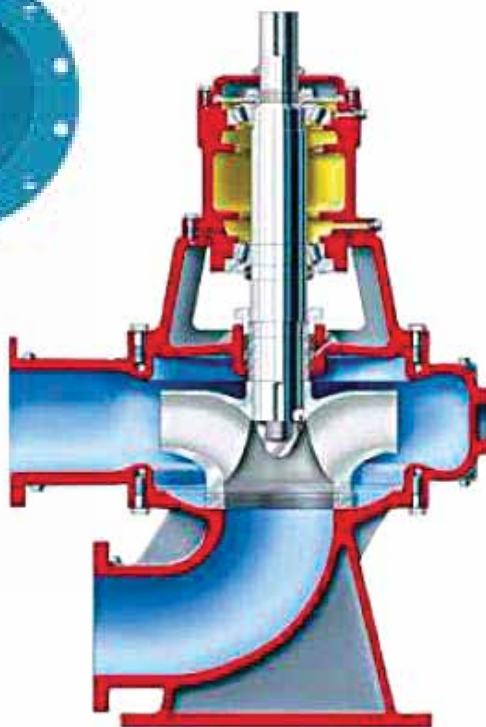
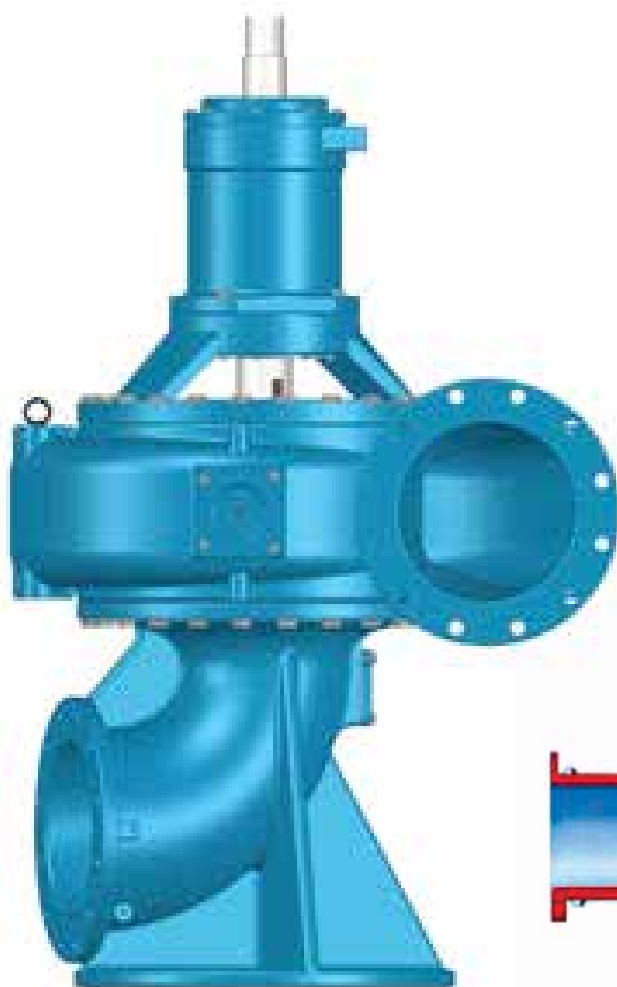




# MN series

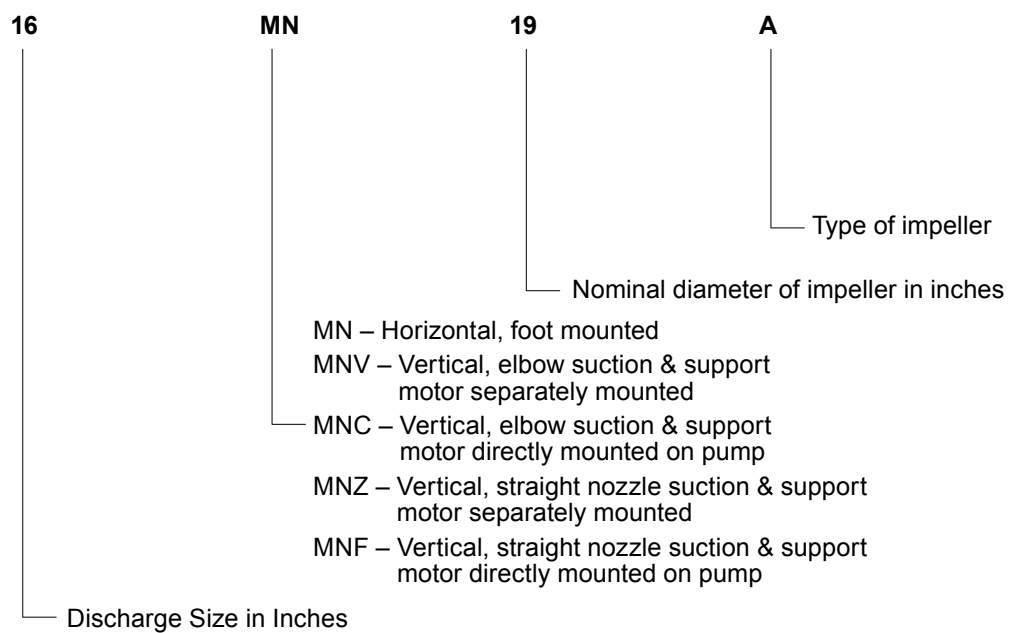
Mixed Flow  
Solid-Handling Pumps





## Heads to 68 metres (225 feet)

## Nomenclature



## MN series overview

### A rugged and efficient design for demanding sewage handling service

MN is a mixed flow, centrifugal pump with enclosed non clog impellers, specifically engineered for reliable low cost, long life in the demanding service of sewage handling.

#### Flexibility

The MN is available in both horizontal and vertical (yet to be developed) models with a variety of mounting arrangements and nozzle positions to suit most piping configurations and pumping station designs without the need of special or costly modifications. The motor can be mounted directly or independently as required.

#### Reliability

The MN design is a result of years of engineering experience and vast manufacturing capabilities. Shaft deflection is minimized with an oversized shaft and reduced overhand, virtually eliminating shaft failures and increasing packing life. The shaft is supported by our conservative bearing design arranged to eliminate all radial and axial play and to provide a minimum **B-10 life of 100,000 hours**.

