



NEXTRON – O₂ and CO controls

**Burner Management System
(BMS)**

O₂ CONTROL ADVANTAGES

Continuous control of the oxygen amount in the flue gases (chimney) in a boiler allows the burner to work constantly with the minimum excess of air, giving the following advantages independently from the ambient conditions:

- **HIGH COMBUSTION EFFICIENCY**
- **FUEL SAVING**
- **RELIABLE PERFORMANCE**
- **REDUCTION OF MAINTENANCE OF THE HEAT GENERATOR**
- **ADDITIONAL REDUCTION OF ELECTRICAL ENERGY CONSUMPTION AND NOISE IF FREQUENCY CONVERTER IS USED (SUGGESTED)**



CO CONTROL ADVANTAGES

CO₂ control system is based on a double-electrode probe: control is based on CO₂ analysis, O₂ is just monitored.

Advantages VS O₂ control:

- **HIGHER ENERGY SAVING**
- **INDEPENDENT FROM EXTERNAL AIR**
- **MAXIMUM SAFETY**
- **AUTOMATIC DETECTION OF MINIMUM POSSIBLE EXCESS OF AIR**



QUANTIFICATION OF ADVANTAGES

Experience demonstrates that with O₂ control you can get total fuel savings up to

5%

With CO₂ control, additional savings of **+2,5%**

TOTAL SAVINGS OF

7.5%

EXAMPLE

Modulating gas burner

Turndown ratio 1:3

Estimated annual fuel expense : **300 k€/year**

BOILER POWER: 3MW

BOILER TYPE: 3 TURNS

FUEL: NATURAL GAS

CURRENT O₂ VALUE:

MIN LOAD = 6,5%

MID LOAD = 6%

MAX LOAD = 5%

WORKING HOURS: 5.000 h/year

LOAD RATIO:

MIN LOAD = 33%

MID LOAD = 33%

MAX LOAD = 34%

O₂ VALUE WITH O₂ REGULATION:

MIN LOAD = 3%

MID LOAD = 2,5%

MAX LOAD = 2%

RESULT

Hypotesis: with gas fuel, every 1% O₂ reduction = efficiency increase of avg. 0,6%

Efficiency increase calculation:

Min load: $(6,5-3) \times 0,6 \times 0,33 = 0,693\%$

Mid load: $(6-2,5) \times 0,6 \times 0,33 = 0,693\%$

Max load: $(5-2) \times 0,6 \times 0,34 = 0,612\%$

On avg I save 2% $(0,693 + 0,693 + 0,612)$ per year = **6 k€/year**

Avg burner lifespan = 10 to 15 years → Life cycle saving = **60k€ to 90k€.**