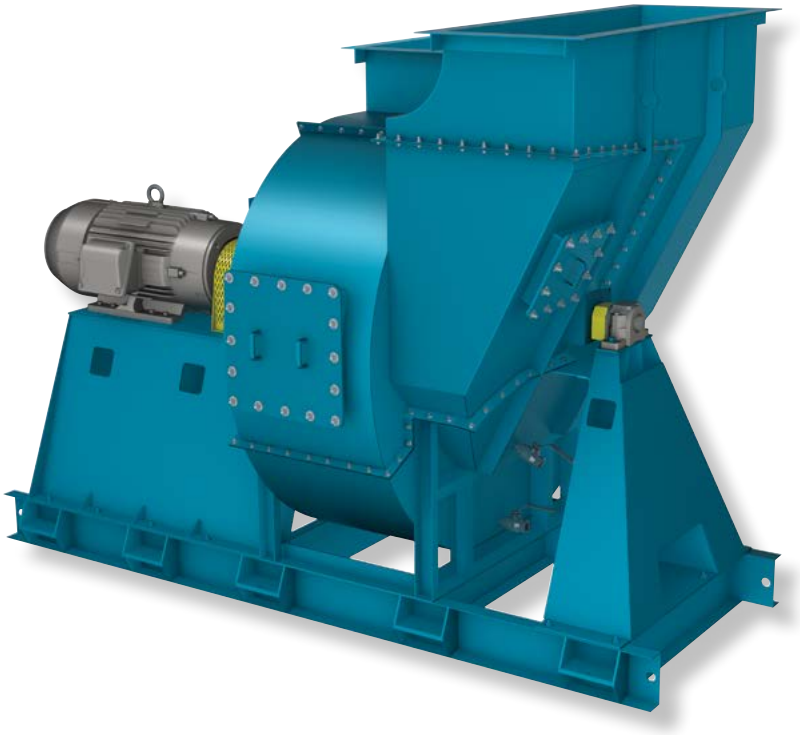
TCF

TWIN CITY FAN

INDUSTRIAL PROCESS AND
COMMERCIAL VENTILATION SYSTEMS

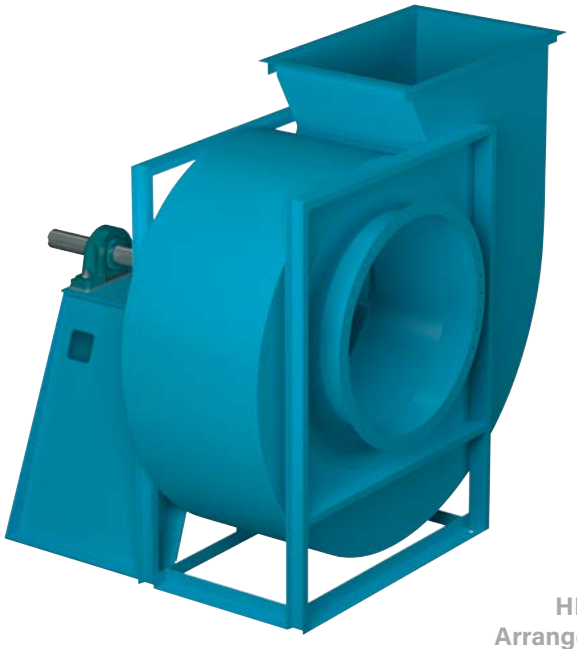
RADIAL TIP FANS, HIGH SPECIFIC SPEED

Model HRT



Overview

HRT



HRT
Arrangement 1

Twin City Fan & Blower's Model HRT Industrial Duty Radial Tip Fan line is engineered for higher specific speeds. It offers a high efficiency selection across a wider range on the fan curve with a peak static efficiency reaching 77%. This is accomplished with a new fan impeller design coupled with an enlarged fan housing. This design shifts the peak efficiencies to higher flow rates at a given pressure, which allows selection of a smaller more efficient fan for a given application.

Typical Industries Include

Aerospace, Agriculture, Air Pollution Control, Asphalt, Automotive, Boilers, Brick, Cement, Chemical, Coal, Composting, Ethanol, Foundry, General Manufacturing, Glass, Industrial Processes, Metal & Minerals, Mining, Nuclear, OEM, Petrochemical, Pharmaceutical, Power Generation, Pulp & Paper, Recycling, Textile, Water Treatment

Arrangements

Available in Arrangement 1, 9F and 9H (Belt Driven) and Arrangement 3SI, 4, 7SI and 8 (Direct Drive) configurations

Impeller Type

Radial Tip

Optional Construction

Abrasion Resistant Construction, High Temperature Construction, Nominally Leak-Tight Construction, Spark Resistant Construction (Type A, B and C), Special Width and Diameter Construction, Scroll Liners, Side Liners

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For complete product performance, drawings and available accessories, download our Fan Selector software at *tcf.com*.

Energy Regulations

Twin City Fan & Blower supports energy efficiency regulations enacted by the U.S. Department of Energy (DOE) and specific states. The selection and application of fan products is a significant part of these regulations. Engineers and specifiers must understand how to apply TCF products to their specific applications to meet applicable DOE and state regulatory requirements. Twin City Fan & Blower has made significant investments in product testing and development to provide efficient products. Developments in Twin City Fan & Blower's Fan Selector software are in place to aid your decision in product selection to assist with meeting the efficiency requirements as stipulated in the applicable regulations.

Overview

HRT

Radial Tip Fans are of a heavy-duty, rugged design suitable for applications involving large volumes of gas streams at moderate to high pressures. Designed to handle clean or dirty airstreams, they are widely used to exhaust gases from bag-type collectors, precipitators, scrubbers, cyclones and other industrial applications. This type of fan is also used for induced draft on boilers, incinerators and kiln exhaust. Steel, air pollution, dryer, petrochemical, cement, furnaces and ovens, solvent recovery, sewage sludge and solid waste incineration industries have found the Radial Tip design particularly suitable for their applications.

Sizes

27 to 80.75 inches (685 mm to 2,055 mm)

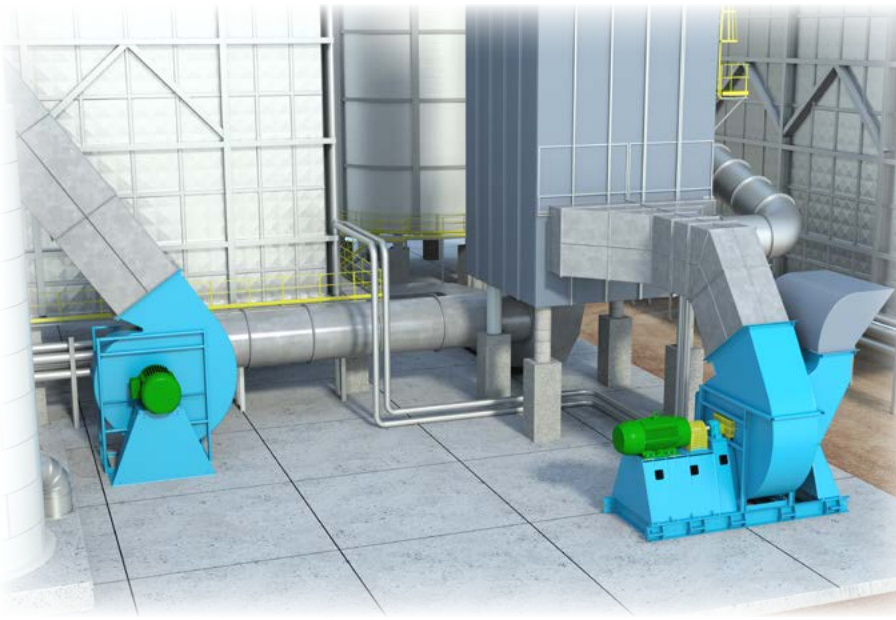
Performance

Airflow to 254,700 CFM (432,700 m^3/hour)

HRT 18 — Suitable to 19,000 FPM tip speed
Static pressure to 22 inches w.g. (5,500 Pa)

HRT 23 — Suitable to 23,000 FPM tip speed
Static pressure to 32 inches w.g. (7,960 Pa)

For higher static pressure applications refer to Catalog 950, Model RTF Radial Tip fans.



