



## Atmosphere controller

- Control on either carbon potential, dew point, or oxygen concentration, with display of the uncontrolled variables
- built-in timers and sequences for automatic burn-off, purge, and probe testing.
- linearization for virtually all oxygen probes on the market
- SMART auto-tuning
- RS-485 MODBUS communications
- IP 65 NEMA 4X front protection.
- Optional 8 input / 10 output card
- Automatic or manual probe testing guarantees you get the most from your oxygen probe

## MCC

**PRELIMINARY**

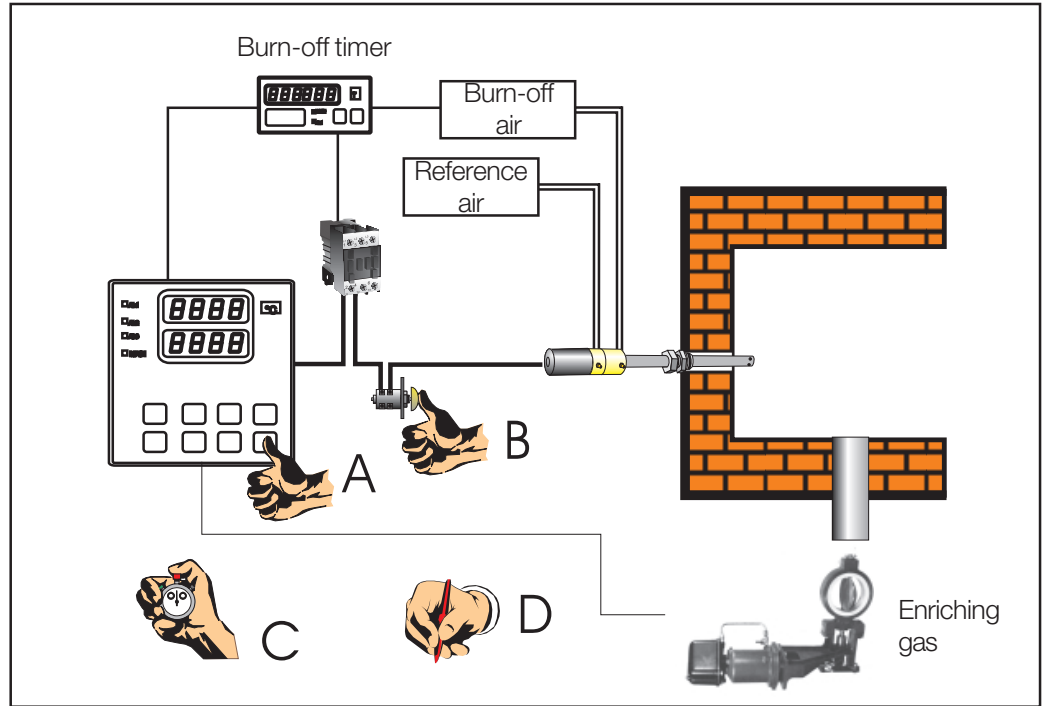
## Typical installation

Traditional carbon control installations require a complex system of timers, switches, and human interface in order to carry out many of the functions that an MCC can do automatically long after you've forgotten about it. Probe burn-off and purge, functions are carried out automatically on either a time-scheduled basis (continuous furnaces), or as a result of a logic input (batch furnaces).

