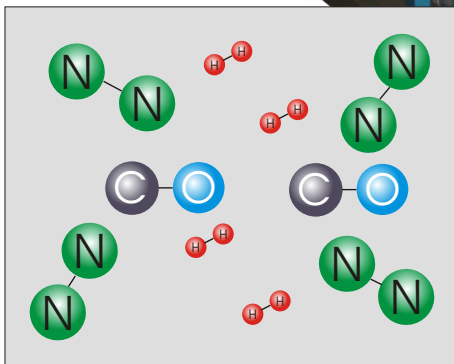


# Protective Gas Generator ENDOMAT<sup>®</sup> air-cooled



$\lambda$ -probe control  
quantity control  
full automatic  
regeneration unit  
no need of  
cooling water

High requirements are placed on the controllability of the atmosphere, where the carbon exchange together with the workpiece surface play an important role. From the process engineering point of view the carrier gas method, using endothermic gas gives best possibilities for:

- ▶ exact process control
- ▶ best reproducibility of the final results and
- ▶ high quality requirements

The development of measuring and control of the furnace atmosphere with O<sub>2</sub>-probes presents an additional and reasonable measuring method: the O<sub>2</sub>-partial pressure measurement with  $\lambda$ -probes.

### The $\lambda$ -probe control

The measuring gas will be conducted through a temperature-constant  $\lambda$ -probe. At the same time a mV-signal is emitted by the  $\lambda$ -probe, which is used for measuring, control and registration of the endogas-composition and is displayed in °C dewpoint.

A very precise control of gas/air mixtures is required to produce constant quality of endothermic gas.

### Quantity control

The generator capacity can be adjusted to the required capacity manually or by automatic quantity control. The unused protective gas is burned off and therefore results a very expensive solution.

This disadvantage of the conventional protective gas generators has now been eliminated by the technicians of AICHELIN.

Through adapted design and in combination with the modern  $\lambda$ -probe a quantity control of the protective gas in the range of 100 % up to 30 % of the nominal capacity is now possible.

This enables a manual adjustment of the protective gas production of every standard ENDOMAT in the range from 100 % up to 30 % of the max. capacity. The control of the gas composition will be done fully automatically by the  $\lambda$ -probe control.

#### Advantages:

protective gas quantity according to requirements

- ▶ reduction of costs
- ▶ no difficult manual adjustments
- ▶

This fully automatic quantity control can be offered for applications where variations in protective gas volumes are required. In these cases the quantity of unrequired protective gas (usually burned off) is kept to minimum using a sensor.

With this new development, three standard sizes are sufficient:

- ▶ nominal capacity: 30 m<sup>3</sup>/hr  
- reduceable to 9 m<sup>3</sup>/hr
- ▶ nominal capacity: 60 m<sup>3</sup>/hr  
- reduceable to 18 m<sup>3</sup>/hr
- ▶ nominal capacity: 120 m<sup>3</sup>/hr  
- reduceable to 36 m<sup>3</sup>/hr

### Heating

The size of 30 m<sup>3</sup>/hr is heated electrically, the sizes 60m<sup>3</sup>/hr und 120m<sup>3</sup>/hr are optionally heated electrically or through gas burners.

### Fully automatic regeneration device (optional)

This device enables a fully automatic regeneration of the protective gas generator. The start can be activated

- ▶ manually
- ▶ automatically with time control
- ▶ with remote control of the FOCOS® process control system

The production of protective gas will be stopped automatically and the generator temperature will be reduced to regeneration temperature. After regeneration the ENDOMAT® is heated up again to operation temperature and prepared for protective gas production.

#### Advantages:

- ▶ minimized maintenance works
- ▶ reduction of running costs

An economic comparison between endogas- and nitrogen-methanol-gasifying has shown besides the costs for investment the maintenance costs were a disadvantage. By using these modern instruments for automation the disadvantages are cancelled and important benefits for the maintenance staff are possible.

## Summary

The development of the measure- and control technology now enables a reasonable, exact control of the gas composition with  $\lambda$ -probes. Positive operational experiences have been gathered over many years.

This new measuring method makes the development of protective gas generators easier, which

**are reducible in their production quantity down to 30%**

Optional,  
- with a minimal additional price - a

**fully automatic quantity control**

of the produced protective gas quantity can be offered.

Further, to decrease maintenance costs, an

**automatical regeneration device**

can be supplied.

All AICHELIN protective gas generators of the series ENDOMAT® can be integrated into the process control system FOCOS® for hardening shops.

Since several years, the AICHELIN ENDOMAT series are delivered with an air-cooling device.

**Therefore there is no more need for cooling water.**

This is a further step to establish a hardening shop without any cooling water requirements. Maintenance costs can be reduced through the drop of corrosion problems.

## Why choose AICHELIN ?

Furnaces and plants made by AICHELIN offer reproducible high quality and economy.

Through our long term partnership with our customers all over the world, proven designs have been developed with unmatched durability and service simplicity.

Permanent research and development as well as the background of well established manufacturing facilities grants our customers a reliable partnership.

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