Fired Heater, Induced & Forced Draft

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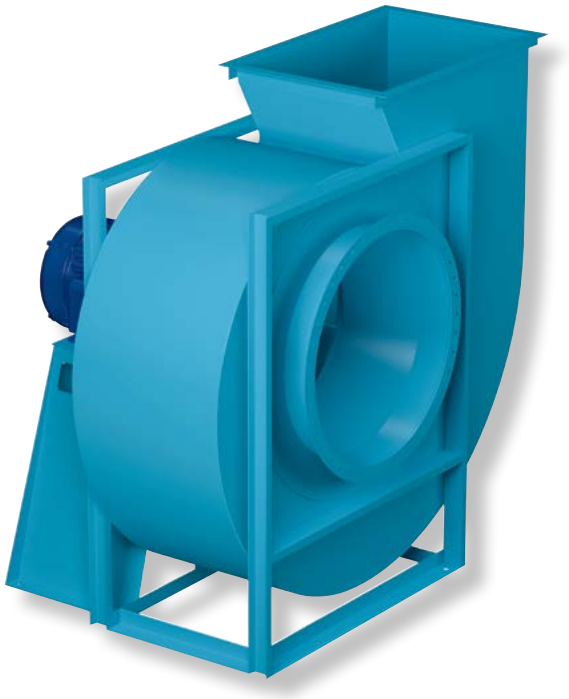
Impeller Type

- Higher specific speed and efficient impeller design allows selection of fan with lower initial and operating cost.
- Radial Tip impeller designed for demanding applications.

HRT Impeller

CONSTRUCTION FEATURES



- Heavy-gauge reinforced, continuously-welded housing and rigid pedestal for vibration-free service.
- Statically and dynamically balanced rotor assembly. Mechanical run test and final balance check of all fans prior to shipment.
- Interference (shrink) fit between impeller and shaft to ensure trouble-free operation at high speed, high temperature and under vibratory load conditions.
- Shaft of AISI 1040 or equal, close tolerances, turned, ground and polished.
- Anti-friction spherical roller bearings with split pillow block housings on all fans. Typically, L-10 bearing life exceeds 40,000 hours on V-belt drive and 100,000 hours on direct drive selections.
- Flanged inlet and flanged outlet, housing drain, ceramic felt type shaft seal (not gas tight) and lifting lugs are standard accessories on all fans.

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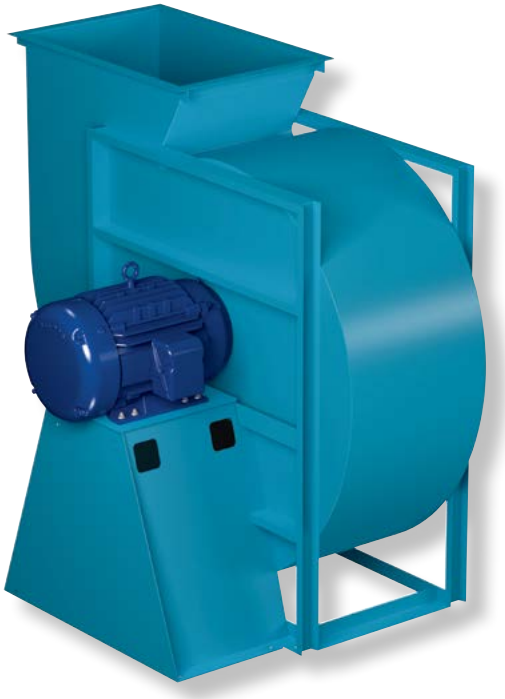
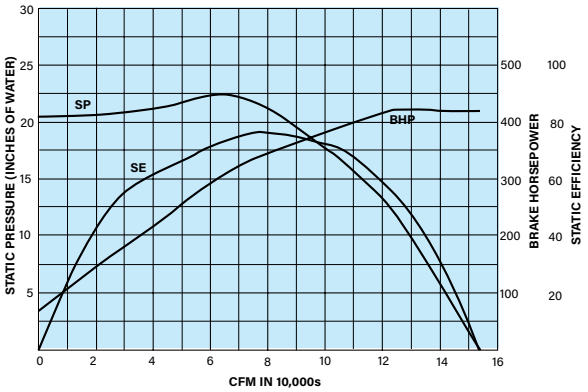


Typical HRT Curve



600 HRT
1175 RPM Density: 0.0750 lbs/ft³

High Temperature Construction

301 to 500°F - Requires addition of shaft cooler and high temperature grease bearings.
501 to 600°F - Above modifications plus high temperature aluminum paint.
601 to 800°F - Above plus modified pedestal design.

Special Width & Diameter Construction

Variations in impeller widths (50% to 105%) and impeller diameters (98% to 102%) are available to match designed performance at motor speeds for the greatest efficiency for any given application.

Abrasion and Corrosion Resistant Alloys & Coatings

Optional construction includes an abrasion resistant steel blade and back plate. Construction materials include Corten, stainless steel, Monel, aluminum, Hastelloy and other alloys. Special corrosion resistant coatings of various types are available.

Scroll Liners

7-gauge AR steel material welded in place. Bolted liners are not recommended. Liners are made out of T-1 steel. Hard surface overlay type as manufactured by Tapco or Chamfer available on request.

Side (Cheek) Liners

Covers approximately 25% of the housing sides. Made of 7 gauge AR steel and welded to housing sides.

Heavier Gauge Construction

Heavier than standard gauge construction is available. Consult factory.

Nominally Leak Tight Construction

A structural steel base provides common support to fan, motor and drive including guards. This style of base is designed for use without isolators and requires adequate foundation integrity (provided and designed by others) for proper installation and vibration free fan operation.

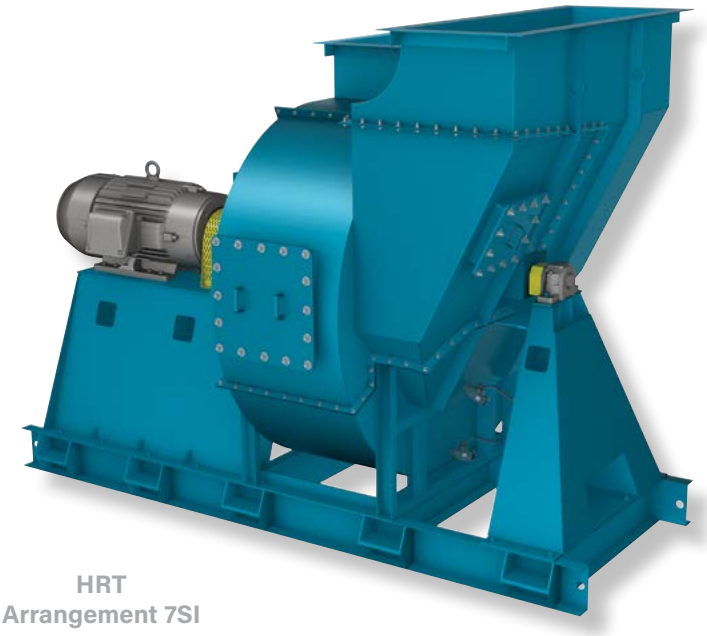
Spark Resistant Construction

Fan applications may involve the handling of potentially explosive or flammable particles, fumes or vapors. Such applications require careful consideration by the system designer to insure the safe handling of such gases. Twin City Fan & Blower offers the following classifications of spark resistant construction per AMCA Standard 99-0401-86. It is the specifier or the user's responsibility to specify the type of spark resistant construction with full recognition of the potential hazards and the degree of protection required.

Type A - Consult factory for construction details.
Type B - Consult factory for construction details.
Type C - The fan shall be so constructed that the shift of the impeller or shaft will not permit two ferrous parts of the fan to rub or strike. This is accomplished with a steel inlet cone with copper/bronze tip and an aluminum rub plate at the shaft opening.

Notes:

1. Bearings shall be placed outside the airstream. Therefore, do not use Arrangement 3 or 7.
2. The user shall electrically ground all fan parts
3. Refer to the above listed AMCA standard for full details.



HRT
Arrangement 7SI

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Arrangement 1

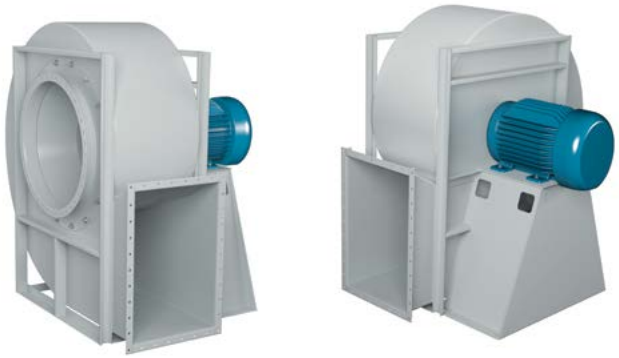
Arrangement 1 is usually belt driven. The impeller is overhung on the shaft, i.e., mounted at the end of the shaft. The motor can be mounted in any of the four AMCA standard motor positions, W, X, Y or Z. The two fan bearings are mounted on the bearing pedestal, out of the airstream, which makes them ideal for high temperature or contaminated air applications. Belt driven configurations offer performance flexibility. Check with the factory for V-belt drive applications larger than 300 HP.

