

COMPRESSOR AUDIT REPORT

Customer : Maharashtra State Power Generation Company Ltd.,
Nasik Thermal Power Station
Nasik -422 105

Audit Location : Stage -2 Compressor House

Audit Date : 12th July 2007 to 16th July 2007

Audit Partner : M/s. Indmark
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: M/s. CrescentHydro Pneumatics
Savarkar Nagar, Gangapur Road, Nasik – 422 013

1. OBJECTIVE

- To find out the compressed air consumption in the plant.
- To find out current network pressure
- To find out existing compressor efficiency
- To estimate losses due to change in performance

2. AUDIT PROCEDURE

BOGE GERMANY – DATA LOGGER is used to audit compressor performance. DATA LOGGER is audit device where various sensors can be connected and actual performance data can be recorded during the operation of the compressors. Data will be recorded in computer (PDA) and reports will be produced in a systematic manner.

- Each compressors audited for following parameters
 - i. Flow
 - ii. Current consumed
 - iii. Discharge Pressure
 - iv. Ambient Temp

3. EXISITNG COMPRESSOR SET UP

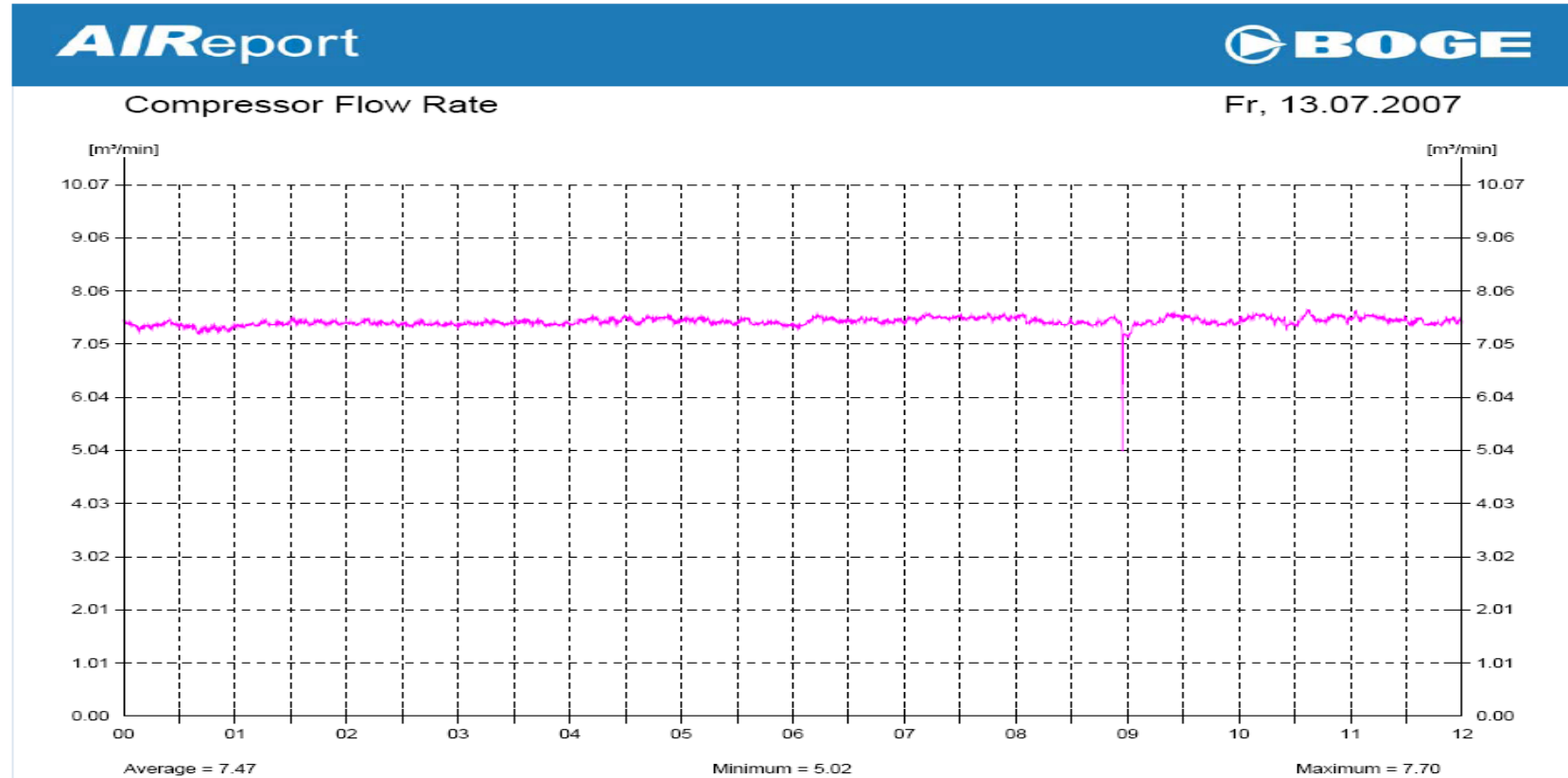
Total number of compressors : 3 nos (2 W + 1 Sb)
 Total number of Dryer : 1 no (Refrigerated)
 Compressor Tag No : 4 a & 4 b