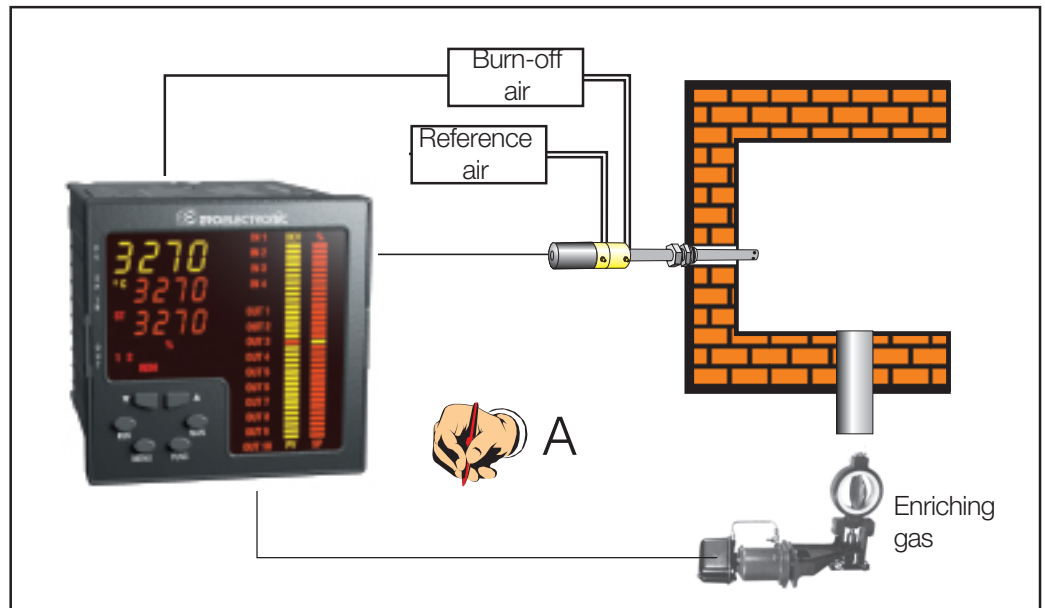
An MCC installation internalizes many of the functions you used to need external timers and switches for. In addition, this solution offers a number of new features which can minimize the need for human interaction. Automatic probe testing will tell you the response time and internal resistance of your oxygen probe, letting you know when it's time to buy or rebuild a new one.

The MCC includes an analog input from a gas analyzer that can automatically adjust the CO compensation factor without the need for an operator to manually input the value. An MCC is less expensive to install, and will provide stability, accuracy,

## Using a standard controller



## Using MCC controller



and repeatability over the long run.



## GENERAL SPECIFICATIONS

**Case:** PC/ABS Black color. Self-extinguishing degree V0 according to UL 94.

**Front panel:** Designed and tested for IP65 and NEMA 4X for indoor location.

**Installation:** Panel mounting

**Rear terminal block:** 55 screw terminals with rear safety cover.

**Dimension:** DIN 43700 96x96, 128 mm depth

**Cut-out:** 92x92 mm

**Weight:** 500 g

**Display:** three 4-digit displays

**Indicators:** 2 green and 16 red LED's.

**Bargraph:**

- One bargraph composed of 33 green LED's for indication of process variable or deviation error.

- One bargraph composed of 33 orange (amber for LITEON) LED's for indication of setpoint or output value.

**I/O indicator:**

- 4 red LED'S labeled (IN1, IN2, IN3 and IN4) to indicate optional digital input

- 10 red LED'S labeled (OUT1 to OUT10) to indicate optional digital output

**Power supply:** from 100 to 240 Vac 50/60 Hz switching

**Power supply variation:** From -15% to 10% (for 100 to 240 Vac)

**Power consumption:**  
- 16 VA (without digital I/O)  
- 20 VA (with digital I/O)

**Insulation resistance:**  
>100 Mohm

**Insulation strength:**  
1500 V rms for 1 min

**Noise immunity:** The instrument should conform with EEC 89/336 directive regarding electromagnetic compatibility

**Insulation requirements:** reinforced between power supply and input: 2650 Vac Requirements for terminal board plastic: VICAT 130°C

**Common mode rejection ratio:** 120 dB @ 50/60 Hz

**Normal mode rejection ratio:** 60 dB @ 50/60 Hz

**Ambient temperature:** from 0 to 50 °C

**Storage temperature:** from -20 to 70 °C

**Humidity:** Max 85% RH non condensing

### MAIN INPUT

**Input range:**

- 0 to 1500 mV (when mV sensor output is selected as primary control variable)
- 1000 to 1300 mV (when carbon potential or dew point is selected as primary control variable)

**Percent carbon range:**

0.00 to 2.00

**Resolution:** 0.01

**Accuracy:**

- $\pm 0.02$  digits over the central 60% of range
- $\pm 0.03$  digits on remainder of range

**Temperature drift:**

- 350 ppm/°C on range 1000 to 1250 mV
- 200 ppm/°C on range 0 to 1500 mV.

