

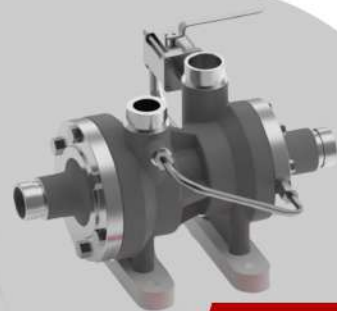
ALAM ENGINEERING

ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS



EXTRA HIGH PRESSURE

CENTRIFUGAL PUMP



AE TURBO

ULTRA HIGH PRESSURE



Plot #F-53, SSIC, Industrial park,
Hub River Road, S.I.T.E, Karachi

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INTRODUCTION

AE TurboCharger Is An Efficient And Cost Effective Solution For Recovering The Wasted Energy In a R.O System.

R.O System With AE TurboCharger Up To 90% Of wasted Energy Can Be Recovered As Well as initial Capital Of The R.O System Is Also Reduces By Smaller High Pressure Pump And The Throttle Valve Is Also Not Required If AE TurboCharger Is Installed.

AE TurboCharger Is Available In Stainless Steel 316L For The High Brackish And Duplex Stainless Steel 2205 For Sea Water.
The AE TurboCharger Provides A Energy Saving Upto 40%.

Range:

AE TurboCharger Range Starts From $16\text{m}^3/\text{h}$ to $120\text{m}^3/\text{h}$ And Pressure Upto 1200psi.

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Models

AET – 100

Flow Range:
16-24 m³/h

AET – 200

Flow Range:
28-50 m³/h

AET – 300

Flow Range:
50-75 m³/h

AET – 400

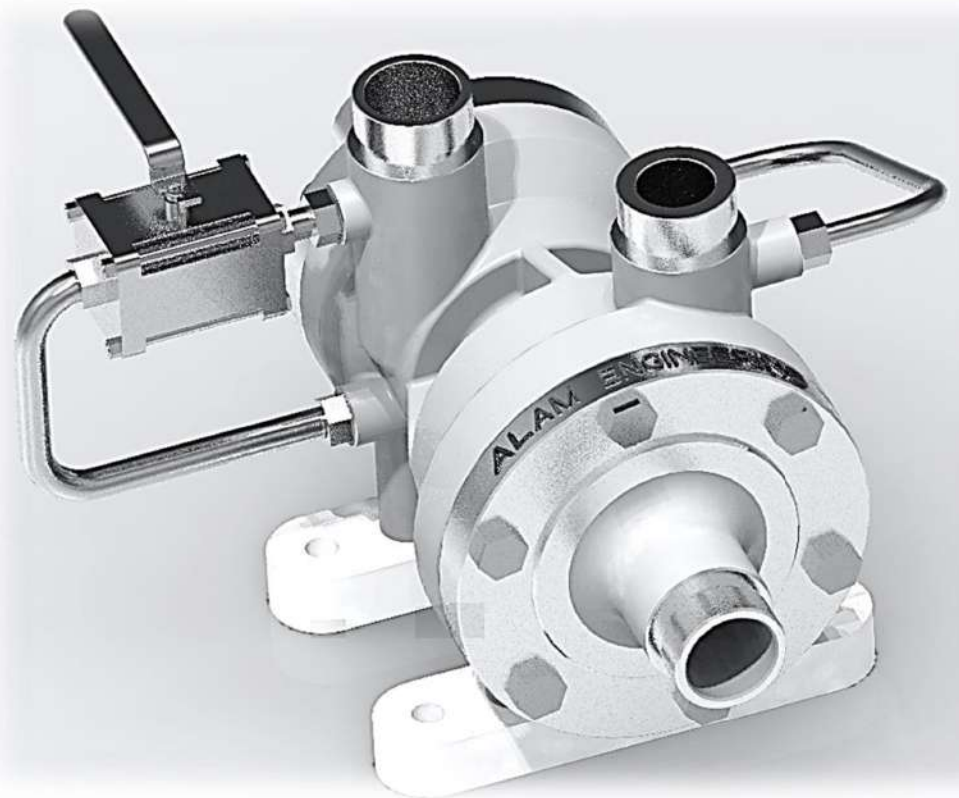
Flow Range:
80-120 m³/h

AET – 500

Flow Range:
120-170 m³/h

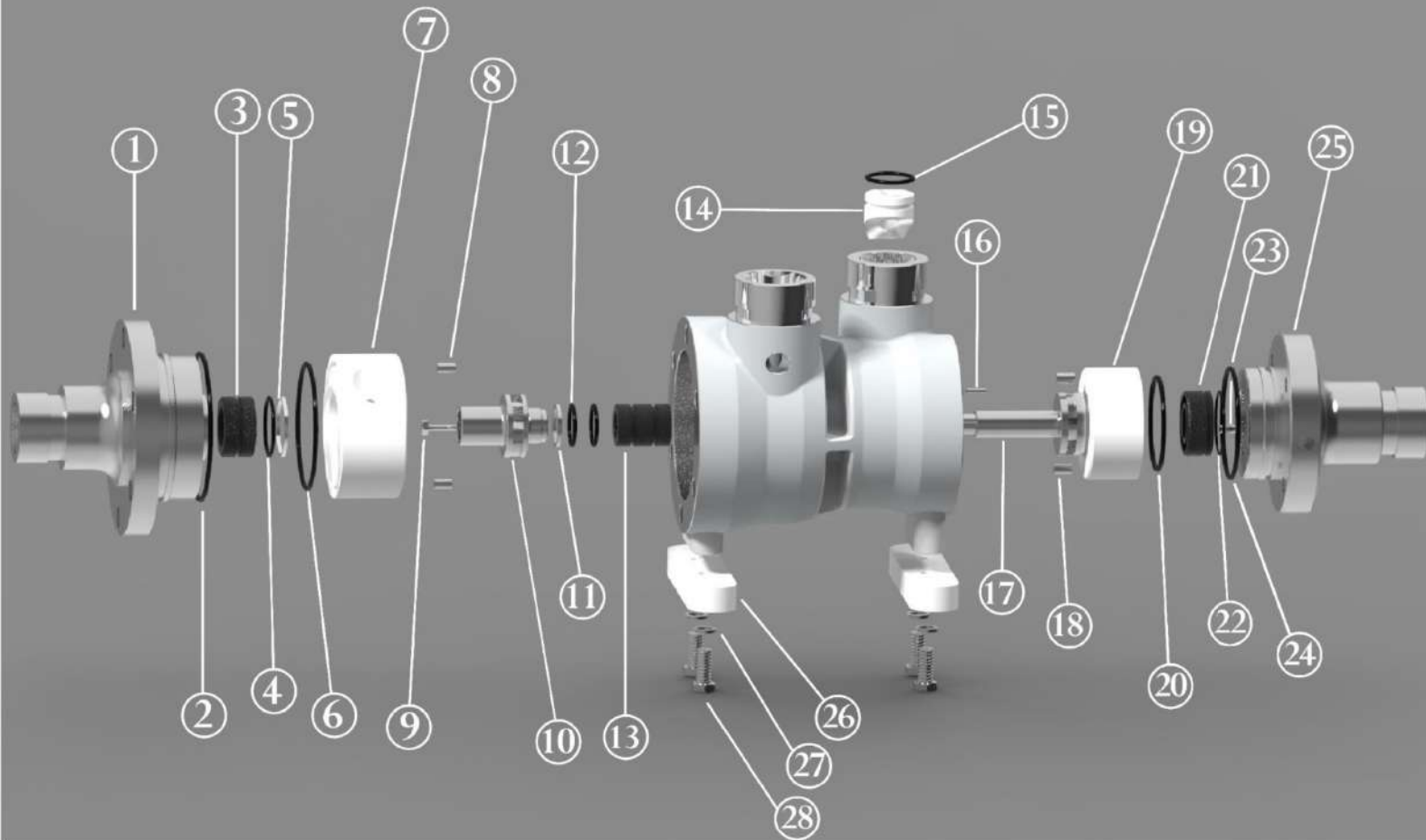
Pressure:

Pressure Range Upto 80 Bar.



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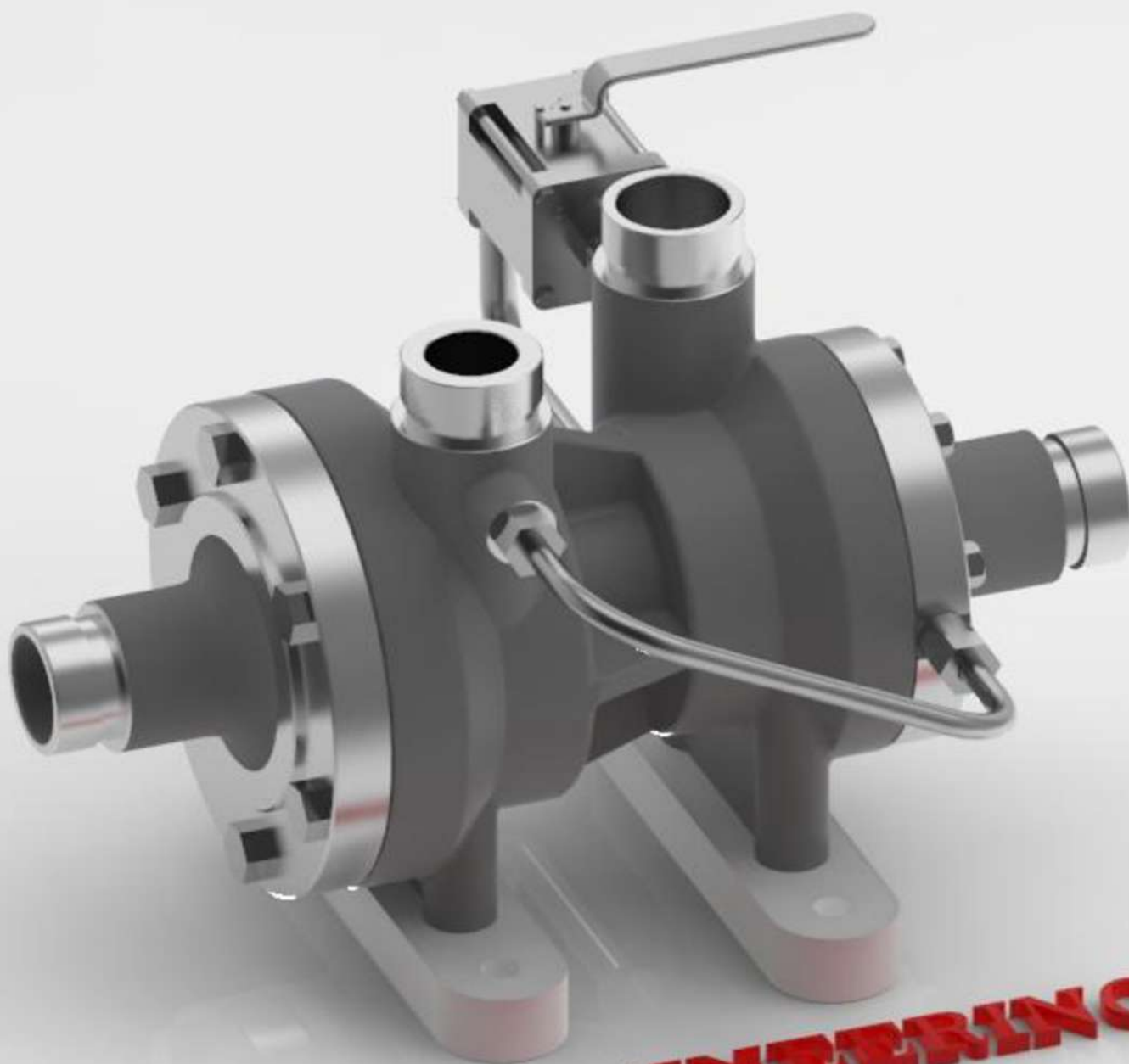
1. End-Cap Pump Side
2. End-Cap O-Ring
3. Support Bearing
4. Support Bearing O-Ring
5. Support Bearing Lock
6. Hydraulic O-Ring (P)
7. Hydraulic Pump Side
8. Hydraulic Lock Pins (P)
9. Bolt
10. Pump Side Impeller

11. Lock Ring Main Bearing
12. Main Bearing O-Rings
13. Main Bearing
14. Fire Pipe
15. Fire Pipe O-Ring
16. Impeller Key
17. Turbine Side Impeller
18. Hydraulic Lock Pins (T)
19. Hydraulic Turbine Side
20. Hydraulic O-Ring (T)

21. Thrust Bearing
22. Thrust Bearing O-Ring
23. Dowel Pin Thrust Bearing
24. End-Cap O-Ring
25. End-Cap Turbine Side
26. Base Turbo
27. Washer
28. Bolts

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XHP

INTRODUCTION:

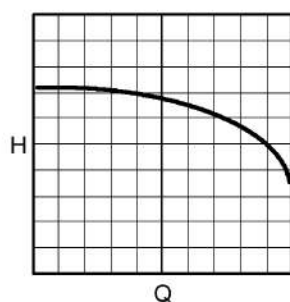
INTRODUCING THE XHP LINE OF HIGH PRESSURE PUMPS BY ALAM ENGINEERING THE ALL NEW XHP IS PERFECT COMBINATION OF BALANCED ENGINEERING AND METALLURGY. THIS NEW SERIES IS CAPABLE OF HANDLING HIGH SEA WATER WITH TDS UP TO 60,000.

XHP COMES IN THREE TYPES OF METALLURGY THE BASIC ONE BEING 316L AND THE OTHER INCLUDE 904L & 2205 DUPLEX THIS RANGE STARTS FROM 25M³/H AND GOES UPTILL 120 M³/H WITH A MAXIMUM HEAD OF 550METERS (55 BARS).



Booklet with Performance Curves

High-pressure Pumps in ring-section design



50 Hz 2900 r/min

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XHP

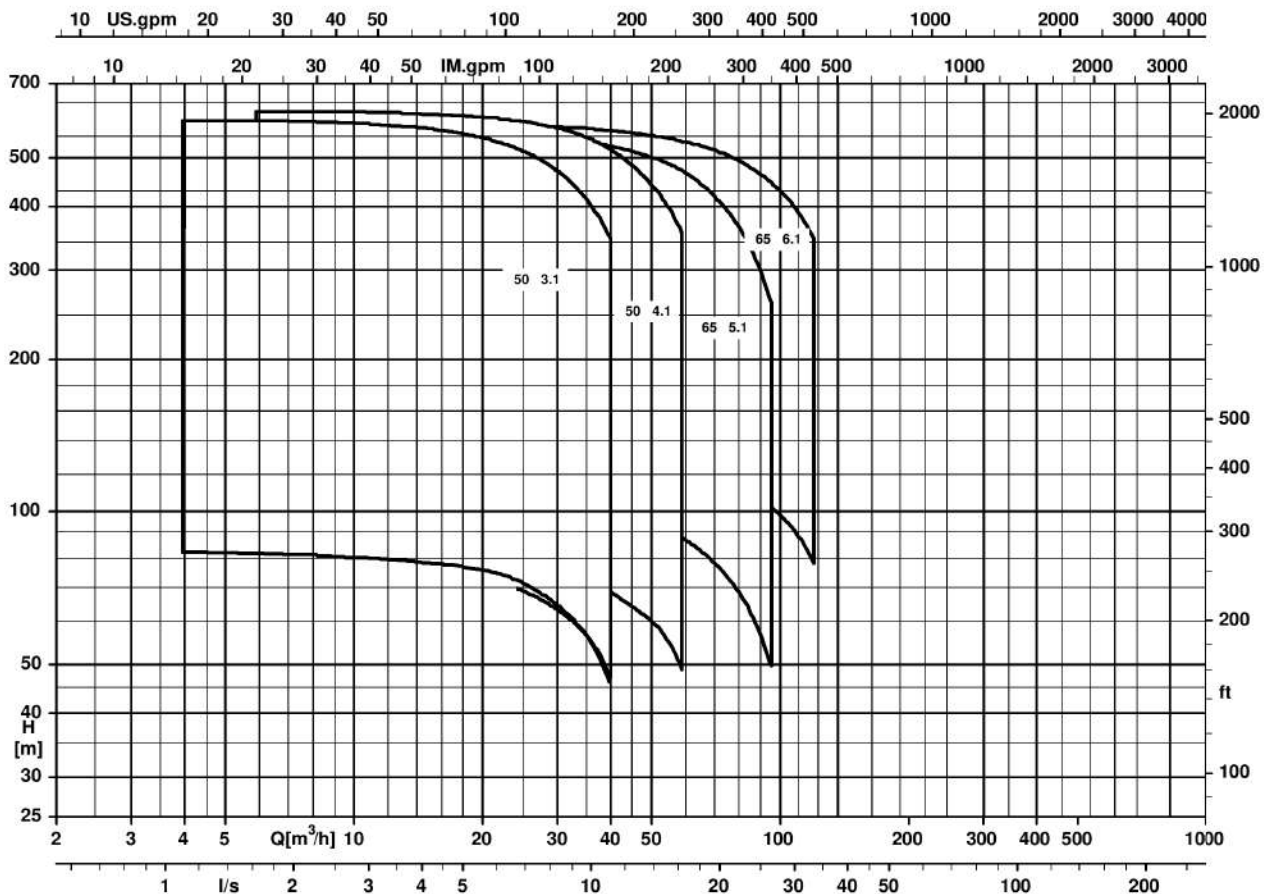
Contents

Pump size	Impeller Ø	Impeller/Diffuser combination		n = 2900 r/min	
		Code No.	Material code (Material)	BEP m ³ /h	Page
Selection charts	-	-			
50	170	3.1		15 - 28	
	173	4.1		30 - 45	
65	193	5.1		50 - 70	
	214	6.1		75 - 100	

Selectioncharts

n = 2900 r/min

316/2205



1. General

The individual performance curves apply to operational pumps including hydraulic balance and seal circulation flows in standard design. Depending on the pump variant, the corrections and limits outlined below must be taken into account.

The performance curves are valid for DIN 1944/III.

For stating warranty values, the data sheet of the AE quotation programme is authoritative.

The shutoff head may only be stated with a tolerance of $\pm 5\%$.

Note applicable to all **single curves** (see pages 4, 5, 6, etc. up to 11).

Total head and power input = Head and power input of a single stage multiplied by the number of stage.

2. Determination of the duty point

Pump sizes 50 and 65

The duty point of the pump is set by impeller combinations by default. It has to be fixed with one of the combinations "A" to "E" (table 1).

The number of stages is taken from the selection charts in the section about performance curves in this booklet. The values shown in table 2 are subtracted from the total head at full impeller diameters, depending on which combination has been chosen. The result is the pump head. This procedure arrives at an approximate value for manual selection. More accurate values will be provided by the pump selection software.

Calculation example:

Enquired duty point : $n = 2900$ r/min, $H = 262$ m, $Q = 40$ m³/h

Selected: XHP 50/8, hydraulics 4.1, material variant 10

Pump head with combination "A": 280 m

Necessary head reduction: -17.5 m

Selected impeller combination "C": $H = 280 - 17.5 = 262.5$ m

A precise adaptation of the pump head can be supplied against an extra charge.

Table 1: Trimmed diameters and impeller combinations

combination	impeller combination	Impeller diameter for hydraulics			
		3.1	4.1	5.1	6.1
A	full impeller	170	173	193	214
B	1 trimmed impeller, rest full	156	158	177	196
C	2 trimmed impellers, rest full	156	158	177	196
D	3 trimmed impellers, rest full	156	158	177	196
E	4 trimmed impellers, rest full	156	158	177	196

Table 2: Pump head subtracted for impeller combinations

Hydraulics	3.1	4.1	5.1	6.1
Combination	n = 2900 r/min			
A	0	0	0	0
B	8.4	8.8	11.2	13.7
C	16.9	17.5	22.5	27.4
D	25.3	26.3	33.7	41.2
E	33.8	35.0	44.9	54.9

3. Efficiency reductions for few stages

If few stages are used, it may be necessary, depending on the hydraulics used, to reduce the efficiency as shown in table 4.

Table 4:

Pump size	Hydraulics	Number of stages			
		2	3	4	5
		Percent to be subtracted			
50	3.1	-2	-1	0	0
	4.1	-2	-1	0	0
65	5.1	-2	-1	0	0
	6.1	-2	-1	0	0

4. NPSH

XHP 50 and 65 pumps are equipped with a suction impeller in the 1st stage as a standard.

The NPSH_{3%} values shown in the individual performance curves are minimum values which correspond to the inception of cavitation. They apply to degassed water.

To cover measuring tolerances and plant-related scattering, a margin of 10 %, but not less than 0.5 m must be taken into account. This margin is included in the NPSH value shown for the pump selection software.

5. Balancing drum

The XHP pump is equipped with a balancing drum for hydraulic balancing of axial thrust, the residual thrust is held by rolling element bearings.

6. Max. number of stages

The different design variants are available up to the following maximum stage numbers. The additional limitations of the maximum allowable pump discharge pressure (discharge pressure for material variants at operating temperature, suction head) must be observed.

