

# “A” Series Wheel & Housing

---

## Product Specification Sheet Number: 318

### Notes:

- Shaded areas indicate Lau preferred product. Selections in non -shaded areas and optional features may affect price and availability.
- Product weights may vary with bore size and hub style.
- Solid style hubs are available for most diameters. (Ref. spec sheet #500)
- Clamplok style hubs are available for most diameters. (Ref. spec sheet #500)
- Wheel moment of inertia may vary with bore size and hub style.

$$\frac{wk^2}{32.2} = (\text{Lb} - \text{Ft} - \text{Sec}^2)$$

- Blast area:

$$\text{BA} = \frac{\text{M}}{\text{E}} \times (\text{Outlet Area})$$

Dimensions shown are for reference only. For certified product dimensions contact Lau Engineering.

- Contact Lau for application assistance
- Outlet Velocity:

$$\text{FPM} = \frac{\text{CFM}}{\text{O. A.}}$$

- \*\*For weight on braced wheel, multiply unbraced wheel weight by 1.04 on 9" thru 15" units and 1.07 on 18" and 20" wheels. Correct wheel and housing weight accordingly.

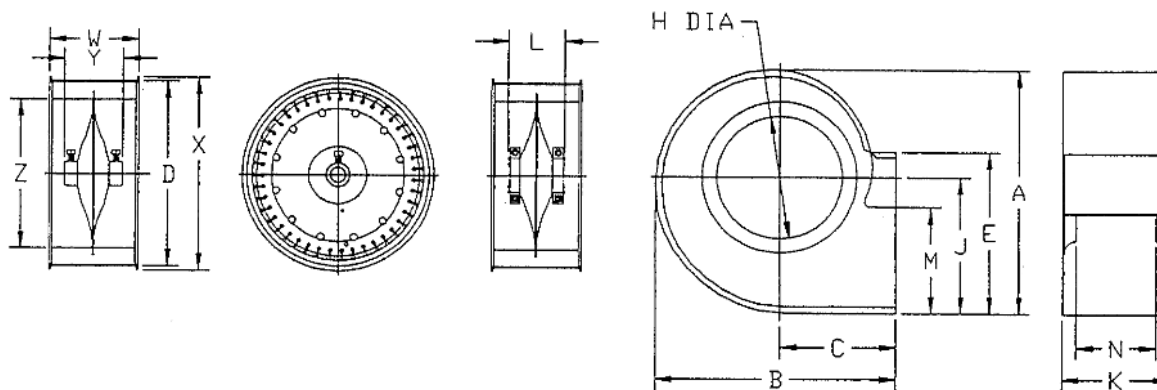
| No. Blades |    |     |     |     |     |     |
|------------|----|-----|-----|-----|-----|-----|
| Dia.       | 9" | 10" | 12" | 15" | 18" | 20" |
| Qty.       | 43 | 48  | 43  | 51  | 48  | 53  |