 Compressor Model : 2HA-2TERT
 Compressor Make : KG Khosla
 Compressor Type : Reciprocating, Non Lubricated, Water Cooled.
 Motor Kw : 90 Kw
 Cos Ø : 0.87

4. COMPRESSOR AUDIT DATA

| Description | Unit | Rated | Actual Data (as per audit) | |
|--------------------|---------------------|-------|----------------------------|-----------------|
| | | | Compressor-4a | Compressor – 4b |
| Flow | m ³ /min | 13.61 | 6.5 | 6.8 |
| Current | Amp | 130 | 130 | 130 |
| Discharge Pressure | kg/cm ² | 8 | 6.5 | 6.4 |
| Ambient Temp | °C | 45 | 36 | 36 |

5. COMPRESSOR 4A - AUDIT REPORT FOR FLOW RATE



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From reports it is visible that, the compressor is developing flow of $7.2 \text{ m}^3/\text{min}$ but at discharge pressure of 5.4 to $6.4 \text{ kg}/\text{cm}^2$. The flow will be $6.5 \text{ m}^3/\text{min}$ if the pressure is rest to $8 \text{ kg}/\text{cm}^2$. Hence the flow rate is $6.5 \text{ kg}/\text{cm}^2$

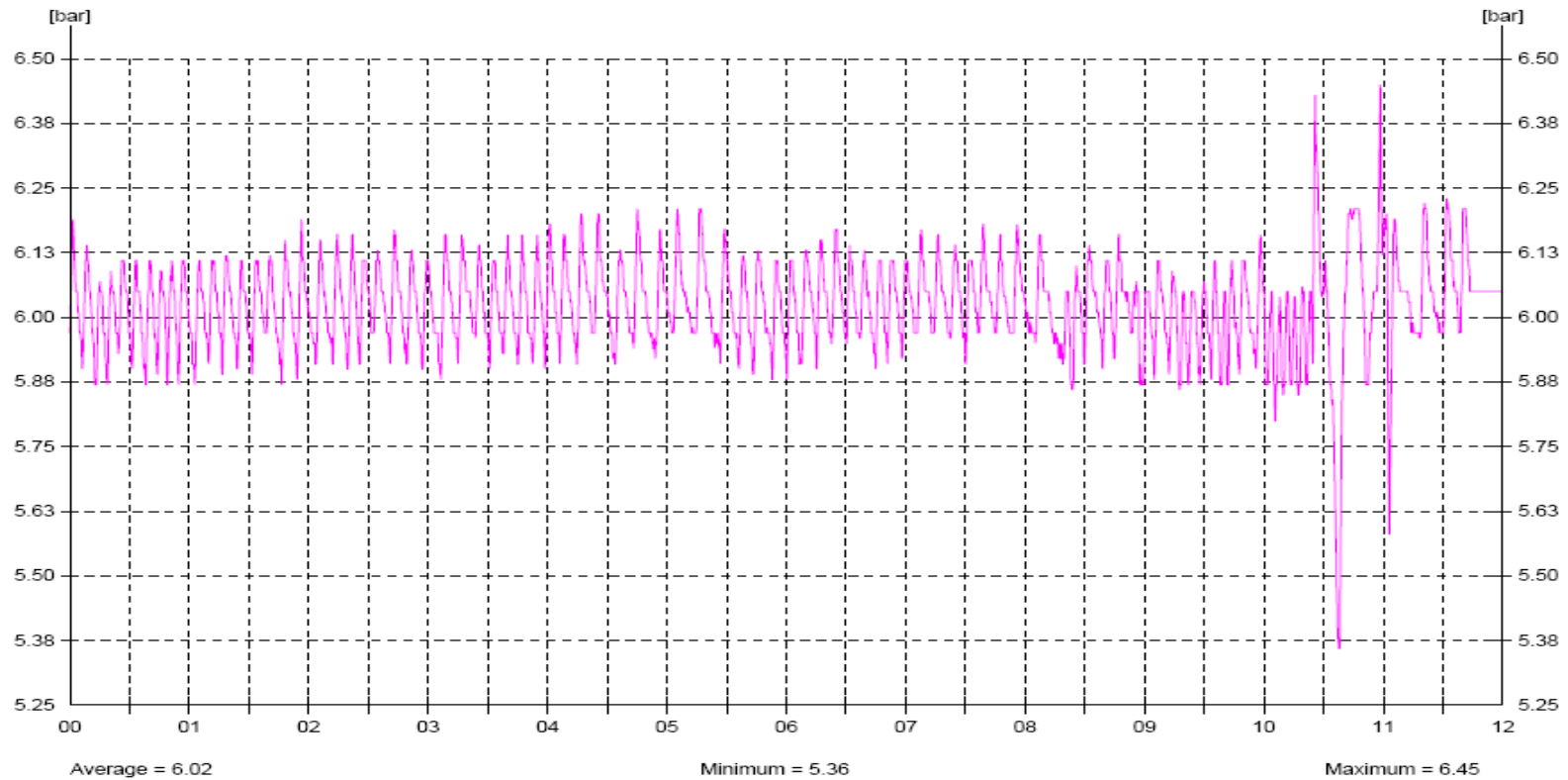
COMPRESSOR 4A - AUDIT REPORT FOR DISCHARGE PRESSURE

AIRreport



Compressor Discharge Pressure

Fr, 13.07.2007



