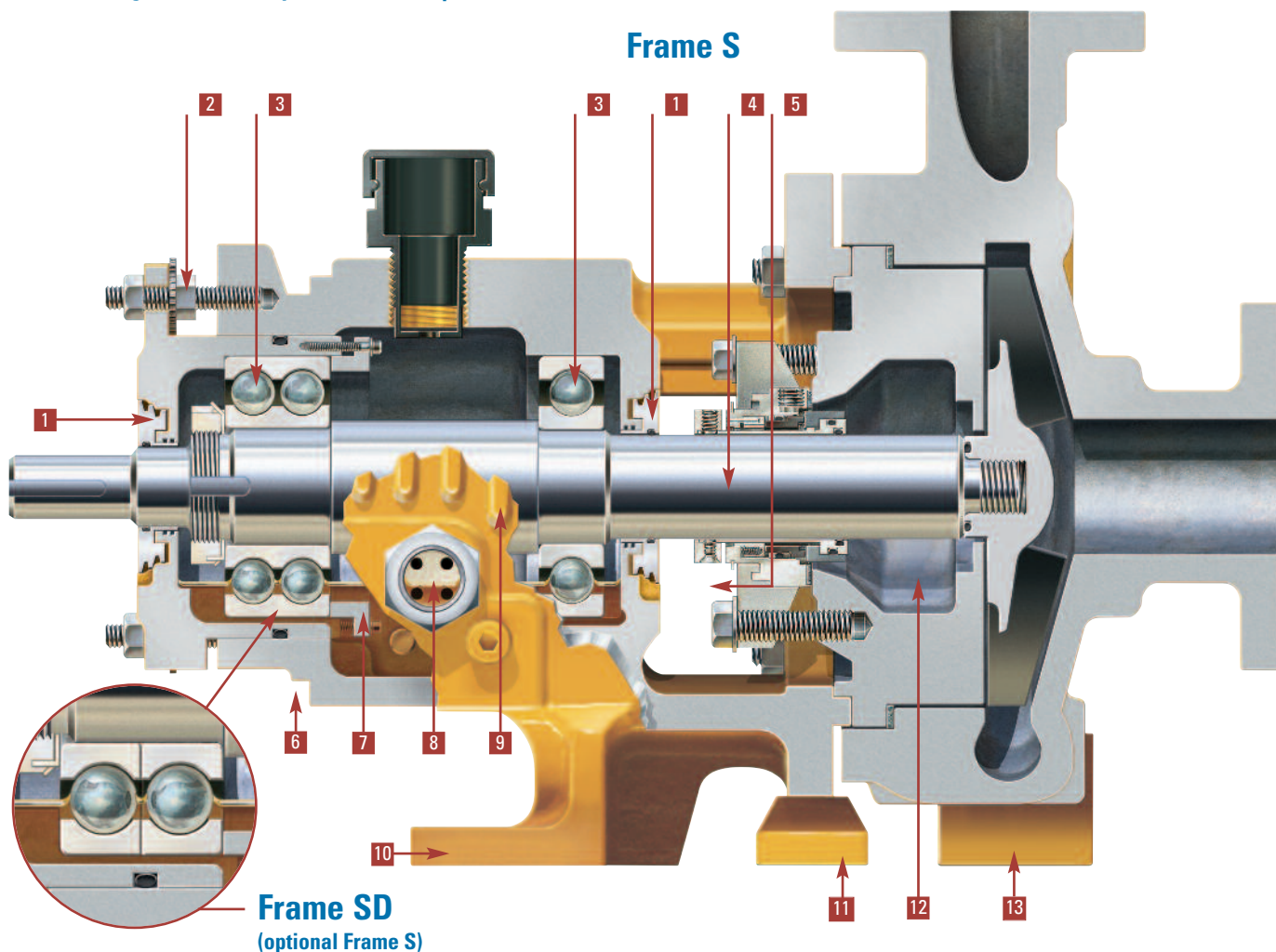




## Construction

Mid-frame strength and reliability in small-frame space.

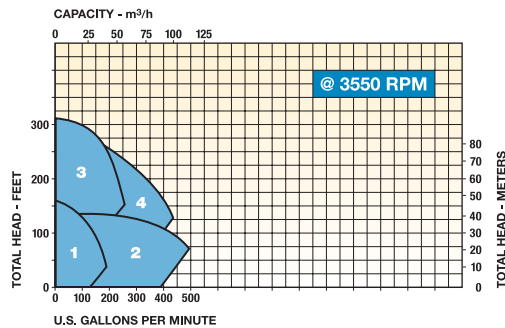
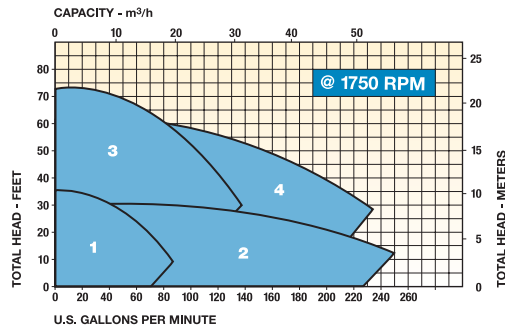
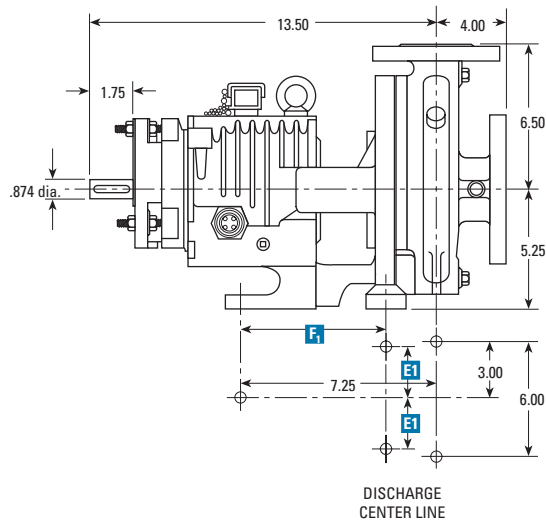


- 1** Patented lifetime labyrinth seals (pat. #4,512,517) protect bearings from intrusion of contaminants without causing the shaft damage typical of lip seals.
- 2** Patented micrometer adjustment nuts (pat. #4,439,096) fine tune impeller setting for maximum efficiency.
- 3** Heavy-duty bearings (two sizes larger than industry standard) provide maximum durability and life. Angular contact thrust bearings optional on Frame S, standard on Frame SD.
- 4** Large shaft cross-section combined with short span adds to structural integrity and resists vibration for longer bearing and seal life.
- 5** Open frame concept for ease of seal maintenance.
- 6** Rabbet for C-Frame (NEMA) or D-Flange (IEC) motor adaptor provides for automatic mechanical motor alignment without special tools or excessive labor.

- 7** Positive locking thrust bearing retaining cover for maximum bearing holding power and minimum axial movement.
- 8** Sight glass for easy observation of oil condition and level.
- 9** Cooling fins to reduce temperature of oil and bearings.
- 10** Self-supporting foot.
- 11** Frame mounted foot provides self-supporting power end and ideal mounting configuration for high temperature applications.
- 12** Seal chamber with large fluid volume promotes better cooling and cleaning action for longer seal life. Optional seal chamber jacket capability for cooling the mechanical seal.
- 13** Optional casing mounted foot to conform to ASME/ANSI standard. (Standard on Frame SD to DIN/ISO spec.)



## Frame S (ASME/ANSI)

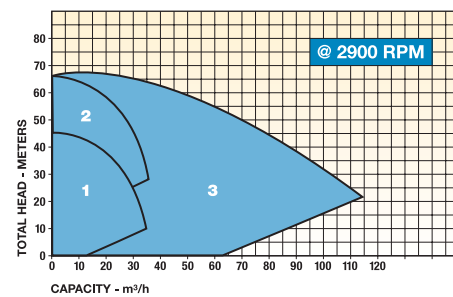
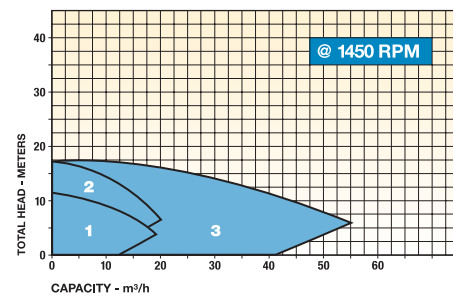
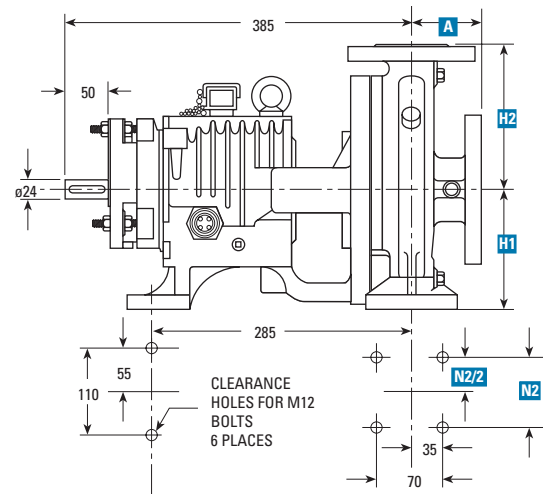


### Frame S Pump – ASME/ANSI

	Pump Size	F <sub>1</sub>	2E <sub>1</sub>
1	1 x 1.5-6	4.88	5.50
2	2 x 3-6	4.88	5.50
3	1 x 1.5-8	4.25	7.50
4	1.5 x 3-8	4.25	7.50

All dimensions are in inches.

## Frame SD (DIN/ISO)



### Frame SD Pump – DIN/ISO

	Pump Size	A	H <sub>1</sub>	H <sub>2</sub>	N <sub>2</sub>
1	32 x 50-160	80	132	160	190
2	32 x 50-200	80	160	180	190
3	50 x 80-200	100	160	200	212

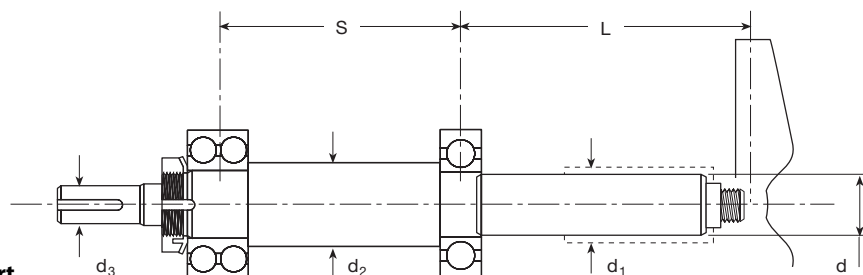
All dimensions are in millimeters.

- Heavy-duty alternative to standard small frame pumps
- Lowest  $L^3/D^4$  stiffness ratio of any competitive size pump
- Designed and built for the toughest applications



	1x1.5-6	2x3-6	1x1.5-8	1.5x3-8
Shaft				
L³/D⁴ Ratio	46 (1.9)			
Diameter at Impeller	.75-10UNC Thread (19)			
Diameter at Seal	1.500 (38)			
Diameter Between Bearings	1.98 (50)			
Diameter at Coupling	0.874 (22)			
Bearings				
Thrust	5308 AHC3			
Thrust Option	7308 BEGBY (pair)			
Radial	6308 C3			
Bearing Span	3.86 (98)			
Shaft Overhang	6.15 (156)			
Seal Chamber				
Seal Bore Diameter (nose)	2.38 (60)			
Inside Bore	3.44 (87)			
Depth	2.21 (56)			
Back Cover/Shaft Clearance	.02 Diametral (.5)			
Gland Bolting	4X .375-16UNC on 3.50 Bolt Circle Diameter (10 on 89 B.C.)			
Distance to Nearest Obstruction	2.38 (60)			
Open Impeller				
Clearance	.06 (1.5) Total .015 (0.4)Suction Side			
Eye Area sq. in. (cm²)	3.30 (21)	8.10 (52)	4.13 (27)	5.71 (37)
Maximum Diameter Solids	0.3 (8)	0.6 (15)	0.4 (10)	0.5 (13)
Number of Vanes	4	5	5	5
Pumps Weights lbs/kg				
Pump Only	110 (50)	130 (59)	112 (50)	126 (57)
Casing				
Type	Single Volute			
Wall Thickness	0.44 (11) Minimum			
Maximum Working Pressure	See Pressure vs. Temperature Limit Chart			
Test pressure	Class 150 Flanges-250PSIG, Class 300 Flanges-450PSIG			
Rotating Element				
Wk² Dry lbs-ft² (kg-m²)	0.18 (.007)	0.24 (.010)	0.38 (.015)	0.43 (.018)
Wk² Wet lbs-ft² (kg-m²)	0.27 (.011)	0.36 (.015)	0.57 (.024)	0.66 (.028)
Maximum Speed (oil lube)	3500	3500	3500	3500
Power Limits				
HP (KW)/100 RPM 316SS	1.1 (0.9)			

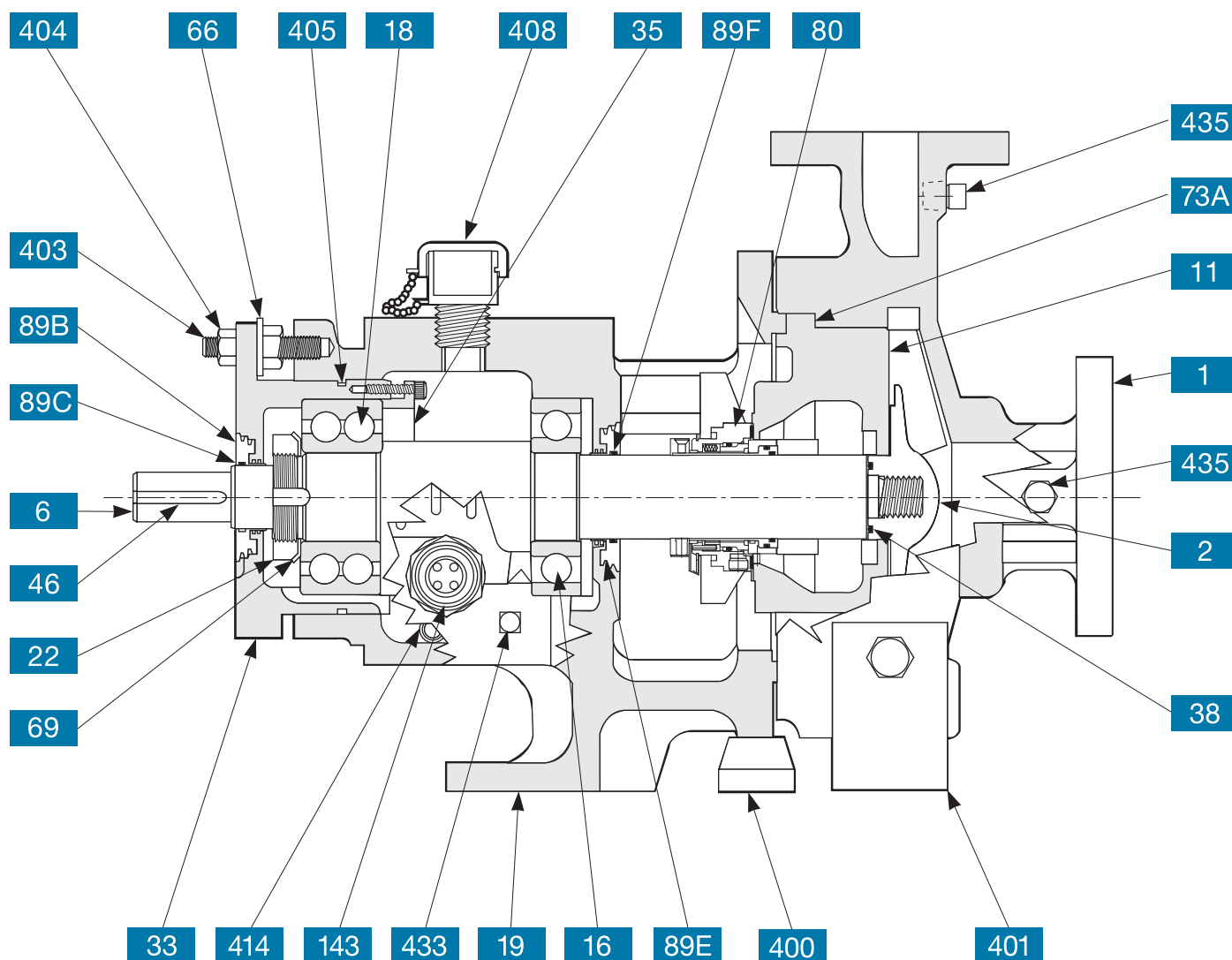
**Lowest L<sup>3</sup>/D<sup>4</sup> stiffness ratio for any competitive size pump in the industry.**



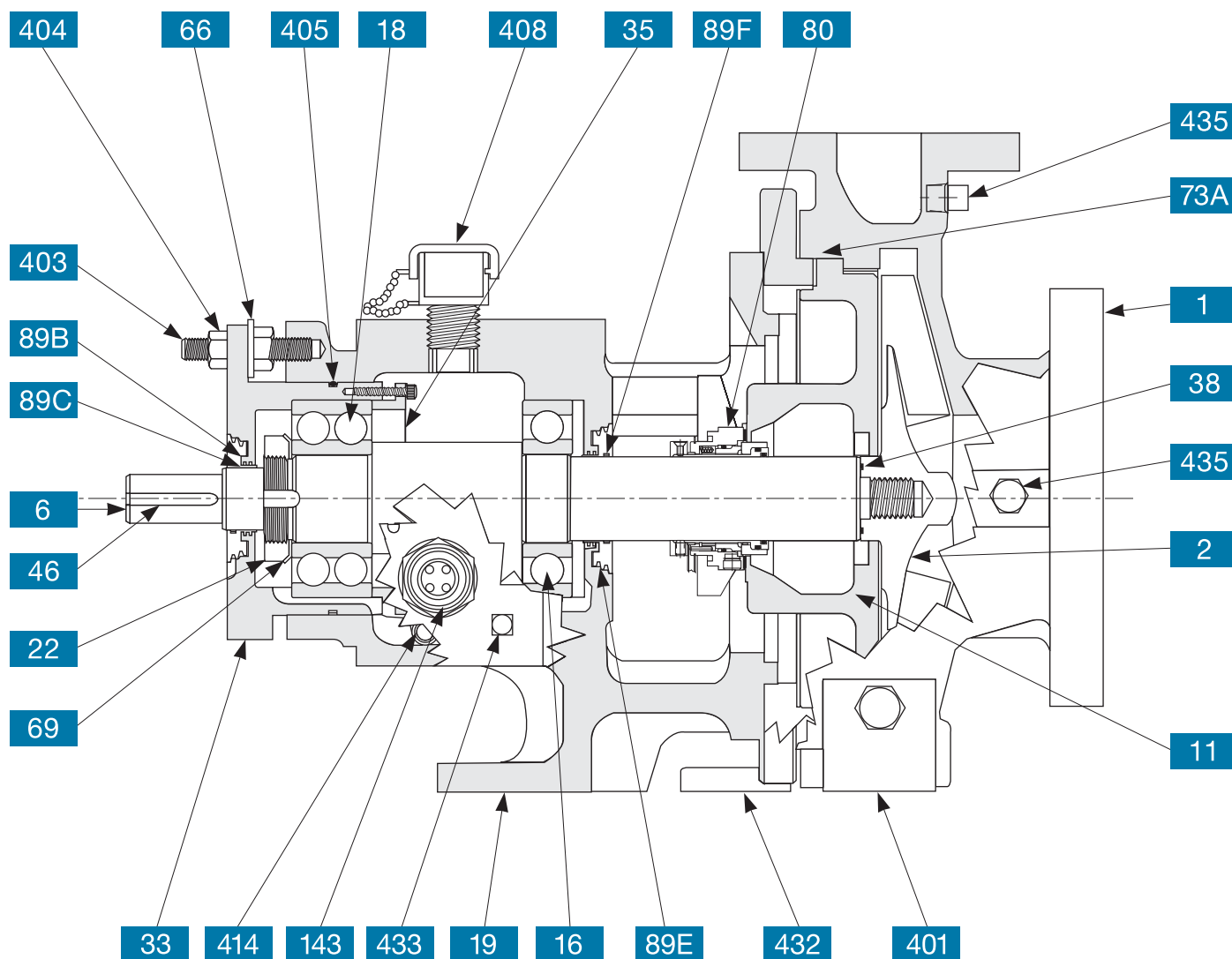
**Shaft Stiffness Ratio Comparison Chart**

