

MODEL 133

MODELS 134 & 135

# **AURORA**<sup>®</sup> 130 SERIES SINGLE STAGE TURBINE TYPE PUMPS

# AURORA® 130 SERIES

## Single Stage Turbine Type Pumps

Capacities to 50 G.P.M.  
Heads to 700 Ft.  
Temperatures to 212°F

### A Pioneer in Turbine Pump Design

Aurora consistently offers the ultimate in turbine pump design. The regenerative turbine pump offers many advantages in the area of low flow and moderate to high pressure. A turbine pump is efficient under low flow, high-pressure conditions and delivers a steady stream of liquid free from pressure pulsations. There is no metal-to-metal contact existing within the operating parts of a turbine pump channel. Turbine pumps have solved many liquid-handling problems. Because of this versatility, thousands of turbine pump units have been in use for over 50 years. Aurora offers an efficient, economical and proven pump.



### Three Reasons to Choose the 130 Series

#### They're Economical

End-mounted, close-coupled design with single mechanical seal and choice of 3500 RPM or 1750 RPM operating speeds means you get greater capacity and pressure, dollar for dollar. In fact, these close-coupled pumps are so economical, it's practical to have a spare unit ready for immediate replacement when maintenance is required.

#### They Can't Vapor Lock

Turbine impeller handles gases and vapors (up to 20%) along with the liquid, eliminating any possibility of vapor lock within the pump.

#### They're Versatile

Steep head curves with near-constant capacity over wide head variations means you can specify a 130 Series pump for an extremely wide range of operating conditions. If necessary, Models 134 and 135 can be easily field converted to right-or left-handed operation by rotating the casing 180° after removing only four mounting bolts. Need a self-priming pump? Specify Model 133, a popular pump selection due to its self-priming feature. Aurora responds to users' needs.

