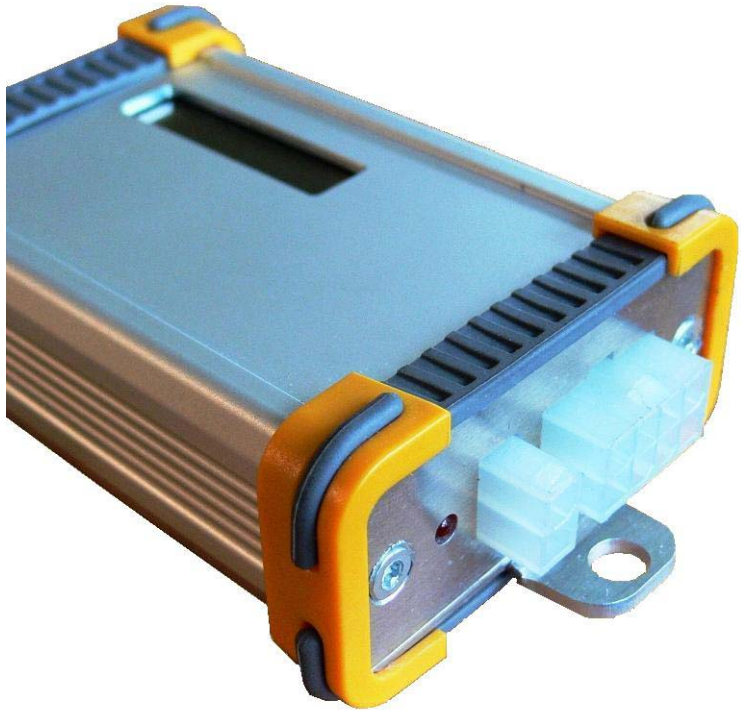


# Capristo Exhaust

## Exhaust Control

### Installation and Operating Instructions



Back pressure monitoring control device  
for exhaust systems equipped with butterflies

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**Trademark**

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## Introduction

This introduction provides information on the back pressure control Exhaust Control, the operation and setting. Both installation and placing into operation are specified in separate instructions.

There are various versions available for different cars. The instructions refer to the basic functions of the control unit for exhaust systems with one or several simultaneously controlled exhaust gas butterflies.

Exhaust Control monitors constantly the back pressure within the exhaust system while driving. When accelerating the back pressure is increasing. In case of exceeding a preset pressure, the control unit opens the butterflies on the rear muffler thus leading to a decreasing back pressure. These characteristics reduce the wear and increase the provided engine performance.

By means of the attached hand-held transmitter the control unit can be set to the specific requirements of the respective automobile. Furthermore it is to be used for switching over between the different modes. For this reason the driver is in a position to adjust the characteristics according to the respective driving situation. Different modes such as cruise mode or sport mode are available.

# Operation

## Important remarks

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At the time when printing these instructions the control unit does not feature an ABE (general permit for operation). Therefore the control unit is allowed to be operated only together with the exhaust system with which it forms part of scope of delivery, within the area of application of the StVZO (road traffic licensing regulations).

## Operation while driving

The requirements of the road traffic always demand the full attention of all road user.

Therefore, Exhaust Control with its numerous functions may only be operated if allowed by the traffic situation.

## General operation

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*These instructions specifies the significant options of controlling the back pressure in order to become quickly familiar with the operation.*

Exhaust control powers itself up automatically once the engine is started. The control unit is already preprogrammed with two different modes. A short pressure on the right button s of the hand-held transmitter activates the sport mode. Here the butterflies open earlier and the maximum engine performance is provided faster. The left button r switches into the cruise mode which makes a more pleasant ride possible.

The back pressure control unit Exhaust Control is constantly enhanced. These instructions specify the functions of the version CSS2 1.008.

## Functions

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The control unit is usually not installed in the cockpit. For this reason its operation is made via a hand-held transmitter.

The device has a display for checking all settings. To make settings exceeding the range of a mode, you need to have a look at the display. For safety reasons such settings are not allowed to make while driving.

### Mode display

In the idle mode the display features e.g. the following data:



In the upper line the selected mode appears. Beneath on the left the actual pressure and on the right the butterfly position is displayed. The device has outputs for two valves. In the default mode the control unit operates with one valve and the position of the butterflies is displayed as illustrated above. Thereby means  butterflies open and  butterflies closed.

### Switch between modes

On the hand-held transmitter there are two buttons. Please always keep the hand-held transmitter so that the triangle  $\triangle$  is on the left. A LED is blinking top right once you press a button. It serves also for monitoring the battery.

While driving you can switch over between different modes. With a short pressure on the left button  $\triangle$  you activate the **CRUISE MODE**. This selection is preferably made at more likely smooth driver operation characteristics. Since the butterflies open lately, the noise disturbance decreases and the comfort increases. The cruise mode is preset when starting the ride.

If a more sportive driver operation characteristics is requested with an early reaction of the butterflies, you can actuate the **SPORT MODE** by shortly pressing the right button  $\circ$ . At any time both buttons can be used for switching over between the modes.

It is important to press the button only shortly. If you keep the right button **O** longer pressed, the butterflies open independent from the back pressure provided that the function **OPEN MODE** has been released in **SETUP**.