HSG- PTO/GALV

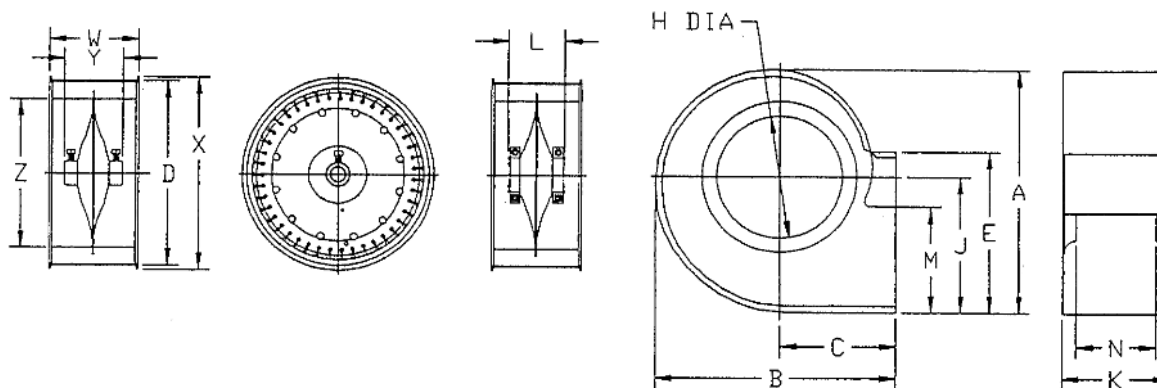
WHL -GALV

## DIMENSIONS IN INCHES

| Model   | A     | B     | C    | D     | E     | H     | J     | K     | L<br>MAX | M    | N     | W     | X     | Y<br>MAX | Z     | O.A<br>Sq.Ft | MAX CAGE RPM |        | W-K²<br>(Lb-Ft² ) | Wheel<br>wt (Lbs) | Unit<br>Wt. |
|---------|-------|-------|------|-------|-------|-------|-------|-------|----------|------|-------|-------|-------|----------|-------|--------------|--------------|--------|-------------------|-------------------|-------------|
|         |       |       |      |       |       |       |       |       |          |      |       |       |       |          |       |              | Unbraced     | Braced |                   |                   |             |
| A9-4A   | 15.44 | 14.94 | 7.19 | 9.50  | 10.25 | 7.81  | 8.62  | 6.81  | 3.75     | 6.31 | 5.00  | 4.50  | 9.94  | 3.44     | 7.69  | 0.48         | 5200         | NONE   | 0.35              | 3.4               | 9.2         |
| A9-6A   | 15.44 | 14.94 | 7.19 | 9.50  | 10.25 | 7.81  | 8.62  | 8.25  | 3.75     | 6.31 | 6.44  | 6.00  | 9.94  | 3.44     | 7.69  | 0.58         | 4000         | NONE   | 0.37              | 4                 | 10.35       |
| A9-7A   | 15.44 | 14.94 | 7.19 | 9.50  | 10.25 | 7.81  | 8.62  | 9.19  | 3.75     | 6.31 | 7.38  | 7.12  | 9.94  | 3.44     | 7.69  | 0.65         | 3300         | NONE   | 0.44              | 4.5               | 11.2        |
| A9-8A   | 15.44 | 14.94 | 7.19 | 9.50  | 10.25 | 7.81  | 8.62  | 10.50 | 3.75     | 6.31 | 8.69  | 8.00  | 9.94  | 3.44     | 7.69  | 0.75         | 2700         | NONE   | 0.49              | 4.85              | 12.04       |
| A9-9A   | 15.44 | 14.94 | 7.19 | 9.50  | 10.25 | 7.81  | 8.62  | 11.81 | 3.75     | 6.31 | 10.00 | 9.50  | 9.94  | 3.44     | 7.69  | 0.83         | 2400         | 2950   | 0.59              | 5.45              | 13.17       |
| A9-10A  | 15.44 | 14.94 | 7.19 | 9.50  | 10.25 | 7.81  | 8.62  | 13.12 | 3.75     | 6.31 | 11.31 | 10.62 | 9.94  | 3.44     | 7.69  | 0.93         | 2200         | NONE   | 0.62              | 5.9               | 14.17       |
| A10-4A  | 17.38 | 16.56 | 7.94 | 10.62 | 11.38 | 8.81  | 9.69  | 6.81  | 4.12     | 7.00 | 4.75  | 4.50  | 11.12 | 3.78     | 8.88  | 0.53         | 5000         | NONE   | 0.53              | 3.45              | 10.81       |
