

Tangential Fans

***Series TA, TA_t, TE_t and GA
Impeller diameter 90 mm (3.54")***



*Example:
Tangential Fan Type TAR 90 (3.54")
(right hand drive)*

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LTG Tangential Fans- an advantage for best heating, cooling, drying, blasting

Many production processes require a linear extended and absolutely even distribution of air or other gases to the working area.

Because of their special design, tangential fans meet this requirements in the best possible way.

The rigid design and the use of high quality materials secure a long service life.

By the working principle, that does away with additional baffles and vanes and the space saving design, the use of tangential fans is very economic.

Flow principle

The air intake of tangential fans takes place over the whole length of the outer impeller periphery. The air then flows into the impeller interior where it is reversed and accelerated by the vortex caused by the impeller rotation. Finally the air is distributed at the discharge side over the whole impeller length. In this way the air flows through the impeller first from outside to inside and then from inside to outside. The impeller is a cylindrical cage of forward curved impeller blades with two or more supporting discs.

The vortex separates suction side and discharge side at the narrowest line between impeller ① and vortex inducer ② and causes the flow pattern together with the scroll ③.

Advantages

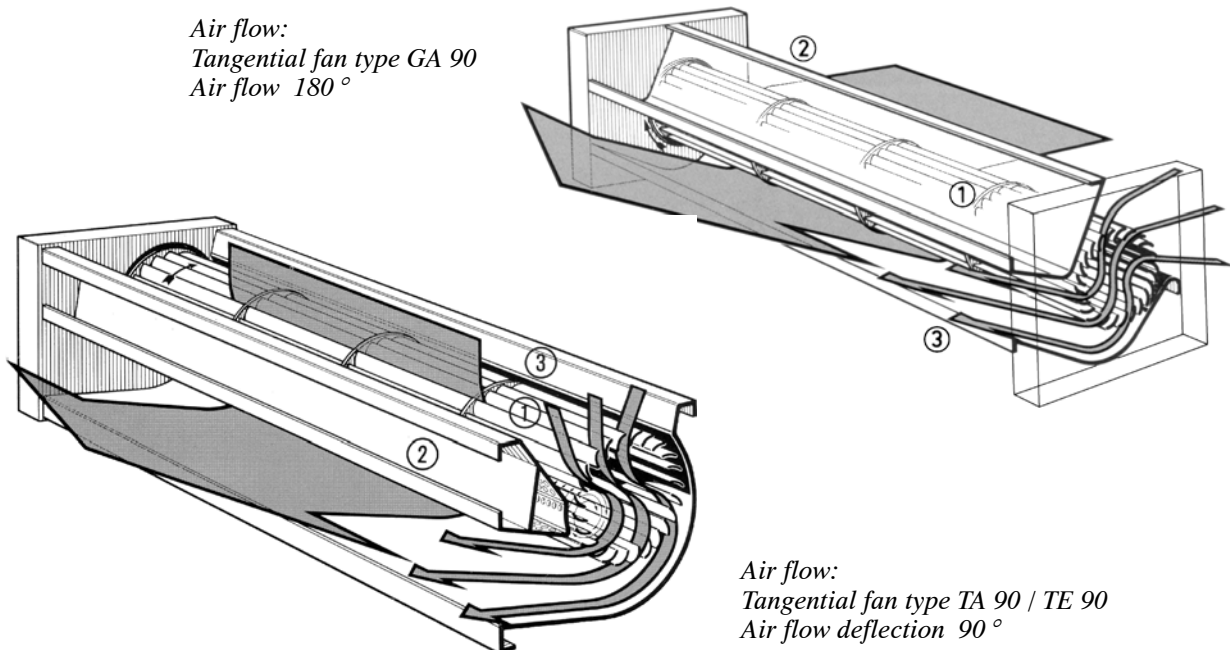
- Uniform air flow over the entire fan width. Additional baffles, plenums and guide vanes are not required.
- Space saving due to a 90° airflow deflection (type TA 90).
- The fan width can be exactly matched to the machine width. The air flow pattern does not change with wider machines (simplifies design and drawings of modular systems).
- Works equally well in any arrangement (right hand drive or left hand drive available).
- Low noise operation due to aerodynamically good impeller and scroll shape.
- Impeller bearings out of air flow.
- Many bolt-on options.

Fields of application

Examples of typical fields of application are:

bakeries, drying systems, industrial ovens, packaging industry, cooling and refrigeration, department stores, automobile industry, agricultural machines, surface treatment, control panels, hardening shops, textile engineering, swimming pools, air treatment, papermaking industry, environment simulation, chemical industry, industrial processing engineering, dust collection.

*Air flow:
Tangential fan type GA 90
Air flow 180°*



*Air flow:
Tangential fan type TA 90 / TE 90
Air flow deflection 90°*

LTG Tangential Fans Type TA, TA_t, TE_t and GA, Impeller Diameter 90 mm (3.54")

General information

LTG Tangential Fans type TA, TA_t, TE_t and GA can be universally applied for heating, cooling, drying and blasting. These fans are specially suitable where an extended airflow over a wide area is necessary.

Position of the fan

Standard arrangement is horizontal. With vertical arrangement the drive motor has to be at the bottom.

Installation and start up

Fix the fans to a plane base frame without any distortion. For the fixation use only the bolt holes in the side elements. Make sure to observe the applicable safety codes before starting the fans.

Motor arrangement

With suction opening on top, viewed against the discharge opening, the driving motor is optional either right hand (TAR, TAR_t, TER_t, GAR) or left hand (TAL, TAL_t, TEL_t, GAL).

Electrical equipment

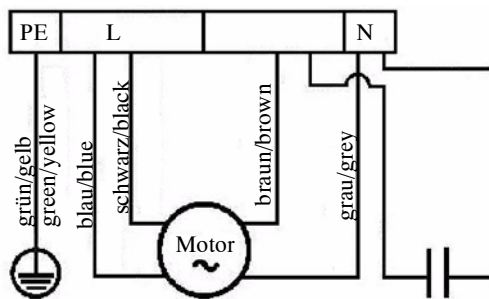
The fan is driven by a 4-pole single phase TEFC induction motor with capacitor,

U = 220 V, f = 50 cps or U = 115 V, f = 60 cps.