		System One Frame S	Competitor A with Sleeve	Competitor A Solid Shaft	Competitor B with Sleeve	Competitor B Solid Shaft
<b>SHAFT DIAMETERS</b>	In Stuffing Box (Less Sleeve)(d)	1 1/2 (38)	1 1/8 (28)	1 3/8 (35)	7/8 (22)	1 1/8 (28)
	In Stuffing Box (With Sleeve)(d <sub>1</sub> )	N/A	1 3/8 (35)	N/A	1 1/8 (28)	N/A
	Between Bearings (d <sub>2</sub> )	2 (51)	1 1/2 (38)	1 1/2 (38)	1 1/4 (32)	1 1/4 (32)
	At Coupling (d <sub>3</sub> )	7/8 (22)	7/8 (22)	7/8 (22)	7/8 (22)	7/8 (22)
<b>BEARINGS</b>	Radial	6308	6207	6207	6206	6206
	Thrust	5308	5306	5306	5305	5305
	Bearing Span (S)	3.86 (98)	4.12 (105)	4.12 (105)	4.06 (103)	4.06 (103)
	Shaft Overhang (L)	6.15 (156)	6.12 (155)	6.12 (155)	5.87 (149)	5.87 (149)
<b>STIFFNESS RATIO<sup>1</sup></b>	L <sup>3</sup> /D <sup>4</sup>	46 (1.9)	143 (4.5)	64 (2.5)	346 (14.3)	127 (4.4)

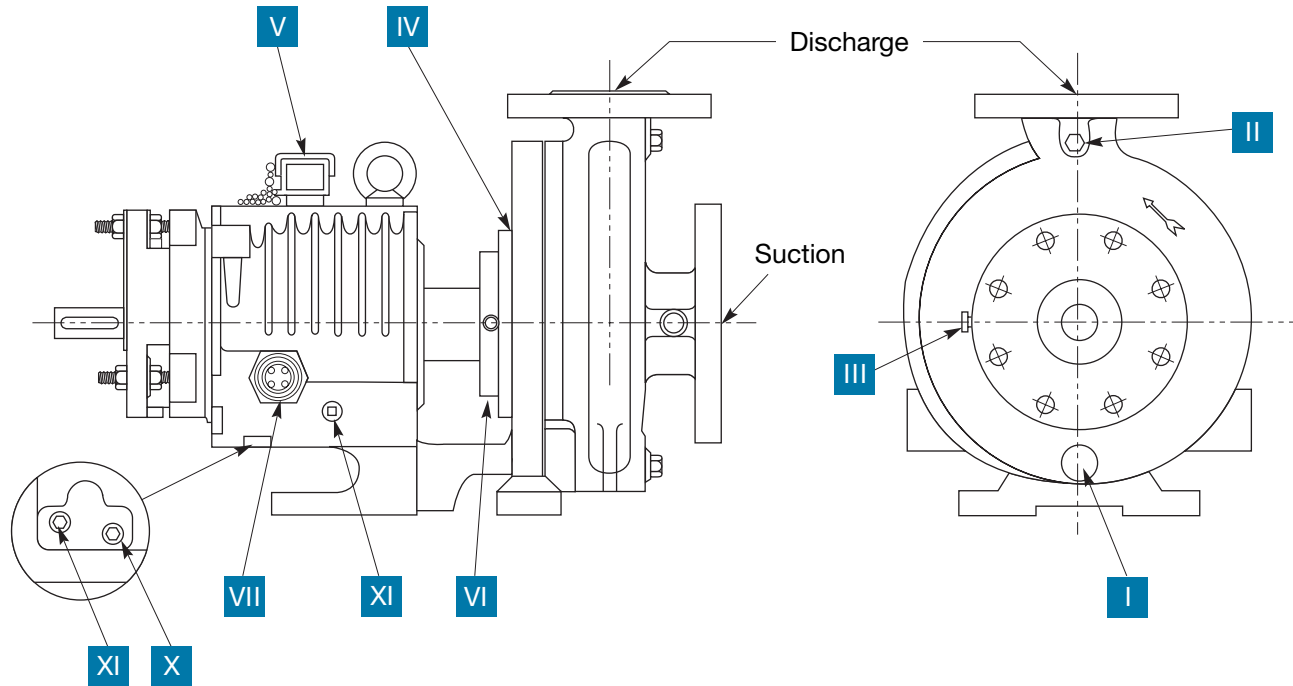
<sup>1</sup> For good vibration resistance, especially at speeds above 1750 RPM, the stiffness ratio should not exceed 60 in the seal area. The higher the ratio, the higher the frequency of downtimes, especially as related to bearing and seal failures. The pump has less resistance to the common running conditions which cause vibration – running off Best Efficiency Point (BEP), cavitation, motor misalignment, water hammer, worn parts, plugged or unbalanced impellers, poor piping.



NO.	ITEM	NO.	ITEM	NO.	ITEM
1	Casing	38	O-ring, Impeller Hub	143	Oil Sight Glass
2	Impeller	46	Key, Coupling	400	Foot, Bearing Frame
6	Shaft	66	Micrometer Nut	401	Foot, casing (optional)
11	Back Cover	69	Lockwasher, Thrust Bearing	403	Stud, Cartridge
16	Bearing, Radial	73A	Gasket, Casing	404	Locknut, Cartridge
18	Bearing, Thrust	80	Mechanical Seal	405	O-Ring, Cartridge
19	Bearing, Frame	89E	Seal, Labyrinth Rotor, Radial	408	Oil Filler Assembly
22	Locknut, Thrust Bearing	89F	Seal, Labyrinth O-Ring, Radial	414	Plug, Magnetic
33	Bearing Cartridge	89B	Seal, Labyrinth Rotor, Thrust	433	Plug, Bearing Frame
35	Retainer Cover	89C	Seal, Labyrinth O-Ring, Thrust	435	Plug, Casing



NO.	ITEM	NO.	ITEM	NO.	ITEM
1	Casing	46	Key, Coupling	401	Foot, casing (optional)
2	Impeller	66	Micrometer Nut	403	Stud, Cartridge
6	Shaft	69	Lockwasher, Thrust Bearing	404	Locknut, Cartridge
11	Back Cover	73A	Gasket, Casing	405	O-Ring, Cartridge
16	Bearing, Radial	80	Mechanical Seal	408	Oil Filler Assembly
18	Bearing, Thrust	89E	Seal, Labyrinth Rotor, Radial	414	Plug, Magnetic
19	Bearing, Frame	89F	Seal, Labyrinth O-Ring, Radial	432	Adapter Plate
22	Locknut, Thrust Bearing	89B	Seal, Labyrinth Rotor, Thrust	433	Plug, Bearing Frame
33	Bearing Cartridge	89C	Seal, Labyrinth O-Ring, Thrust	435	Plug, Casing
35	Retainer Cover	143	Oil Sight Glass		
38	O-ring, Impeller Hub	400	Foot, Bearing Frame		



ITEM NUMBER	NPT SIZE	NUMBER OF TAPS	CONNECTION
* I	0.38-18	1	Casing Drain
II	0.25-18	1	Discharge Gage
III	0.25-18	1	Suction Gage
IV	0.12-27	1	Seal Chamber Flush
V	0.75-14	1	Oil Fill
* VI	0.25-18 & 0.12-27	2	Seal Chamber Jacket-Inlet & Outlet
# VII	0.75-14	1	Oil Sight Glass
## X	0.25-18	1	Oil Drain
XI	0.25-18	2	Magnetic Plug or Cooling Coil *

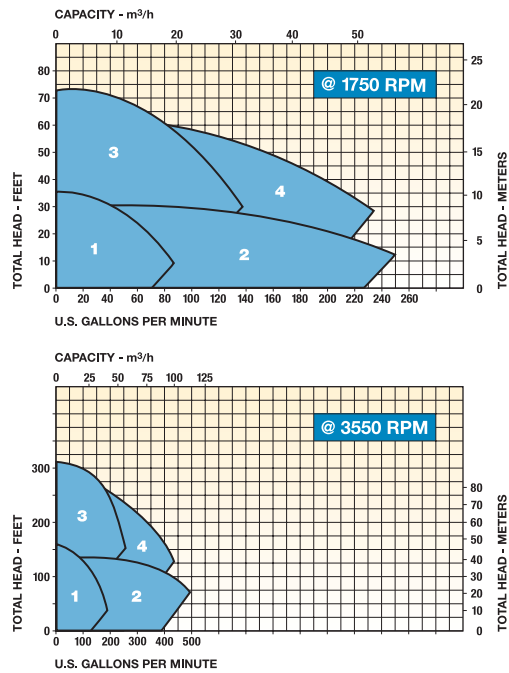
\* Optional

# Left side of pump facing suction end

## Right side of pump facing suction end



## Frame S (ASME/ANSI)

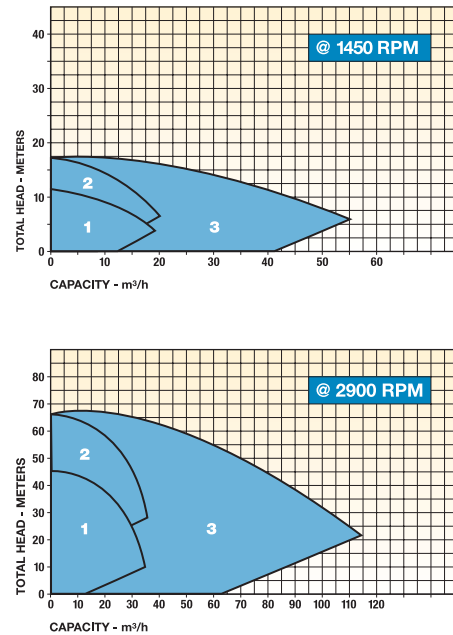


### Frame S Pump – ASME/ANSI

	Pump Size	F <sub>1</sub>	2E <sub>1</sub>
1	1 x 1.5-6	4.88	5.50
2	2 x 3-6	4.88	5.50
3	1 x 1.5-8	4.25	7.50
4	1.5 x 3-8	4.25	7.50

All dimensions are in inches.

## Frame SD (DIN/ISO)

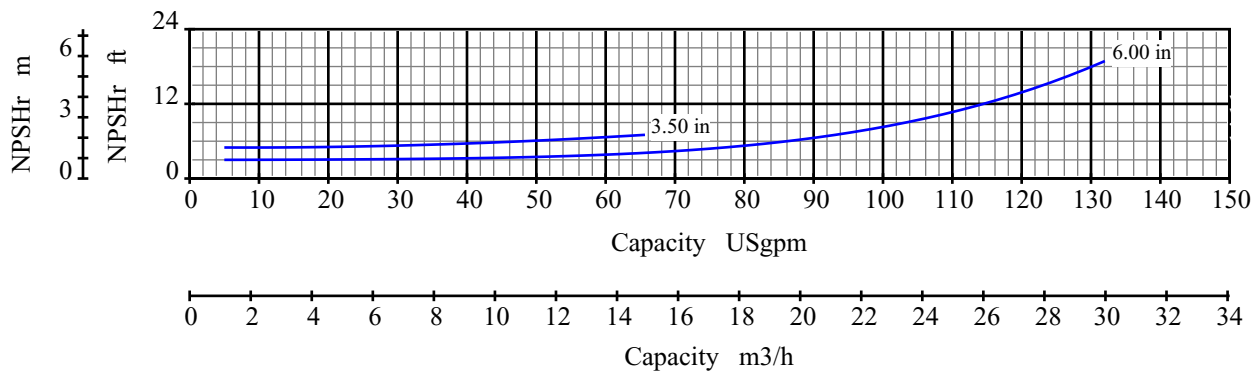
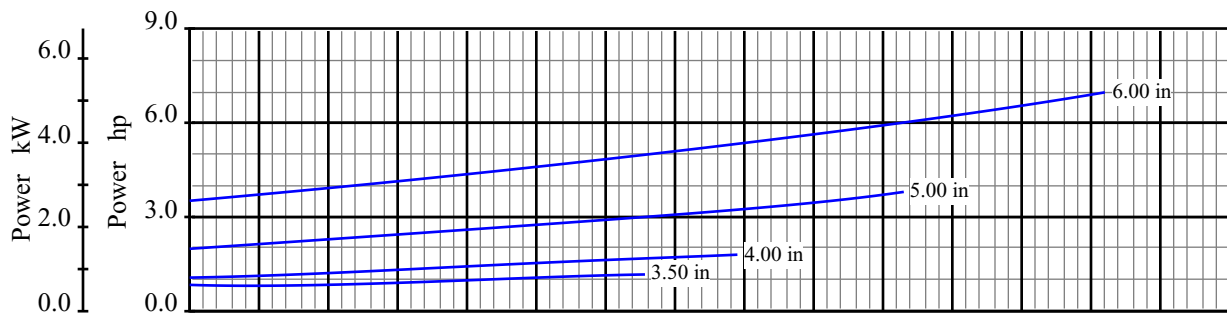
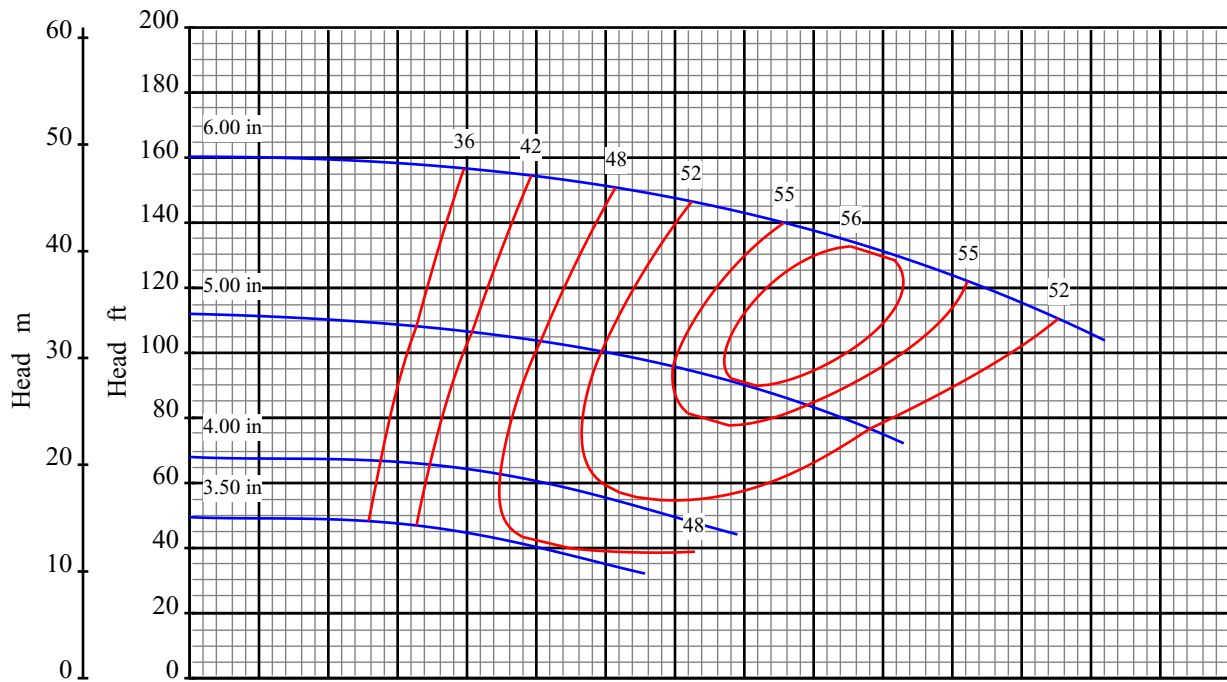


### Frame SD Pump – DIN/ISO

	Pump Size	A	H <sub>1</sub>	H <sub>2</sub>	N <sub>2</sub>
1	32 x 50-160	80	132	160	190
2	32 x 50-200	80	160	180	190
3	50 x 80-200	100	160	200	212

All dimensions are in millimeters.





Curve No: S18100V1

## Blackmer System One

Pump Size: 1x1.5 6

Pump Performance Characteristics

Effective Date: Jan/2005

Catalog: 1301

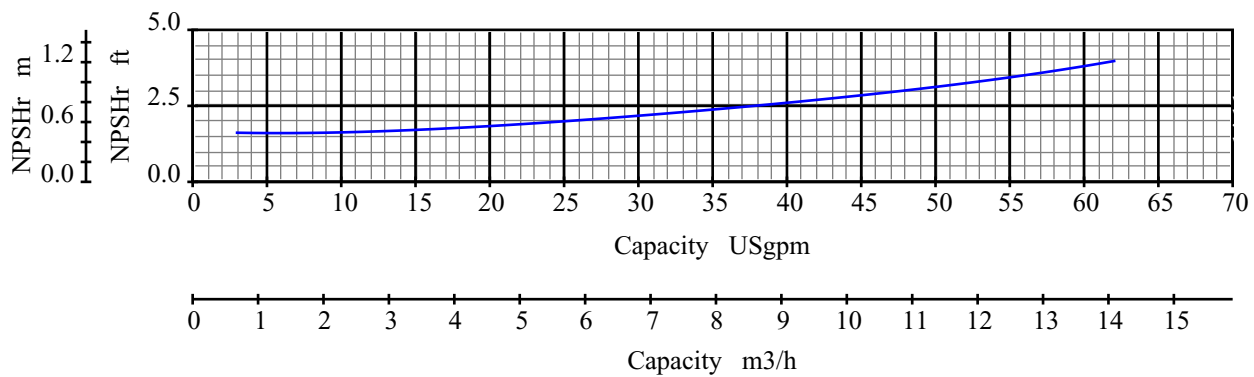
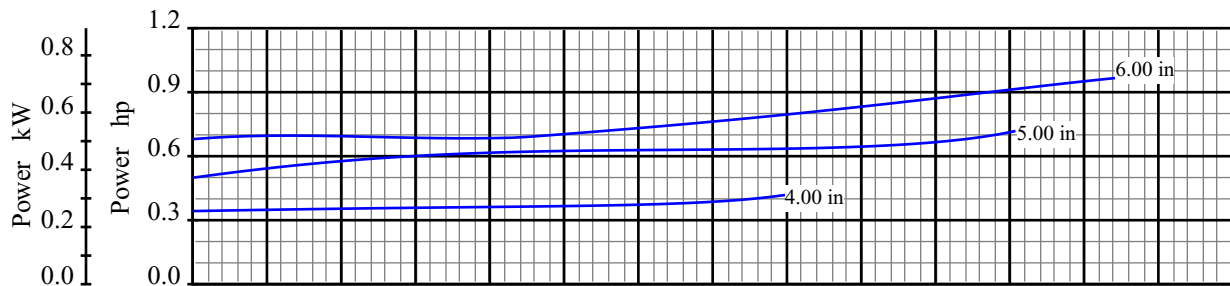
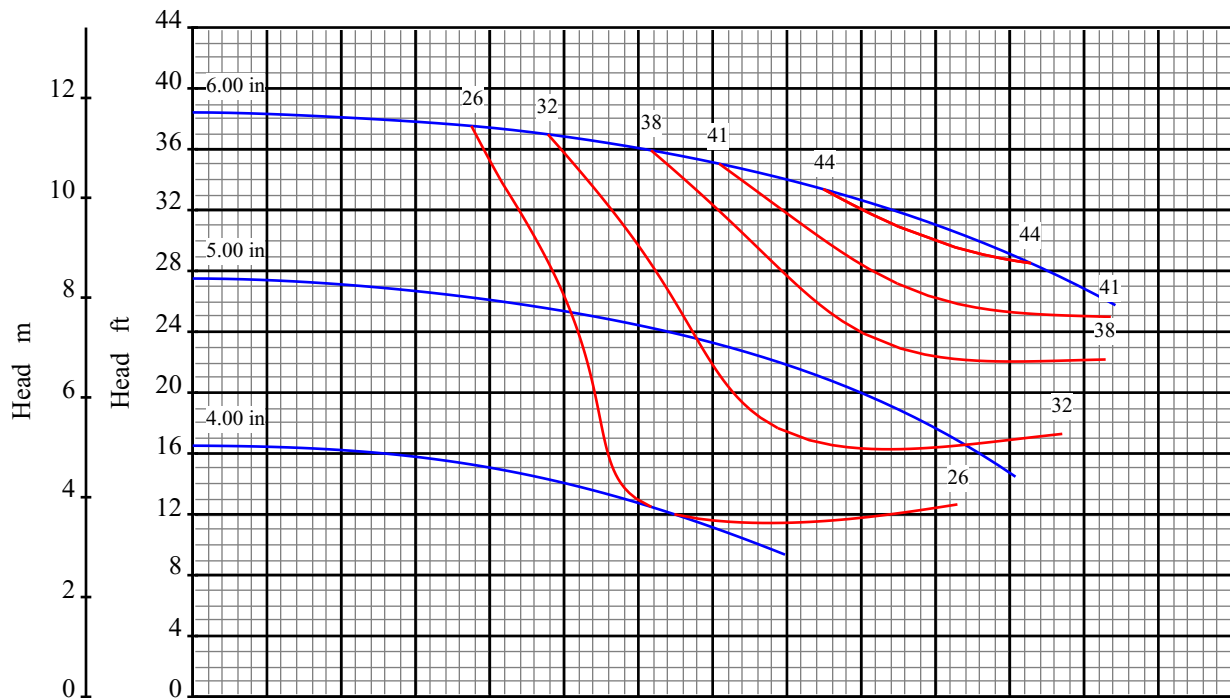
Speed: 3550 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com