Arrangement 3SI

Arrangement 3SI is direct drive. Like the Arrangement 3, the impeller is mounted between the bearings. The Arrangement 3SI utilizes an integrated inlet box to locate the bearing outside of the airstream on independent bearing pedestals, which allows for elevated operating temperatures and relatively clean air. The Arrangement 3SI includes a pie split housing for easy impeller removal. The motor is located by the customer off the fan assembly and direct coupled to the shaft opposite of the inlet box side.

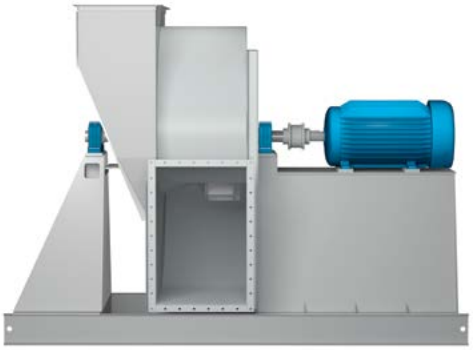
Arrangement 4

Arrangement 4 is a direct drive fan. The impeller is mounted directly to the motor shaft with the motor mounted to a pedestal. Arrangement 4 offers low maintenance since there are no fan bearings, fan shaft or drive parts to maintain. Arrangement 4 fans are typically limited up to size 365.



Arrangements 7SI

Arrangement 7SI is direct drive. Like the Arrangement 3SI, the impeller is mounted between the bearings. The Arrangement 7SI includes an integrated inlet box to locate the bearing outside of the airstream. The pedestal is designed to accommodate the motor, flexible coupling and one bearing. A pie split housing is provided for easy impeller removal. The fan assembly is then mounted on a unitary base as standard. An inertia base is an available option.



Arrangement 8

Arrangement 8 is a modified version of Arrangement 1 used for direct drive. The Arrangement 1 bearing pedestal is extended to accommodate the motor. A flexible coupling connects the fan and motor shaft.

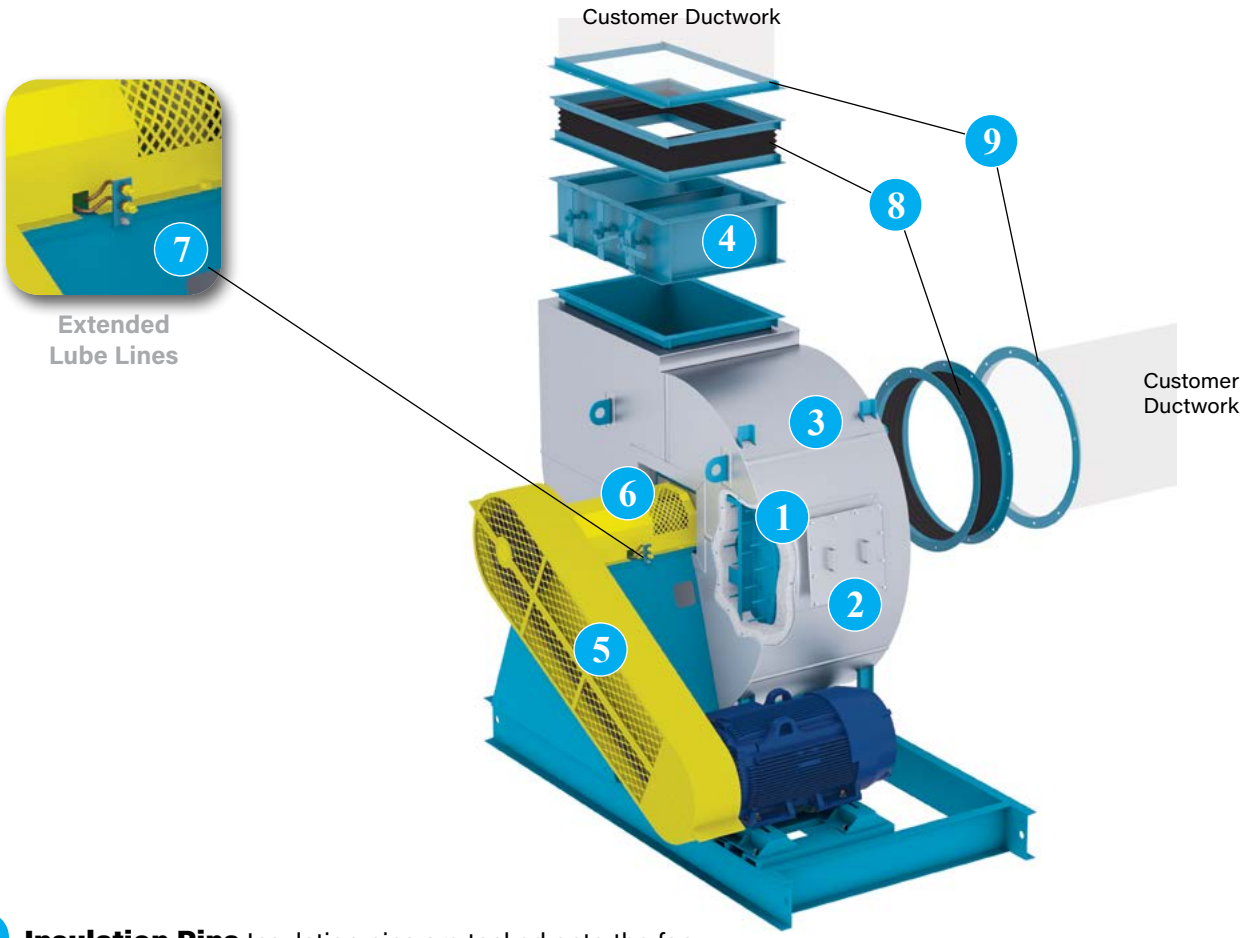
Arrangements 9F

Arrangement 9F is available when an Arrangement 9 requires a motor that is too large to mount on the bearing pedestal. The fan frame is extended to accommodate the motor, for horizontal mounting, similar to an Arrangement 1 fan. Arrangement 9F is not suitable for mounting vibration isolators directly under the fan.

Arrangements 9H

Arrangement 9H is available for motor mounting on the side of the bearing pedestal when horizontal motor adjustment is preferred. The pedestal is extended on one side to accommodate the motor for horizontal mounting. Typically, the motor is mounted on the left side of the pedestal for CW rotation fans and on the right side for CCW rotation fans.

OPTIONS/ACCESSORIES



1 **Insulation Pins** Insulation pins are tacked onto the fan housing for customer mounted insulation. Insulation pins, 4" or 6" long, can be provided. Insulation thickness must be specified at the time of order.

2 **4" Raised Access Door** For quick impeller inspection and maintenance. Access doors are specified where examination and cleaning of the fan interior is required.

3 **Aluminum Clad Housing** To insulate the fan surface from high temperature, condensation or sound. Exterior cladding material is 0.040" (minimum) thick stucco-embossed aluminum.

4 **Opposed Blade Outlet Damper** Outlet dampers add resistance to the fan by shifting the operating point to the left of the rating point. Outlet dampers are typically the least expensive option and should be considered when infrequent operation at lesser capacity is desired or when handling hot, humid or particulate laden air. Opposed blade dampers cost about 10% more and are recommended for systems where volume is modulated over the entire range. Opposed blades reduce air volume in a closer relationship to the control arm movement. Available to 750°F construction.

5 **Belt Guard** Belt guard protects personnel from the moving drive parts. OSHA and quick access guards are available. Arrangement 10 offers a standard belt guard.

