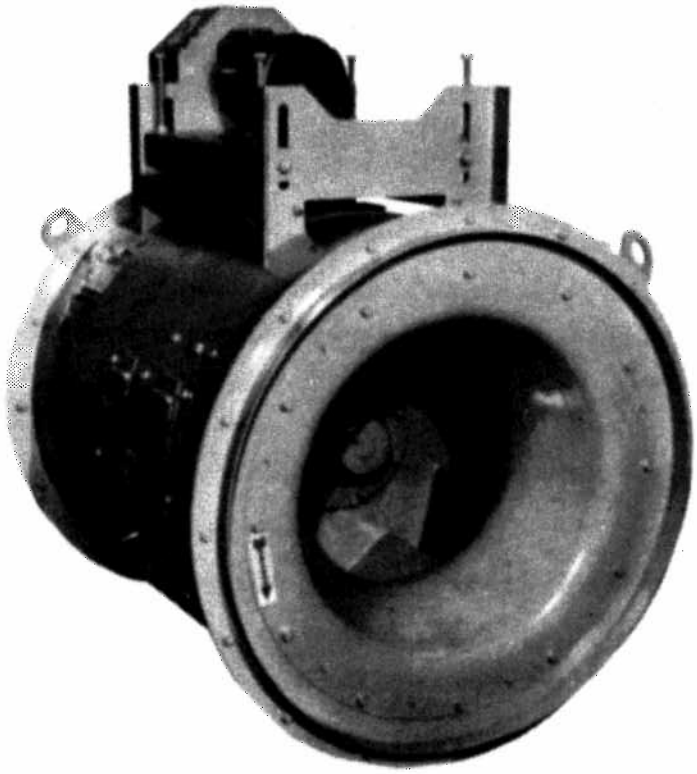
Sheldons Engineering.

Leaders in fan technology

Division of Earlscourt Metal Industries Ltd.
6660 Ordan Drive,
Mississauga, Ontario, Canada. L5T 1J7
Phone: (905) 564-5072 Toll Free (800) 265-3572
Fax: (905) 564-9004 email: sales@sheldonsengineering.com
www.sheldonsengineering.com

SERIES ILA IN-LINE AIRFOIL CENTRIFUGAL FAN

Catalogue 357
Issue May 1994



IN-LINE AIRFOIL
CENTRIFUGAL FAN

Series ILA In Line Centrifugal

Sheldons' In-Line Centrifugal Fans are produced in manufacturing facilities well equipped with modern CNC machinery, utilizing automated tooling and sophisticated die-forming capabilities to ensure duplication of construction, tolerances, fit and performance.

The products in this catalogue are supported by design and research engineering facilities including three wind tunnels, computerized test instruments and a reverberant sound room. This allows a product to be designed not only for maximum efficiency and air performance but also for the lowest sound levels possible. All products are tested to current AMCA standards to ensure product performance and compliance with published data.

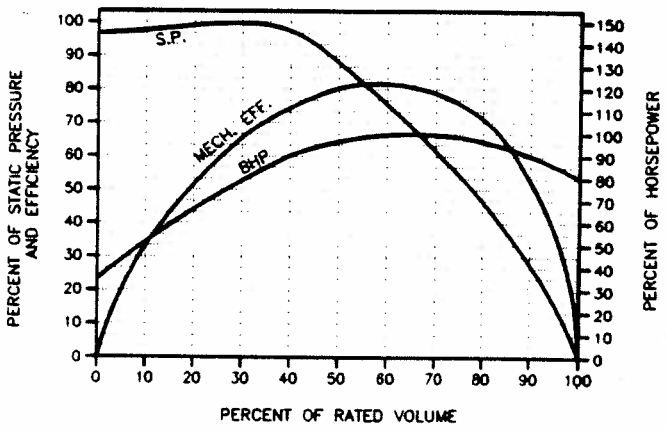
To further assure that high standards are maintained throughout all phases of the manufacturing processes, all products are factory tested to rigid standards prior to shipment and backed by Sheldons limited warranty and service commitment. Quality construction and dependable performance are supported by an expert, highly trained staff, with a combined experience of several hundred years in various aspects of the air moving equipment industry, devoted to the design and production of high quality products.

TABLE OF CONTENTS

Series ILA In Line Centrifugal

DESIGN FEATURES

Available in Class I, II and III, standard Arrangement 1 and 9. The Series ILA fans have been designed and engineered to meet the highest standards for maximum efficiency, low operating cost, quietness, stability and non- overloading horsepower. The concept in design combines the reliable performance of scroll-type centrifugal fans with the space advantages of axial type fans. Series ILA fans are used for general building ventilation, commercial and industrial air conditioning, industrial process supply and exhaust, drying and cooling, combustion air supply, etc.



Benefits

- Airfoil bladed centrifugal wheel for efficient and quiet operation.

- In-line airflow eliminating costly elbows and duct configurations.

- Space saving compactness in both horizontal and vertical applications.

- Equal size inlet and outlet connections for ease of installations.

- Wide range of mounting arrangements, brackets and motor positions and accessories.

Centrifugal Airfoil Wheel

The Series ILA wheels are backwardly inclined airfoil blade type. The inlet shrouds are spun for close tolerance fit to the die-formed blades. Trailing edges of the blades are welded. Blades are continuously welded to heavy gauge backplate and inlet shroud. All wheels are given accurate static and dynamic balance to insure smooth operation.

Quietness Of Operation

Correct orientation of wheel blades, combined with careful aerodynamic design of the wheel, straightening vanes and casing decreases air turbulence and increases pressure conversion efficiency, resulting in a quiet operating fan.

Non-Overloading Horsepower

The horsepower curve peaks within the normal operating range and at maximum efficiency as illustrated. This built-in protection assures that the motor selected will not be overloaded when the fan is operating near optimum performance.

Stable Pressure Curve

As illustrated above, the inherent design of the airfoil wheel results in a steeply rising pressure characteristics over a wide range of capacities. This assures minimum changes in volume with shifts in system pressure, providing exceptionally stable operation. Components are manufactured accurately to the proper shape and dimensions providing further assurance rated performance is obtained.

Space Saving Reduces Overall Space Requirements.

In- line airflow eliminates the need for costly elbows and duct turns for horizontal as well as vertical applications, thus permitting installations in the smallest possible space. ILA fans use approximately 50 to 70% of the space normally required by conventional scroll type centrifugal fans and are generally shorter than most competitive in-line fans.

TYPICAL CONSTRUCTION FEATURES

Housing

All welded heavy gauge steel construction designed with air passages of proper aerodynamic shape resulting in smooth, efficient airflow through the fan. Casings are rigidly braced internally to carry the weight of the motor. The streamlined inlet is bolted independently in such a way as to ensure correct wheel to inlet clearances. Flanged inlet and outlet connections are standard with optional slip fit available. Mounting feet or brackets for floor or ceiling mounting are available on all Arrangement 9 fans and lifting lugs are furnished where required.

The V-belt drive sheaves and bearings are isolated from the airstream by a belt tube through which the V-belts pass from the outside of the casing to the inner tube, which houses the fan shaft and bearings. The end cover of the inner tube is readily removable for easy access to the shaft and bearing assembly and a standard access door allows easy wheel inspection.

The inner cylinder is not air tight and, therefore, the fan should not be used where the escape of contaminated air would cause problems.

Wheels

Class I, II and III wheels are made of welded high strength material selected for proper yield strength, featuring streamlined, die formed, airfoil blades for shock free airflow and low power requirements, minimizing turbulence and sound. All wheels are precision balanced to ensure smooth trouble free operation. Hubs are fabricated from steel plate or are cast iron.

Shaft

Turned, ground and polished SAE 1045 medium carbon steel and designed to operate well below the first critical speed.

Bearings

All Series ILA fans are furnished with heavy duty, self-aligning, grease lubricated bearings with extended greases fittings as standard. Bearings are rated at a L_{10} life of 20,000 hours for Classes I,II and III. Extra heavy duty, split pillow block bearings with extended L_{10} life are also available.

High Temperature Construction

Temperature limit for standard fans is 150°F (66°C). All classes can be modified to handle gases up to 300°F (149°C). This is done by utilizing an interference fit between the wheel and shaft, insulation pads under the bearings and a special high temperature lubrication and eight thrust fins on the backplate of the wheel to induce airflow through the belt tube. Bearings are carefully selected to suit higher operating temperatures. **Fans for higher temperatures up to 600°F (316°C) are available per special order.**

Spark Proof Construction

Explosive applications require special construction. Modified Classes I, II and III to meet either AMCA A, B or C can be supplied. Explosion proof motors and static resistant belts should be furnished to meet AMCA requirements in volatile atmospheres.

Arrangements

- Arrangement 1 is for floor mounting only.

- Arrangement 9 is for either horizontal or vertical mounting.

Horizontal is supplied with mounting feet for floor mounting. Brackets are supplied for horizontal ceiling suspension

Brackets are supplied for vertical airflow.

OPTIONAL ACCESSORIES

Belt Guard

Solid vented or expanded metal guard for protection around motor sheave and V-belts. The standard Belt Guard is a three sided Non OSHA type. Fully enclosed OSHA type belt guards are available for all sizes and arrangements. An opening for a tachometer is available if specified.

Weathercover

Totally enclosed solid vented fabricated sheet metal cover designed to protect motor and V-belt drive in outdoor applications, on horizontal or vertical units. When a Weathercover is specified a belt guard is not required.

Screens

Flat, heavy gauge, coated wire mesh available for inlet and/or outlet, with or without IVC.

Access Door

Designed to provide access for inspection and cleaning of the fan wheel. Access doors are offered in either flush mounted or raised with either standard bolted arrangement or quick release type (hinged/latch). All access doors are furnished with standard gasketing. Location over wheel is determined by installation and mounting requirements.

Drains and Weep Holes

To drain water resulting from condensation or cleaning of the wheel, a casing drain or weep holes can be furnished at low points in the fan casing. Weep holes may be furnished in the wheel to eliminate the possibility of water condensing in the blades.

Shaft Seal

Shaft Seals are available to protect bearings and belt tube from contaminated air. The standard seal consists of a flat type material backed by a steel retaining plate secured to the inner cylinder around the shaft opening. Note: Standard shaft seals are not considered air tight.

Motor Mounting

Motors up to NEMA size 404T and V-belt drives can be mounted on both Arrangement 1 and 9 fans per standard AMCA positions.

Slip Ring Or Companion Angles

Available for use where inlet or outlet slip connections is required or to provide flanged inlet connection.

Inlet Vane Control (IVC)

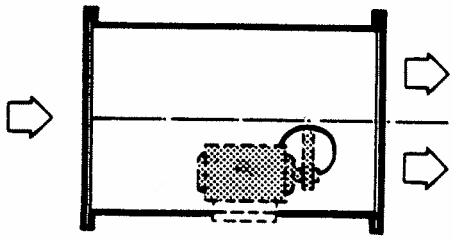
Vane control is a simple and efficient means of regulating fan output over a wide range of operating conditions. It combines the advantages of instantaneous regulation of fan capacity (to meet exact pressure and volume requirements of the system) with substantial power savings during those periods when the fully rated delivery of the fan is not required. Vanes may be operated automatically or manually without shutting the fan down. Vane control is available for all fan sizes.

