



Technical Documentation

LTG High Performance Tangential Fans

Series TTF

Impeller diameter 150 mm

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.

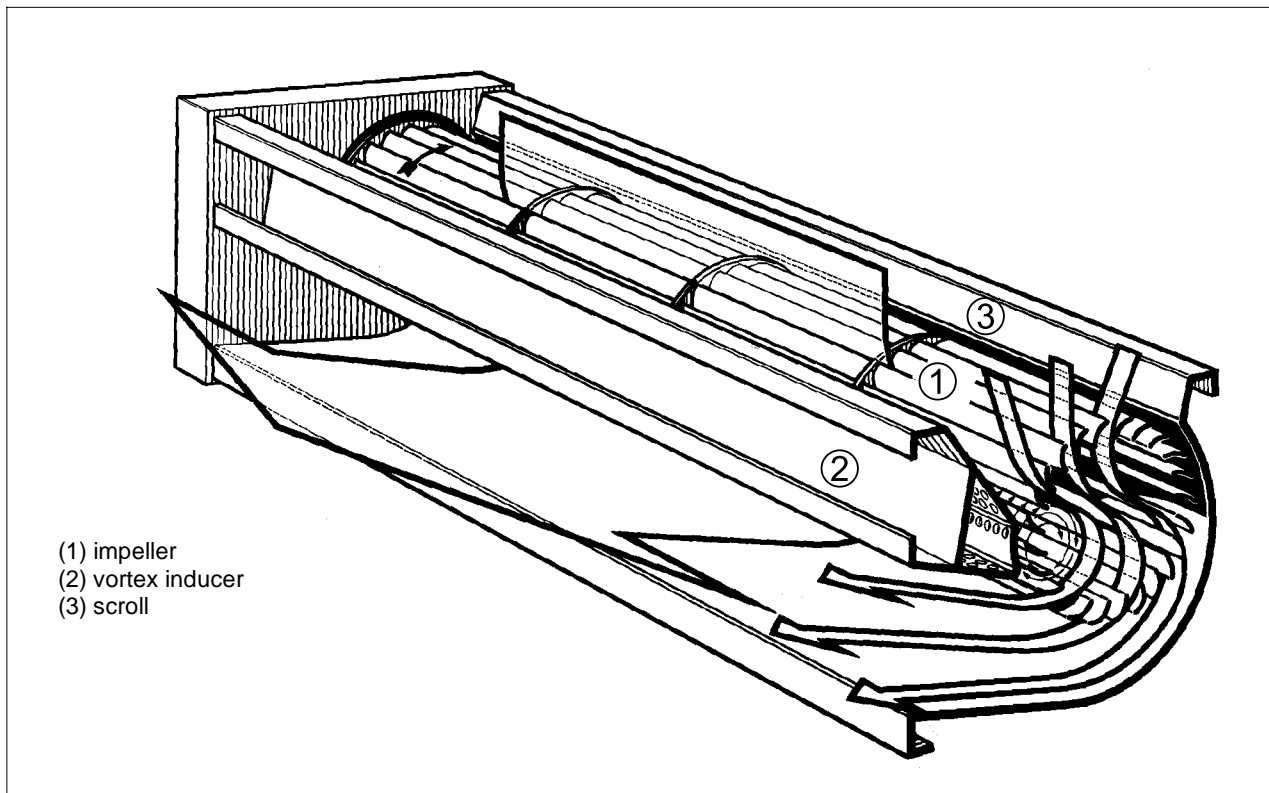
Advantages

- 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.
- 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.



LTG Tangential Fans Type TTF

Service conditions

Gas temperatures:
-40 °C up to +250 °C
Ambient temperatures:
-25 °C up to +40 °C
Permissible bearing temperatures:
-25 °C up to +120 °C



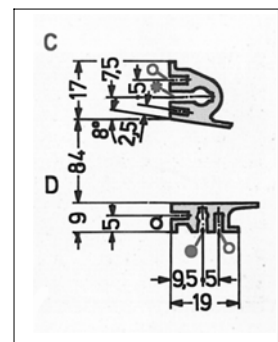
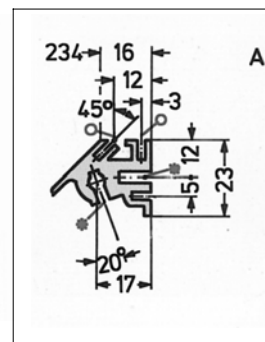
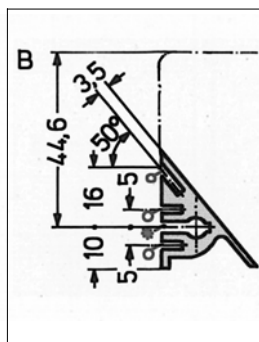
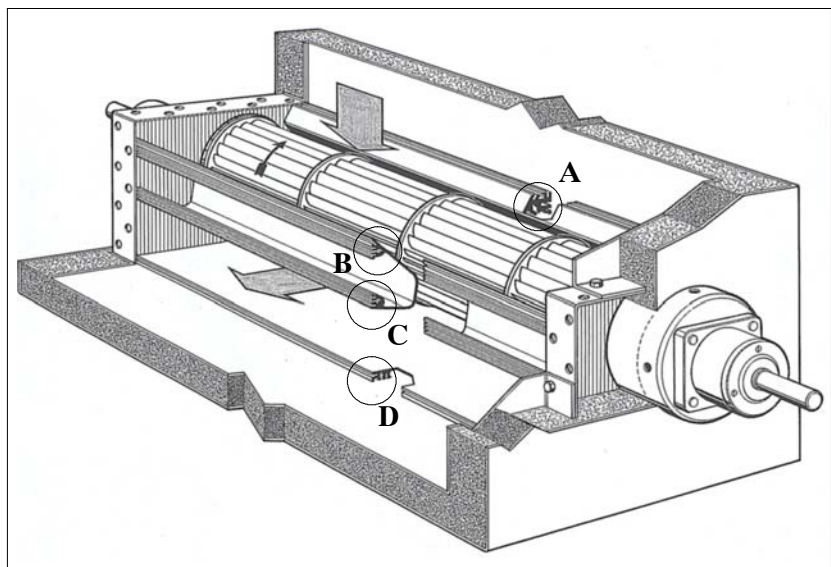
Delivery Range