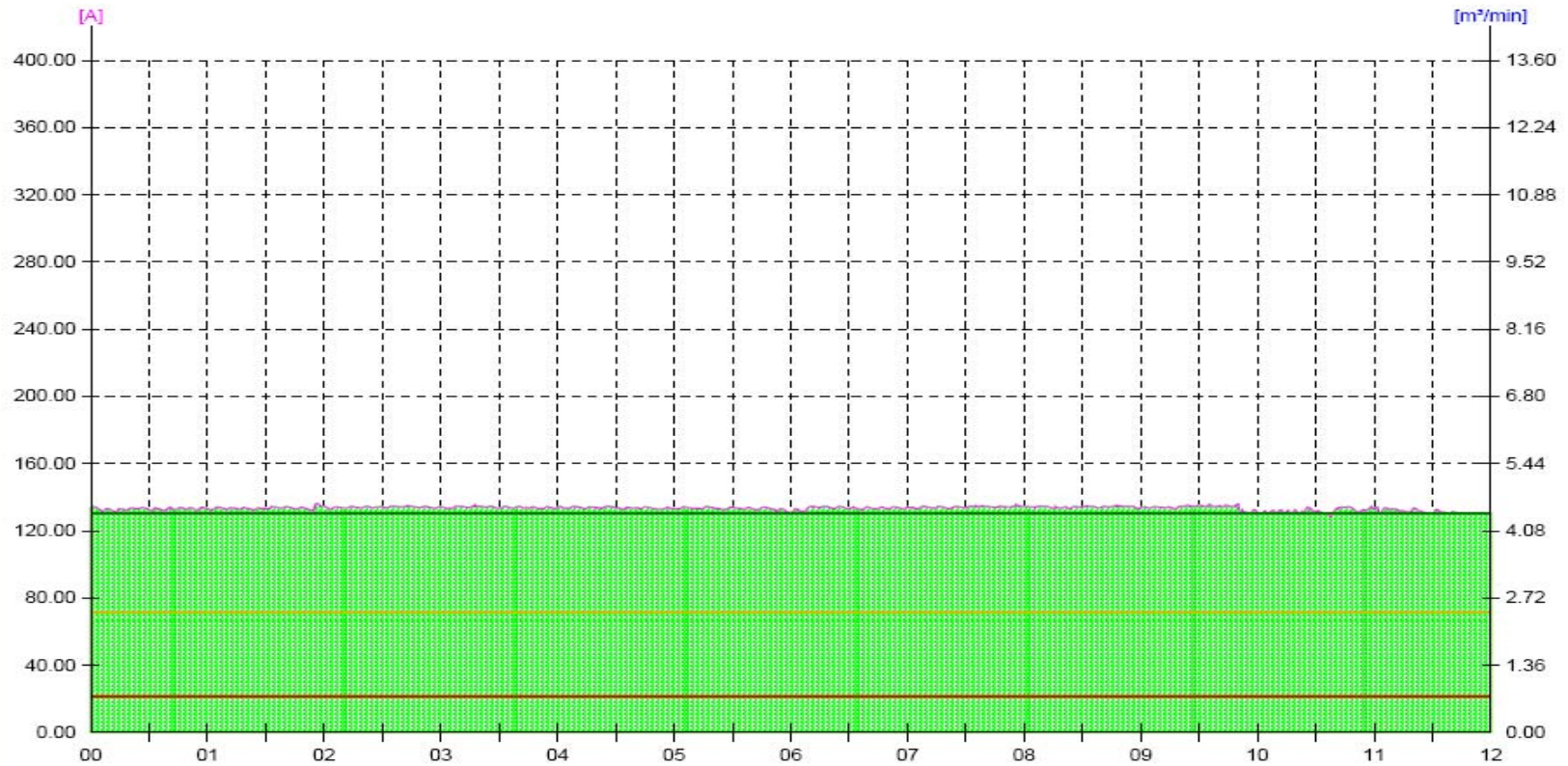
COMPRESSOR 4A - AUDIT REPORT FOR COMPRESSOR CURRENT

AIRreport



Current Consumption

Fr, 13.07.2007



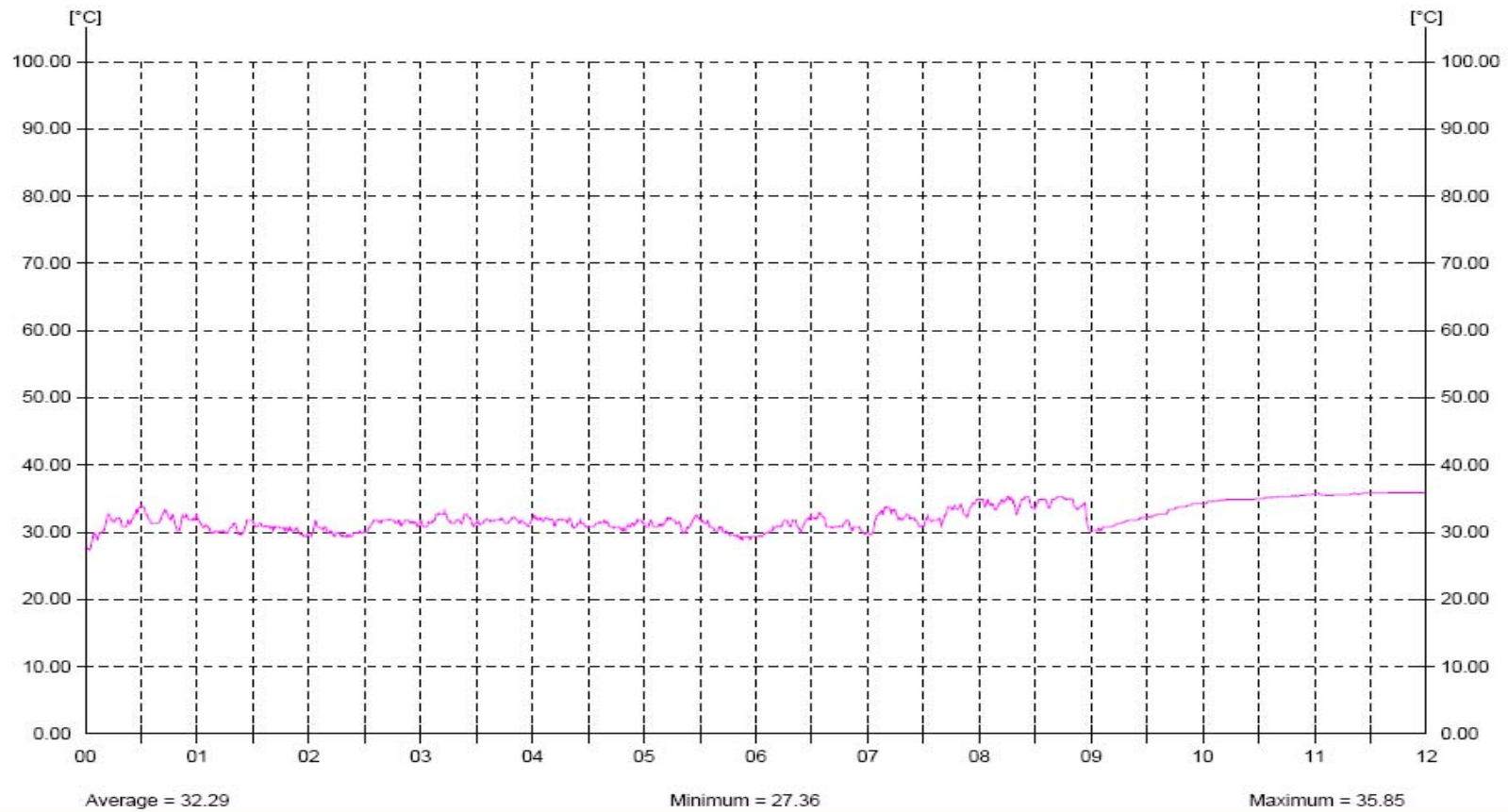
COMPRESSOR 4A - AUDIT REPORT FOR ROOM TEMPERATURE

AIRreport



Room Temperature

Fr, 13.07.2007



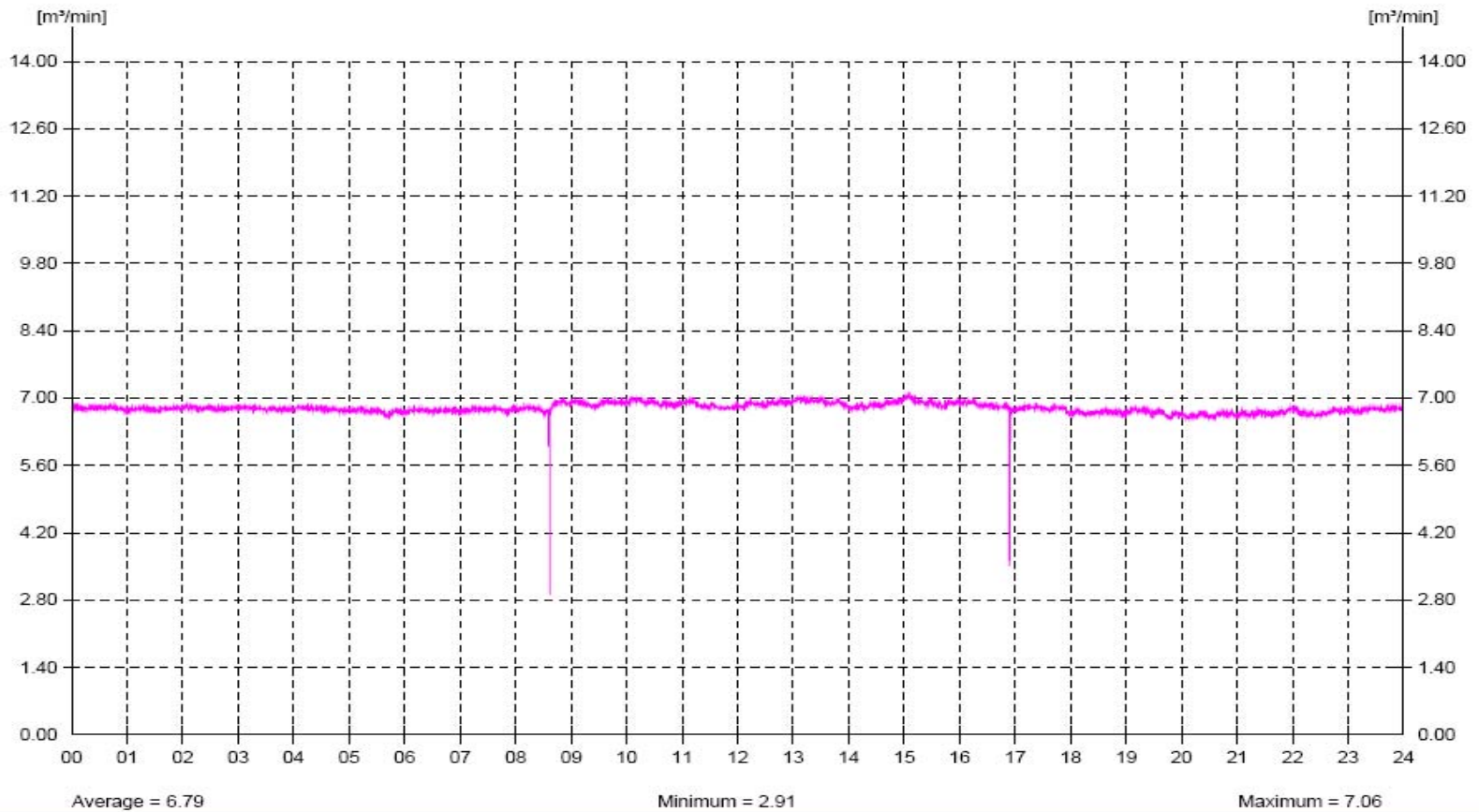
6. COMPRESSOR 4B – AUDIT REPORT FOR FLOW RATE