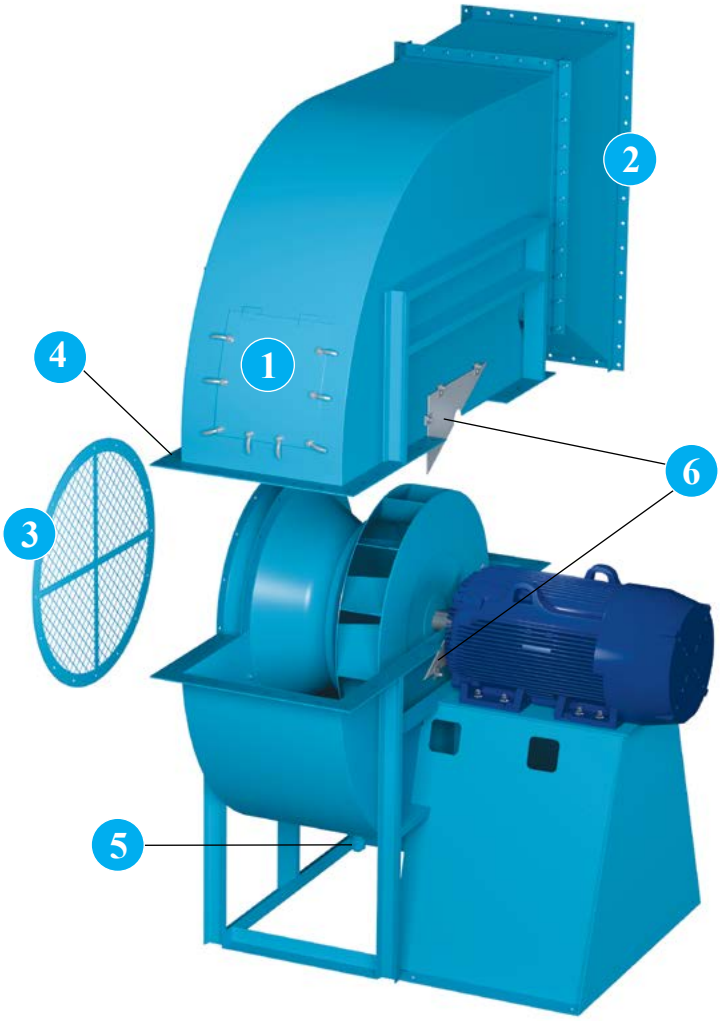
6 **Shaft & Bearing Guard** Shaft and bearing guard covers both shaft and bearings from incidental contact. Provided with holes for ease of bearing lubrication. When fan is provided with shaft cooler, guard extends to cover the shaft cooler.

Shaft guard covers only the shaft between the bearings exposing the bearing to the ambient conditions.

7 **Extended Lube Lines** Exterior mounting zerk fittings are available with lines to the fan shaft bearings for relubrication from outside the unit.

8 **Inlet/Outlet Flex Connectors** Flex connectors are punched to match the fan's inlet or outlet punching.

9 **Inlet/Outlet Companion Flanges** Inlet and outlet companion flanges are available for ease of duct connection. Companion flanges are rolled angle rings punched to match the standard inlet or outlet flange.



1 **Quick Open Access Door** For quick impeller inspection and maintenance. Access doors are specified where examination and cleaning of the fan interior is required.

2 **Evasé (Rectangular)** Often fabricated by customer as a part of ductwork. Fan outlet must be expanded to equal evasé area shown in the catalog to obtain rated performance. Same gauge as fan housing when purchased from the factory.

3 **Inlet Screens (Flange Mounted)** Heavy-gauge screen mounted to fan inlet/outlet for easy removal.

4 **Horizontal Split Housing (Exploded)** Available for impeller removal without disturbing inlet or outlet duct. All fans are designed for removal of impellers through inlet as standard.

5 **Drain With Plug** 3/4" NPT coupling welded to the lowest point in the housing scroll. All fans come with a weep hole in the bottom of the housing.

6 **Shaft Seal** The standard shaft seal is constructed of non-asbestos woven fibrous materials compressed between an aluminum cover plate and the fan housing. The standard shaft seal is included as a standard accessory. The standard shaft seal does not make the fan gas tight. Special seals are available for low leakage applications requiring more positive protection. Consult factory for availability.

Other Accessories Include:

- Temperature & Vibration Detectors
- Piezometer Ring
- Scroll & Side (Cheek) Liners
- Steel Wall Housings
- Special Width & Special Diameter Impellers
- Inlet Boxes (see page 11)
- Shaft Guard - Exposed Bearings
- Inlet Vanes

VIBRATION ISOLATION

Inertia Bases

Inertia Bases provide a common support to fan, motor and drive including guards and utilize heavy-duty structural channel with spring isolators. Inertia bases incorporate reinforcing rods and require customer supplied concrete. Inertia bases are typically used on longer, direct drive fans to mitigate assembly deflection, maintaining proper alignment between the motor, coupling, shaft and bearings. Flexible connectors at inlet and outlet are required.

Isolation Bases

Isolation Bases provide a common support to fan, motor and drive, including guards. Constructed with heavy-duty structural channels and includes spring isolations. Not available on Arrangement 8. Flexible connectors at inlet and outlet are required.

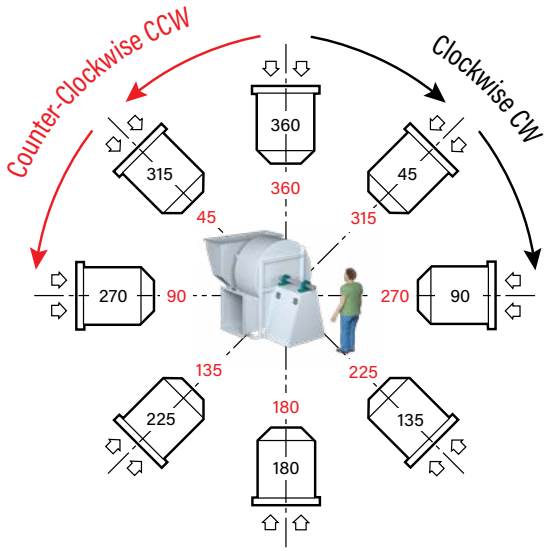
Unitary Bases

A structural steel base provides common support to fan, motor and drive including guards. This style of base is designed for use without isolators and requires adequate foundation integrity for proper operation.

Inlet Boxes

Bolt-on (detached) or attached (integral) type, generously designed to minimize pressure drop. Same heavy-gauge construction as fan housing. Drain and bolted access door are standard inlet box acessories. Specify inlet box position referring to AMCA Standard 99 shown below.

Inlet Box Positions For Centrifugal Fans



Inlet box positions **determined from Drive Side**.

INLET BOX POSITIONS AND DESCRIPTIONS
45 — Angular Down Intake
90 — Horizontal Intake
135 — Angular Up Intake
180 — Bottom Up Intake
225 — Angular Up Intake
270 — Horizontal Intake
315 — Angular Down Intake
360 — Top Down Intake

Reference line is the Top Vertical Axis through center of fan shaft.

Position of inlet box and air entry to inlet box is determined from drive side of fan.

Position of inlet box is designated in degrees clockwise from Top Vertical Axis as shown.

Positions 135° to 225° in some cases interfere seriously with floor structure.

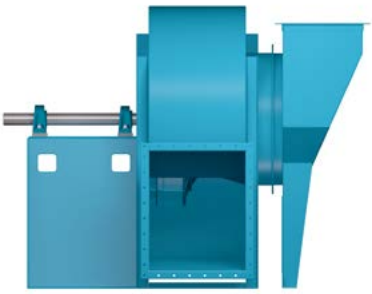
Integrated

Fan with attached or integral inlet box. Available on Arrangements 1, 4, 8 and 9F. Included on Arrangements 3SI and 7SI.

Detached Bolt-On

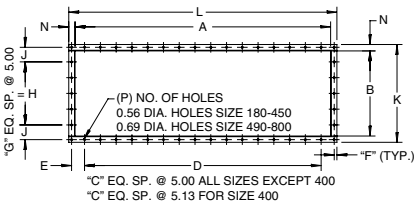
Fan with bolt-on (detached) inlet box (shown with optional subbase). Available on Arrangements 1, 4, 8 and 9F.

Integrated

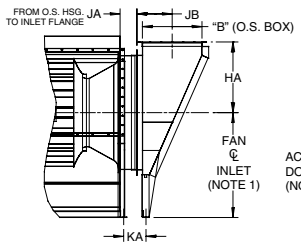


Detached Bolt-On

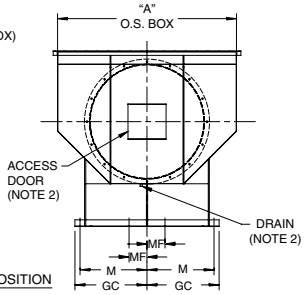
Typical Inlet Box Dimensions



INLET BOX FLANGE DETAIL



360° INLET BOX POSITION



Notes:

1. For inlet box positions 90° to 270°, fan centerline height may change. Consult factory for centerline height.
2. Drain and bolted access door are standard inlet box accessories.
3. Consult factory for foundation mounting location.