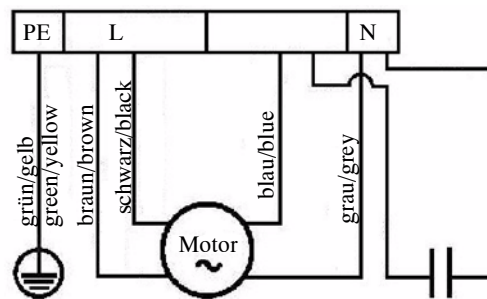
Enclosure is IP 44 according to DIN 40050. This gives protection against dust deposits inside the motor and spray water.

The motor is also adjustable for special voltage and cycles according to the performance data.

Electrical connection



TAR/TER/GAR



TAL/TEL/GAL

LTG Tangential Fans Type TA, TAt and TEt, Impeller Diameter 90 mm (3.54")

Gas temperature

-40°C up to +70°C (-40°F up to +160°F) TA

-40°C up to +120°C (-40°F up to +250°F) TAt

-25°C up to +200°C (-13°F up to +400°F) TEt

The tangential fan Type TA is a fan with enhanced corrosion resistance and suitable for use in low temperature applications.

The tangential fans Type TAt and TEt are fans with enhanced corrosion resistance and suitable for an extended temperature range.

Service conditions

Gas temperatures:

-40°C up to +70°C/120°C (-40°F up to +160/250°F) TA/TAt

-25°C up to +200°C (-13°F up to +400°F) TEt

Ambient temperatures:

-25°C up to +40°C (-13°F up to +104°F)

for the drive side with motor and

-40°C up to max. +70°C (-40°F up to +160°F)

for the counter side (TA and TAt)

-25°C up to max. +70°C (-13°F up to +160°F)

for the counter side (TEt)

Types TA / TAt / TEt: the range

Type	Max. medium temperatures	Impeller length	Casing	Impeller	Motor*	
TAR 90/397/N TAL 90/397/N	-40°F to +160°F (-40°C to +70°C)	15.63 inch (397 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz 220 V, 60 Hz 240 V, 50 Hz	IP 44 4 poles
TAR 90/397/US TAL 90/397/US		15.63 inch (397 mm)	marine grade aluminium	marine grade aluminium	115 V, 60 Hz	IP 44 4 poles
TAR 90/597/N TAL 90/597/N		23.5 inch (597 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz 220 V, 60 Hz 240 V, 50 Hz	IP 44 4 poles
TAR 90/597/US TAL 90/597/US		23.5 inch (597 mm)	marine grade aluminium	marine grade aluminium	115 V, 60 Hz	IP 44 4 poles
TAR 90/827/N TAL 90/827/N		32.56 inch (827 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz 240 V, 50 Hz	IP 44 4 poles
TAR 90/827/US TAL 90/827/US		32.56 inch (827 mm)	marine grade aluminium	marine grade aluminium	115 V, 60 Hz	IP 44 4 poles
TAR 90/1027/N TAL 90/1027/N		40.43 inch (1027 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz	IP 44 4 poles
TAR 90/1027/US TAL 90/1027/US		40.43 inch (1027 mm)	marine grade aluminium	marine grade aluminium	115 V, 60 Hz	IP 44 4 poles
TARt 90/397/N TALt 90/397/N	-40°F to +250°F (-40°C to +120°C)	15.63 inch (397 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz 220 V, 60 Hz 240 V, 50 Hz	IP 44 4 poles
TARt 90/397/US TALt 90/397/US		15.63 inch (397 mm)	marine grade aluminium	marine grade aluminium	115 V, 60 Hz	IP 44 4 poles
TARt 90/597/N TALt 90/597/N		23.5 inch (597 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz 220 V, 60 Hz 240 V, 50 Hz	IP 44 4 poles
TARt 90/597/US TALt 90/597/US		23.5 inch (597 mm)	marine grade aluminium	marine grade aluminium	115 V, 60 Hz	IP 44 4 poles
TERt 90/497/E104 TELt 90/497/E104	-13°F to +400°F (-25°C to +200°C)	19.57 inch (497 mm)	marine grade aluminium	stainless steel	230 V, 50 Hz	IP 44 2 poles

*) Use the standard for every voltage and frequency indicated.

Version 115 V, 60 Hz is UL/CSA approved

LTG Tangential Fans Type TA, Impeller Diameter 90 mm (3.54") -40°C up to + 70°C (-40°F up to +160°F)



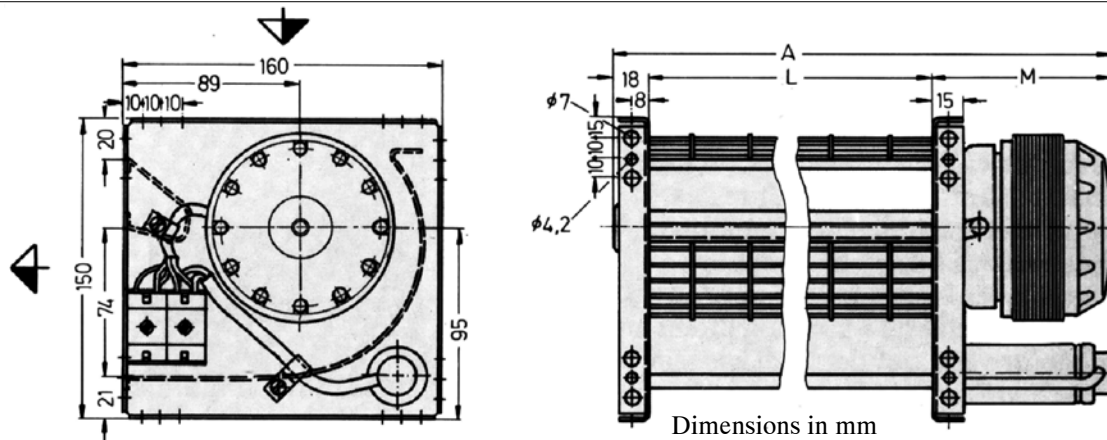
Tangential fan type TAR 90 (right hand drive)

Specification and design features

Tangential fan with close coupled, spray water protected drive motor.