Curve No: S18102V1

## Blackmer System One

Pump Size: 1x1.5 6

Pump Performance Characteristics

Effective Date: Jan/2005

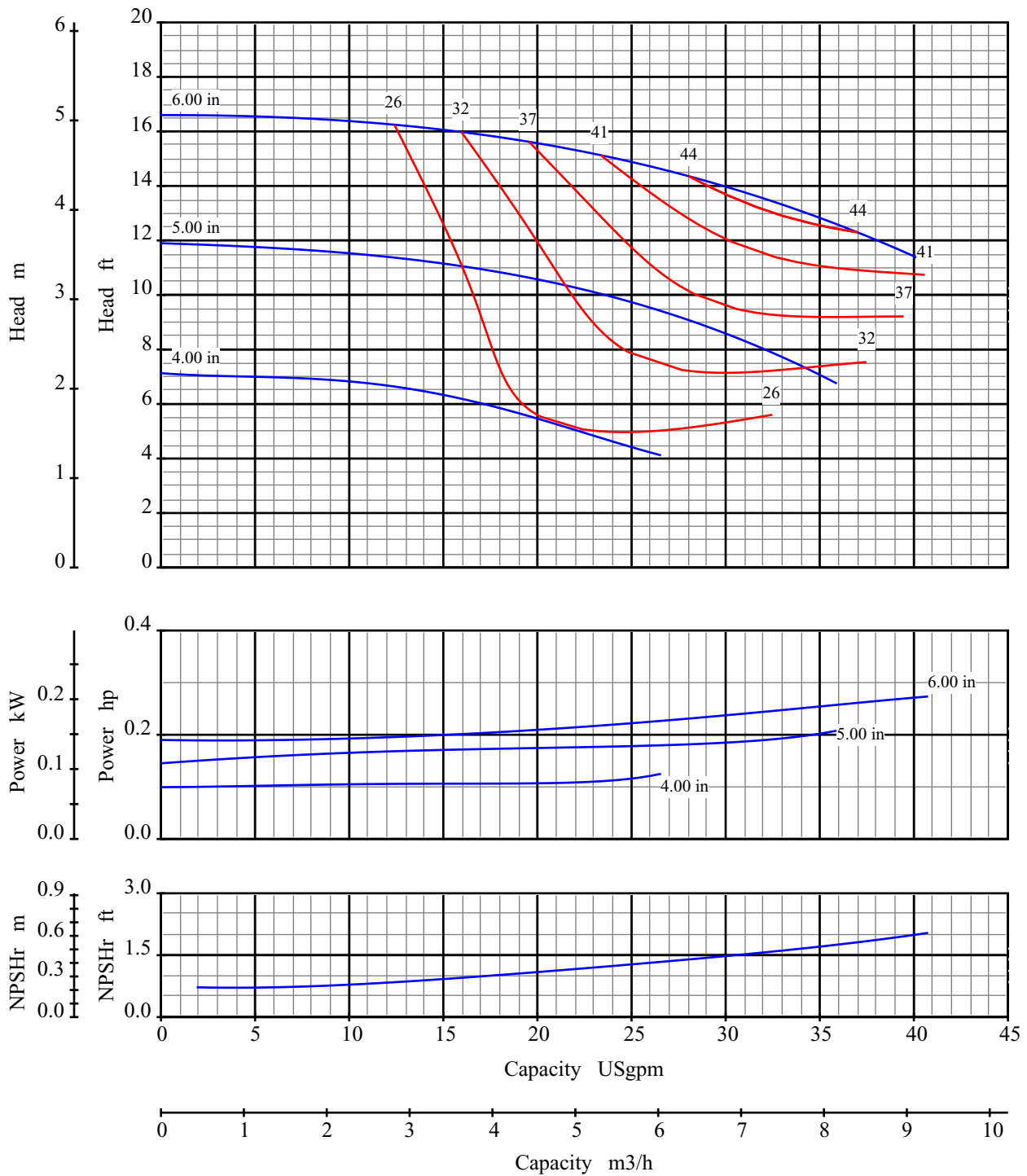
Catalog: 1301

Speed: 1750 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18104V1

## Blackmer System One

Pump Size: 1x1.5 6

Pump Performance Characteristics

Effective Date: Jan/2005

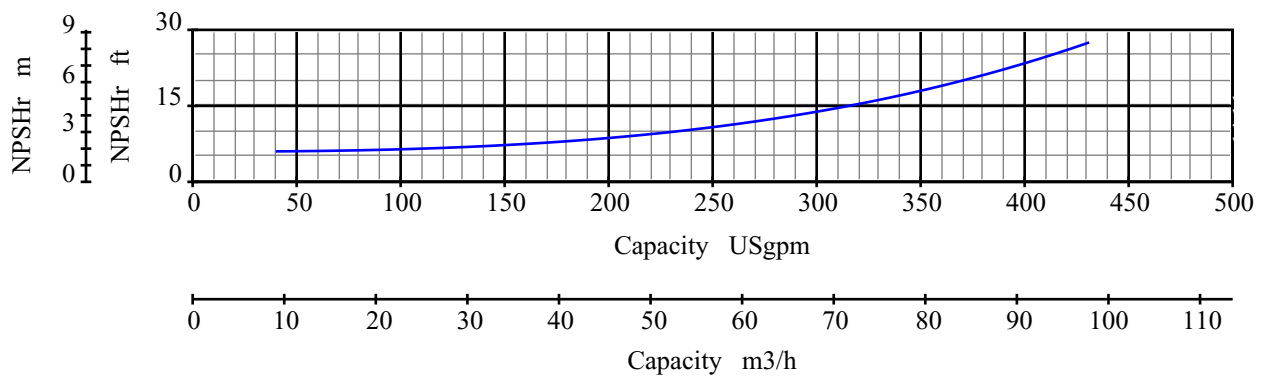
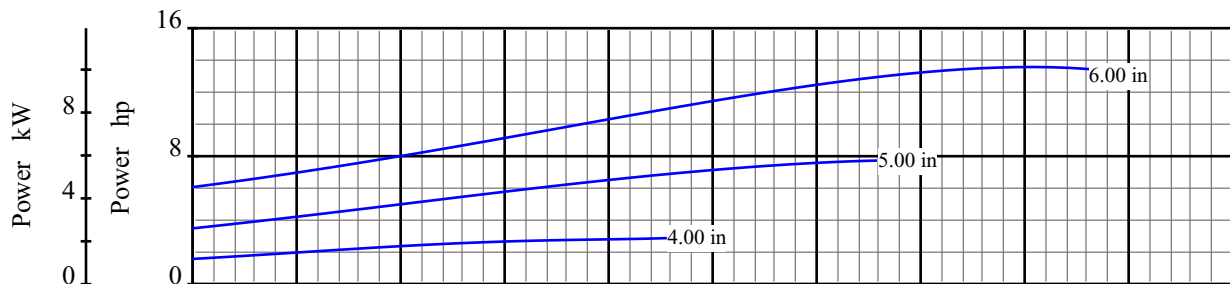
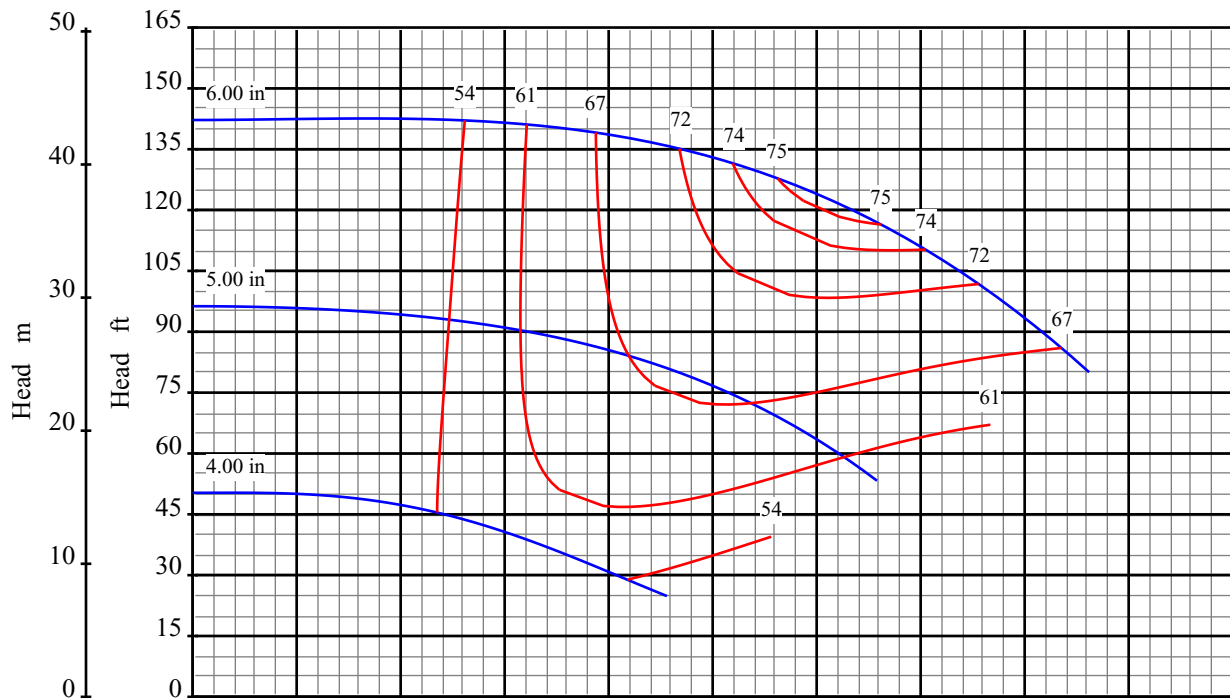
Catalog: 1301

Speed: 1150 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18106V1

## Blackmer System One

Pump Size: 2x3 6

Pump Performance Characteristics

Effective Date: Jan/2005

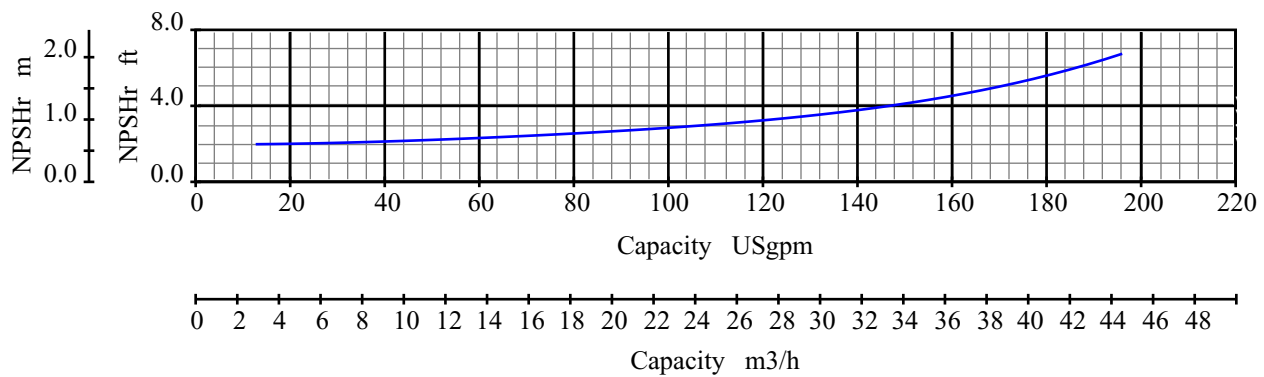
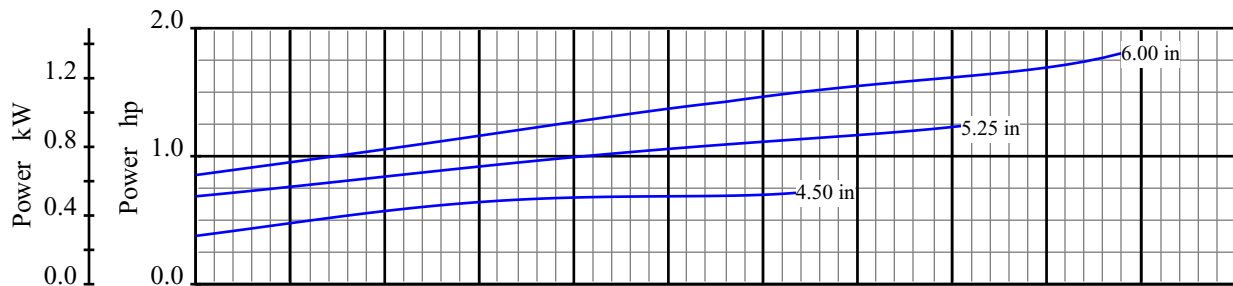
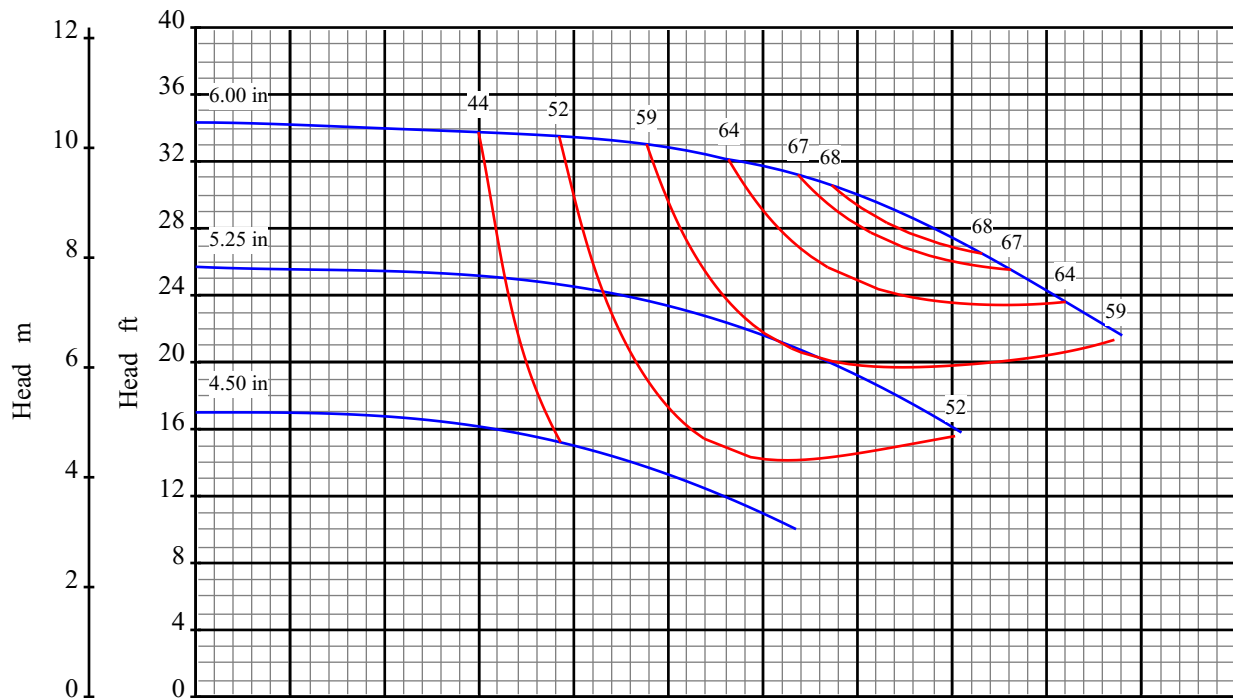
Catalog: 1301

Speed: 3550 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18108V1

## Blackmer System One

Pump Size: 2x3 6

Pump Performance Characteristics

Effective Date: Jan/2005

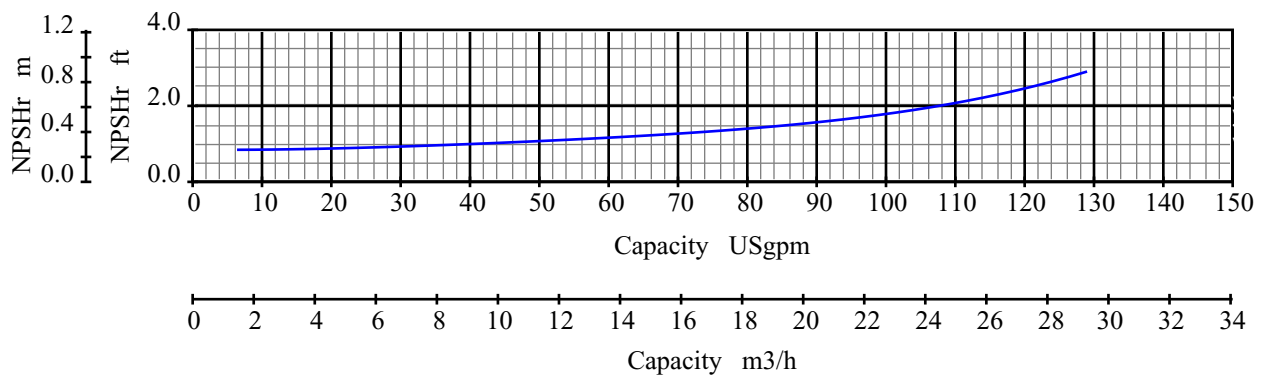
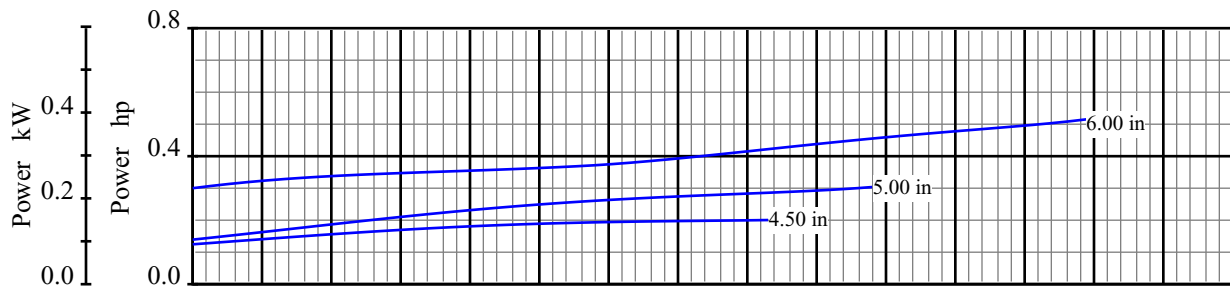
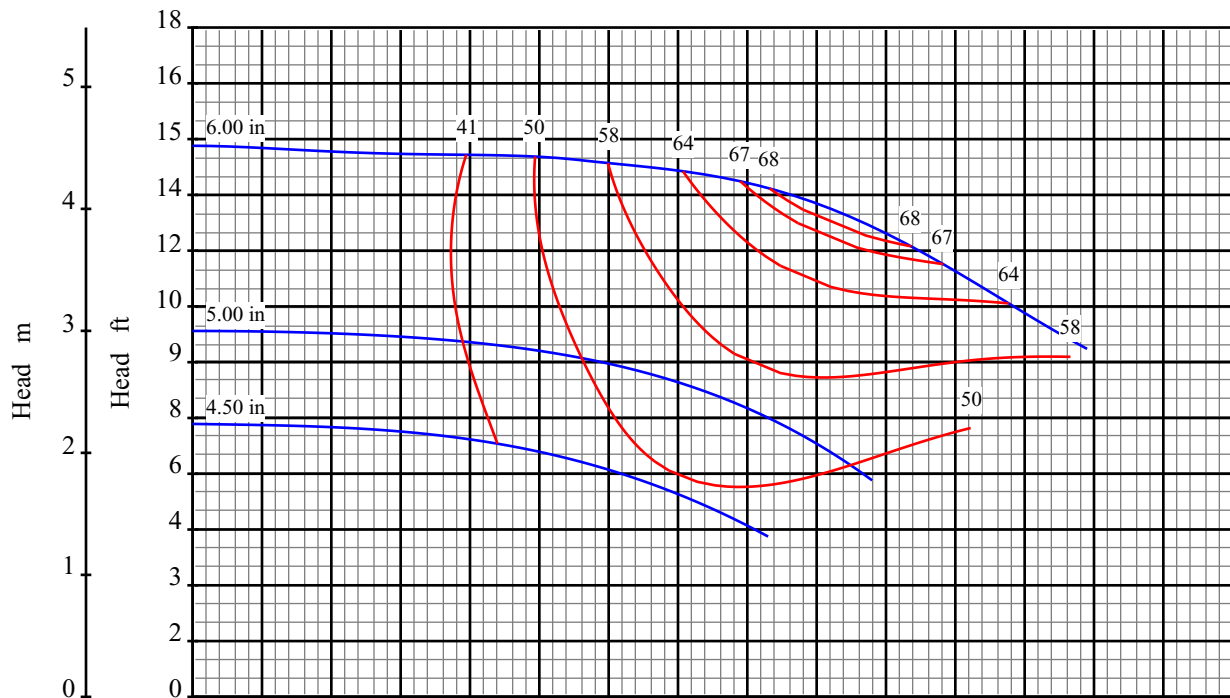
Catalog: 1301