## Quick Reference Feature Selector

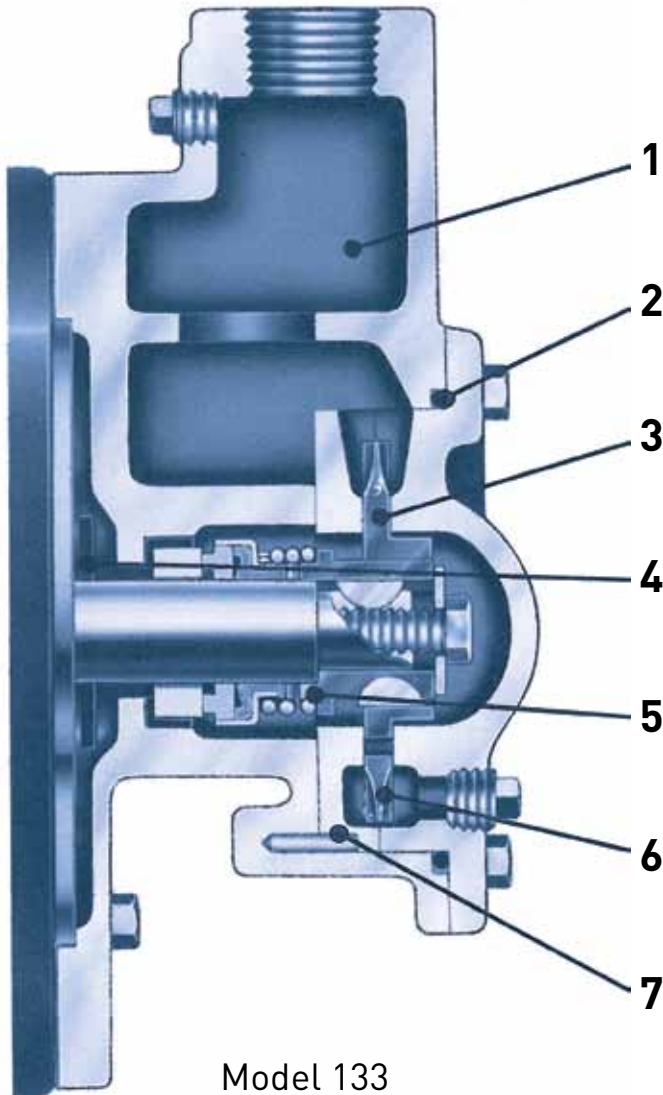
### STANDARD

- Bronze fitted construction
- Hydraulically balanced bronze impeller
- 300# case working pressure
- 416 stainless steel shaft
- Internal sealing water passages
- Removable channel rings
- VIP-TEST – Every pump is hydrostatically tested and given a running check consisting of head and capacity

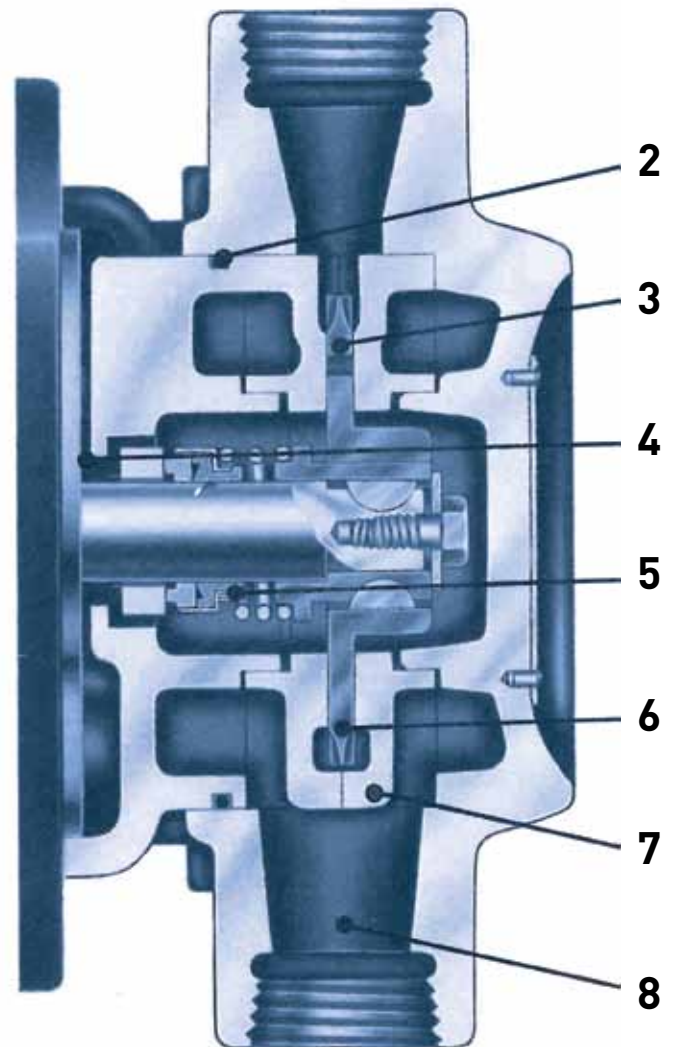
### OPTIONAL

- All iron, bronze ring, all bronze construction
- Ductile iron or stainless steel impeller
- 316 stainless steel or Monel® shaft
- Vertical ASA Flanged suction casing (Models 134 and 135 only)
- Bypass with manual shut-off valves
- Bypass with relief valve
- Certified performance test data consisting of head capacity and horsepower readings taken over the full operating range of the pump

# Pump Features



Model 133



Model 134

- 1 Self-priming feature is provided on Model 133.
- 2 O-ring gaskets prevent leakage.
- 3 Self-centering impeller minimizes wear.
- 4 Water slingers protect bearings.
- 5 Mechanical seal has carbon against ceramic face for optimum hot water performance. Long life is also assured with 303 stainless steel metal parts and Buna-N elastomers.
- 6 Double suction impeller minimizes axial thrust.
- 7 Replaceable channel rings and impellers reduce maintenance costs.
- 8 Straight-through in-line piping is provided on Models 134 and 135 for simple installation.