**Input impedance:** >10 M $\Omega$

**Sampling time:** 125 ms (typical)

**Display update time:** 375 ms

### TEMPERATURE INPUT

**Input type:** Thermocouple type K, S or R.

- 1) TC type K From -100 to 1370 °C [IEC 584-1]  
From -150 to 2500 °F
- 2) TC type S From - 50 to 1760 °C [IEC 584-1]  
From - 60 to 3200 °F
- 3) TC type R From - 50 to 1760 °C [IEC 584-1]  
From - 60 to 3200 °F

**Sampling time:**

- 1.125 s if Carbon Monoxide input is used,
- 750 ms otherwise

**Accuracy:**  $\pm 0.2\%$  fsv  $\pm 1$  digit @ 25 °C and nominal power supply voltage

**Temperature drift:**

< 200 ppm/°C of full span

**Source impedance:** 100  $\Omega$  max for TC/mV input.

**Current for TC open detection:** -100 nA.

**Input impedance:** > 1 M $\Omega$

**Reference junction:** Automatic compensation from 0 to 50 °C.

**Reference junction drift:** 0.1 °C/°C

### CARBON MONOXIDE INPUT

**Input range:** 20 mA, 5 V or 10 V

**Input type:** not isolated from main and temperature inputs.

**Sampling time:** 1.125 s.

**Accuracy:**  $\pm 0.2\%$  fsv  $\pm 1$  digit @ 25 °C and nominal power supply voltage.

**Temperature drift:** < 300 ppm/°C of full span

**Input impedance:**

- for 5 V input: > 200 K $\Omega$ .
- for 10 V input: > 400 K $\Omega$ .
- for mA input: < 5  $\Omega$ .

### DIGITAL INPUTS

The instrument is equipped with three digital input.

**Input type:** contact closure (voltage free)

**Input function:**

The first and second inputs can be as:

- a) Auto/Manual selector
- b) Output limiter activator
- c) Alarm manual reset/acknowledge

The third input (DIG3) is used to start probe BURNOFF routine.

**Active logic level:** open or closed programmable for each input.

### OUTPUTS

#### OUT 1

**Output type:** Relay or SSR

OUT 1 relay

**Contact type:** SPDT

**Contact rating:** 3 A @ 250 Vac on resistive load.

OUT 1 SSR (option)

**Output type:** Voltage output for SSR drive.

**Logic level 1:**

- 14 Vdc  $\pm 20\%$  @ 20 mA.
- 24 Vdc  $\pm 20\%$  @ 1 mA.

**Logic level 0:** <0.5 Vdc

**Maximum current:** 20 mA.

#### OUT 2

**Output type:** Relay or SSR  
**Output function:** selectable as time proportional control (Main or Secondary) or alarm 2 output.

OUT 2 relay

**Contact type:** SPST. (NO or

NC selectable by jumper)

**Contact rating:** 3 A @ 250 Vac on resistive load.

OUT 2 SSR (option)

**Output type:** Voltage output for SSR drive.

**Logic level 1:**

- 14 Vdc  $\pm 20\%$  @ 20 mA.
- 24 Vdc  $\pm 20\%$  @ 1 mA.

**Logic level 0:** <0.5 Vdc

**Maximum current:** 20 mA.

#### OUT 3, 4 and 5

**Output type:** Relay

**Output function:** selectable as time proportional control (Main or Secondary) or alarm output (alarm 3, 4 or 5 respectively).

**Contact type:** SPST. (NO contact)

**Contact rating:** 3 A @

250 Vac on resistive load.

#### OUT 6 and 7

**Output type:** 0-20/4-20 mA isolated analog output.

Maximum load: 600  $\Omega$  max.

**Output function:** each output can be selectable as:

- a) Linear control output (Main or Secondary)
- b) Process variable retransmission
- c) Operative setpoint retransmission

**Resolution:**

- 0.1 % when used as control output
- 0.05 % when used as signal retransmission

**Readout scaling:** when used as signal retransmission the value is scaled from -199 to 999.

**Output filter:** when used as signal retransmission the outputs can be filtered with a first order filter with programmable time constant.

## ALARMS

**Number of alarms:** up to 5 alarms.

**Alarm function:**

- process alarm
- deviation alarm
- band alarm

**Alarm type:** High/Low (Outside/Inside if band alarm)

**Alarm action:** Direct/Reverse

**Alarm reset:** Automatic or Manual programmable.

**Special function:** standard or mask alarm.

**Alarm threshold:**

- Span limits for process alarm;
- From 0 to 1000 digits for band alarm,
- From -1000 to 1000 digits for deviation alarm.