Table 5: Design variant A, B, C, D

Hydraulic	3.1	4.1	5.1	6.1
2900 r/min	15	15	11	10

Table 6: Design variant E, Ex, F, Fx, Vx

Hydraulic	3.1	4.1	5.1	6.1
2900 r/min	6	6	4	4

Table 7: Design variant V

Hydraulics	3.1	4.1	5.1	6.1
2900 r/min	10	9	8	6

7. Max. allowable speed

Table 8:

Hydraulics	1.4408
3.1	4000
4.1	4000
5.1	4000
6.1	4000

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Type-Size

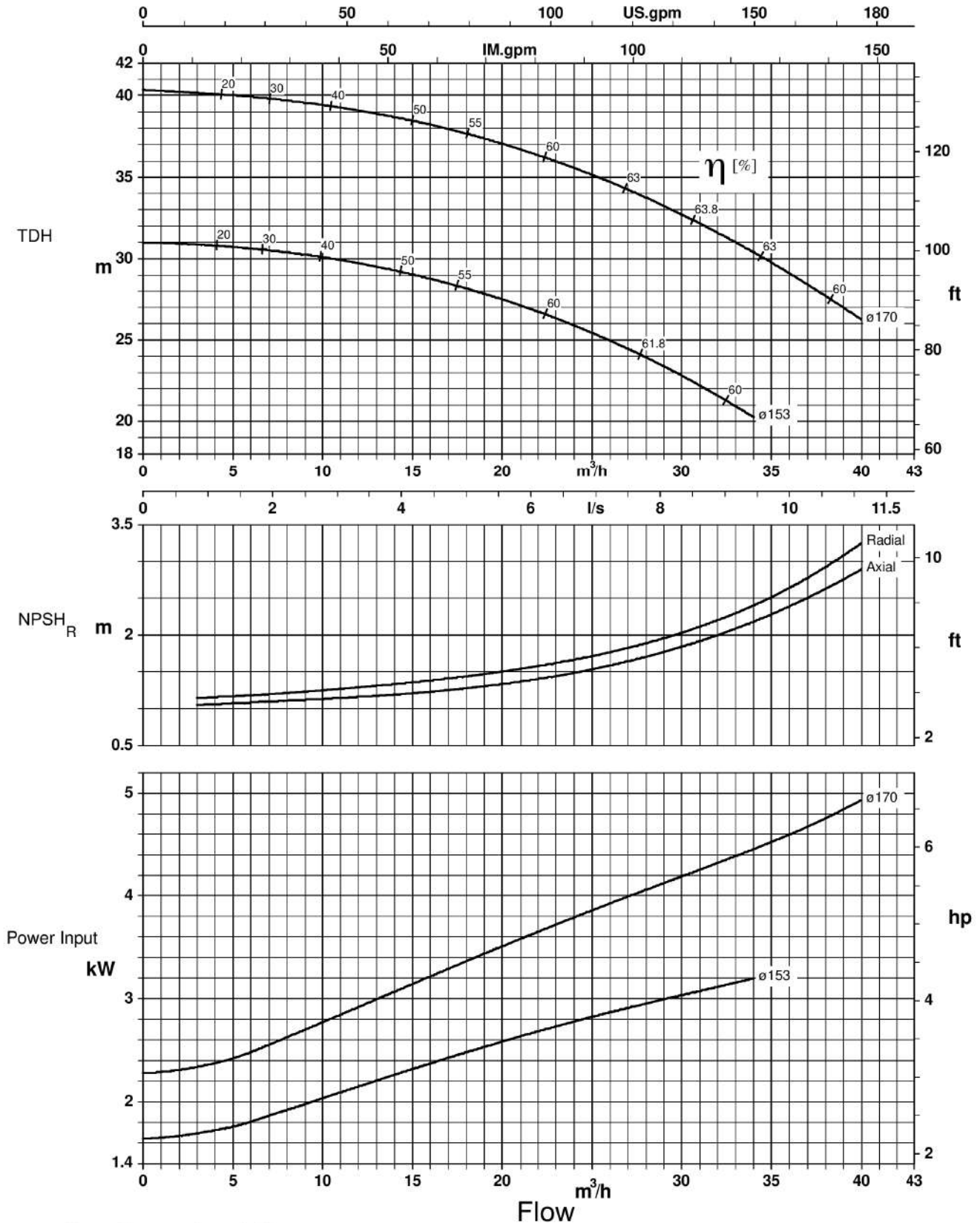
XHP 50 3.1

Nom. speed

2900 r/min

Material

316/2205



Impeller outlet width 7.5mm

ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS



Type-Size

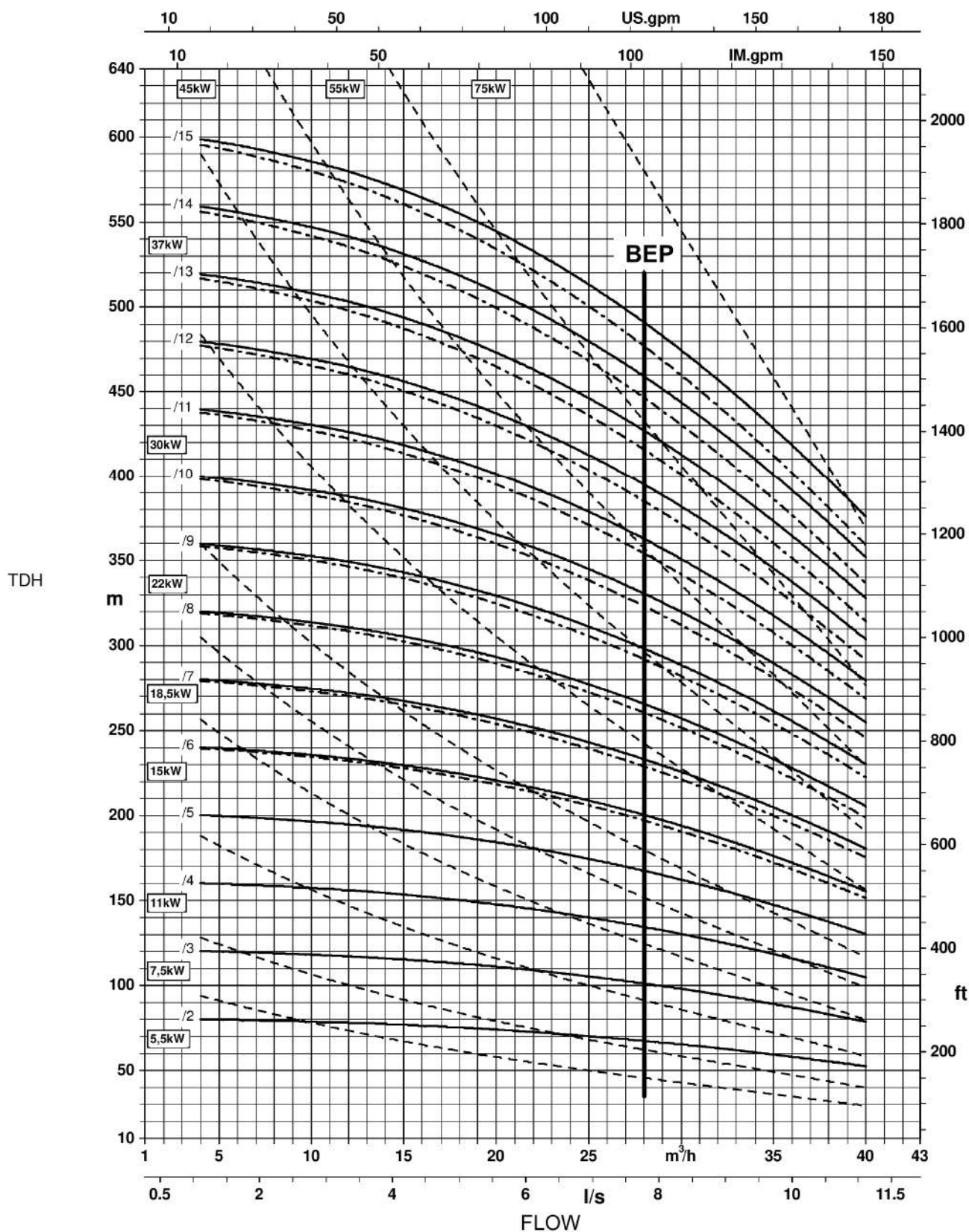
XHP 50 3.1

Nom. speed

2900 r/min

Material

316/2205



Impeller Outlet Width 7,5 mm

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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS



Type-Size

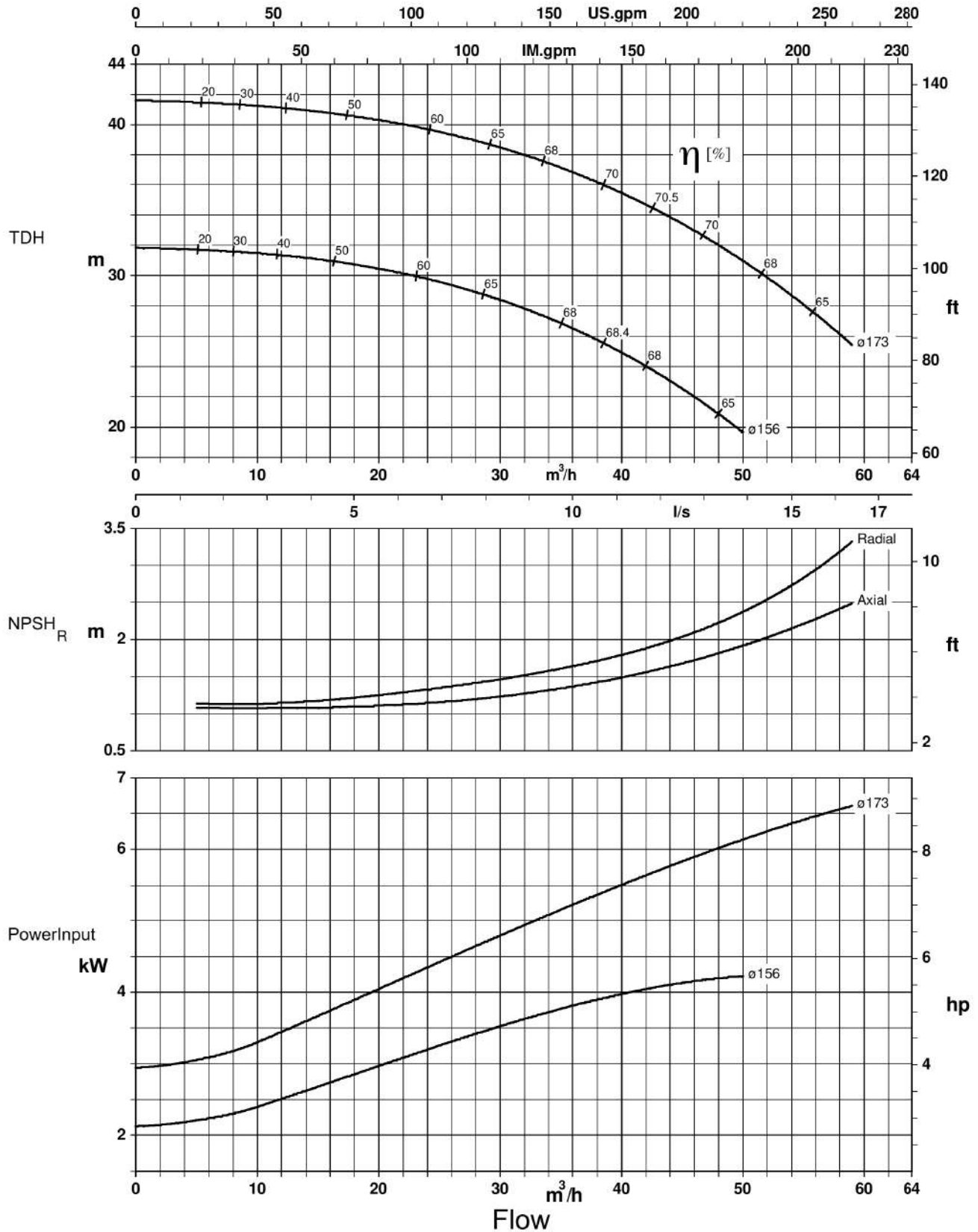
XHP 50 4.1

Nom. speed

2900 r/min

Material

316/2205



Impeller outlet width 10 mm

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Type-Size

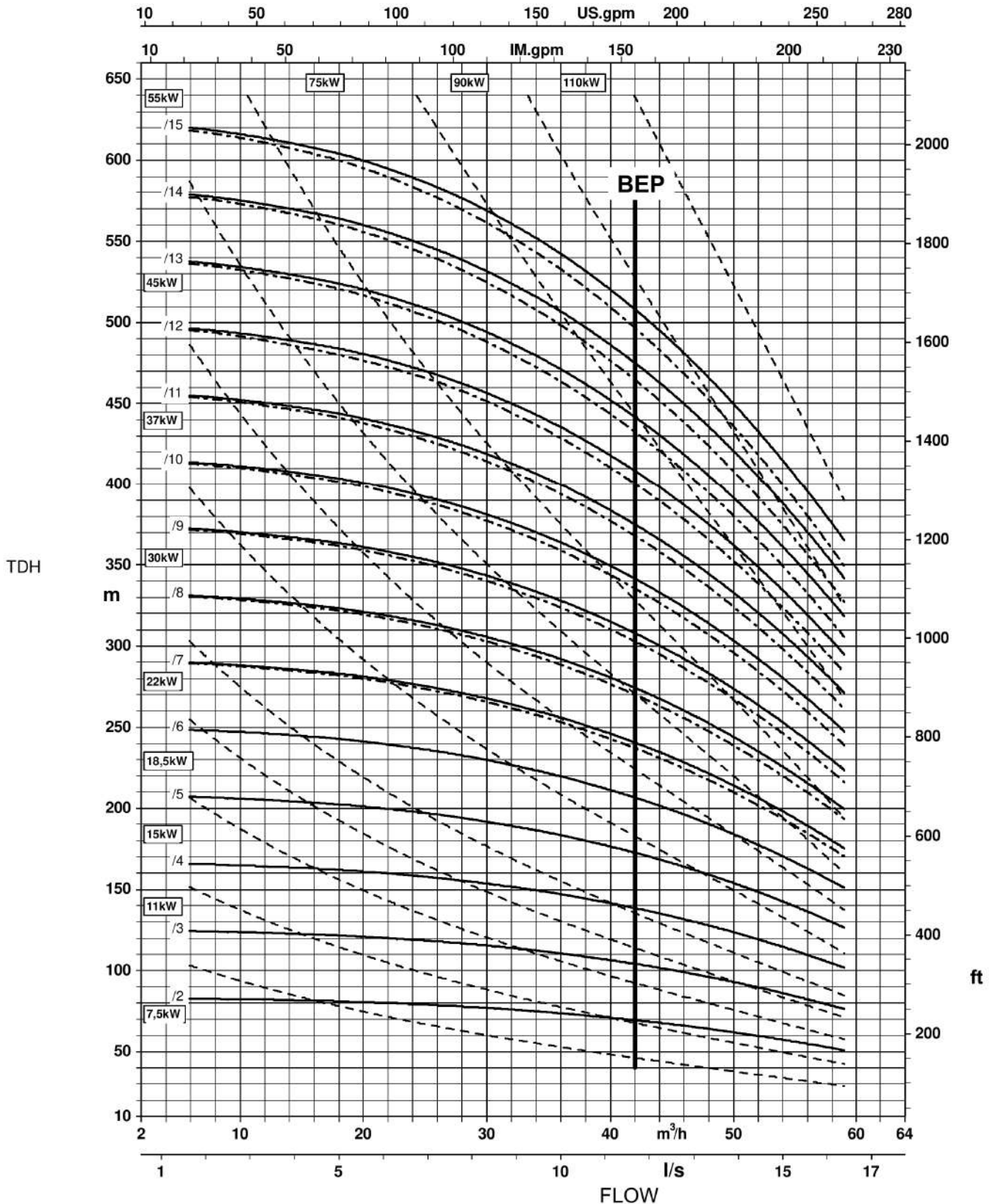
XHP 50 4.1

Nom. speed

2900 r/min

Material

316/2205



Impeller Outlet Width 10 mm

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Type-Size

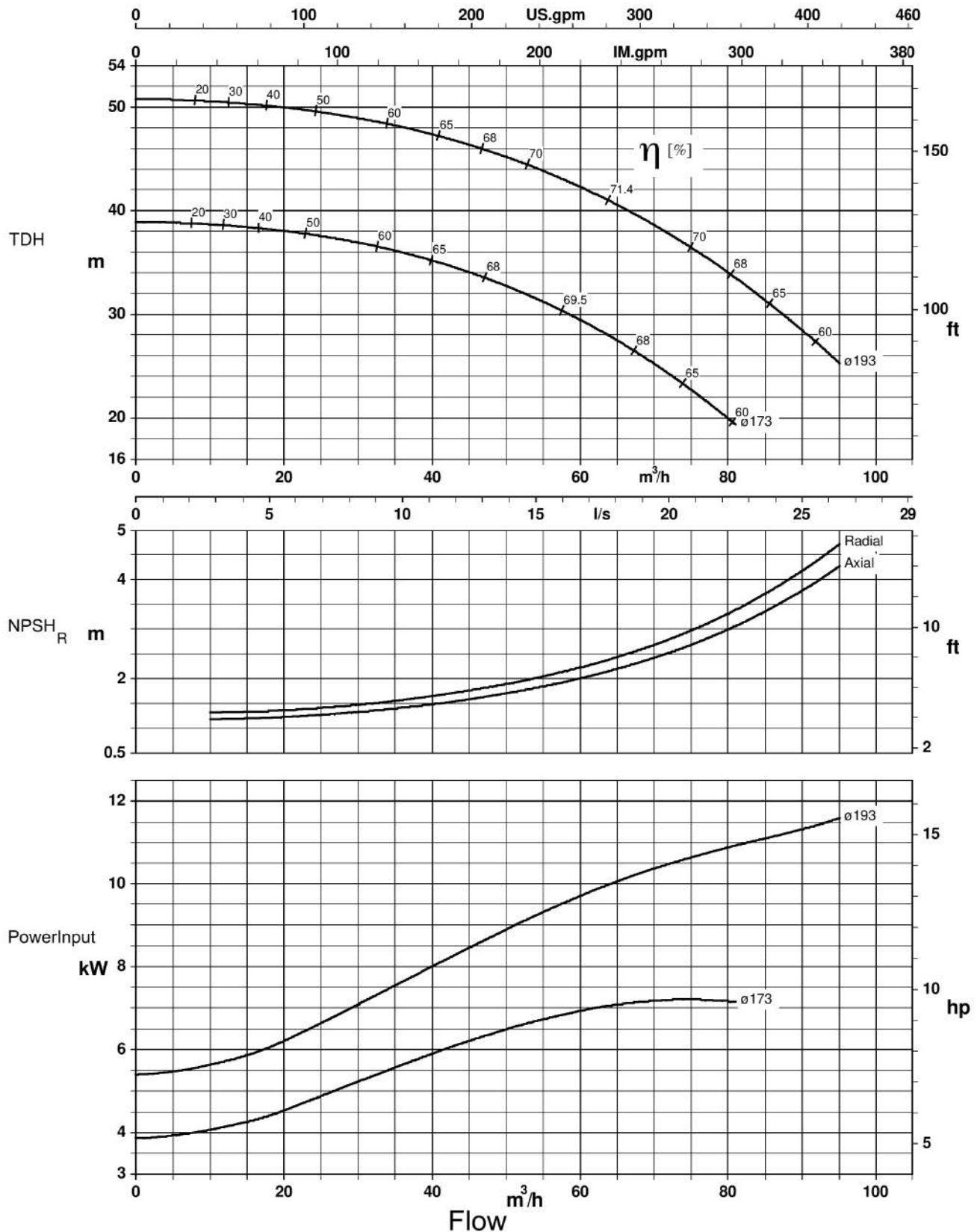
XHP 65 5.1

Nom. speed

2900 r/min

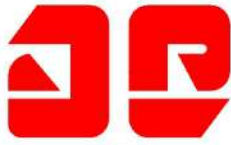
Material

316/2205



ALAM ENGINEERING

ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS



Type-Size

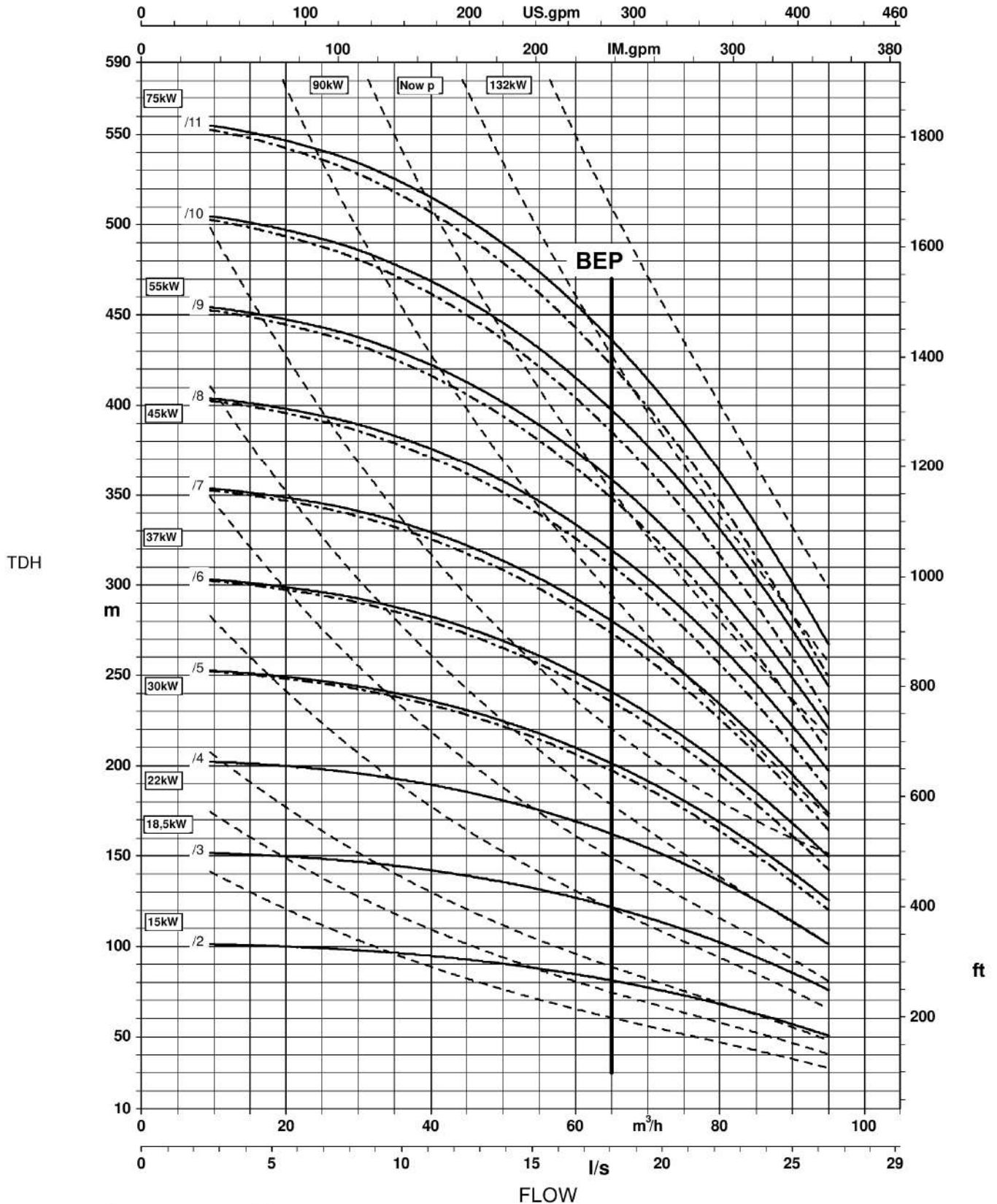
XHP 65 5.1

Nom. speed

2900 r/min

Material

316/2205

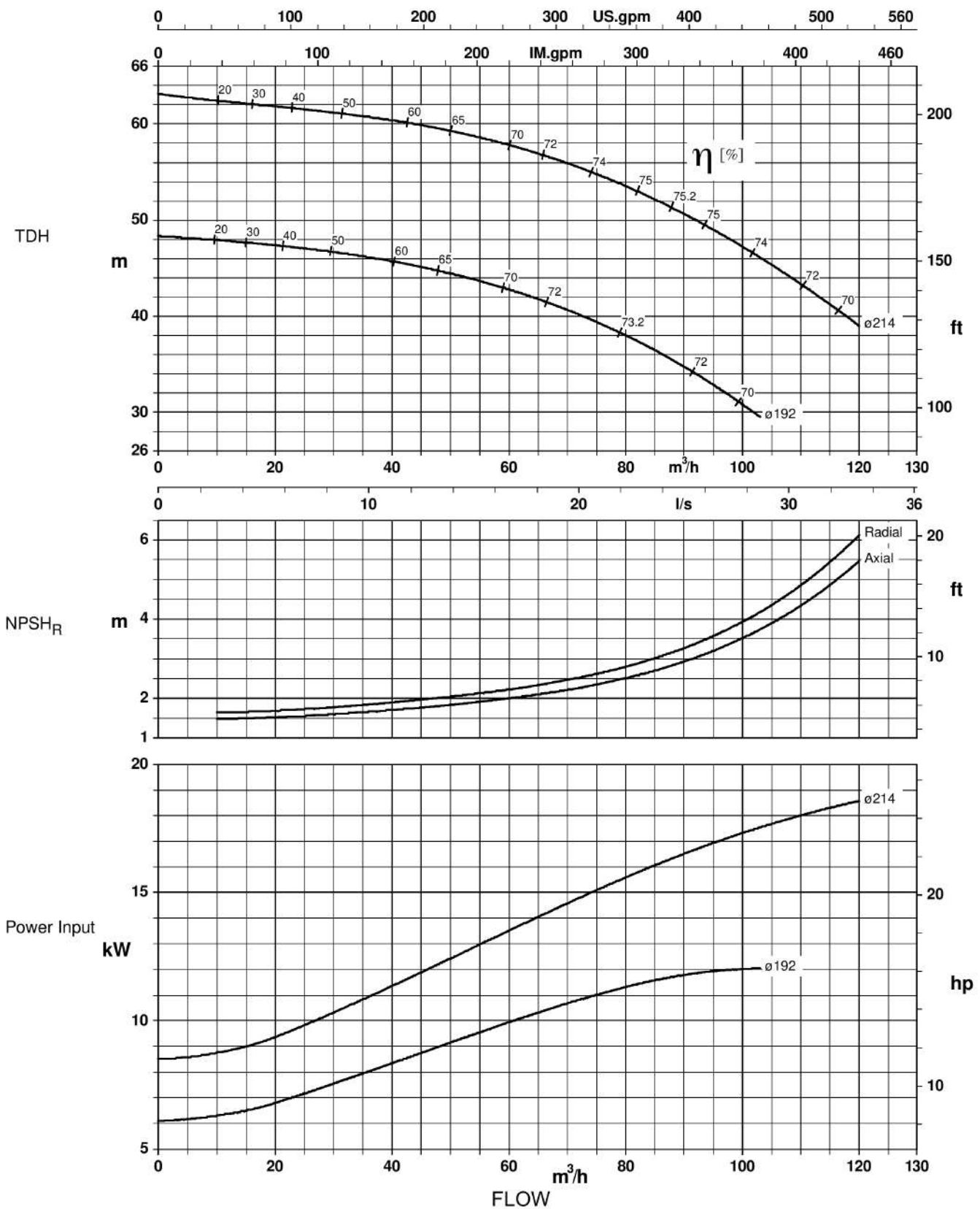


Impeller Outlet Width 11.5 mm

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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