Rigid bolted, corrosion proof casing. Impeller and casing of marine grade aluminium. Side elements of stainless steel (1.4301). On the drive side the impeller is bedded via an elastic coupling on the motorshaft; on the counter side in vibration damped friction bearings from sinter bronze with an ample grease reserve.

Bearing design life is 20 000 hours. Drive motor wired with capacitor and terminal block. Intake and discharge openings have sealing planes to connect exactly to ducts and appliances. Low noise operation due to aerodynamically good impeller and scroll shape.



Dimensions and performance data

Type	Dimensions			Air Volume V	Speed n	Power consumption P _A	Full load Amps J _A		Capacitor		Masses	
	A	L	M				[cfm]	[rpm]	[W]	[A]	[μF]	[V]
TAR 90/397/N TAL 90/397/N	19.73 (502)	15.63 (397)	3.43 (87)	471 (800)	1230	68	0.31	2	400	6.4 (2.9)		
TAR 90/397/US TAL 90/397/US	20.47 (520)	15.63 (397)	4.13 (105)	553 (940)	1570	115	1.00	12	220	6.4 (2.9)		
TAR 90/597/N TAL 90/597/N	27.63 (702)	23.5 (597)	3.43 (87)	612 (1040)	1050	77	0.35	2	400	7.5 (3.4)		
TAR 90/597/US TAL 90/597/US	28.35 (720)	23.5 (597)	4.13 (105)	789 (1340)	1390	134	1.17	12	220	7.5 (3.4)		
TAR 90/827/N TAL 90/827/N	37.4 (950)	32.6 (827)	4.13 (105)	965 (1640)	1210	115	0.52	4	400	10.14 (4.6)		
TAR 90/827/US TAL 90/827/US	37.4 (950)	32.6 (827)	4.13 (105)	977 (1660)	1220	149	1.28	12	220	10.14 (4.6)		
TAR 90/1027/N TAL 90/1027/N	45.28 (1150)	40.43 (1027)	4.13 (105)	1095 (1860)	1150	123	0.56	4	400	11.46 (5.2)		
TAR 90/1027/US TAL 90/1027/US	45.28 (1150)	40.43 (1027)	4.13 (105)	960 (1630)	1130	150	1.31	12	220	11.46 (5.2)		

LTG Tangential Fans Type TA, Impeller Diameter 90 mm (3.54")

Fan curves for 220 V, 50 Hz

Test conditions for the fan curves

The indicated curves are valid for an air density of $\rho = 1.2 \text{ kg/m}^3$, a supply voltage of $U = 220 \text{ V}$ with $f = 50 \text{ cps}$, if operated with a 4-pole motor.

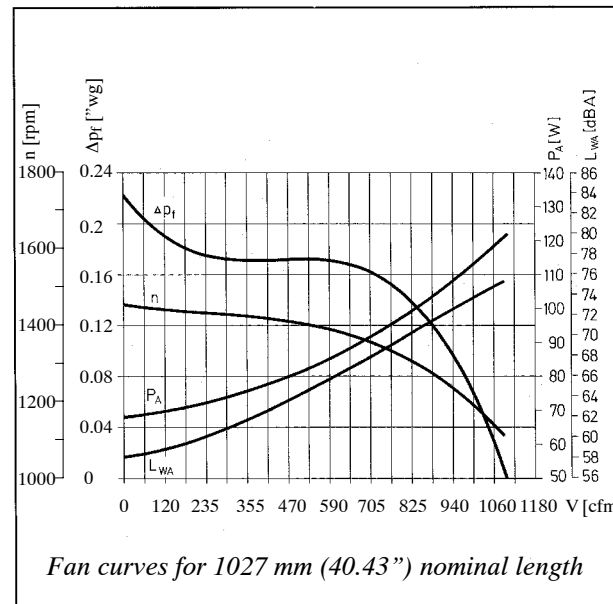
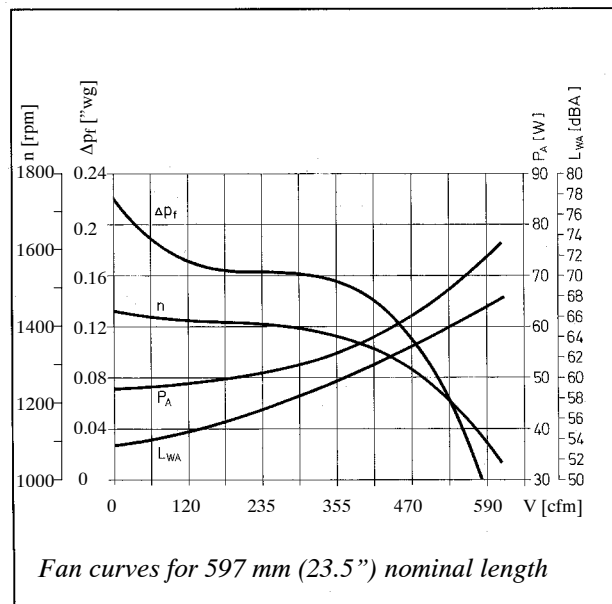
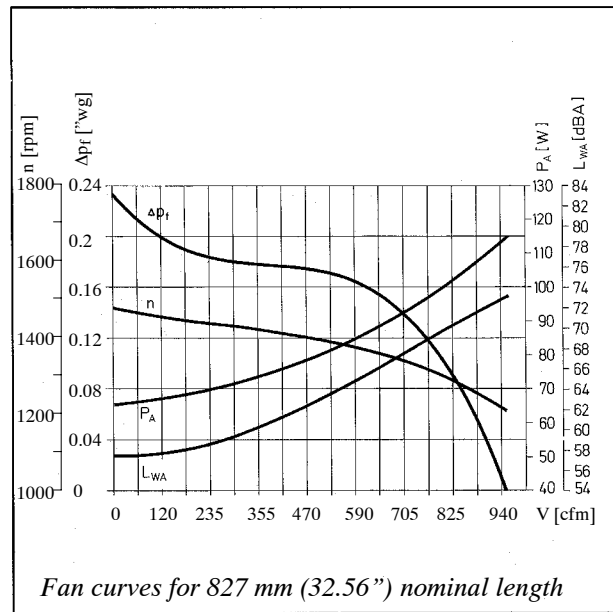
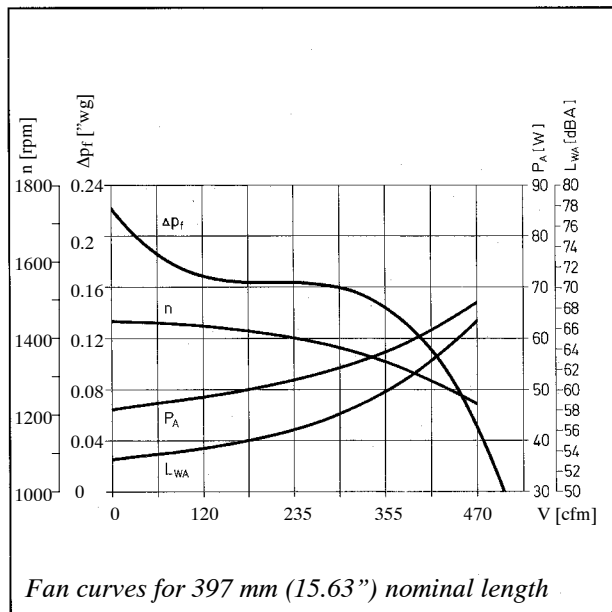
The rating tests were done as laboratory tests according to VDI 2044 with unrestricted inlet and discharge.

