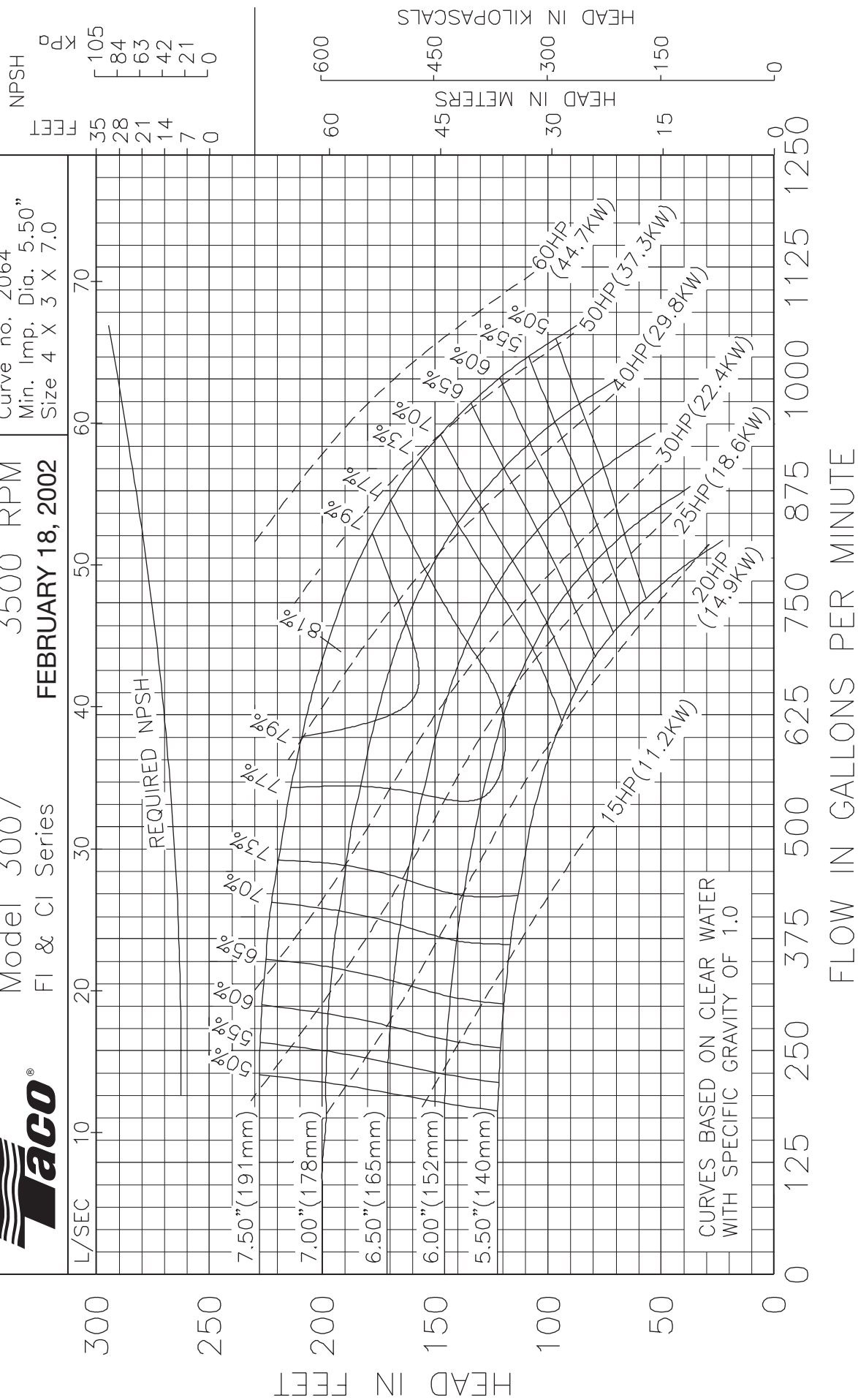
Curve no. 2079
Min. Imp. Dia. 6.75"
Size 3 X 2.5 X 9.0