	Type-Size XHP 65 6.1	Nom. speed 2900 r/min	Material 316/2205
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Impeller Outlet Width 12.5 mm

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Type-Size

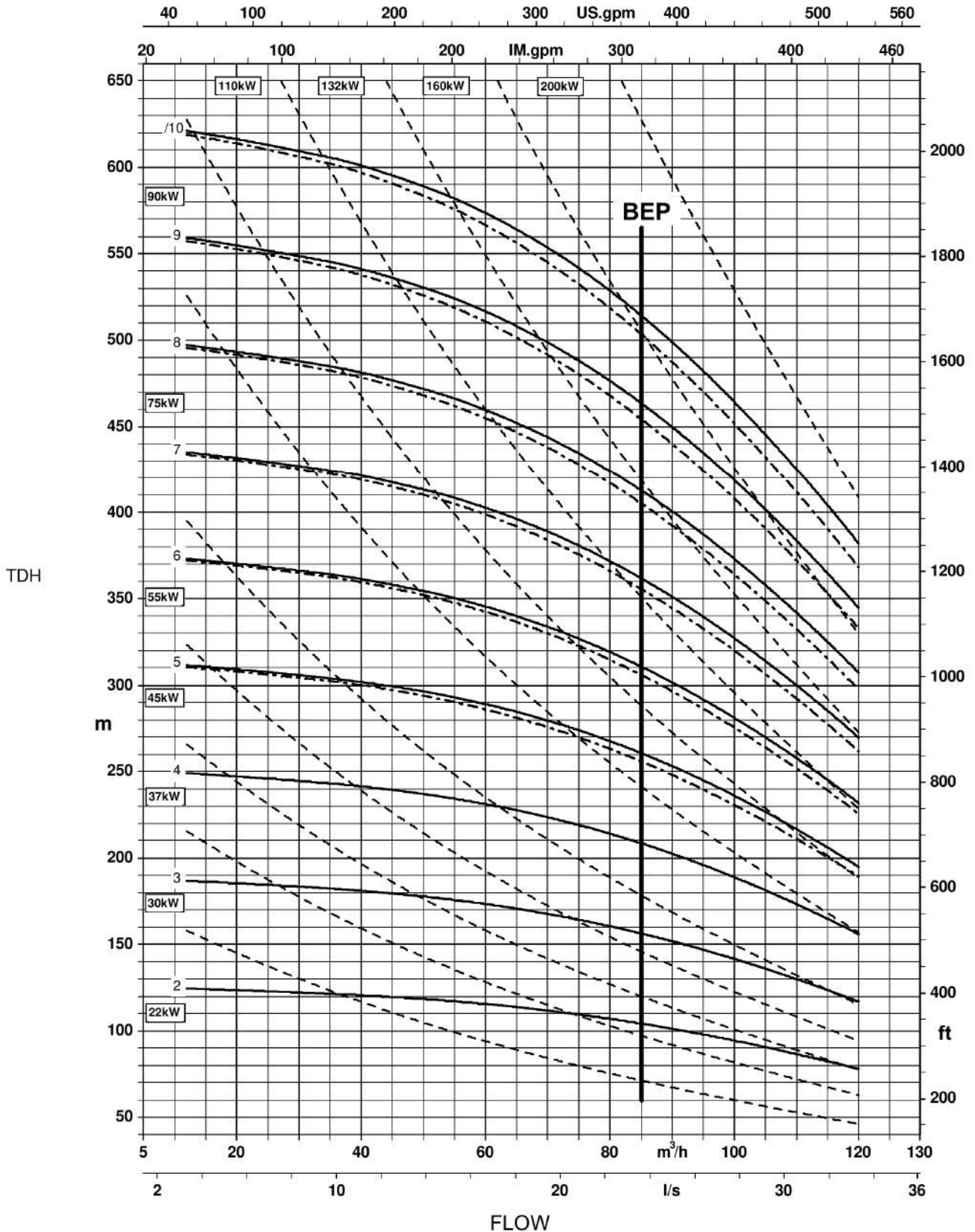
XHP 65 6.1

Nom. speed

2900 r/min

Material

316/2205



Impeller Outlet Width 12.5 mm

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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS



Type-Size

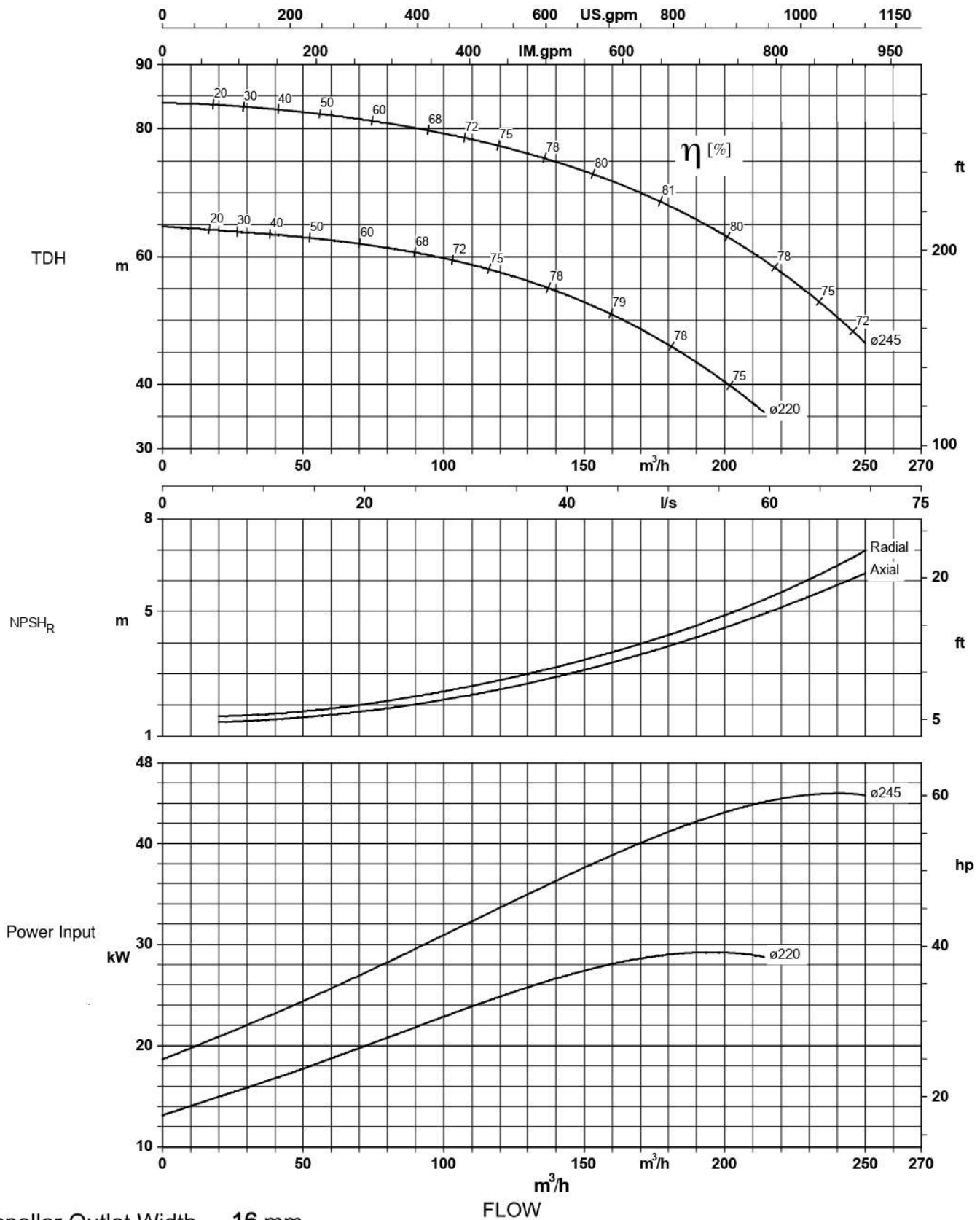
XHP 100 8.1

Nom. speed

2900 r/min

Material

316/2205

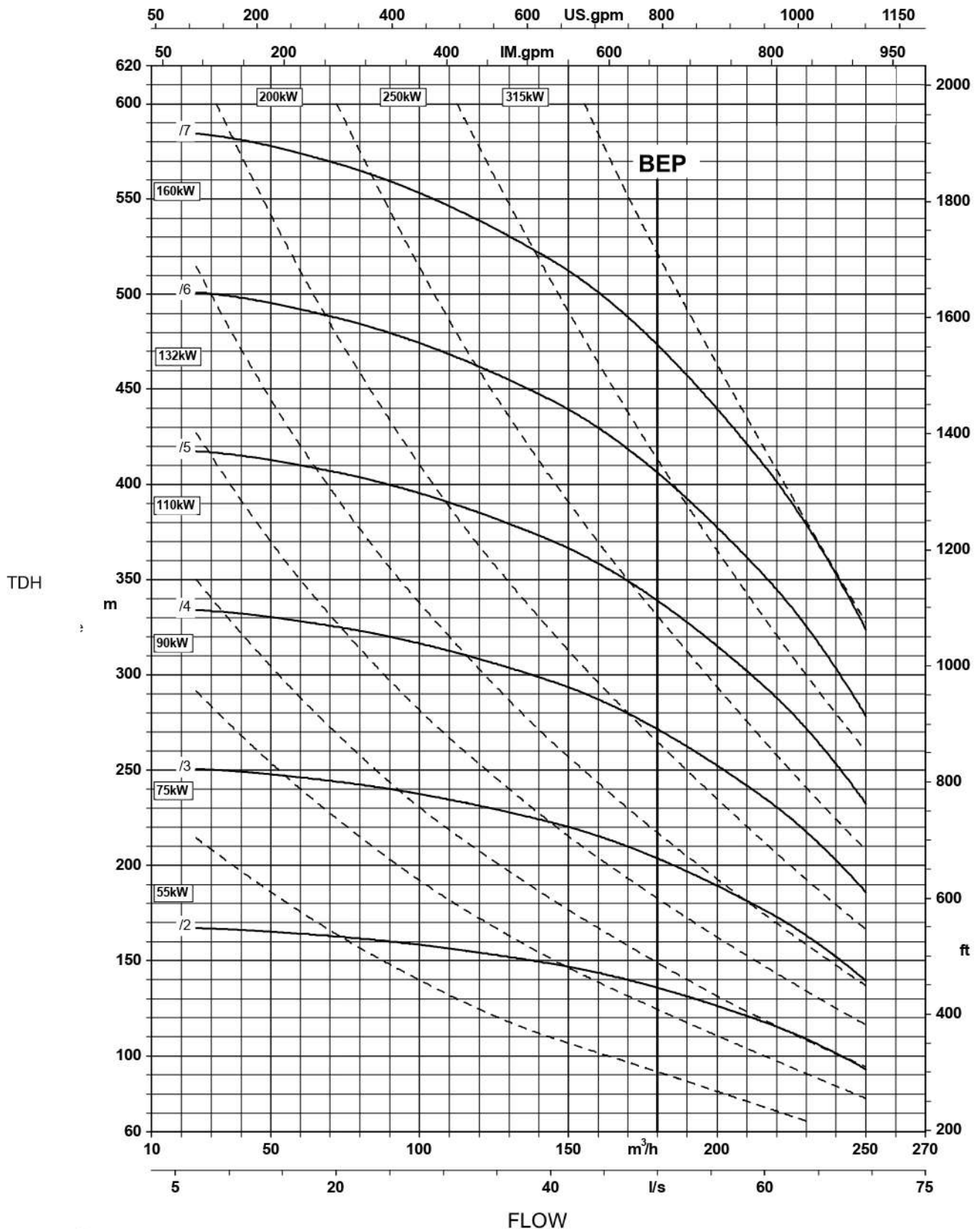


Impeller Outlet Width 16 mm

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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

	Type-Size	Nom. speed	Material
	XHP 100 8.1	2900 r/min	316/2205



Impeller Outlet Width 16 mm

Centrifugal Pump:

Types Of Pumps:

- 1 . BES (BARE SHAFT END SECTION)
- 2 . MES (MONOBLOCK END SECTION)



Centrifugal Pump



1450 RPM

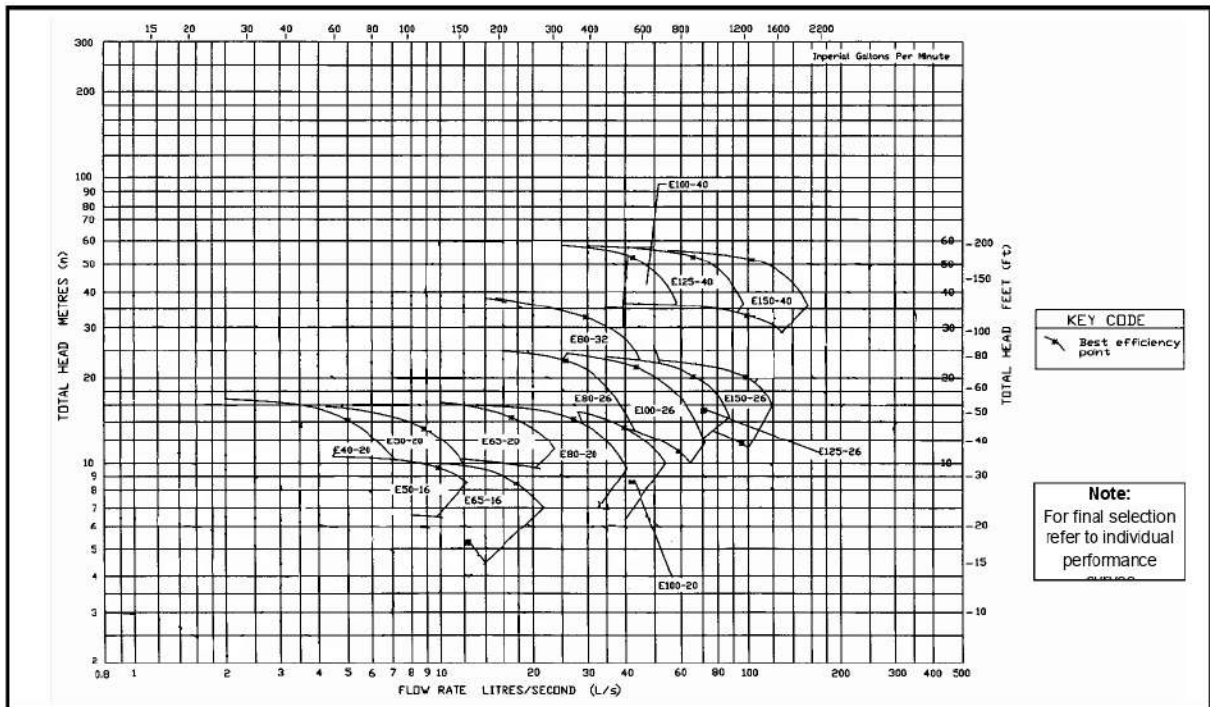
Model	Date	Curve No.	Issue
E40-20	28/08/97	PT-2031	2
E50-16	28/08/97	PT-2098	3
E50-20	28/08/97	PT-2107	3
E65-16	28/08/97	PT-2194	3
E65-20	28/08/97	PT-2027	3
E80-20	28/08/97	PT-2115	3
E80-26	28/08/97	PT-2158	3
E80-32	28/08/97	PT-2489	3
E100-20	28/08/97	PT-2153	3
E100-26	28/08/97	PT-2192	3
E100-40	28/08/97	PT-5316	4
E125-26	28/08/97	PT-5318	4
E125-40	28/08/97	PT-5319	4
E150-26	28/08/97	PT-5314	4
E150-40	28/08/97	PT-5317	4

2900 RPM

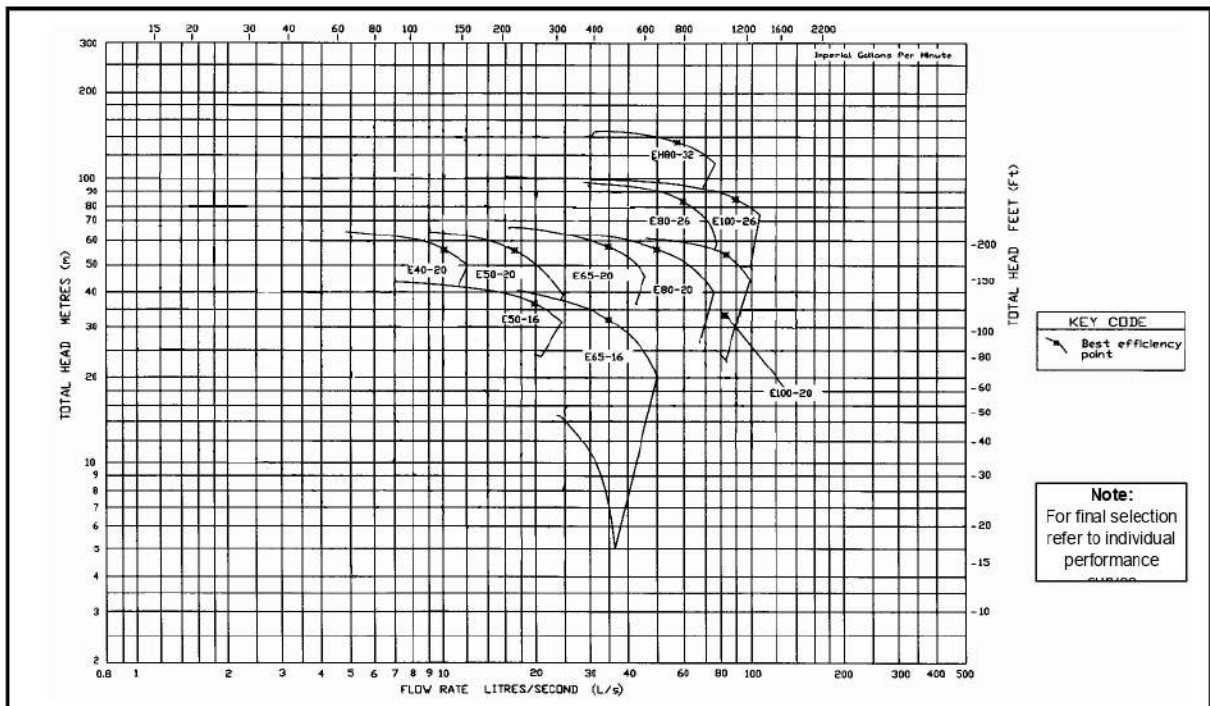
Model	Date	Curve No.	Issue
E40-20	28/08/97	PT-2029	3
E50-16	28/08/97	PT-2097	3
E50-20	28/08/97	PT-2106	3
E65-16	28/08/97	PT-2195	3
E65-20	28/08/97	PT-2028	3
E80-20	28/08/97	PT-2116	3
E80-26	28/08/97	PT-2231	3
E80-32	28/08/97	PT-5025	3
E100-20	28/08/97	PT-2238	4
E100-26	28/08/97	PT-2235	3

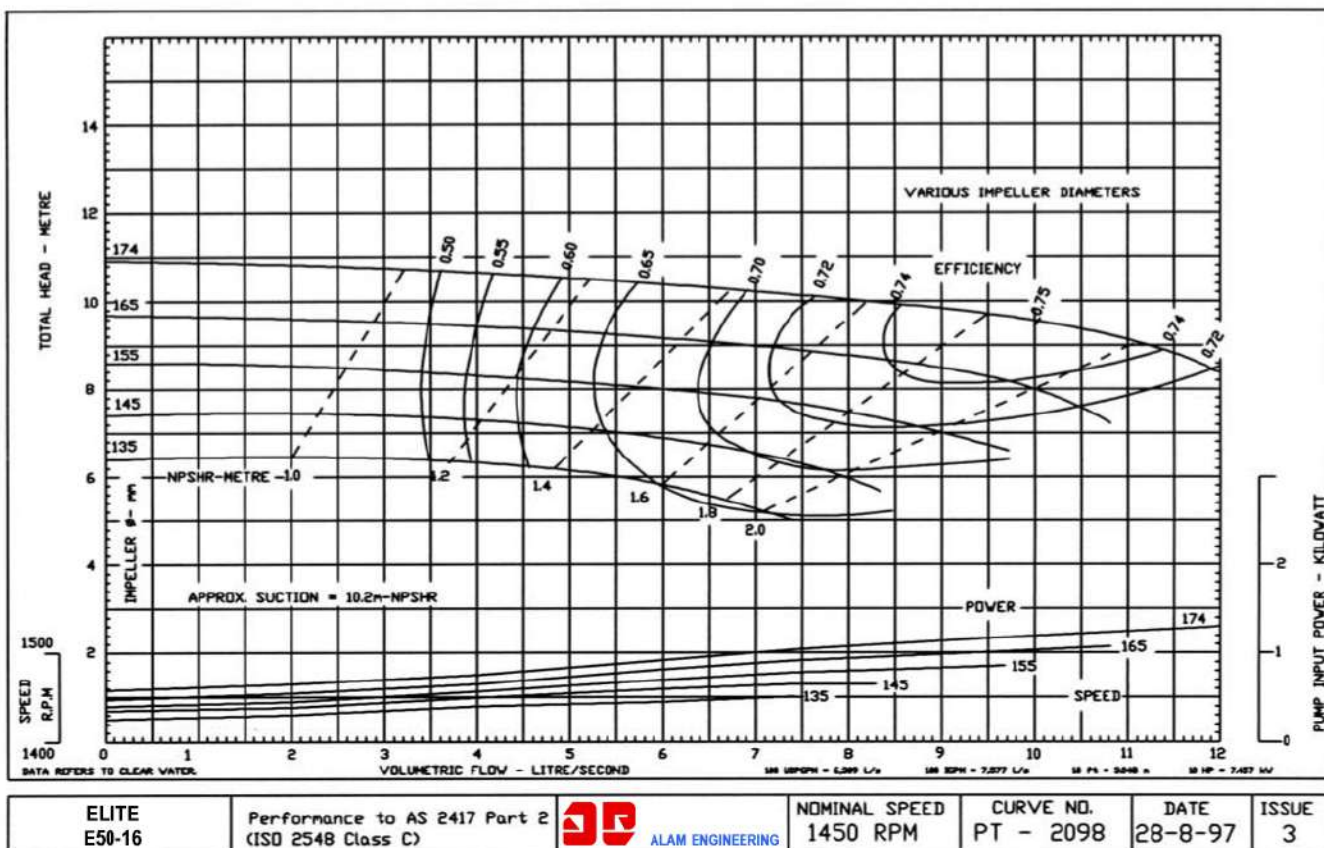
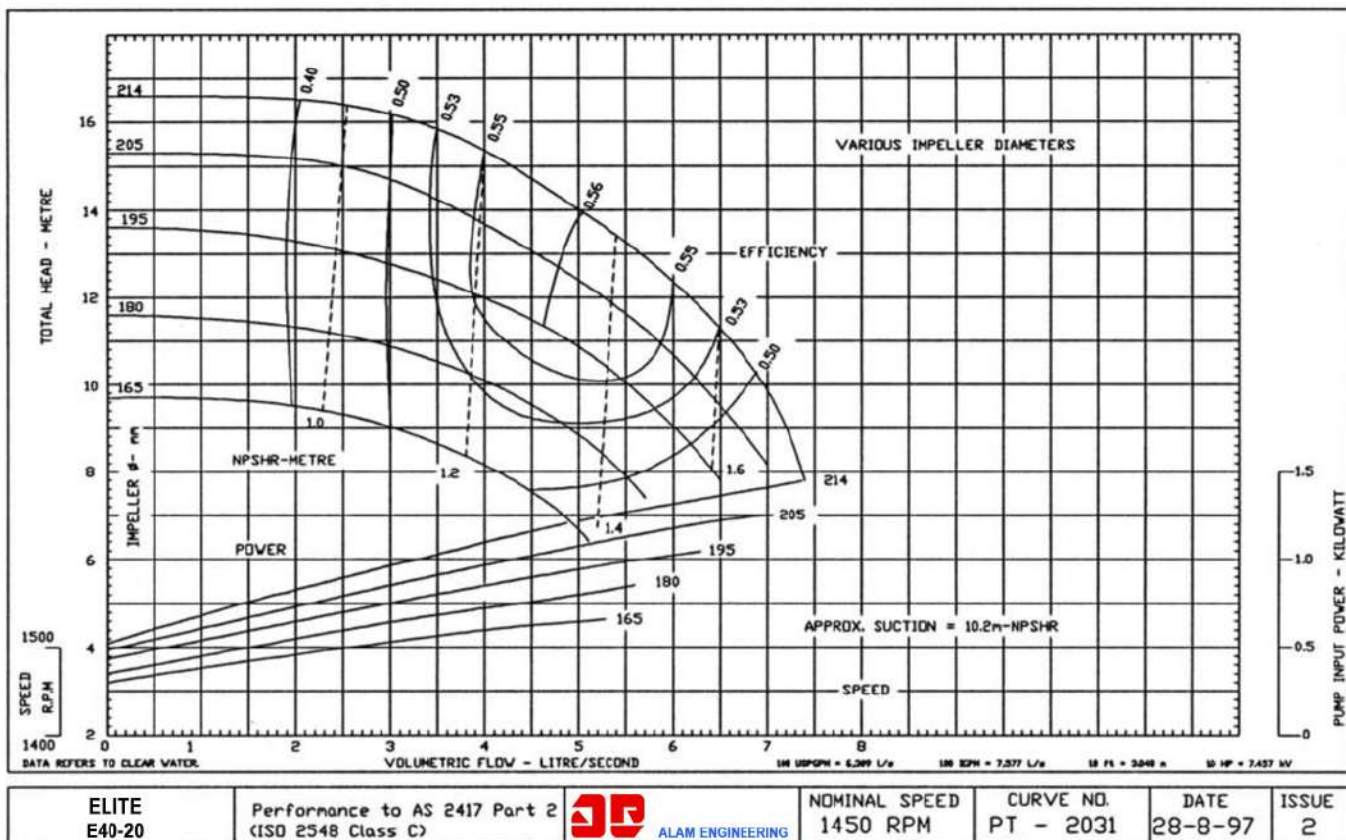