Type	Max. medium temperatures	Impeller length	Casing	Impeller
TTF 150/401/N	-40 °C up to +250 °C (-40 °F up to +482 °F)	401 mm (15.79 inch)	stainless steel, marine grade aluminium	galvanized steel
TTF 150/601/N	-40 °C up to +250 °C (-40 °F up to +482 °F)	601 mm (23.66 inch)	stainless steel, marine grade aluminium	galvanized steel
TTF 150/864/N	-40 °C up to +250 °C (-40 °F up to +482 °F)	864 mm (34.01 inch)	stainless steel, marine grade aluminium	galvanized steel
TTF 150/1064/N	-40 °C up to +250 °C (-40 °F up to +482 °F)	1064 mm (41.89 inch)	stainless steel, marine grade aluminium	galvanized steel
TTF 150/1264/N	-40 °C up to +250 °C (-40 °F up to +482 °F)	1264 mm (49.76 inch)	stainless steel, marine grade aluminium	galvanized steel

Specification and design features

Tangential fan with both side shaft ends. Rigid bolted, corrosion proof casing. Scroll of marine grade aluminium (DIN 1725). Side elements of stainless steel (1.4541). Impeller of galvanized steel.

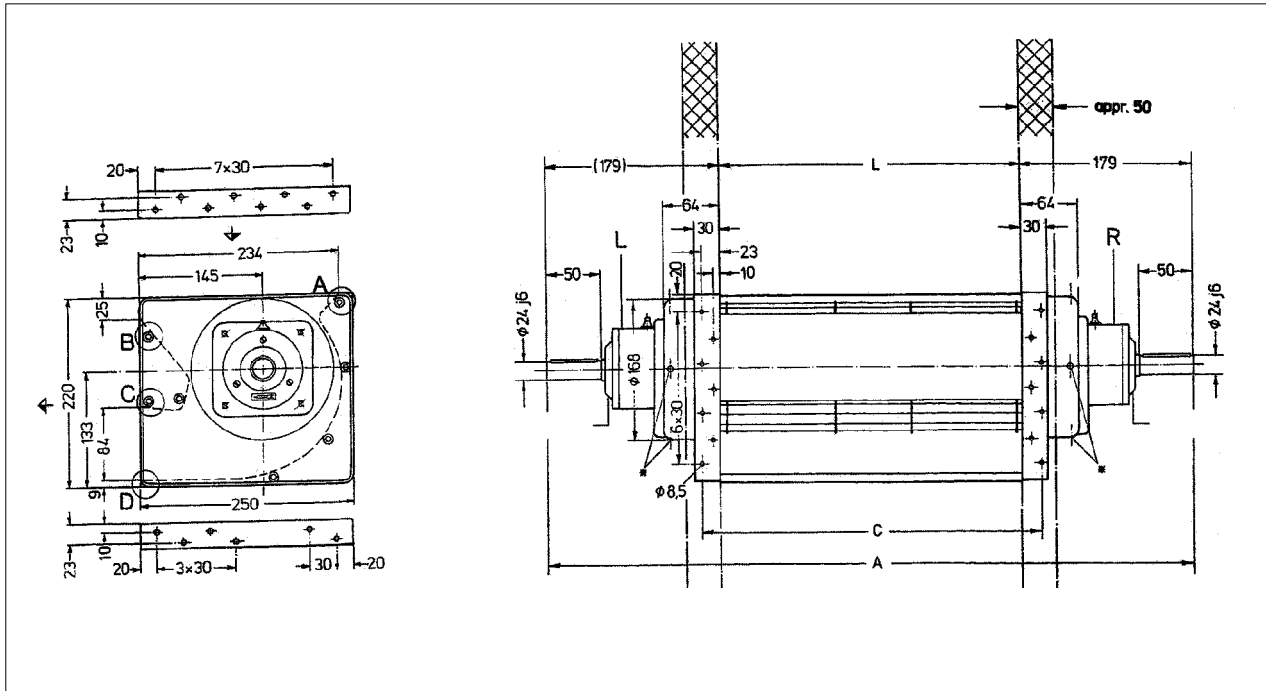
The impeller is both sides bedded in self-aligning ball bearings with regreasing nipples. Bearing design life is 20 000 hours. The bearings are protected by heat-insulation caps against the gas temperature. Intake and discharge openings have sealing planes and plug in slots to connect exactly to ducts and appliances. The complete fan (including bearing clearance etc.) is balanced to grade Q 6.3 according to VDI 2060. With the suction opening on top, viewed against the discharge opening, the drive side shaft end in standard design is right hand. After changing the loose bearing ring the drive side shaft end can be left hand.



