



### Special features:

- Menu-guided operation
- Foil keyboard
- Exact C-level control
- Soot limit monitoring
- Universal application by virtue of optional connection of O<sub>2</sub>, O<sub>2</sub>+CO<sub>2</sub>, CO detectors and two thermocouples (type S or K)
- O<sub>2</sub>-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)
- Optional:
  - Serial interface for example, to the connection of the process visualization "CARBOVIS"

## C Level Controller Carbomat-M

### Function:

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

By means of switch settings on the rear panel of the instrument, **Carbomat-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. **Carbomat-M** provides special support for these methods. Data sheets on probes and other equipment are available on request.

### Optional Accessories:

- Auxiliary unit REL..., PRL...
- Adapter for Terminal strips

## Technical Data:

### Construction:

Metal housing for mounting in control panels, in conformance with DIN 40050  
Type of protection IP 54, as specified in DIN 50050

### Dimensions:

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

### Auxiliary voltage:

230 Vac  $\pm$  10 % 50/60 Hz

### Power consumption:

About 15 VA

### Input signals (selected by means of switch setting):

#### Analog (in following combinations):

- O<sub>2</sub> measuring probe, cell voltage directly or through amplifier
- O<sub>2</sub> measuring probe and CO analyzer
- CO<sub>2</sub> analyzer
- CO<sub>2</sub> analyzer and CO analyzer
- O<sub>2</sub> probe and L-probe
- O<sub>2</sub> probe, L-probe and CO analyzer
- L-probe and CO analyzer
- L-probe and CO<sub>2</sub> analyzer
- L-probe, CO<sub>2</sub> analyzer and CO analyzer
- L-probe and L-probe
- O<sub>2</sub> probe and O<sub>2</sub> probe
- CO<sub>2</sub> analyzer and O<sub>2</sub> probe

### Attention:

If you use L-probe and O<sub>2</sub>-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: analog or through **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

### Serial interface (option):

- RS 232
- RS 422 / RS 485
- 20 mA current loop (TTY)

### Measuring range:

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

### Output signals:

#### 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:

- Integrated temperature transmitter
- 11 additional control tracks with an external box.

#### Switching outputs:

- 5 control tracks freely available
- 2 switching outputs for 1 motor valve for gas or solenoid valves for gas and air
- 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)**

#### 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 profiles, internally storable and recallable;  
(program travel time per program: up to 100 h)
- 23 segments / program
- External entry by means of program generator, for example, 0...20 mA, 4...20 mA, 0...10 V.

#### Option:

- 99 set point programs for C level **and** temperature profiles
- Set point through serial interface

#### Climate:

Storage: -10...+60 °C  
Operation: 0...+50 °C  
5...95 % relative humidity, non-condensing

#### Impedance for cell voltage:

> 100 MOhm

All specifications subject to change without prior notice.