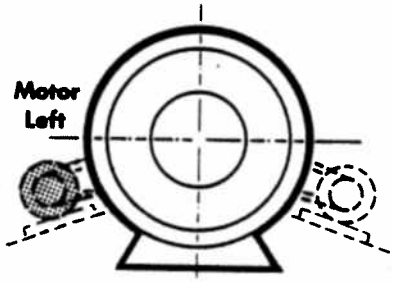
The control of fan output by movable inlet vanes has been accepted as one of the most economical means of varying fan capacity at high efficiency.

Additional Accessories

- Discharge Windband and Damper.
- Discharge Windband Extension.
- Roof Mounting Base (Curb Cap).
- Spark Resistant Construction, Type A, B or C.
- High Temperature Construction.
- Special Metals and Alloys.
- Heavy Duty Bearings.
- Stainless Steel Nameplates.
- IVC Operators.
- Vibration Isolation.
- Special Paints and Coatings.
- Special Access Doors or Housing Construction.

Motor Positioning Guide

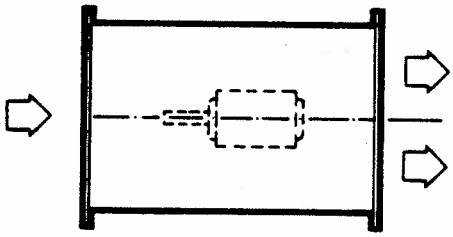


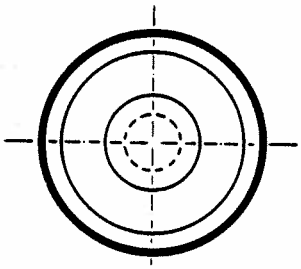


View Facing Outlet

ARRANGEMENT 1

For belt drive. Impeller overhung on a shaft supported by bearings mounted within casing. Motor mounted independent of casing. Horizontal discharge.

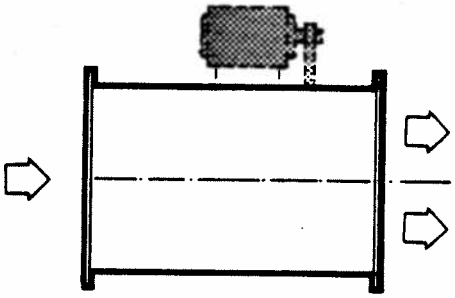




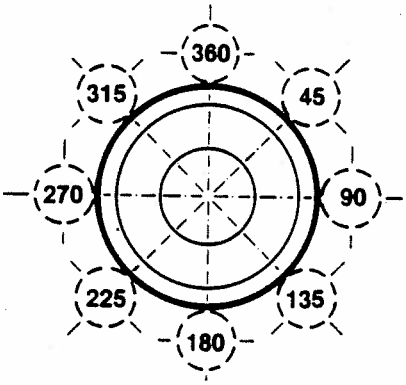
View Facing Outlet

ARRANGEMENT 4

For direct drive. Impeller overhung on motor shaft. Motor supported within casing. For horizontal and vertical discharge. Duct mounting shown.



Motor Shown in Position 360



View Facing Outlet

ARRANGEMENT 9

For belt drive. Impeller overhung on a shaft supported by bearings mounted within casing. Designed for mounting of motor on outside of casing in one of the standard locations shown. For horizontal and vertical discharge. Duct mounting shown.

Arrow ⇨ designates the direction of airflow.

Rotation of fans is determined by viewing from the fan outlet end.

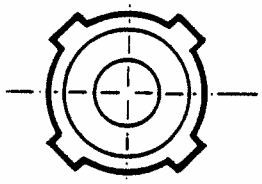
Specify either up blast or down blast discharge for vertically-mounted fans.

The locations of motors, supports, access doors, etc., are determined by viewing the outlet of the fan and resting location 180 on the floor as shown for Arrangement 9.

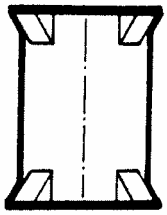
Arrangements 4 and 9 can be furnished with supports for floor, wall or ceiling mounting. The position of these supports determines which motor locations are available for motor placement. Generally motor locations 135, 180, and 225 are not available on floor, wall or inverted ceiling-mounted fans and motor locations 45, 90, 270 and 315 may not be available for ceiling-hung fans.

Another method of mounting vertical fans is shown in the view on the right. Specify fan to be furnished with ceiling-mounting brackets, floor-mounting brackets or both.

VERTICAL MOUNTING



Ceiling-Mounting Brackets

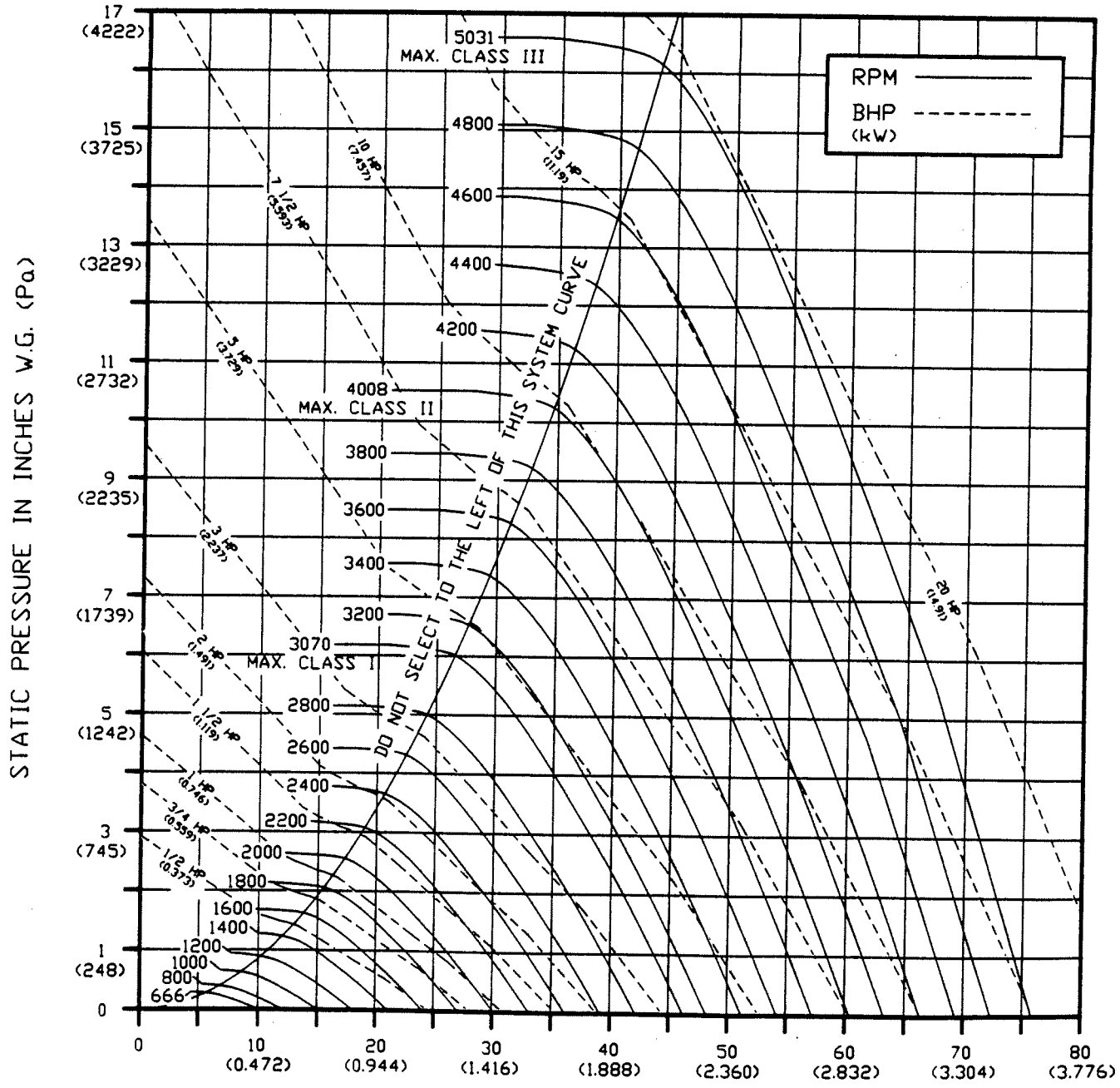


Floor-Mounting Brackets

Series ILA In Line Centrifugal

Size IL15A

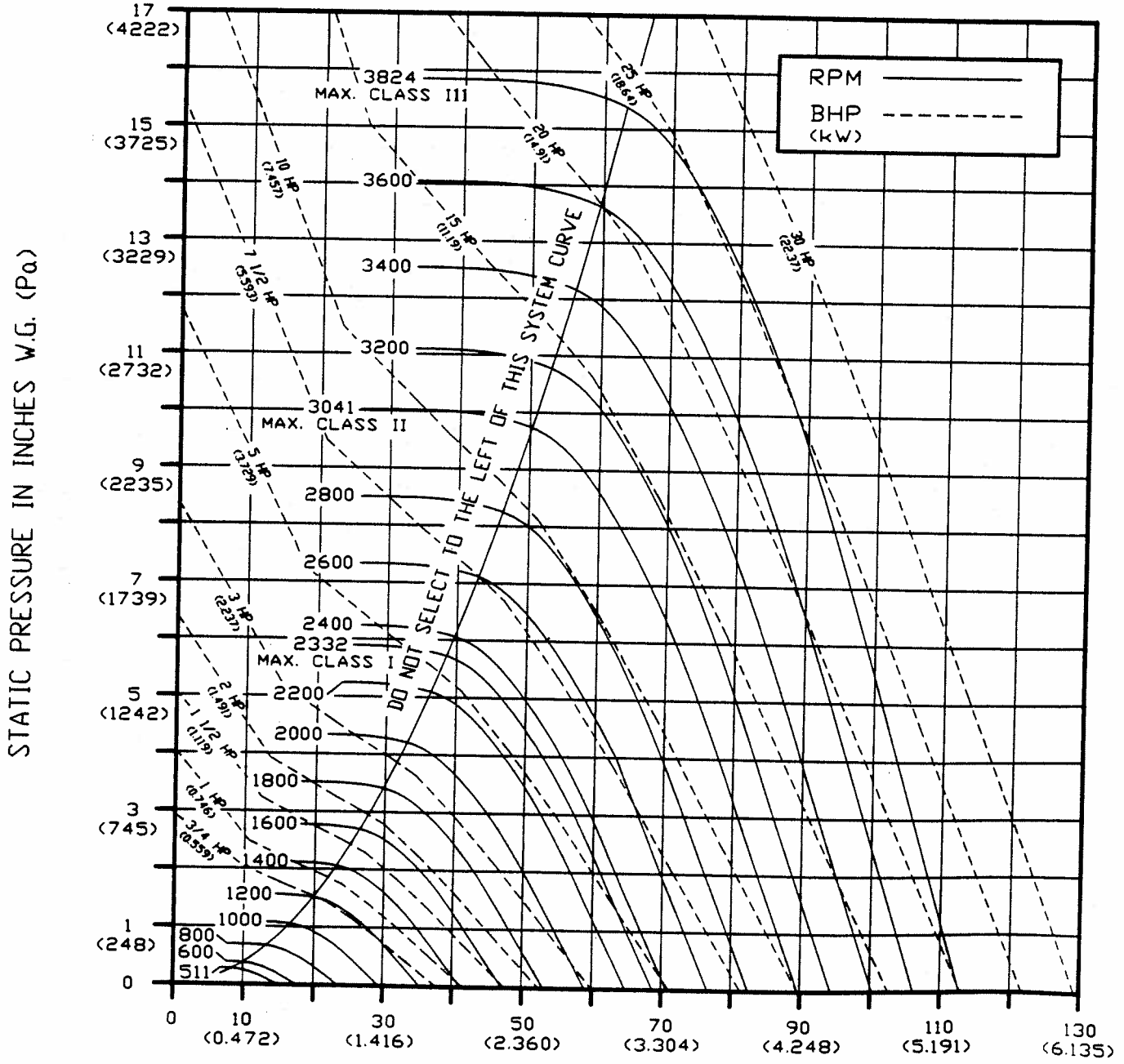
Wheel Diameter	**15 inches**	**381 mm**
Wheel Circumference	**3.93 feet**	**1.198 m**
Inlet Diameter/ Area	**20.125 inches/ 2.21 ft²**	**511 mm/ .3698 m²**
Outlet Diameter/ Area	**20.125 inches/ 2.21 ft²**	**511 mm/ .3698 m²**
Tip Speed	**3.93 x (RPM) ft/min**	**1.198 x (RPM) m/min**
Maximum BHP	**.128 x (RPM/1000)³ BHP**	**.0955 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL18A