Model 3007
FI & CI Series

3500 RPM
FEBRUARY 18, 2002

Curve no. 2064
Min. Imp. Dia. 5.50"
Size 4 X 3 X 7.0

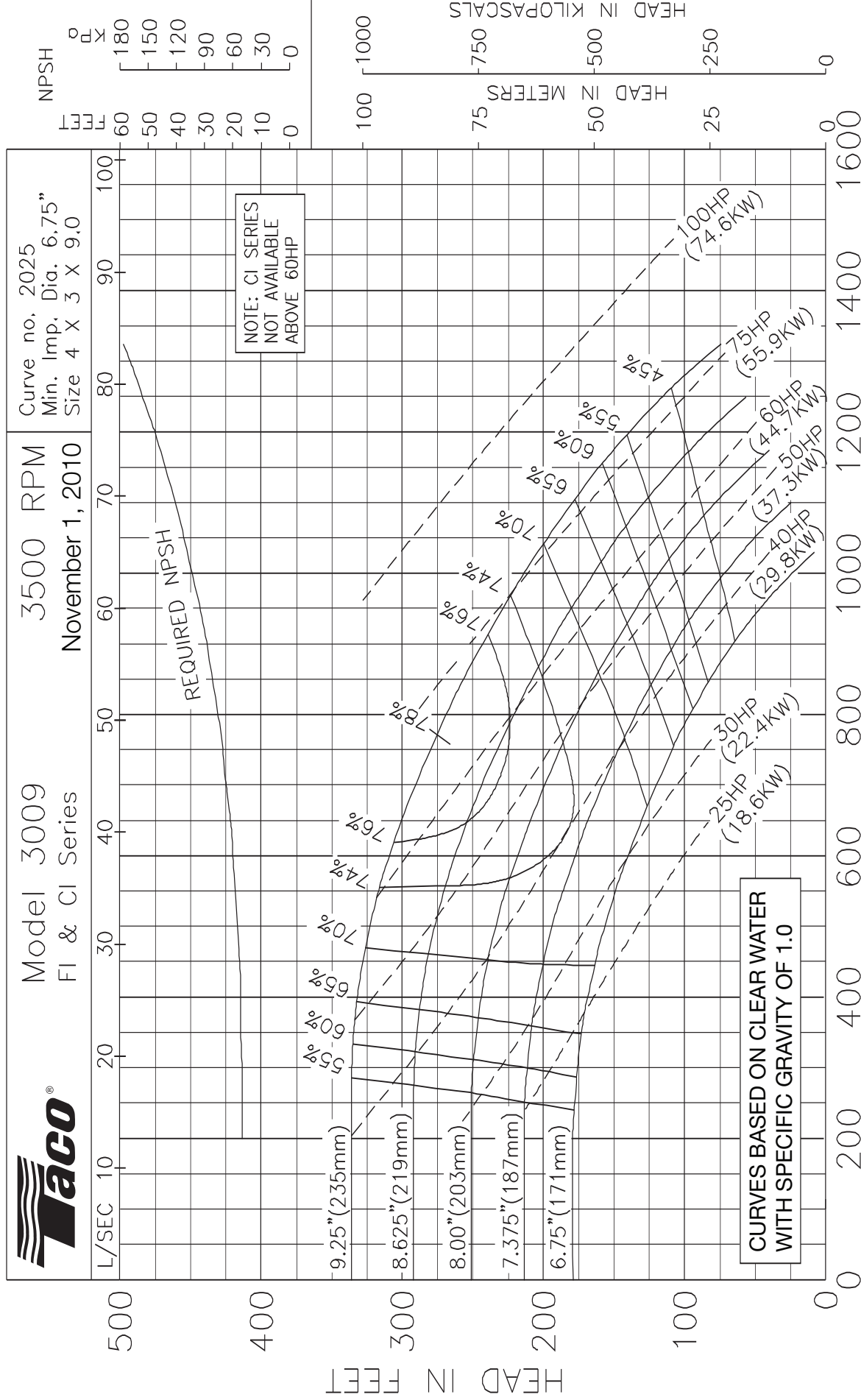




Model 3009
FI & CI Series

3500 RPM
November 1, 2010