| A10-6A  | 17.38 | 16.56 | 7.94 | 10.62 | 11.38 | 8.81  | 9.69  | 8.25  | 4.12     | 7.00 | 6.19  | 6     | 11.12 | 3.78     | 8.88  | 0.65         | 3900         | NONE   | 0.54              | 4.65              | 12.1        |
| A10-7A  | 17.38 | 16.56 | 7.94 | 10.62 | 11.38 | 8.81  | 9.69  | 9.69  | 4.12     | 7.00 | 7.62  | 7.12  | 11.12 | 3.78     | 8.88  | 0.77         | 3100         | NONE   | 0.68              | 5.45              | 13.5        |
| A10-8A  | 17.38 | 16.56 | 7.94 | 10.62 | 11.38 | 8.81  | 9.69  | 10.50 | 4.12     | 7.00 | 8.44  | 8     | 11.12 | 3.78     | 8.88  | 0.81         | 3000         | NONE   | 0.77              | 5.6               | 14.03       |
| A10-9A  | 17.38 | 16.56 | 7.94 | 10.62 | 11.38 | 8.81  | 9.69  | 12.25 | 4.12     | 7.00 | 10.19 | 9.5   | 11.12 | 3.78     | 8.88  | 0.97         | 2300         | NONE   | 0.81              | 6.3               | 15.47       |
| A10-10A | 17.38 | 16.56 | 7.94 | 10.62 | 11.38 | 8.81  | 9.69  | 13.12 | 4.12     | 7.00 | 11.06 | 10.62 | 11.12 | 3.78     | 8.88  | 1.02         | 2100         | 2550   | 0.96              | 6.8               | 16.35       |
| A12-6A  | 20.38 | 19.38 | 9.13 | 12.62 | 13.44 | 10.38 | 11.50 | 8.81  | 4.75     | 8.38 | 6.50  | 6     | 13.19 | 3.88     | 10.31 | 0.82         | 3800         | NONE   | 1.12              | 6.85              | 17.44       |
| A12-8A  | 20.38 | 19.38 | 9.13 | 12.62 | 13.44 | 10.38 | 11.50 | 10.75 | 4.75     | 8.38 | 8.44  | 8     | 13.19 | 3.88     | 10.31 | 1            | 2900         | NONE   | 1.23              | 7.75              | 19.05       |
| A12-9A  | 20.38 | 19.38 | 9.13 | 12.62 | 13.44 | 10.38 | 11.50 | 12.25 | 4.75     | 8.38 | 9.94  | 9.5   | 13.19 | 3.88     | 10.31 | 1.13         | 2500         | NONE   | 1.28              | 8.55              | 20.9        |
| A12-11A | 20.38 | 19.38 | 9.13 | 12.62 | 13.44 | 10.38 | 11.50 | 14.69 | 4.75     | 8.38 | 12.38 | 11.12 | 13.19 | 3.88     | 10.31 | 1.37         | 2000         | 2100   | 1.63              | 9.55              | 23.09       |
| A12-12A | 20.38 | 19.38 | 9.13 | 12.62 | 13.44 | 10.38 | 11.50 | 15.62 | 4.75     | 8.38 | 13.31 | 12.62 | 13.19 | 3.88     | 10.31 | 1.44         | 1800         | 2100   | 1.79              | 10.25             | 34.25       |
| A12-15A | 20.38 | 19.38 | 9.13 | 12.62 | 13.44 | 10.38 | 11.50 | 18.62 | 4.75     | 8.38 | 16.31 | 15    | 13.19 | 3.88     | 10.31 | 1.74         | 1100         | NONE   | 2.29              | 12.8              | 28.1        |