- Plug in slots 6mm deep for duct connection, max. 1.5 mm sheet thickness
- ☆ Slots for self-tapping screws, 4.2 mm, max. 10 mm screw in depth
- Slots for self-tapping screws, 3.9 (3.5) mm, max. 7.5 mm screw in depth

LTG Tangential Fans Type TTF

Dimensions and performance data

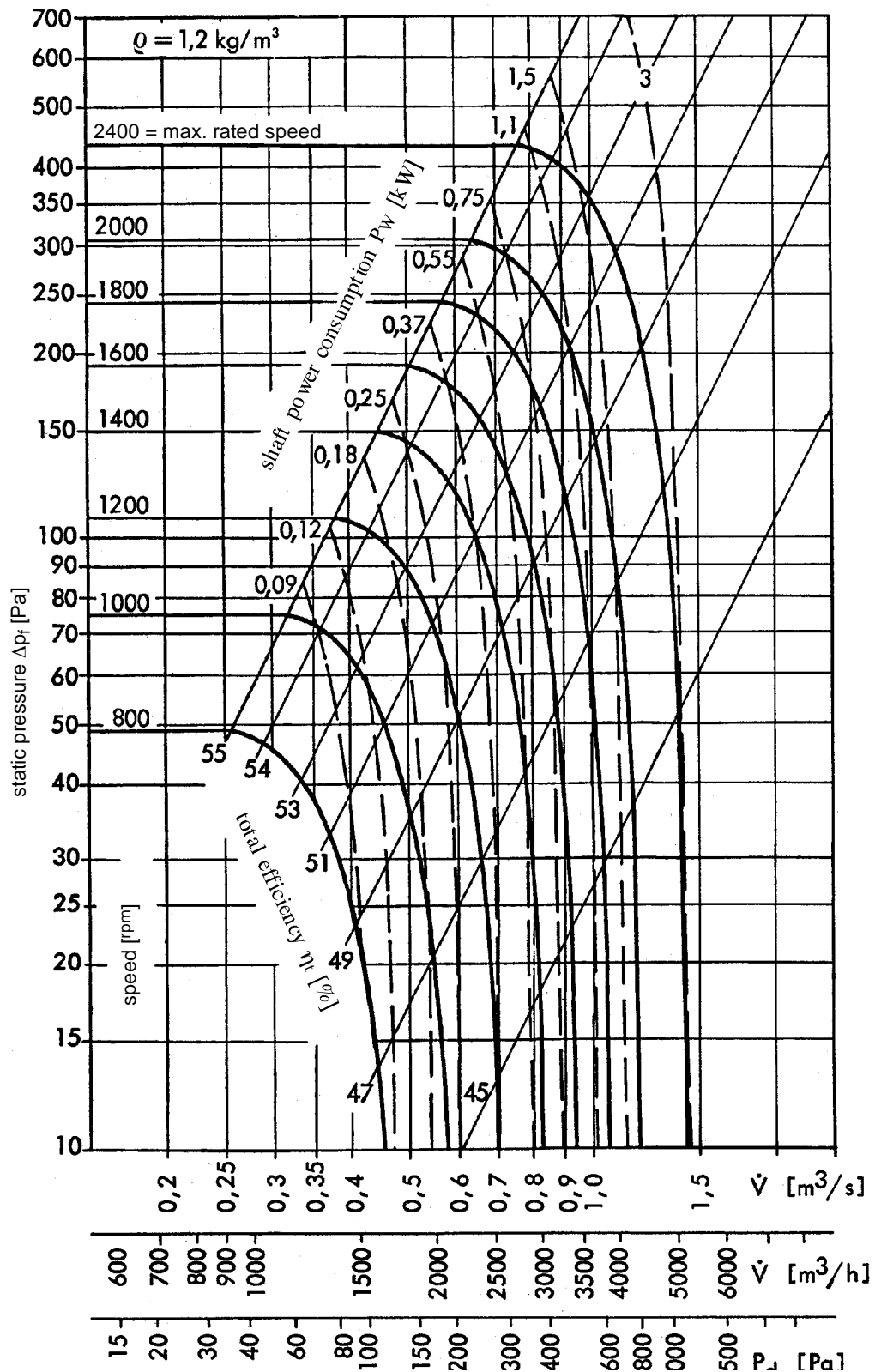


Type	Dimensions [mm] [inch]			Air volume V_{\max} [m ³ /h] [cfm]	Speed n_{\max} [rpm]	Static pressure $\Delta p_{f \max}$ [Pa]	Masses [kg] [lb]
	A	L	C				
TTF 150/401/N	759 (29.88)	401 (15.79)	447 (17.6)	5300 (3120)	2400	440	16 (35.3)
TTF 150/601/N	959 (37.76)	601 (23.66)	647 (25.47)	7500 (4415)	2400	440	19 (42)
TTF 150/864/N	1222 (48.11)	864 (34.01)	910 (35.83)	9700 (5710)	2200	340	22 (48.5)
TTF 150/1064/N	1422 (55.99)	1064 (41.89)	1110 (43.7)	11000 (6475)	2000	300	25 (55)
TTF 150/1264/N	1622 (63.86)	1264 (49.76)	1310 (51.57)	9000 (5298)	1400	145	28 (61.7)

