

TECHNICAL REPORT OF 05.12.2003 WITH ECONOMIC EFFICIENCY CALCULATION

# Compressor VP-20/8: lower current, faster charging, no shutdown, no teardown

KRAST JSC, Stavropol Truck Crane Plant · commission: chief engineer V. A. Yakhno, chief power engineer I. N. Selivanov · work performed by Revitalization Center LLC

Russia · work contract No. 16 of 20.11.2003 · works 20.11–05.12.2003 · report of 05.12.2003

**PRODUCT**

XADO technology  
MK treatment of the crank  
mechanism and cylinder-piston  
group — restoration of rubbing  
surfaces without disassembly

**TEST OBJECT**

Compressor VP-20/8  
Serial No. 9949 · 29 years in  
service · receivers with a total  
volume of 27 m<sup>3</sup>

**DOCUMENT TYPE**

Technical report  
with economic efficiency  
calculation

**EQUIPMENT**

Compressor VP-20/8,  
serial No. 9949

**CONDITION AT START OF WORK**

Built in 1974, 29 years in service;  
treated on site, without taking it  
out of operation

**WHAT WAS MEASURED**

Drive motor current and stage pressures  
at five operating modes, time to fill the 27  
m<sup>3</sup> receivers to 6 kgf/cm<sup>2</sup>, oil pressure in  
the crank mechanism lubrication system

The MK treatment was carried out under normal operation — without stopping the compressor for repair, without disassembly and without replacing parts.

## Key results

↓ **33-37 %**

drive motor current at operating  
modes, 180-245 → 120-160 A

↓ **1.5 min**

time to fill the 27 m<sup>3</sup> receivers to 6  
kgf/cm<sup>2</sup>, 7 → 5.5 min

↑ **11.4 %**

first-stage pressure at the operating  
mode, 1.75 → 1.95 kgf/cm<sup>2</sup>

## Motor current and first-stage pressure by operating mode

| 2ND-STAGE PRESSURE, kgf/cm <sup>2</sup> | CURRENT BEFORE, A | CURRENT AFTER, A | CURRENT CHANGE | 1ST-STAGE PRESSURE, kgf/cm <sup>2</sup> |
|-----------------------------------------|-------------------|------------------|----------------|-----------------------------------------|
| 6.0 — operating mode                    | 245               | 160              | −34.7 %        | 1.75 → 1.95                             |
| 5.0                                     | 230               | 145              | −37.0 %        | 1.65 → 1.8                              |
| 4.0                                     | 205               | 130              | −36.6 %        | 1.5 → 1.7                               |
| 3.0                                     | 180               | 120              | −33.3 %        | 1.4 → 1.55                              |

First-stage pressure rose at every mode — a direct sign of reduced clearances in the cylinder-piston group and restored sealing.

## Output and lubrication system

| PARAMETER                                                             | BEFORE TREATMENT        | AFTER TREATMENT         |
|-----------------------------------------------------------------------|-------------------------|-------------------------|
| Time to fill the 27 m <sup>3</sup> receivers to 6 kgf/cm <sup>2</sup> | 7 min                   | 5 min 30 s              |
| Oil pressure in the crank mechanism lubrication system                | 2.9 kgf/cm <sup>2</sup> | 2.9 kgf/cm <sup>2</sup> |

According to the conclusion of the report, compressor output increased by 22 %; our measurement of the receiver filling time is 7 → 5.5 min.

# Commission findings

The compressor had been running at the plant for **29 years**, and the MK treatment of the crank mechanism and cylinder-piston group by XADO technology was performed while it stayed in operation — without stopping for repair, without disassembly and without replacing parts. The commission of KRAST JSC and Revitalization Center LLC recorded: "The measurements established that the parameters characterizing the operation of the compressor differ for the better." Conclusions of the report:

1. As a result of the MK treatment of the crank mechanism and cylinder-piston group, the rubbing metal parts were restored and friction between them was significantly reduced, which made it possible to increase compressor output by **22 %** while simultaneously reducing power consumption by **35 %**.
2. The results obtained confirm the expediency of performing MK treatment on equipment units.



© XADO. All rights reserved.

The results relate to the VP-20/8 piston compressor (serial No. 9949) and to its normal operating modes; on other equipment and under other conditions the figures may differ. The treatment was performed by Revitalization Center LLC, which also prepared the economic efficiency calculation attached to the report. The original technical report of 05.12.2003 with signatures and stamps is published in full and available for download.