



**Reference 88**

# Carburetors Synchronization Controller (4-way)

## CSS4a model (with self-diagnosis)

### Specification

#### 1. Mechanical characteristics

Dimensions: 162 x 98 (front) x 60 x 42.

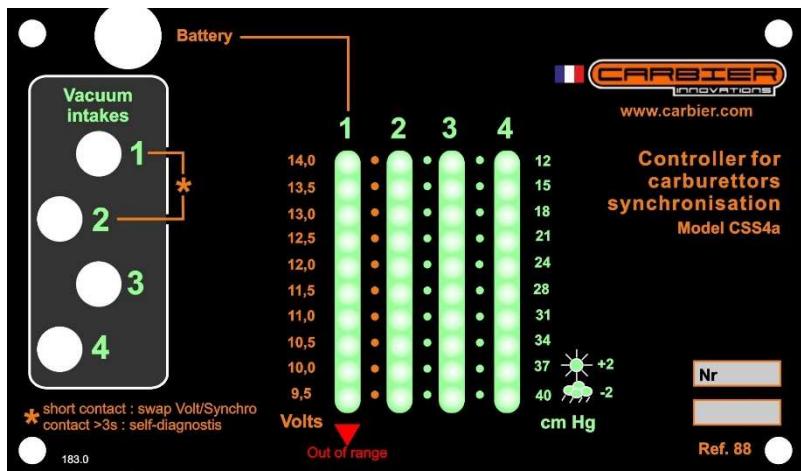
Weight: 280 grams (with its wires).

Materials:

Housing: Light grey ABS

Front face: PMMA (plexiglas) transparent.

Marking: in color on paper.



#### 2. Electrical characteristics

Power: by two wires (length 80 cm) on the 12 V battery of the vehicle.

Wires endings: red and black alligator clips.

Operating voltage: 9 to 18 V DC ; reverse voltage protected.

Maximum permissible voltage: 24 V

Consumption: less than 100 mA at 14 V.

#### Voltmeter function (VOLT):

Displays the supply voltage on a scale of 10 green LEDs (light-emitting diodes).

Measuring range: 9.5 V to 14.0 V.

Below 9.5V: No LEDs lit. The red LED is ON.

Above 14.0 V: The 14.0 V LED remains ON.

Resolution: 0.5V; accuracy: displayed value  $\pm 0.25$  V  $\pm 5\%$

#### 3. Pneumatic characteristics (SYNCHRO)

Measured pressure: the vacuum in the intake manifolds of the carburetors, displayed on four parallel scales of 10 green LEDs, for a total of 40 LEDs.

Type of measurement: absolute pressure.

Pressure range displayed:

12 to 40 cm Hg (based on an atmospheric pressure of 76 cm Hg).

Resolution: 3 cm Hg.

Precision: value displayed  $\pm 1.5$  cm Hg  $\pm 5\%$  of the displayed value.

For depressions below 12 cm Hg, the LEDs remain lit.

For depressions greater than 40 cm Hg, the LEDs remain off, and the red LED lights up.

Gap between two channels for the same pressure: half the resolution.

Note: the atmospheric pressure varies between 72 cm Hg (storm) and 80 cm Hg (very good weather). Since the purpose of the adjustment is to make the depressions of the six carburetors equal, these pressure variations are irrelevant.

#### 4. Miscellaneous

Protection against power polarity reversals.

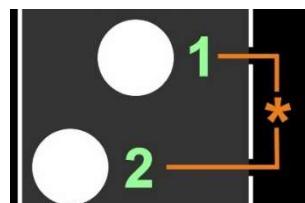
IP50 protection (dust protected, not liquid protected)).

The ABS housing does not tolerate contact with hydrocarbons very well.