LTG Tangential Fans Type TTF

Selection, fan curves

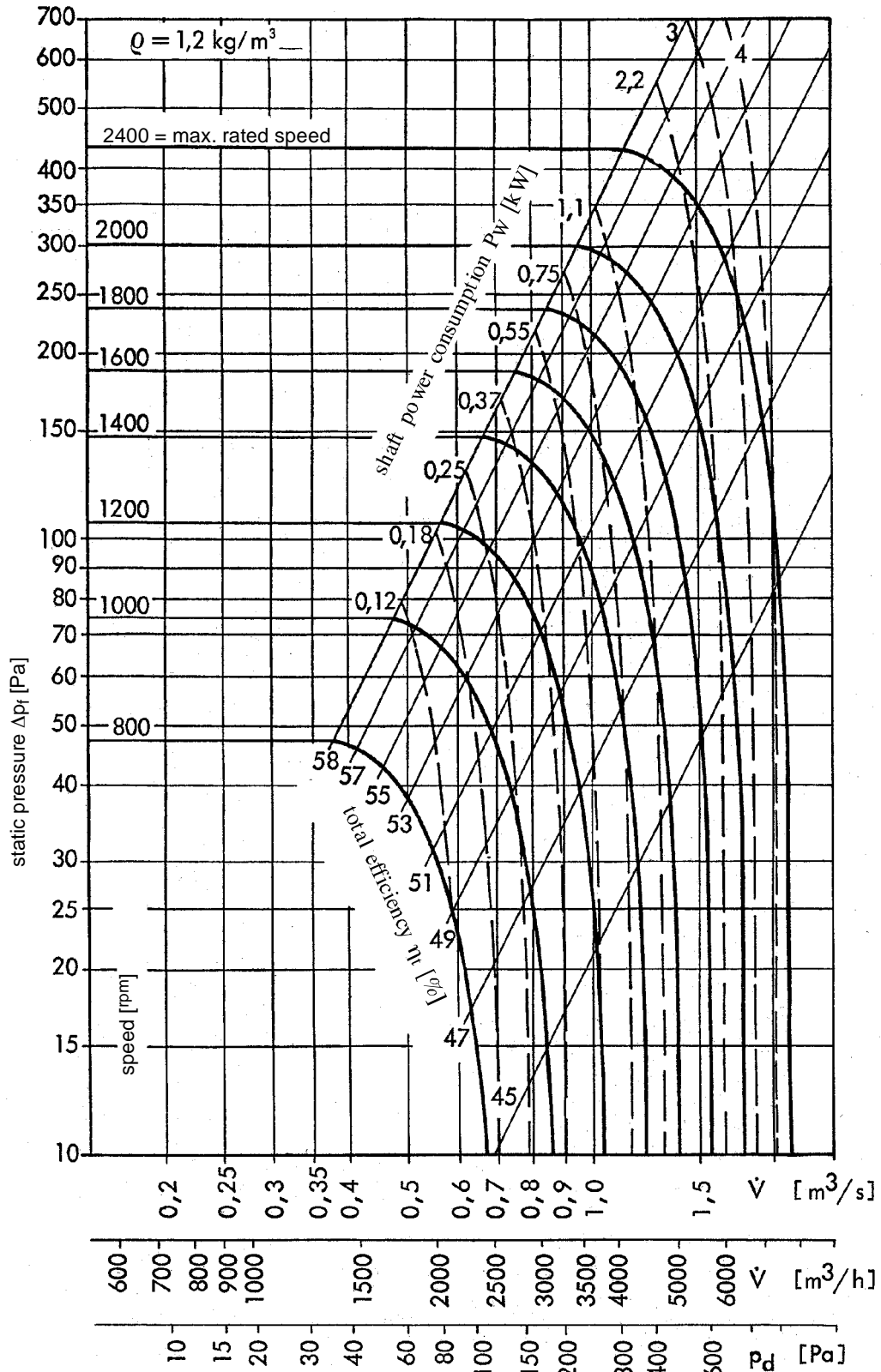
Fan curves for TTF 150/ 401/ N



LTG Tangential Fans Type TTF

Selection, fan curves

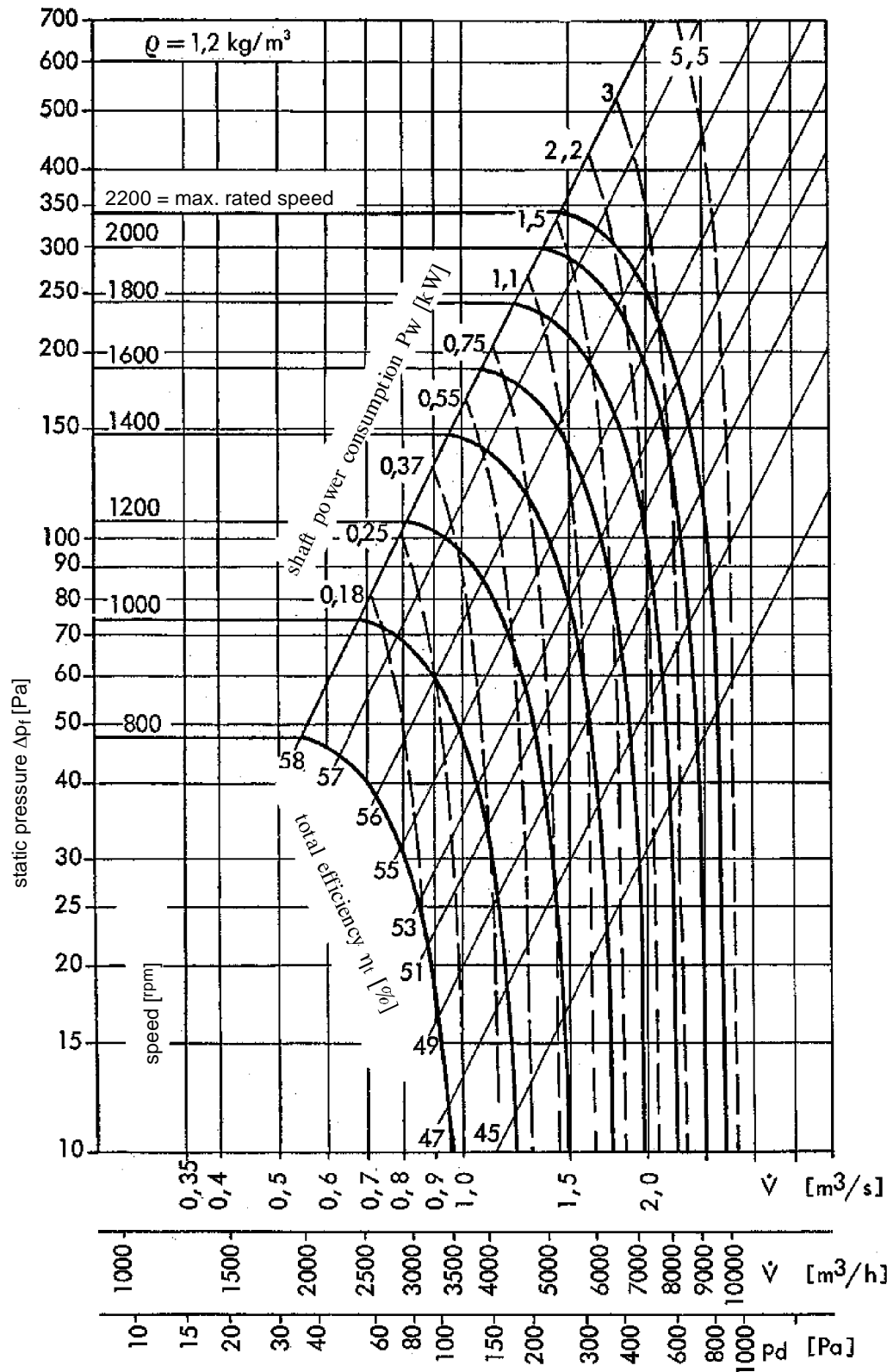
Fan curves for TTF 150/ 601/ N



LTG Tangential Fans Type TTF

Selection, fan curves

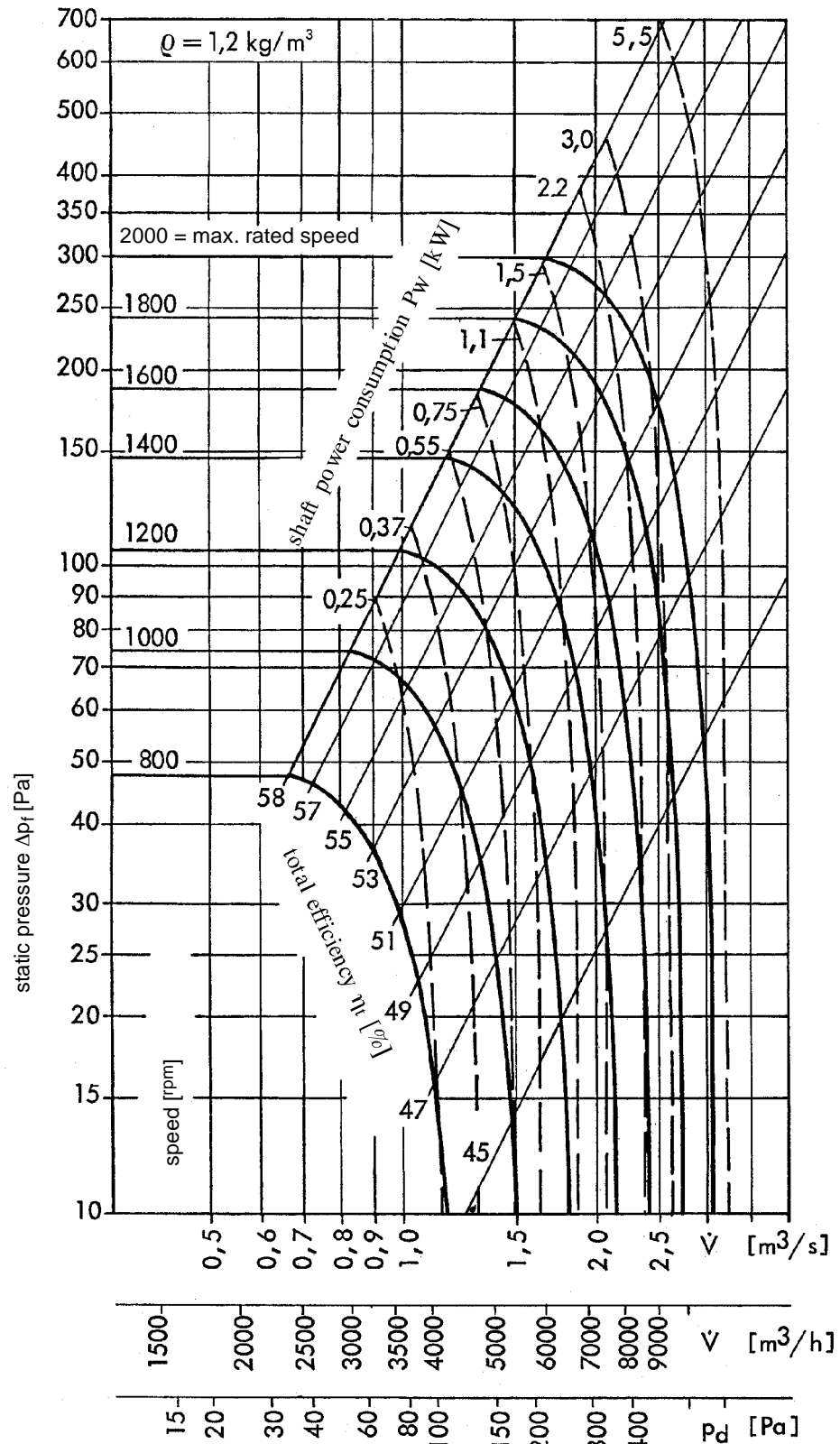
Fan curves for TTF 150/ 864/ N



LTG Tangential Fans Type TTF

Selection, fan curves

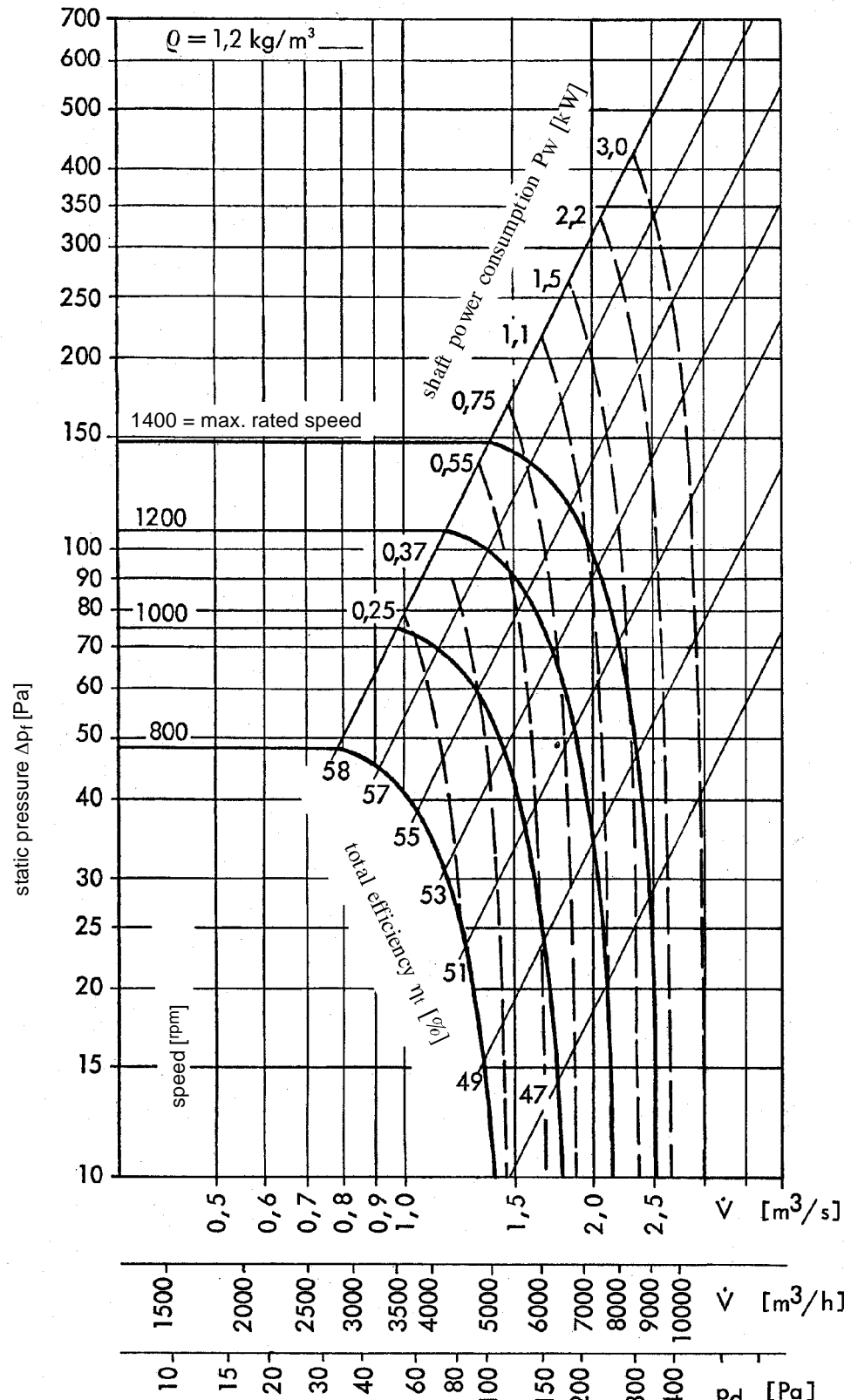
