

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, 5195.14 → 4894 kWh/day

↑ **65 %**

bearing running time between grease refills, 1000 → 1654 h

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

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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.