Acoustical data

The acoustical data are for discharge side, tested in a reverberant field.

The A-weighted sound power level L_{WA} can be transformed into an A-weighted sound pressure level by the equation $L_{pA} = L_{WA} - 10 \log S/1 \text{ m}^2$. For this the exact total panel area S can be used. The sound pressure level in the free field in 1 m distance (full spheric sound radiation) is abt. 11 dB less than the sound power level.

Measuring tolerances for Δp_f : $\pm 0.08 \text{ "wg}$; measuring tolerances for L_{WA} : $\pm 2 \text{ dB (A)}$



LTG Tangential Fans Type TA, Impeller Diameter 90 mm (3.54")

Fan curves for 110 -115 V, 60 Hz

Test conditions for the fan curves

The indicated curves are valid for an air density of $\rho = 1.2 \text{ kg/m}^3$, a supply voltage of $U = 220 \text{ V}$ with $f = 50 \text{ cps}$, if operated with a 4-pole motor.

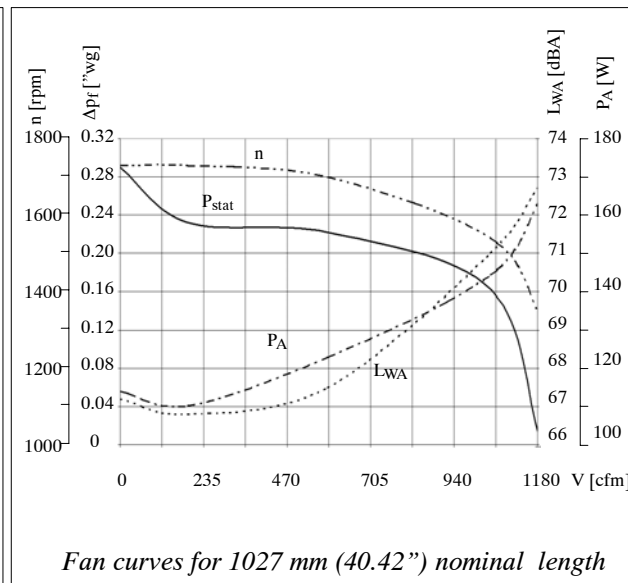
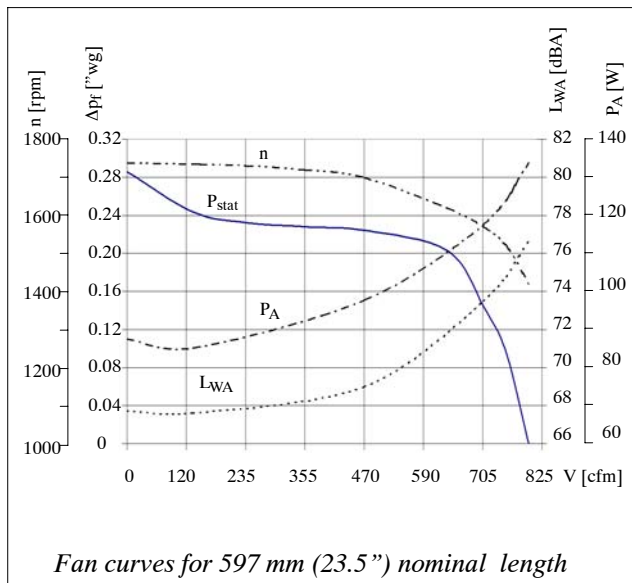
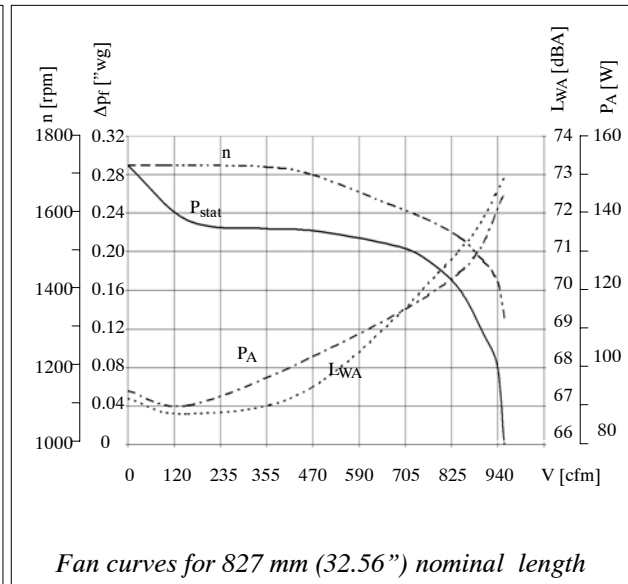
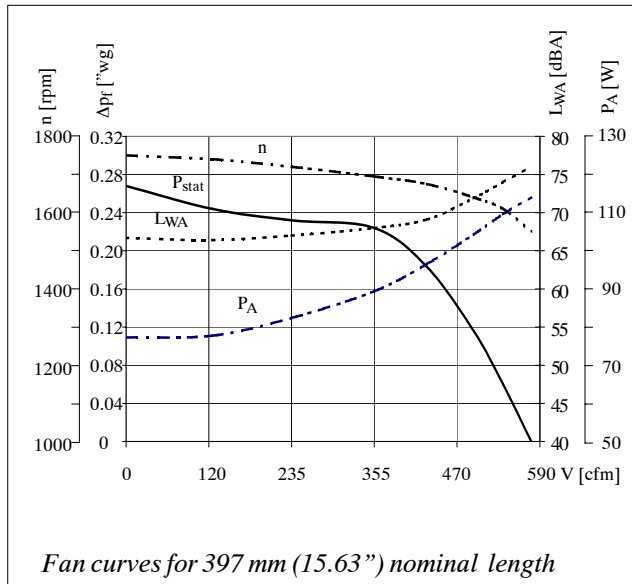
The rating tests were done as laboratory tests according to VDI 2044 with unrestricted inlet and discharge.