Fan curves for TTF 150/ 1064/ N



LTG Tangential Fans Type TTF

Selection, fan curves

Fan curves for TTF 150/ 1264/ N



LTG Tangential fans Type TTF

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 a 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.

The equation for the unweighted sound power level according to VDI 2081 is:

$L_W = L_{Wspec} + 10 \lg V + 20 \lg \Delta p_t$. For the total pressure Δp_t use Pa and for the air volume use m^3/s .

Position of the fan

Any arrangement is possible.

Installation and Start up

Fix the fans without any distortion to a plane base frame.

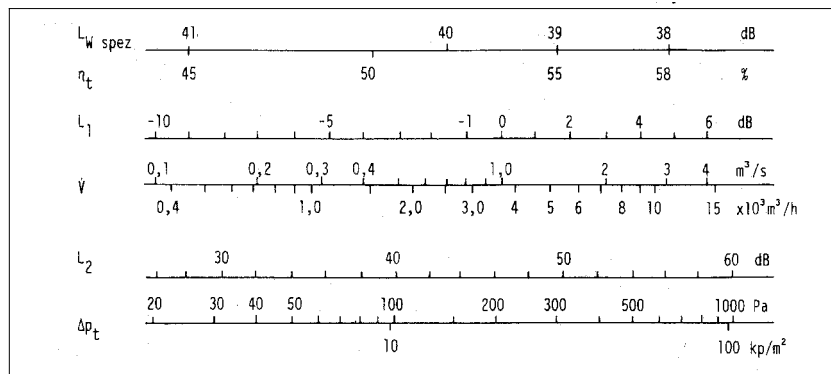
For fixation of the fan use only the bolt holes provided in the side elements. Provide for sufficient sliding room of the counter side to absorb the thermal expansion.

To connect to ducts and appliances plug in slots and sealing planes are provided over the whole fan width for the intake and discharge openings. Make