| Model   | A     | B     | C     | D     | E     | H     | J     | K     | L<br>MAX | M     | N     | W     | X     | Y<br>MAX | Z     | O.A<br>Sq.Ft | MAX CAGE RPM |        | W-K2<br>Lb-Ft2 | Wheel<br>wt (Lbs) | Unit<br>Wt. |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|----------|-------|--------------|--------------|--------|----------------|-------------------|-------------|
|         |       |       |       |       |       |       |       |       |          |       |       |       |       |          |       |              | Unbraced     | Braced |                |                   |             |
| A 16-6A | 24.25 | 22.69 | 10.50 | 15.00 | 15.88 | 12.62 | 13.56 | 9.19  | 5.38     | 9.69  | 6.44  | 6.00  | 15.50 | 4.50     | 12.62 | 1.02         | 3500         | NONE   | 2.24           | 8.10              | 24.49       |
| A15-9A  | 24.25 | 22.69 | 10.50 | 15.00 | 15.88 | 12.62 | 13.56 | 12.81 | 5.38     | 9.69  | 10.06 | 9.50  | 15.50 | 4.50     | 12.62 | 1.41         | 2500         | NONE   | 3.08           | 11.10             | 30.07       |
| A15-11A | 24.25 | 22.69 | 10.50 | 15.00 | 15.88 | 12.62 | 13.56 | 14.69 | 5.38     | 9.69  | 11.94 | 11.12 | 15.50 | 4.50     | 12.62 | 1.59         | 2100         | NONE   | 3.36           | 12.10             | 32.93       |
| A15-12A | 24.25 | 22.69 | 10.50 | 15.00 | 15.88 | 12.62 | 13.56 | 16.00 | 5.38     | 9.69  | 13.25 | 12.62 | 15.50 | 4.50     | 12.62 | 1.76         | 1900         | NONE   | 3.49           | 12.60             | 33.54       |
| A15-15A | 24.25 | 22.69 | 10.50 | 15.00 | 15.88 | 12.62 | 13.56 | 18.62 | 5.38     | 9.69  | 15.88 | 15.00 | 15.50 | 4.50     | 12.62 | 2.01         | 1550         | 1750   | 4.49           | 16.20             | 38.33       |
| A18-9A  | 29.19 | 27.00 | 12.38 | 18.03 | 18.88 | 15.50 | 16.31 | 12.88 | 6.25     | 11.75 | 9.50  | 9.00  | 18.54 | 5.38     | 14.62 | 1.68         | 1600         | NONE   | 8.05           | 19.00             | 47.04       |
| A18-13A | 29.19 | 27.00 | 12.38 | 18.03 | 18.88 | 15.50 | 16.31 | 17.38 | 6.25     | 11.75 | 14.00 | 13.50 | 18.54 | 5.38     | 14.62 | 2.28         | 1500         | NONE   | 11.48          | 27.10             | 58.96       |
| A18-15A | 29.19 | 27.00 | 12.38 | 18.03 | 18.88 | 15.50 | 16.31 | 18.88 | 6.25     | 11.75 | 15.50 | 15.00 | 18.54 | 5.38     | 14.62 | 2.47         | 1400         | 1650   | 12.54          | 29.60             | 64.75       |
| A18-18A | 29.19 | 27.00 | 12.38 | 18.03 | 18.88 | 15.50 | 16.31 | 21.88 | 6.25     | 11.75 | 18.50 | 18.00 | 18.54 | 5.38     | 14.62 | 2.87         | 1200         | 1450   | 13.56          | 32.00             | 67.69       |
| A20-9A  | 35.75 | 32.34 | 14.44 | 20.00 | 24.75 | 16.25 | 20.53 | 13.75 | 6.25     | 14.00 | 9.69  | 9.00  | 20.50 | 5.38     | 16.56 | 2.36         | 1300         | NONE   | 11.85          | 27.00             | 73.44       |
| A20-13A | 35.75 | 32.34 | 14.44 | 20.00 | 24.75 | 16.25 | 20.53 | 18.25 | 6.25     | 14.00 | 14.19 | 13.50 | 20.50 | 5.38     | 16.56 | 3.14         | 1300         | NONE   | 14.93          | 34.00             | 85.96       |
| A20-15A | 35.75 | 32.34 | 14.44 | 20.00 | 24.75 | 16.25 | 20.53 | 19.75 | 6.25     | 14.00 | 15.69 | 15.00 | 20.50 | 5.38     | 16.56 | 3.39         | 1200         | 1400   | 16.47          | 37.50             | 92.22       |
| A20-18A | 35.75 | 32.34 | 14.44 | 20.00 | 24.75 | 16.25 | 20.53 | 22.75 | 6.25     | 14.00 | 18.69 | 18.00 | 20.50 | 5.38     | 16.56 | 3.91         | 1100         | 1300   | 18.44          | 42.00             | 100.87      |