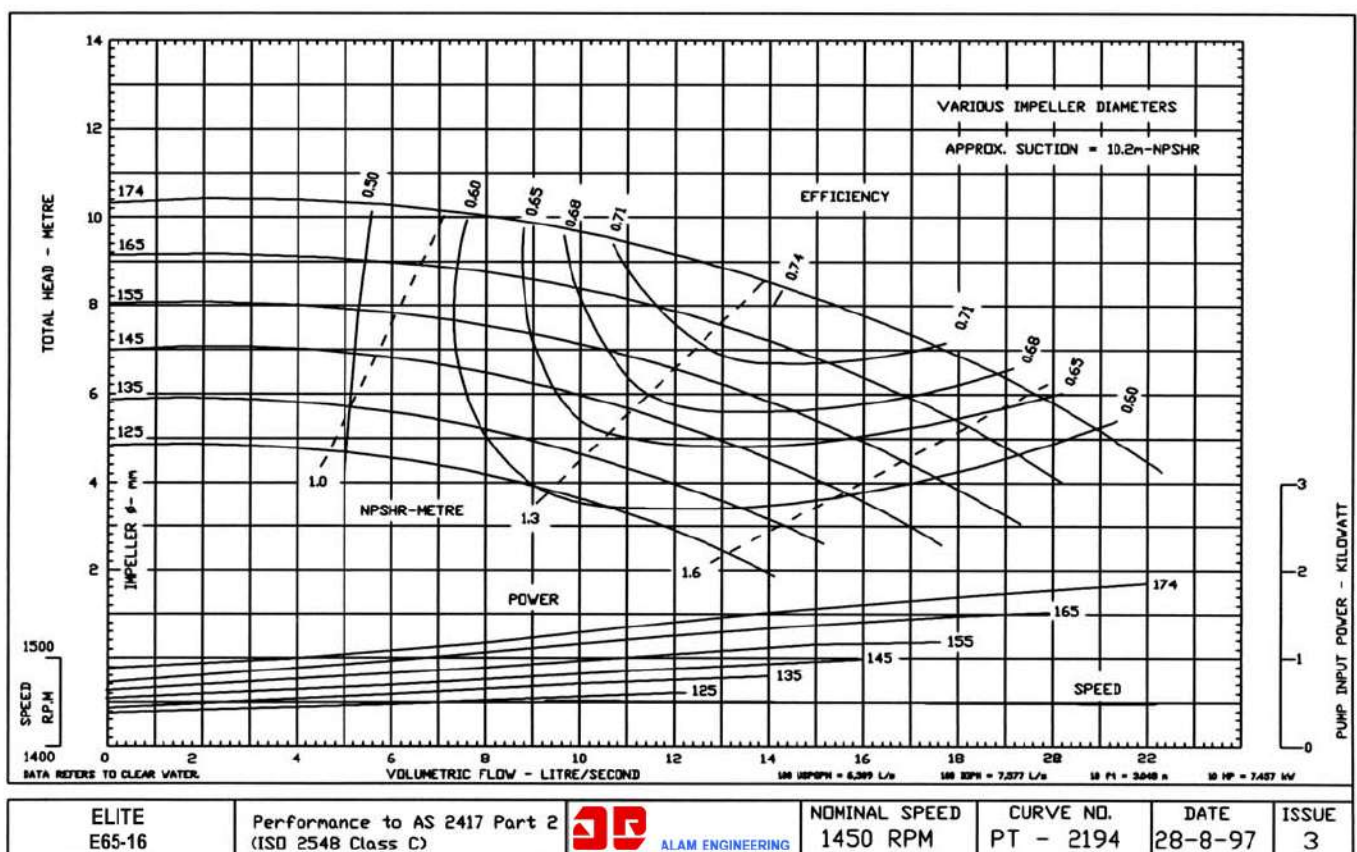
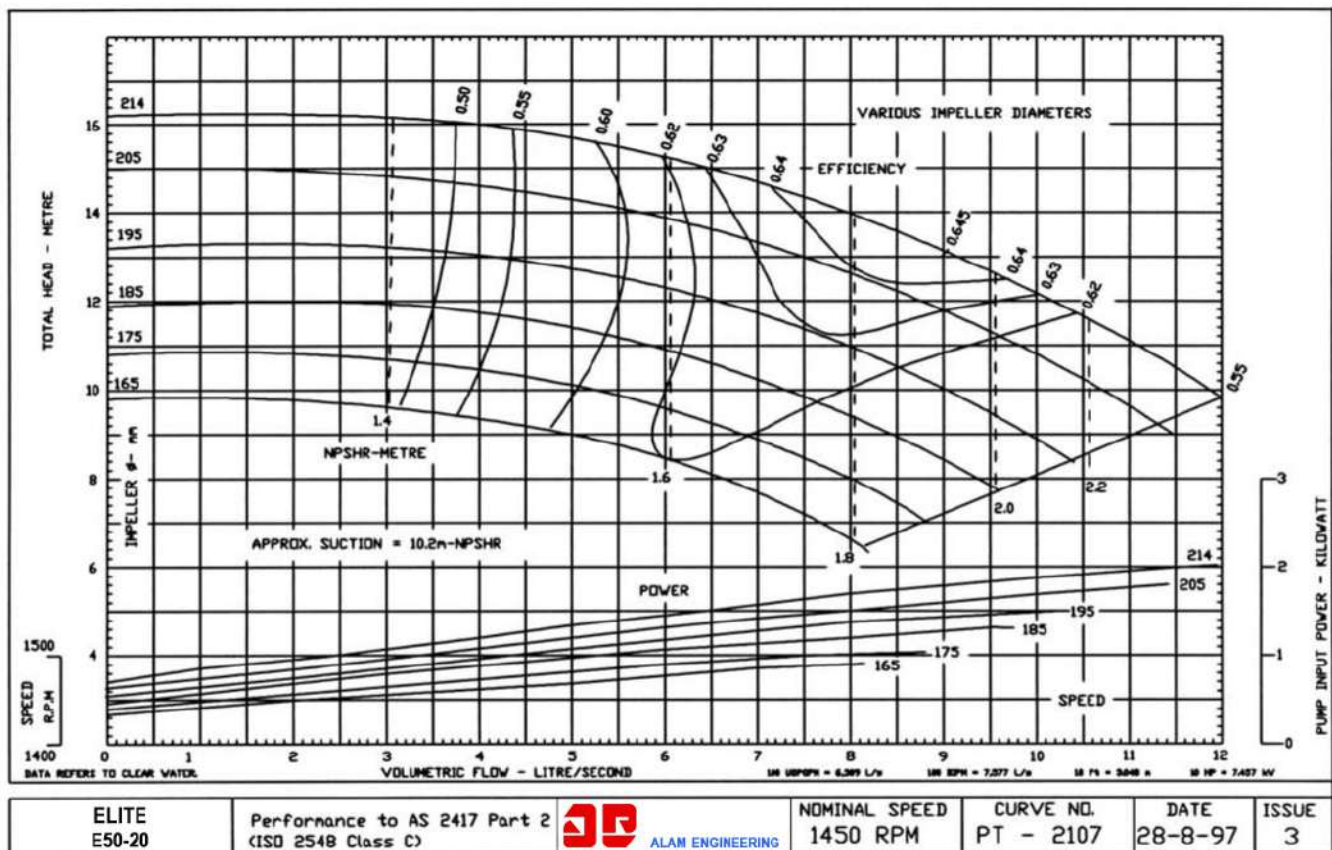
Selection Chart 1450 rpm

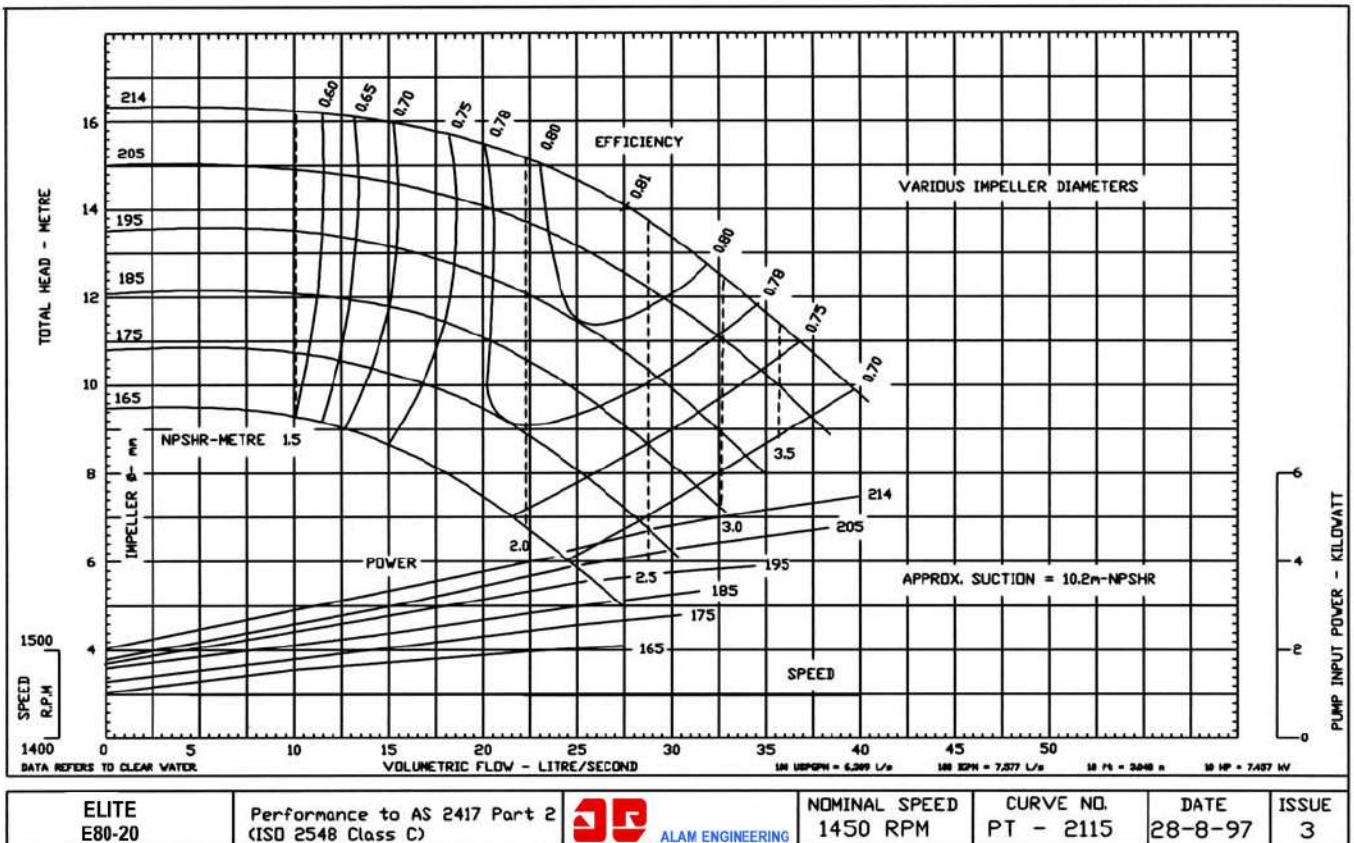
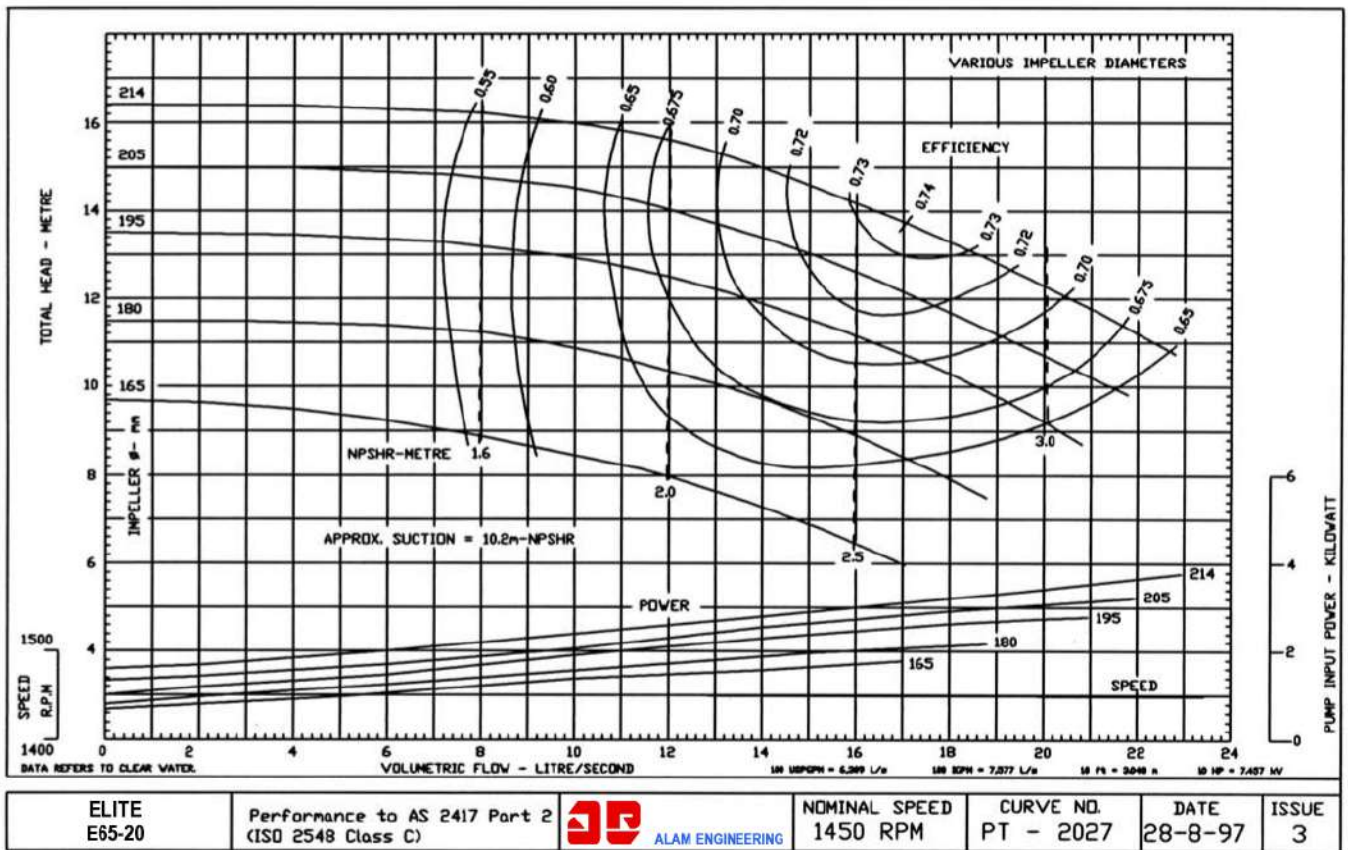


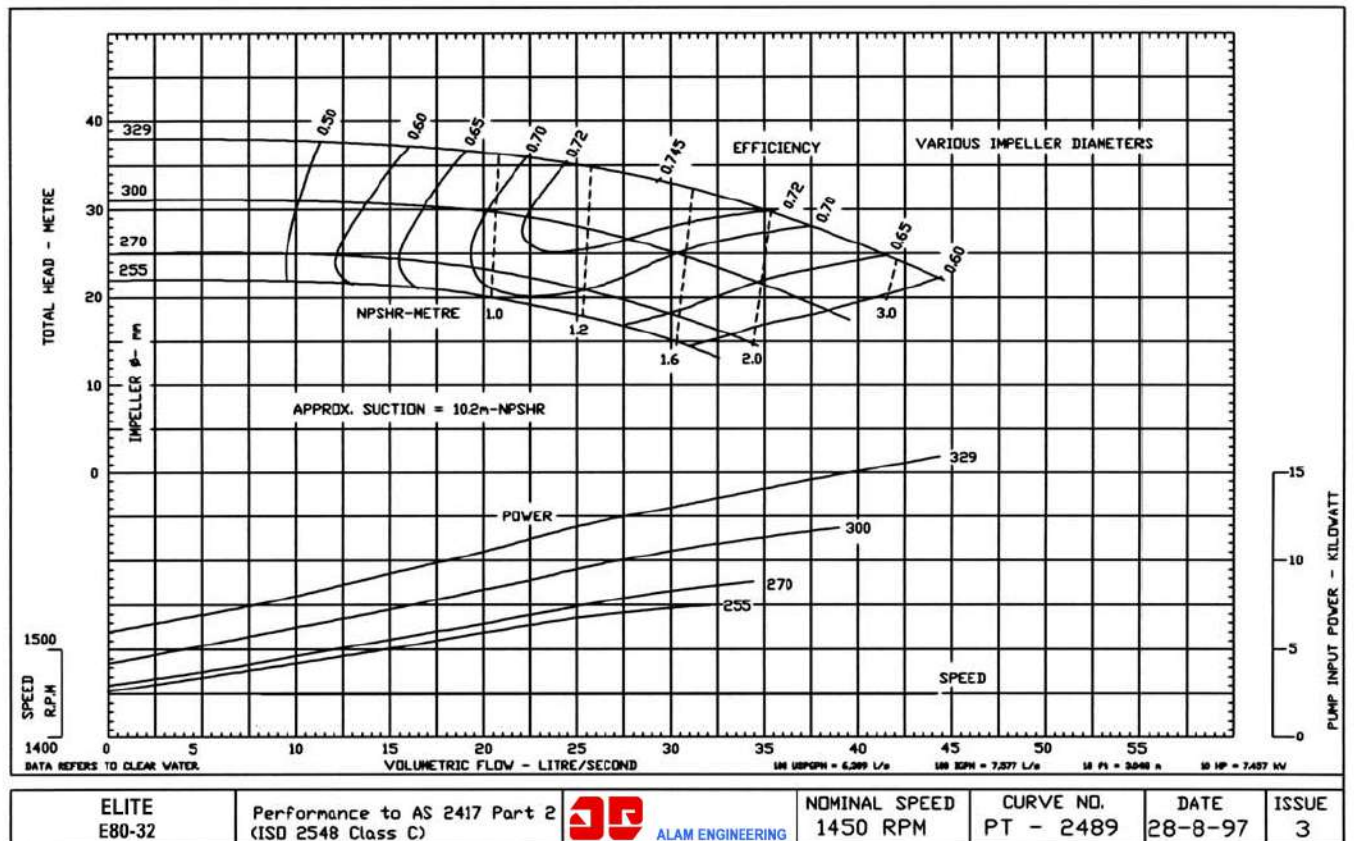
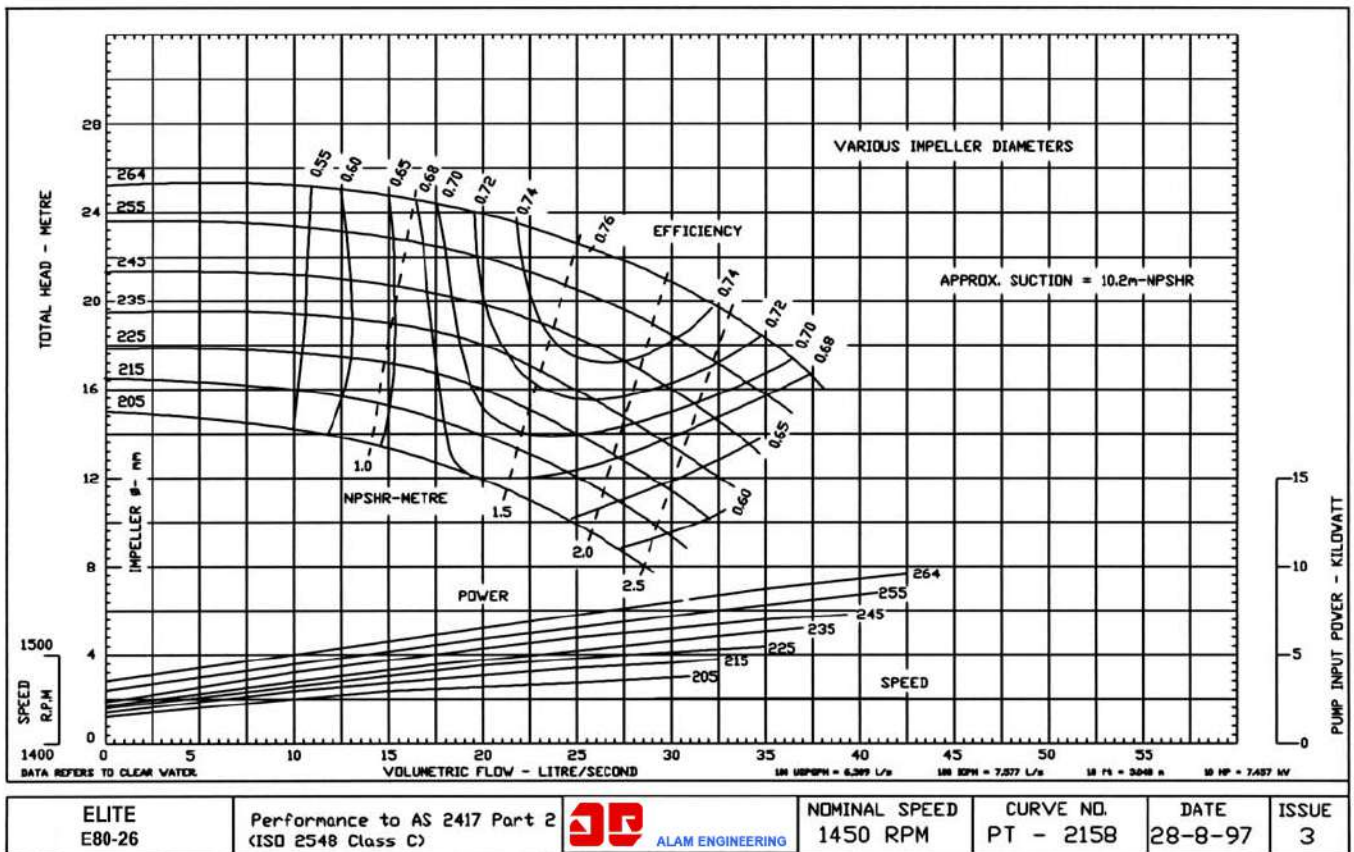
Selection Chart 2900 rpm