Speed: 1750 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18110V1

## Blackmer System One

Pump Size: 2x3 6

Pump Performance Characteristics

Effective Date: Jan/2005

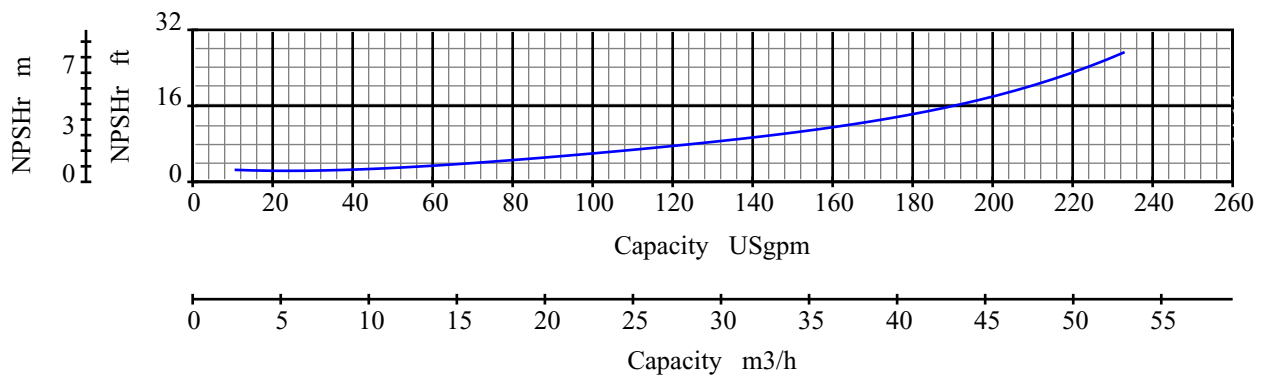
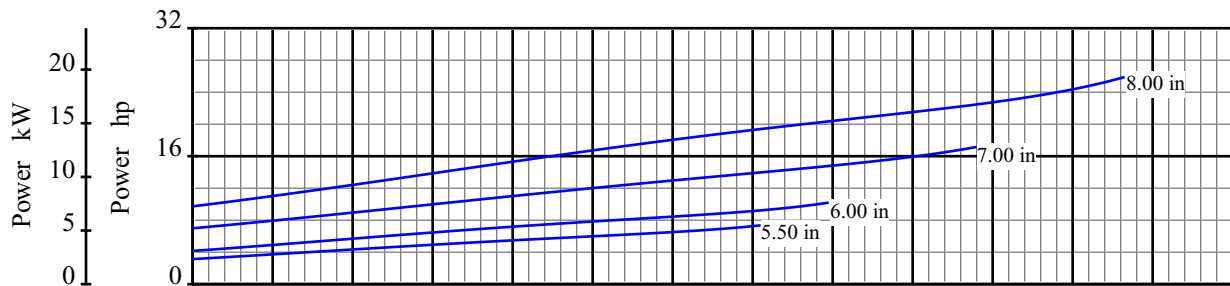
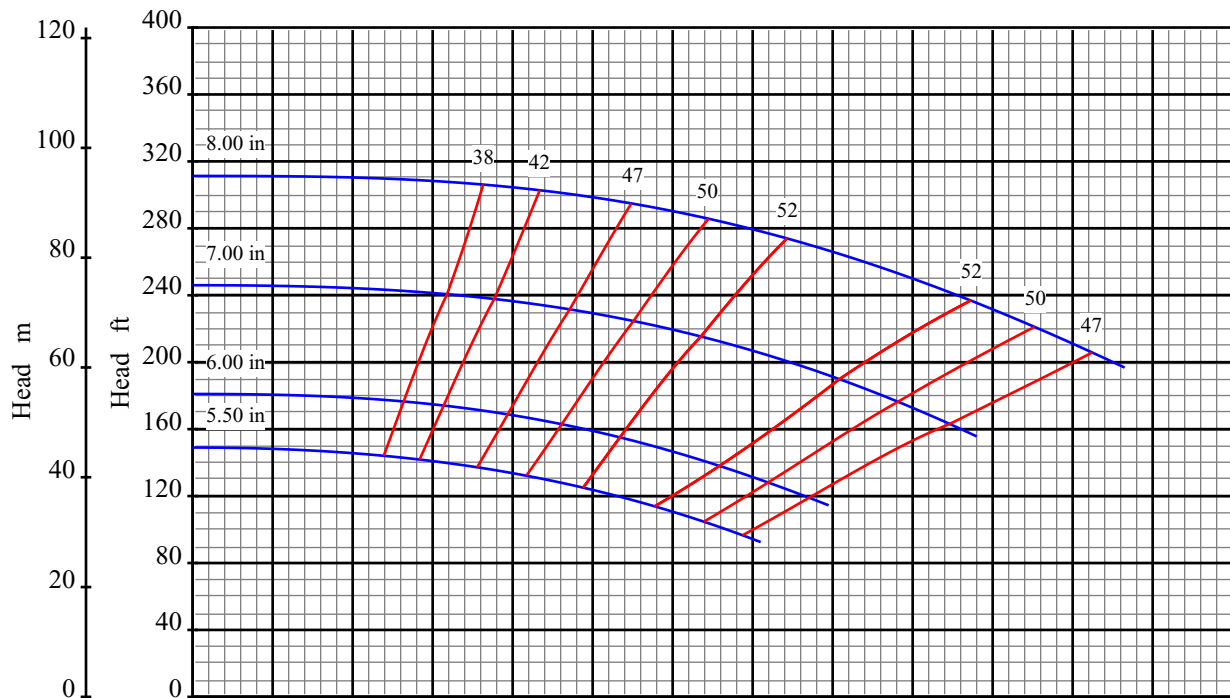
Catalog: 1301

Speed: 1150 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18112V1

## Blackmer System One

Pump Size: 1x1.5 8

Pump Performance Characteristics

Effective Date: Jan/2005

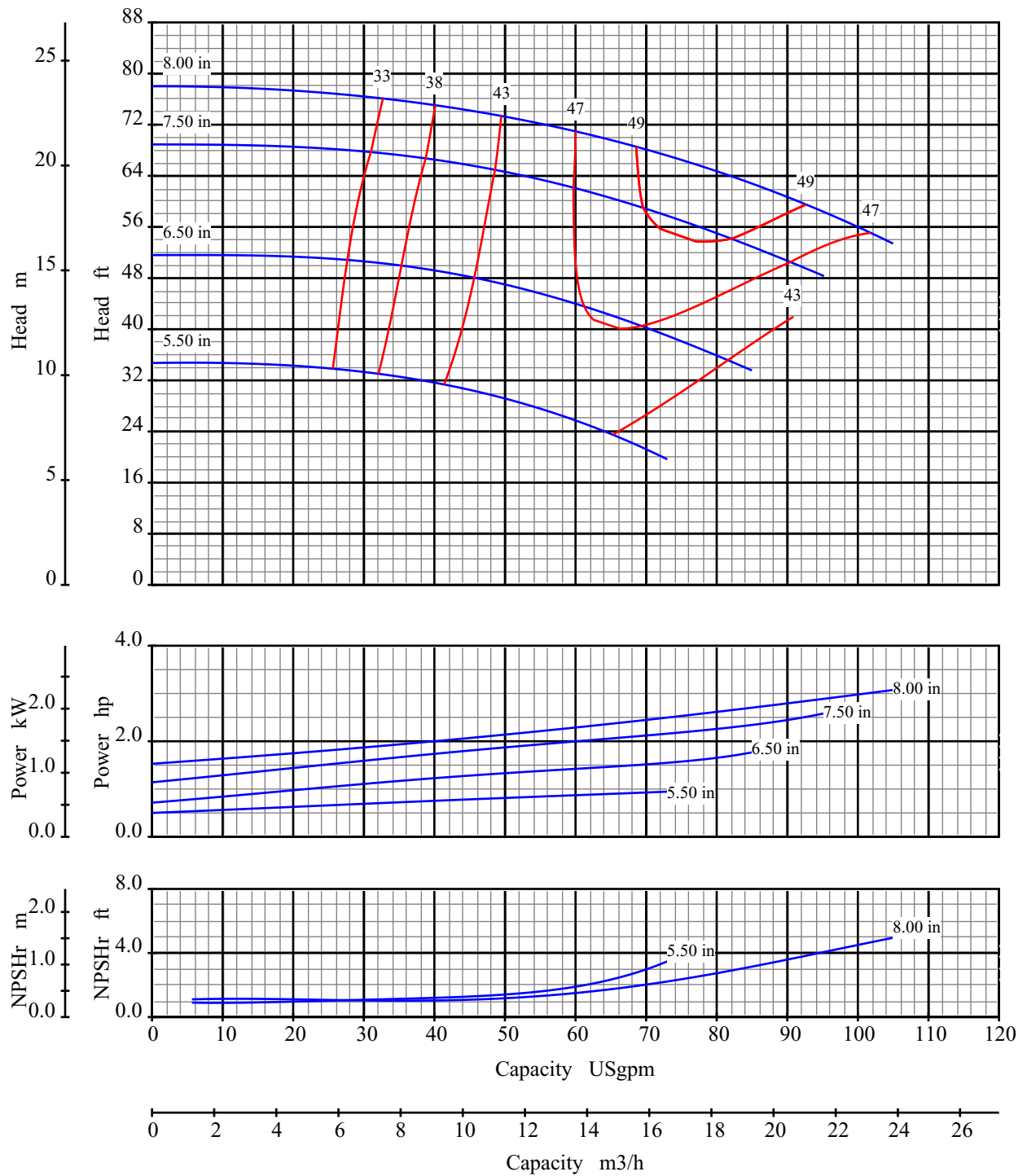
Catalog: 1301

Speed: 3550 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18114V1

## Blackmer System One

Pump Size: 1x1.5 8

Pump Performance Characteristics

Effective Date: Jan/2005

Catalog: 1301

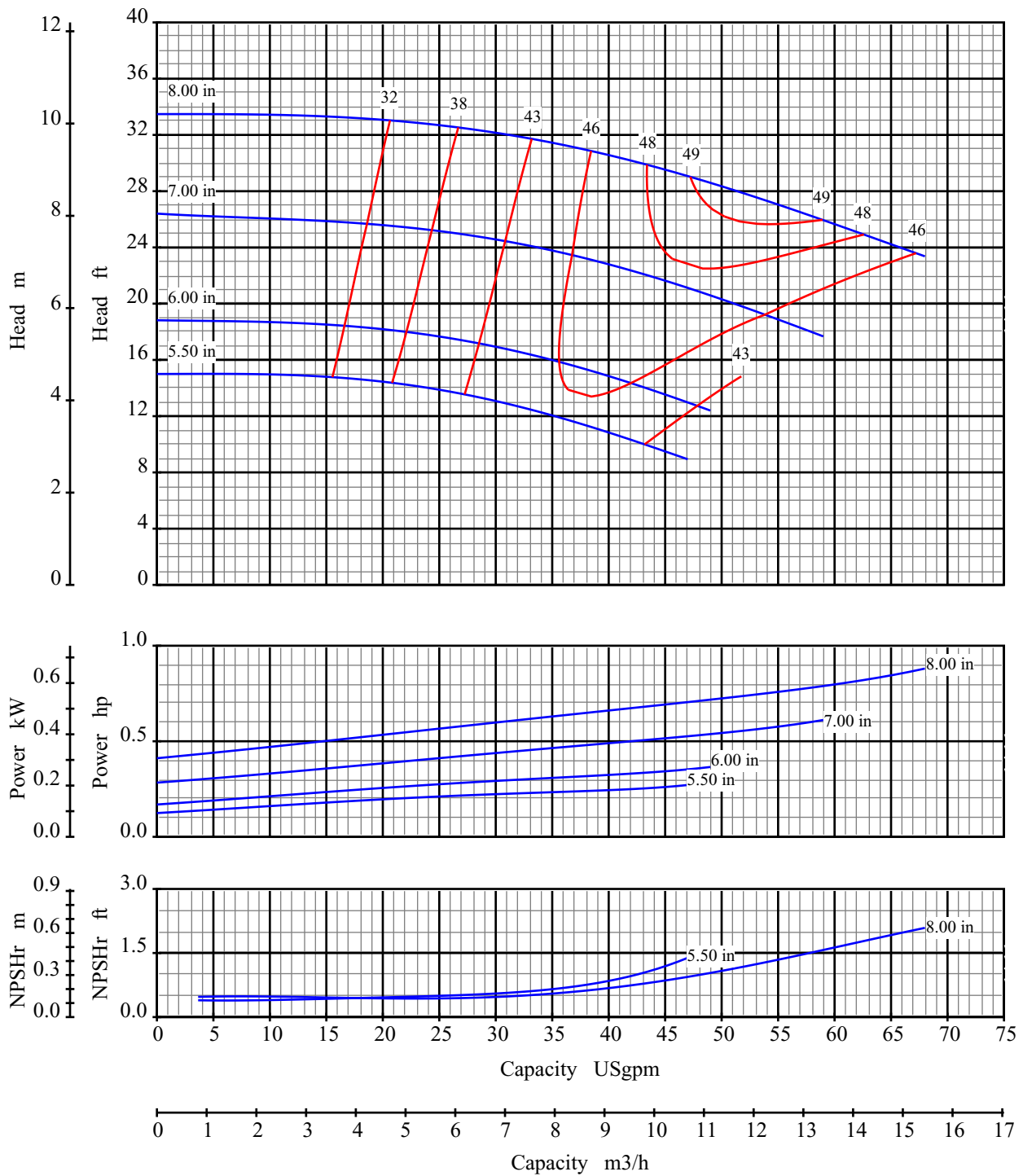
Speed: 1750 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com





Curve No: S18116V1

## Blackmer System One

Pump Size: 1x1.5 8

Pump Performance Characteristics

Effective Date: Jan/2005

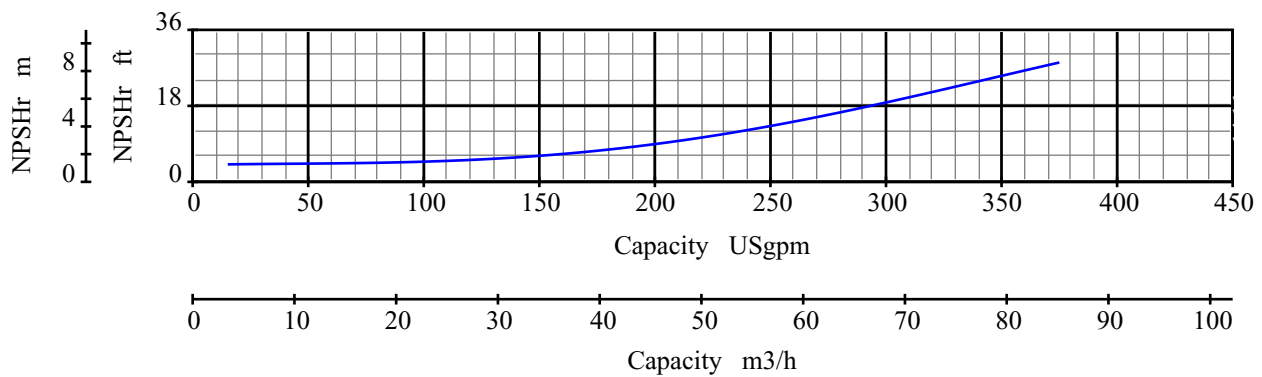
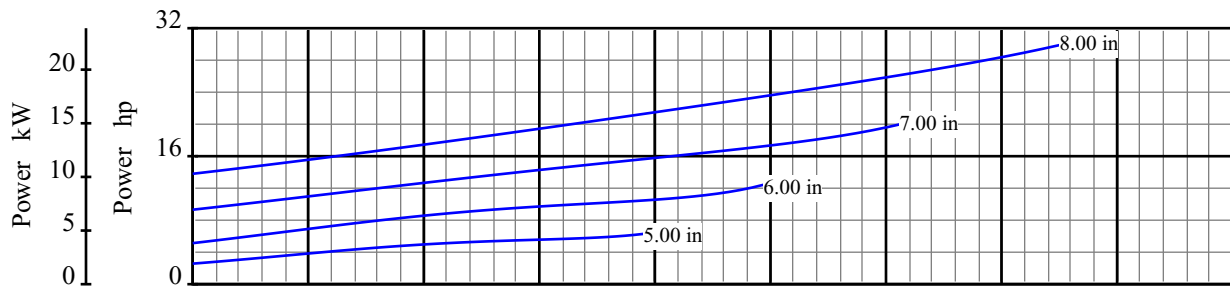
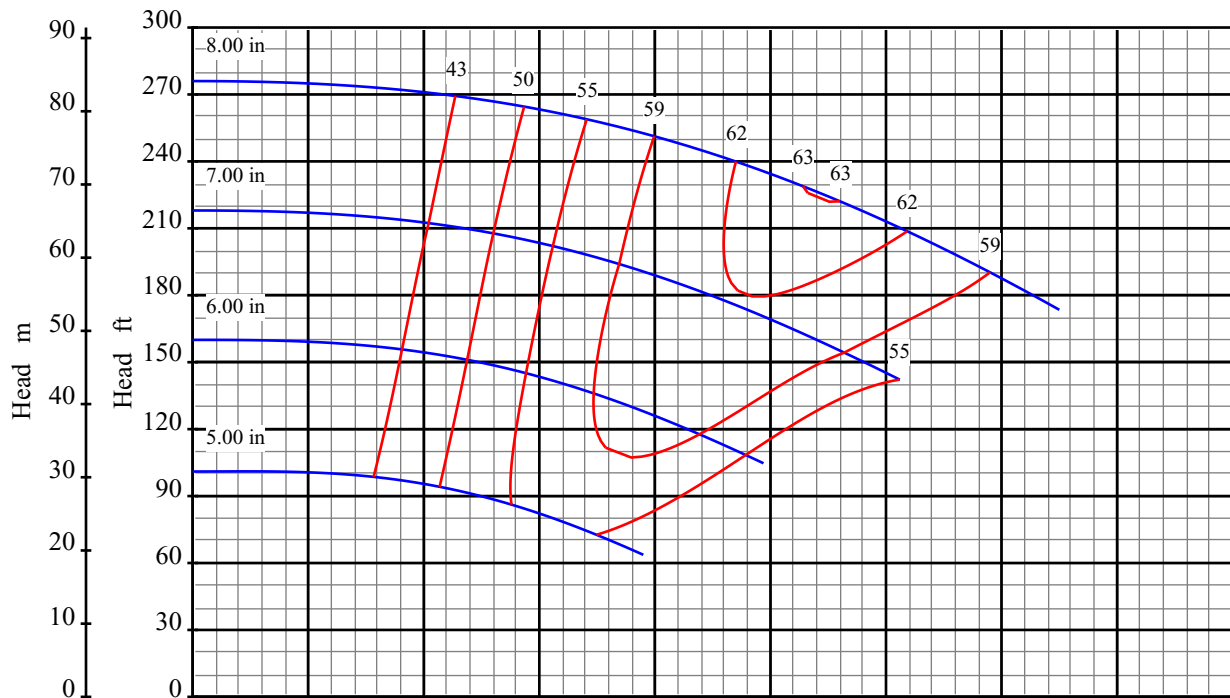
Catalog: 1301