# Principles of Operation

Turbine pumps derive their name from the many buckets machined into the periphery of the rotating impeller. They have long been recognized for their effectiveness in the areas of low flow, high head application. The turbine pump offers higher heads than centrifugal pumps. Because the head capacity curve is steep in a turbine pump, a greater degree of flexibility is available to the engineer. Turbine pumps having top centerline discharge are self-venting and have the ability to handle vapors without vapor lock. This characteristic allows handling of boiling liquids and liquefied gases at suction heads slightly over the vapor pressure. The turbine pump also has higher efficiencies at low flows than a centrifugal pump. Turbine pumps use close running clearances and are normally used on clean liquid applications. Viscous materials up to 500 S.S.U. can be pumped. Turbine pumps are unique in operation. The pumped liquid is directed by the liquid passage so that the liquid circulates in and out of the impeller buckets many times on its way from the pump inlet to

the pump outlet. Both centrifugal and shearing actions combine to impart additional energy to the liquid each time it passes through the buckets. Heads over 700 feet are successfully developed in a single stage pump. The impeller runs at very close axial clearances with the pump channel rings to minimize recirculation losses. The channel rings provide a circular channel around the blade area of the impeller, from the inlet to the outlet. Liquid entering the channel from the inlet is picked up immediately by the buckets on both sides of the impeller and pumped through the channel (Figure 1) by a shearing action. The flow of the liquid within the impeller buckets is illustrated in Figure 2. This process is repeated over and over, each cycle imparting more energy until the liquid is discharged. This flow is smooth and continuous. Turbine pumps are the most economical solution to general lift applications. Aurora Pump knows how to design and build an economical turbine pump without sacrificing quality or performance.

Figure 1

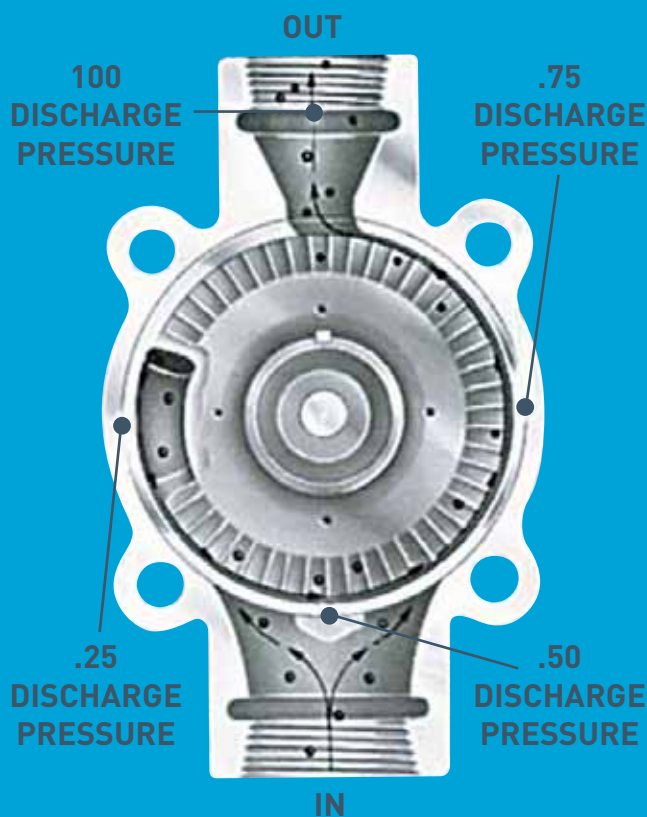
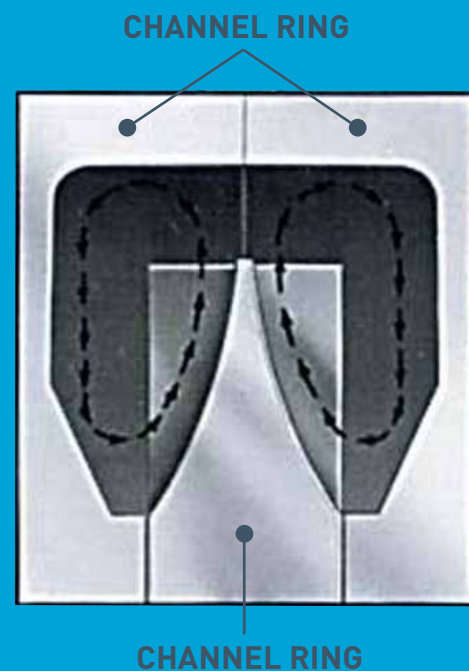