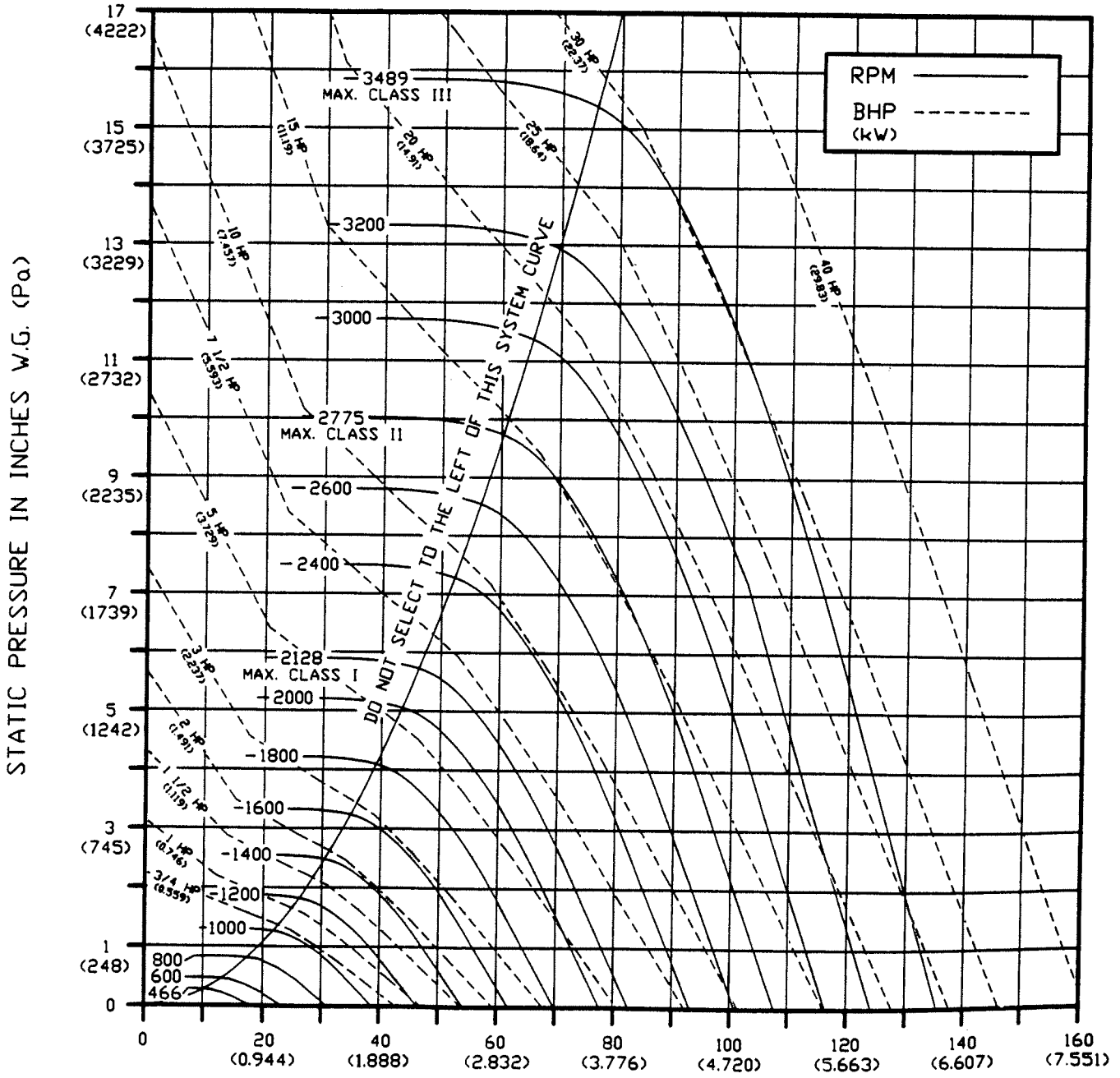
Wheel Diameter	**18.25 inches**	**464 mm**
Wheel Circumference	**4.78 feet**	**1.457 m**
Inlet Diameter/ Area	**24.5625 inches/ 3.29 ft²**	**624 mm/ .3056 m²**
Outlet Diameter/ Area	**24.5625 inches/ 3.29 ft²**	**624 mm/ .3056 m²**
Tip Speed	**4.78 x (RPM) ft/min**	**1.457 x (RPM) m/min**
Maximum BHP	**.417 x (RPM/1000)³ BHP**	**.311 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL20A

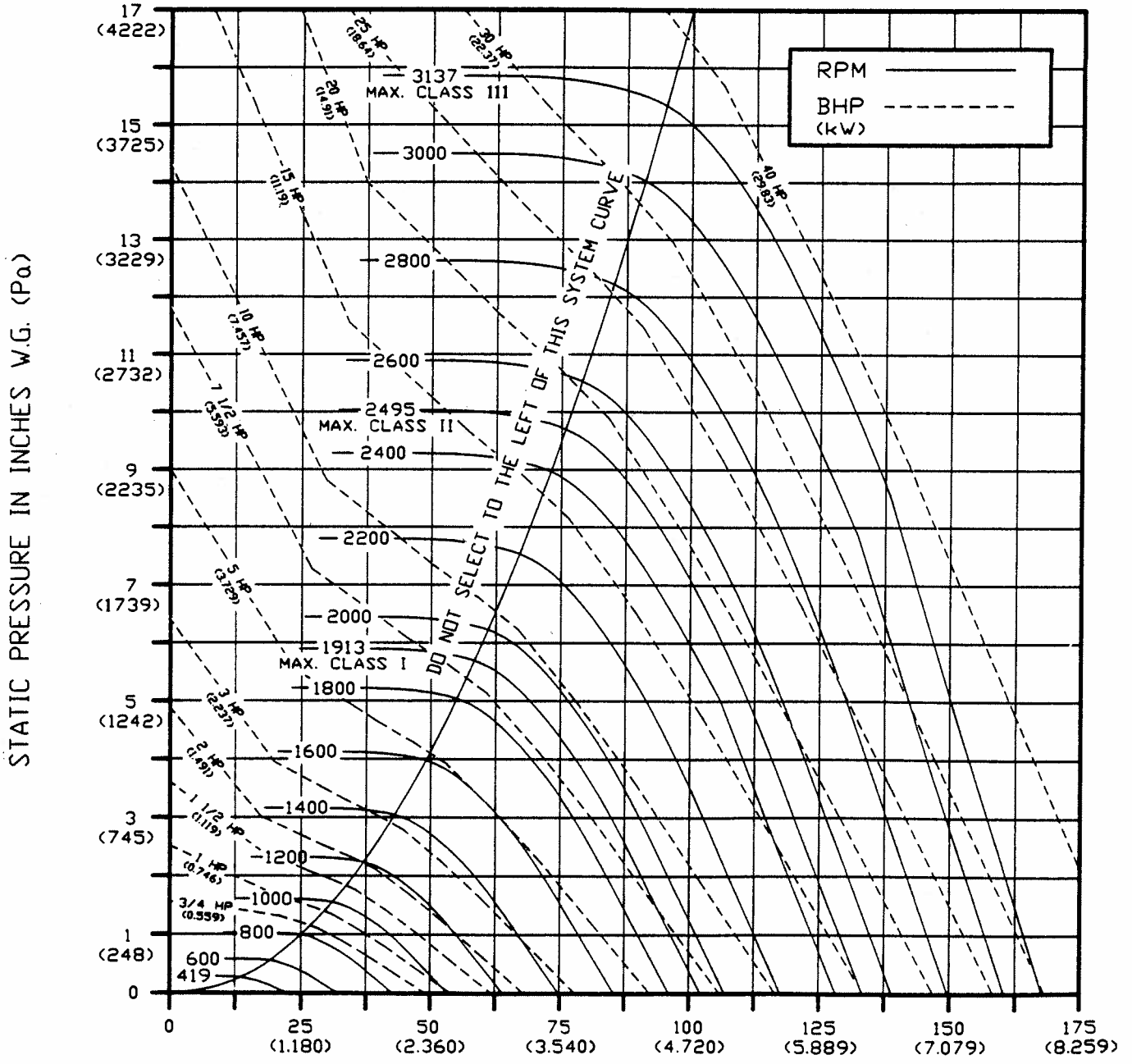
Wheel Diameter	**20 inches**	**508 mm**
Wheel Circumference	**5.24 feet**	**1.597 m**
Inlet Diameter/ Area	**27 inches/ 3.96 ft²**	**696 mm/ .3698 m²**
Outlet Diameter/ Area	**27 inches/ 3.96 ft²**	**696 mm/ .3698 m²**
Tip Speed	**5.24 x (RPM) ft/min**	**1.597 x (RPM) m/min**
Maximum BHP	**.661 x (RPM/1000)³ BHP**	**.4929 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL22A

