Find out about the essential aspects of energy efficiency in compressed air installations

Save money
Put it into practice
Take care of the environment
Get training
Did you know that.....?

...90% of companies use compressed air

...on average, the energy cost makes up between 10% and 20% of industrial production costs

SMC research reveals that it is possible to save up to 40% of the energy used to generate compressed air.

Enter and find out how to do it
ENS-200 - Energy saving trainer

ENS-200 integrates a series of applications (vacuum, actuators and blowing) aimed at understanding and implementing the methodology associated with energy saving in compressed air installations. ENS-200 teaches you how to detect possible excessive consumption and suggest actions to prevent it.

Users will analyse different scenarios through a series of guided activities. Each experiment shows how much has been saved, both as a percentage and in the chosen currency.

This equipment acts on the four fundamental pillars of energy saving in pneumatics:

- **PRESSURE**
  Pneumatic components must be set to just the right pressure. Avoid excessive pressure as consumption is proportional to work pressure.

- **SECTORISATION**
  To sectorise means to divide. It is possible to sectorise by differentiating between zones with different working pressure levels. It is also possible to sectorise by area, thereby minimising the impact of leaks when a zone is not active.

- **MONITORING**
  Monitoring means to measure. Measuring makes it possible to locate defects in the facility and assess what can be saved by correcting them. Measuring can be done constantly or occasionally. Monitoring also leads to prevention, i.e. knowing when a part of the facility is beginning to consume more energy due to leaks or other faults.

- **AIR QUALITY**
  A dirty filter generates a drop in pressure. If this filter is not replaced, the pressure must be raised to continue meeting system requirements. This poor practice has a negative impact on consumption which leads to more compressed air generation.
Main areas

ENS-200 includes the most common consumption sources for an automated process.

- **Vacuum area**
  ENS-200 includes venturi and multi-stage vacuum ejectors which can be used to check the impact of including high-performing elements in vacuum applications.

- **Actuator area**
  It includes a standard cylinder and a high-performing cylinder, as well as valves and controllers which can simulate leaks or analyse the impact of an incorrectly dimensioned facility. Actions and strategies can, therefore, be devised from the results obtained.

- **Blowing area**
  ENS-200 includes two blower guns, built differently with varying efficiency, plus interchangeable nozzles that can be used to obtain comparative efficiency results.

Documentation:
- User manual.
- Practice manual.
- Theoretical course on pneumatics and energy saving concepts.
- Theoretical exercises based on a consumption calculation tool (included).
ENS-200 - With this system you could...

This trainer teaches you to come up with and implement energy efficiency solutions in compressed air facilities.

Working scenarios

PRESSURE

ENS-200 facilitates comparing the effect of adjusting the operating pressure to meet the facilities requirements using the following types of activities:

- Comparing different types of vacuum ejectors.
- Assessment of the impact of using excessively long pipes.
- Analysis of the impact of using double pressures.
- Adjustment of the network pressure to that required by each actuator.
- Comparison of various types of blow guns.
- Comparison of different types of blow nozzle.
- Comparison of alternative various types of actuators.
- Analysis of the negative effects of excessive pressure on pneumatic facilities.

SECTORISATION

ENS-200 looks at the advantages of dividing the facility into different areas, thus favouring the implementation of the following activities:

- Quantifying the advantages of positioning pressure controllers in each area.
- Quantifying the effect of leaks on the consumption and sizing of the compressor.

MONITORING

Monitoring identifies potential savings and verifies their subsequent application. ENS-200 enables:

- Checking whether a machine’s consumption falls within expected limits.
- Detecting and locating leaks in a system by sequentially checking areas or actuators.

@ eLEARNING-200

Find out more about the theory behind the technologies developed in ENS-200 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES

Principles of pneumatics (SMC-101)

*See eLEARNING-200 chapter for more information
ENS-200 includes an HMI (Human Machine Interface) with a built-in PLC, interactive menus guide the user through the different activities.

The system sets up all of the parameters automatically for each exercise.

The results from measuring consumption and the savings obtained are presented as a percentage and in monetary savings.

### ENS-200 - Technical features

<table>
<thead>
<tr>
<th>Modules</th>
<th>Sensors (type &amp; qty.)</th>
<th>Input / Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum area</td>
<td>Pressure switch (x2)</td>
<td>Digital 6/13</td>
</tr>
<tr>
<td>Actuator area</td>
<td>Vacuum switch (x1)</td>
<td>Analog 4/0</td>
</tr>
<tr>
<td>Blowing area</td>
<td>Flowmeter (x1)</td>
<td></td>
</tr>
<tr>
<td>Control area</td>
<td>Load cell (x1)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actuators (type &amp; quantity)</th>
<th>Other devices (quantity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic linear (x2)</td>
<td>2/2 cutoff valve (x1)</td>
</tr>
<tr>
<td>Blow gun (x2)</td>
<td>Solenoid valve block (x3)</td>
</tr>
<tr>
<td>Vacuum pad (x1)</td>
<td>Manual 5/2 valve with selector switch (x2)</td>
</tr>
<tr>
<td>Venturi type vacuum ejector (x1)</td>
<td>Pressure regulator with pressure gauge (x1)</td>
</tr>
<tr>
<td>Multistage vacuum ejector with hysteresis function (x1)</td>
<td>Bicolour pressure gauge (x2)</td>
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<tr>
<td></td>
<td>Flow regulator - leakage simulator (x2)</td>
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<tr>
<td></td>
<td>Pressure/Flow regulator (x2)</td>
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<td></td>
<td>OR flow control valve (x2)</td>
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<tr>
<td></td>
<td>Blower nozzles (x5)</td>
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<tr>
<td></td>
<td>Manual valve (x2)</td>
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<tr>
<td></td>
<td>Power supply (x1)</td>
</tr>
</tbody>
</table>

**ENS-200 - How to use it**

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**PRESSURE-Practice 1**

**CONCLUSIONS**

- Flow consumption average (0.4MPa): 14.8 l/min
- Flow consumption average (0.3MPa): 7.6 l/min

**AIR CONSUMPTION SAVING:** 45%

**PRESSURE-Practice 1 (Costs conclusions)**

- Cost extrapolation to X actuators like this working in a factory during a year (t):
  - Air cost in first situation: 1480 €
  - Air cost in second situation: 780 €
  - Saving: 700 €