Figure 2



# Booster System Dimensions

Determine the pump capacity and discharge head. Find the nearest charted head under the Total Dynamic Head listing, select the desired motor speed, and head down to the next larger capacity closest to the calculated requirement. The figures and numbers identify the size of the pump and the motor horsepower.

**Horsepowers shown may not be non-overloading. Check performance curve for actual BHP.**

Selections are based on cold water with specific gravity of 1.0... for final selection refer to performance curves.

If fluctuation or increase in head is anticipated, the specific pump performance curve should be checked for final selection.

Pump Size	R.P.M.		TOTAL DYNAMIC HEAD																					
			10	20	30	40	50	60	70	80	90	100	150	200	250	300	350	400	450	500	550	600	650	
D03	3500	GPM	7.2	6.9	6.6	6.3	5.9	5.6	5.2	4.7	4.3	3.9	2.3	1.0										
		HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/2	3/4										
E03	3500	GPM	10.8	10.1	9.7	9.2	8.8	8.4	8.0	7.2	7.2	6.9	5.2	3.7	2.1									
		HP	1/3	1/3	1/3	1/3	1/3	1/2	1/2	1/2	1/2	1/2	3/4	1	1									
F03	3500	GPM	12.0	11.5	11.0	10.4	9.9	9.5	9.1	8.6	8.3	7.9	6.1	4.4	2.7									
		HP	1/3	1/3	1/3	1/3	1/2	1/2	1/2	1/2	3/4	3/4	3/4	1	1-1/2									
G03	3500	GPM	15.8	15.3	14.7	14.2	13.7	13.2	12.7	12.2	11.7	11.3	9.1	6.9	4.5	2.0								
		HP	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1	1-1/2	2	2								
B04	1750	GPM	3.8	3.5	3.2	2.8	2.5	2.2	1.8	1.5	1.1	0.7												
		HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3												
C04	3500	GPM	8.5	8.2	7.8	7.6	7.3	7.0	6.8	6.6	6.3	6.1	5.1	4.2	3.3	2.4	1.4							
		HP	1/3	1/3	1/3	1/3	1/3	1/3	1/2	1/2	1/2	1/3	3/4	3/4	1	1	1-1/2							
D04	1750	GPM	5.0	4.4	3.9	3.6	3.2	2.9	2.6	2.3	2.0	1.7												
		HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3												
E04	3500	GPM	10.6	10.2	9.9	9.6	9.4	9.1	8.8	8.5	8.3	8.1	6.9	5.8	4.8	3.8	2.8	1.9						
		HP	1/3	1/3	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	3/4	3/4	1	1	1-1/2	1-1/2						
F05	1750	GPM	6.6	6.2	5.7	5.2	4.7	4.2	3.6	3.0	2.4	1.8												
		HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3												