Acoustical data

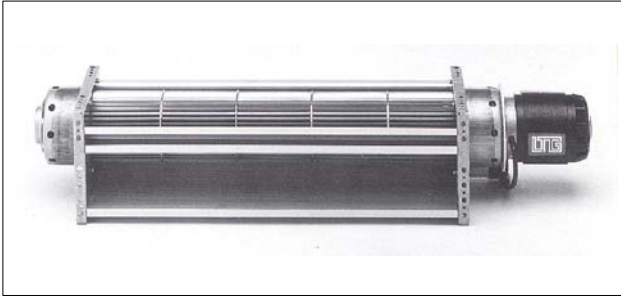
The acoustical data are for discharge side, tested in a reverberant field.

The A-weighted sound power level L_{WA} can be transformed into an A-weighted sound pressure level by the equation $L_{pA} = L_{WA} - 10 \log S/1 \text{ m}^2$. For this the exact total panel area S can be used. The sound pressure level in the free field in 1 m distance (full spheric sound radiation) is about 11 dB less than the sound power level.

Measuring tolerances for Δp : $\pm 0.08 \text{ "wg}$; measuring tolerances for L_{WA} : $\pm 2 \text{ dB (A)}$



LTG Tangential Fans Type TEt, Impeller Diameter 90 mm -25°C up to +200°C (-13°F up to +400°F)



Tangential fan type TERt 90 (right hand drive)

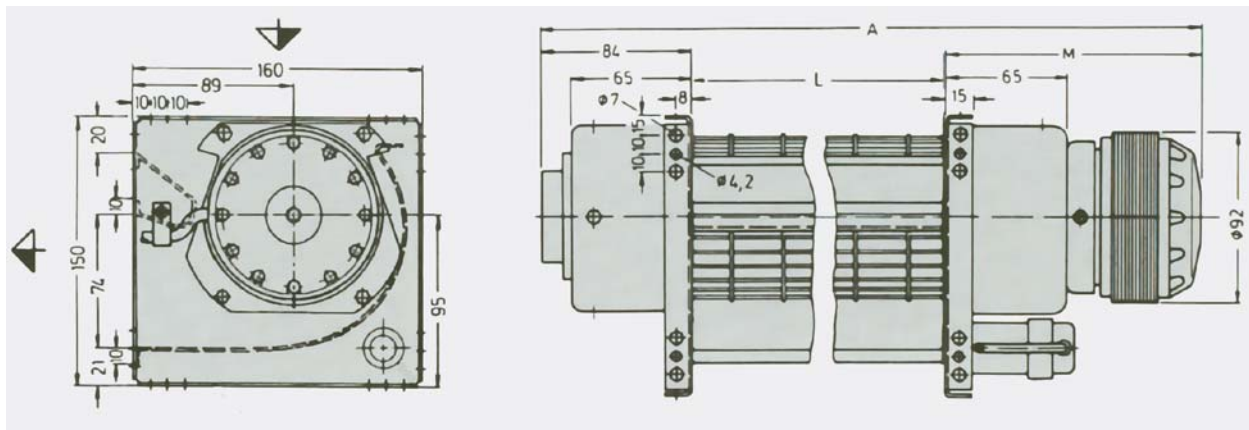
Specification and design features

Tangential fan with close coupled, spray water protected drive motor.

Rigid bolted, corrosion proof casing. Impeller and casing of marine grade aluminium. Side elements of stainless steel (1.4301). On the drive side the impeller is bedded via an elastic coupling on the motorshaft, on the counter side via vibration dampened bearing inserted in the heat insulation cover.

Motor and end bearing side in specially greased ball bearings, made for a service life of 10,000 hours. Intake and discharge openings have sealing planes to connect exactly to ducts and appliances.

Low noise operation due to aerodynamically good impeller and scroll shape.