Curve no, 2025
Min. Imp. Dia. 6.75"
Size 4 X 3 X 9.0

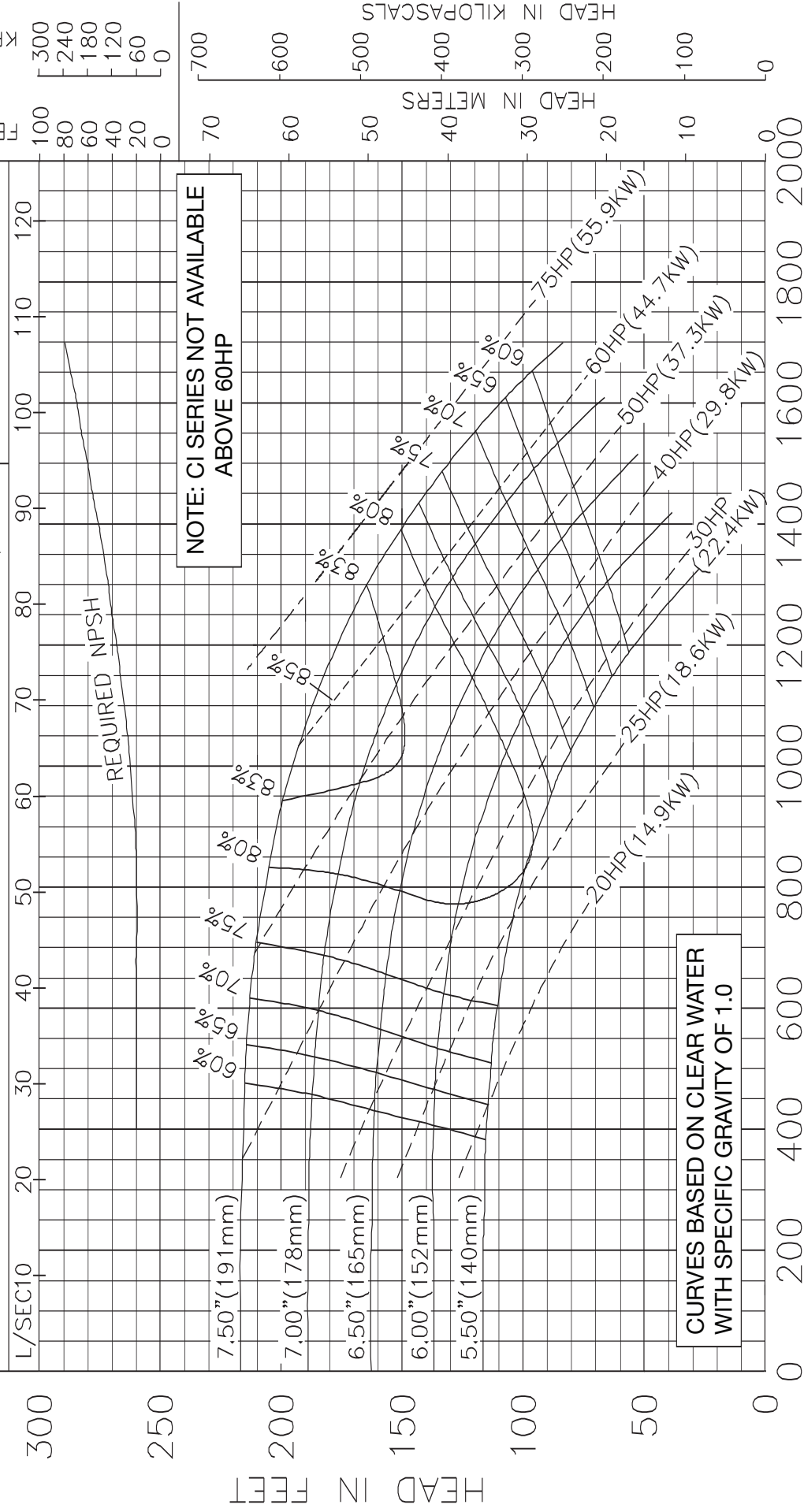




Model 4007
FI & CI Series

3500 RPM
November 1, 2010

Curve no. 2069
Min. Imp. Dia. 5.50"