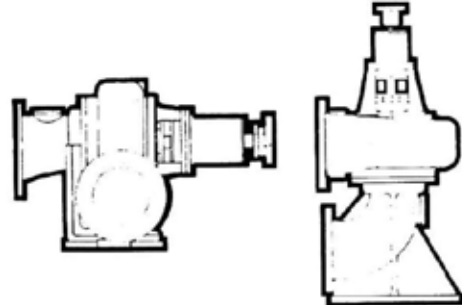
Replaceable hardened chrome steel wearing rings are furnished on the impeller and suction head as standard equipment to extend the life of the pump. The shaft is protected from wear by a hardened chrome steel shaft sleeve also furnished as standard equipment.

All supports are designed to minimize vibration and assure rigidity.

These are just a few of the features incorporated into MN design to provide you with the most reliable pump available.

#### Efficiency

Greatest efficiency and maximum solids handling capabilities are built into every MN pump to provide a wide range of efficient operation and reduce power consumption. Adjustable wearing ring clearance assures continued high efficiency even after years of service.



#### Ease of Maintenance

Large openings in the bearing bracket permit easy access to the stuffing box. The removable gland facilitates packing adjustment and/or replacement. The stuffing box is arranged for either grease or water seal. A wide variety of mechanical seals can be accommodated. If dismantling is required the entire rotating assembly can be removed without disturbing the casing or suction and discharge piping.

The bearing housings are provided with readily accessible lubrication points.

#### Non-clogging

The MN impeller is a mixed-flow, enclosed sewage type capable of passing large solids and stringy material. The contoured impeller nut, locked to prevent loosening, is designed to match the contour of the back shroud of the impeller to eliminate projections which might catch strings or trap solids and impede flow. Large hand holes with contoured covers in both the casing and the suction head provide ready access to the impeller.

#### Typical Applications

In addition to the wide usage in wastewater treatment plants for raw sewage, return and waste sludge, effluent and many others, the following is only a sample of the areas of application for this versatile pump:

Stormwater	Slurries
Irrigation	Condenser circulation
Drainage	Paper mill chips
General industrial use	Fitter backwash



For 50 cycle speed multiply capacity by 0.83  
Multiply head by 0.69



Pump Size	10MN-12	12MN-14	12MN-19	12MN-24	14MN-16	14MN-24	16MN-19	15MN-25	16MN-33	20MN-24	20MN-30	20MN-39	24MN-28	24MN-33	24MN-47	30MN-33	30MN-43
Max solid size	4	4 3/8	4 1/2	4 1/2	5 1/4	3 3/4	6	4 1/2	6	6	5	7 1/4	7	6	9	7	8
Number impeller vanes	2	2	2	3	2	3	2	3	3	3	3	3	3	3	3	3	3
Max impeller diameter	12	14	18 3/8	23 3/8	16	23 1/2	18 1/4	24 1/2	32 1/2	23 1/2	39 5/8	39 3/8	27 1/2	32 1/2	47 1/4	32 1/2	39 3/8
Stuffing box:																	
Inside diameter	4 5/8	5 1/2	5 1/2	6 1/4	5 1/2	5 1/2	6 1/4	6 1/4	8 9/16	6 1/4	6 1/4	8 9/16	6 1/4	8 9/16	9 1/4	7 3/8	8 9/16
depth	3 1/4	3 1/4	3 3/4	4 5/8	3 3/4	3 3/4	4 5/8	5 5/8	5 5/8	4 5/8	4 5/8	5 5/8	4 5/8	5 5/8	5 5/8	5 5/8	5 5/8
number of rings	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
size of packing	1/2	1/2	1/2	5/8	1/2	1/2	5/8	5/8	1/2	5/8	5/8	1/2	5/8	1/2	1/2	1/2	1/2
Casing thickness	5/8	5/8	1/2	1/2	7/8	1	1/2	1	7/8	1/2	1/2	1	7/8	1	1 1/4	1	1 1/8
Max discharge pressure, psi	35	35	70	160	35	70	35	70	160	35	70	160	35	70	160	50	70
Max suction pressure, psi	15	15	25	25	15	25	15	25	25	15	25	25	15	25	25	15	25
Hydro test pressure, psi	50	50	95	200	50	95	50	95	200	50	95	200	50	95	200	65	95

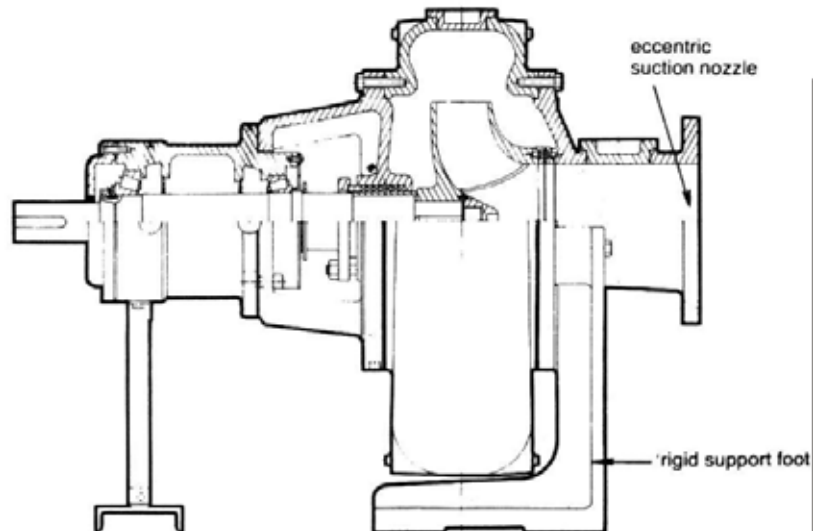
* Ribbed casing			
	Part	Material	
<b>fittings of standard pumps</b>	Casing	cast iron	Part
	Impeller	cast iron	shaft sleeve
	Impeller wearing ring	chrome steel	line bearing
	Suction-head wearing ring	chrome steel	thrust bearing
	Gland	bronze	stuffing-box head
	Shaft	alloy steel	bearing frame
			suction head or elbow
			Material
			chrome steel
			tapered roller <sup>^</sup>
			tapered roller <sup>^</sup>
			cast iron
			cast iron
			cast iron

Note: Optional materials available upon request.