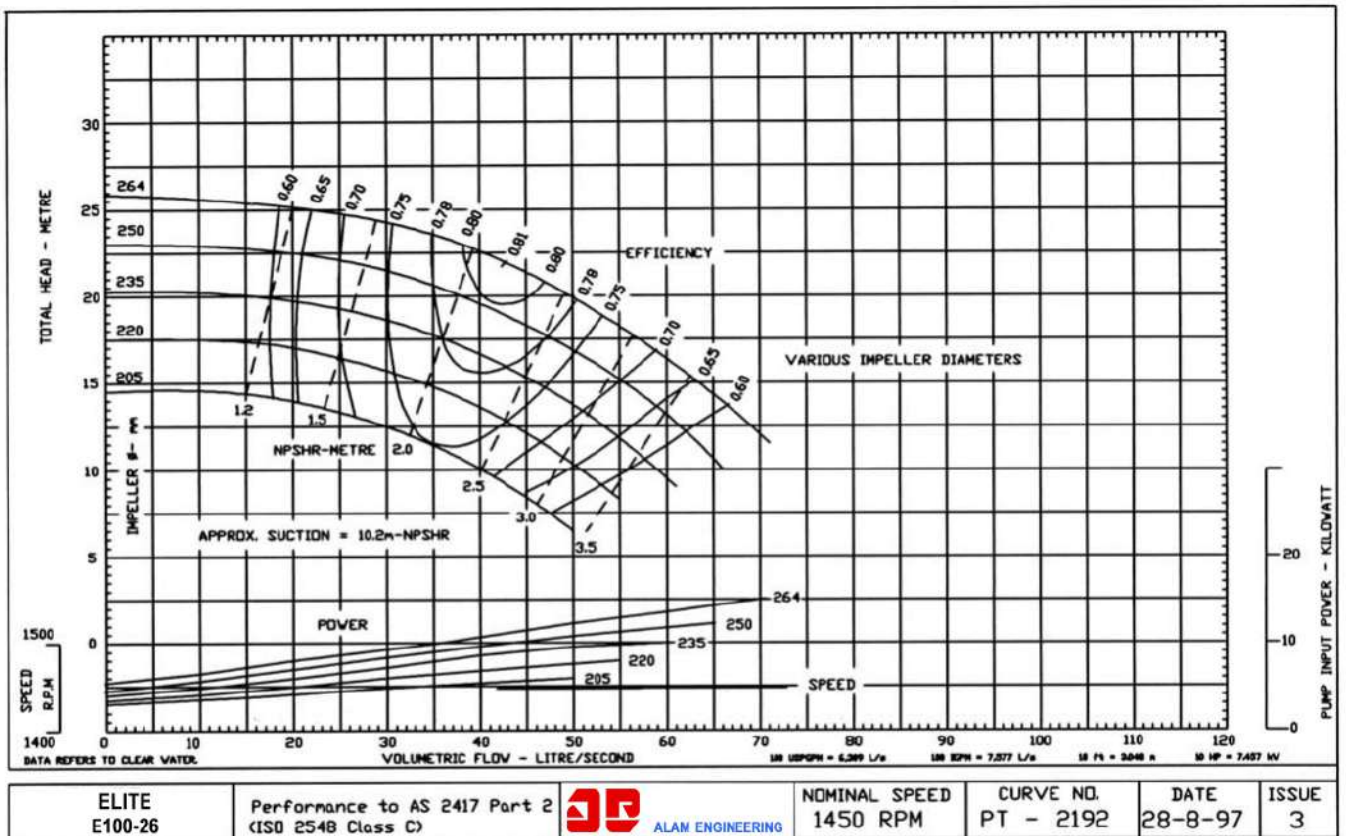
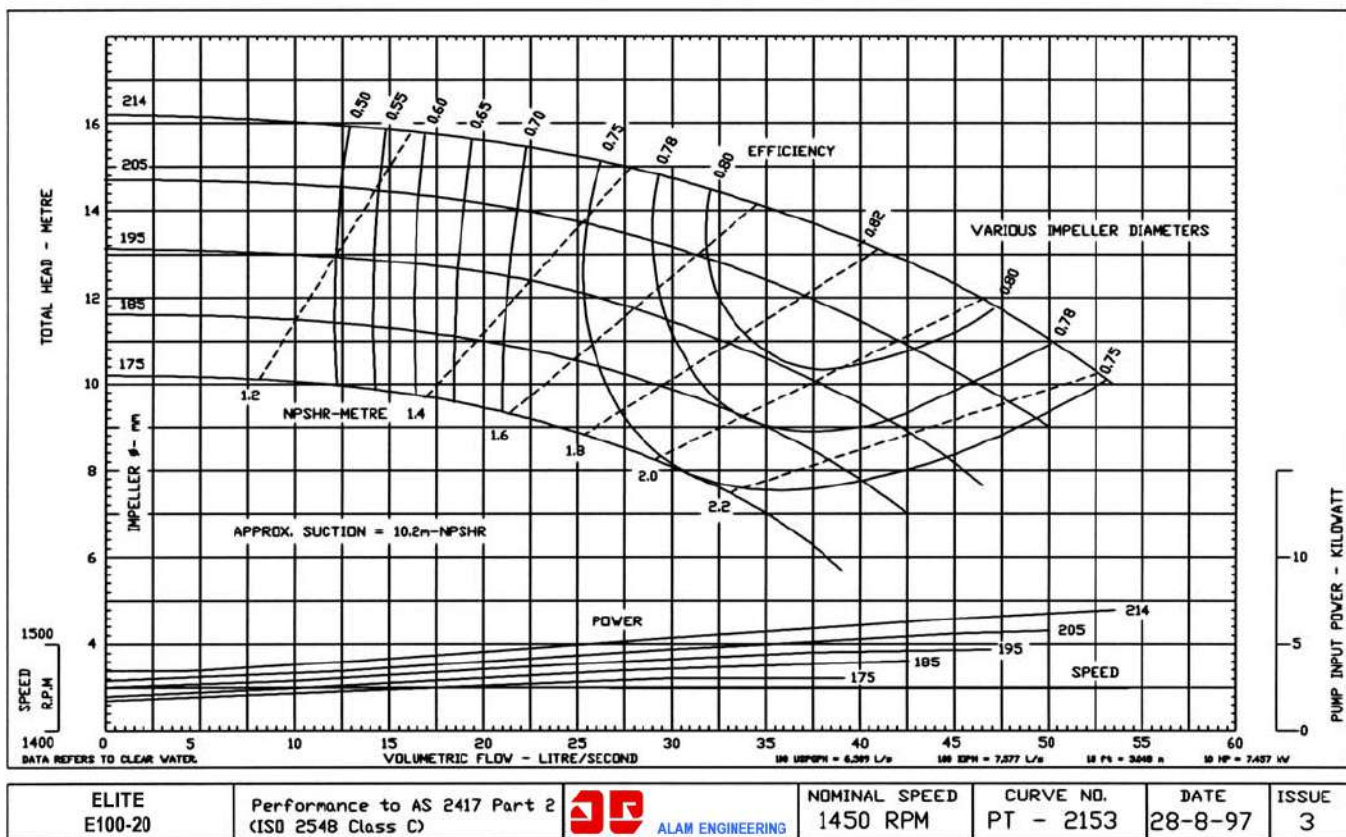


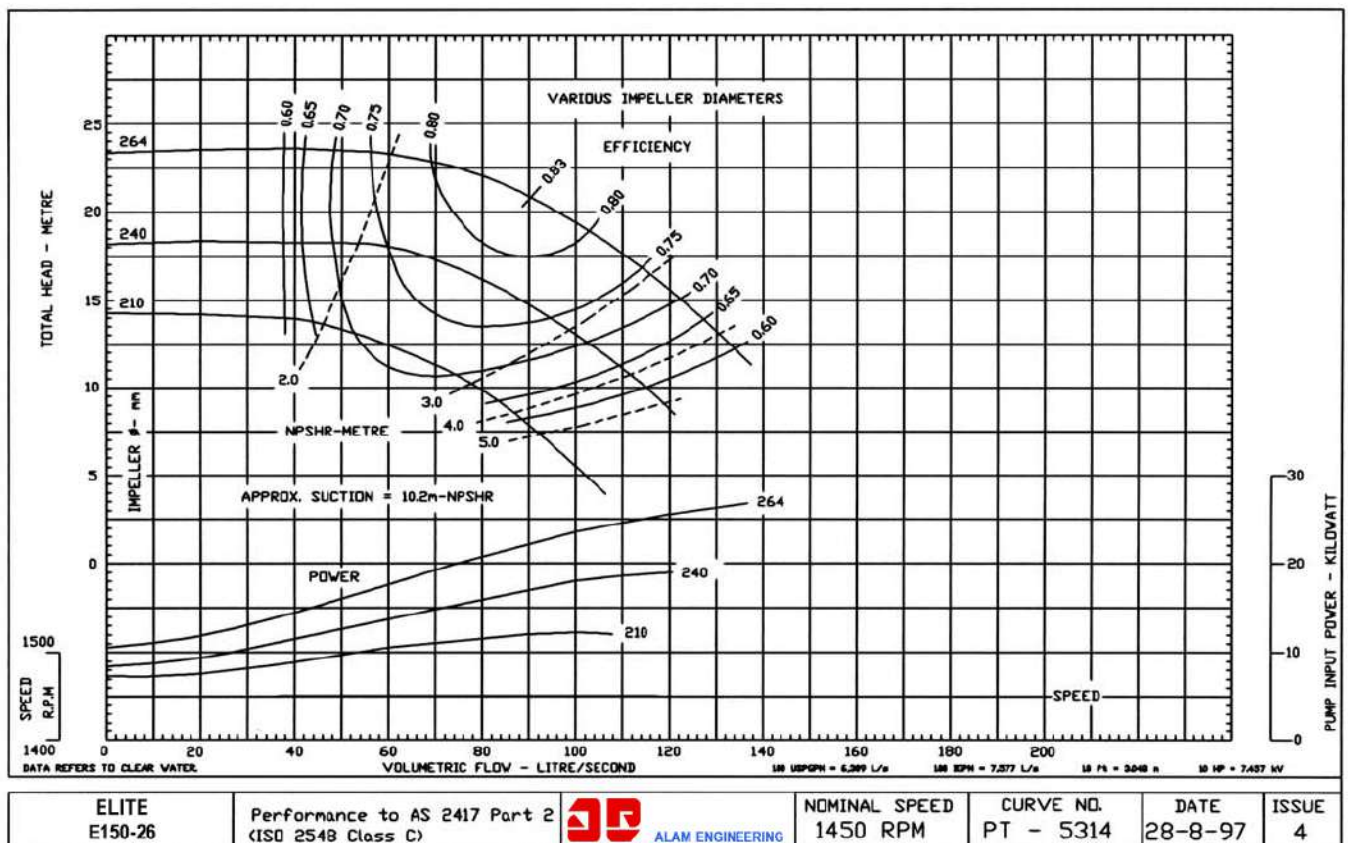
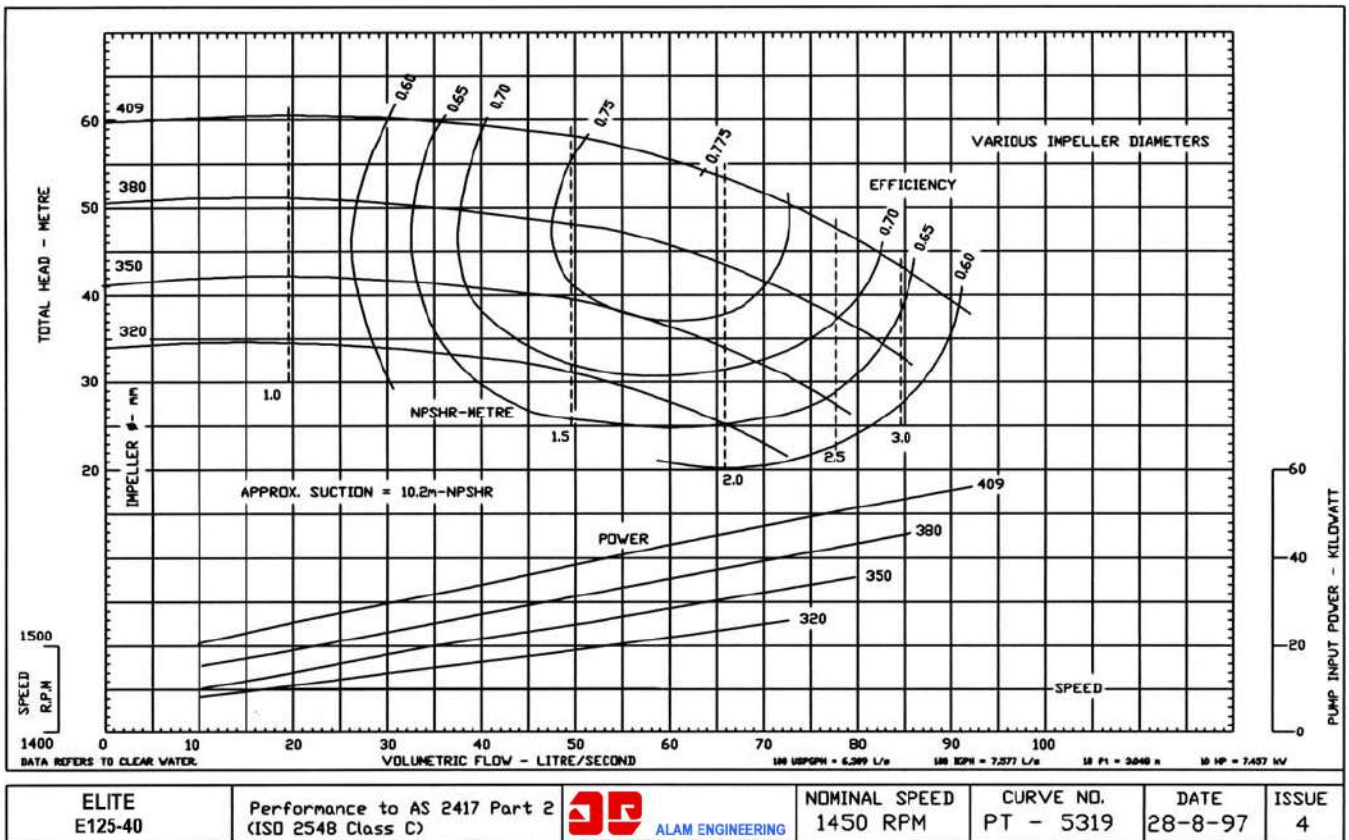


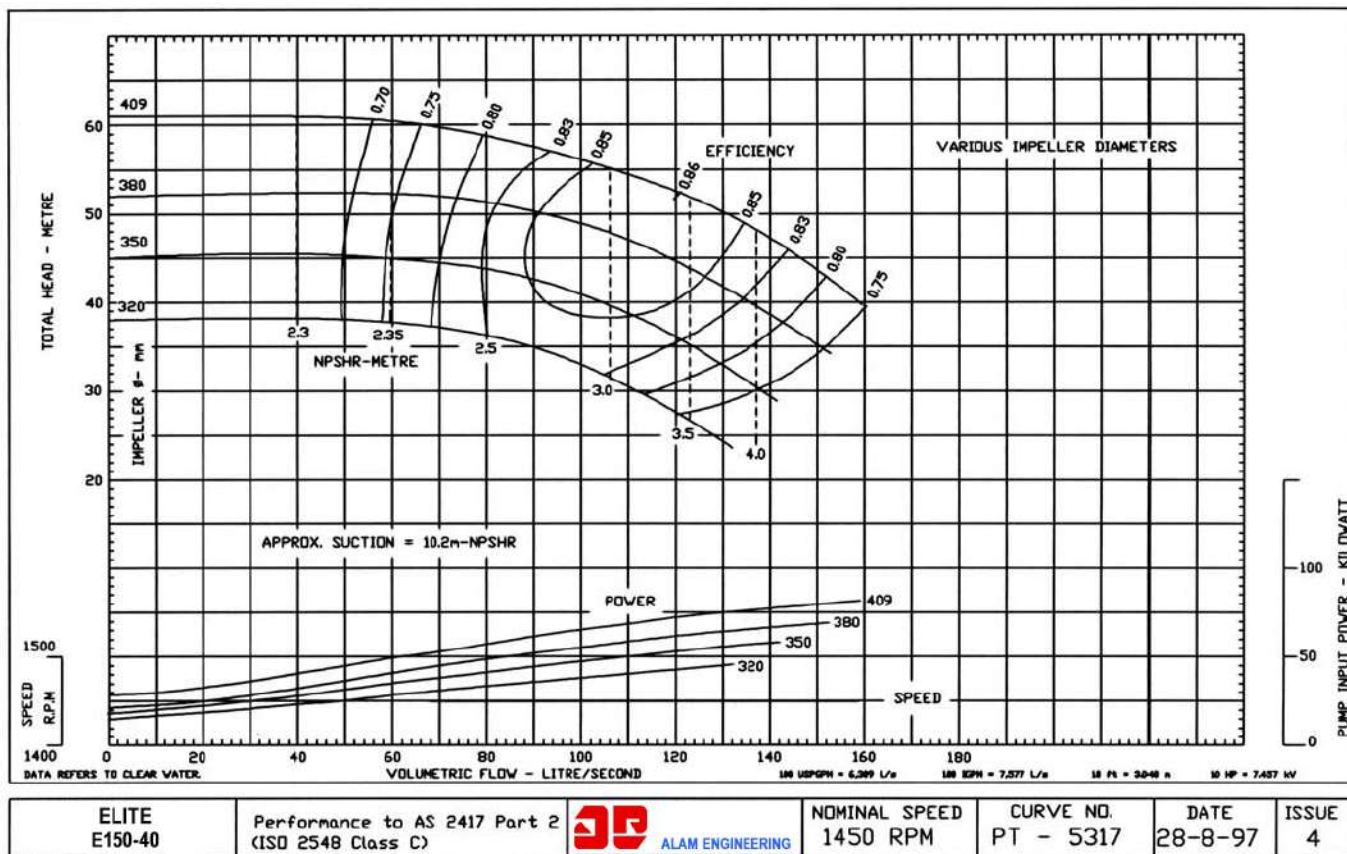


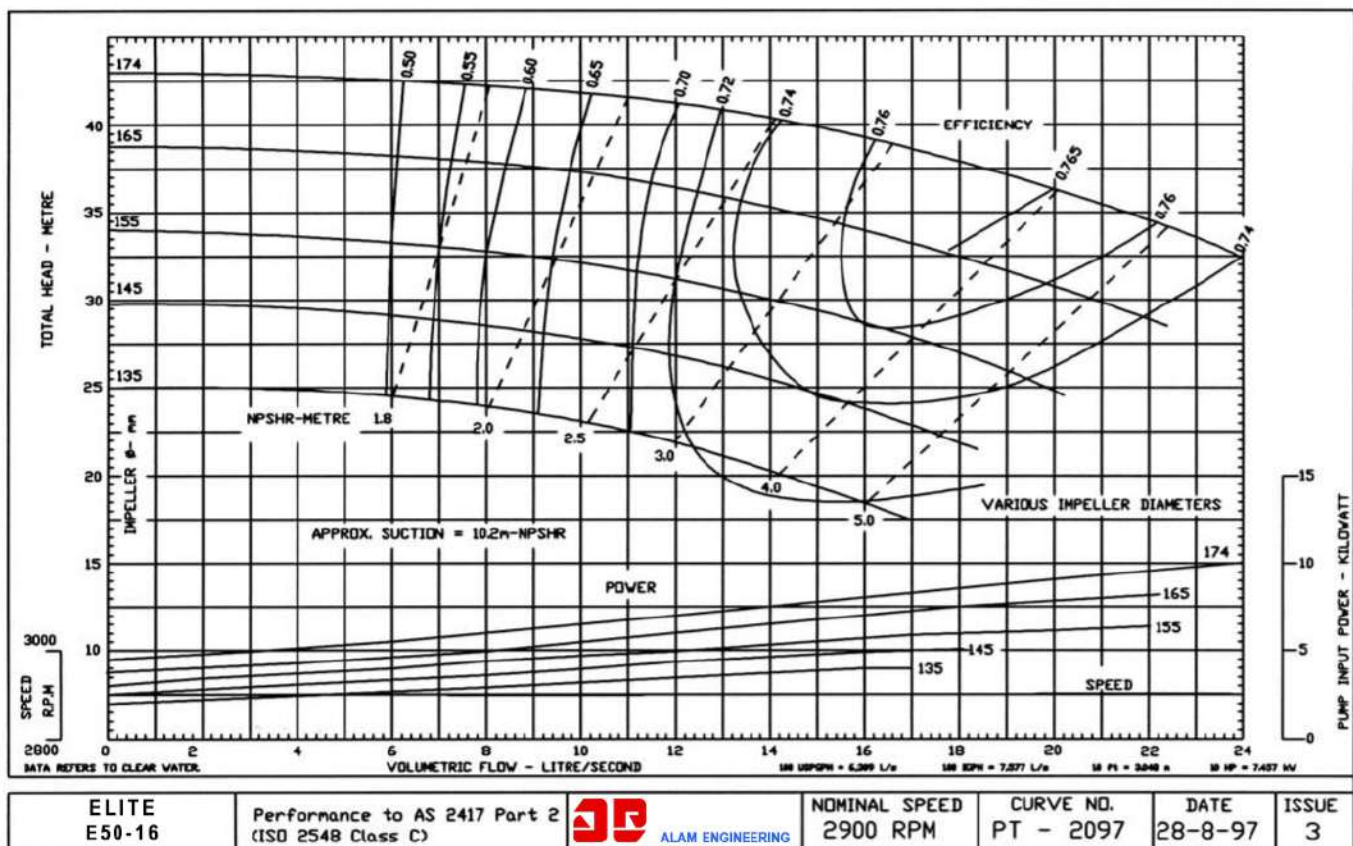
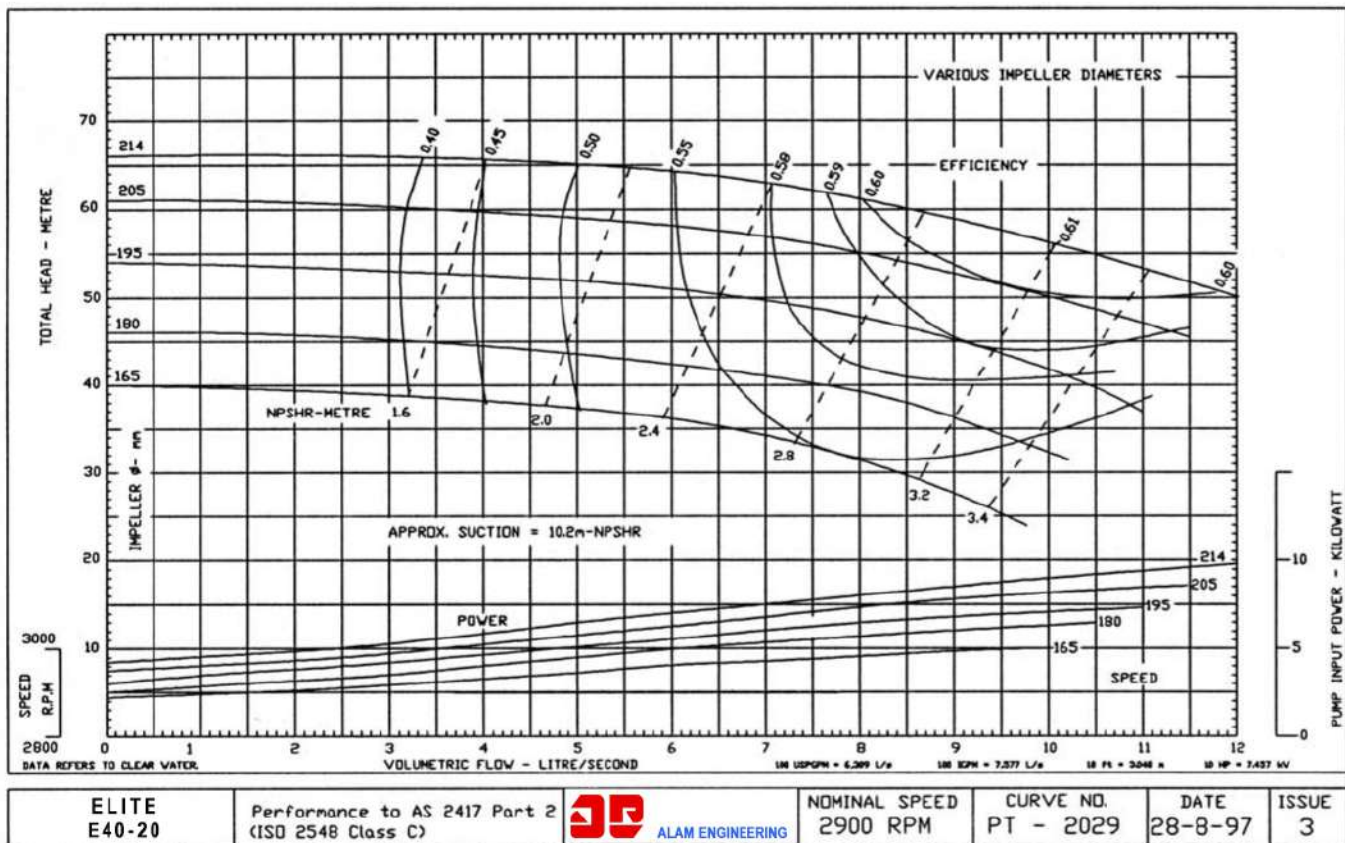