Dimensions and performance data

Type	Dimensions			Air Volume V [cfm] [m ³ /h]	Speed n [rpm]	Power consumption P _A [W]	Full load Amps J _A [A]	Capacitor		Masses [lb] [kg]
	A [inch] [mm]	L [inch] [mm]	M [inch] [mm]					[μF]	[V]	
TERt 90/497/E104 TELt 90/497/E104	30.24 (768)	19.57 (497)	7.36 (187)	1060 (1800)	2600	430	0.8	6	400	10 (4.5)

LTG Tangential Fans Type TEt, Impeller Diameter 90 mm (3.54")

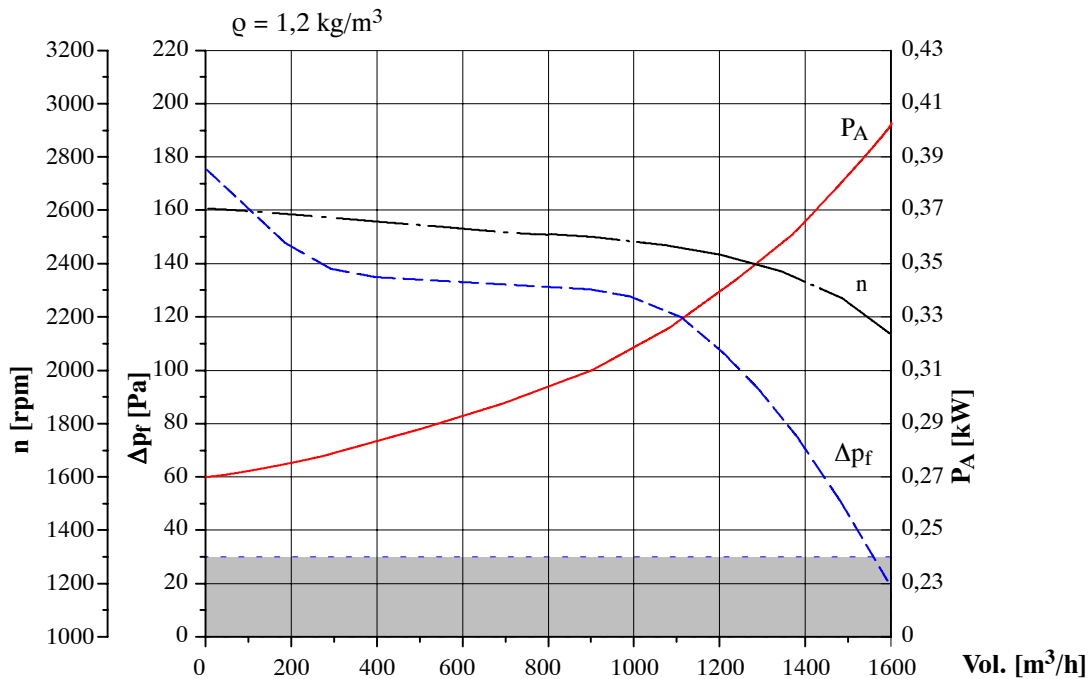
Fan curves for 220 V, 50 Hz

Test conditions for the fan curves

The indicated curves are valid for an air density of $\rho = 1.2 \text{ kg/m}^3$, a supply voltage of $U = 220 \text{ V}$, with $f = 50 \text{ Hz}$ if operated with a 2-pole motor.

The rating tests were done as laboratory tests according to VDI 2044 with unrestricted inlet and discharge.

The sound pressure level in the free field in 1 m distance (full spheric sound radiation) is abt. 11 dB less than the sound power level.



Fan curves for 497 mm nominal length

Attention! The fan is not suitable for an operation with free diffusion!
Minimum counter pressure (static) should be 30 Pa.

LTG Tangential Fans Type TA, TAt and TEt, Impeller Diameter 90 mm (3.54")

Selection

Application			Example	Your data	Designations
gas			hot air		V [cfm] air volume
gas temperature	t	[°F]	210		Δp_f [”wg] static pressure
ambient temperature					p_d [”wg] dynamic pressure at the
drive side	t	[°F]	95		discharge area
counter side	t	[°F]	115		c [fpm] velocity at the discharge area
condensation			no		ρ [kg/m ³] specific gravity
located at			drying oven		$p_d = \rho/2 \cdot c^2$ $J_A = P_A/U$
drive side			right hand		n [rpm] speed
arrangement			horizontal		U [V] voltage
Drive motor					f [Hz] frequency
power supply			AC		J_A [A] full load amps
voltage	U	[V]	400 / 460		P_A [W] power consumption
frequency	f	[Hz]	60		L_{WA} [dBA] A-weighted sound power level
Specified performance					L_{pA} [dBA] A-weighted sound power level
air volume	V	[cfm]	470		S [m ²] panel area
static pressure	Δp_f	[”wg]	0.2		
at specific gravity	ρ	[kg/m ³]	1.2		
active impeller length	min. L	[”]	12		
	max. L	[”]	24		
total length	A	[”]	36		
Procedure					
1. conditions of application fan type			hot air 210°F TAt		
2. air volume achievable with length	V	[cfm]	470 397 and 597		
3. static pressure achievable with length	Δp_f	[”wg]	0.2 597		
4. drive side			right hand		
Selected					
LTG-Tangential fan type			TARt 90/597/N		
Performance data					
air volume	V	[cfm]	470		
static pressure	Δp_f	[”ws]	0.21		
dynamic pressure	p_d	[”ws]	0.06		
exhaust velocity	c	[fpm]	1000		
speed	n	[rpm]	1700		
Electrical data					
power input	P_A	[W]	74		
full load amps	J_A	[A]	0.28		
Acoustical data					
sound power level A-weighted	L_{WA}	[dBA]	69		
sound pressure level in the free field in 1 m distance (full spheric sound radiation)	L_{pA}	[dBA]	59		

LTG Tangential Fans Type GA, Impeller Diameter 90 mm (3,54")

Gas temperature

-40 °C up to +70 °C (- 40 °F up to + 160 °F)

Service conditions

Gas temperatures:

-40 °C up to +70 °C/120 °C (- 40 °F up to + 160/250 °F)

Ambient temperatures:

-25 °C up to +40 °C (- 13 °F up to + 104 °F)
for the drive side with motor and

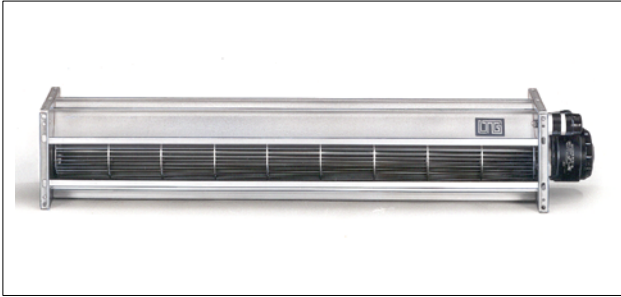
-40 °C up to max. +70 °C (- 40 °F up to + 160 °F)
for the counter side.