**Alarm hysteresis:** From 1 to 200 digits.

## SERIAL INTERFACE

**Interface type:** RS-485

Optoisolated

**Protocol type:** Modbus/Jbus (RTU mode)

**Device address:** 1 to 255

**Baud rate:** 600 upto 19200 baude

**Byte format:** 1 start bit + 8 bit + parity + 1 stop bit.

**Parity:** Even, Odd or none

## SPECIAL OPTIONS

**Additional digital input:** Eight inputs from contact closure(voltage free) (The input status can be read throught serial link)

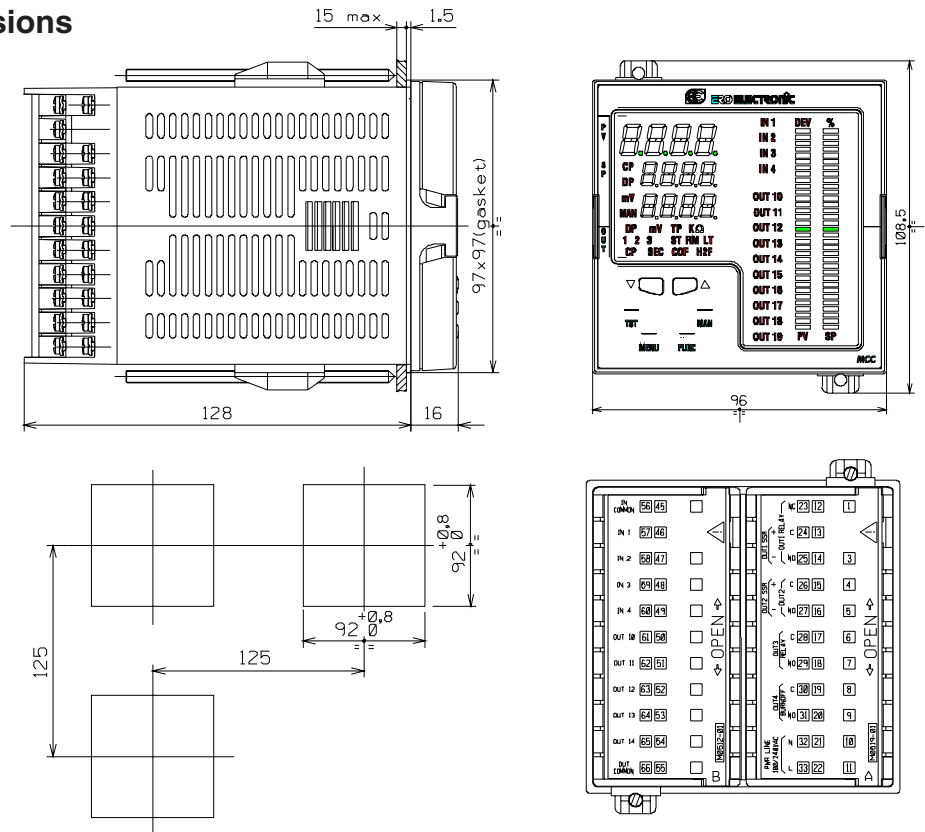
**Additional digital output:** Five Relay 0.5 A 1 FORM A @ 250 Vac on resistive load

Note: The side C of relays are is common

Five Relay 0.5 A 1 FORM A @ 250 Vac resistive load

Note: The side C of relays are is common (The digital output can be driven throught keyboard or serial link)

## Dimensions



## HOW TO ORDER

**MODEL**  
MCC

### INPUT

8 = Oxygen Prb-in + Temp-in + CO-in + Logic inputs

### OUT1

1 = relay Form C

### OUT2:

1= relay Form A

### OUT3 - OUT4 & OUT5:

1 = 3 relays Form A

### OUT6 & OUT7:

5 = two linear 0-20 mA outputs

### OPTIONS

0 = RS- 485

5 = RS- 485 + additional 8 Logic inputs and 10 Logic outputs \*

### POWER SUPPLY

3 = 100 - 240 V AC

MCC 8 1 1 1 5 3 0 0

\* Under development