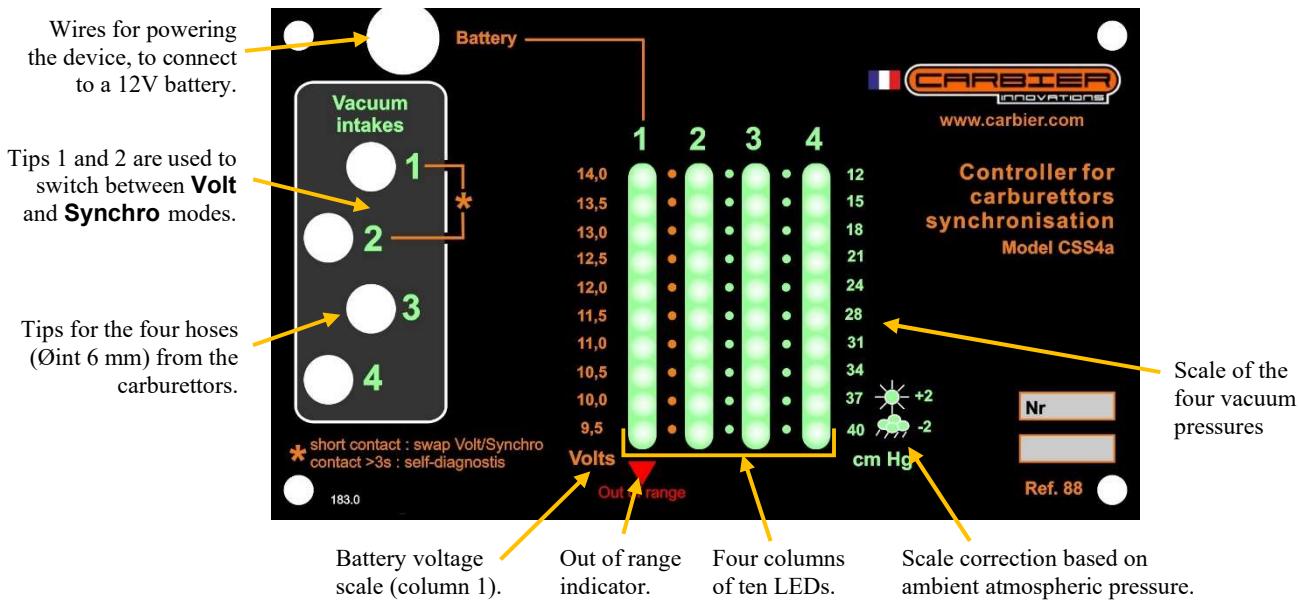
Storage temperature: -10 to +70 °C

Operating temperature: 10 to 50 °C

Tips 1 and 2 also have an electrical role: they allow the user to switch from **Volt** mode to **Synchro** mode and back, and to start self-diagnosis. Short or long electrical contact between the tips (with a screwdriver for example) allow this function.



\* short contact : swap Volt/Synchro  
contact >3s : self-diagnosis



## Operation

### Power supply

Connect the two red and black wires to the vehicle 12 V battery (or any other battery). The device is protected against reverse polarity. **Red wire:** PLUS terminal; **black wire:** MINUS or ground terminal.

At power-on, an initialization phase starts: a battery of tests is carried out by the device. The 40 LEDs light up successively for 8 seconds. Then the battery voltage is displayed for about 6 s on column 1 of LEDs. A battery in good condition gives 12.0 V to 12.5 V at rest. Finally, the device switches to **Synchro** mode. The device can then be used to trim the carburetors.

### Pneumatic connection

Connect the vacuum hoses on one side to the vacuum sockets on the carburetors and on the other side to the controller's tips. There is no problem to leave one or more tips unconnected. Depending on the vehicle, vacuum plugs are present on the carburetors or must be screwed after removal of the original shutter screws. The hoses to be used may be made of rubber or other flexible material. Aquarium pipes with an inner diameter of 6 mm are very suitable.

### Adjustment

Engine stopped, the vacuum in the tubing is at atmospheric pressure, which is at 0 cm of mercury (relative pressure). As a result, in **Synchro** mode, the four highest LEDs are ON.

Start the engine. The display is positioned and indicates the average depression in the intake tubing. Ideally, all four LEDs lit should be aligned. If they are not, act on the carburetor settings to approach the alignment. It is normal for the display to shake when the engine is running.

Some four-carburetor vehicles have only three adjustable carburetors (example: some Honda CB750 Four). In these cases, align the three adjustable on the fixed one.

### Overscaling

In case of very low battery voltage (less than 9.0 V) and in case of very high depression in one of the four channels (greater than 40 cm Hg), a red LED lights up to indicate this anomaly.

In case of very high battery voltage (greater than 14.5 V) and in case of very low vacuum in one of the four channels (less than 12 cm Hg), the highest LED of the corresponding column remains lit.

### Switching from Synchro mode to Volt mode and back

Normally, after the initialization phase, the device is in **Synchro** mode. But it is possible to return to **Volt** mode by creating an electrical contact between the two tips 1 and 2 of the vacuum sockets. This can be done with a screwdriver or any metal object. At each contact between these two tips, the device changes mode.

### Self-diagnosis

Switch to **Volt** mode. Maintain electrical contact between tips 1 and 2 for more than 3 seconds. Self-diagnosis starts. All the LEDs light up in turn. This checks all the internal circuitry of the device. No time limit for this function.

Return to normal operation: repeat the electrical contact between tips 1 and 2, or disconnect and reconnect the device from the battery. The device returns to **Synchro** mode.

**After adjustment**, disconnect the electrical wires, remove the hoses from the carburetors' vacuum sockets and reinstall the screws, if any.