Speed: 1150 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18118V1

## Blackmer System One

Pump Size: 1.5x3 8

Pump Performance Characteristics

Effective Date: Jan/2005

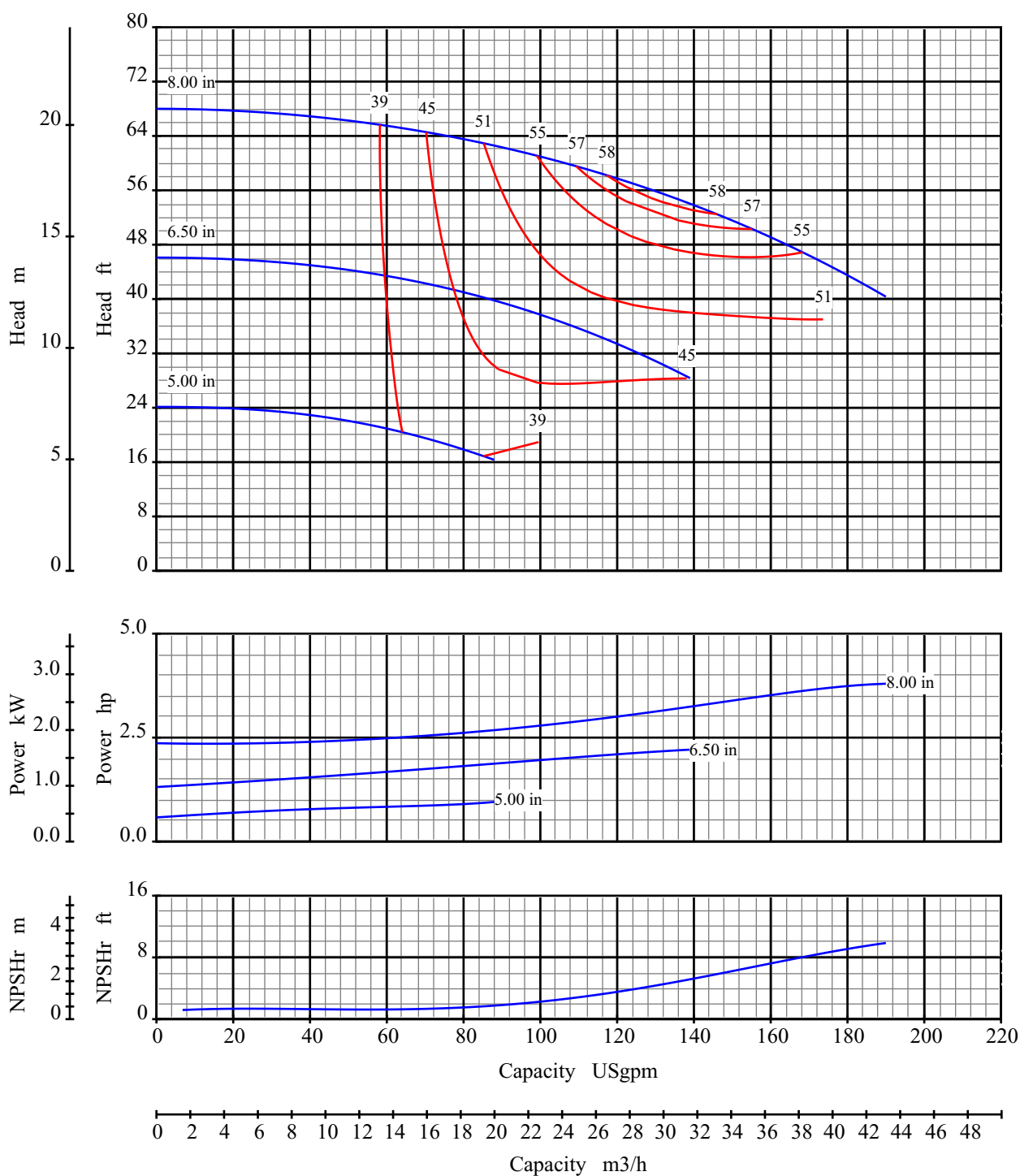
Catalog: 1301

Speed: 3550 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18120V1

## Blackmer System One

Pump Size: 1.5x3 8

Pump Performance Characteristics

Effective Date: Jan/2005

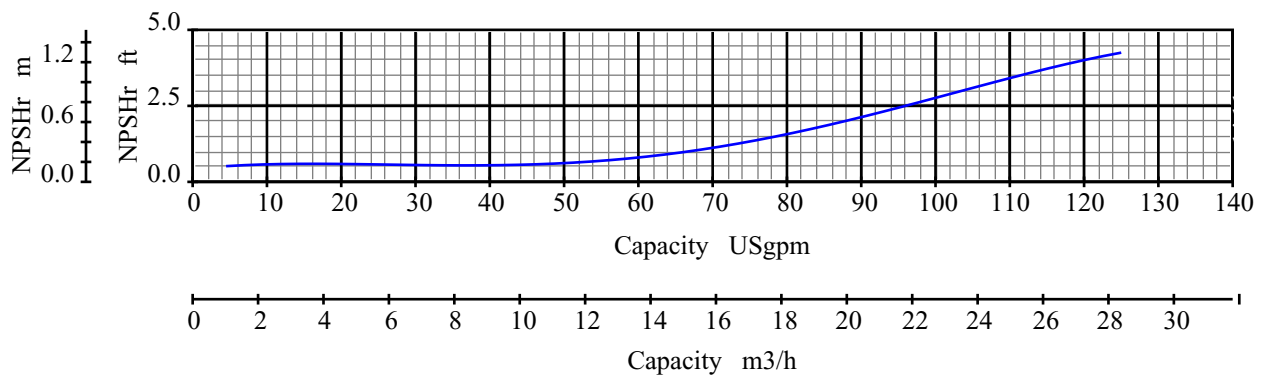
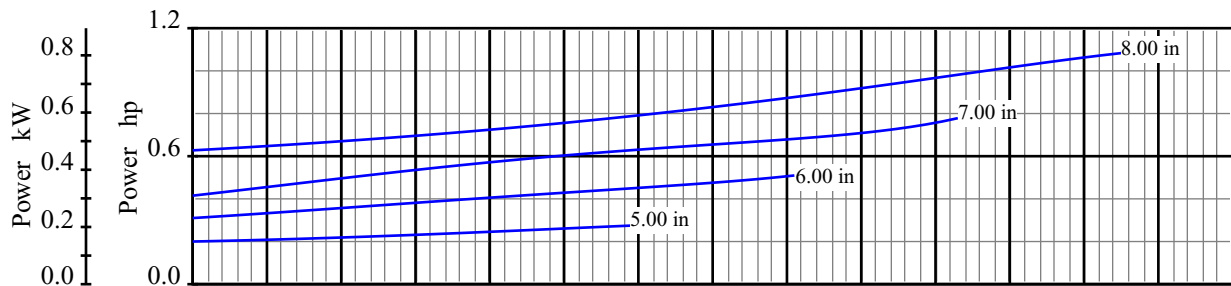
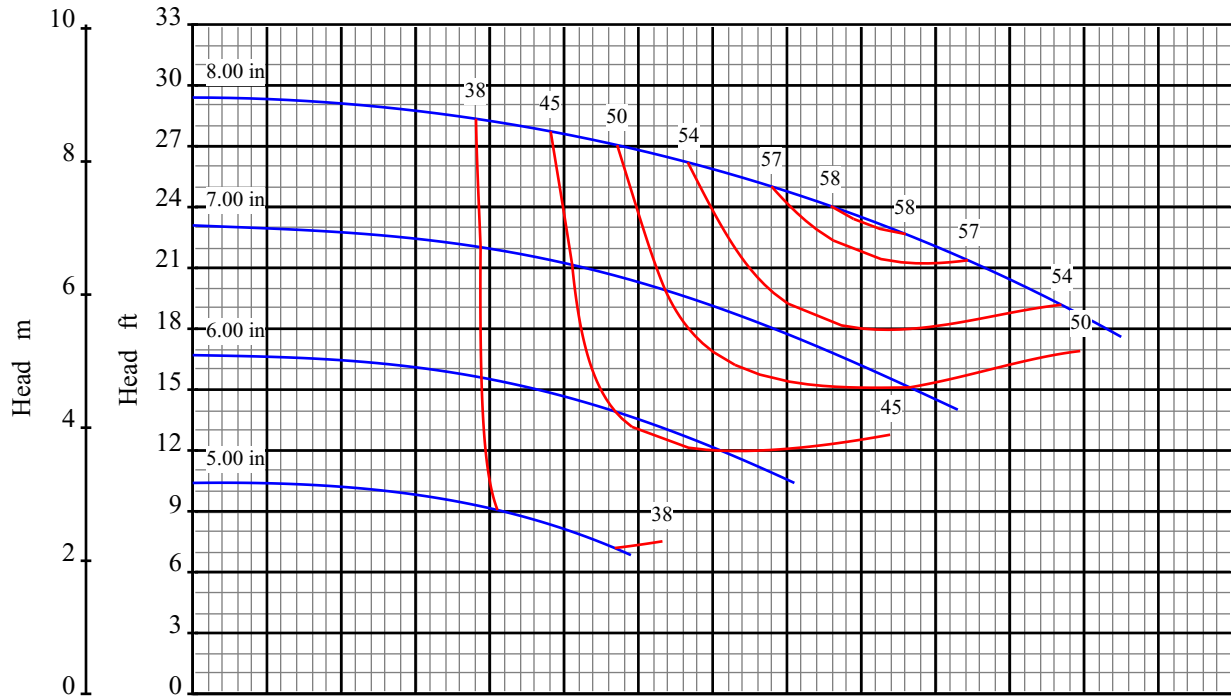
Catalog: 1301