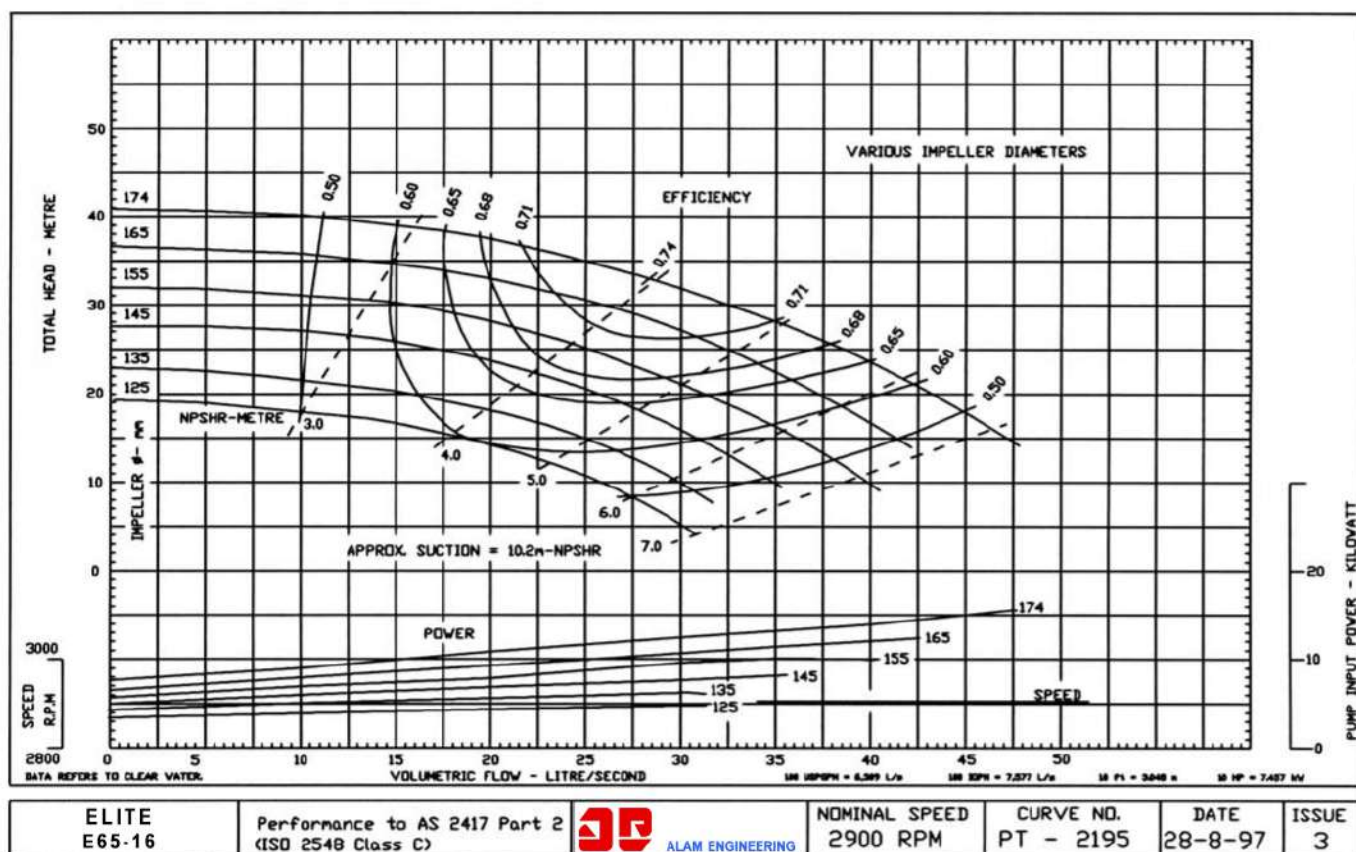
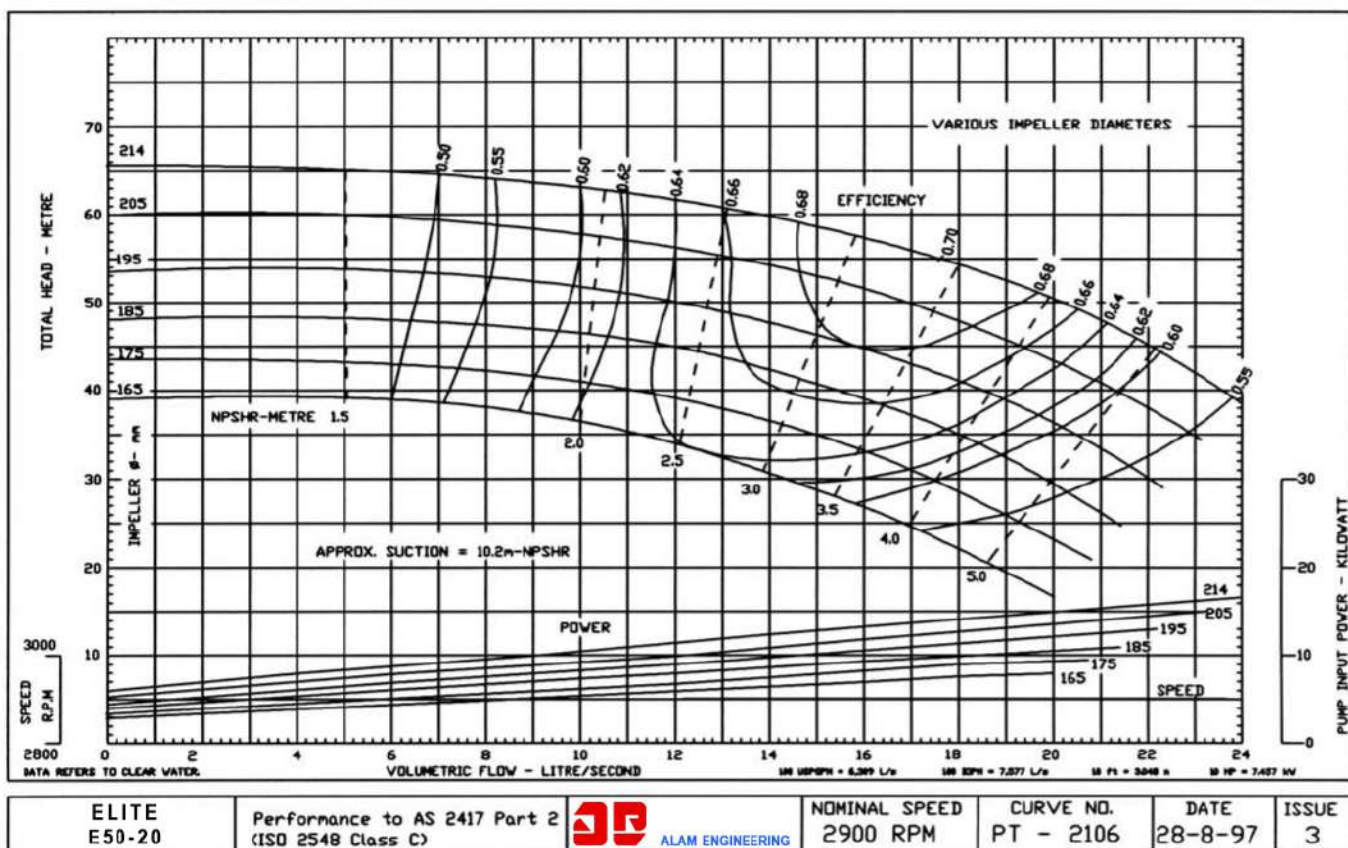


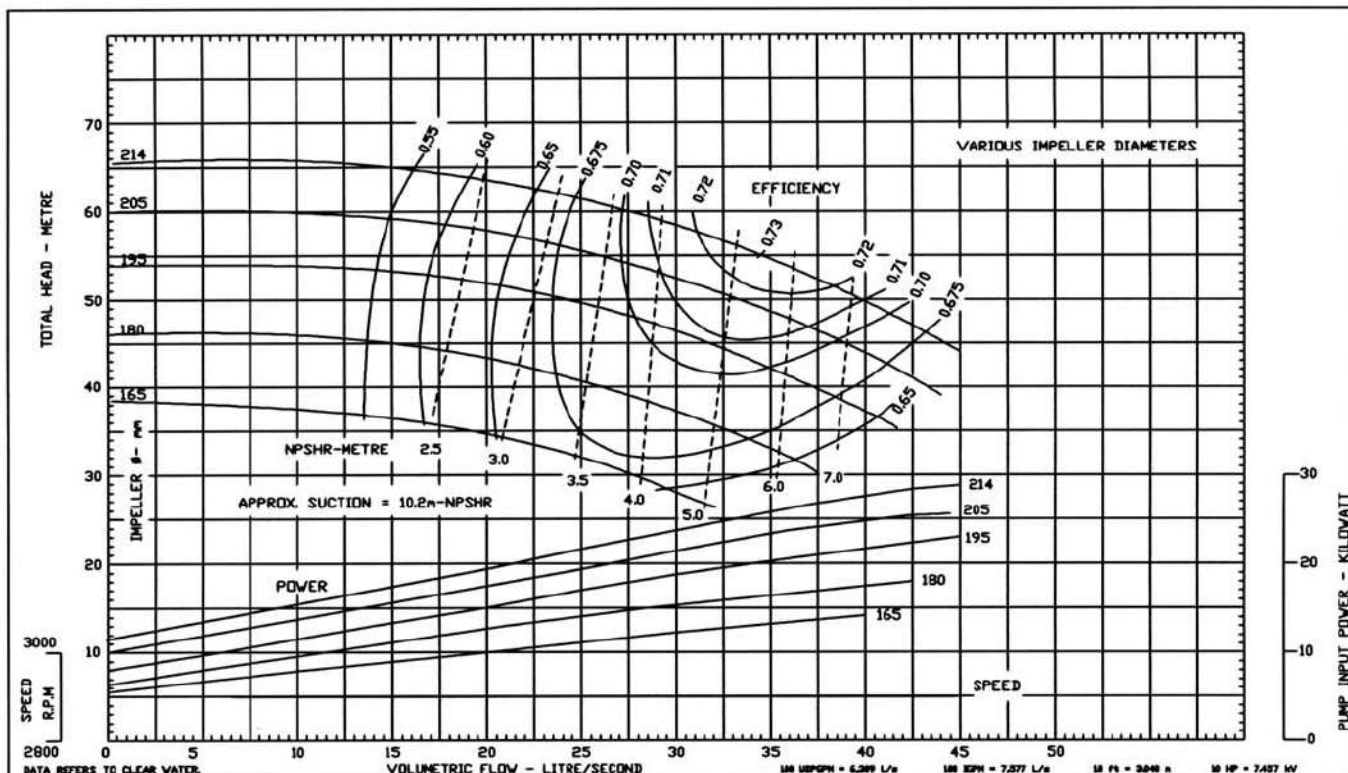




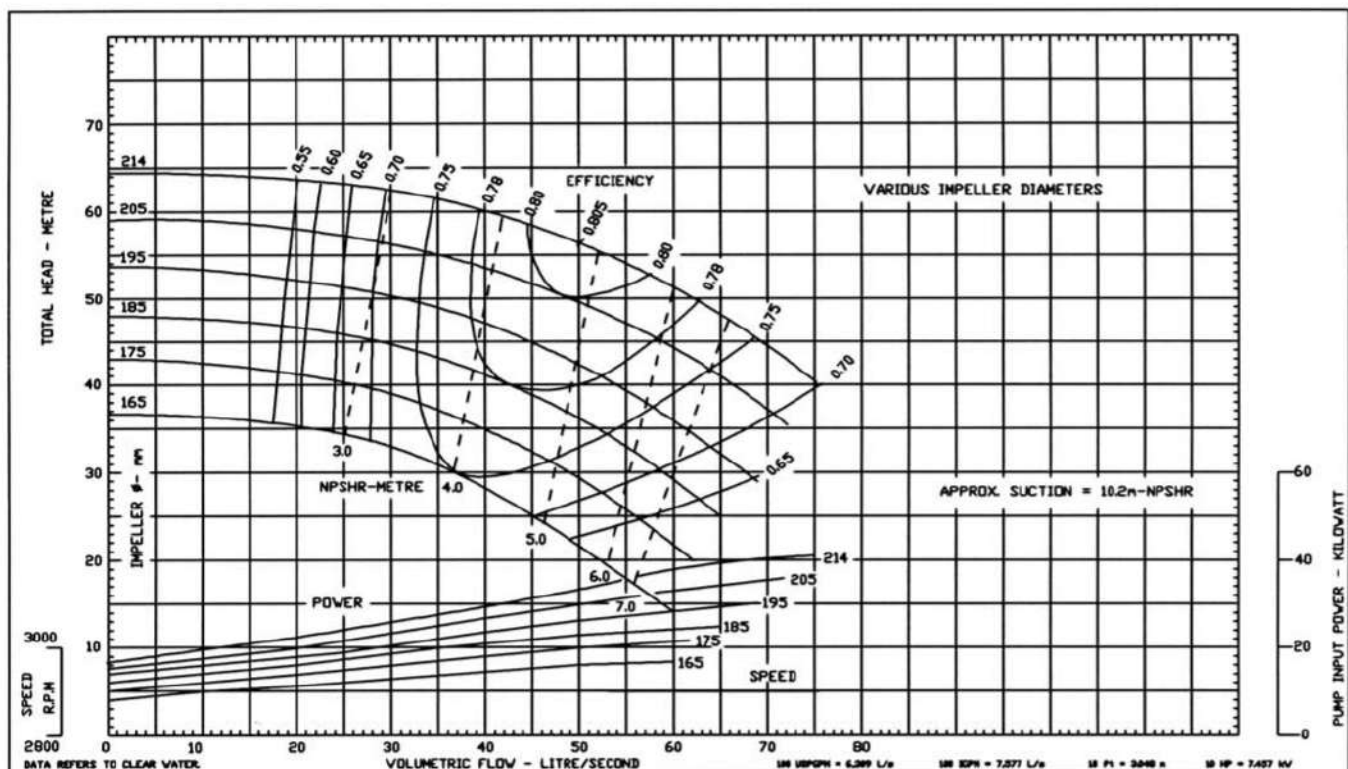




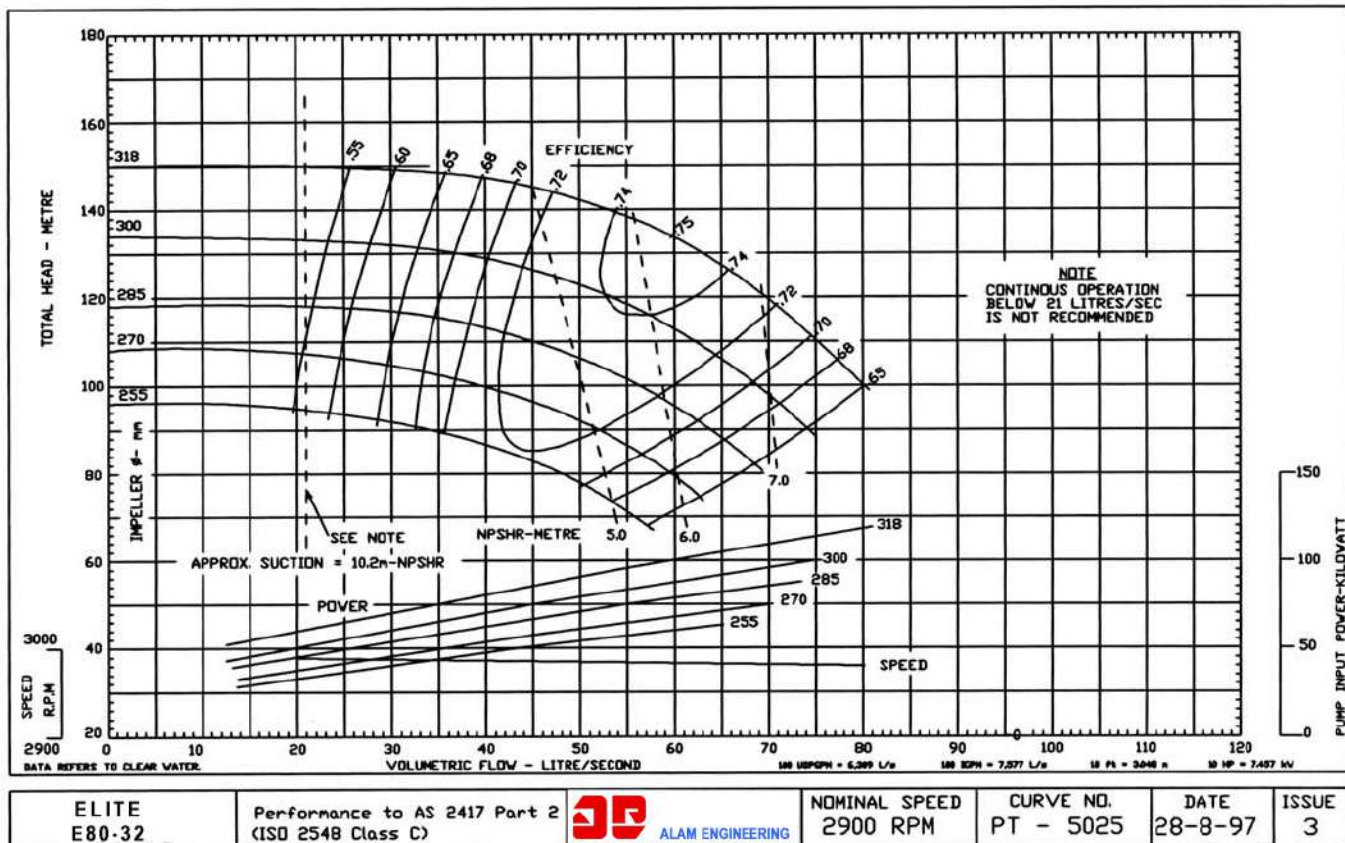
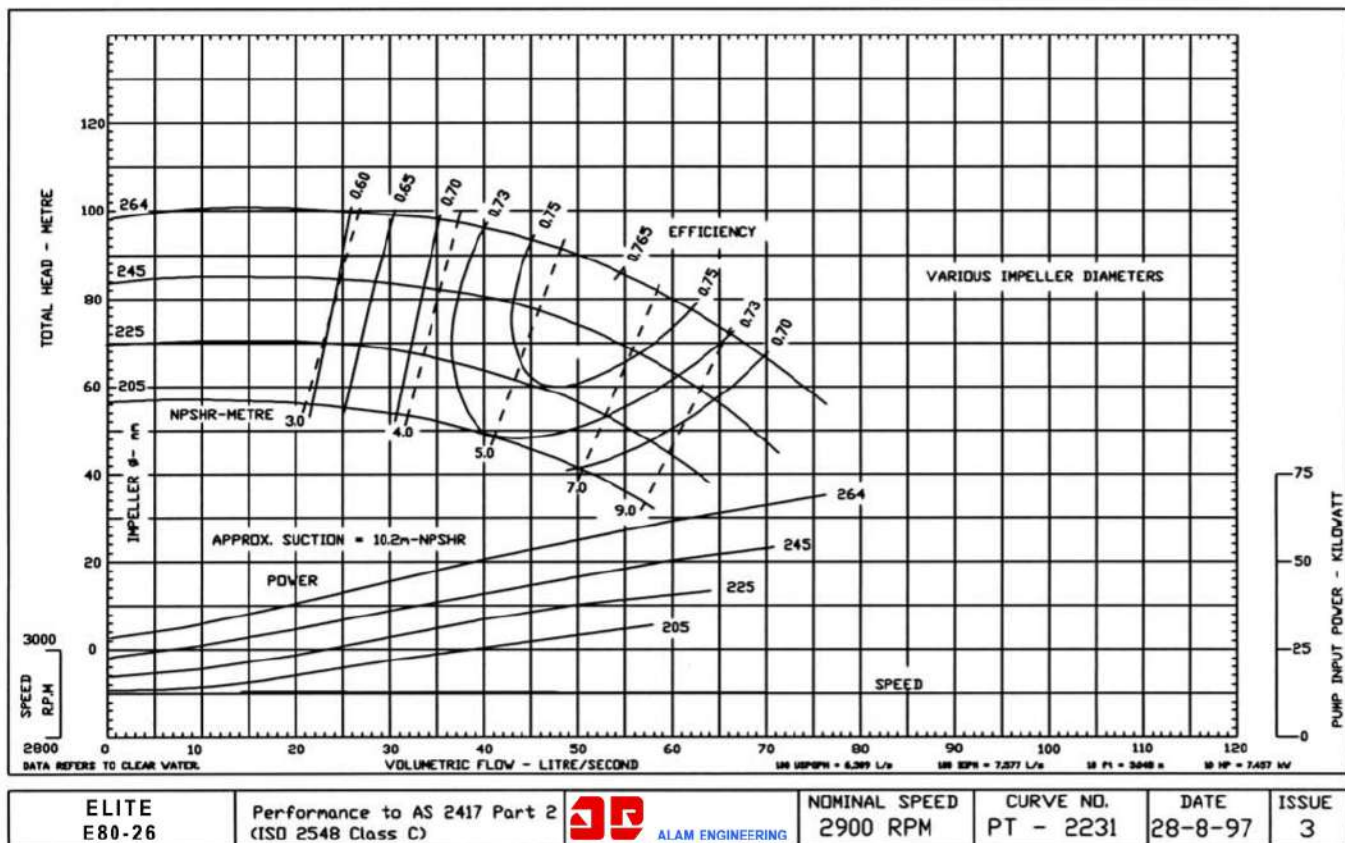