sure to observe the applicable safety codes before starting the fans. Check V-belt selection for high temperature applications.

The fans are designed for continuous operation with constant load (operation mode S1 analogous to VDE 0530).

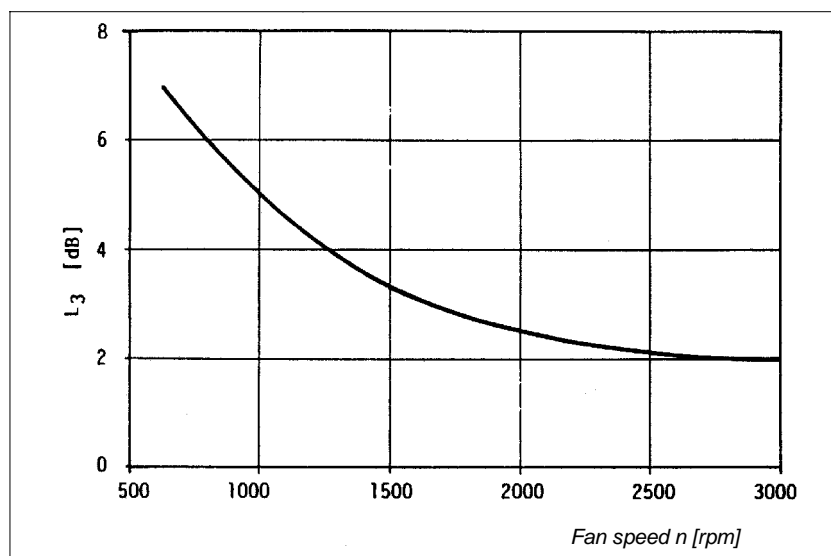
For frequent start/stop operation please check with LTG.

To keep the ambient temperature below max. at the bearings, it is necessary to insulate the side elements on site as per drawings on page 4.