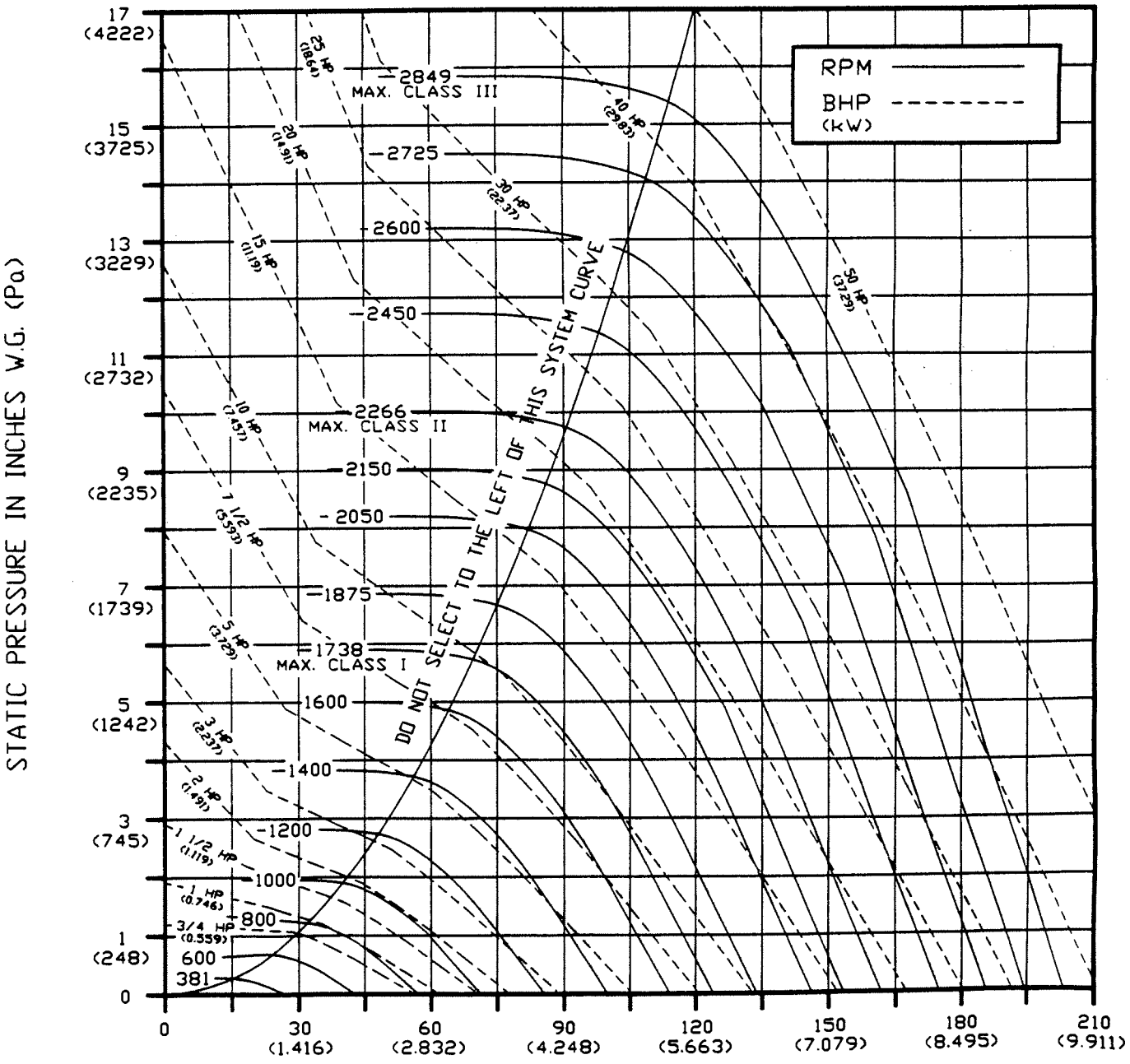
Wheel Diameter	**22.25 inches**	**565 mm**
Wheel Circumference	**5.83 feet**	**1.777 m**
Inlet Diameter/ Area	**29.9375 inches/ 4,89 ft²**	**760 mm/ .4543 m²**
Outlet Diameter/ Area	**29.9375 inches/ 4.89 ft²**	**760 mm/ .4543 m²**
Tip Speed	**5.82 x (RPM) ft/min**	**1.774 x (RPM) m/min**
Maximum BHP	**.889 x (RPM/1000)³ BHP**	**.6629 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL24A

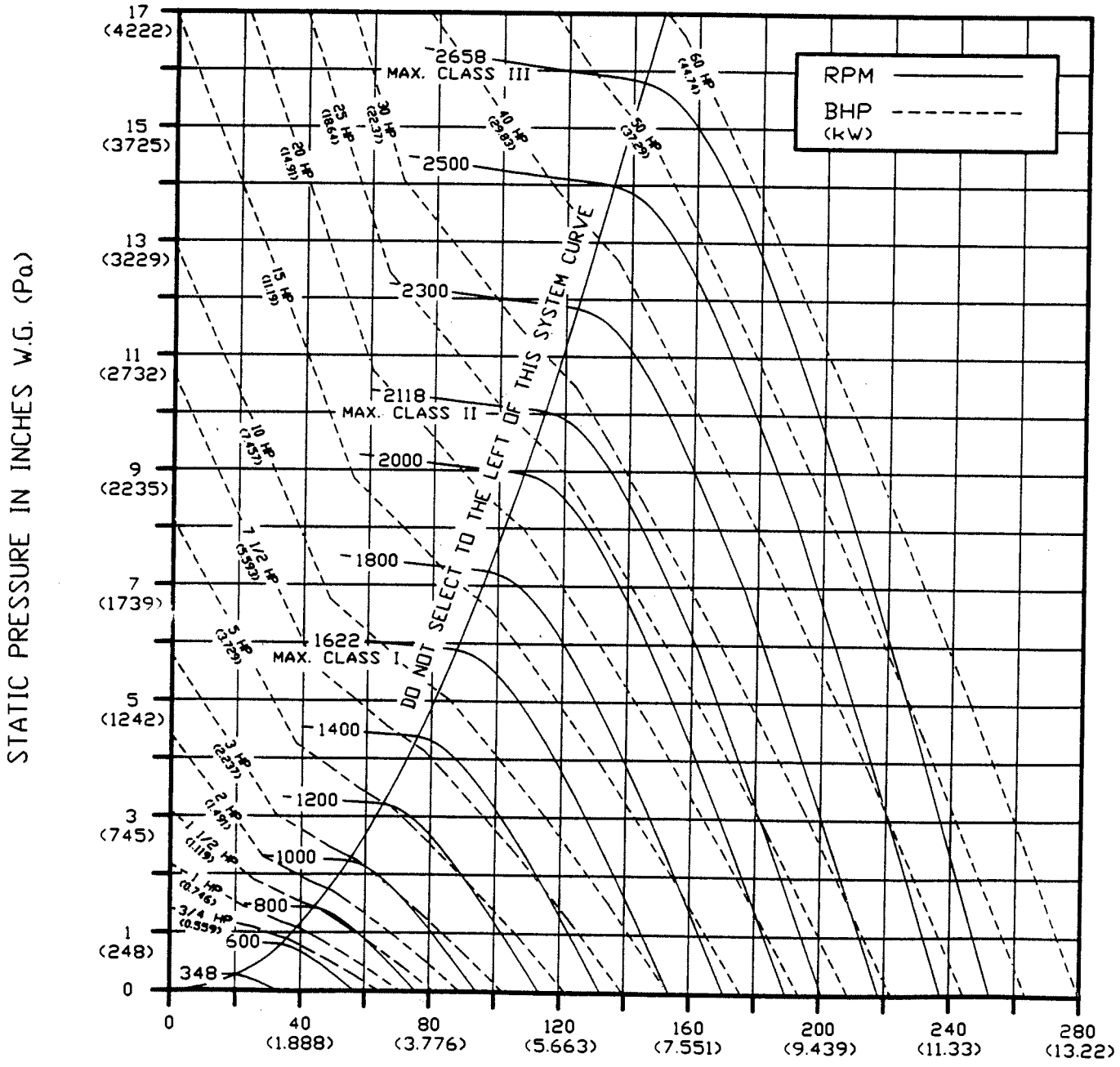
Wheel Diameter	**24.5 inches**	**622 mm**
Wheel Circumference	**6.41 feet**	**1.954 m**
Inlet Diameter/ Area	**32.9375 inches/ 5.92 ft²**	**837 mm/ .55 m²**
Outlet Diameter/ Area	**32.9375 inches/ 5.92 ft²**	**837 mm/ .55 m²**
Tip Speed	**6.42 x (RPM) ft/min**	**1.956 x (RPM) m/min**
Maximum BHP	**1.824 x (RPM/1000)³ BHP**	**1.36 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL27A

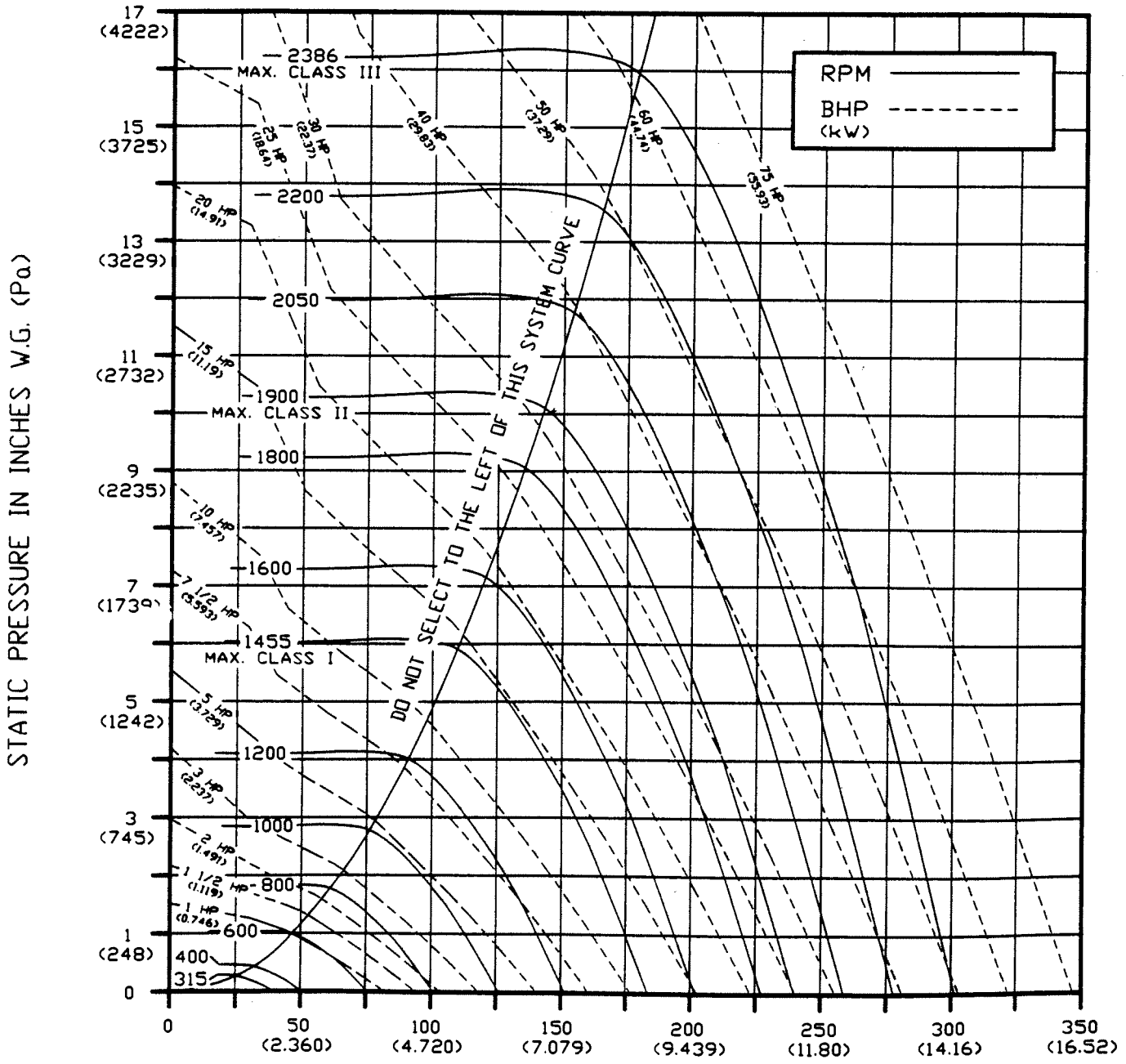
Wheel Diameter	**27 inches**	**686 mm**
Wheel Circumference	**7.07 feet**	**2.155 m**
Inlet Diameter/ Area	**36.4375 inches/ 13.1 ft²**	**926 mm/ .6735 m²**
Outlet Diameter/ Area	**36.4375 inches/ 13.1 ft²**	**926 mm/ .6735 m²**
Tip Speed	**7.85 x (RPM) ft/min**	**2.155 x (RPM) m/min**
Maximum BHP	**3.826 x (RPM/1000)³ BHP**	**1.682 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL30A

