

Balancing Technology for Fans and Air Pollution Control Systems



One key factor for successful asset management is to optimize the efficiency of all systems. In addition to quality management and output, having trouble-free operation is also very important.

Particle and waste accumulations reduce the life cycle of the fan's air pollution control system. This causes system downtimes and, thus, high costs. Furthermore, this can often result in: vibrations due to unbalances, resonances, broken weld seams, bearing failure, etc.

To extend the fan life cycle considerably, Keller offers the possibility to control the current fan condition at the installation location. An electronic vibration analysis with minute function verification is completed to determine the balancing inaccuracy. After having localized the cause of error, the imbalance at the impeller is eliminated (1-level or 2-level balancing). This preventive inspection saves costs and extends the service intervals of the fans.

The balancing works, which have to be done, normally happen locally and during operation.

ADVANTAGES

- Extension of the fan's life cycle and air pollution control systems
- Avoidance of consequential damages
- Time and cost savings by mobile balancing

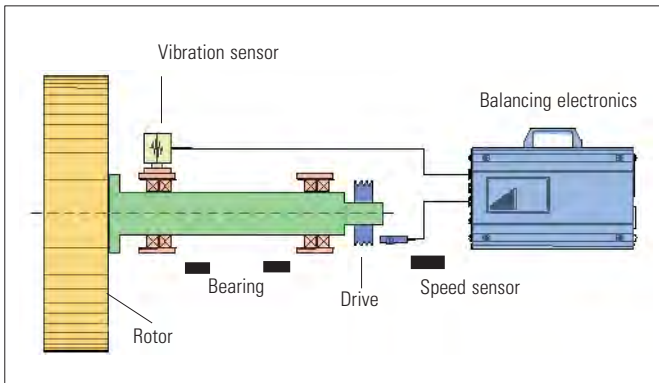


Balancing Technology for Fans and Air Pollution Control Systems



Data set no.	System description	Date	Time
2	Fan XxX-company Xx	15.06.2005	09:00
Level 1		improvement: 94.4 %	
Measurement before balancing		Balancing result	
Balancing speed	2261 U/min	Balancing speed	2261 U/min
Vibrating velocity	20,932 mm/s	Vibrating velocity	1,154 mm/s
Gram *mm	1.29 kgcm	Gram *mm	744.0 gmm
Angle heavy side	157 °	Angle heavy side	101 °
Weight mass	+28.72 g	Weight mass	+ 1.66 g
Angle light side	337 °	Angle light side	261 °
Pitch circle diameter	900.0 mm	Pitch circle diameter	900.0 mm
Quality grade	G 40	Quality grade	G 2
Speed	2200 U/min	Speed	+ 90.0 kg

Balancing minutes - Example



Example 1-level balancing

Vibration measurement				
Type	L-Cut 4			
Serial No.	AU.1009967.2.1-3			
Year of construction				
	Commissioning	Inspection	Inspection	Inspection
Measuring point	Motor flange			
Measuring range Y-axis	60 mVpp			
Measuring range X-axis	120,000 U/min			
Date	02/24/2005			
Time				
Power KW	12.5			
Impeller Ø				
Impeller weight Kg				
Max. vibration mm/s	1.00			
at 1 min	3047			
Motor speed	2885			

Assessment according to DIN/ISO 10816-1

Vibration speed in mm/s				
Category	Good	Useful	Yet allowed	Unusable
K to 15 kw	0.28 – 0.7	0.7 – 1.8	1.8 – 4.5	4.5 -
M 15 to 75 kw	0.28 – 1.1	1.1 – 2.8	2.8 – 7.0	7.0 -
G - large-scale machines	0.28 – 1.8	1.8 – 4.5	4.5 – 11.0	11.0 -
T - turbo machines	0.28 – 2.8	2.8 – 7.0	7.0 – 18.0	18.0 -

Vibration measurement - Example



Keller USA, Inc.
 2168 Carolina Place Drive
 Fort Mill, SC 29708 USA
 Phone (803) 396-2000 Fax (803) 396-2905
 E-mail info@kellerusa.com
www.kellerusa.com