

Protective Gas Generator ENDOMAT[®]



λ -probe control
no need of cooling water

Protective Gas Generator ENDOMAT[®] air-cooled

High requirements are placed on the controllability of the atmosphere, where gas carburising processes and other heat treatments are carried out under controlled atmosphere conditions, 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 (proved over many years) 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 O₂-probes presents an additional and reasonable measuring method: the O₂-partial pressure measurement with λ-probes.

The λ-probe control

The measuring gas will be conducted through a temperature-constant λ-probe. At the same time a mV-signal is emitted by the λ-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 λ-probe a quantity control of the protective gas in the range of 100 % up to 50 % of the nominal capacity is now possible.

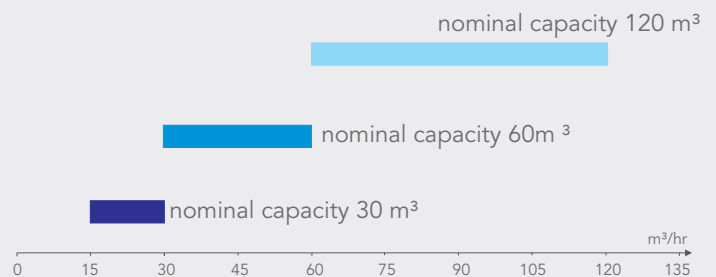
This enables a manual adjustment of the protective gas production of every standard ENDOMAT in the range from 100 % up to 50 % of the max. capacity. The control of the gas composition will be done fully automatically by the λ-probe control.

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:



Heating

While size of 30 m³/hr is heated only electrically and size of 120 m³/hr is heated only by gas burners, size 60 m³/hr can be optionally heated electrically or by 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 AICHELIN - 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

Change of retorts

The life expectancy of the retort amounts up to 3 years, depending on type of application. Due to the simple assembly concept, the retort can be exchanged safely by the customer within few minutes after cooling. AICHELIN offer their customers exclusively the free of charge and professional disposal of the used up catalyst in the context of the retort exchange. Exchange retorts are available at any time in all sizes on stock.

Summary

The development of the measure- and control technology now enables a reasonable, exact control of the gas composition with λ -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 50%

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

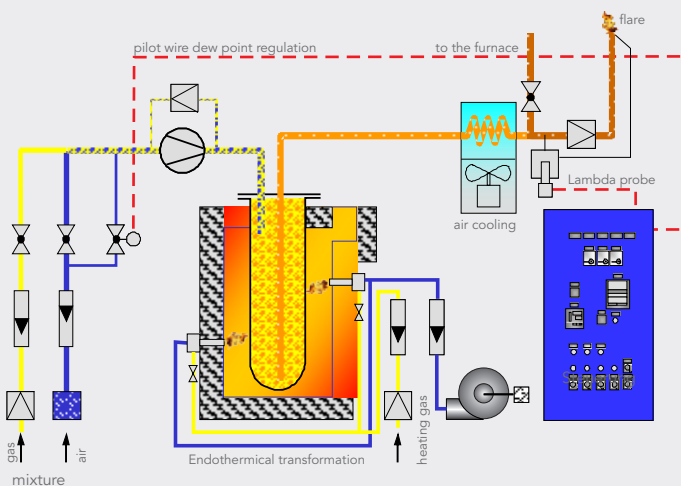
can be supplied.

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.



Process design ENDOMAT[®] gas heated



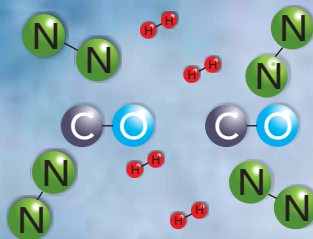
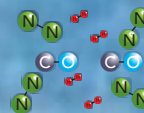
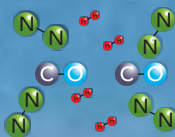
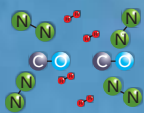
Why choose AICHELIN ?

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.

Protective Gas Generator ENDOMAT[®]



quantity control • full automatic regeneration unit

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