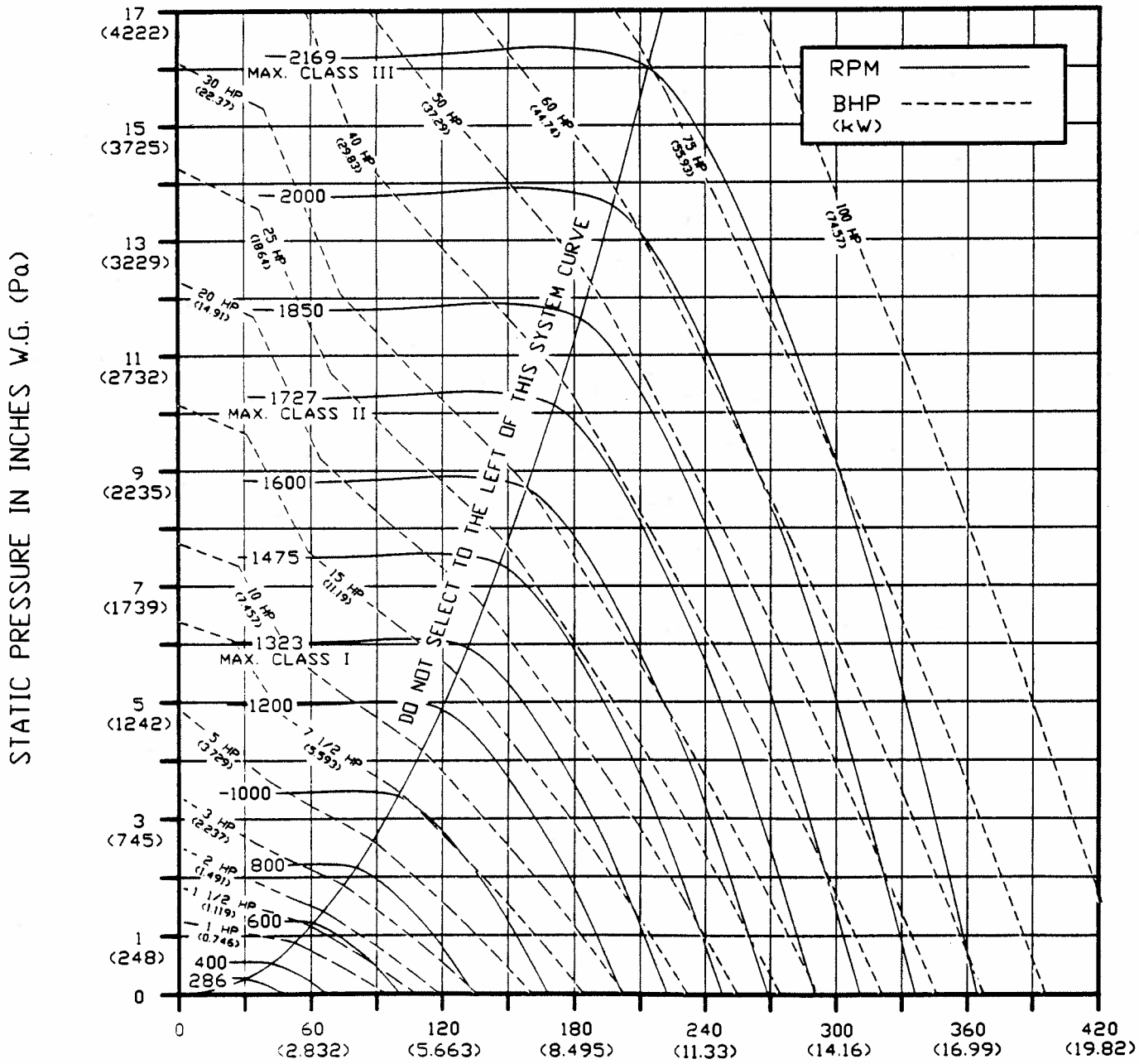
Wheel Diameter	**30 inches**	**762 mm**
Wheel Circumference	**7.85 feet**	**2.393 m**
Inlet Diameter/ Area	**40.1875 inches/ 13.1 ft²**	**1021 mm/ .8185 m²**
Outlet Diameter/ Area	**40.1875 inches/ 13.1 ft²**	**1021 mm/ .8185 m²**
Tip Speed	**7.85 x (RPM) ft/min**	**2.393 x (RPM) m/min**
Maximum BHP	**3.826 x (RPM/1000)³ BHP**	**2.853 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL33A

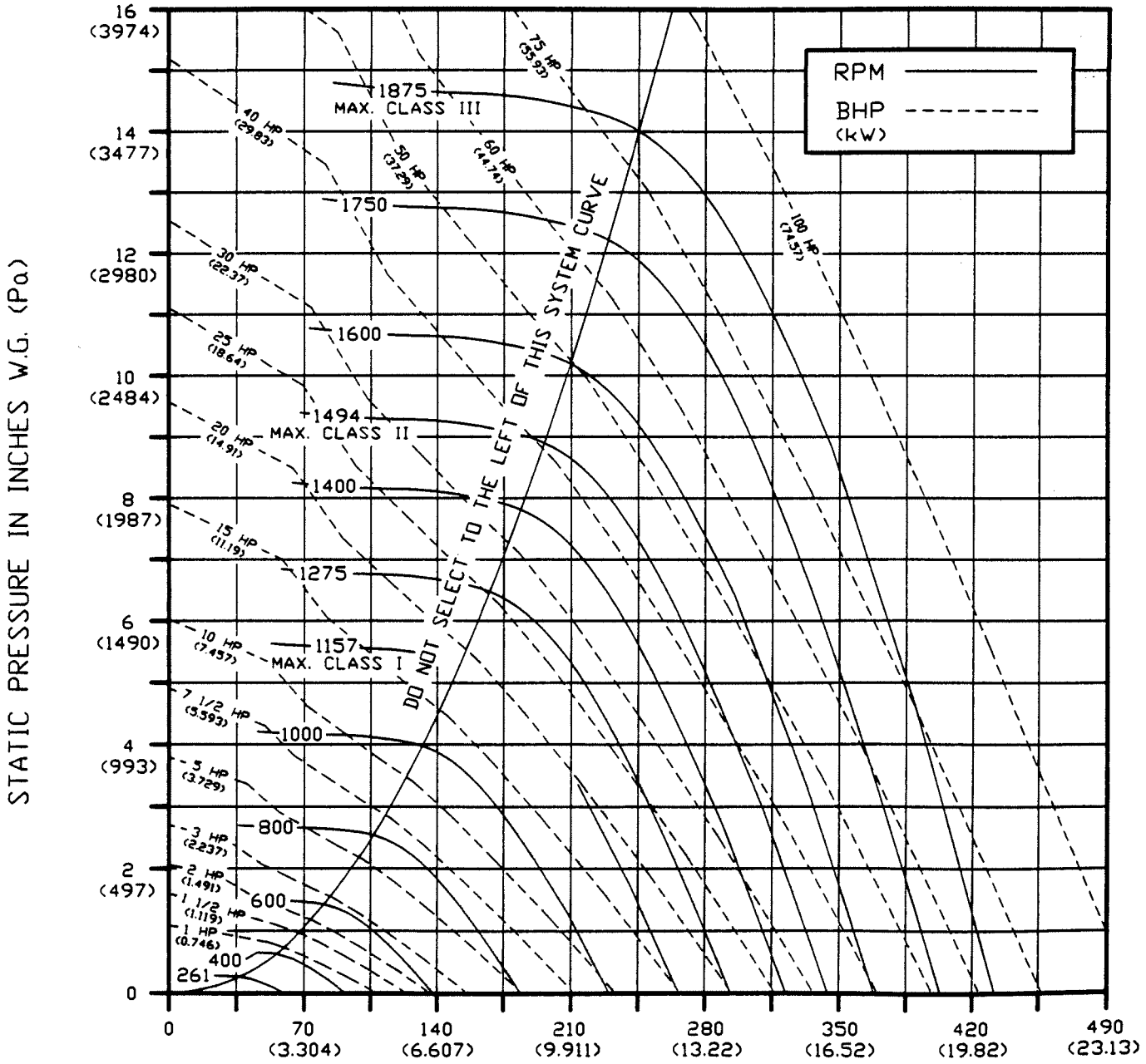
Wheel Diameter	**33 inches**	**838 mm**
Wheel Circumference	**8.64 feet**	**2.633 m**
Inlet Diameter/ Area	**44.5625 inches/ 13.1 ft²**	**1132 mm/ 1.003 m²**
Outlet Diameter/ Area	**44.5625 inches/ 13.1 ft²**	**1132 mm/ 1.003 m²**
Tip Speed	**8.64 x (RPM) ft/min**	**2.633 x (RPM) m/min**
Maximum BHP	**6.153 x (RPM/1000)³ BHP**	**4.588 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL37A

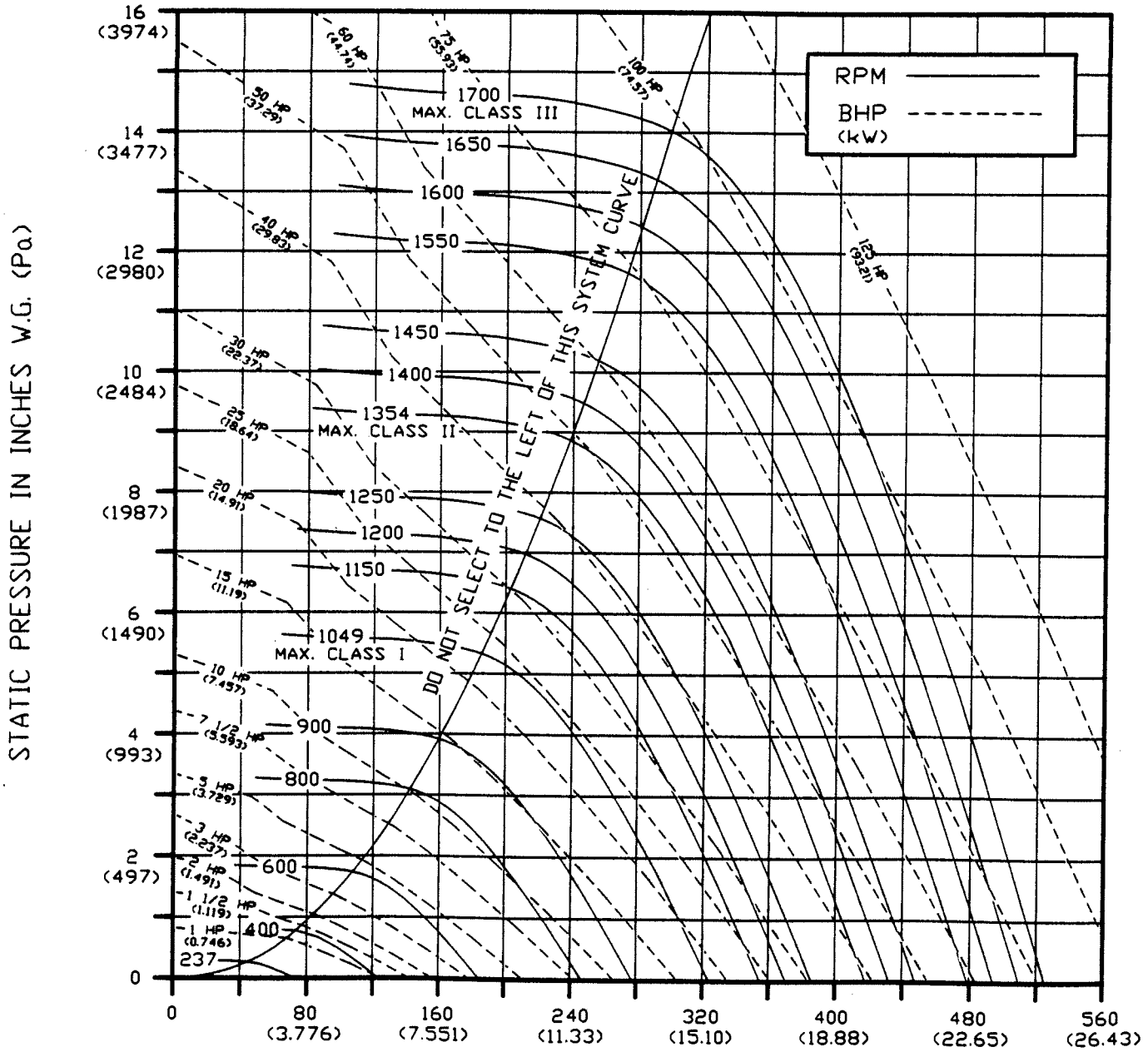
Wheel Diameter	**36.5 inches**	**927 mm**
Wheel Circumference	**9.56 feet**	**2.914 m**
Inlet Diameter/ Area	**49.0625 inches/ 13.1 ft²**	**1246 mm/ 1.217 m²**
Outlet Diameter/ Area	**49.0625 inches/ 13.1 ft²**	**1246 mm/ 1.217 m²**
Tip Speed	**9.55 x (RPM) ft/min**	**2.911 x (RPM) m/min**
Maximum BHP	**10.75 x (RPM/1000)³ BHP**	**8.016 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL40A