SIZE	A	B	C	D	E	F	G	H	J	K	L	N	P	HA	JA	JB
270	42.50	14.38	7	35.00	4.63	0.63	2	10	3.06	17.38	45.50	1.50	26	18.00	7.00	9.19
300	46.88	15.88	8	40.00	4.31	0.63	2	10	3.81	18.88	49.88	1.50	28	19.00	7.00	9.94
330	52.13	17.88	9	45.00	4.69	0.88	2	10	5.06	21.88	56.13	2.00	30	20.50	7.00	10.94
360	57.38	19.38	10	50.00	4.81	0.88	3	15	3.31	23.38	61.38	2.00	34	22.00	8.00	11.69
400	63.38	21.38	11	56.38	4.88	1.13	3	15	4.56	26.38	68.38	2.50	36	23.50	10.00	12.69
450	69.38	23.38	12	60.00	6.06	1.13	3	15	5.56	28.38	74.38	2.50	38	25.50	10.00	13.69
490	76.88	25.88	14	70.00	4.81	1.13	4	20	4.31	30.88	81.88	2.50	44	27.50	9.00	15.94
540	84.50	28.50	15	75.00	6.13	1.13	4	20	5.63	33.50	89.50	2.50	46	29.50	12.00	17.25
600	93.50	31.50	17	85.00	6.13	1.63	5	25	5.13	38.50	100.50	3.50	52	32.00	12.00	18.75
660	103.50	34.88	19	95.00	6.13	1.63	6	30	4.31	41.88	110.50	3.50	58	34.50	12.00	20.44
730	114.50	38.50	22	110.00	4.13	1.63	7	35	3.63	45.50	121.50	3.50	66	37.50	12.00	23.25
800	126.50	42.50	24	120.00	5.13	1.63	7	35	5.63	49.50	133.50	3.50	70	41.00	14.00	25.25

BC1002143C

STANDARD CONFIGURATIONS

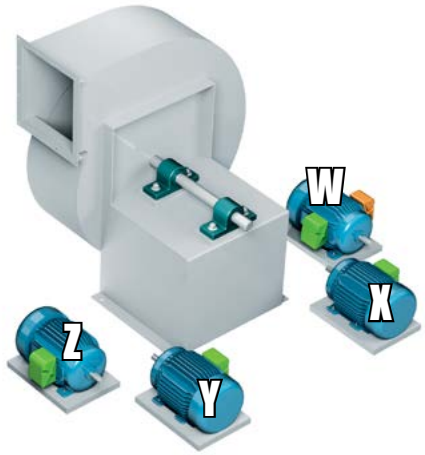
CLOCKWISE (CW) - ROTATION & DISCHARGE (ROTATION VIEW FROM DRIVE SIDE)

UBD Upblast CW 360
TAU Top Angular Up CW 45
THD Top Horizontal CW 90
TAD Top Angular Down CW 135
DBD Downblast CW 180
BAD Bottom Angular Down CW 225
BHD Bottom Horizontal CW 270
BAU Bottom Angular Up CW 315

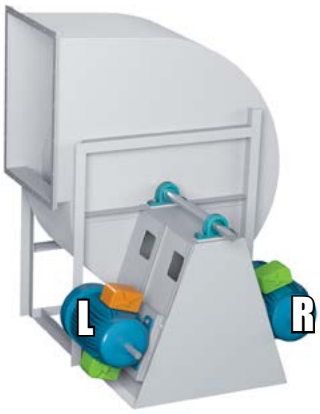
COUNTER CLOCKWISE (CCW) - ROTATION & DISCHARGE (ROTATION VIEW FROM DRIVE SIDE)

UBD Upblast CCW 360
TAU Top Angular Up CCW 45
THD Top Horizontal CCW 90
TAD Top Angular Down CCW 135
DBD Downblast CCW 180
BAD Bottom Angular Down CCW 225
BHD Bottom Horizontal CCW 270
BAU Bottom Angular Up CCW 315

MOTOR POSITIONS

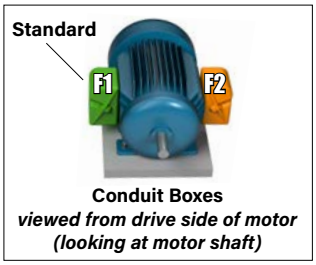


Arrangements 1 & 3



Arrangement 9

Arrangement 9F



Conduit Boxes
viewed from drive side of motor (looking at motor shaft)

Material and Mechanical Specifications

FAN SIZE	DESIGN	SHAFT DIA.	MAX. HP V-BELT DRIVE*	MIN. SHEAVE DIA.*	MAX. HP DIRECT DRIVE	MAX. RPM**	IMPELLER GAUGES			WR^2 VALUE LB-FT^3	HOUSING GAUGE
							BACK PLATE	BLADES	SHROUD		
270	19	2.437	75	8.5	100	2688	0.31	10	7	80	7
	23	2.937	125	7.2	150	3254	0.31	10	7	82	7
300	19	2.437	75	9.6	125	2419	0.31	10	7	118	7
	23	2.937	150	8.5	200	2928	0.31	10	7	123	7
330	19	2.687	100	10.3	150	2199	0.31	10	7	175	7
	23	2.937	150	8.6	250	2662	0.31	10	7	181	7
360	19	2.937	150	13.1	200	1988	0.31	10	7	251	7
	23	3.437	250	9.5	300	2407	0.31	10	7	259	1/4
400	19	3.437	200	13.1	200	1803	0.38	10	7	443	7
	23	3.937	300	10.5	400	2183	0.38	7	7	513	1/4
450	19	3.437	200	8.7	250	1631	0.38	10	7	628	7
	23	3.937	300	11.6	450	1974	0.38	7	7	728	1/4
490	19	3.937	250	14.0	300	1481	0.50	7	1/4	1289	7
	23	3.937	300	12.8	550	1793	0.50	7	1/4	1366	1/4
540	19	3.937	300	17.0	400	1338	0.50	7	1/4	2061	7
	23	3.937	300	14.0	650	1619	0.50	7	1/4	2176	1/4
600	19	3.937	300	20.0	450	1210	0.50	7	1/4	2920	1/4
	23	3.937	300	15.7	850	1464	0.50	7	1/4	3093	1/4
660	19	4.437	300	20.8	550	1100	0.63	7	1/4	4595	1/4
	23	4.437	300	17.2	1000	1331	0.63	7	1/4	4846	1/4
730	19	4.437	300	21.9	700	994	0.63	7	1/4	6713	1/4
	23	4.437	300	19.0	1200	1203	0.63	7	1/4	7095	1/4
800	19	4.437	300	22.6	850	899	0.63	7	1/4	9895	1/4
	23	4.437	300	21.0	1500	1088	0.63	7	1/4	10458	1/4

NOTES:
* Minimum sheave diameter when using maximum horsepower motor. Check with factory on applications over 250 HP.
** Maximum fan RPM listed is for carbon steel construction. For stainless steel construction, contact the factory.

Bare Fan Weights (Lbs.)

FAN SIZE	CLASS 19				CLASS 23			
	ARR. 1	ARR. 4	ARR. 8	ARR. 9F	ARR. 1	ARR. 4	ARR. 8	ARR. 9F
270	1230	1230	1600	1290	1290	1290	1675	1355
300	1435	1435	1865	1505	1485	1485	1930	1560
330	1670	1670	2170	1755	1720	1720	2235	1805
360	2100	2100	2730	2205	2480	2480	3225	2605
400	2610	2610	3395	2740	3030	3030	3940	3180
450	3150	3150	4095	3310	3710	3710	4825	3895
490	3970	—	5160	4170	4550	—	5915	4780
540	4860	—	6320	5105	5680	—	7385	5965
600	6580	—	8555	6910	6740	—	8760	7075
660	7520	—	9775	7895	7950	—	10335	8350
730	9110	—	11845	9565	9620	—	12505	10100
800	10852	—	—	—	11562	—	—	—

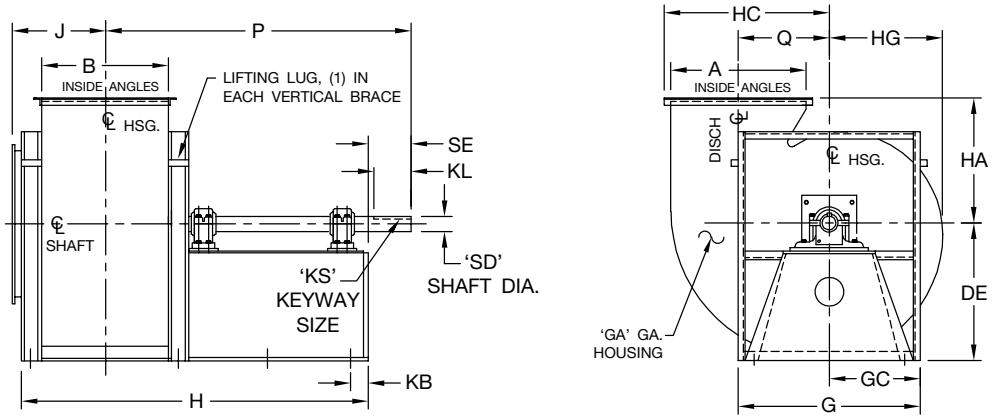
Size 800 Model HRT is not supplied with a conventional bearing pedestal. Instead, channel subbases are supplied. The subbase is to be mounted on concrete pedestal in the field. Concrete pedestal to be supplied by others. Fan weights include weight of channel subbase.