AIRreport



Compressed air Flow Rate

Su, 15.07.2007



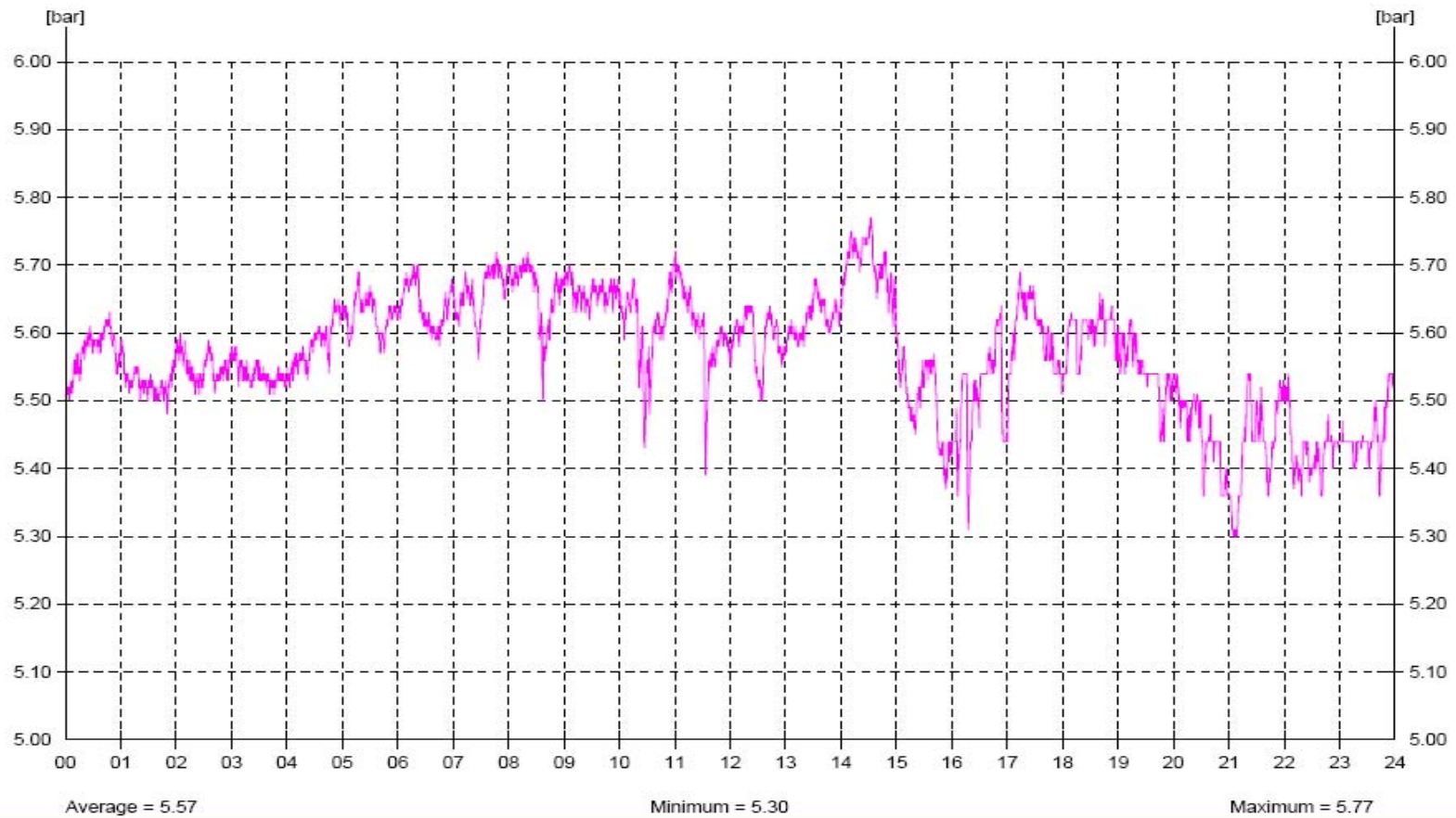
COMPRESSOR – 4B AUDIT REPORT FOR DISCHARGE PRESSURE

AIRreport



CompressorDischarge Pressure

Su, 15.07.2007



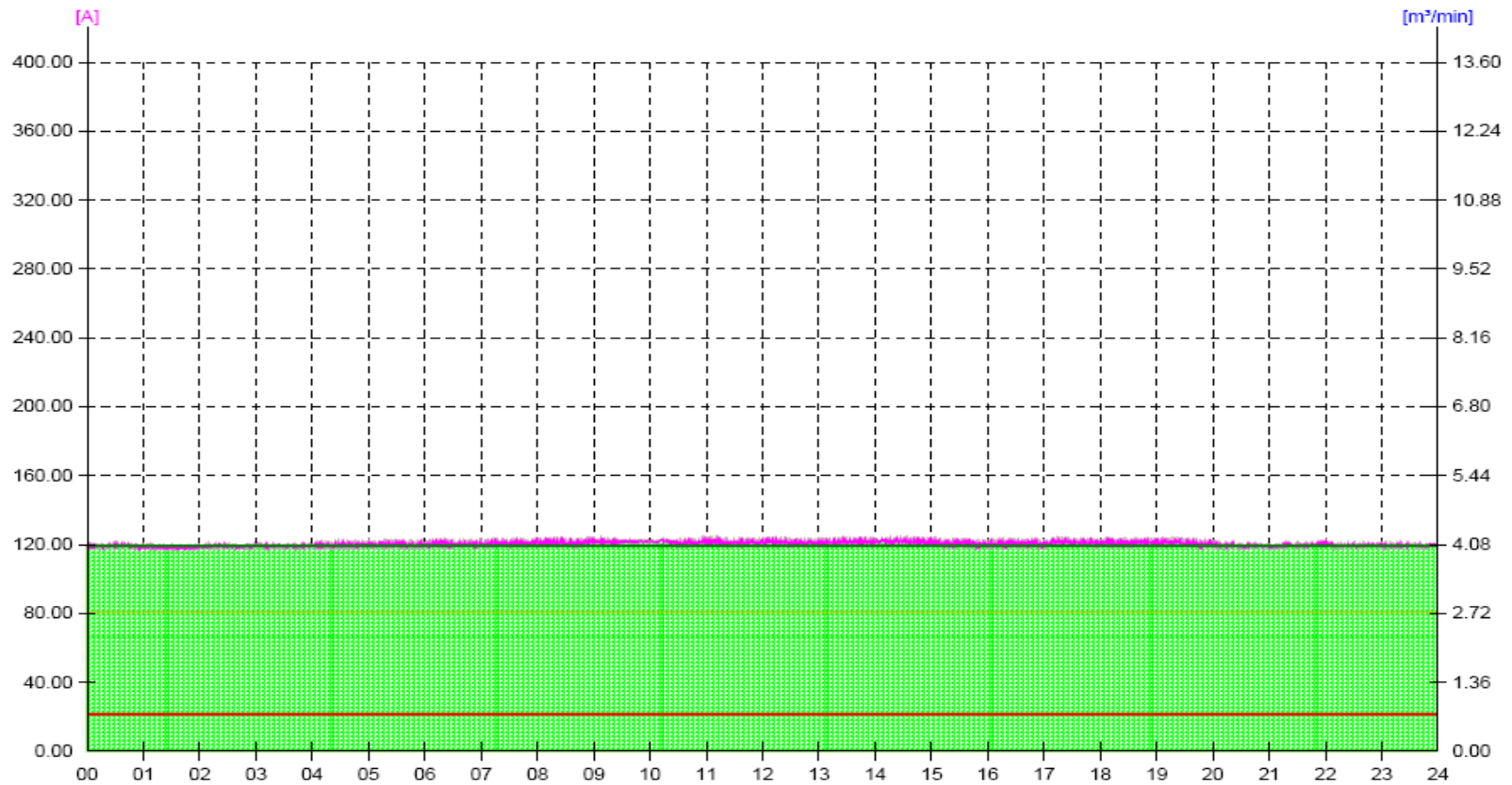
COMPRESSOR 4B – AUDIT REPORT FOR COMPRESSOR CURRENT

AIRReport



Compressor Current

Su, 15.07.2007



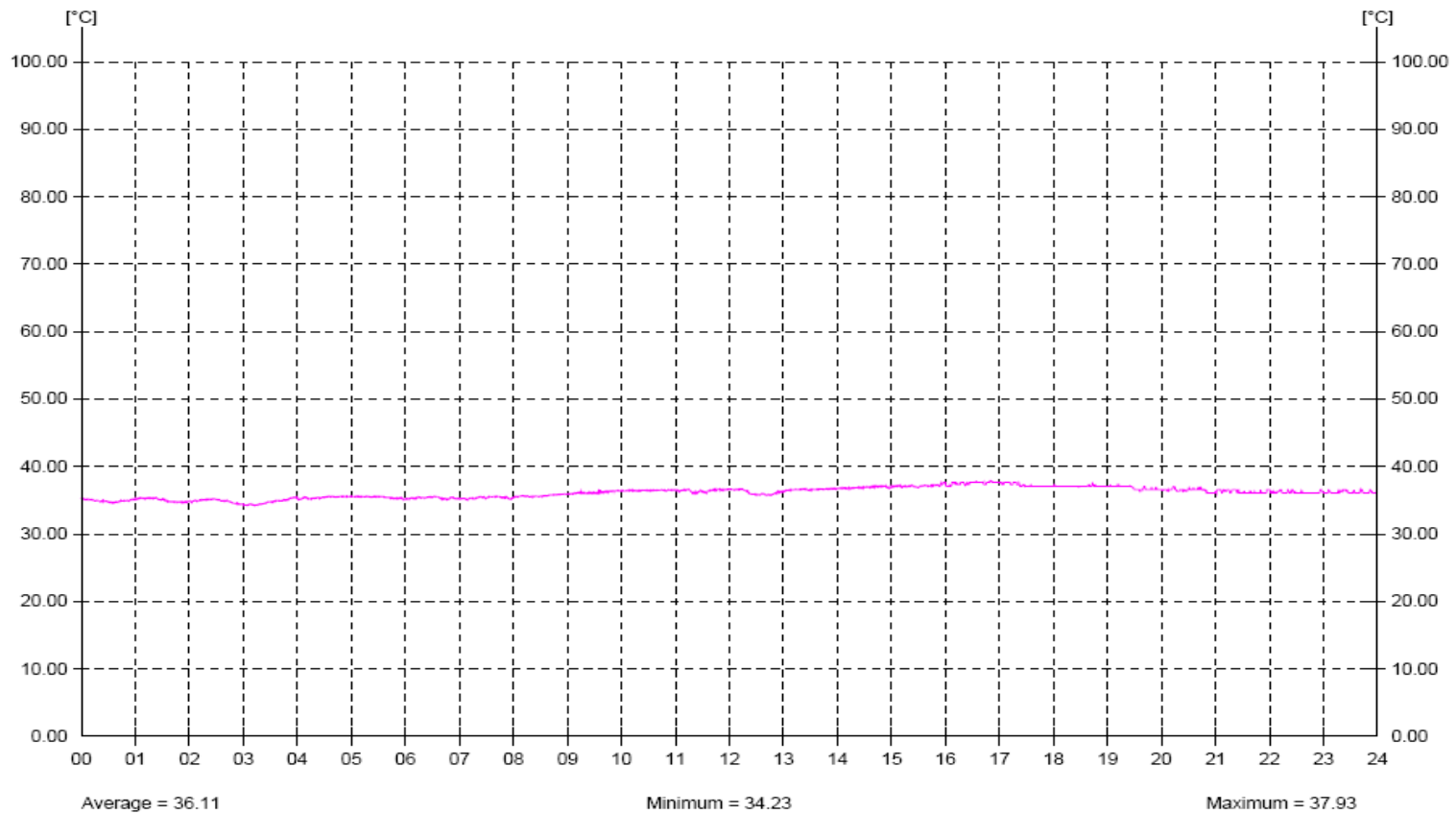
COMPRESSOR -4B AUDIT REPORT FOR ROOM TEMPERATURE

AIRreport



Room Temperature

Su, 15.07.2007



7. AUDIT ANALYSIS

- Compressor 4A efficiency = 49 %