For connecting vertical pumps to their drivers. Universal joint drive shafts are generally recommended. For torque requirements exceeding the limits of this type, solid shafting with piloted couplings is usually used.

## Typical sections

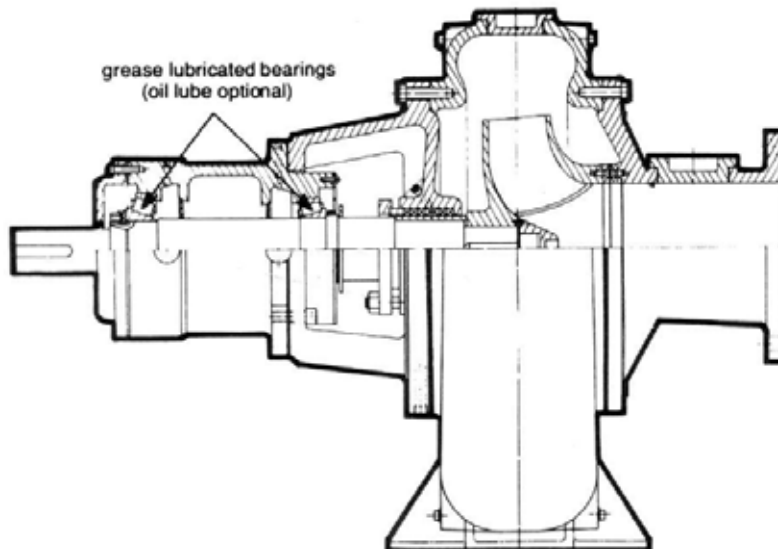
### Model MN



All pump sections on this page are typical of sizes:

10MN-12  
12MN-14  
12MN-19  
12MN-24  
14MN-16  
14MN-24  
16MN-19  
16MN-25  
16MN-33  
20MN-24  
20MN-30  
24MN-28

### Model MN

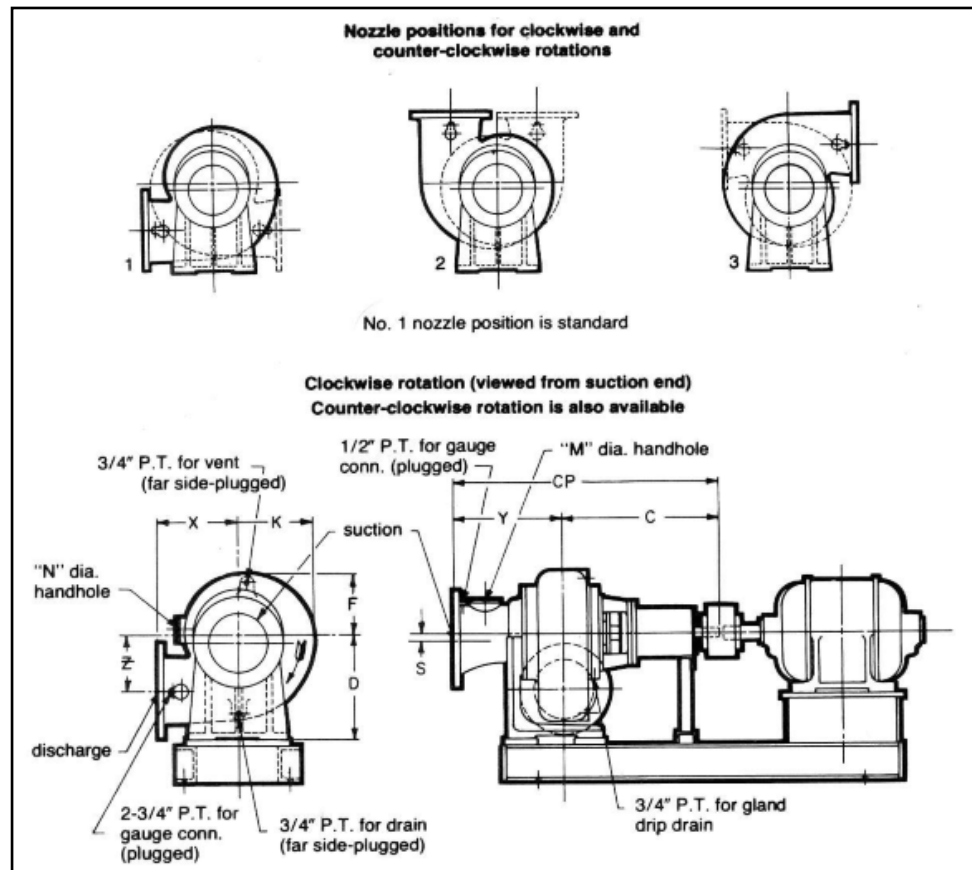


All pump sections on this page are typical of sizes:

20MN-39  
24MN-33  
24MN-47  
30MN-33  
30MN-43

## Dimensions

### Model MN – Horizontal



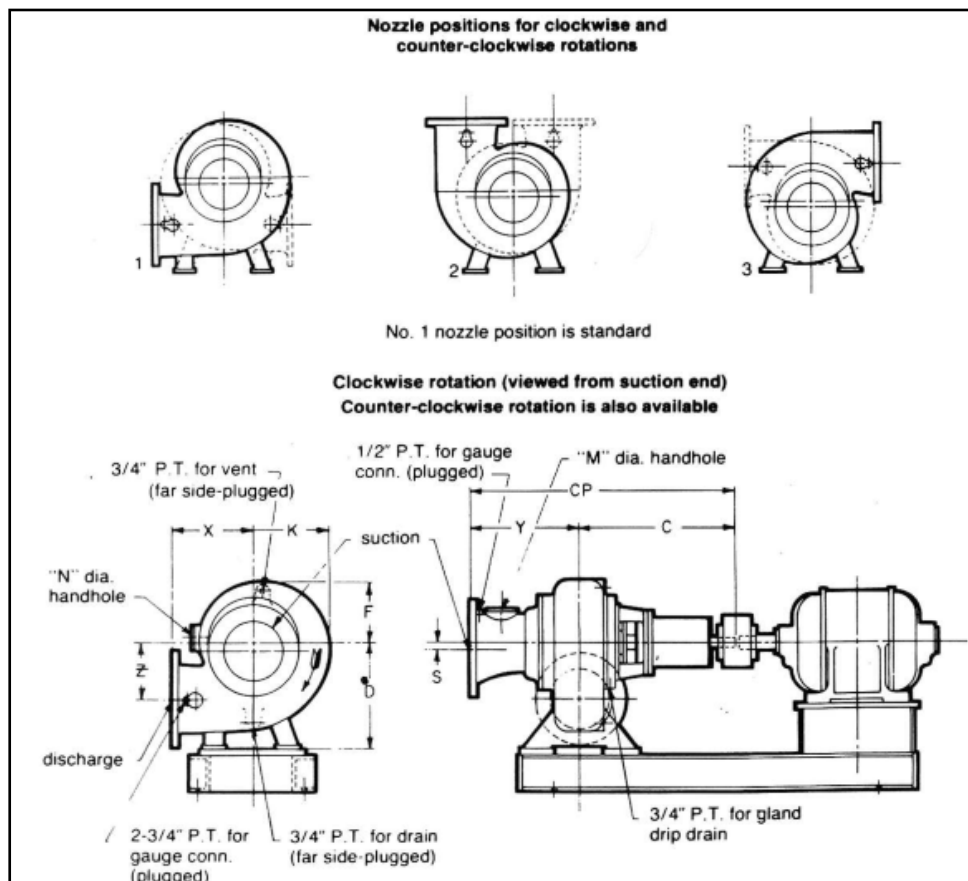
PUMP SIZE	DISCH SUCT													DATA ON FLANGES				
	DIA	DIA	C	CP	D	F	K	M	N	S	X	Y	Z	DIA OF FLANGE	FLANGE THICKN	SIZE OF BOLT CIRCLE	NO. OF BOLTS	
10 MN-12	10	10	28.75	46.75	18.00	10.81	12.44	4.00	4.50	1.00	13.50	18.00	9.00	16.00	0.94	0.88	14.25	12
12 MN-14	12	12	33.12	52.38	21.50	12.62	14.94	4.00	4.50	1.25	14.00	19.25	11.00	19.00	1.00	0.88	17.00	12
12 MN-19	12	12	38.75	57.25	26.00	15.69	17.81	5.00	5.00	1.62	17.00	18.50	14.50	19.00	1.25	0.88	17.00	12
12 MN-24	12	12	46.12	67.00	26.75	19.00	20.50	4.50	5.50	0.00	20.00	20.88	14.75	19.00	1.38	0.88	17.00	12
14 MN-16	14	14	37.75	58.50	26.50	16.19	18.88	5.00	5.00	1.50	16.50	20.75	14.00	21.00	1.12	1.00	18.75	12
14 MN-24	14	14	38.62	59.62	34.00	20.06	22.75	5.00	6.00	1.38	21.00	21.00	17.50	21.00	1.38	1.00	18.75	12
16 MN-19	16	16	39.81	59.31	28.00	16.56	19.75	4.00	5.00	1.62	18.62	19.50	14.62	23.50	1.19	1.00	21.25	16
16 MN-25	16	16	46.62	69.12	34.00	21.06	24.25	6.00	6.00	0.00	22.00	22.50	19.00	23.50	1.44	1.00	21.25	16
16 MN-33	16	16	57.06	84.62	33.75	24.75	26.75	6.00	6.00	0.72	26.56	27.56	19.69	23.50	1.75	1.00	21.25	16
20 MN-24	20	20	44.38	66.56	35.50	23.25	26.62	5.00	6.00	1.75	24.00	22.19	18.00	27.50	1.25	1.12	25.00	20
20 MN-30	20	20	46.06	70.31	41.00	25.00	28.88	6.00	6.00	0.62	26.62	24.25	23.00	27.50	1.69	1.12	25.00	20
24 MN-28	24	24	44.62	72.25	41.00	24.75	29.50	6.00	6.00	1.69	28.00	27.62	22.00	32.00	1.38	1.25	29.50	20

Note: Dimensions are in inches.



## Dimensions

### Model MN – Horizontal



PUMP SIZE	DISCH SUCT		C	CP	D1	D2	D3	F	K	M	N	S	X	Y	Z	DATA ON FLANGES			
	DIA	DIA														DIA OF FLANGE	FLANGE THICKN	SIZE OF BOLT BOLT	NO. OF CIRCLE BOLTS
20 MN-39	20	20	58.25	91.81	40.00	36.00	33.00	31.75	34.25	7.88	7.88	0.81	33.25	33.56	24.62	27.50	2.12	2.12	25.00 20
24 MN-33	24	24	58.00	88.00	43.00	35.00	33.00	31.00	33.50	7.00	7.00	1.00	31.00	30.00	25.00	32.00	1.88	1.25	29.50 20
24 MN-47	24	24	58.38	93.50	48.44	42.31	40.16	39.00	41.50	9.00	9.00	0.00	33.88	35.12	31.50	32.00	2.12	1.25	29.50 20
30 MN-33	30	30	50.56	91.31	47.25	42.00	35.00	32.75	40.00	10.25	9.00	3.38	32.00	40.75	20.06	38.75	1.88	1.25	36.00 28
30 MN-43	30	30	62.00	104.0	56.00	52.00	44.00	42.00	50.00	10.00	9.00	1.00	38.00	42.00	35.00	38.75	2.12	1.25	36.00 28

\* D1 refers to D dimension in the No. 1 nozzle position.

D2 refers to D dimension in the No. 2 nozzle position.

D3 refers to D dimension in the No. 3 nozzle position.

Note: Dimensions are in inches.

SL. NO.	PUMP MODEL	BARE PUMP WEIGHT (Kg.)	GD2 OF ROTOR (Kg. M2)
1	14 MN 16 A	1400	17
2	14 MN 24 A	1780	42
3	20 MN 24 A	2550	73

## Typical Specifications

Each pump shall be designed to pump sewage containing solids and stringy materials with a minimum of clogging. Each pump shall be rated at  $\text{m}^3/\text{hr}$  at total head of mtr. at rpm. In addition, each pump shall be capable of producing not less than  $\text{m}^3/\text{hr}$  at a minimum total head of mtr at rated speed. Minimum shut off head shall be mtr. Variable speed pumps shall be capable of  $\text{m}^3/\text{hr}$  at a total head of mtr. at reduced speed of rpm.

Driver horsepower shall be min. so as to be non-overloading from shutoff to minimum head specified for full speed operation. Suction and discharge connection shall be inches minimum and the flanges shall be drilled in accordance with ANSI standards for B16.5 flanges.