Impeller Weights (Lbs.)

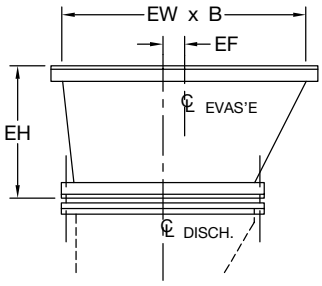
FAN SIZE	CLASS	
	19	23
270	144	147
300	165	171
330	205	210
360	232	238
400	362	397
450	406	447
490	634	659
540	912	943
600	1030	1068
660	1272	1317
730	1471	1527
800	1715	1783

TCF TWIN CITY FAN

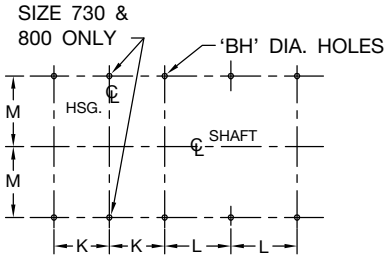
Model HRT — Arrg. 1



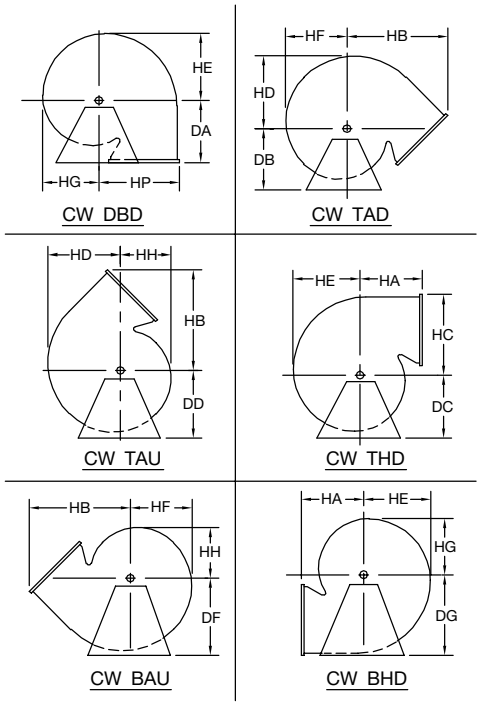
CW UBD

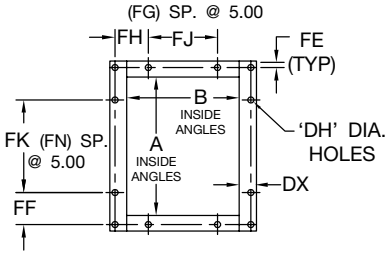


EVAS'E (OPTIONAL)

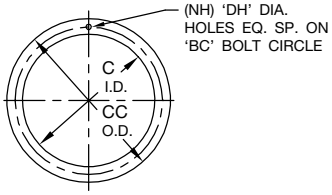


FOUNDATION PLAN
FOR ALL DISCHARGES EXCEPT DBD (NOTE 2)





OUTLET FLANGE DETAIL (NOTE 2)



INLET FLANGE DETAIL

Notes:
1. CW rotation is shown, CCW rotation is similar but opposite.
2. See AC15578 for DBD foundation plan and outlet flange.

Model HRT — Arrg. 1

FAN SIZE	A	B	BC	BH	C	CC	DA	DB	DC	DD	DE	DF	DG	DH	DX	EF	EH	EW	FE
270	26.56	17.63	25.75	0.81	23.50	27.50	24.50	20.50	23.00	25.00	27.00	29.50	34.06	0.56	1.50	3.63	17.19	35.75	0.63
300	29.50	19.38	28.00	0.81	25.75	29.75	27.00	23.00	25.50	27.50	30.00	33.00	37.50	0.56	1.50	3.88	18.25	39.38	0.63
330	32.38	21.38	30.75	0.81	28.50	32.50	30.00	25.00	28.00	30.50	33.00	36.25	40.94	0.56	2.00	4.38	21.19	43.50	0.88
360	35.94	23.63	33.75	1.06	31.63	35.63	33.00	28.00	31.00	34.00	36.50	40.00	45.00	0.56	2.00	4.88	23.00	48.25	0.88
400	39.56	26.00	37.00	1.06	34.88	38.88	36.00	31.00	34.00	37.00	40.50	44.00	49.75	0.56	2.50	5.38	26.13	53.25	1.13
450	43.69	28.75	40.63	1.06	38.50	42.50	40.00	34.00	37.00	41.00	44.50	48.50	54.63	0.56	2.50	6.00	28.44	58.88	1.13
490	48.06	31.63	46.00	1.06	42.50	48.50	44.00	37.00	41.00	45.00	49.00	53.00	59.75	0.69	2.50	6.56	30.75	64.75	1.13
540	53.13	35.13	50.50	1.06	47.00	53.00	48.50	41.00	45.00	50.00	54.00	58.50	65.81	0.69	2.50	7.25	33.56	71.63	1.13
600	58.69	38.75	55.50	1.06	52.00	58.00	53.50	45.50	50.00	55.00	60.00	65.00	73.00	0.69	3.00	8.06	37.75	79.25	1.38
660	64.50	42.63	60.75	1.06	57.25	63.25	59.00	50.00	55.00	60.50	65.50	71.25	79.50	0.69	3.00	8.94	41.13	87.25	1.38
730	71.31	47.00	67.75	1.06	63.25	71.25	65.00	55.00	61.00	67.50	73.50	78.88	88.38	0.69	3.50	9.88	45.75	96.38	1.63
800	78.81	52.00	74.50	1.06	70.00	78.00	72.00	61.00	68.00	74.00	80.50	86.88	97.50	0.69	3.50	10.94	50.00	106.63	1.63

FAN SIZE	FF	FG	FH	FJ	FK	FN	G	GA		GC	H	HA	HB	HC	HD	HE	HF	HG	HH
								CL-19	CL-23										
270	4.16	2	4.69	10.00	20.00	4	35.88	7	7	17.94	49.38	24.31	40.25	32.56	28.88	26.69	24.50	22.31	20.13
300	5.63	3	3.06	15.00	20.00	4	39.88	7	7	19.94	52.38	27.00	44.50	36.00	32.06	29.63	27.19	24.75	22.31
330	4.81	3	4.31	15.00	25.00	5	43.88	7	7	21.94	55.38	29.63	49.19	39.94	35.25	32.63	29.91	27.25	24.56
360	4.09	4	2.94	20.00	30.00	6	47.88	7	0.25	23.94	60.63	32.69	54.25	44.00	39.06	36.06	33.13	30.19	27.19
400	3.66	4	4.38	20.00	35.00	7	52.88	7	0.25	26.44	63.00	36.00	59.94	48.81	43.00	39.75	36.50	33.19	30.00
450	3.22	5	3.25	25.00	40.00	8	58.13	7	0.25	29.06	68.75	39.75	66.06	53.63	47.50	43.94	40.31	36.75	33.13
490	5.41	5	4.69	25.00	40.00	8	63.13	7	0.25	31.56	75.13	43.75	72.50	58.81	52.31	48.38	44.38	40.38	36.44
540	5.44	6	3.94	30.00	45.00	9	69.50	7	0.25	34.75	79.63	48.38	80.00	64.81	57.88	53.50	49.13	44.69	40.31
600	3.47	7	3.50	35.00	55.00	11	76.00	0.25	0.25	38.00	84.75	53.44	88.56	71.88	64.00	59.19	54.31	49.44	44.56
660	3.88	7	5.44	35.00	60.00	12	83.50	0.25	0.25	41.75	89.63	58.75	97.19	78.75	70.38	65.06	59.69	54.31	49.00
730	5.03	8	5.38	40.00	65.00	13	92.88	0.25	0.25	46.44	97.00	64.88	107.56	87.25	77.81	71.88	66.00	60.06	54.19
800	3.78	9	5.38	45.00	75.00	15	99.88	0.25	0.25	49.94	106.00	71.75	118.69	96.13	86.06	79.50	73.00	66.44	59.88