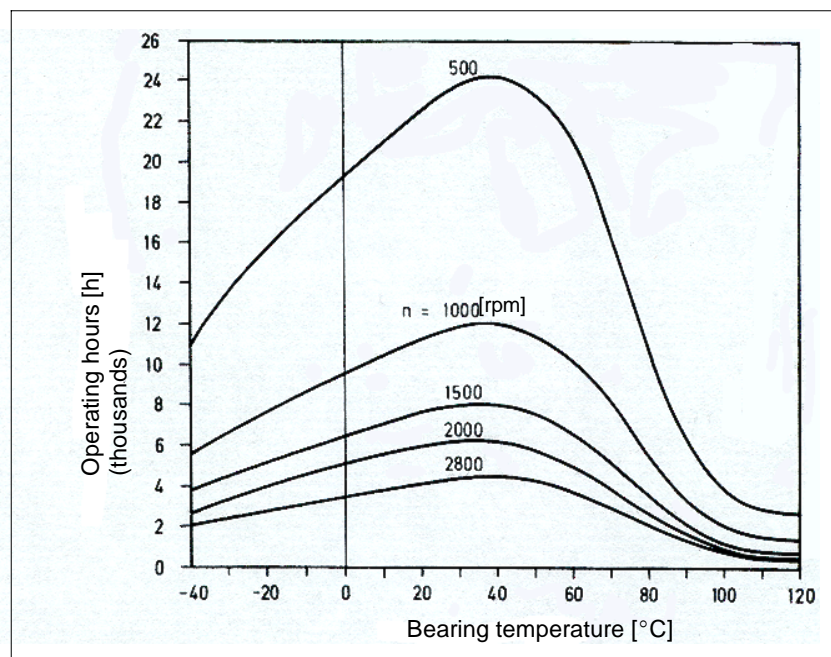
Unweighted sound power level L_W [dB]

$L_W = L_{Wspec} + L_1 + L_2$ [dB]



A-weighted sound power level L_{WA} [dB(A)]

$L_{WA} = L_W - L_3$ [dB(A)]



Greasing intervalls for series TTF

LTG Tangential Fans Type TTF

Selection

Application			Example	Your Data	Designations
gas			hot air		V [m ³ /h] air volume
gas temperature	t	[°C]	+200		Δp _f [Pa] static pressure
ambient temperature					p _d [Pa] dynamic pressure at the discharge area
drive side	t	[°C]	+50		p _d = Q/2•c ²
counter side	t	[°C]	+60		Δp _t [Pa] total pressure
condensation			no		c [m/s] velocity at the discharge area
located at			drying oven		Q [kg/m ³] specific gravity
drive side			right hand		n [rpm] speed
arrangement			horizontal		
Drive Motor					
power supply			3- phase		P _W [kW] shaft power consumption
voltage	U	[V]	220 / 380		L _W [dB] sound power level
frequency	f	[Hz]	50		L _{WA} [dB(A)] A- weighted sound power level
Specified Performance					
air volume	V	[m ³ /h]	7000		L _{pA} [dB(A)] A- weighted sound pressure level
static pressure	Δp _f	[Pa]	200		s [m ²] panel area
at specific gravity	Q	[kg/m ³]	1,2		η _t [%] efficiency
active impeller length	min. L	[mm]	550		
	max. L	[mm]	1000		
total length	max. A	[mm]	1500		
Procedure					
1. air volume	V	[m ³ /h]	7000		
achievable with length			601 864		
2. static pressure	Δp _f	[Pa]	350		
achievable with length		[mm]	601		
3. drive side			right hand		
Selected					
LTG Tangential Fan type			TTF 150/601/N		
Performance Data					
air volume	V	[m ³ /h]	7000		
static pressure	Δp _f	[Pa]	200		
dynamic pressure	p _d	[Pa]	434		
total pressure	Δp _t	[Pa]	634		
exhaust velocity	c	[m/s]	27		
speed	n	[rpm]	2000		
efficiency	η _t	[%]	55		
shaft power consumption	P _W	[kW]	2.5		
Acoustical Data					
L _{W spec} spec. sound power level		[dB]	39		
L ₁		[dB]	3		
L ₂		[dB]	56		
sound power level	L _W	[dB]	98		
L ₃		[dB]	2.5		
sound power level A- weighted	L _{WA}	[dBA]	95.5		
sound pressure level in the free field in 1 m distance (full spheric sound radiation)	L _{pA}	[dBA]	84.5		



Comfort Air Technology

Air Conditioning Systems

- Decentralized Facade Ventilation Units
- Fan Coil Units
- Induction Units,
Active Chilled Beams

Air Diffusers

- Linear Air Diffusers
- Wall and Floor Mounted Air Diffusers
- Swirl Diffusers
- Industrial and Special Air Diffusers

Air Distribution

- Flow Rate and Pressure Controllers
- Shut-off and Balancing Dampers
- Silencers

Process Air Technology

Fans

- Tangential Fans
- Axial Fans
- Centrifugal Fans
- Fahrtwind-Simulators

Filtration Technology

- Suction Nozzles
- Dampers
- Filters, Dust Collectors
- Separators, Compactors

Humidification Technology

- Air Humidifiers
- Product Humidifiers

Engineering Services

Fluid Engineering

- Flow analysis
- Flow visualization
- CFD-simulations
- Flow optimization
- Air conditioning concepts

Thermodynamics

- Calorimetric performance measurement
- Thermal, dynamic, unsteady,
system simulations

Acoustics

- Sound level measuring
- Vibration analysis
- Echo chamber measurement
- Acoustic optimization

Comfort

- Evaluation
- Optimization

Customer-specific Solutions

- Product development
- Process optimization
- Installation analysis

LTG Aktiengesellschaft

Grenzstraße 7
70435 Stuttgart
Germany
Tel.: +49 (711) 8201-0
Fax: +49 (711) 8201-696
E-Mail: info@LTG.net
www.LTG.net

LTG Incorporated

105 Corporate Drive, Suite E
Spartanburg, SC 29303
USA
Tel.: +1 (864) 599-6340
Fax: +1 (864) 599-6344
E-Mail: info@LTG-INC.net
www.LTG-INC.net