**Casing** – The pump casing shall be of the one piece volute type with integral discharge flange and arranged as shown on the drawings. It shall be made of close grained cast iron and of sufficient strength, weight and thickness to provide accurate alignment and prevent excessive deflection.

The casing shall be designed to permit the removal of the rotating assembly without disturbing the suction or discharge connections and provided with a large hand hole to permit inspection and cleaning of the pump interior. The hand hole cover shall match the contour of the casing. Three lifting eyes shall be furnished to facilitate handling.

Each casing shall be hydrostatically tested to one and one quarter times the maximum shut off pressure and provided with three-quarter inch vent, drain and gauge connections.

**Suction Head** – The suction head shall be of the same material as the casing and designed to provide equal flow distribution to the impeller eye. It shall be provided with a flanged connection, a hand hole with removable cover and a one-half inch gauge tap connection.

**Impeller** – The impeller shall be single stage end suction mixed flow enclosed

type with a minimum number of vanes and shall be designed to prevent clogging and to pass solids, trash and stringy materials contained in sewage.

The impellers shall be made of close grained cast iron, accurately machined and polished to remove hollows or projections which might encourage cavitation. Each impeller shall be statically and dynamically balanced prior to assembly.

The impeller shall be secured to the shaft with a key and contoured lock nut which in turn is secured by a locking screw. The arrangement shall be such that the impeller cannot be loosened by torque from either forward or reverse rotation.

**Wearing rings** – Removable wearing rings of unlike hardness stainless steel shall be furnished on the impeller and suction head and the axis of rotation. They shall be securely fastened to prevent any relative rotation, and designed to compensate for a minimum of one-quarter inch wear. The impeller ring shall be suitable chrome steel and the suction head ring shall be chrome steel and exceed the impeller ring hardness by not less than 50 points Brinell hardness.

**Pump Shaft and Sleeve** – Pump shafts shall be of heat treated alloy steel of sufficient size to transmit the full driver horsepower with a liberal safety factor and shall be accurately machined over the entire length. The shafts shall be protected from wear in the stuffing box by a hardened chrome steel shaft sleeve sealed to prevent leakage between the sleeve and the shaft.

**Stuffing Box** – The stuffing box shall be cast integrally with the stuffing box head, designed for a minimum of five rings of packing in addition to a bronze/C.I. seal cage and suitable for clear water or grease sealing. The stuffing box shall be readily accessible and provided with a removable bronze/C.I. gland to facilitate packing replacement (or mechanical seal as specified). The stuffing box head shall be tapped for a three-quarter inch drain connection.



**Bearings** – Pump bearings shall be of the tapered roller type mounted in a removable cast iron frame. The bearings shall be arranged to eliminate all radial play and designed for a minimum B-10 life of 100,000 hours in accordance with AFBMA. The bearings shall be grease lubricated and provided with tapped openings for addition of lubricant and draining. Suitable seals shall be provided in the bearing covers to prevent the entrance of contaminants. The bearing frame shall be arranged to provide for the axial adjustment of the wearing rings by the use of jacking screws and removable shims between the bearing frame and the stuffing box head.

**Shop Testing** – Each pump shall be fully tested on water in the manufacturer's shop in accordance with the Standards of the Hydraulic Institute of Indian standard to determine compliance with the rated conditions. Certified test curves shall be submitted for approval prior to shipment.

**Certified Drawings** – Certified prints of the proposed equipment shall be furnished for approval. These shall include a combined elevation drawing showing pump, driving equipment and couplings, a pump sectional drawing with a list of materials a proposed performance curve and separate driver prints and data.



Radially Split, Single stage,  
End Suction,  
Mixed flow type  
Solid Handling Pump