G05	3500	GPM	12.3	12.2	12.1	12.0	11.9	11.8	11.7	11.6	11.5	11.3	10.4	9.0	7.1	5.5	4.0	2.6						
		HP	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1	1	1-1/2	1-1/2	2	2						
H05	1750	GPM	8.2	7.6	7.1	6.6	6.3	6.0	5.6	5.4	5.1	4.8	3.4	2.0										
		HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/2	1/2	1/2	3/4										
I05	3500	GPM	16.5	16.3	16.0	15.7	15.5	15.3	15.0	14.7	14.4	14.2	13.0	11.9	10.8	9.8	9.0	8.0	7.1	6.3	5.5	4.6	3.8	
		HP	3/4	3/4	3/4	3/4	1	1	1	1	1	1	1-1/2	1-1/2	2	2	3	3	3	3	3	5	5	5
J05	1750	GPM	12.3	10.7	9.9	9.2	8.4	7.8	7.2	6.5	6.0	5.4	2.6											
		HP	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/2	1/2	1/2	3/4											
K05	3500	GPM	24.9	24.6	24.1	23.8	23.6	23.0	22.7	22.3	22.0	21.5	20.0	18.2	16.6	15.0	13.5	12.0	10.5	9.0	7.7	6.4	5.1	
		HP	2	2	2	2	2	2	2	2	3	3	3	3	3	5	5	5	5	5	7-1/2	10	10	
L05	1750	GPM	14.0	13.1	12.4	11.8	11.2	10.7	10.2	9.7	9.2	8.8	6.7	4.7	3.0									
		HP	1/3	1/3	1/3	1/3	1/3	1/2	1/2	3/4	3/4	3/4	1	1	1-1/2									
M05	3500	GPM	25.0	24.9	24.7	24.5	24.4	24.2	24.1	24.0	23.8	23.7	22.8	21.7	20.5	19.2	17.8	16.0	14.4	12.9	11.3	10.0	8.5	
		HP	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	2	2	2	3	3	5	5	5	5	7-1/2	10	10	10	
N05	1750	GPM	18.0	17.2	16.5	15.6	15.0	14.2	13.5	12.8	12.2	11.5	8.5	5.7	3.0									
		HP	1/3	1/3	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1-1/2	2									
O05	3500	GPM	31.3	31.2	31.1	31.1	31.0	30.9	30.8	30.7	30.6	30.5	29.8	28.5	26.8	25.0	23.2	21.5	19.8	18.1	16.5	14.9	13.2	
		HP	3	3	3	3	3	3	3	3	3	3	5	5	5	5	5	7-1/2	10	10	10	10	10	
P05	1750	GPM	24.4	23.7	22.6	21.5	20.3	19.2	18.1	17.0	15.6	14.5	8.4	2.2										
		HP	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1-1/2	1-1/2										
Q05	3500	GPM	38.4	38.3	38.2	38.1	38.1	38.0	37.9	37.8	37.8	37.2	36.5	35.0	32.8	30.3	27.5	24.5	21.3	18.0	14.5	11.0	15	
		HP	3	3	3	3	3	3	3	3	3	3	5	5	7-1/2	7-1/2	10	10	10	10	10	15		
R05	1750	GPM	30.1	29.0	28.0	26.9	25.8	24.6	23.5	22.2	21.0	19.8	12.7	5.0										
		HP	1/3	1/3	1/2	1/2	3/4	3/4	3/4	1	1	1	1-1/2	2										
S05	3500	GPM	43.7	43.6	43.6	43.5	43.5	43.4	43.4	43.3	43.3	43.2	42.9	42.3	41.7	40.9	39.0	36.0	32.7	29.1	25.7	22.0	18.0	
		HP	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	10	10	10	10	15	15	15	