- Compressor 4B efficiency = 45 %
- Plant air consumption = 12.83 m³/min @ 8 bar
= 14.7 m³/min @ 6.5 bar
- Compressor current = 122 Amps
- Room Temp (avg) = 36 Deg C

8. PROPOSED SCREW COMPRESSOR DATA

| Description | Unit | Existing | Proposed |
|------------------------|---------------------|---------------|----------|
| Compressor Type | | Reciprocating | Screw |
| Flow Rate | m ³ /min | 13 | 15.7 |
| Work Pressure | Kg/cm ² | 8 | 8 |
| Connected motor | Kw | 180 | 90 |
| Total Savings in power | Kw | 90 | |

9. SAVINGS WITH PROPOSED SCREW COMPRESSOR

- Power Cost
- Total savings in connected power : 90 Kw
- Unit Rate : Rs.5.50 /unit
- No of working hours/annum(24x 365) : 8760
- Total cost of power (8760 x 5.50 x 90): Rs,43,36,200.00
- Maintenance Cost
- Savings in spares cost(2 comp) : Rs,4,00,000.00

- **Total Savings/annum : Rs,47,36,200.00**

10. RETRUN ON INVESTMENT

- Est.cost of proposed compressor each = Rs,25,00,000.00
- Total cost of proposed compressor (1w+ 1sb)= Rs,50,00,000.00
- Total Savings =Rs,47,36,000.00
- ROI = Less than 1 year