Speed: 1750 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18122V1

## Blackmer System One

Pump Size: 1.5x3 8

Pump Performance Characteristics

Effective Date: Jan/2005

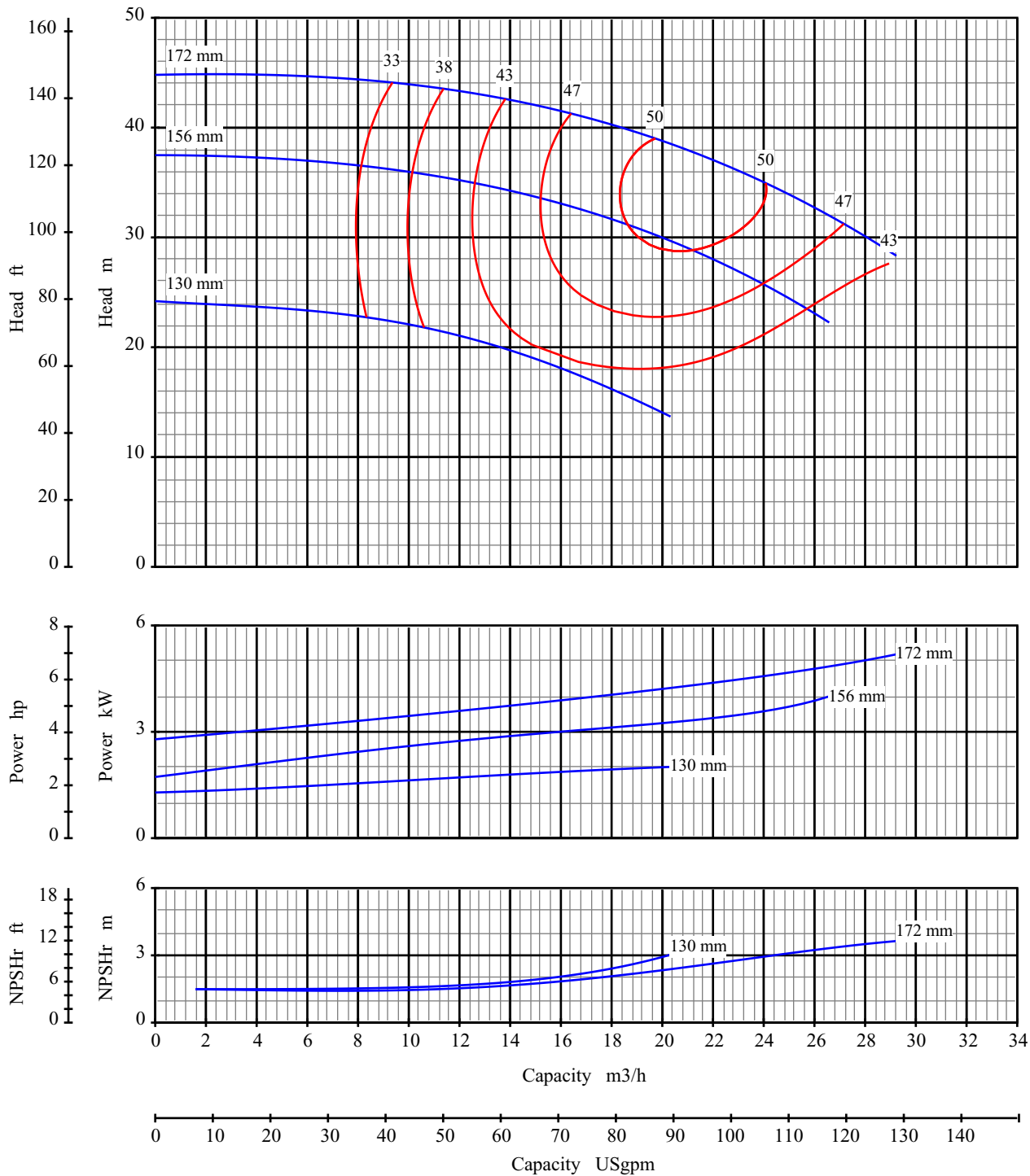
Catalog: 1301

Speed: 1150 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18125V1

## Blackmer System One

Pump Size: 32x50 160

Pump Performance Characteristics

Effective Date: Jan/2005

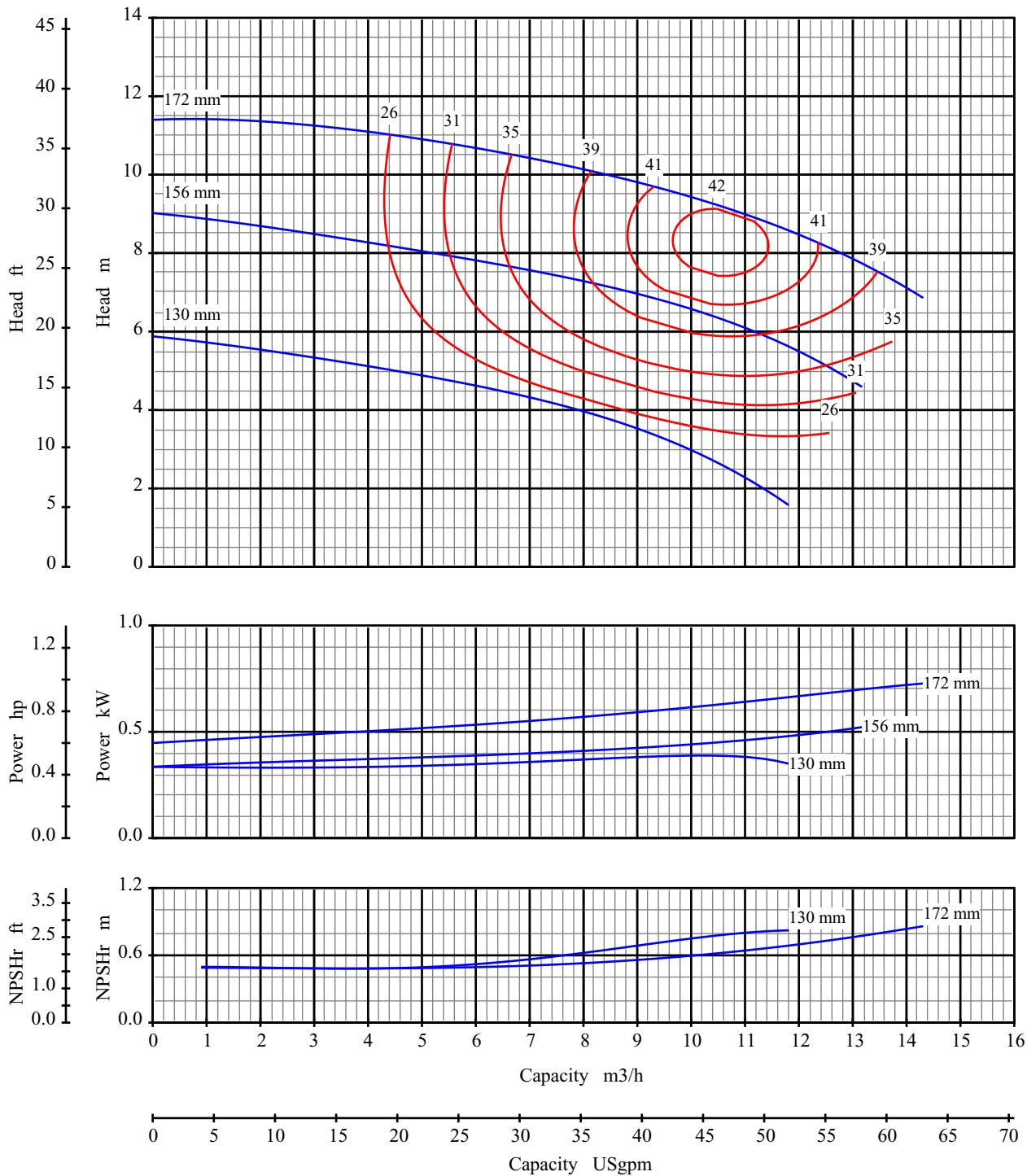
Catalog: 1301

Speed: 2900 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18127V1

## Blackmer System One

Pump Size: 32x50 160

Pump Performance Characteristics

Effective Date: Jan/2005

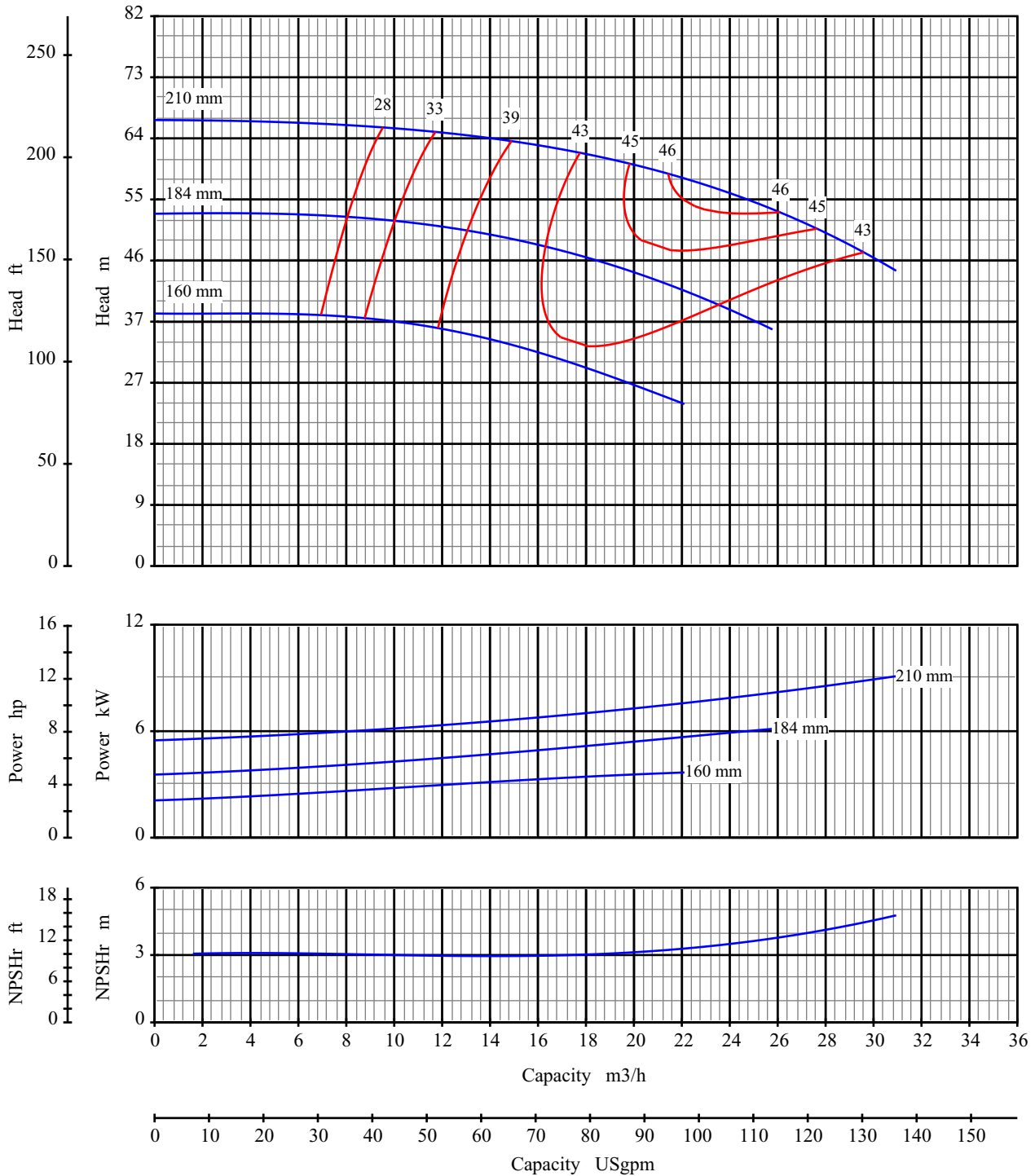
Catalog: 1301

Speed: 1450 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18131V1

## Blackmer System One

Pump Size: 32x50 200

Pump Performance Characteristics

Effective Date: Jan/2005

Catalog: 1301

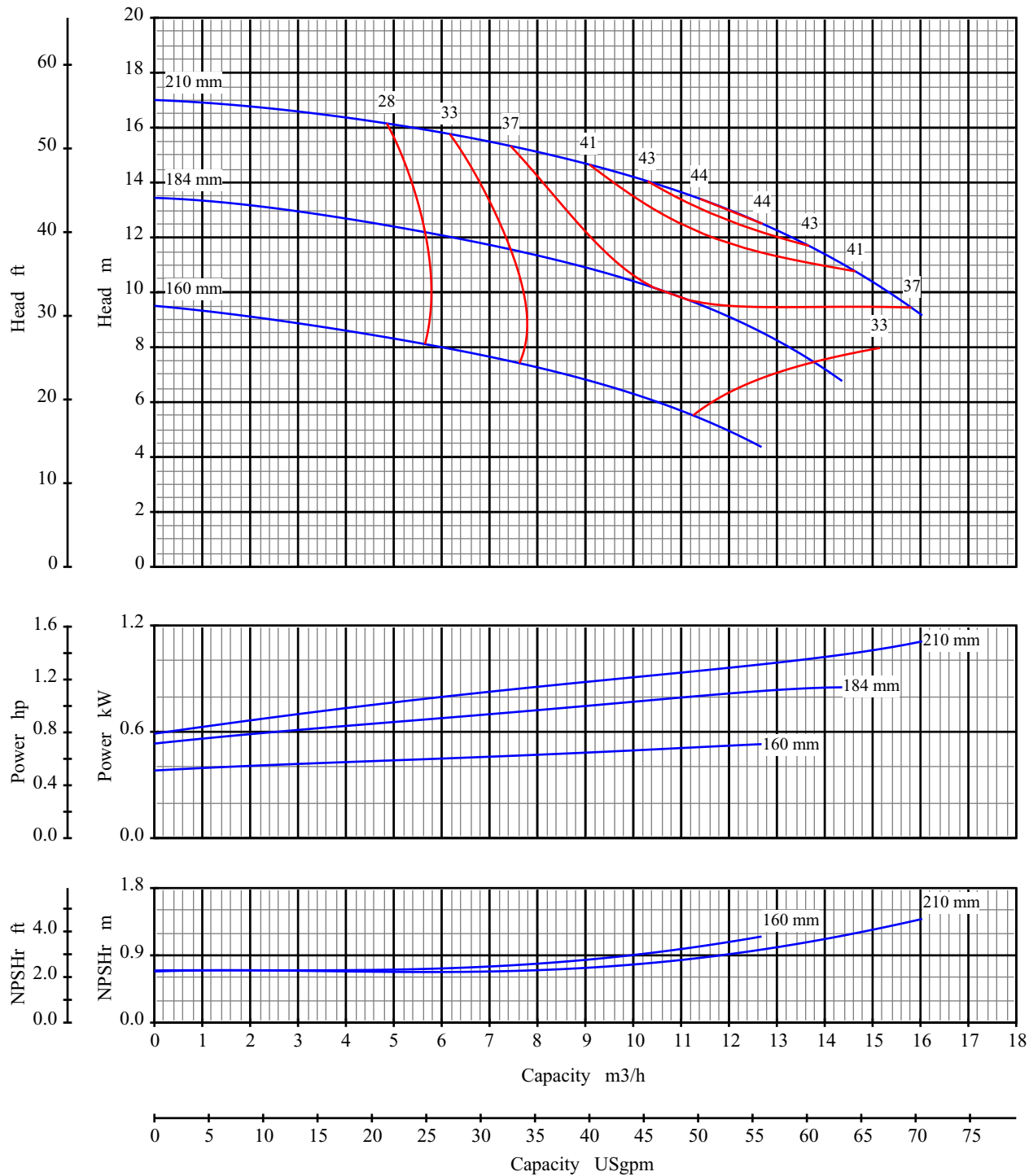
Speed: 2900 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com





Curve No: S18133V1

## Blackmer System One

Pump Size: 32x50 200

Pump Performance Characteristics

Effective Date: Jan/2005

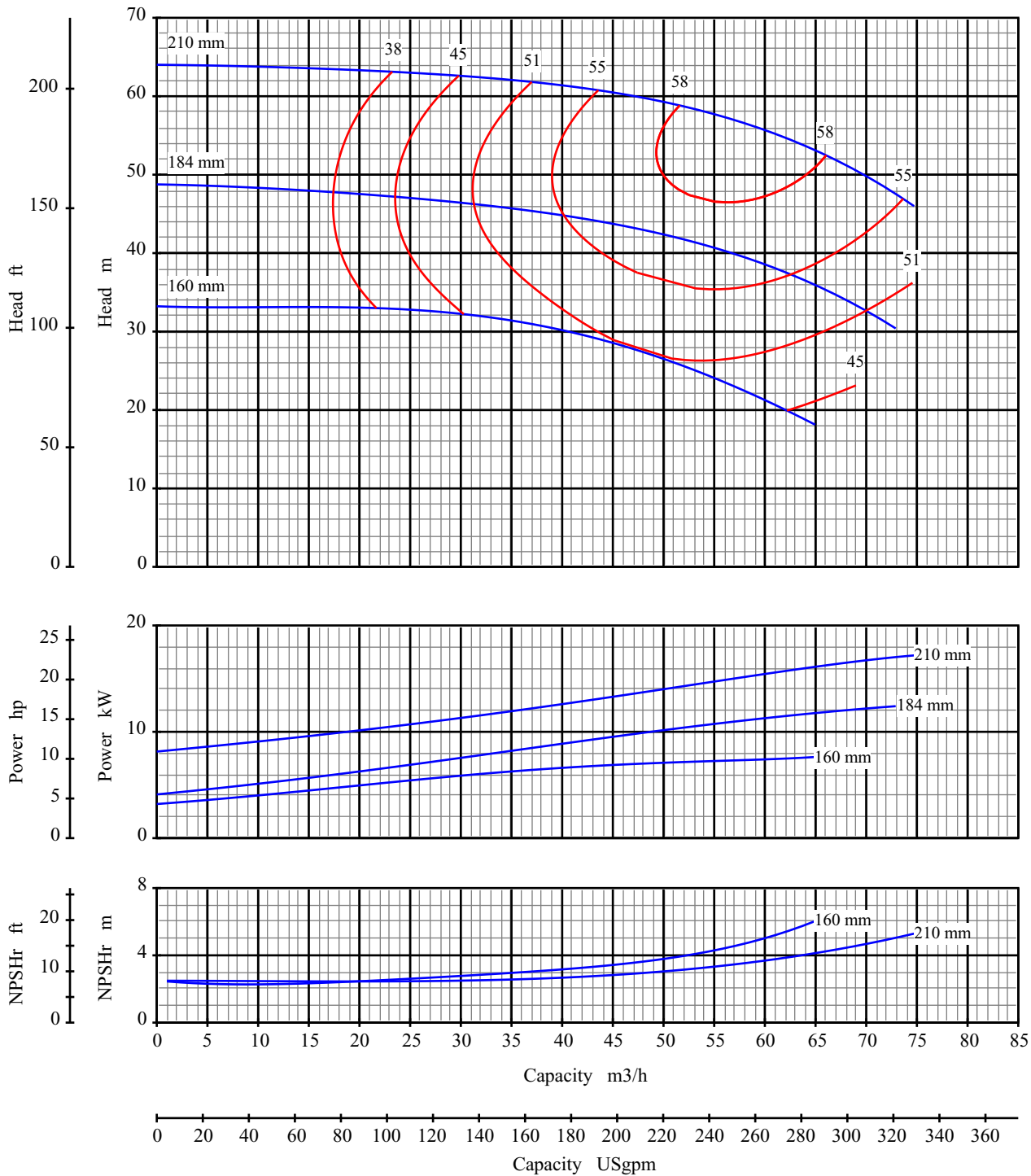
Catalog: 1301

Speed: 1450 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18137V1

## Blackmer System One

Pump Size: 50x80 200

Pump Performance Characteristics

Effective Date: Jan/2005

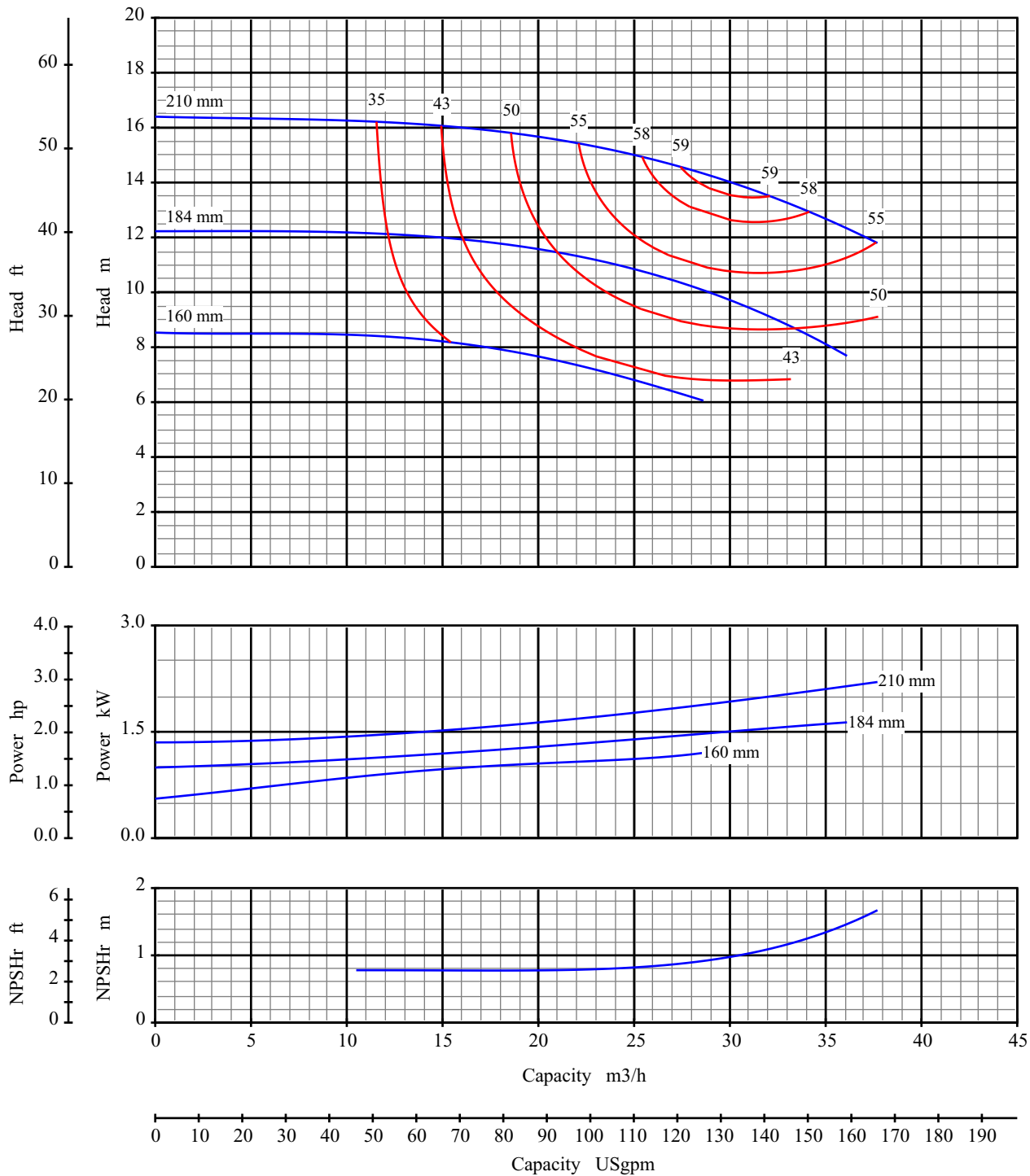
Catalog: 1301

Speed: 2900 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18139V1

## Blackmer System One

Pump Size: 50x80 200

Pump Performance Characteristics

Effective Date: Jan/2005

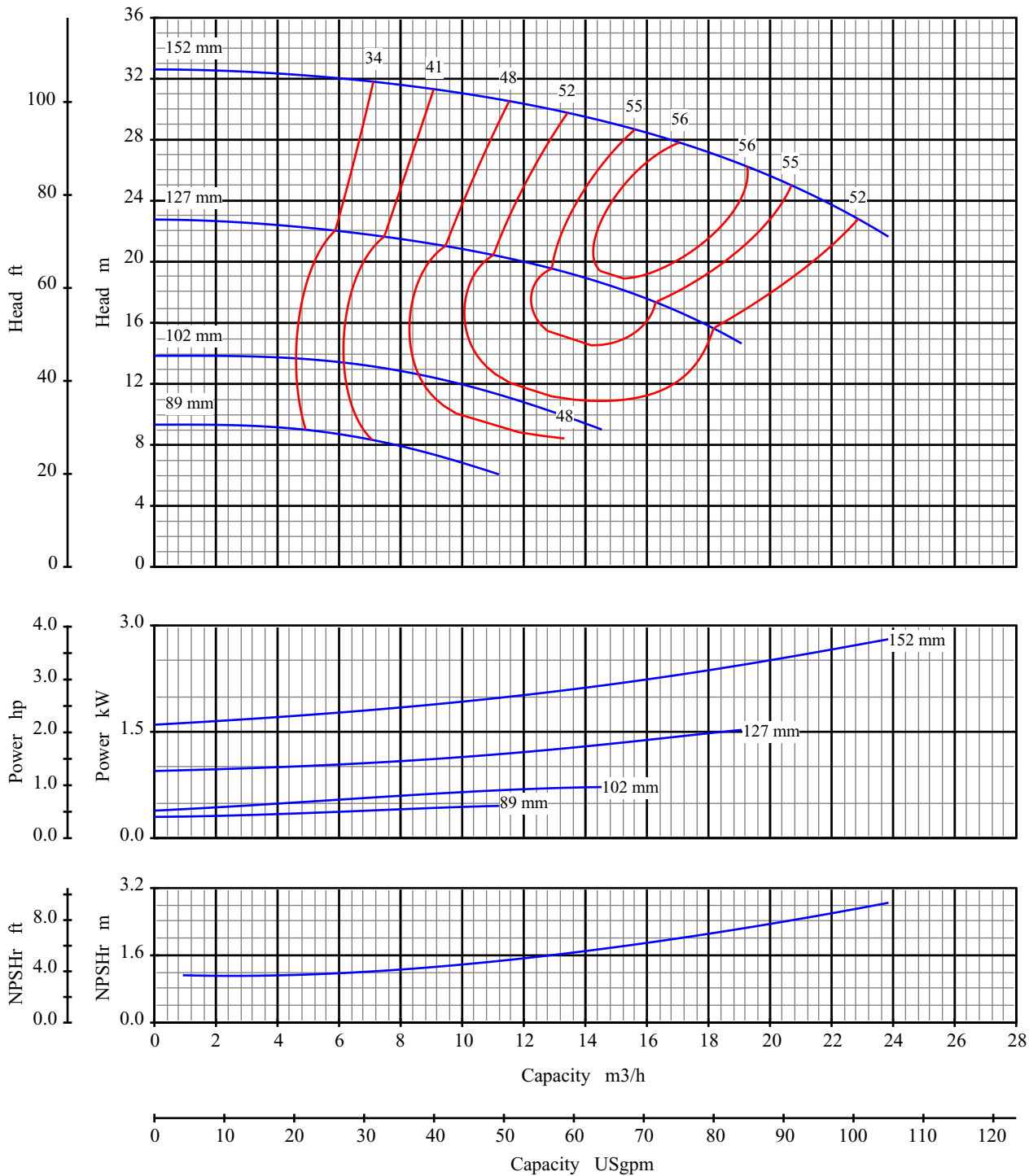
Catalog: 1301

Speed: 1450 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18101V1

## Blackmer System One

Pump Size: 1x1.5 6

Pump Performance Characteristics

Effective Date: Jan/2005

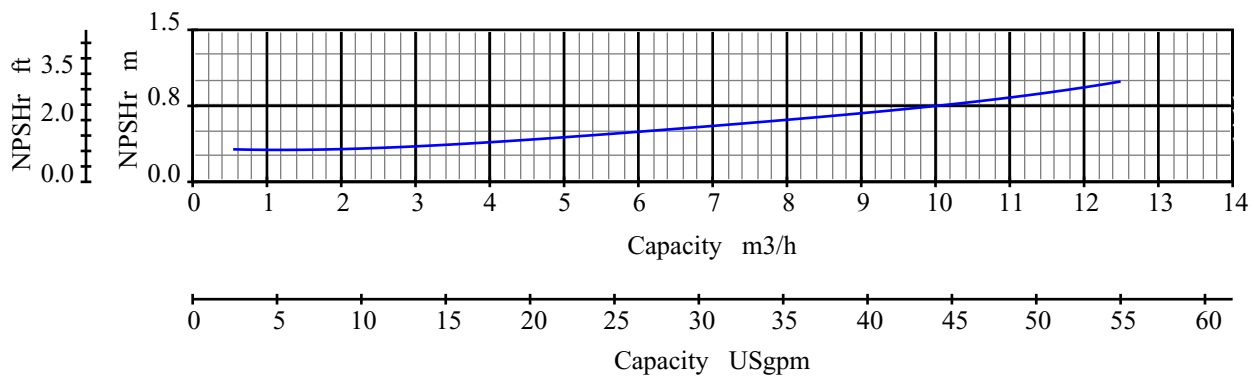
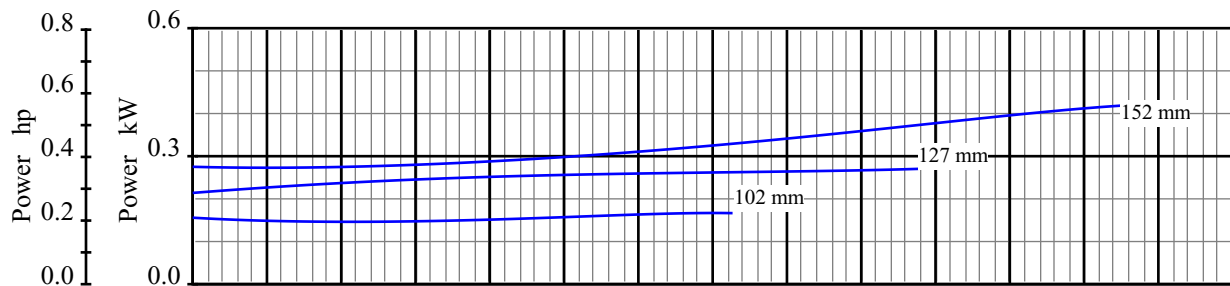
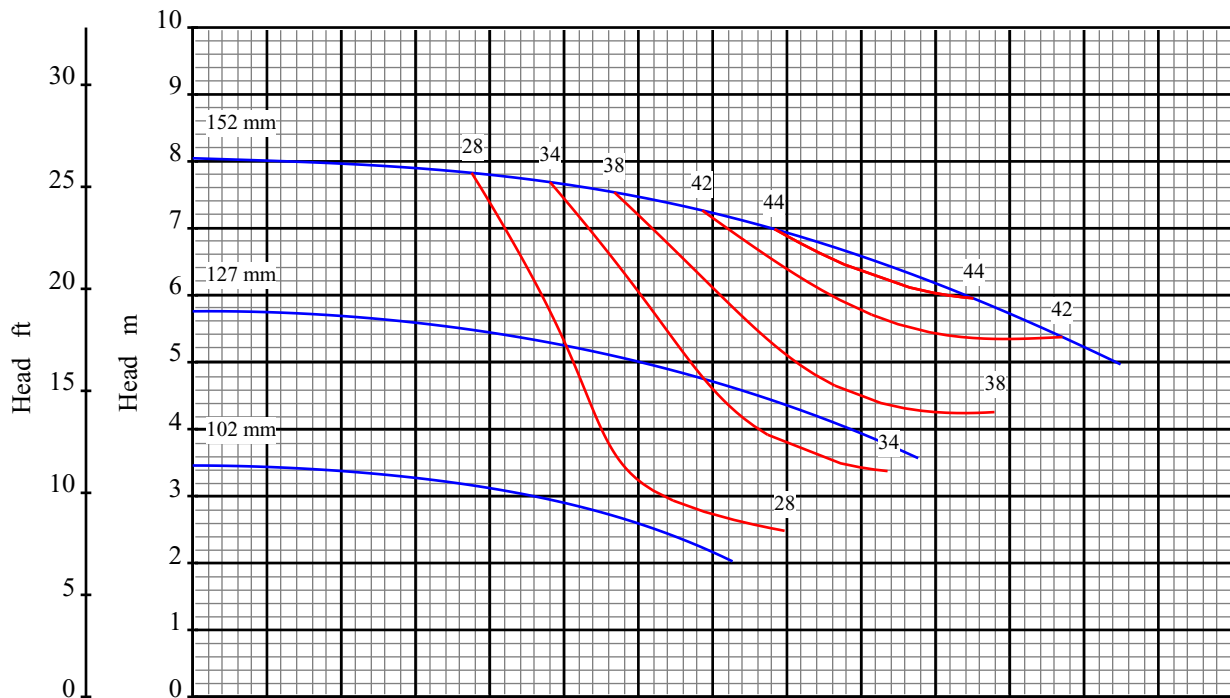
Catalog: 1301