Type GA: the range

Type	Max. medium temperatures	Impeller length	Casing	Impeller	Motor*	
GAR 90/397/N GAL 90/397/N	-40°F to +158°F (-40°C to +70°C)	15.63 inch (397 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz 220 V, 60 Hz 240 V, 50 Hz	IP 44 4 pole
GAR 90/597/N GAL 90/597/N		23.5 inch (597 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz 220 V, 60 Hz 240 V, 50 Hz	IP 44 4 pole
GAR 90/827/N GAL 90/827/N		32.56 inch (827 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz 240 V, 50 Hz	IP 44 4 pole
GAR 90/1027/N GAL 90/1027/N		40.43 inch (1027 mm)	marine grade aluminium	marine grade aluminium	220 V, 50 Hz	IP 44 4 pole

*) Use the standard for every voltage and frequency indicated.

LTG Tangential Fans Type GA, Impeller Diameter 90 mm (3.54") -40°C up to + 70°C (-40°F up to +160°F)



Tangential fan type GAR 90 (right hand drive)

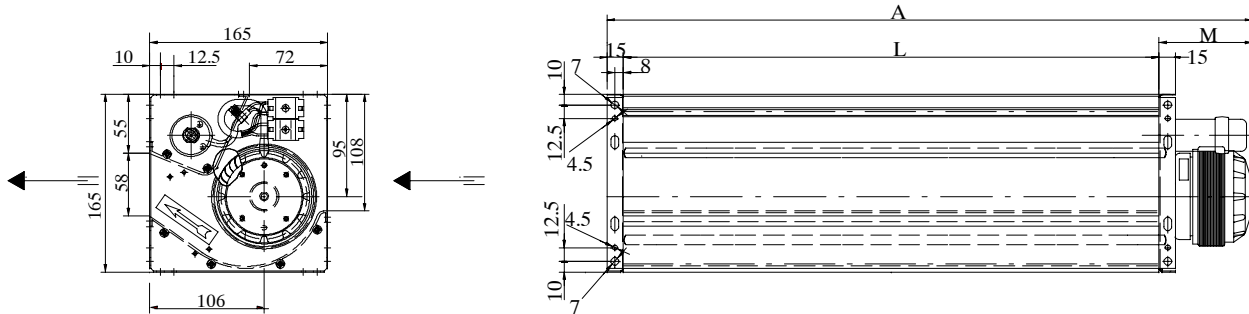
Specification and design features

Tangential fan with close coupled, spray water protected drive motor.

Rigid bolted, corrosion proof casing. Impeller and casing of marine grade aluminium. Side elements of stainless steel (1.4301). On the drive side the impeller is bedded via an elastic coupling on the motorshaft; on the counter side in vibration damped friction bearings from sinter bronze with an ample grease reserve.

Bearing design life is 20 000 hours. Drive motor wired with capacitor and terminal block. Intake and discharge openings have sealing planes to connect exactly to ducts and appliances.

Low noise operation due to aerodynamically good impeller and scroll shape.



Dimensions in mm

Dimensions and performance data

Typ	Dimensions			Air Volume V [cfm] [m ³ /h]	Speed n [rpm]	Power consumption P _A [W]	Power consumption P _A [A]	Capacitor		Masses [lb] [kg]
	[inch] [mm]	[inch] [mm]	[inch] [mm]					[μF]	[V]	
	A	L	M							
GAR 90/397/N GAL 90/397/N	19.73 (502)	15.63 (397)	3.43 (87)	371 (630)	1330	67	0.31	2	400	7.5 (3.4)
GAR 90/597/N GAL 90/597/N	27.63 (702)	23.5 (597)	3.43 (87)	536 (910)	1260	75	0.34	2	400	9 (4.1)
GAR 90/827/N GAL 90/827/N	37.4 (950)	32.6 (827)	4.13 (105)	783 (1330)	1340	95	0.43	4	400	11.9 (5.4)
GAR 90/1027/N GAL 90/1027/N	45.28 (1150)	40.43 (1027)	4.13 (105)	942 (1600)	1280	119	0.53	4	400	13.45 (6.1)

LTG Tangential Fans Type GA, Impeller Diameter 90 mm (3.54")

Fan curves

Test conditions for the fan curves

The indicated curves are valid for an air density of $\rho = 1.2 \text{ kg/m}^3$, a supply voltage of $U=220 \text{ V}$ with $f = 50 \text{ cps}$, if operated with a 4-pole motor.

