MICRO, SMALL & MEDIUM ENTERPRISES
सूक्ष्म, लघु एवं मध्यम उद्यम

Ministry of New and Renewable Energy
Government of India

"PROMOTING ENERGY EFFICIENCY AND RENEWABLE ENERGY IN SELECTED MSME CLUSTERS IN INDIA"

To develop and promote a market environment for introducing energy efficiency and enhanced use of renewable energy technologies in process applications in the selected energy-intensive MSME clusters, United Nations Industrial Development Organization (UNIDO) in collaboration with Bureau of Energy Efficiency (BEE) is implementing a project titled "Promoting Energy Efficiency and Renewable Energy in selected MSME clusters in India" funded by Global Environment Facility (GEF) and co-financed by Ministry of Micro, Small and Medium Enterprises (MoMSME) and Ministry of New and Renewable Energy (MNRE).

Installation of a screw compressor with in-build VFD in ceramic glazing unit

Objective

To minimize the energy consumption in the compressed air system by avoiding unloading of the compressor.

Implementation

Installed a screw compressor with inbuild VFD in place of existing reciprocating compressor to reduce energy consumption.

Principle

The screw compressor is generally not equipped with valves and has no mechanical forces that cause unbalance. So, it can work at a high shaft speed and can combine a large flow rate with small exterior dimensions. VFD installed screw compressors can speedup and slowdown in response to load. They are the best choice for efficiency when a compressed air load varies throughout the day.

- Offers a constant air flow at all times and guarantees a uniform pressure through out
- Improves the life of the compressor by limiting functioning time
- Reduces the electrical consumption of the compressor system.

VFD air compressors can reduce the energy consumption by 10 - 40% compared to modulating compressors.

Savings	Investment	Pay Back
₹ 4,01,000	₹ 9,80,000	30 months

Prepared & designed by:
Confederation of Indian Industry

Unit Profile

Champion Ceramic is a ceramic industry located in Thangadh. The capacity of the unit is 3600 MT of sanitary ware per year.

Benefits

- **Improved life of the machinery & process output by maintaining constant header pressure**
- **Constant airflow at uniform pressure**
- **Reduced leakages**
- **Reduction in specific energy consumption in the compressed air system.**

Outcomes

- **61,285 kWh of annual energy saving**
- **₹ 4,01,000 of annual cost saving**
- **50.2 T of CO_2 reduction per year (0.82 kg/kWh)**

Replication Potential

In all the units with transformers on No-load

Cost Economics

Input motor power	**28 kWh**
Specific Power Consumption (kW/m^3/min)	**9.19**
Proposed power consumption (kW/m^3/min)	**6**
Reduction of power consumption	**18 kWh**
Reduction in annual energy consumption	**61,285 kWh**
Annual cost savings	**₹ 4,01,000**
Installation cost of new screw compressor with VFD	**₹ 9,80,000**
Simple payback period	**30 months**

Calculation

Energy savings per annum (kWh/year) = (Energy consumption before implementation- after implementation, kWh/month) * 12

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