



INDUSTRIAL APPLICATION REPORT · 2012–2013

Fan DN-17: lower power draw and bearing vibration

PJSC KhMZ Svet Shakhtera, foundry shop · approved by: chief power engineer V. V. Miroshnichenko · plant commission with the participation of XADO LLC specialists

Kharkiv, Ukraine · initial measurements 19.07.2012 · final measurements 02.08.2013 · report 12.08.2013

PRODUCT

XADO Revitalizant gel
for compressors and bearings

TREATED UNIT

Induced-draught fan DN-17
No. 1
bearing assemblies — front and
rear · drive 1500 rpm · foundry
shop

DOCUMENT TYPE

Plant commission report
with the participation of
XADO LLC

EQUIPMENT**DUTY AND OPERATING TIME****WHAT WAS MEASURED**

Induced-draught fan DN-17
No. 1, foundry shop — drive
in service

1500 rpm, damper closed; 360
h of operation after the full
treatment cycle

Motor current and power draw, apparent
power (kVA)

Fan bearing assemblies —
front and rear

Treatment cycle 19.07.2012 –
30.05.2013, final
measurements 02.08.2013

Vibration at 10 test points: bearing
supports and casing base

The treatment was carried out without disassembling the units and without taking the fan out of service; the measurement duty before and after treatment was identical.

Key results

↓ **4.7 %**

motor power draw, 110-118 → 106-114 kW

↓ **5.1-8.4 %**

motor current draw, 200-214 → 190-202 A

↓ **46-56 %**

vibration velocity at the test points, 4.08-8.67 → 1.88-4.43 mm/s

Electrical parameters of the drive — same duty before and after treatment

PARAMETER	BEFORE	AFTER	CHANGE	INSTRUMENT
Motor current draw	200-214 A	192-202 A	5.1 %	ATK2200 clamp meter
Motor current draw	208-209 A	190-192 A	8.4 %	SMZ/KMB Systems
Power draw	110-118 kW	106-114 kW	4.7 %	ATK2200 clamp meter
Apparent power (kVA)	45.0-46.7	41.7-43.0	7.6 %	SMZ/KMB Systems

Two independent measurement channels — an ATK2200 clamp meter and an SMZ/KMB Systems panel meter — took readings under the same duty: 1500 rpm, damper closed.

Vibration of the bearing supports and casing base — 10 test points

MEASUREMENT POINT	VIBRATION VELOCITY, MM/S	VIBRATION ACCELERATION, M/S ²	VIBRATION DISPLACEMENT, μM
Front bearing, vertical	8.67 → 4.43	129 → 112	92.8 → 68.6
Front bearing, horizontal	6.75 → 2.94	155.3 → 117	69.8 → 45.7
Front bearing, axial	5.43 → 3.42	128.3 → 74.8	87.1 → 56.0
Rear bearing, vertical	5.92 → 2.9	96.1 → 84.7	40.0 → 15.9
Rear bearing, horizontal	5.7 → 3.09	101.7 → 96.2	63.9 → 40.9

MEASUREMENT POINT	VIBRATION VELOCITY, MM/S	VIBRATION ACCELERATION, M/S ²	VIBRATION DISPLACEMENT, μM
Rear bearing, axial	5.77 → 3.2	99.6 → 80.5	85.2 → 44.6
Casing base, front — horizontal	5.57 → 2.08	184.0 → 55.2	42.8 → 31.9
Casing base, front — axial	4.08 → 1.88	102.3 → 66.0	53.5 → 16.8
Casing base, rear — horizontal	4.1 → 1.99	123.3 → 60.0	44.9 → 34.4
Casing base, rear — axial	4.89 → 1.95	95.2 → 82.3	49.9 → 24.6

SENDIG 911 vibrometer, measurement with the damper closed. A reduction was recorded at all ten points and for all three vibration quantities.

Commission conclusions

The commission of PJSC KhMZ Svet Shakhtera, with the participation of XADO LLC specialists, recorded the following: after treatment with the "XADO Revitalizant gel for compressors and bearings" and completion of the full revitalization cycle (total operating time **360 hours**) of the bearing assemblies of induced-draught fan DN-17 No. 1 operated in the foundry shop, it was established that:

1. The motor power draw decreased by **4.7 %**, the current draw — by **5.1 %** (ATK2200 clamp meter readings).
2. The apparent power (kVA) decreased by **7.6 %**, the motor current draw — by **8.4 %** (SMZ/KMB Systems readings); average values are given.
3. The vibration parameters of the bearing assemblies at the test points decreased by **1.5-2×**, taking into account that the motor and the fan casing are mounted on a rigid base.
4. The reduction in the vibration parameters of the bearing supports makes it possible to reduce the dynamic loads on the bearings and to extend their service life by at least **2×**.

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The results apply to induced-draught fan DN-17 No. 1 of the foundry shop of PJSC KhMZ Svet Shakhtera and to the measurement duty with the damper closed, 1500 rpm; on other equipment and under other duties the figures may differ. The original report with signatures and stamps is published in full and available for download. The treatment was performed by XADO LLC specialists, who signed the report together with the plant commission.