## WHEEL SELECTION PROCEDURE:

There are a number of factors that need to be considered for specification of the proper "A" Series wheels & Housings for your application. The following procedures outline the factors that need to be considered in the wheel selection process.

## PERFORMANCE:

Using the multispeed catalog or ELEMENT selection software performance curves for the "A" Series wheels & Housings, select the wheel diameter and width that provide the performance required. The selection should be made in the efficient operating range shown on the curves. From the curve determine the speed and brake horsepower required. Required fan speed should not exceed MAXIMUM CAGE RPM as shown in table for the wheel size selected. Performance curves are based on tests in the Lau Standard housing with outlet duct. Brake horsepower does not include drive losses.

## HUB BORE SIZE:

The hub bore size and type must selected so that the starting torque experienced by the wheel does not exceed the maximum torque capability of the hub. (See Spec. Sheet #500).

Based on the nominal motor horsepower selected for the application, calculate the fan starting torque at the hub by the following equation:

K = 3 for one wheel on shaft.

K = 1.8 for two wheels on shaft.

K = 1.2 for two wheels on shaft.

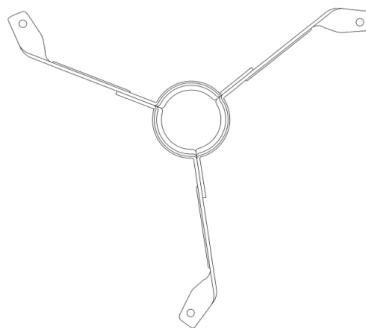
$$\text{Starting Torque (lb. -ft.)} = \frac{\text{Motor Horsepower} \times 5252}{\text{Fan RPM}} \times K$$

Note: K in above equation is based on NEMA Design B motors. Contact Lau if other than design B motor is used.

Based on calculated starting torque, select hub type and bore from hub selection table that has torque capability that equals or exceeds calculated torque.

## ROTOR CRITICAL SPEED:

The shaft size selected from the starting torque procedures needs to be checked to ensure that the shaft natural frequency occurs at an RPM that is a minimum of 20% greater than the fan running RPM. The rotor critical speed is dependent on the wheel weight, shaft weight, driven pulley weight, the shaft length, span between bearings and location of the wheel(S) and pulley on the shaft. See the Miscellaneous Section of the Lau Engineering Manual for "Calculating Blower Shaft Diameter".



When two or more wheels are used on a common shaft, the torsional stiffness and torsional natural frequency should also be determined to select shaft size. The actual shaft size required for the application is the larger of the shaft sizes determined from the starting torque or natural frequency calculations.

**BEARING LIFE:**

Bearing Life calculations should be made to ensure that required bearing life expectancy is obtained. Contact your bearing manufacture for assistance in determining bearing life. Quite often stepped or tubular shafts should be considered since shaft size determined from previous steps may be substantially larger than that required for adequate bearing life.

**FEATURES:**

**BALANCE:**

Lau “A” Series wheels & Housing are statistically and dynamically balanced in accordance with 1989 ARI Guideline G and ANSI S2.19 – 1986.

**FINISH:**

Lau “A” Series GALV & PTD are finished with medium grey enamel paint. Contact Lau regarding operation at higher temperatures.

**MAXIMUM TEMPERATURES:**

The Blower air inlet temperature should not exceed 82°C (180° F). Contact Lau regarding operation at higher temperatures.

**ASSISTANCE:**

Please feel free to contact Lau for assistance in selecting “A” Series Wheels & Housings