# Engineering Specifications

The contractor shall furnish (and install as shown on the plans) an Aurora regenerative turbine type pump model \_\_\_\_\_ size \_\_\_\_\_ (Bronze Fitted) (All Iron) (All Bronze). Each pump shall have a capacity of \_\_\_\_\_ G.P.M. when operating at a total head of \_\_\_\_\_ feet. Pumping temperature is \_\_\_\_\_ °F. Specific gravity is \_\_\_\_\_. The fluid to be pumped is (describe) \_\_\_\_\_ and NPSH of \_\_\_\_\_. Suction pressure will be \_\_\_\_\_ feet. The pump is to be furnished with mechanical seal, replaceable channel rings with in-line suction and discharge openings in casing. The casing shall be of 30,000 pound tensile strength cast iron. The impeller

shall be hydraulically self-centering and no external adjustment shall be necessary. Each pump shall be tested prior to shipment. The pump shall be close coupled to a \_\_\_\_\_ HP, \_\_\_\_\_ phase, \_\_\_\_\_ Hertz, \_\_\_\_\_ voltage, \_\_\_\_\_ R.P.M., horizontal (drip proof) (totally enclosed) (explosion proof) motor. For (continuous) (intermittent) operation in a \_\_\_\_\_ °F maximum and \_\_\_\_\_ °F minimum atmosphere. The motor shall be sized to prevent overloading at the highest head condition listed in the specifications.

## Materials of Construction

Pump Part	Bronze Fitted	All Iron	All Bronze
Casing	Cast Iron ASTM A48	Cast Iron ASTM A48	Bronze ASTM B62
Cover (133)	Cast Iron ASTM A48	Cast Iron ASTM A48	Bronze ASTM B62
Impeller	Bronze ASTM B62	Ductile Iron ASTM A395	Bronze ASTM B62
Impeller Sleeve	Bronze ASTM B62	Stainless Steel AISI 316	Bronze ASTM B62
Inner Ring	Cast Iron ASTM A48	Cast Iron ASTM A48	Bronze ASTM B62
Outer Ring (134 & 135)	Cast Iron ASTM A48	Cast Iron ASTM A48	Bronze ASTM B62
Mechanical Seal	316 stainless steel metal parts, Buna-N elastomer parts, Ceramic seat and carbon washer.		



Model 133

Models 134 & 135

## Limitations

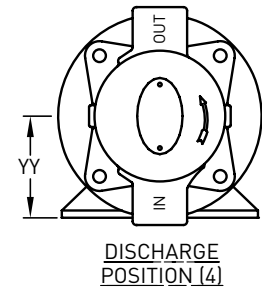
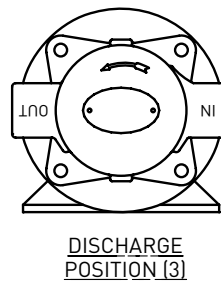
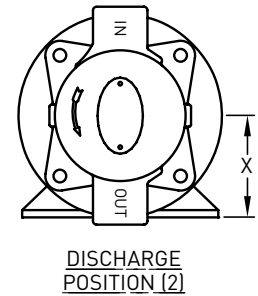
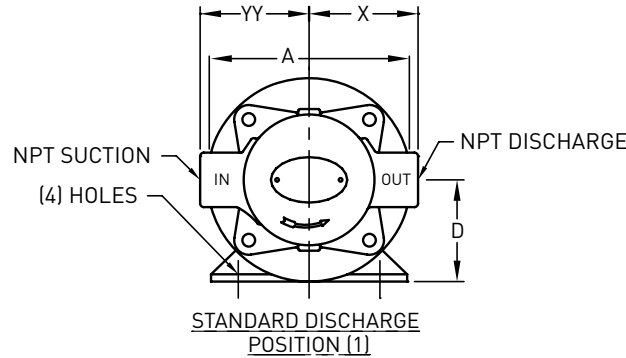
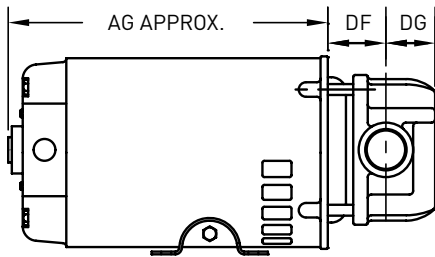
Pump Model	Pump Size	Maximum Suction Pressure P.S.I.	Maximum Diff. Pressure P.S.I.	Maximum Casing Pressure P.S.I.	Maximum Temp. °F	Minimum Suction Pressure Vac. in Hg	Motor Frame
133	D03 through G03	100	150	175	225	26	56 145T 182T 184T
134	A04 B04 C04 D04	100	225 225 190 180	300	225	26	
135	F05 G05 H05 I05 J05 K05	100	280 250 220 175 150 130	300	225	26	
135	F05 through K05	100	300	300	225	26	