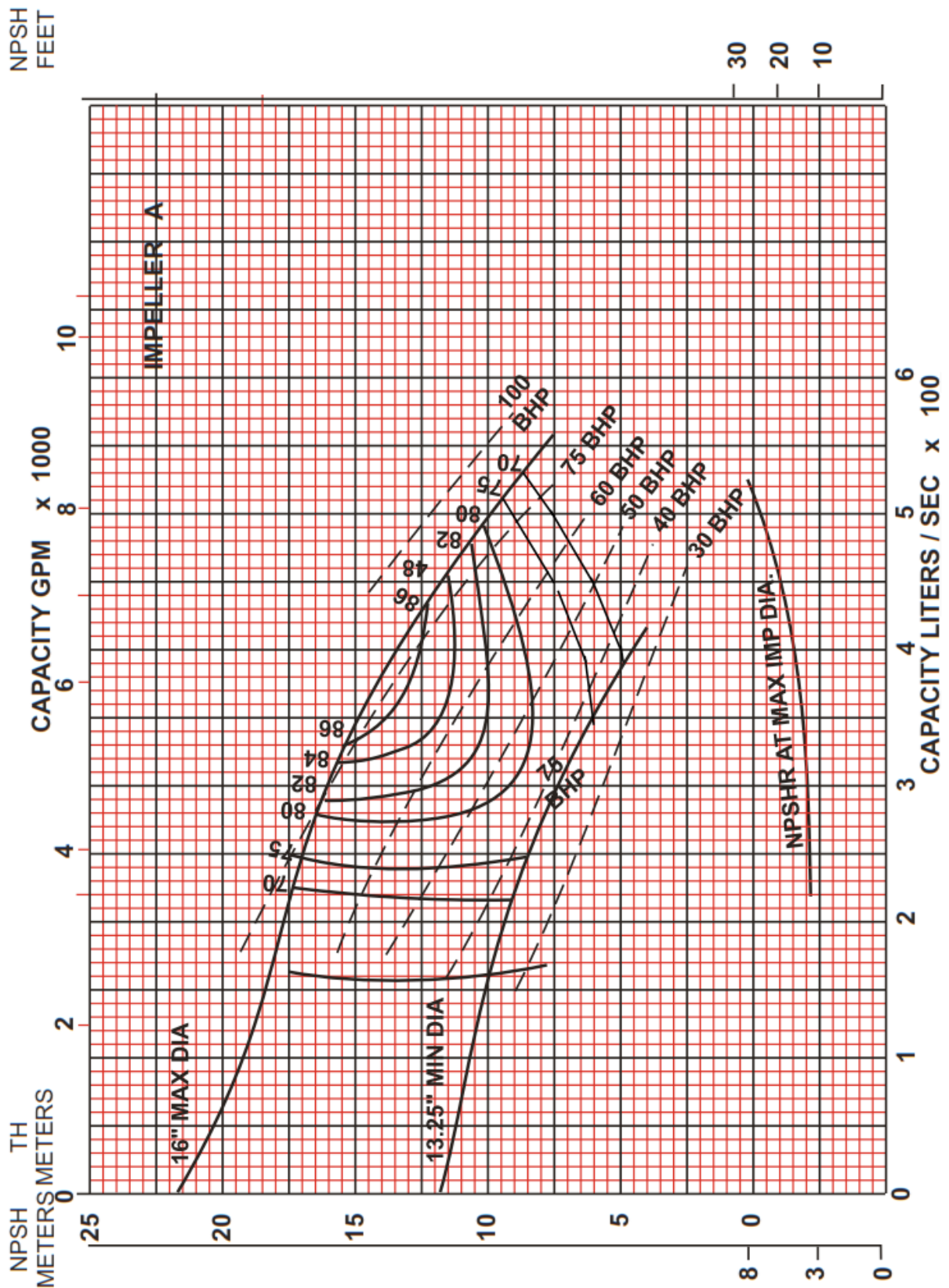
**PUMP MODEL**  
**14 MN 16**

SPEED  
975 RPM

CURVES BASED ON COLD WATER

CURVE SHEET NO.:

TYPE MN



Eye Area total	cm <sup>2</sup>	Suction Flange	350mm	14 inches
		Discharge Flange	350mm	14 inches



Radially Split, Single stage,  
End Suction,  
Mixed flow type  
Solid Handling Pump

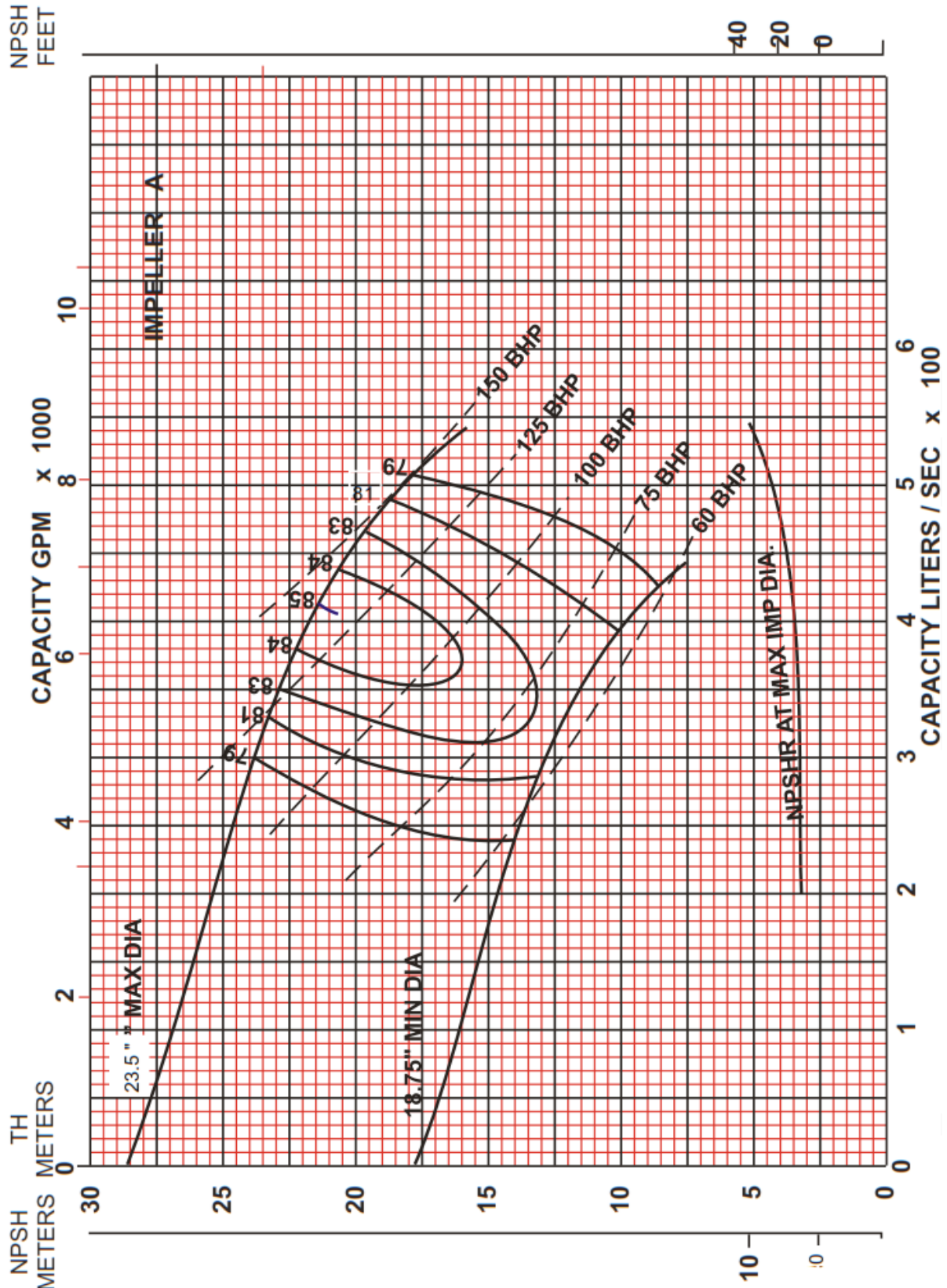
**PUMP MODEL**  
**14 MN 24C**

SPEED  
730 RPM

CURVES BASED ON COLD WATER

CURVE SHEET NO.:

TYPE MN



Eye Area total	cm <sup>2</sup>	Suction Flange	350mm	14 inches
		Discharge Flange	350mm	14 inches



Radially Split, Single stage,  
End Suction,  
Mixed flow type  
Solid Handling Pump