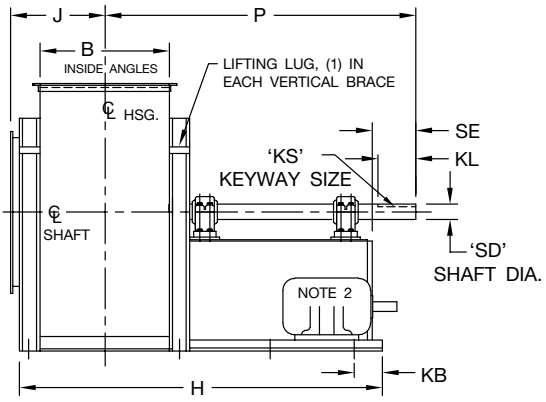
FAN SIZE	HP	J	K	KB	KL	KS		L	M	NH	P	Q	SD		SE
						CL-19	CL-23						CL-19	CL-23	
270	34.06	13.13	10.44	1.63	7.50	0.63x0.31	0.75x0.38	12.75	15.00	16	45.81	17.81	2.437	2.937	8.25
300	37.50	14.00	11.31	1.63	8.00	0.63x0.31	0.75x0.38	13.38	17.00	16	48.44	19.75	2.437	2.937	8.75
330	40.94	15.00	12.31	1.63	8.25	0.63x0.31	0.75x0.38	13.88	18.75	16	50.69	21.75	2.687	2.937	9.00
360	46.00	17.06	13.81	2.13	8.25	0.75x0.38	0.88x0.44	14.44	20.50	24	53.81	24.06	2.937	3.437	9.00
400	50.31	18.25	15.00	2.13	9.00	0.88x0.44	1.00x0.50	14.44	23.00	32	56.00	26.56	3.437	3.937	10.00
450	55.13	19.63	16.38	2.13	9.00	0.88x0.44	1.00x0.50	15.94	25.50	32	60.38	29.31	3.437	3.937	10.00
490	60.31	21.13	17.81	2.13	10.00	1.00x0.50	1.00x0.50	17.63	28.00	40	66.31	32.31	3.937	3.937	11.00
540	67.31	23.81	19.56	2.63	10.00	1.00x0.50	1.00x0.50	17.44	31.00	40	68.06	35.75	3.937	3.937	11.00
600	73.88	25.63	21.38	2.63	10.75	1.00x0.50	1.00x0.50	18.19	34.25	40	72.13	39.56	3.937	3.937	11.75
660	80.75	27.56	23.31	2.63	11.00	1.00x0.50	1.00x0.50	18.69	38.00	40	75.31	43.50	4.437	4.437	12.00
730	89.75	30.81	25.50	3.13	11.00	1.00x0.50	1.00x0.50	19.44	42.50	48	79.50	48.13	4.437	4.437	12.00
800	98.63	33.31	28.00	3.13	11.75	1.00x0.50	1.00x0.50	21.44	46.00	48	86.75	53.25	4.437	4.437	12.75

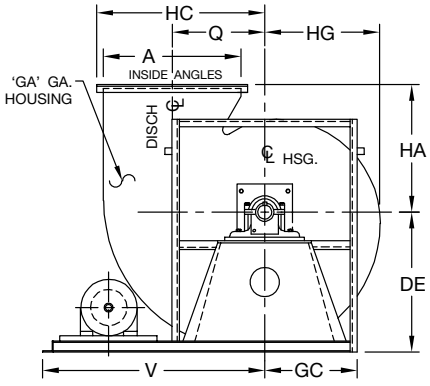
BC15576A

DIMENSIONS NOT TO BE USED FOR CONSTRUCTION. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

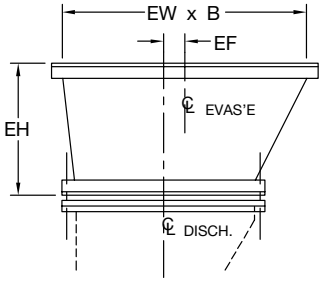
TCF
TWIN CITY FAN

Model HRT — Arrg. 9F

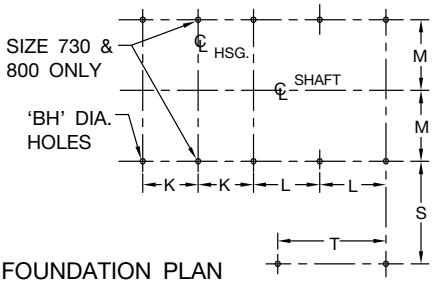




CLOCKWISE ROTATION, UPBLAST DISCHARGE 'CW UBD'
MOTOR LOCATION 'L' LEFT SHOWN. (NOTE 2)

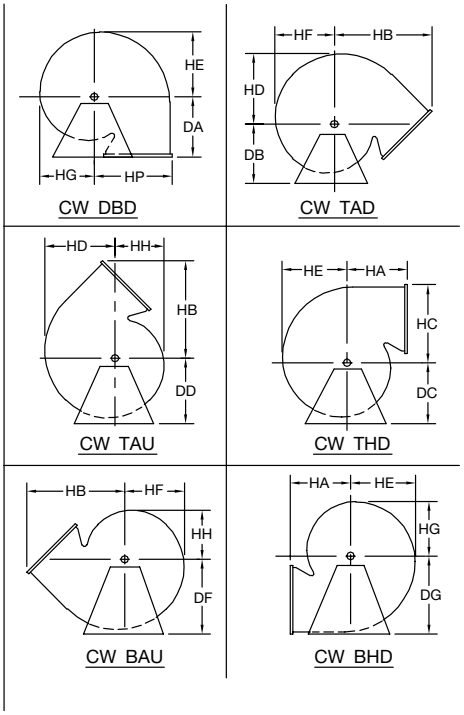


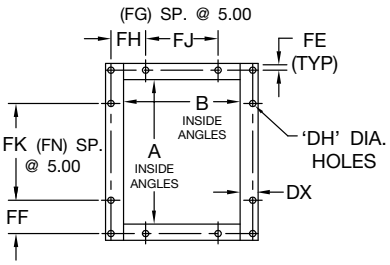
EVAS'E (OPTIONAL)



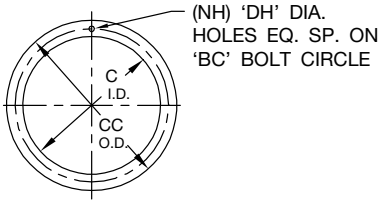
FOUNDATION PLAN

FOR ALL DISCHARGES EXCEPT DBD
(NOTE 3) MOTOR LOCATION 'L' LEFT SHOWN





OUTLET FLANGE DETAIL (NOTE 3)



INLET FLANGE DETAIL

Notes:
1. CW rotation, motor position 'Z' shown. CCW rotation, motor position 'W' similar but opposite.
2. Standard Arrg. 9F motor location is left for CW rotation and right for CCW rotation (unless otherwise specified). Dimension 'FR' equals Max. Motor Frame.
3. See AC15578 for DBD foundation plan and outlet flange.