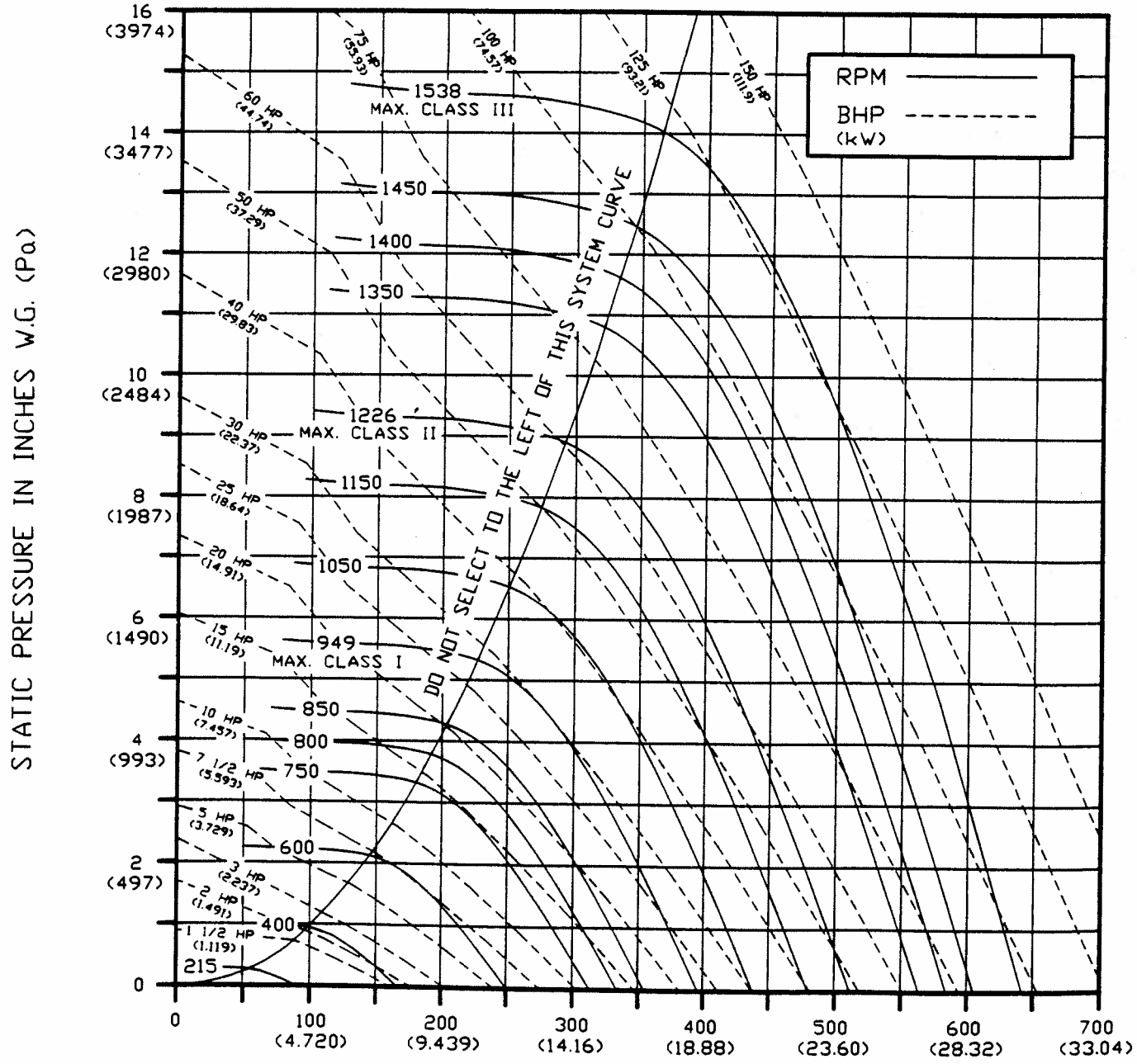
Wheel Diameter	**40.25 inches**	**1022 mm**
Wheel Circumference	**10.5 feet**	**3.20 m**
Inlet Diameter/ Area	**54.3125 inches/ 16.1 ft²**	**1380 mm/ 1.496 m²**
Outlet Diameter/ Area	**54.3125 inches/ 16.1 ft²**	**1380 mm/ 1.496 m²**
Tip Speed	**10.5 x (RPM) ft/min**	**3.20 x (RPM) m/min**
Maximum BHP	**17.49 x (RPM/1000)³ BHP**	**13.04 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL45A

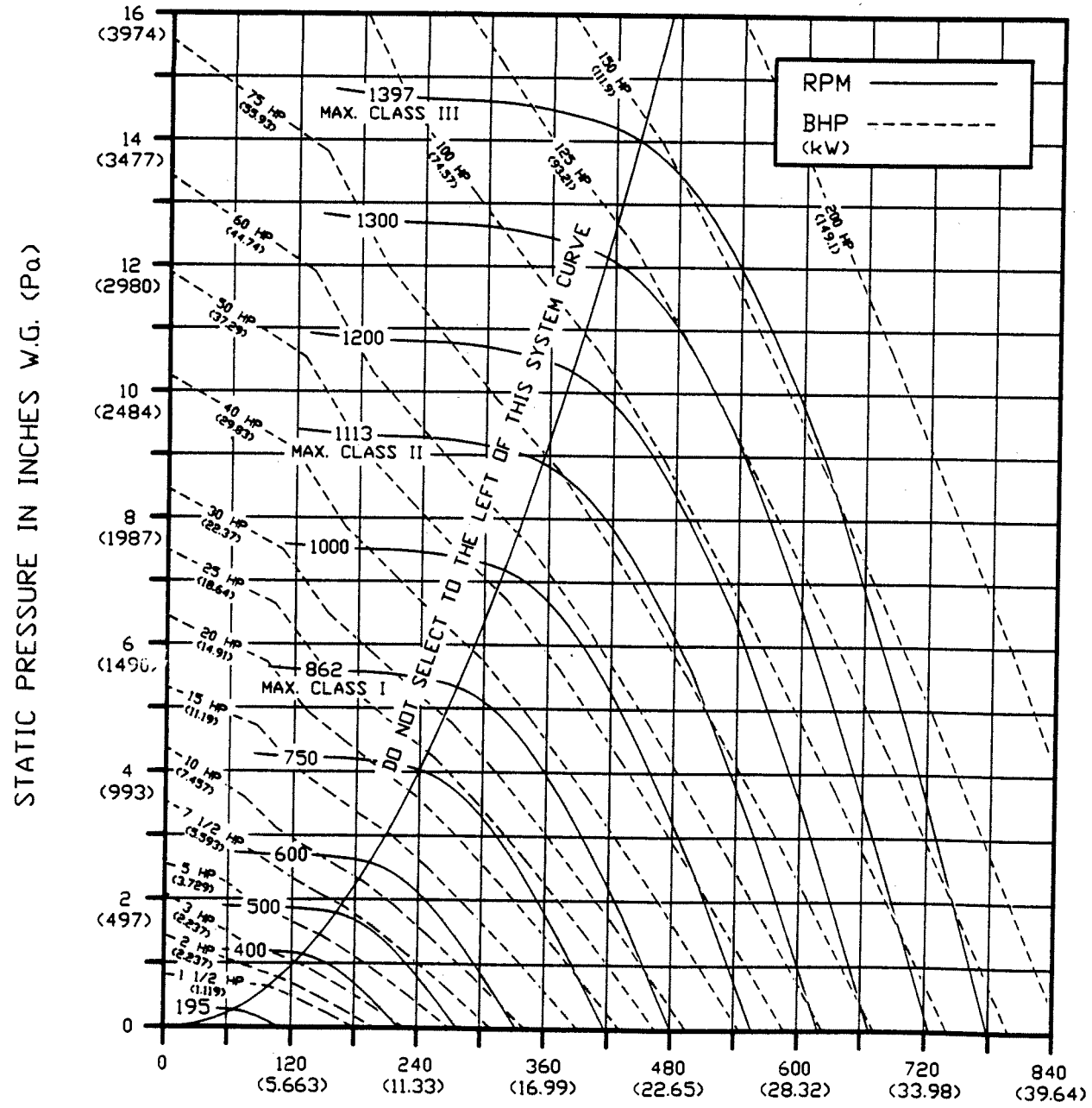
Wheel Diameter	**44.5 inches**	**1130 mm**
Wheel Circumference	**11.7 feet**	**3.566 m**
Inlet Diameter/ Area	**60.375 inches/ 19.9 ft²**	**1534 mm/ 1.849 m²**
Outlet Diameter/ Area	**60.375 inches/ 19.9 ft²**	**1534 mm/ 1.849 m²**
Tip Speed	**11.7 x (RPM) ft/min**	**3.566 x (RPM) m/min**
Maximum BHP	**28.86 x (RPM/1000)³ BHP**	**21.52 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL49A