## Notes

- Maximum differential pressure based on allowable shaft deflection for standard shafts.
- Maximum casing pressure based on laboratory tests at twice the pressure shown.
- All pressure limitations on this chart are based on standard pumps constructed of standard materials and handling water at normal temperatures.
- For temperatures below -32°F, consult factory.
- Maximum suction pressure based on limitations of mechanical seal furnished as standard.
- Pumps should not be used when any one of the above limitation is exceeded.

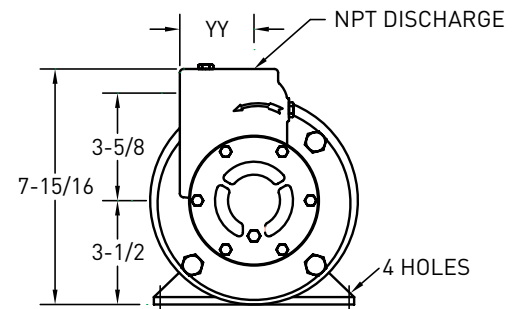
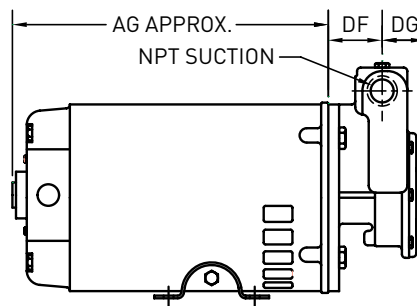


# Specifications



## Notes

1. Dimensions and weights are approximate.
2. All dimensions are in inches and may vary  $\pm 1/8"$ .
3. Frame sizes, AG dimension and motor weight are for open drip proof motors only.
4. Conduit box is shown in approximate position. Dimensions are not specified as they vary with each motor manufacturer.
5. Add pump and motor weight for unit weight.
6. Not for construction purposes unless certified.
7. Aurora Pump reserves the right to make revisions to its products and their specifications, and to this bulletin and related information, without notice.



Frame	Horsepower		Motor Weight (Lbs.)	A	D	AG	Model
	3500 RPM	1750 RPM					
56	1/3	1/3	29	6-3/4	3-1/2	11	133 134 135
	1/2	1/2	46				
	3/4	3/4	56				
	1	1	56				
	1-1/2	1-1/2**	65				
145T	2	—	80	7	3-1/2	11	134 135
	—	1-1/2*	42				
182T	3**	2**	48	9	4-1/2	11	134 135
	3*	2*	65				
184T	5**	3**	69	9	4-1/2	12	135
	7-1/2**	3*	79				
213T	—	5**	83	10-1/2	5-1/4	14	135
	10	—	105				
215T	15	—	125	10-1/2	5-1/4	15	135
254T	20	—	200	12-1/2	6-1/4	17	135

Model	133	134	135
Suction	3/4	1	2
Discharge	3/4	1	1-1/2
DF	1-7/8	2	2-1/4
DG	1-1/2	1-11/16	2-1/4
X	N/A	3-3/4	4-1/2
YY	2-1/2	3-3/4	4-1/2
Pump Wt. (Lbs.)	13	16	30

\* Single phase only  
\*\* Three phase only



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Because we are continuously improving our products and services, Pentair reserves the right to change specifications without prior notice.

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