C Level and Temperature Controller
Type: Carbo-M

Special Features:

- Menu-guided operation
- Foil keyboard
- Exact control for C level and temperature
- Soot limit monitoring
- Universal application of optional connection of O2, O2+CO2, CO detectors and two thermocouples (type S or K)
- O2 probe monitoring (checking Ri and EMF, purging)
- Simultaneous measurement with two probes for super version
- Automatic change to spare probe
- Program memory with 99 set point programs for C level and temperature
- Analog output, for example, for recorder connection C level correction (for example, by means of foil specimens)
- Options:
  · Serial interface for example, for visualization software "MESAVis"

Function:

The **Carbo-M** is a dual-channel measuring and control system for C level calculation and C level and temperature control in the furnace atmosphere of heat treatment plants.

By means of switch settings on the rear panel of the instrument, **Carbo-M** can be easily adapted to match existing facilities. Alterations in the data acquisition scheme, for example, change of gas analyzers to oxygen probes, can be effected without difficulty.

A currently available analytical method for determining the carbon content in furnace atmospheres is the indirect measurement of the oxygen content in the furnace with zirconium oxide probes. **Carbo-M** provides special support for these methods. Datasheets on probes and other equipment are available on request.

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Technical Data

Construction:
Metal housing for mounting in control panels, in conformance with DIN 40050
Type of protection IP 54 (front), as specified in DIN50050

Dimensions:
144 x 144 x 300 mm (l x w x h)

Auxiliary voltage:
230 Vac ± 10 % 50/60 Hz

Power consumption:
About 15 VA

Input signals (selected by means of switch setting):

Analog (in following combinations):
- O_2 measuring probe, cell voltage directly or Through amplifier
- O_2 measuring probe and CO analyzer
- CO_2 analyzer
- CO_2analyzer and CO analyzer
- O_2 probeandL-probe
- O_2 probe, L-probe and CO analyzer
- L-probe and CO analyzer
- L-probe and CO_2 analyzer
- L-probe, CO_2 analyzer and CO analyzer
- L-probe and L-probe
- O_2 probe and O_2 probe
- CO_2 analyzer and O_2 probe

Attention: If you use L-probe and O_2-probe you can´t connect an additional Reference junction.
- Thermocouple, type K or S
- Reference junction, type K or S (also mixed)
- Terminal temperature (Pt 100)
- External set value: **serial interface**

Digital:
- IN 0: program release with set point program in progress: otherwise, controller locked
- IN 1: program continuation in succession
- IN 2: input disable

Measuring range:
0,15...1,5 % C, or as specified by customer

Analog:
- C potential actual value, selected, 0 to 20 mA, 4 to 20 mA or 0 to 10 Vdc (in three scale divisions: 0...1,5 %; 0,15...1,5 %; 0...2,0 %)

Option:
- Control variable temperature controller

Output signals:

Switching outputs:
- 3 control tracks freely available
- 2 switching outputs for 1 motor valve for gas or solenoid valves for gas and air
- 2 switching outputs for temperature heat + cool
- Signal gas release
-Signal probe purging
- Signal actual values in tolerance range
- Signal program active
- Signal Alarm indication
(all outputs "open collector" 24 V / 100 mA)

Serial interface (option):
- RS 232
- RS 422 / RS 485

Display:
Graphical LCD display with 160 x 128 pixels

Operation:
Five keys (soft keys) with user guidance (menu guidance);
respective function of the keys indicated on display

Set point:
- 4 preset points for C level
- 99 set point programs for C level and temperature profiles, internally storable and recallable;
(program travel time per program: up to 100 h)
- 23 segments / program

Climate:
Storage: -10...+60 °C
Operation: 0...+50 °C
5...95 % relative humidity, non-condensing
Impedance for cell voltage:
> 100 MOhm