Speed: 2900 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18103V1

## Blackmer System One

Pump Size: 1x1.5 6

Pump Performance Characteristics

Effective Date: Jan/2005

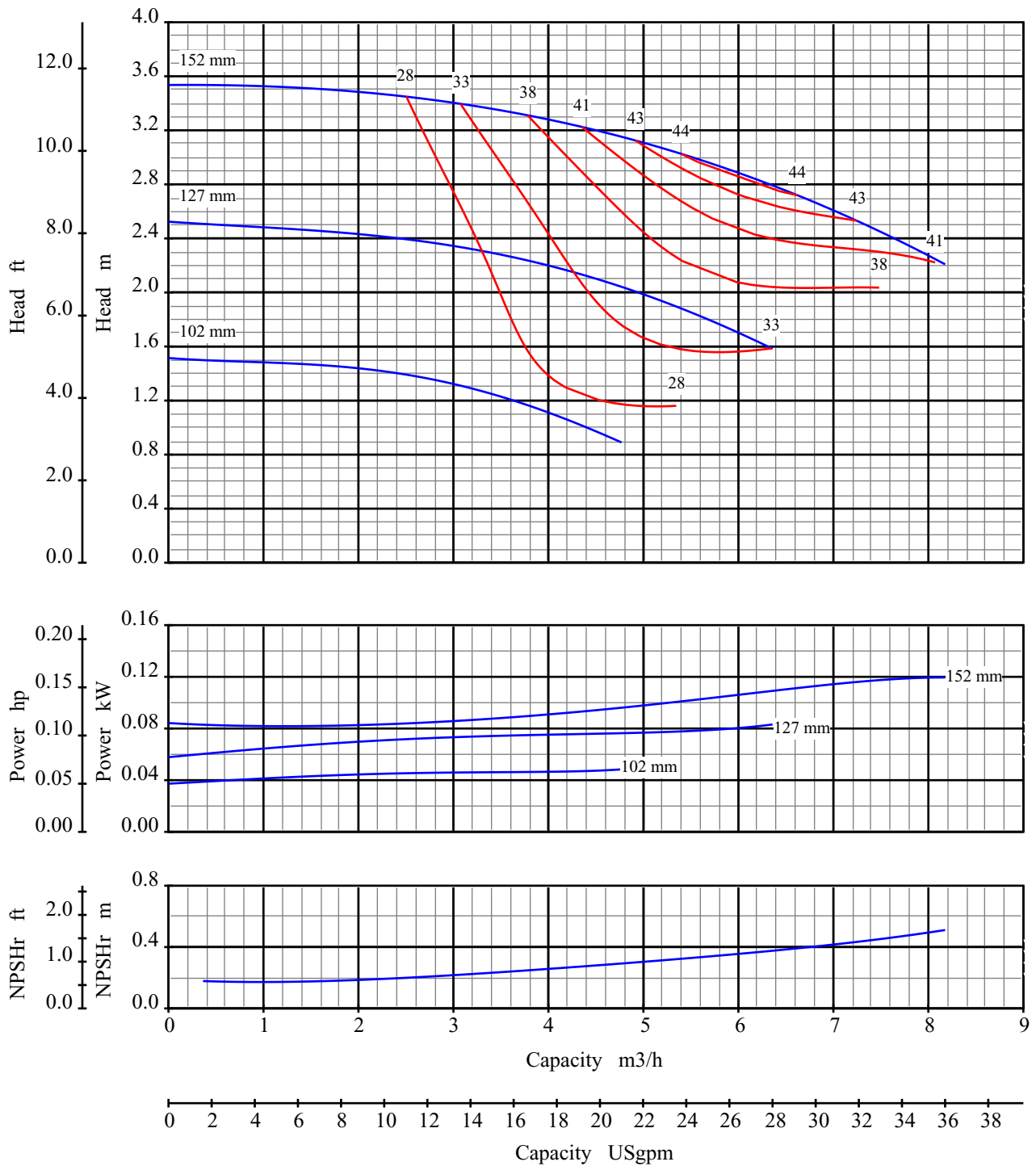
Catalog: 1301

Speed: 1450 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18105V1

## Blackmer System One

Pump Size: 1x1.5 6

Pump Performance Characteristics

Effective Date: Jan/2005

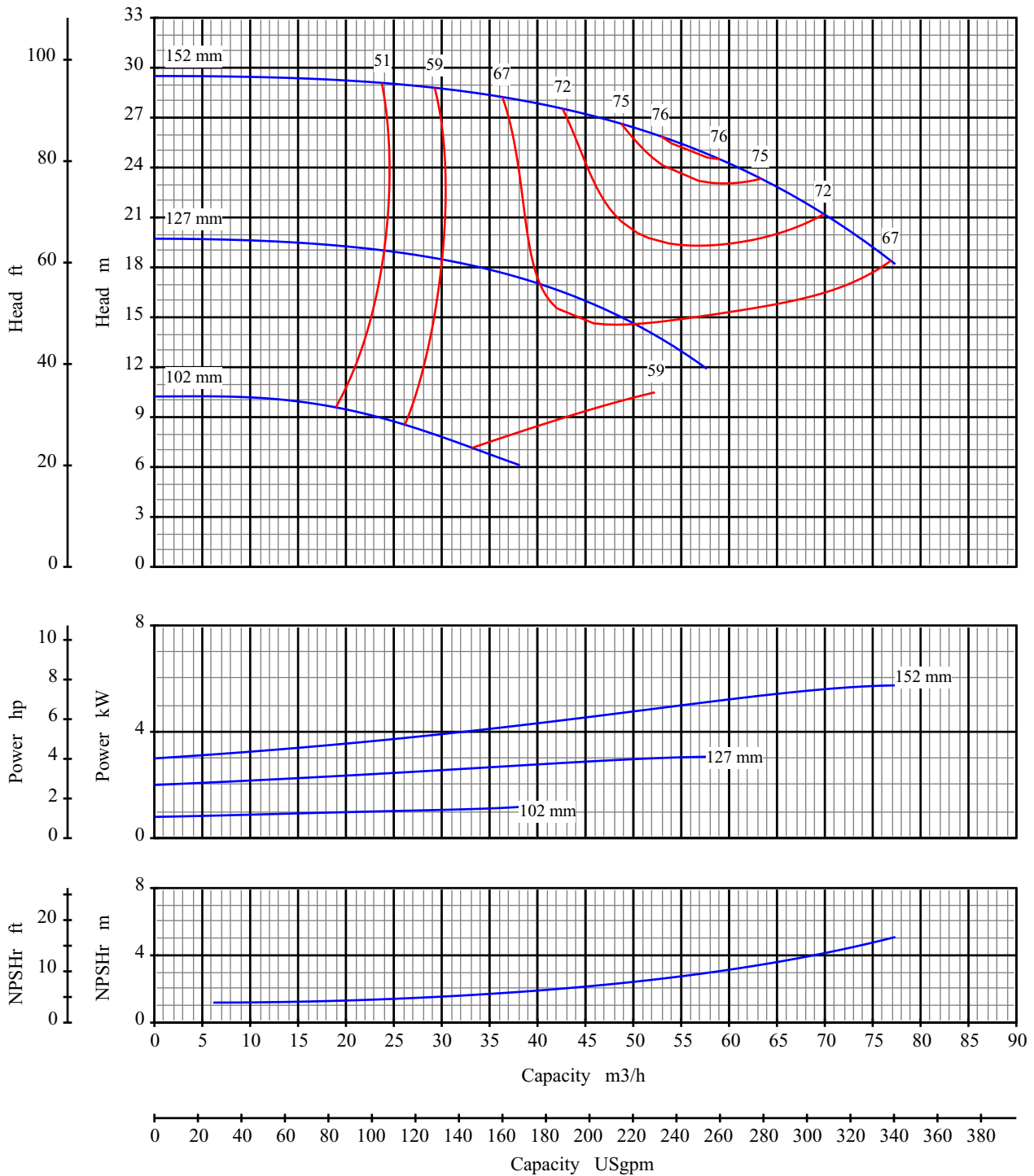
Catalog: 1301

Speed: 960 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18107V1

## Blackmer System One

Pump Size: 2x3 6

Pump Performance Characteristics

Effective Date: Jan/2005

Catalog: 1301

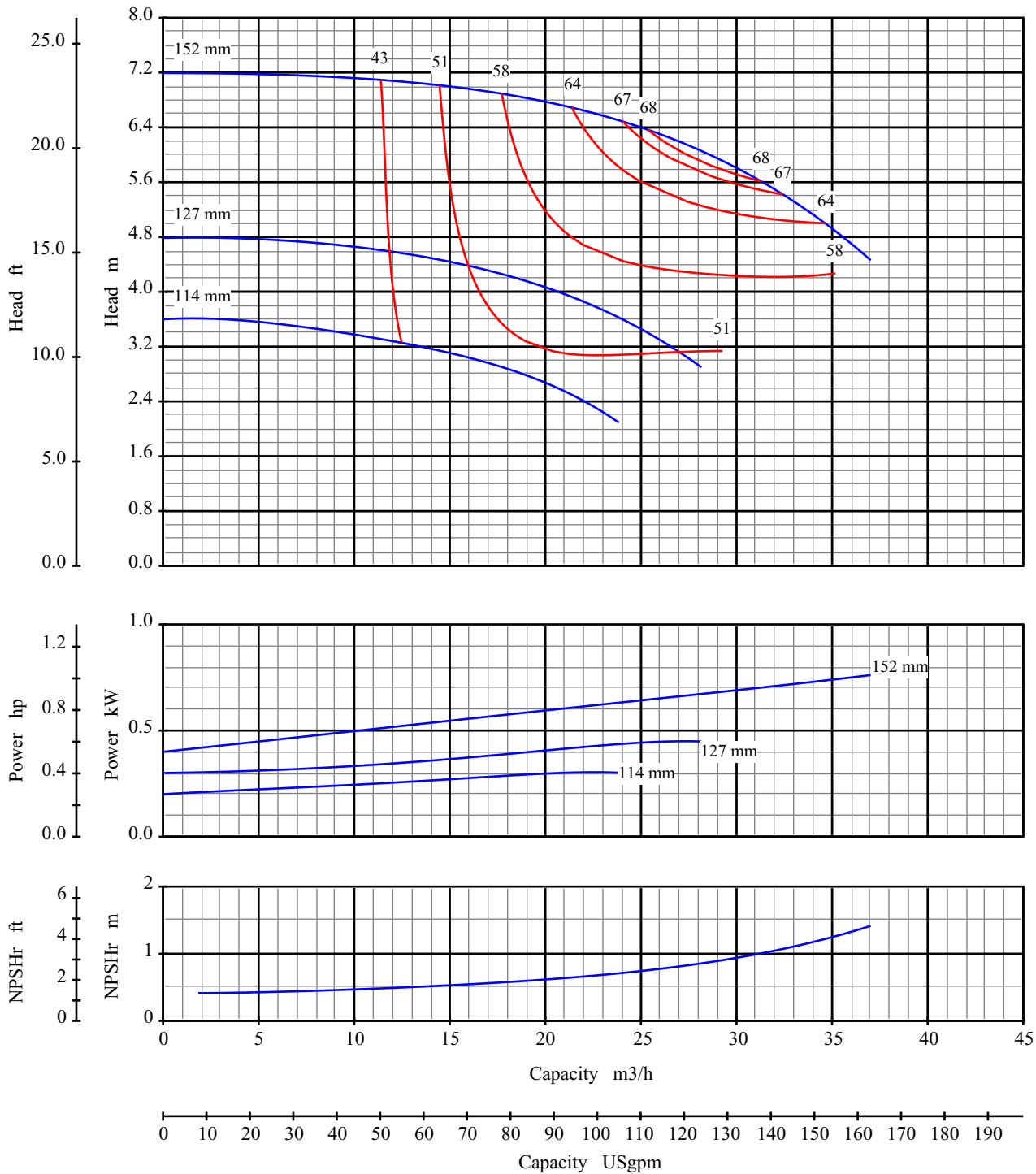
Speed: 2900 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com





Curve No: S18109V1

## Blackmer System One

Pump Size: 2x3 6

Pump Performance Characteristics

Effective Date: Jan/2005

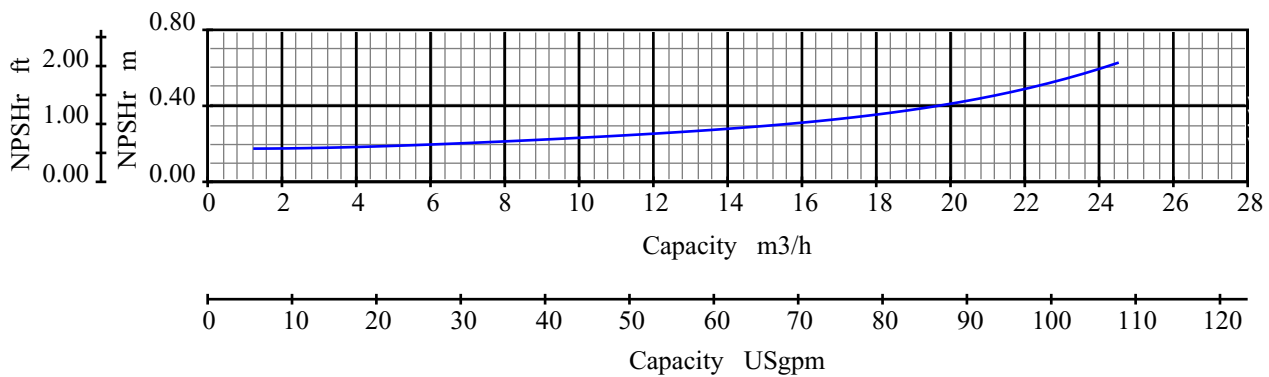
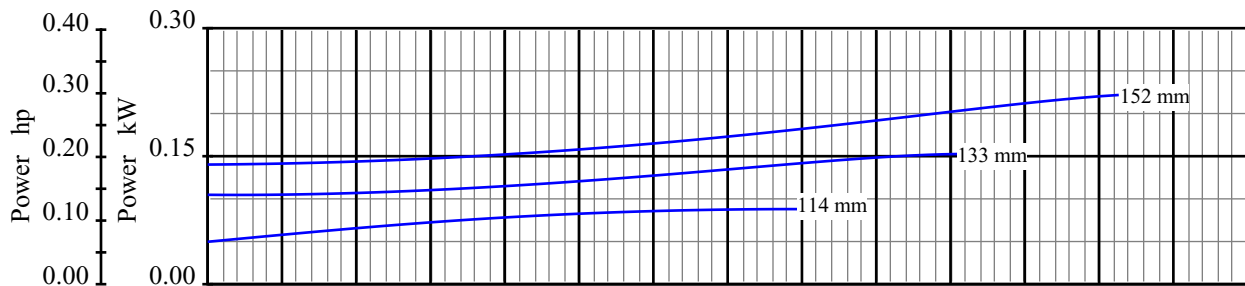
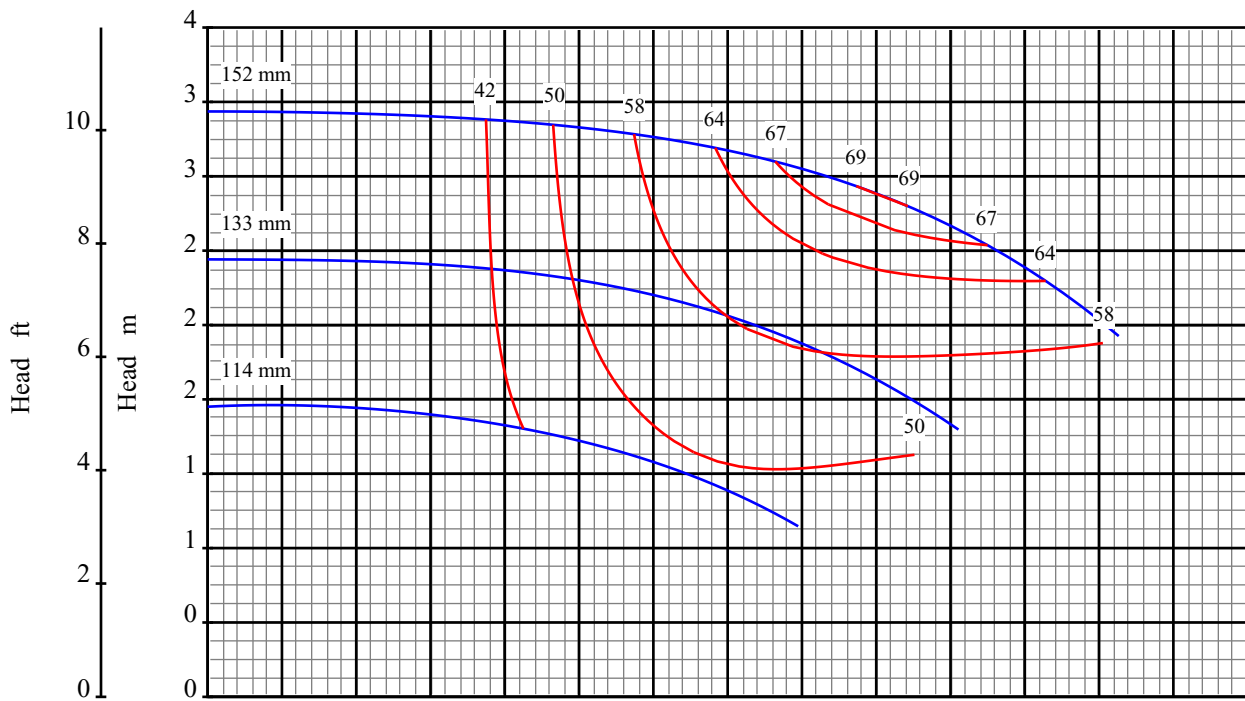
Catalog: 1301