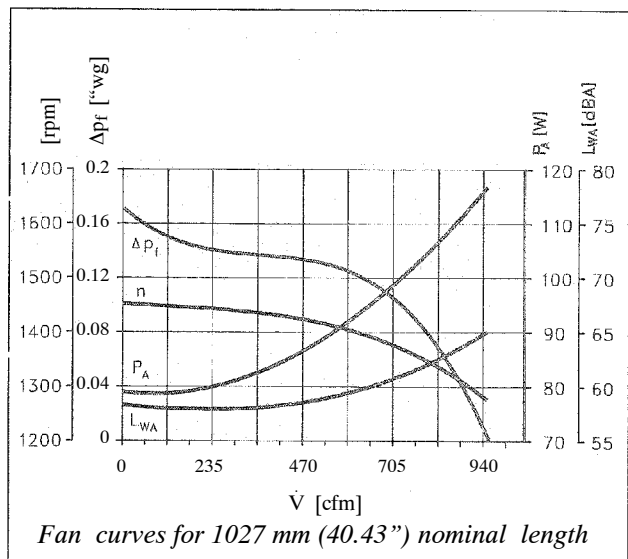
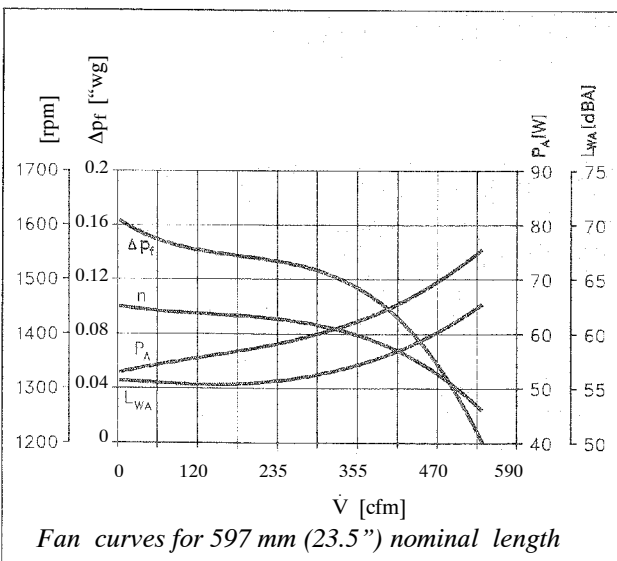
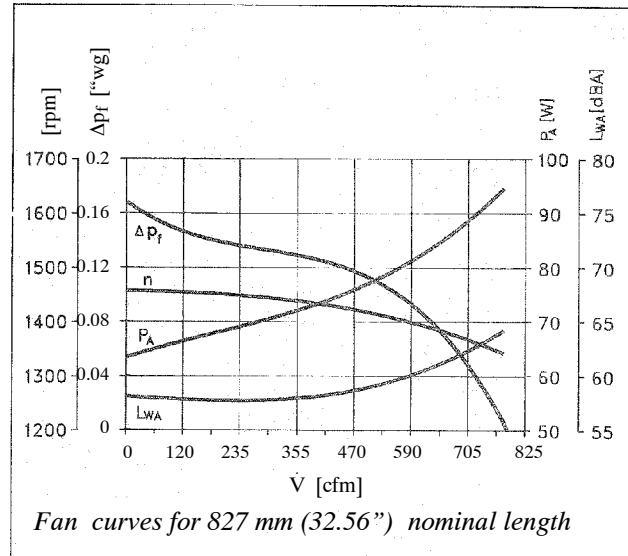
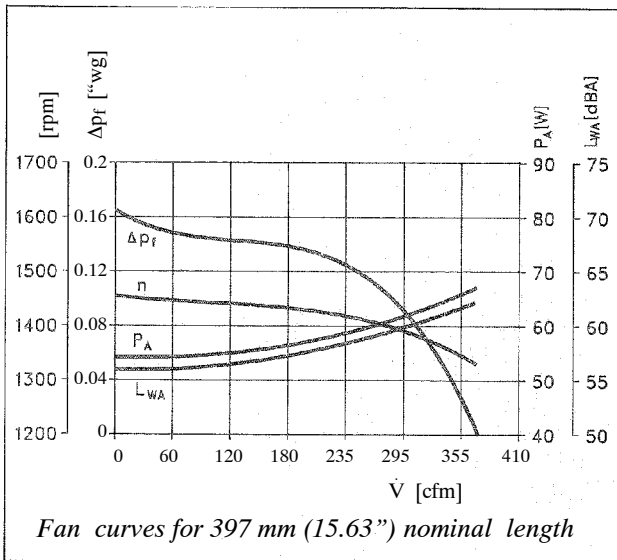
The rating tests were done as laboratory tests according to DIN 2044 with unrestricted inlet and discharge.

Acoustical data

The acoustical data are for discharge side, tested in a reverberant field.

The A-weighted sound power level L_{WA} can be transformed into an A-weighted sound pressure level by the equation $L_{pA} = L_{WA} - 10 \log S/1 \text{ m}^2$. For this the exact total applicable panel area S can be used. The sound pressure level in the free field in 1 m distance (full spheric sound radiation) is abt. 11 dB less than the sound power level.

Measuring tolerances for Δp : $\pm 0.008 \text{ "wg}$; measuring tolerances for L_{WA} : $\pm 2 \text{ dB (A)}$



LTG Tangential Fans Type GA, Impeller Diameter 90 mm (3.54")

Selection

Application			Example	Your data	Designations	
gas			warm air		V [cfm]	air volume
gas temperature	t	[°F]	140		Δp_f [”wg]	static pressure
ambient temperature					p_d [”wg]	dynamic pressure
drive side	t	[°F]	95			at the
counter side	t	[°F]	115		c [fpm]	discharge area
condensation			no			velocity at the
located at			drying oven		ρ [kg/m ³]	discharge area
drive side			right hand		$p_d = \rho/2 \cdot c^2$	specific gravity
arrangement			horizontal		$J_A = P_A/U$	
Drive motor					n [rpm]	speed
power supply			AC		U [V]	voltage
voltage	U	[V]	400 / 460		f [Hz]	frequency
frequency	f	[Hz]	50		J_A [A]	full load amps
Specified performance					P_A [W]	power consumption
air volume	V	[cfm]	470		L_{WA} [dBA]	A-weighted sound power level
static pressure	Δp_f	[”wg]	25		L_{pA} [dBA]	A-weighted sound power level
at specific gravity	ρ	[kg/m ³]	1.2		S [m ²]	panel area
active impeller length	min. L	[”]	20			
	max. L	[”]	35			
total length	A	[”]	40			
Procedure						
1. conditions of application fan type			warm air 140°F GA			
2. air volume	V	[cfm]	470			
achieveable with length			597 and 827			
3. static pressure	Δp_f	[”wg]	25			
achieveable with length			827			
4. drive side			right hand			
Selected						
LTG-Tangential fan type			GAR 90/827/N			
Performance data						
air volume	V	[cfm]	470			
static pressure	Δp_f	[”wg]	0.12			
dynamic pressure	p_d	[”wg]	0.05			
exhaust velocity	c	[fpm]	900			
speed	n	[rpm]	1420			
Electrical data						
power input	P_A	[W]	76			
full load amps	J_A	[A]	0.35			
Acoustical data						
sound power level A-weighted	L_{WA}	[dBA]	58			
sound pressure level in the free field in 1 m distance (full spheric sound radiation)	L_{pA}	[dBA]	47			