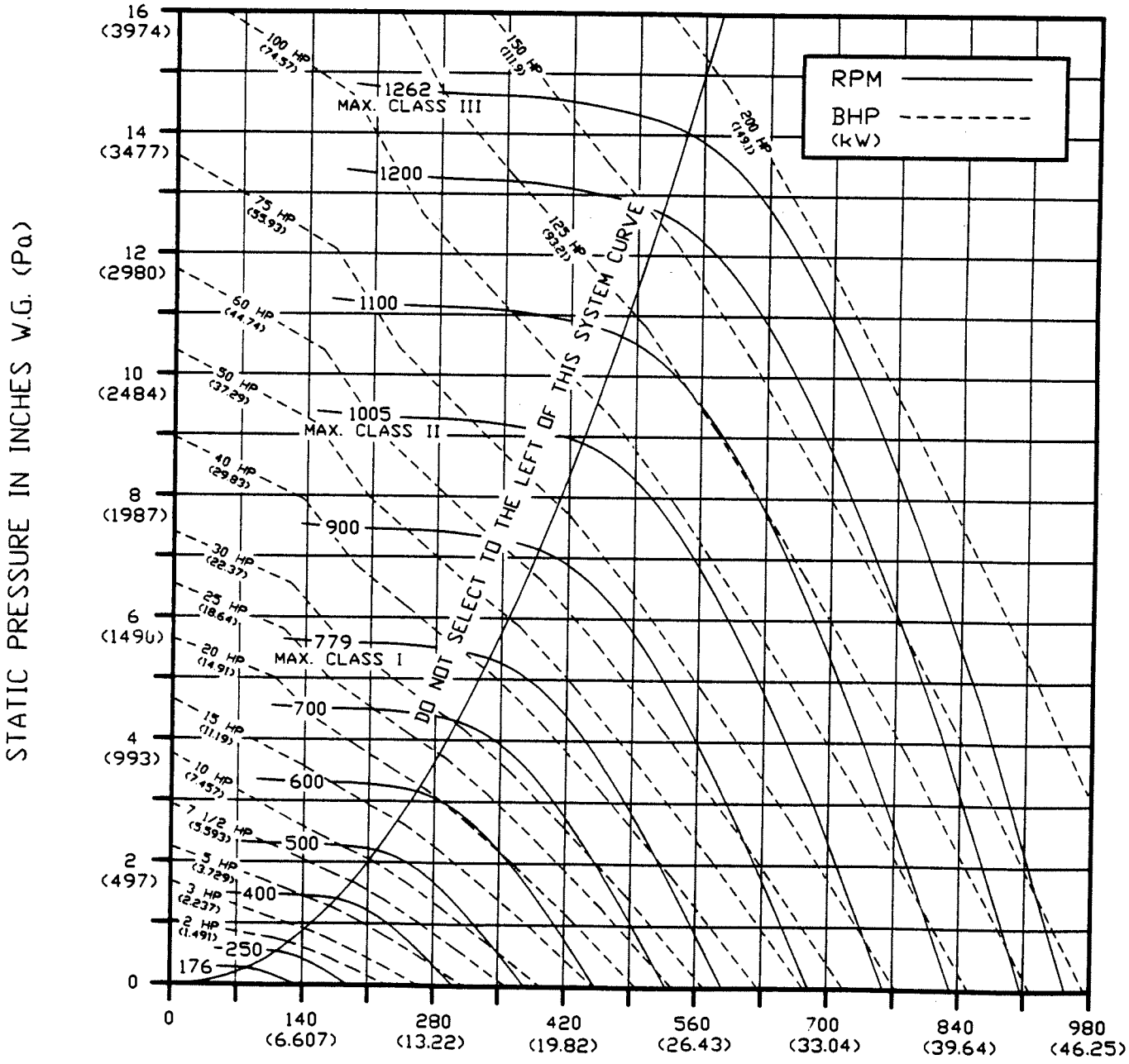
Wheel Diameter	**49 inches**	**1245 mm**
Wheel Circumference	**12.9 feet**	**3.932 m**
Inlet Diameter/ Area	**66.25 inches/ 23.9 ft²**	**1683 mm/ 2.22 m²**
Outlet Diameter/ Area	**66.25 inches/ 23.9 ft²**	**1683 mm/ 2.22 m²**
Tip Speed	**12.9 x (RPM) ft/min**	**3.932 x (RPM) m/min**
Maximum BHP	**46.74 x (RPM/1000)³ BHP**	**34.85 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL54A

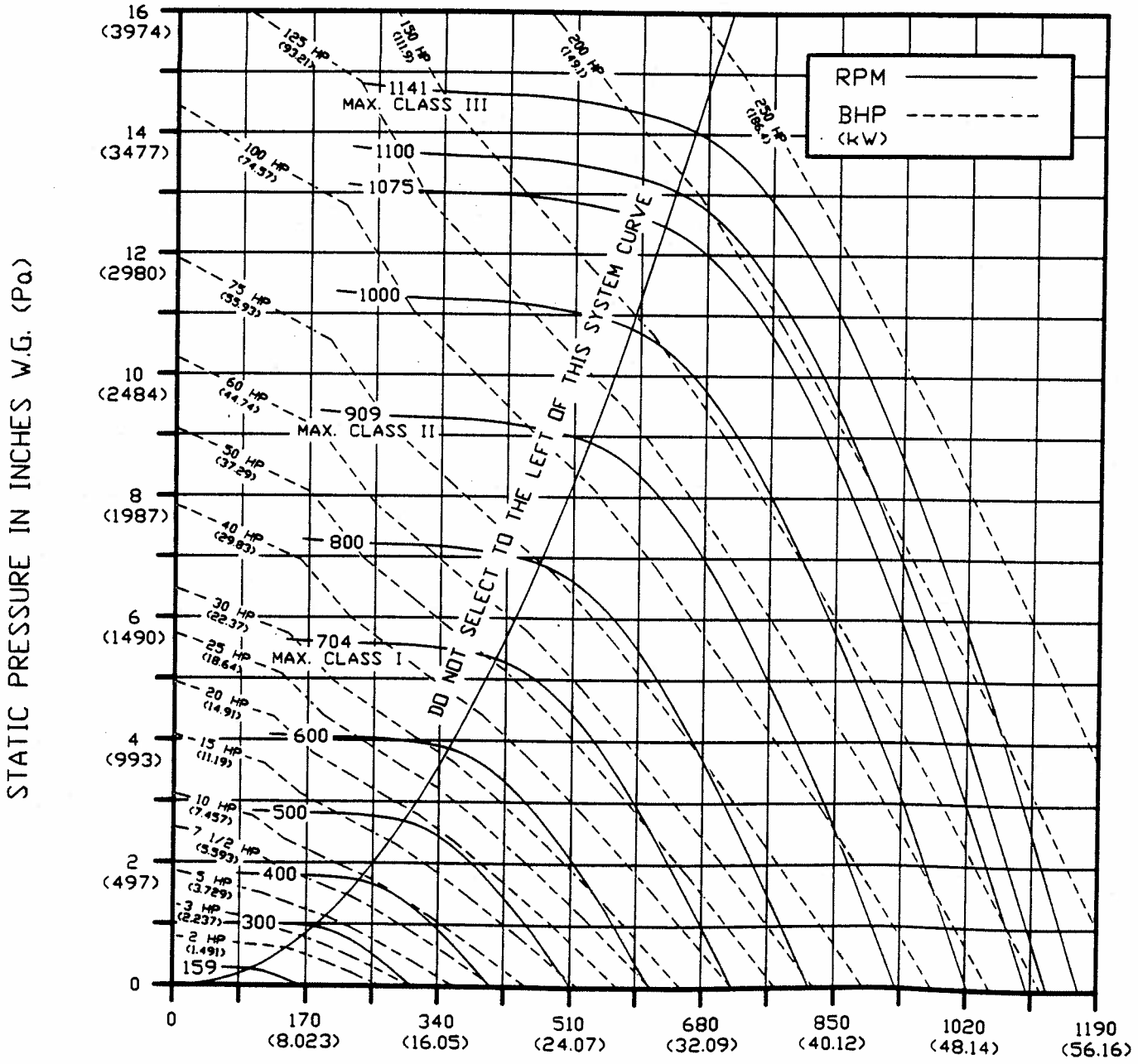
Wheel Diameter	**54.25 inches**	**1378 mm**
Wheel Circumference	**14.2 feet**	**4.328 m**
Inlet Diameter/ Area	**72.375 inches/ 28.6 ft²**	**1838 mm/ 2.657 m²**
Outlet Diameter/ Area	**72.375 inches/ 28.6 ft²**	**1838 mm/ 2.657 m²**
Tip Speed	**14.2 x (RPM) ft/min**	**4.328 x (RPM) m/min**
Maximum BHP	**78.2 x (RPM/1000)³ BHP**	**58.31 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL60A

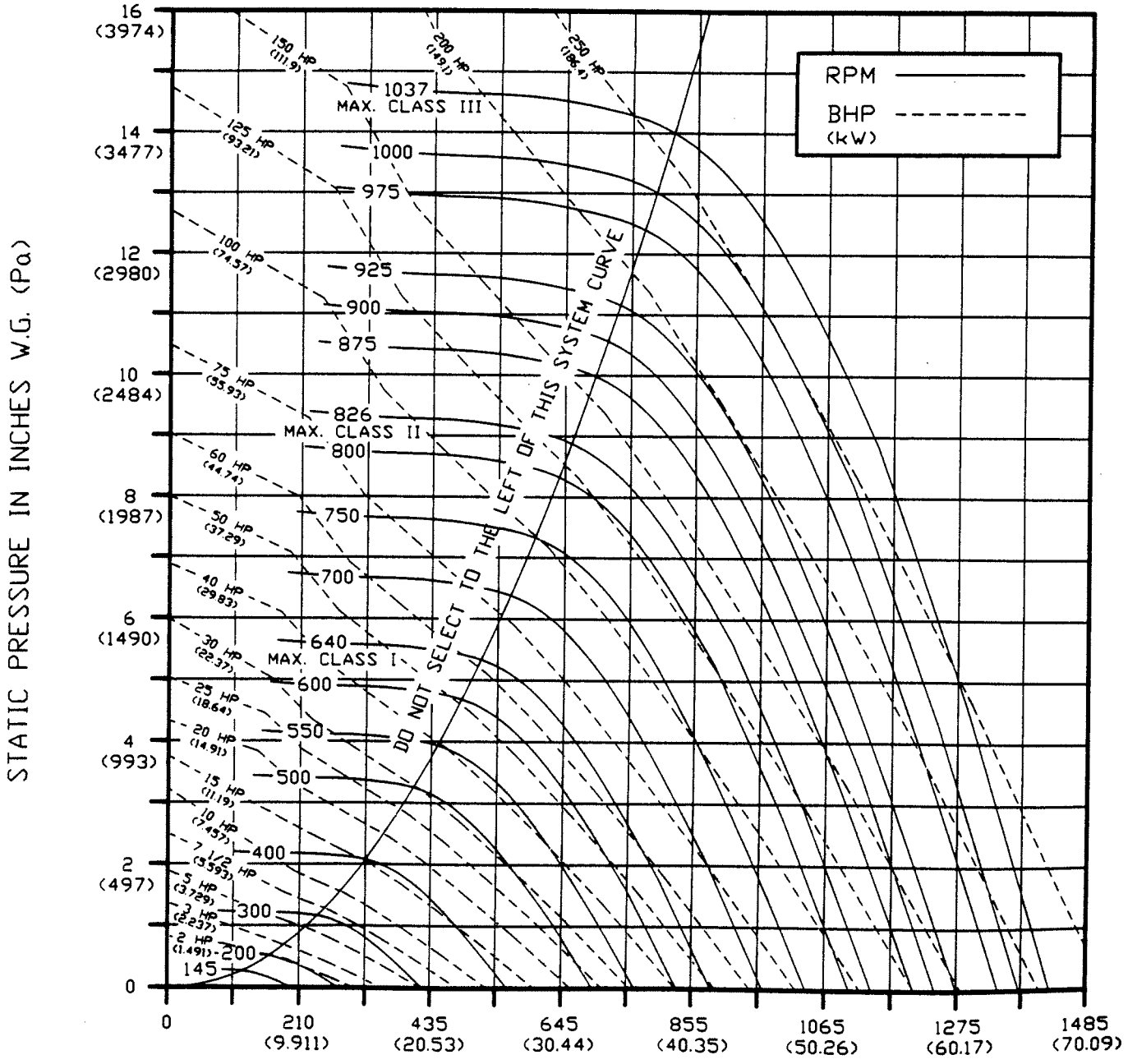
Wheel Diameter	**60 inches**	**1524 mm**
Wheel Circumference	**15.7 feet**	**4.785 m**
Inlet Diameter/ Area	**80.75 inches/ 35.6 ft²**	**2051 mm/ 3.307m²**
Outlet Diameter/ Area	**80.75 inches/ 35.6 ft²**	**2051 mm/ 3.307 m²**
Tip Speed	**15.7 x (RPM) ft/min**	**4.785 x (RPM) m/min**
Maximum BHP	**129.2 x (RPM/1000)³ BHP**	**96.34 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL66A