Model HRT — Arrg. 9F

FAN SIZE	A	B	BC	BH	C	CC	DA	DB	DC	DD	DE	DF	DG	DH	DX	EF	EH	EW	FE
270	26.56	17.63	25.75	0.81	23.50	27.50	24.50	20.50	23.00	25.00	27.00	29.50	34.06	0.56	1.50	3.63	17.19	35.75	0.63
300	29.50	19.38	28.00	0.81	25.75	29.75	27.00	23.00	25.50	27.50	30.00	33.00	37.50	0.56	1.50	3.88	18.25	39.38	0.63
330	32.38	21.38	30.75	0.81	28.50	32.50	30.00	25.00	28.00	30.50	33.00	36.25	40.94	0.56	2.00	4.38	21.19	43.50	0.88
360	35.94	23.63	33.75	1.06	31.63	35.63	33.00	28.00	31.00	34.00	36.50	40.00	45.00	0.56	2.00	4.88	23.00	48.25	0.88
400	39.56	26.00	37.00	1.06	34.88	38.88	36.00	31.00	34.00	37.00	40.50	44.00	49.75	0.56	2.50	5.38	26.13	53.25	1.13
450	43.69	28.75	40.63	1.06	38.50	42.50	40.00	34.00	37.00	41.00	44.50	48.50	54.63	0.56	2.50	6.00	28.44	58.88	1.13
490	48.06	31.63	46.00	1.06	42.50	48.50	44.00	37.00	41.00	45.00	49.00	53.00	59.75	0.69	2.50	6.56	30.75	64.75	1.13
540	53.13	35.13	50.50	1.06	47.00	53.00	48.50	41.00	45.00	50.00	54.00	58.50	65.81	0.69	2.50	7.25	33.56	71.63	1.13
600	58.69	38.75	55.50	1.06	52.00	58.00	53.50	45.50	50.00	55.00	60.00	65.00	73.00	0.69	3.00	8.06	37.75	79.25	1.38
660	64.50	42.63	60.75	1.06	57.25	63.25	59.00	50.00	55.00	60.50	65.50	71.25	79.50	0.69	3.00	8.94	41.13	87.25	1.38
730	71.31	47.00	67.75	1.06	63.25	71.25	65.00	55.00	61.00	67.50	73.50	78.88	88.38	0.69	3.50	9.88	45.75	96.38	1.63
800	78.81	52.00	74.50	1.06	70.00	78.00	72.00	61.00	68.00	74.00	80.50	86.88	97.50	0.69	3.50	10.94	50.00	106.63	1.63

FAN SIZE	FF	FG	FH	FJ	FK	FN	FR	GA		GC	H	HA	HB	HC	HD	HE	HF	HG	HH
								CL-19	CL-23										
270	4.16	2	4.69	10.00	20.00	4	405T	7	7	17.94	57.19	24.31	40.25	32.56	28.88	26.69	24.50	22.31	20.13
300	5.63	3	3.06	15.00	20.00	4	445T	7	7	19.94	65.44	27.00	44.50	36.00	32.06	29.63	27.19	24.75	22.31
330	4.81	3	4.31	15.00	25.00	5	445T	7	7	21.94	67.44	29.63	49.19	39.94	35.25	32.63	29.91	27.25	24.56
360	4.09	4	2.94	20.00	30.00	6	445T	7	0.25	23.94	70.69	32.69	54.25	44.00	39.06	36.06	33.13	30.19	27.19
400	3.66	4	4.38	20.00	35.00	7	445T	7	0.25	26.44	73.06	36.00	59.94	48.81	43.00	39.75	36.50	33.19	30.00
450	3.22	5	3.25	25.00	40.00	8	445T	7	0.25	29.06	75.81	39.75	66.06	53.63	47.50	43.94	40.31	36.75	33.13
490	5.41	5	4.69	25.00	40.00	8	445T	7	0.25	31.56	78.69	43.75	72.50	58.81	52.31	48.38	44.38	40.38	36.44
540	5.44	6	3.94	30.00	45.00	9	445T	7	0.25	34.75	83.19	48.38	80.00	64.81	57.88	53.50	49.13	44.69	40.31
600	3.47	7	3.50	35.00	55.00	11	445T	0.25	0.25	38.00	86.81	53.44	88.56	71.88	64.00	59.19	54.31	49.44	44.56
660	3.88	7	5.44	35.00	60.00	12	445T	0.25	0.25	41.75	91.19	58.75	97.19	78.75	70.38	65.06	59.69	54.31	49.00
730	5.03	8	5.38	40.00	65.00	13	445T	0.25	0.25	46.44	98.56	64.88	107.56	87.25	77.81	71.88	66.00	60.06	54.19
800	3.78	9	5.38	45.00	75.00	15	445T	0.25	0.25	49.94	107.56	71.75	118.69	96.13	86.06	79.50	73.00	66.44	59.88

FAN SIZE	HP	J	K	KB	KL	KS		L	M	NH	P	Q	SD		S	SE	T	V
						CL-19	CL-23						CL-19	CL-23				
270	34.06	13.13	10.44	3.19	7.50	0.63x0.31	0.75x0.38	15.88	15.00	16	52.06	17.81	2.437	2.937	44.50	8.25	29.00	60.88
300	37.50	14.00	11.31	3.19	8.00	0.63x0.31	0.75x0.38	19.13	17.00	16	59.94	19.75	2.437	2.937	48.00	8.75	35.50	66.38
330	40.94	15.00	12.31	3.19	8.25	0.63x0.31	0.75x0.38	19.13	18.75	16	61.19	21.75	2.687	2.937	48.00	9.00	35.50	68.13
360	46.00	17.06	13.81	3.69	8.25	0.75x0.38	0.88x0.44	18.69	20.50	24	62.31	24.06	2.937	3.437	48.50	9.00	34.00	70.38
400	50.31	18.25	15.00	3.69	9.00	0.88x0.44	1.00x0.50	18.69	23.00	32	64.50	26.56	3.437	3.937	48.50	10.00	34.00	72.88
450	55.13	19.63	16.38	3.69	9.00	0.88x0.44	1.00x0.50	18.69	25.50	32	65.88	29.31	3.437	3.937	48.50	10.00	34.00	75.38
490	60.31	21.13	17.81	3.69	10.00	1.00x0.50	1.00x0.50	18.63	28.00	40	68.31	32.31	3.937	3.937	48.50	11.00	34.00	77.88
540	67.31	23.81	19.56	4.19	10.00	1.00x0.50	1.00x0.50	18.44	31.00	40	70.06	35.75	3.937	3.937	48.50	11.00	32.50	80.88
600	73.88	25.63	21.38	4.19	10.75	1.00x0.50	1.00x0.50	18.44	34.25	40	72.63	39.56	3.937	3.937	48.50	11.75	32.50	84.13
660	80.75	27.56	23.31	4.19	11.00	1.00x0.50	1.00x0.50	18.69	38.00	40	75.31	43.50	4.437	4.437	48.50	12.00	33.00	87.88
730	89.75	30.81	25.50	4.69	11.00	1.00x0.50	1.00x0.50	19.44	42.50	48	79.50	48.13	4.437	4.437	48.50	12.00	33.50	92.38
800	98.63	33.31	28.00	4.69	11.75	1.00x0.50	1.00x0.50	21.44	46.00	48	86.75	53.25	4.437	4.437	48.50	12.75	37.50	95.88

BC15577A

DIMENSIONS NOT TO BE USED FOR CONSTRUCTION. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

TCF
TWIN CITY FAN

Model

HRT

Furnish and install as shown on the plans, Model HRT Radial Tip Fan as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota. The fan shall conform to the following requirements.

PERFORMANCE — Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA accredited laboratory.

HOUSING — Casings shall be made of heavy-gauge steel with continuously-welded construction and braced with structural shapes to eliminate any resonant vibration and provide smooth operation. Flanged inlet and outlet, shaft seal, and drain shall be provided as standard equipment.

IMPELLER — Blade design shall be forward curved at the entering edge to meet air at the correct angle of entry for high efficiency, and radial at the tip of the leaving edge providing a self-cleaning characteristic. Blades shall be formed of special alloy material for strength and accuracy of contour and continuously-welded to the impeller cone and back plate. All impellers shall be supplied with welded wear pads. A heavy cast iron or fabricated steel hub shall be provided. All impellers shall be statically and dynamically balanced on precision electronic machines, as well as balance tuned after complete assembly.

SHAFT — Shafts shall be solid material selected for AISI 1040 or 1045 hot rolled steel, accurately turned, ground, polished and ring-gauged for accuracy. Shaft design shall be of sufficient diameter to allow the first critical speed to be at least 1.35 times the maximum fan operating speed.

BEARINGS — Fans must be supplied with heavy-duty, self-aligning grease or oil lubricated anti-friction spherical roller bearings with split pillow block housings to provide long bearing life.

FINISH AND COATING — The entire fan assembly, excluding the shaft, shall be properly washed and pretreated before application of a rust-preventative primer, if called out on the order. After the fan is completely assembled, a finish coat of paint shall be applied to the entire assembly, if called out on the order. The fan shaft shall be coated with a petroleum-based rust protectant. Aluminum components shall be unpainted.

FACTORY TEST RUN — All Arrangement 1 and Arrangement 9F fans shall be completely assembled and test run as a unit at operating speed or at the maximum RPM allowed for the particular construction type. Balance shall be taken by electronic equipment and records maintained of the readings of axial, vertical and horizontal direction on each of the bearings. A written copy of this record shall be available upon request by the customer.

TCF
TWIN CITY FAN

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RADIAL BLADED FANS | RADIAL TIP FANS | HIGH EFFICIENCY INDUSTRIAL FANS | PRESSURE BLOWERS
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