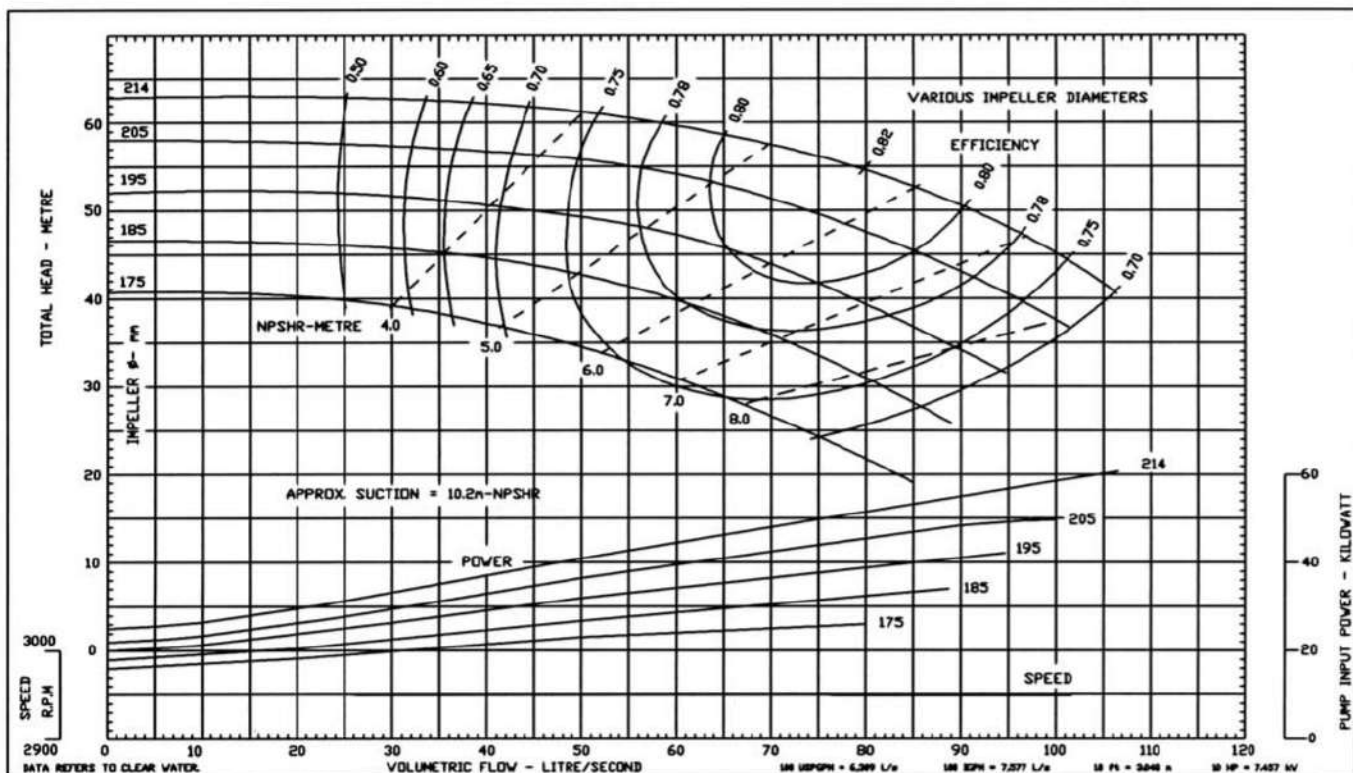


ELITE E65-20	Performance to AS 2417 Part 2 (ISO 2548 Class C)	ALAM ENGINEERING	NOMINAL SPEED 2900 RPM	CURVE NO. PT - 2028	DATE 28-8-97	ISSUE 3
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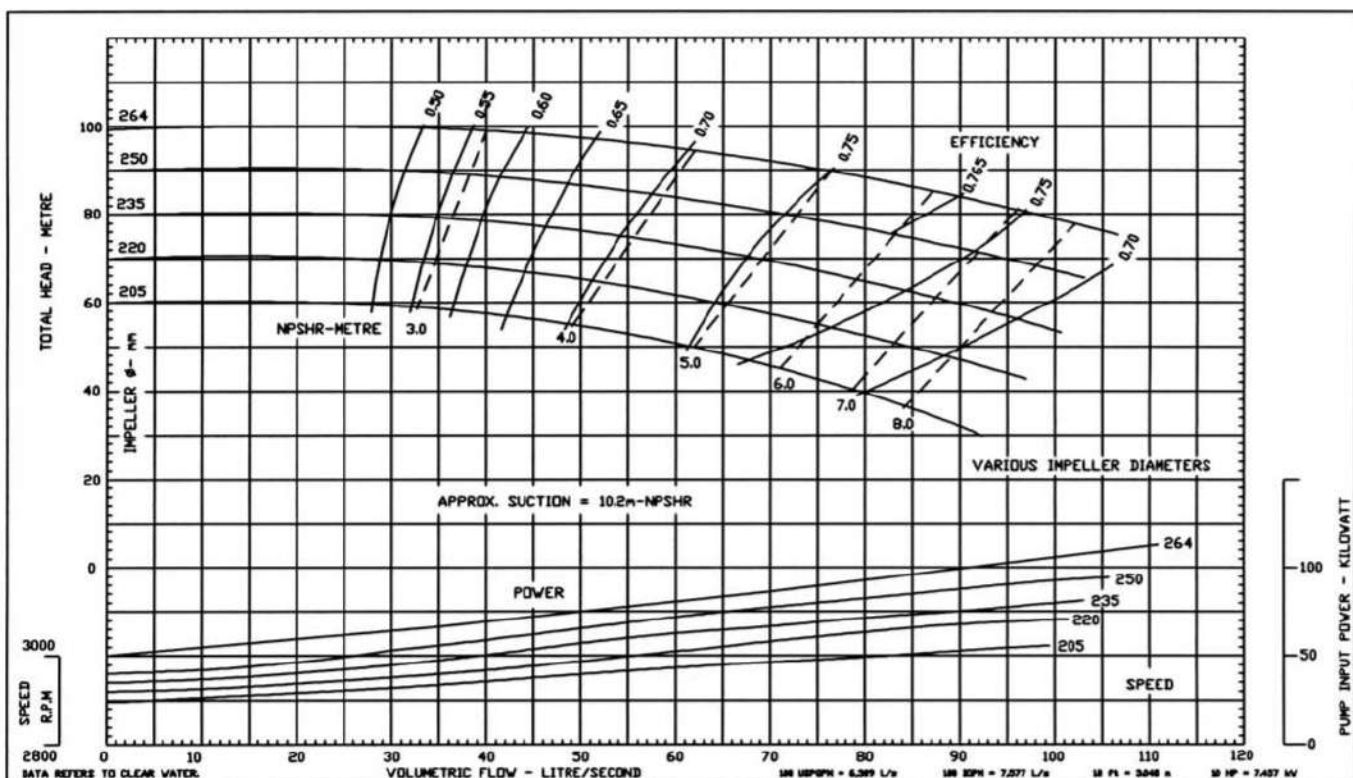


ELITE E80-20	Performance to AS 2417 Part 2 (ISO 2548 Class C)	ALAM ENGINEERING	NOMINAL SPEED 2900 RPM	CURVE NO. PT - 2116	DATE 28-8-97	ISSUE 3
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ELITE E100-20	Performance to AS 2417 Part 2 (ISO 2548 Class C)	ALAM ENGINEERING	NOMINAL SPEED 2900 RPM	CURVE NO. PT - 2238	DATE 23-12-97	ISSUE 4
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ELITE E100-26	Performance to AS 2417 Part 2 (ISO 2548 Class C)	ALAM ENGINEERING	NOMINAL SPEED 2900 RPM	CURVE NO. PT - 2235	DATE 28-8-97	ISSUE 3
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ALAM ENGINEERING

ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

UHP

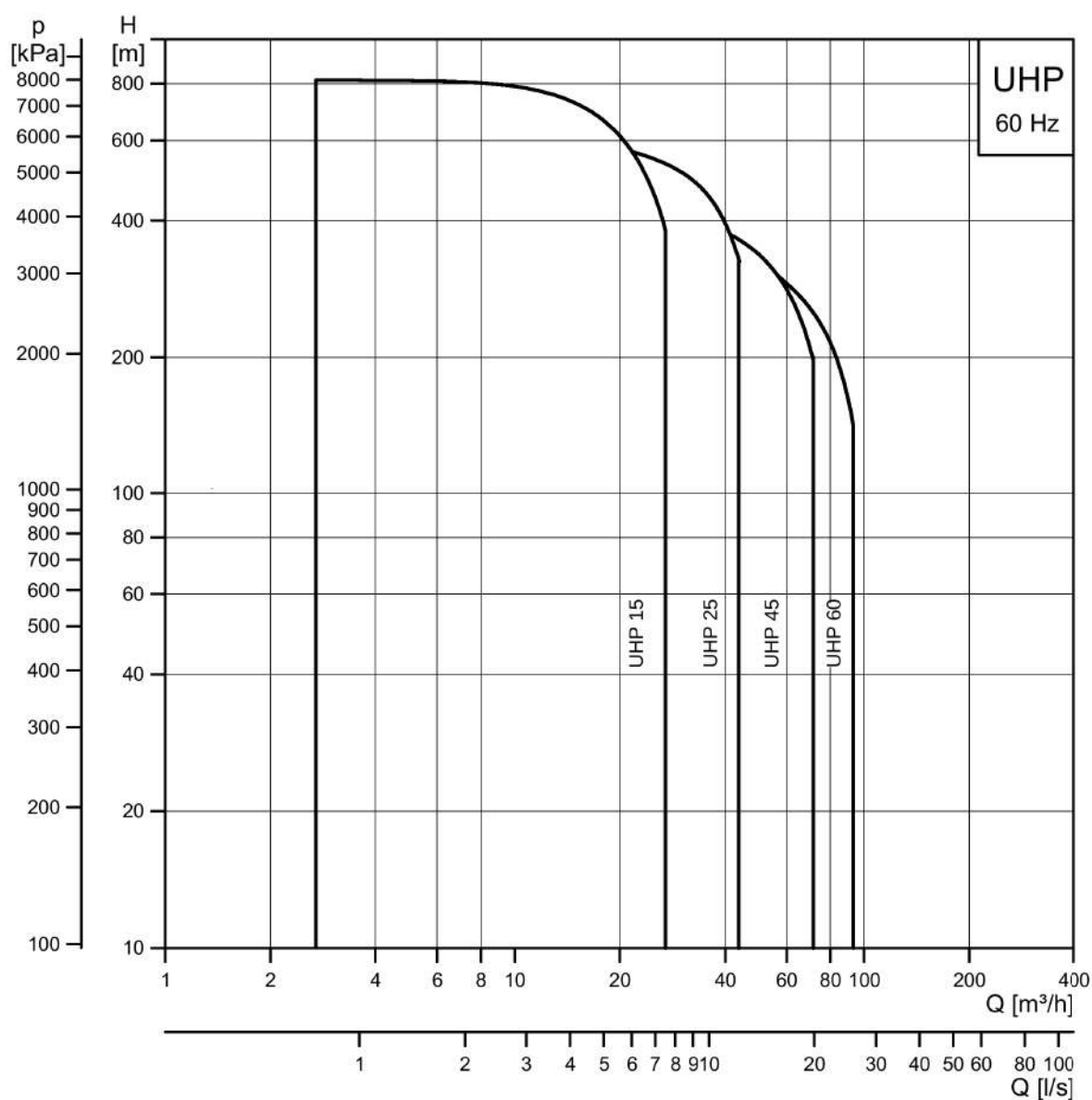
Introduction:

UHP Being The Most Trusted Pump In Local High Pressure Pumping Solutions. All Together There are Four Number Of Models Which Start From 5m³/h Up to 60m³/h, UHP Still Remains The Most Energy Efficient Pump Among All The Pumping Solutions Available In The Market, This High Pressure Solution Provides A Maximum Head Of 550 Meters (55 Bar) Also A UHP PRO Models Is Available For Bearing High TDS Of Up To 50,000 With 904L Metallurgy.



1. General description

Performance range



4. Operating conditions

To ensure long and trouble-free pump life, it is important that the following is observed.

Inlet pressure

The minimum inlet pressure is indicated by the NPSH-curves in the single-stage curve charts.

The minimum safety margin of the NPSH-curves must always be 0.5 m head.

Minimum flow rate

To ensure sufficient lubricant for bearings, the pump must not run continuously at a flow rate below 0.1 x nominal flow rate.

Operation of the pump against a closed valve must be limited to a maximum of 30 seconds due to the risk of local heating of the pumped liquid and the consequent damage to the pump.

Maximum flow rate

The pump must not run continuously at a flow rate above 1.3 x nominal flow rate due to the risk of upthrust and cavitation.

Pumped liquids

UHP and UHP-PRO pumps are capable of pumping clean, thin, non-aggressive liquids, not containing solid particles or fibres.

Pump type	Maximum content of sand [ppm]
UHP 15 - UHP 60	100

Liquid temperature

For protection of pump and motor rubber parts, the liquid temperature must not exceed 60 °C.

Alternatively, you can fit the pump with bearings made of FKM material, resistant to liquid temperatures of up to 90 °C.

Maximum liquid temperature

The maximum liquid temperature allowed depends on the flow velocity of the liquid past the Pump.

Service

If you request ALAM ENG to service the pump, contact ALAM ENG with details about the pumped liquid before you return the pump for service. Otherwise ALAM ENG can refuse to accept the pump for service.

Possible costs of returning the pump are paid by the customer.

However, any application for service, no matter to whom it may be made, must include details about the pumped liquid if the pump has been used for liquids which are injurious to health or toxic.

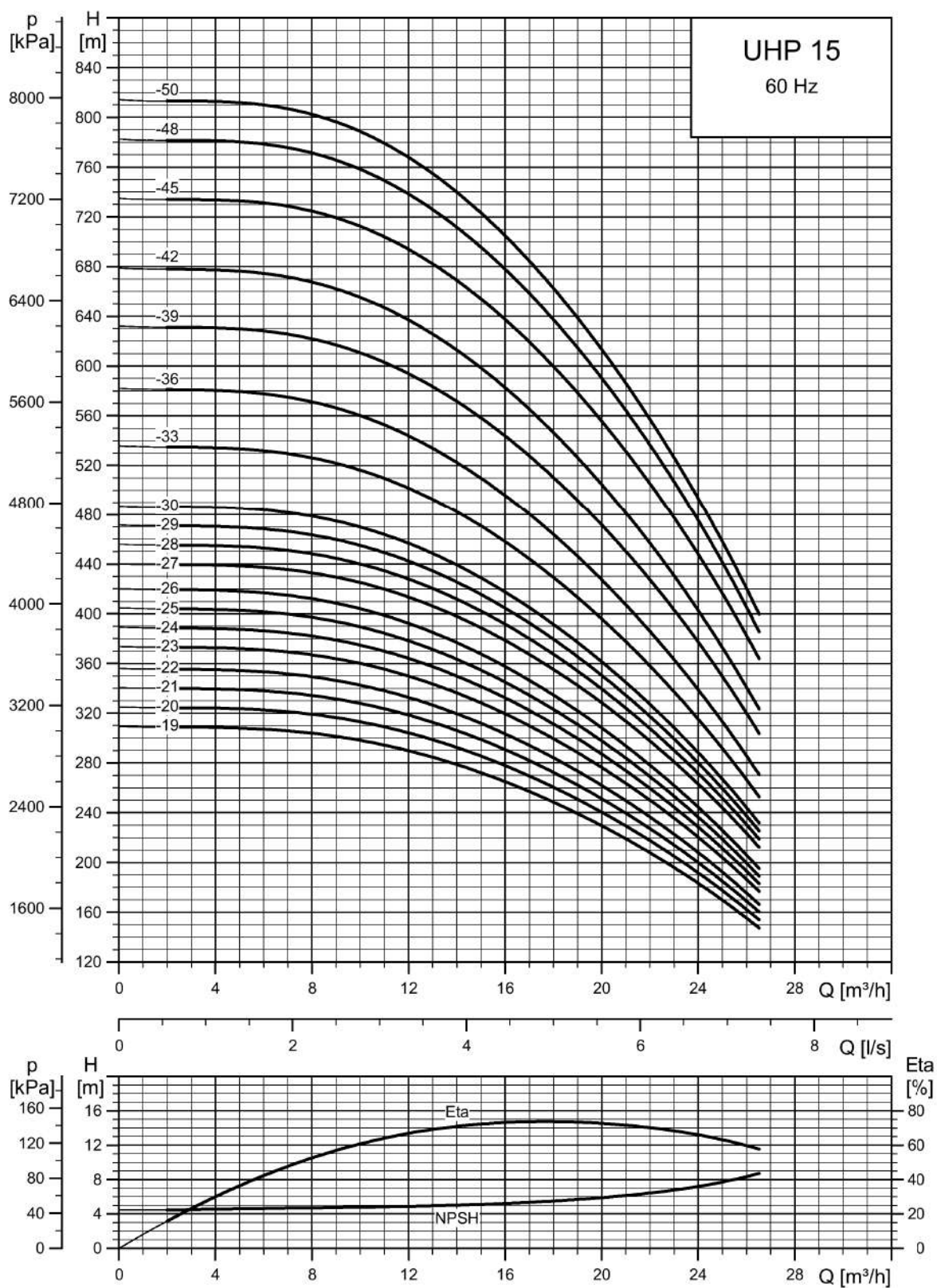
Before you return a pump, clean it in the best possible way.

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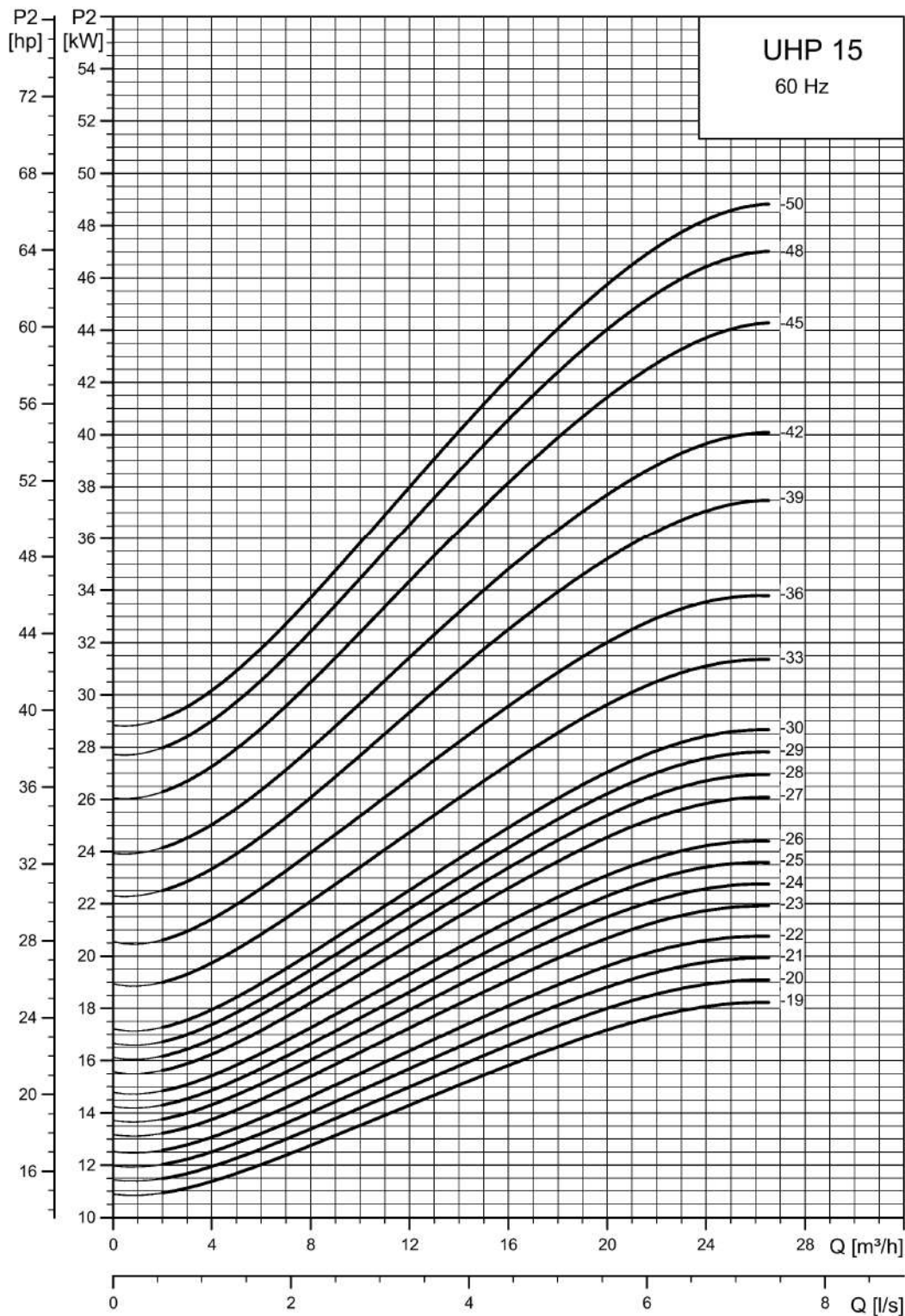
ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

UHP

Performance curves and technical data



Performance curves and technical data

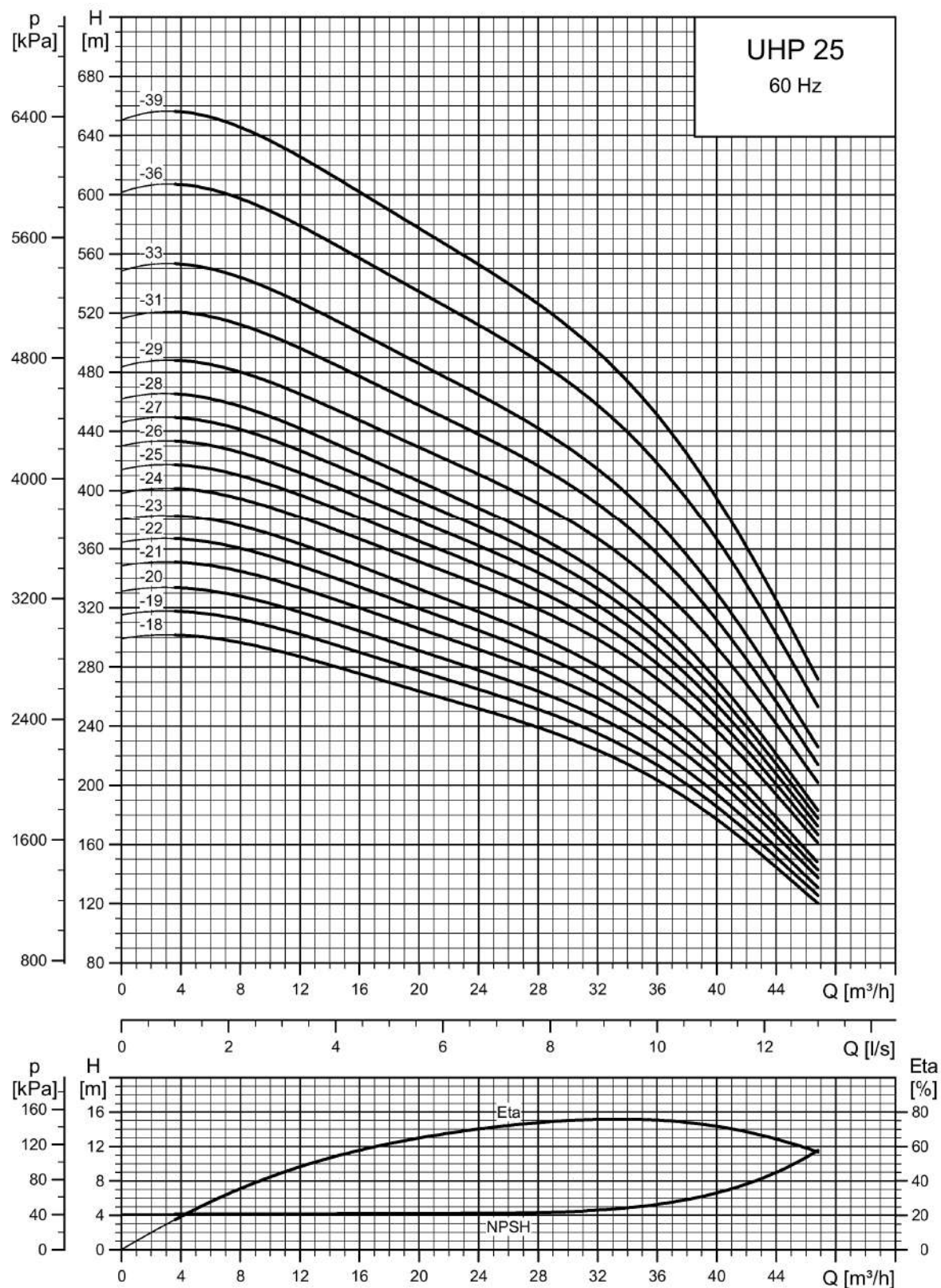


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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

