



PISTON COMPRESSOR TREATMENT REPORT · SKLO LLC

VP 205 40/3 compressor: less power, higher output, lower vibration and noise

SKLO LLC · report approved by the technical director; measurements signed by the chief mechanic and the senior foreman of the compressor section, with an engineer of XADO LLC in attendance

Merefa, Kharkiv region, Ukraine · treatment 13.08.2001 · report 28.08.2001

TECHNOLOGY	TREATED UNIT	DOCUMENT TYPE
Treatment by XADO technology Metal-ceramic coating on friction surfaces, without disassembling the unit	VP 205 40/3 piston compressor Serial No. 50120 · cylinder-piston group, stages I and II	Company report with signatures and seal

UNIT	CONDITION AT START OF TESTING	WHAT WAS MEASURED
VP 205 40/3 piston compressor, serial No. 50120	In service; water from the cooling system was entering the working chamber of the stage II cylinder through a micro-crack in the liner	Current draw, pump-up time, vibration by stage, noise, operating temperatures, oil consumption and oil pressure

The treatment was carried out on 13.08.2001 without disassembling the compressor; the "before" and "after" measurements were taken at steady-state operating conditions.

Key results

↓ **28.6 %**

no-load current draw, 210 → 150 A

↑ **5.6 %**

compressor output, pump-up time
280 → 265 s

↓ **47-67 %**

vibration velocity, stages I and II,
1.5-2.4 → 0.8 mm/s

↓ **30 %**

oil consumption through the
lubricator, 0.5 → 0.35 l/h

Power consumption and output

PARAMETER	BEFORE	AFTER	CHANGE
Current draw, no load, A	210	150	−28.6 %
Pump-up time, s	280	265	−15 s

Current was measured at no load; pump-up time — while raising pressure from 1.5 to 3.5 atm. It is this figure that yields the 5.6 % gain in output.

Vibration, noise and thermal behaviour

PARAMETER	BEFORE	AFTER	CHANGE
Vibration velocity, stage I, mm/s	2.4	0.8	−67 %
Vibration velocity, stage II, mm/s	1.5	0.8	−47 %
Noise level, dB	93.5	89.5	−4 dB
Oil temperature, °C	76	73	−3 °C
Discharge air temperature, °C	129	124	−5 °C
Coolant temperature, °C	32	32	no change

Coolant temperature was identical in both measurements: the cooling regime was comparable, so it does not account for the drop in oil and air temperatures.

Lubrication system

PARAMETER	BEFORE	AFTER	CHANGE
Oil consumption through the lubricator, l/h	0.5	0.35	−30 %
Oil pressure, kgf/cm ²	1.1	1.15	+0.05 kgf/cm ²

The report attributes the lower consumption to the cylinder-piston group: "oil carry-over through the cylinder-piston group decreased".

Conclusion of the company commission

The commission of SKLO LLC — the technical director, the chief mechanic and the senior foreman of the compressor section — recorded in the report: "After the treatment, oil carry-over through the cylinder-piston group decreased, electricity consumption fell by **28.5 %**, and noise and vibration levels went down. Compressor output increased by **5.6 %**. The ingress of water from the cooling system into the working chamber of the stage II cylinder ceased, because the existing micro-crack in the cylinder liner was sealed over by a layer of metal-ceramics". Before the treatment the compressor was running with a defect in the stage II liner, through which coolant water entered the working chamber. The unit was returned to working condition without disassembly and without replacing the liner.



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The results relate to the VP 205 40/3 piston compressor (serial No. 50120) of SKLO LLC and to its operating conditions; on other units and duty cycles the figures may differ. The original report is published in full and available for download.