Speed: 1450 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18111V1

## Blackmer System One

Pump Size: 2x3 6

Pump Performance Characteristics

Effective Date: Jan/2005

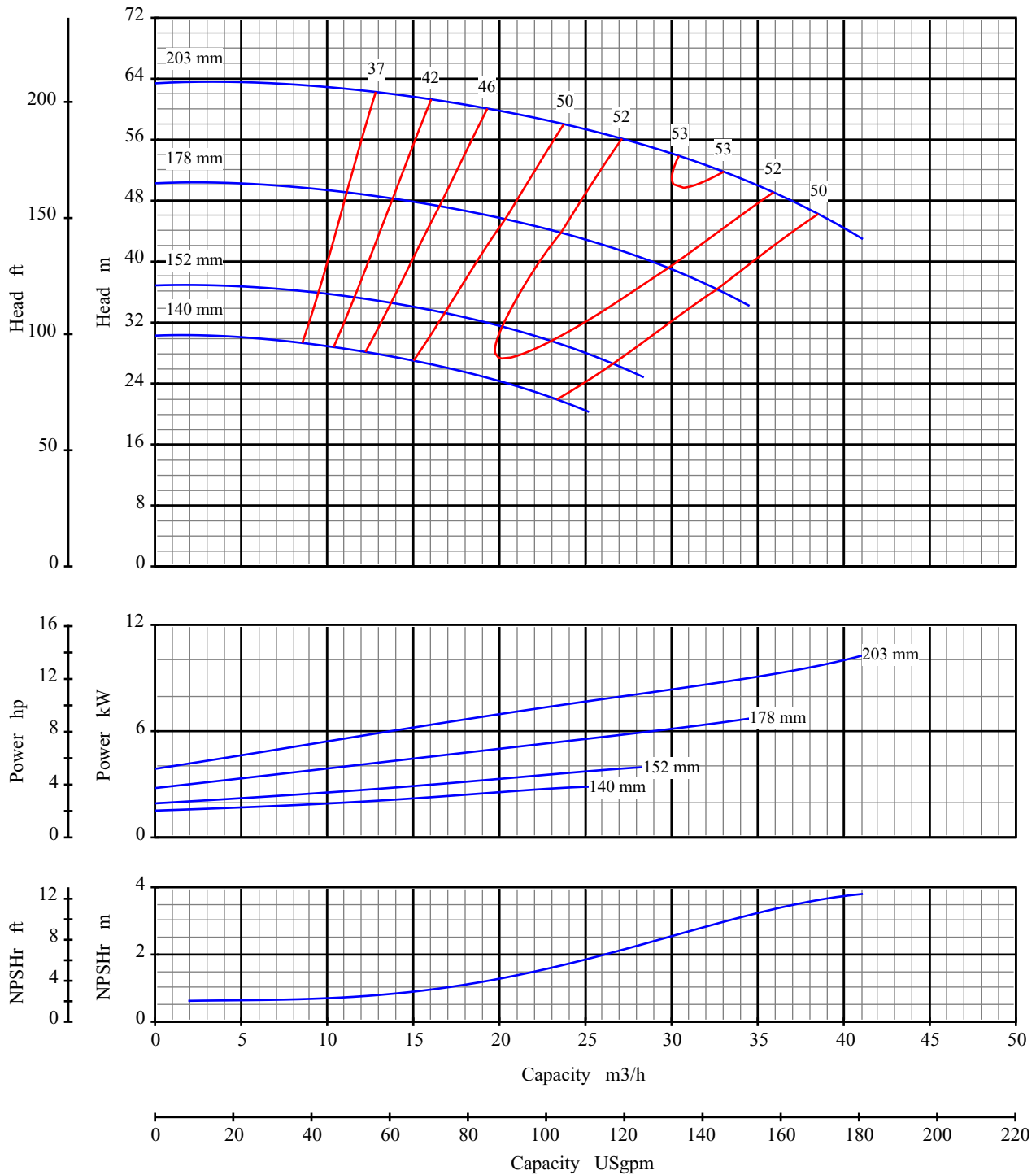
Catalog: 1301

Speed: 960 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18113V1

## Blackmer System One

Pump Size: 1x1.5 8

Pump Performance Characteristics

Effective Date: Jan/2005

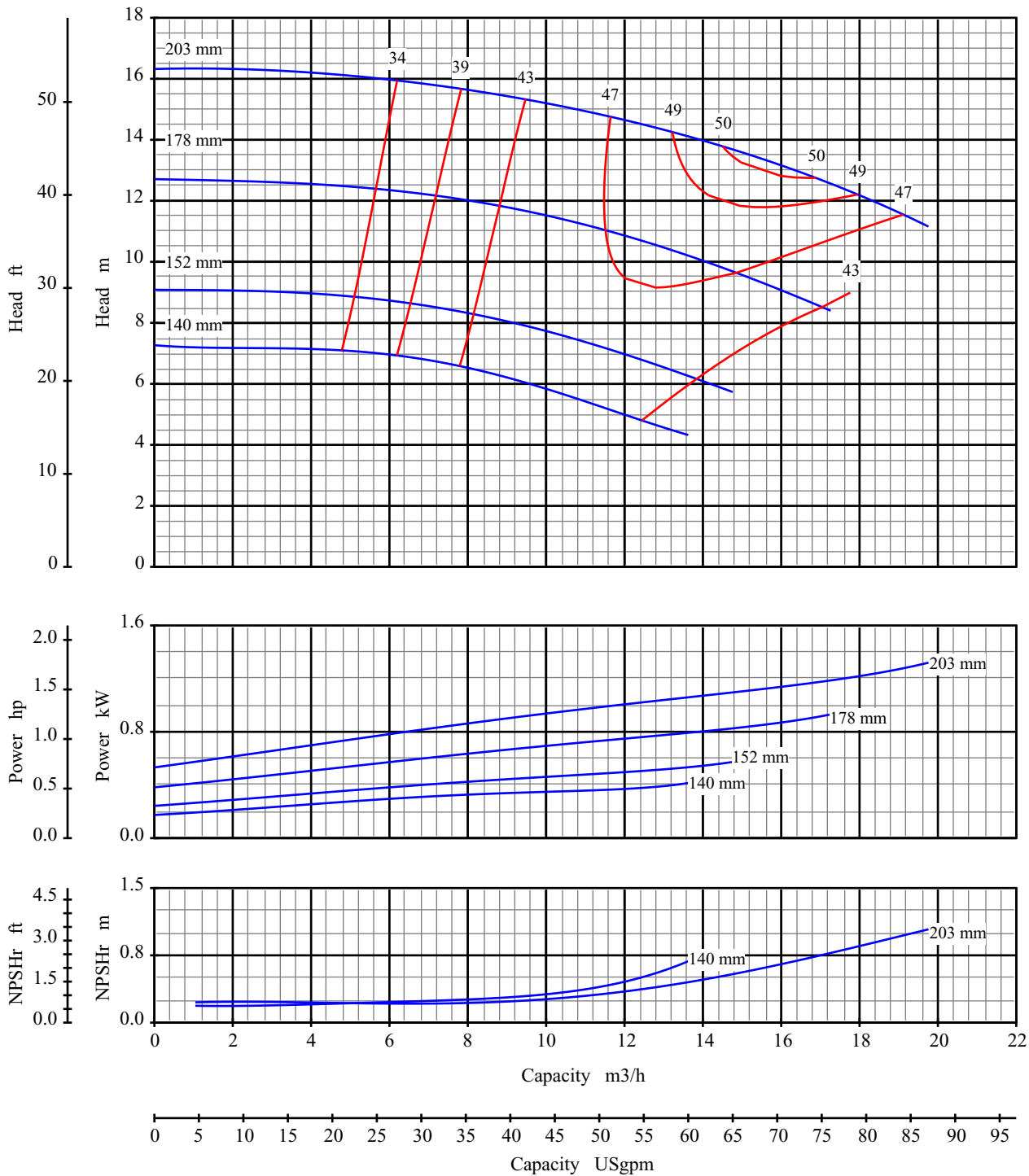
Catalog: 1301

Speed: 2900 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18115V1

## Blackmer System One

Pump Size: 1x1.5 8

Pump Performance Characteristics

Effective Date: Jan/2005

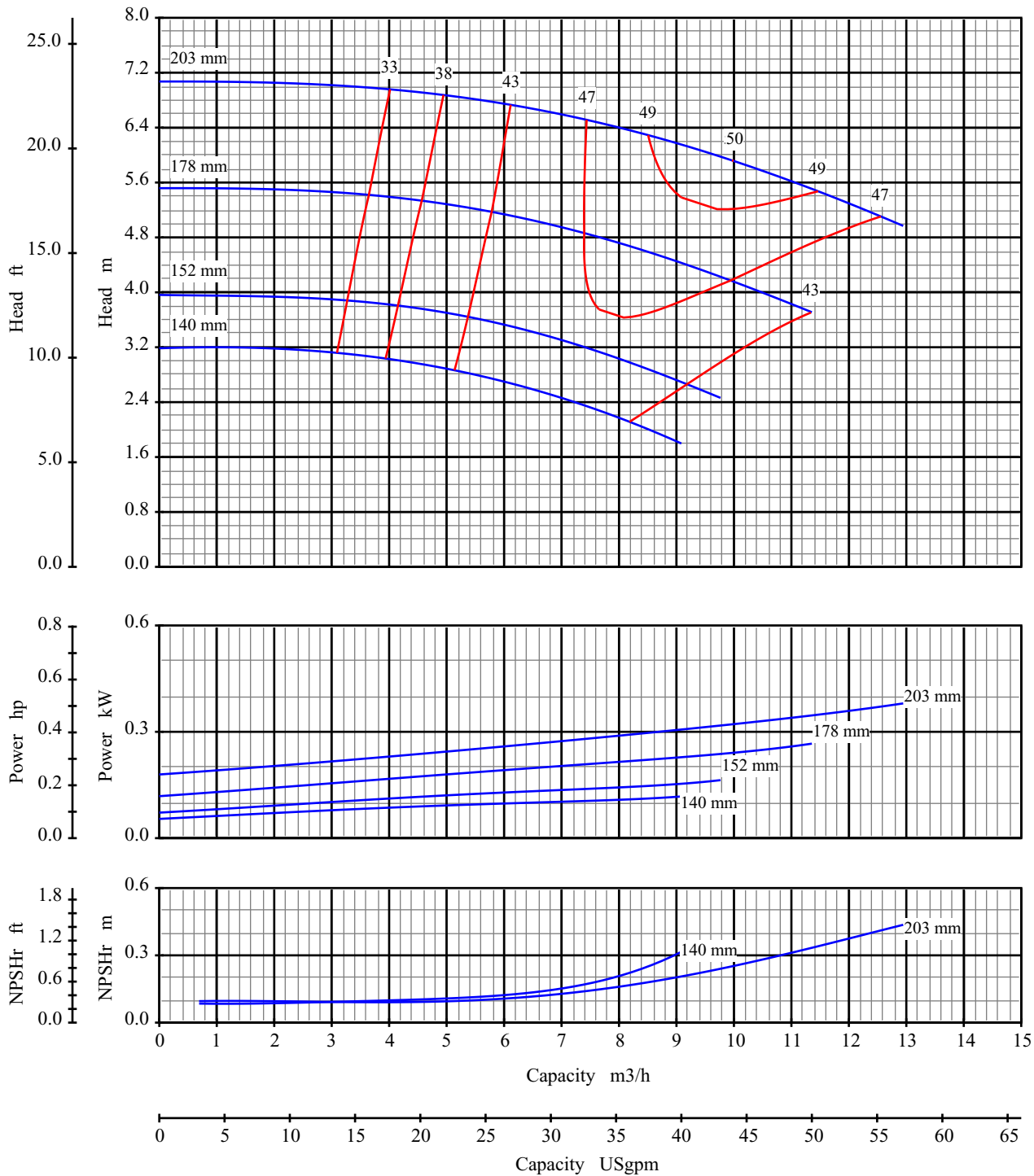
Catalog: 1301

Speed: 1450 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18117V1

## Blackmer System One

Pump Size: 1x1.5 8

Pump Performance Characteristics

Effective Date: Jan/2005

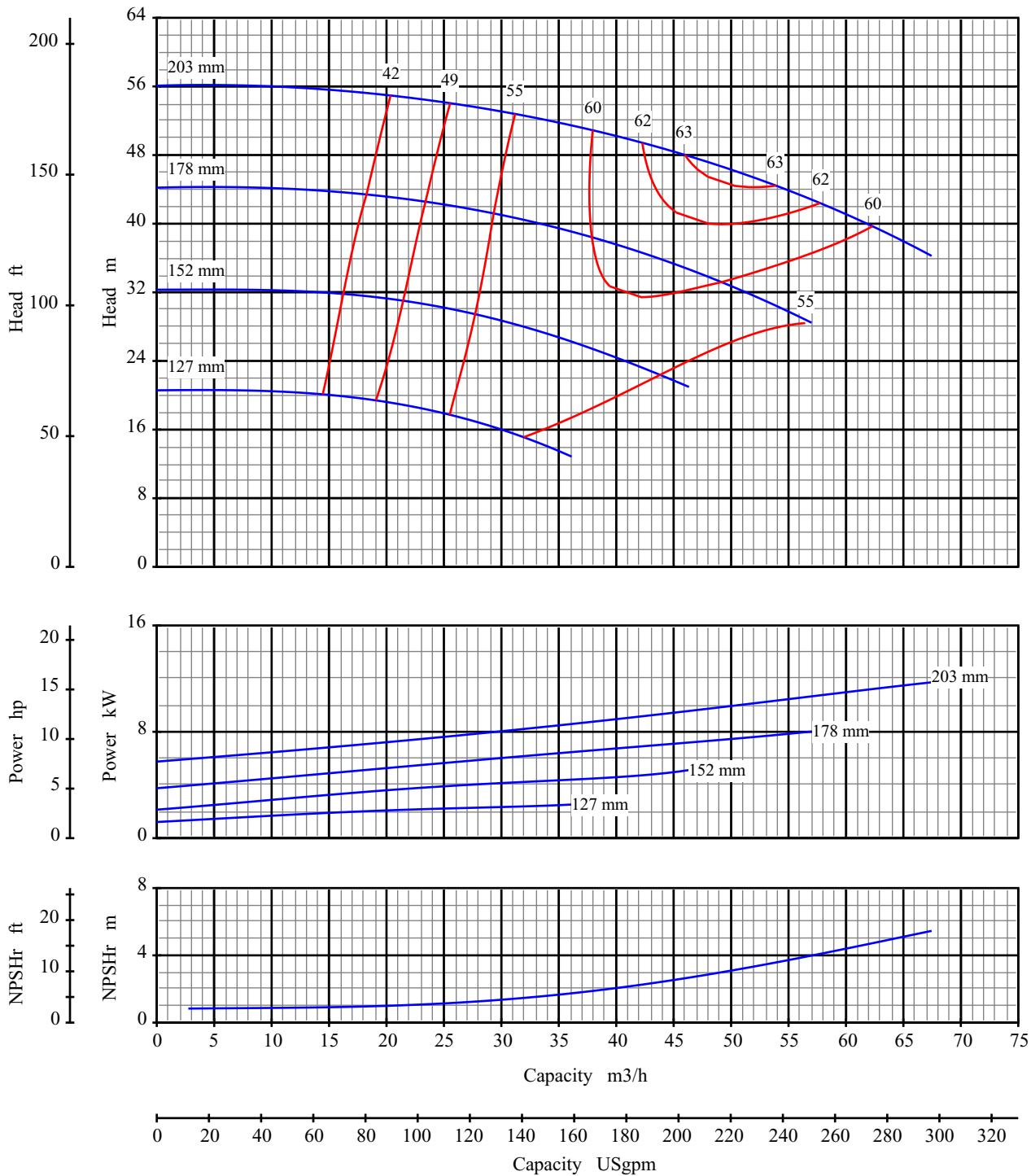
Catalog: 1301

Speed: 960 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18119V1

## Blackmer System One

Pump Size: 1.5x3 8

Pump Performance Characteristics

Effective Date: Jan/2005

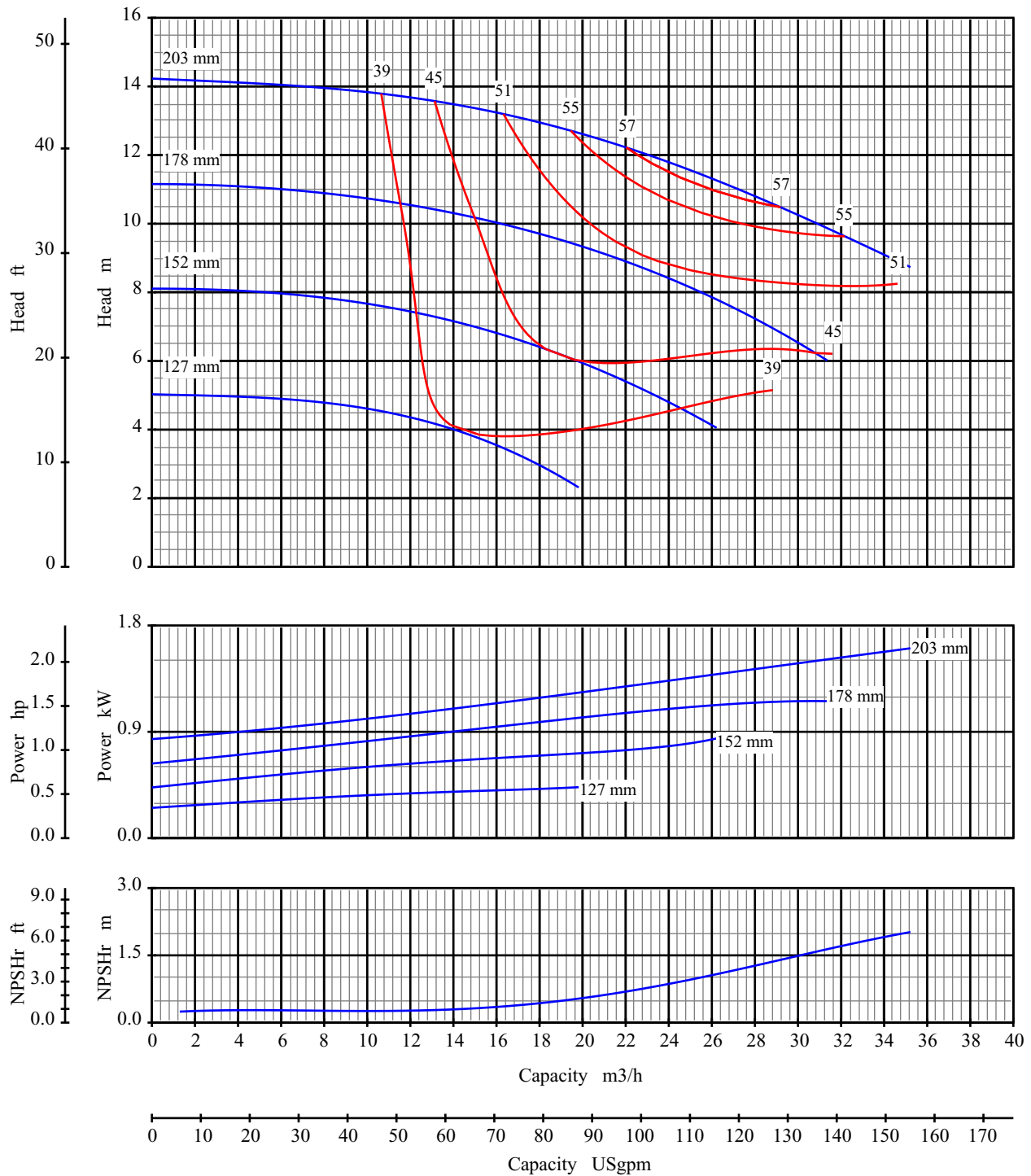
Catalog: 1301

Speed: 2900 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com



Curve No: S18121V1

## Blackmer System One

Pump Size: 1.5x3 8

Pump Performance Characteristics

Effective Date: Jan/2005

Catalog: 1301

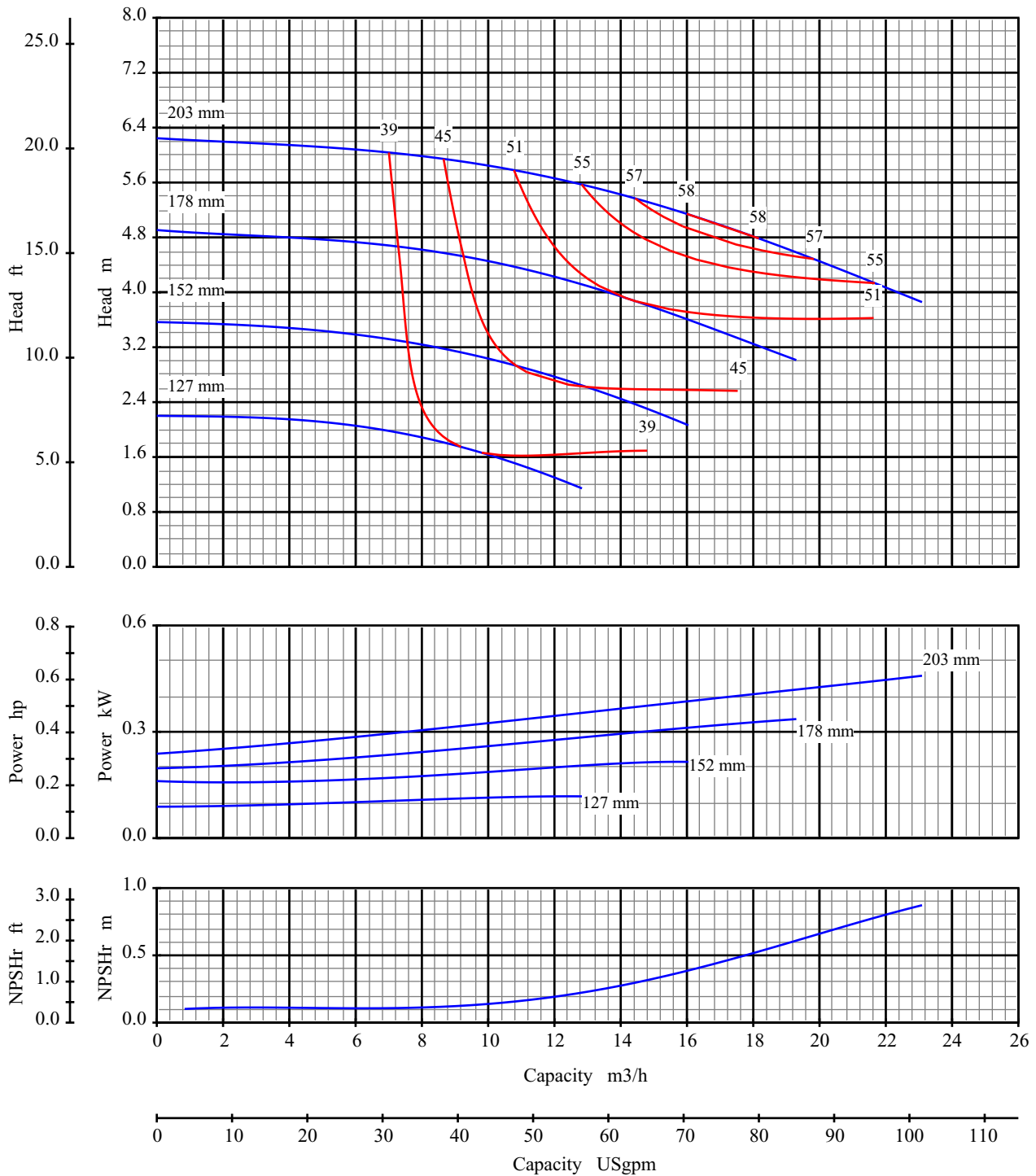
Speed: 1450 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com





Curve No: S18123V1

## Blackmer System One

Pump Size: 1.5x3 8

Pump Performance Characteristics

Effective Date: Jan/2005

Catalog: 1301

Speed: 960 rpm

Open Impeller

Blackmer 1809 Century Avenue SW Grand Rapids, MI 49503 1530 USA

telephone: 616 241 1611 f ax: 616 241 3752 www .blackmer.com