XADO

IE B031 | INDUSTRIAL CASE STUDY | WATER UTILITY · WASTEWATER TREATMENT | TURBO BLOWER · BEARINGS

**REPORTS UNDER THE CONTRACT OF 04.12.2002 · FOUR MONTHS OF OBSERVATION**

# Turbo blower TV-175/1.6: less energy, bearings without regreasing

Evpatoria PPVKH water utility, wastewater treatment plant · approved by L. I. Vorobyov, head of the PPVKH; for the customer — chief engineer V. I. Kovalenko and WWTP manager I. A. Stepanov; work performed by ChPKP Rigonda

**Evpatoria, AR Crimea, Ukraine · treatment 16.12.2002 · observation 09.12.2002 – 08.04.2003 · report of 08.04.2003**

**PRODUCT**

XADO compounds for bearings

compressor gel — into the turbine oil bath · revitalizing grease 120 ml and protective grease 125 ml — into the electric motor bearings

**TEST OBJECT**

Turbo blower TV-175/1.6, inv. No. V-4

250 kW, 3000 rpm · 4 bearings treated: 2 of the turbine and 2 of the drive electric motor

**DOCUMENT TYPE**

Reports on work performed under the contract of 04.12.2002

| UNIT AND TREATED ASSEMBLY | CONDITION AT THE START OF TESTING | WHAT WAS MEASURED |
|---|---|---|
| Turbo blower TV-175/1.6, inv. No. V-4 — 250 kW, 3000 rpm, continuous duty at the WWTP | In service, current load 383 A against a rating of 385 ± 5 A | Daily electricity consumption by meter, current load |
| Turbine bearings (2) — XADO compressor gel into the 0.5 l oil bath | Running time 478 h as of 16.12.2002 | Running time between refills of the standard grease |
| Electric motor bearings (2) — XADO revitalizing and protective grease | Running time 478 h as of 16.12.2002 | Running time between refills of the standard grease |

Treatment was performed on 16.12.2002 without disassembling the units; the machine ran continuously, bearing running time after treatment — 3070 h as of 08.04.2003.

## Key results

**↓ 5.8 %**

average daily electricity consumption of the turbo blower

**↑ 65 %**

bearing running time between grease refills

## Electricity: daily consumption before and after treatment

| PERIOD | DAILY CONSUMPTION, kWh | CHANGE |
|---|---|---|
| Before treatment, 09-16.12.2002 (7 days) | **5195.14** on average, **4989.6-5371.2** by day | — |
| After treatment, 25.01-09.02.2003 (16 days) | **4894** on average, **4665.6-5142** by day | **−301.14 kWh/day · 5.8 %** |

Metering by electricity meter No. 019204 (current transformers 600/5); readings were taken daily at 08.00.

## Electricity: Q1 2003 by meter readings

| PERIOD | CALCULATED AT PRE-TREATMENT CONSUMPTION, kWh | ACTUAL BY METER, kWh | SAVINGS |
|---|---|---|---|
| 08.01-08.02.2003 | **145468.3** | **136893.60** | **8574.8 kWh · 5.9 %** |
| 08.02-08.03.2003 | **145468.3** | **139108.80** | **6359.6 kWh · 4.4 %** |
| 08.03-08.04.2003 | **161054.3** | **151730.40** | **9323.9 kWh · 5.8 %** |
| Total for the quarter, 87 days of operation | **451991** | **427732.8** | **24258.3 kWh · 5.4 %** |

The report conclusions state savings of **6.9 %** for the month of the experiment — this figure also covers the turbine bearing cooling pump (**3.3 kW**) taken out of service.

# Bearings and current load of the electric motor

| PARAMETER | BEFORE TREATMENT | AFTER TREATMENT |
|---|---|---|
| Bearing running time without refilling the standard grease | per schedule — every **1000 h** | **1654 h** of operation with no stop for regreasing |
| Current load of the electric motor, rating **385 ± 5 A** | **383 A** | **330 A** |
| Turbine bearing cooling pump, **3.3 kW** | in operation | taken out of service, **5512.32 kWh** per quarter |

The plant's standard schedule calls for grease refilling of the bearings every **1000 h**; during the observation period the machine was not stopped for regreasing.

# Report conclusions

The reports under the contract of 04.12.2002, approved by the head of the Evpatoria PPVKH, record that the use of XADO technology led to a reduction of the friction coefficient in the bearings of the machine; a reduction of mechanical losses; an increase in the interval between repeat servicing of the bearings; lower noise and vibration; a longer service life of the equipment without replacing assemblies and parts; prevention of wear and optimisation of the axial and radial clearances of the bearings; electricity savings of **6.9 %**. "The total electricity savings from the introduction of XADO technology at the WWTP of the Evpatoria PPVKH for the first quarter of **2003** amount to **29770.62 kW**." Based on the results, the enterprise recommended introducing scheduled preventive treatment of machines and mechanisms by XADO technology instead of scheduled routine servicing of equipment at all PPVKH facilities.

XADO

© XADO. All rights reserved.
The results relate to the 250 kW TV-175/1.6 turbo blower at the Evpatoria wastewater treatment plant and to its continuous operating mode; on other machines and in other modes the figures may differ. The treatment was performed and the reports prepared by ChPKP Rigonda — the contractor for the work. The original reports with signatures and stamps are published in full and available for download.