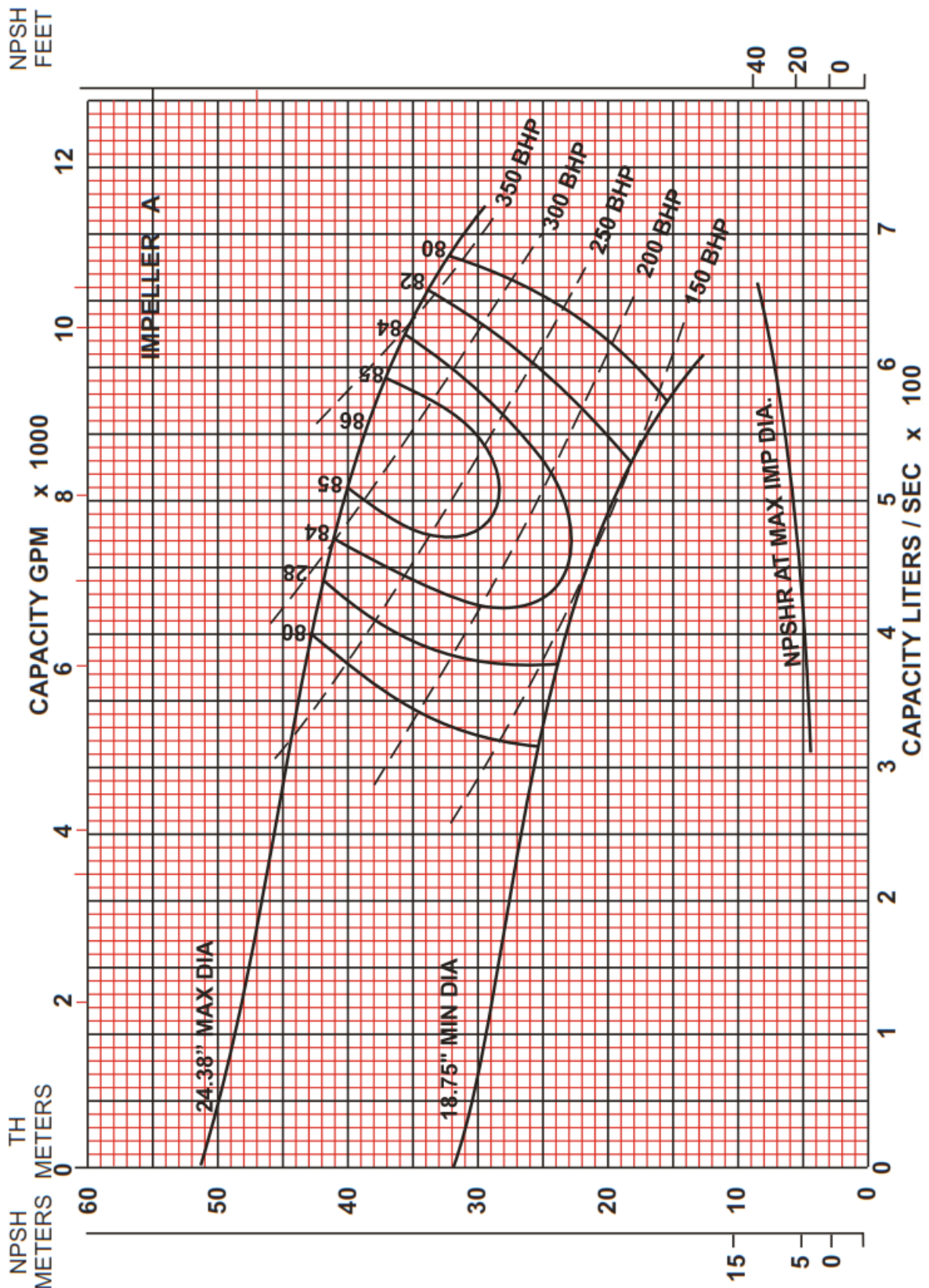
**PUMP MODEL**  
**14 MN 24**

SPEED  
975 RPM

CURVES BASED ON COLD WATER

CURVE SHEET NO.:

TYPE MN



Eye Area total	cm <sup>2</sup>	Suction Flange	350mm	14 inches
		Discharge Flange	350mm	14 inches



Radially Split, Single stage,  
End Suction,  
Mixed flow type  
Solid Handling Pump