UHP

Performance curves and technical data

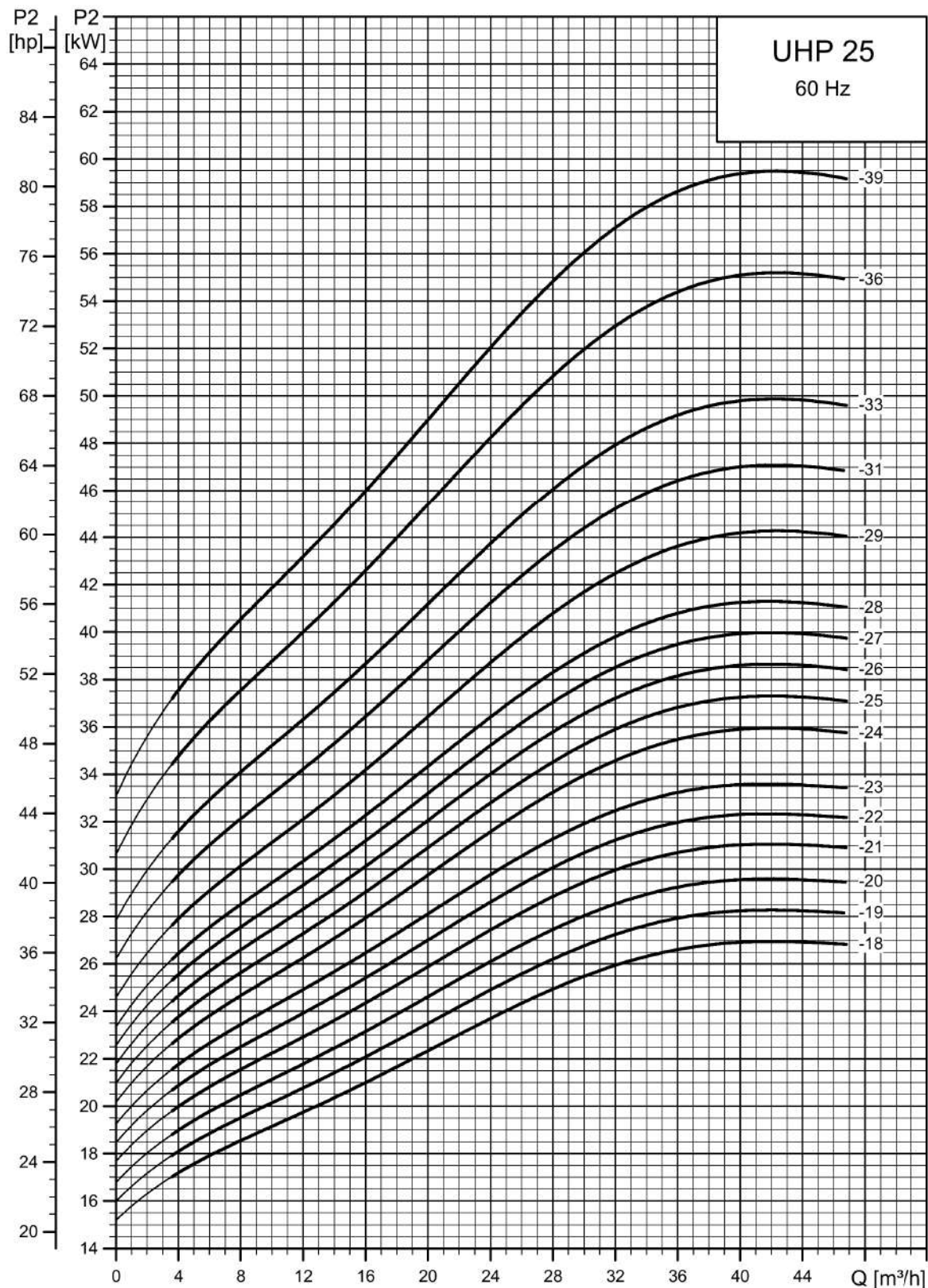


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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

UHP

Performance curves and technical data

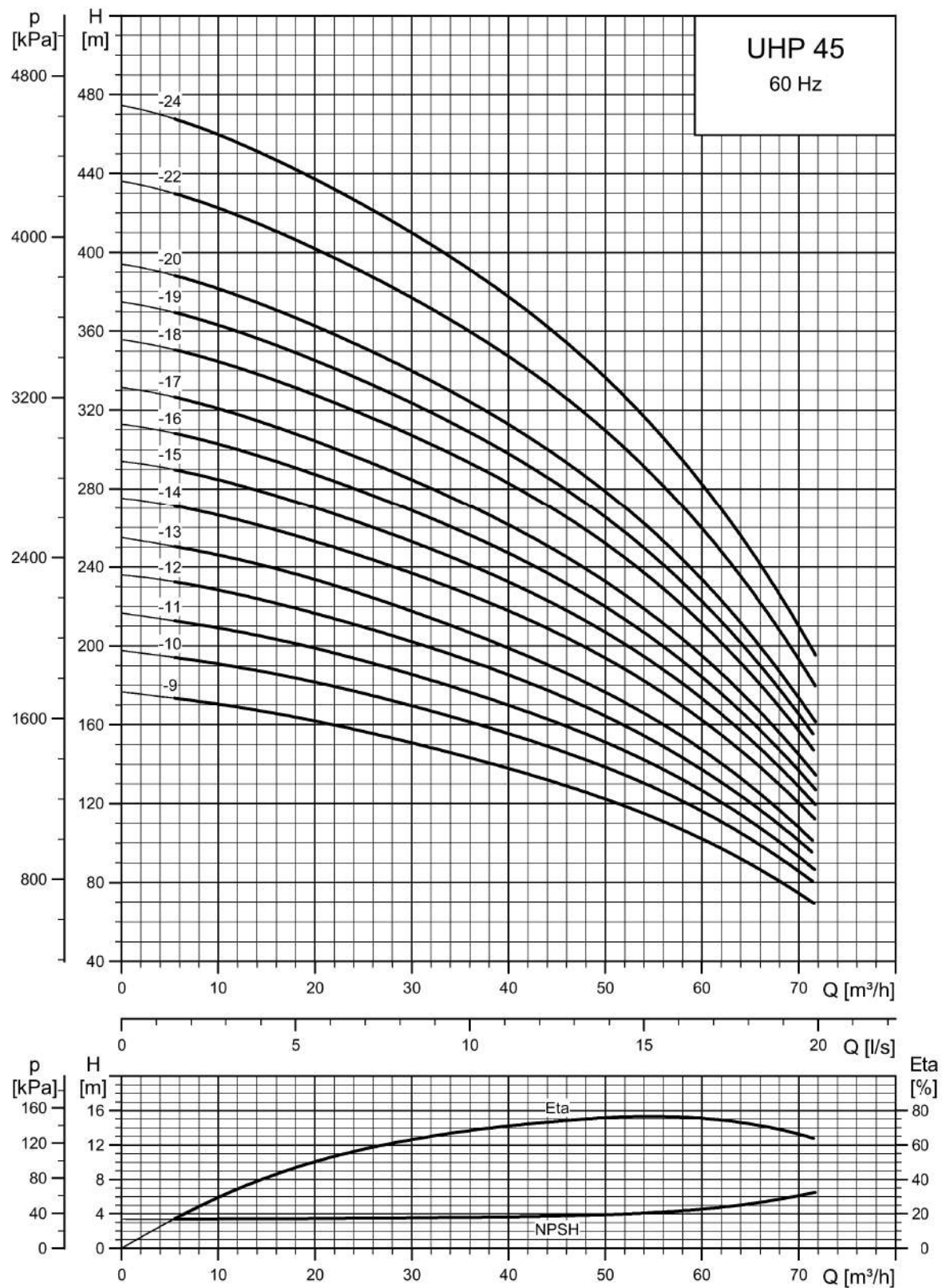


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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

UHP

Performance curves and technical data

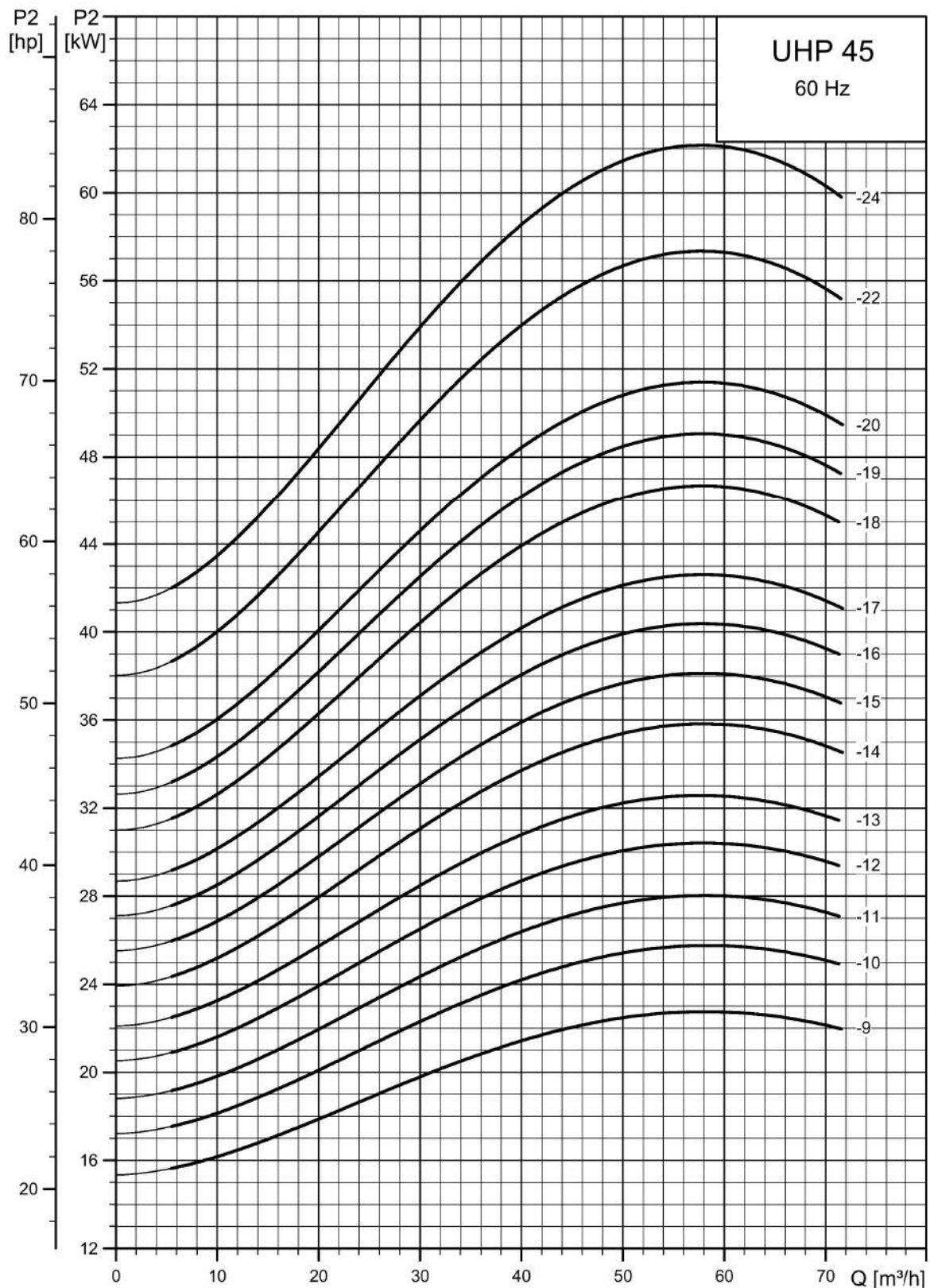


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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

UHP

Performance curves and technical data

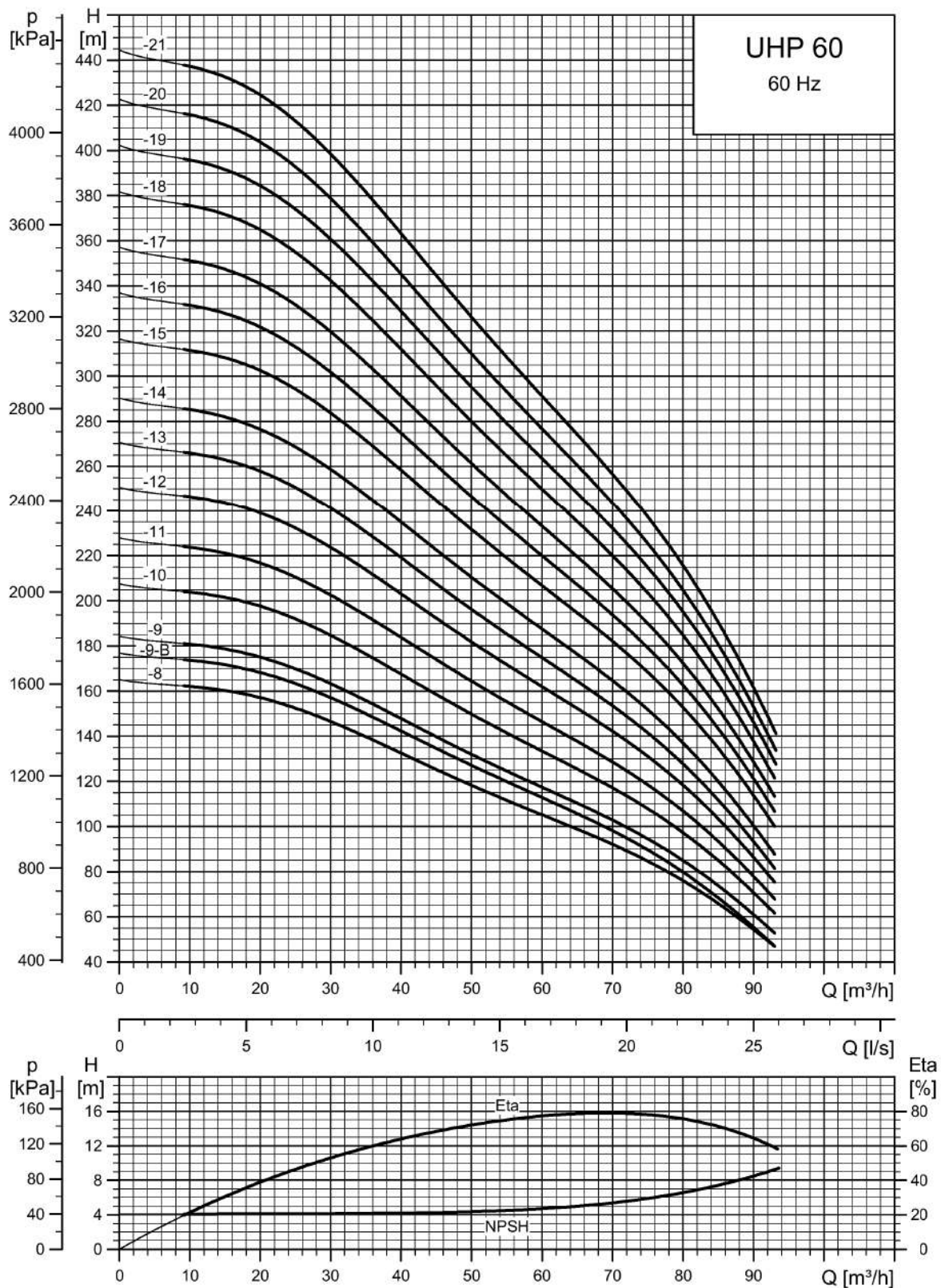


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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

UHP

Performance curves and technical data

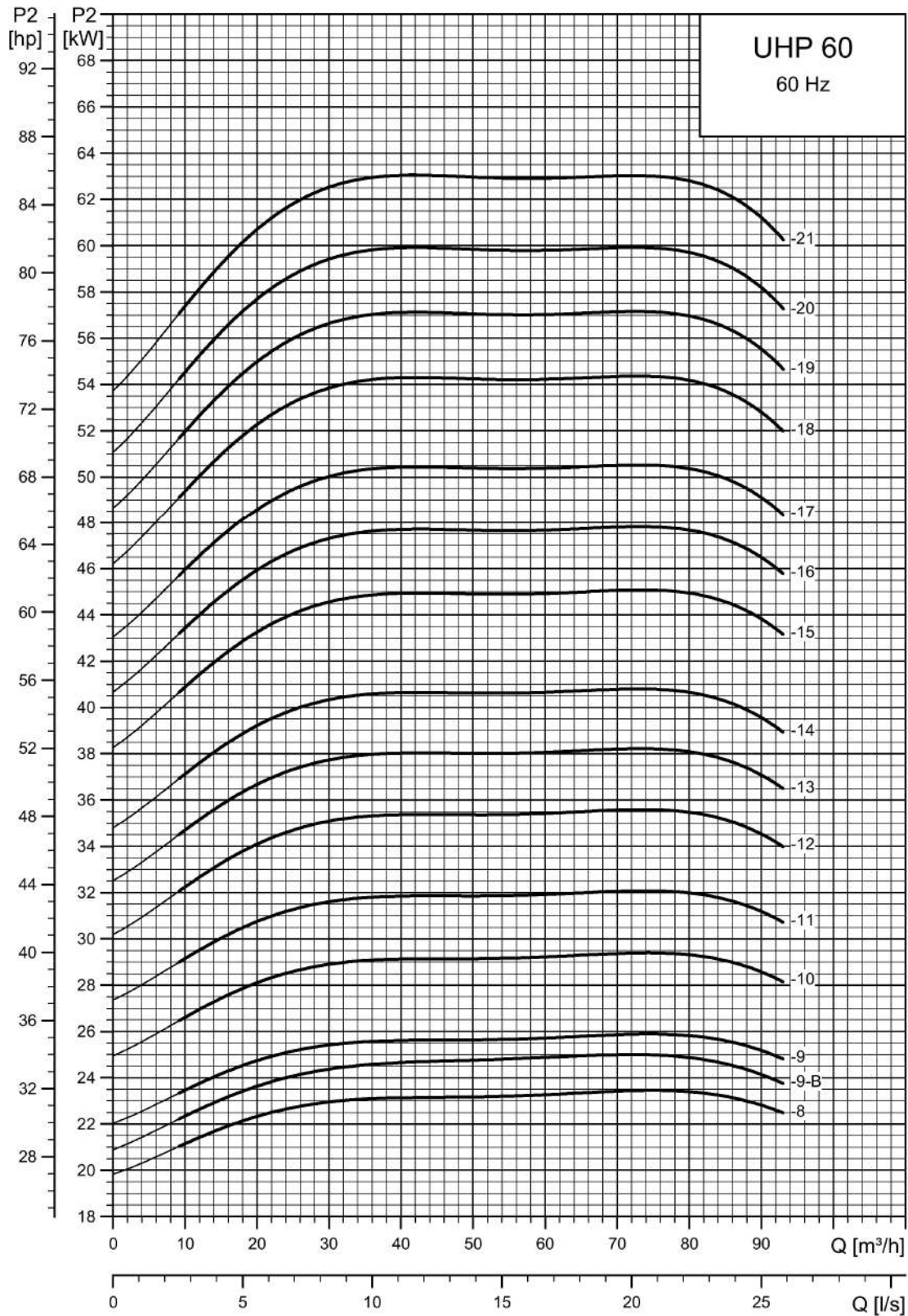


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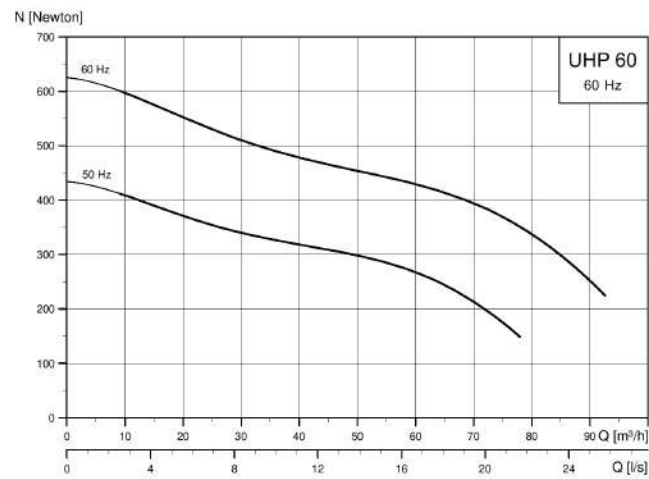
ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

UHP

Performance curves and technical data



Single-stage curves, axial thrust



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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

GREENPOWER

ALAM ENGINEERING WISHES TO INTRODUCE TO THE LOYAL CUSTOMERS THEIR SISTER BRAND GREEN POWER.

GREEN POWER IS THE PIONEER IN MANUFACTURING AND COMMISSIONING OF THE MOST TYPICAL REVERSE OSMOSIS SOLUTIONS. GREEN POWER MANUFACTURES AN R.O SYSTEM TOTALLY ON CUSTOMIZED BASIS DEPENDING ON THE NEED AND DEMANDS OF THE CUSTOMERS ITSELF.

GREEN POWER OFFERS OFTEN SOLUTIONS FROM 100 TDS UP TO 60,000 TDS AND SINGLE R.O UNIT OF UP TO 1 MILLION GPD.

SOME TYPICALLY SOLUTIONS AND SUCCESSFUL PROJECTS OF GREEN POWER ARE LISTED BELOW;

PROJECTS	
JACOBABAD AIRBASE	5,00,000 GPD TDS : 15,000
QADRI NOORIE (FISHRIES)	3,00,000 GPD TDS : 60,000
ANEES APPAREL	1,00,000 GPD TDS : 54,000
RAUF TEXTILE	2,00,000 GPD TDS : 35,000
IRAN (CHABAHAR FREEZONE) EXPORTED	3,00,000 GPD TDS : 40,000
JIVANI (GAWADAR)	40,000 GPD TDS : 35,000
AGS BATTERIES	2,00,000 GPD TDS : 15,000
RAJBY TEXTILES	1,00,000 GPD TDS : 35,000

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ENERGY RECOVERY DEVICES & PUMPING SOLUTIONS

OUR PROJECTS



Mian Noor



Chabahr Freezone



Customize Panel Based
On PLC Logic And HMI
Controlled



COM 3

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