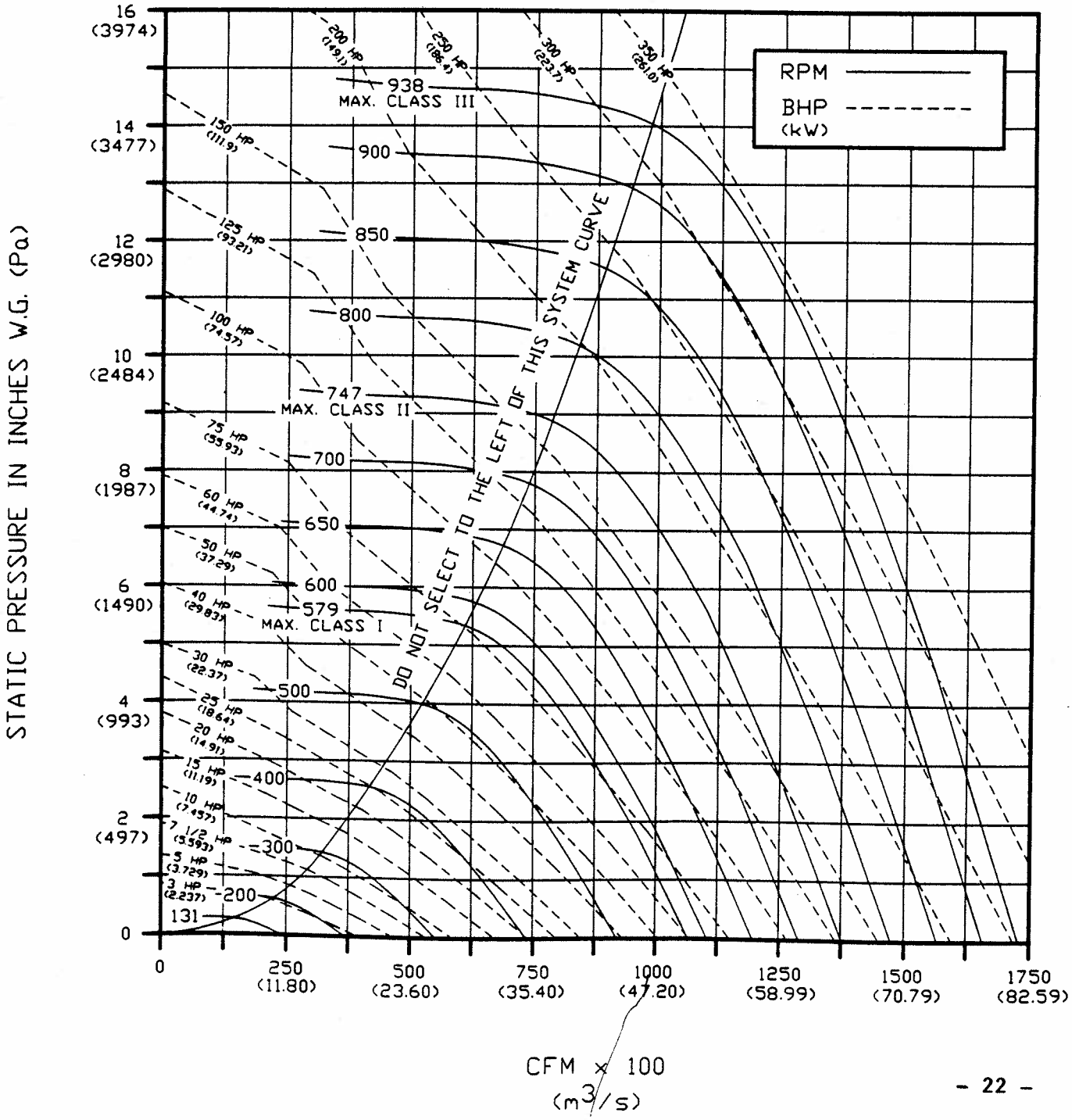
Wheel Diameter	**66 inches**	**1676 mm**
Wheel Circumference	**17.3 feet**	**5.273 m**
Inlet Diameter/ Area	**88.625 inches/ 42.9 ft²**	**2251 mm/ 3.985m²**
Outlet Diameter/ Area	**88.625 inches/ 42.9 ft²**	**2251 mm/ 3.985 m²**
Tip Speed	**17.3 x (RPM) ft/min**	**5.273 x (RPM) m/min**
Maximum BHP	**207.7 x (RPM/1000)³ BHP**	**154.9 x(RPM/1000)KW**



Series ILA In Line Centrifugal

Size IL73A

Wheel Diameter	**73 inches**	**1854 mm**
Wheel Circumference	**19.1 feet**	**5.822 m**
Inlet Diameter/ Area	**98 inches/ 52.4 ft²**	**2489 mm/ 4.868m²**
Outlet Diameter/ Area	**98 inches/ 52.4 ft²**	**2489 mm/ 4.868 m²**
Tip Speed	**19.1 x (RPM) ft/min**	**5.822 x (RPM) m/min**
Maximum BHP	**343.9 x (RPM/1000)³ BHP**	**256.4 x(RPM/1000)KW**

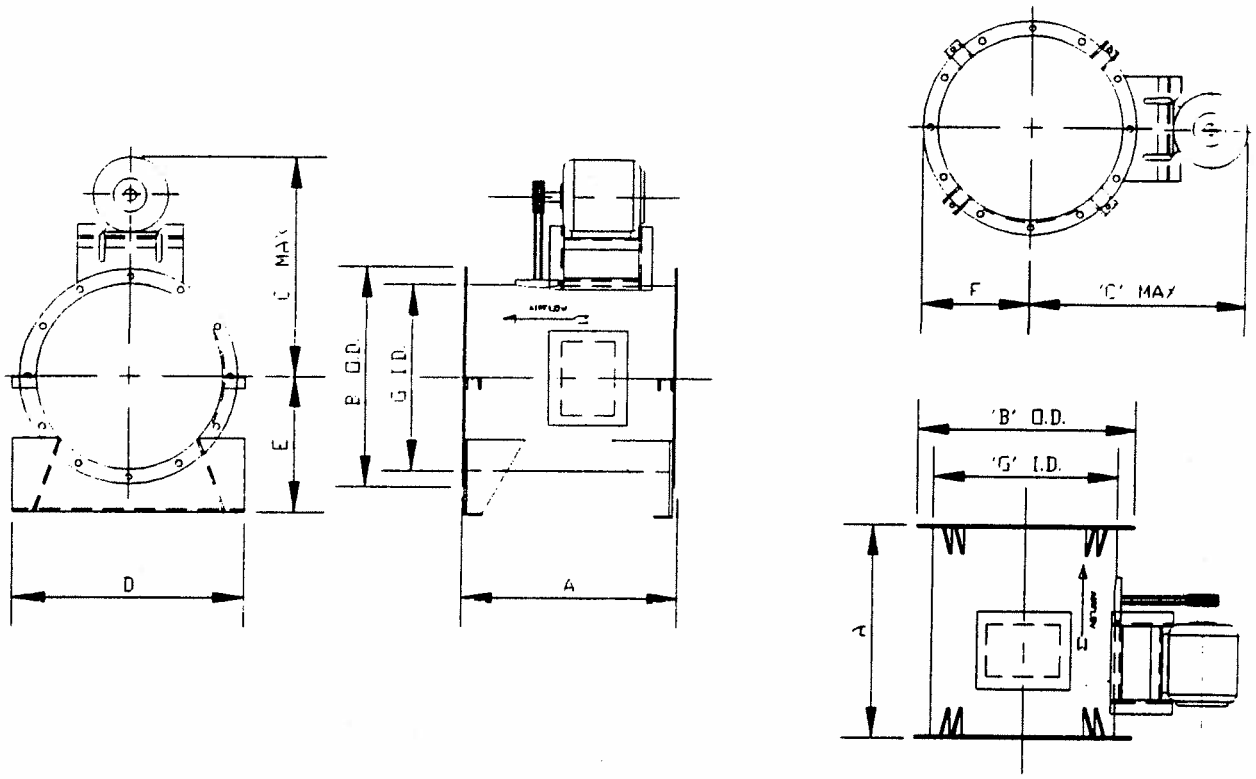


Series ILA In Line Centrifugal

Dimensional Data

Sizes IL15 A- IL73A

Arrangement 9



Size	A	B	C	D	E	F	G	Est.Wt. Class 1	Est. Wt. Class 2	Est Wt. Class 3
	Ins	Ins	Ins	Ins	Ins	Ins	Ins	lb	lb	lb
15	23.31	23.38	30.00	25.00	14.69	11.69	20.19	180	200	225
18	28.31	27.75	36.00	26.50	16.81	13.88	24.56	240	260	280
20	31.00	30.13	37.00	26.50	18.13	15.07	26.92	285	330	385
22	34.56	33.13	39.00	33.25	19.63	16.57	29.95	345	365	430
24	38.06	36.19	42.00	35.50	21.63	18.10	32.97	425	450	480
27	41.88	39.56	44.00	36.00	23.38	19.78	36.34	525	550	595
30	46.56	43.56	46.00	42.50	25.25	21.78	40.38	660	685	705
33	51.19	47.69	51.00	45.00	27.38	23.85	44.41	820	860	905
37	56.63	53.44	54.00	46.25	29.63	26.72	49.13	1035	1075	1130
40	62.50	58.56	57.00	48.25	32.25	29.28	54.26	1390	1460	1575
45	69.06	65.25	63.00	64.00	35.88	32.63	59.98	1815	1890	2005
49	76.13	71.44	66.00	66.00	38.81	35.72	66.05	2275	2390	2560
54	84.25	78.50	69.00	68.00	41.88	39.25	73.11	3050	3205	3430
60	93.19	86.26	73.00	71.50	46.06	43.13	80.87	3990	4270	4525
66	102.44	94.31	77.00	100.00	50.00	47.16	88.96	4975	5275	5590
73	113.31	103.75	82.00	101.00	54.69	51.88	98.39	6115	6420	6740

Data shown on this page is for general information only and should not be used for exact installation dimensions. For detailed dimensional data refer to the appropriate submittal drawings. For arrangements other then Arr.9 apply to the factory for the appropriate submittal print.