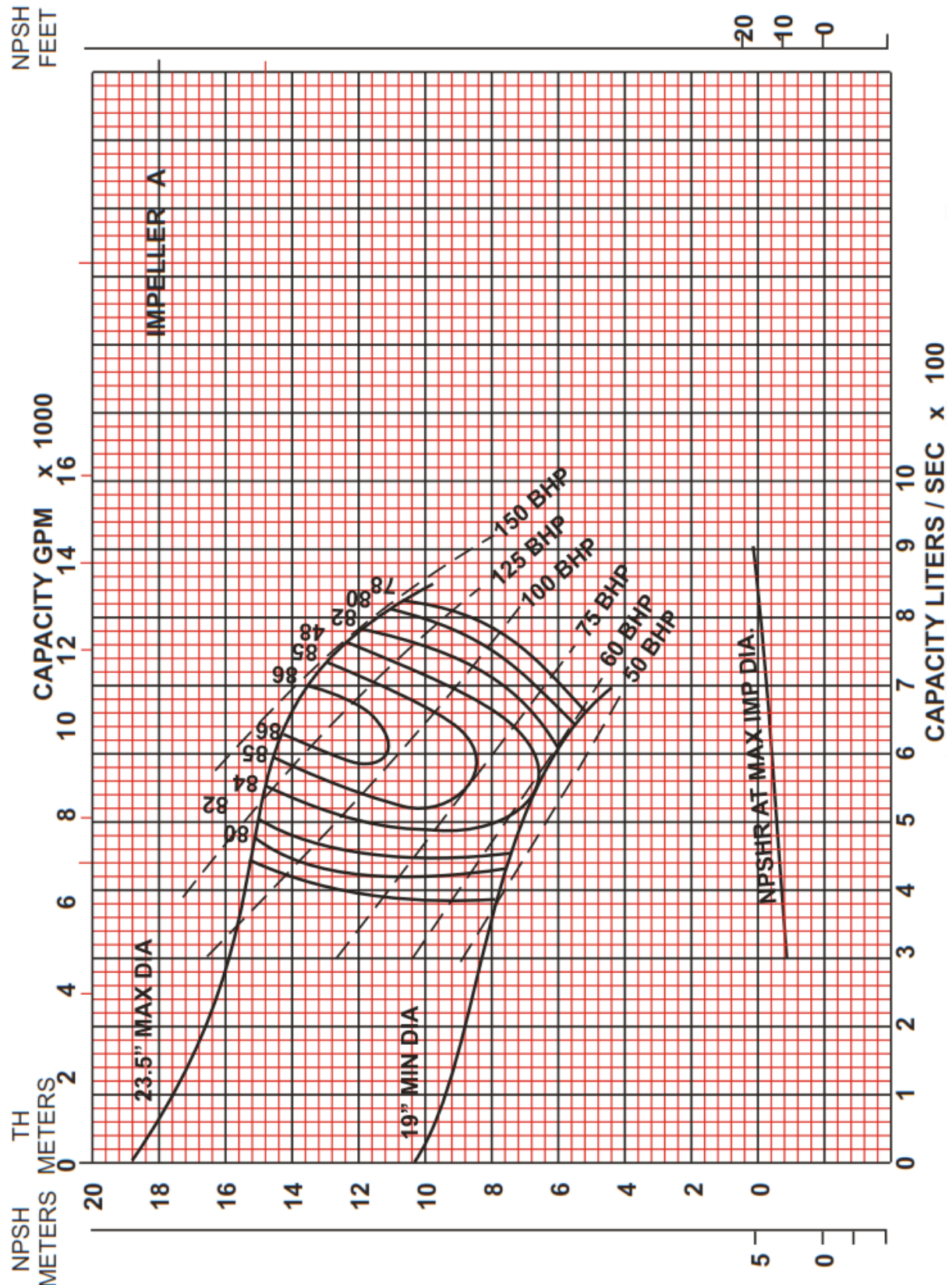
**PUMP MODEL**  
**20 MN 24**

SPEED  
585 RPM

CURVES BASED ON COLD WATER

CURVE SHEET NO.:

TYPE MN



Eye Area total	cm <sup>2</sup>	Suction Flange	500mm	20 inches
		Discharge Flange	500mm	20 inches





Radially Split, Single stage,  
End Suction,  
Mixed flow type  
Solid Handling Pump

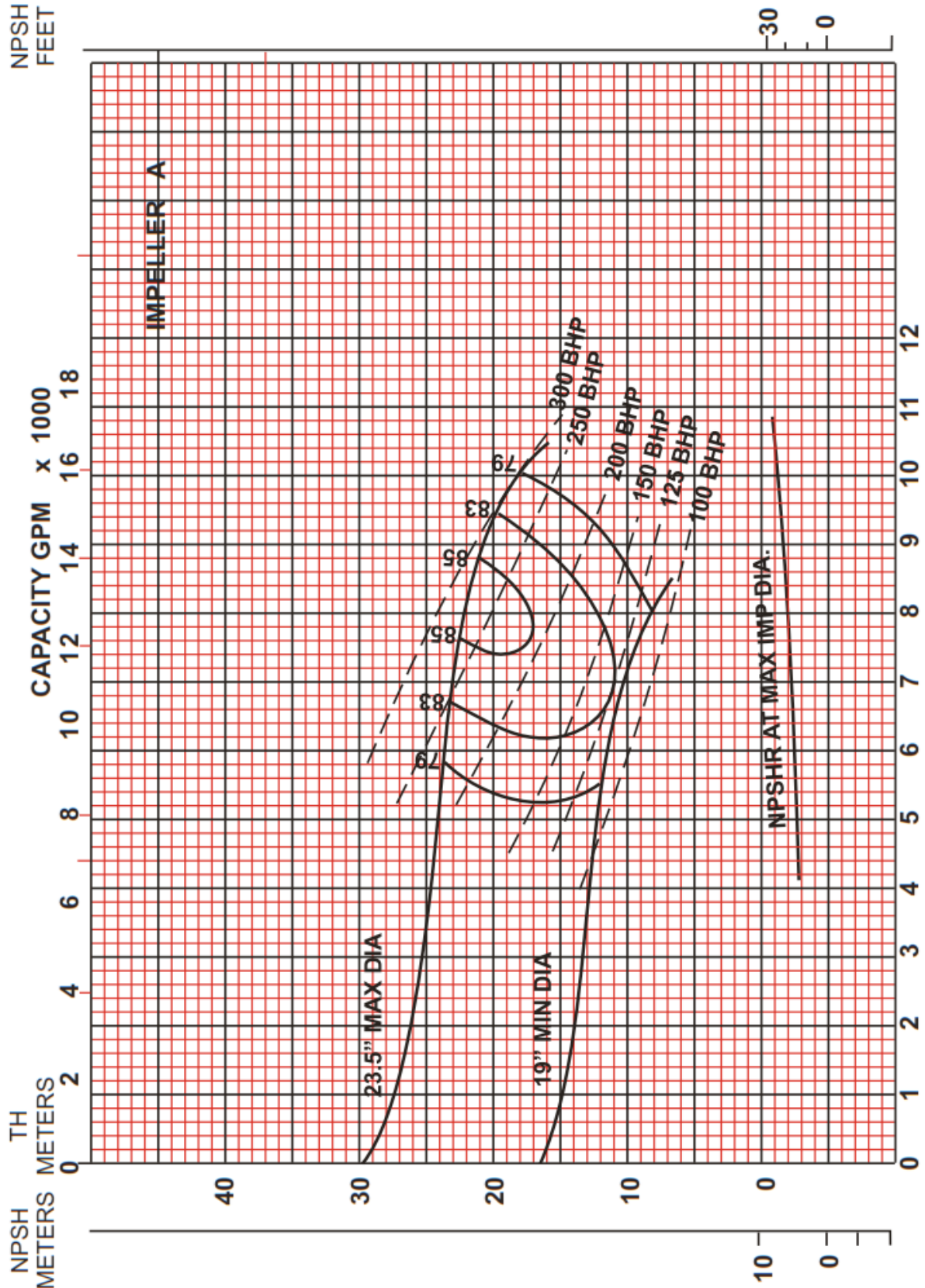
**PUMP MODEL**  
**20 MN 24**

SPEED  
930 RPM

CURVES BASED ON COLD WATER

CURVE SHEET NO.:

TYPE MN



Eye Area total	cm <sup>2</sup>	Suction Flange	500mm	20 inches
		Discharge Flange	500mm	20 inches





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