Size 5 X 4 X 7.0

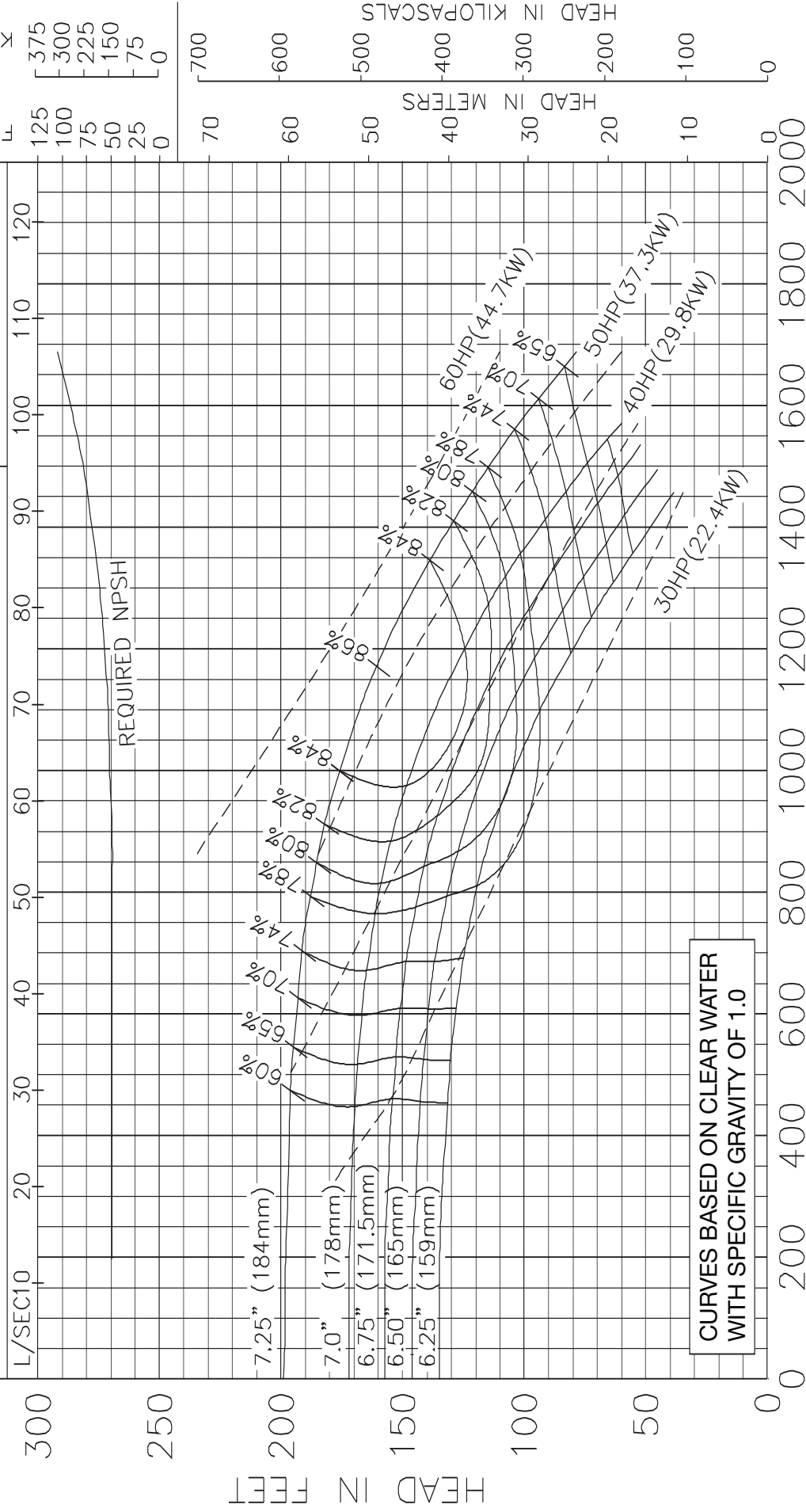




Model 4075
FI & CI Series

3500 RPM
November 1, 2010

Curve no. 2192
Min. Imp. Dia. 6.25"
Size 5 x 4 x 7

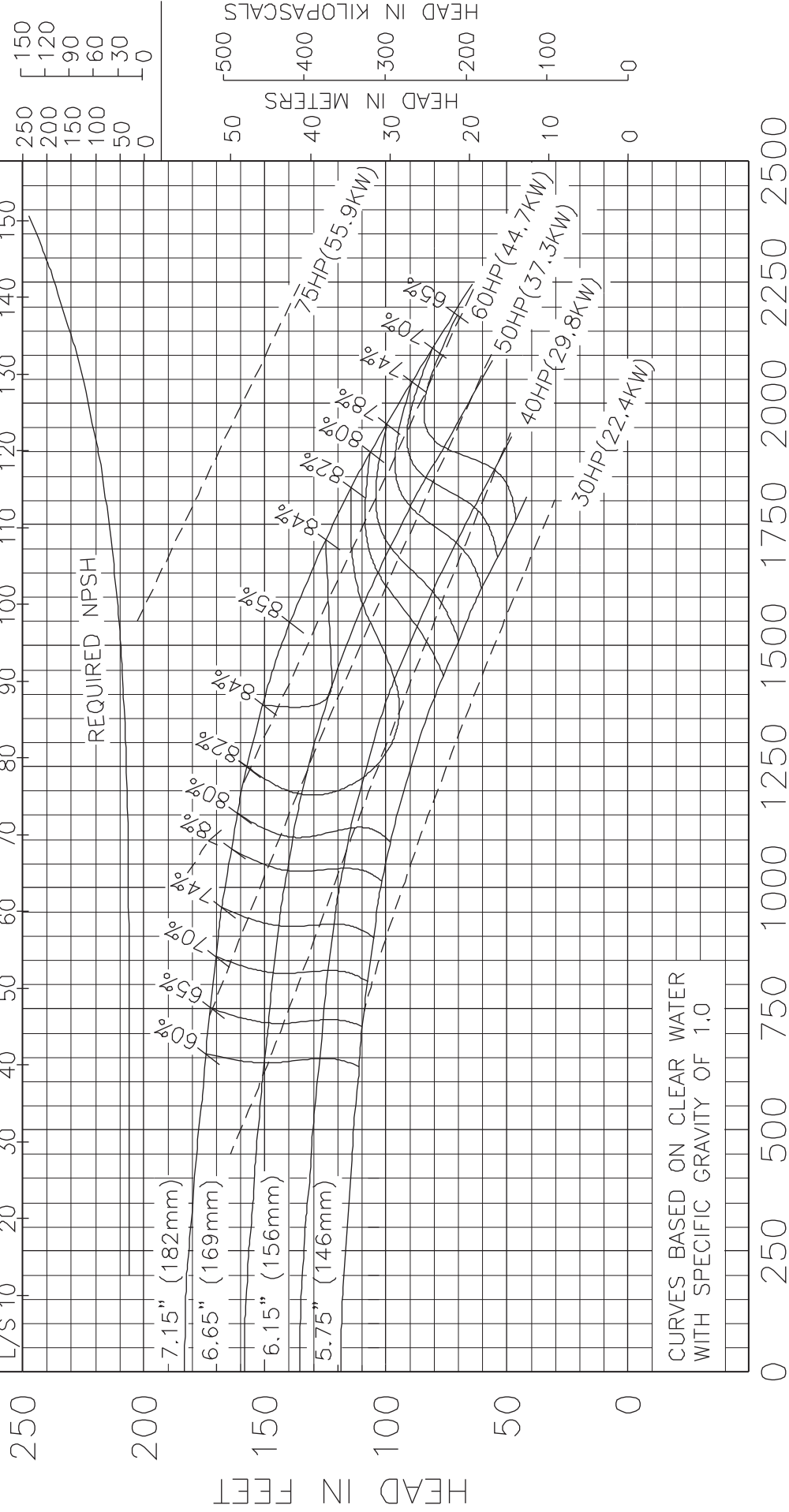




Model 5007
FI Series

3500 RPM
SEPTEMBER 9, 2009

Curve no. 2194
Min. Imp. Dia. 5.75"
Size 6 x 5 x 7.0



CURVES BASED ON CLEAR WATER
WITH SPECIFIC GRAVITY OF 1.0

FLOW IN GALLONS PER MINUTE