**Remark:** This mode is locked in factory setting. If the mode is released, the approval for the exhaust system is no longer existing, since the permitted limits of the emissions values can be exceeded. Do not use this function on public roads.

If the car is parked for some time, the control unit automatically switches over into the preset mode in Setup. Afterwards the device switches in the neutral mode **STANDBY MODE** to reduce the power consumption.

## Selecting SETUP

If you want to alter any settings, you have to select the Setup of the Exhaust Control. Detailed information on this subject are given in the following chapter.

**Remark:** The control unit has been optimally set to the requirements of your exhaust system by the supplier. Inappropriate alterations may lead to malfunctions and to damages on the control unit and the automobile.

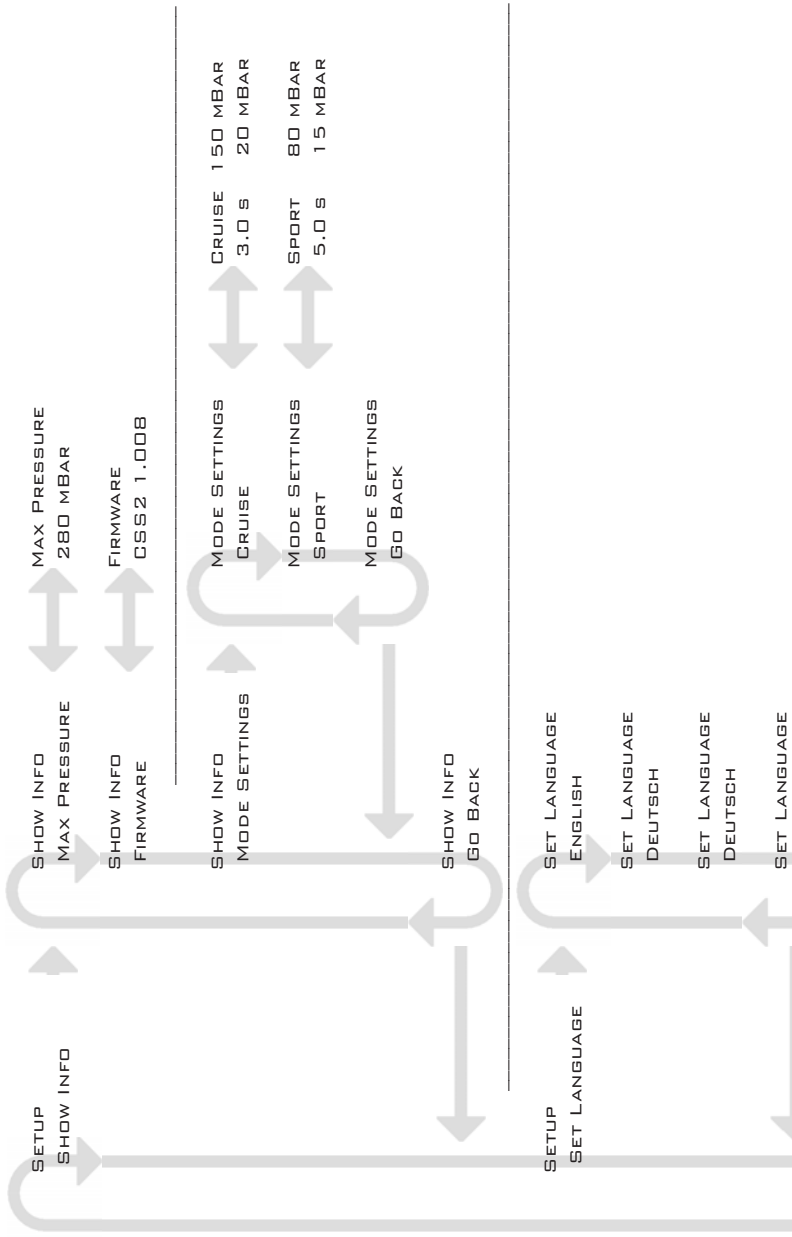
## Statement of Non-Liability

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This product has been developed according to the best of our knowledge and has been manufactured on modern machinery. However, please do not use it carelessly and inform yourselves by means of the attached information as well as the legal requirements.

Sticking to the operating instruction as well as to the conditions and methods of installation, operation, use and maintenance of the product cannot be supervised by the manufacturer. Therefore the manufacturer does not assume any liability for loss, damages or costs resulting from improper or negligent use or operation or which may be in connection therewith in any way.

# SETUP menu (Version CSS2 1.008) Part 1



SETUP  
SET MODES

SET MODES  
CRUISE MODE

CRUISE MODE --+  
OPEN: 150 MBAR

CRUISE MODE --+  
CLOSE: 20 MBAR

CRUISE MODE --+  
DELAY: 3.0 SEC

CRUISE MODE  
GO BACK

△=DOWN O=UP △O=SET

SET MODES  
SPORT MODE

SPORT MODE --+  
OPEN: 80 MBAR

SPORT MODE --+  
CLOSE: 15 MBAR

SPORT MODE --+  
DELAY: 5.0 SEC

SPORT MODE  
GO BACK

△=DOWN O=UP △O=SET

SET MODES  
OPEN MODE

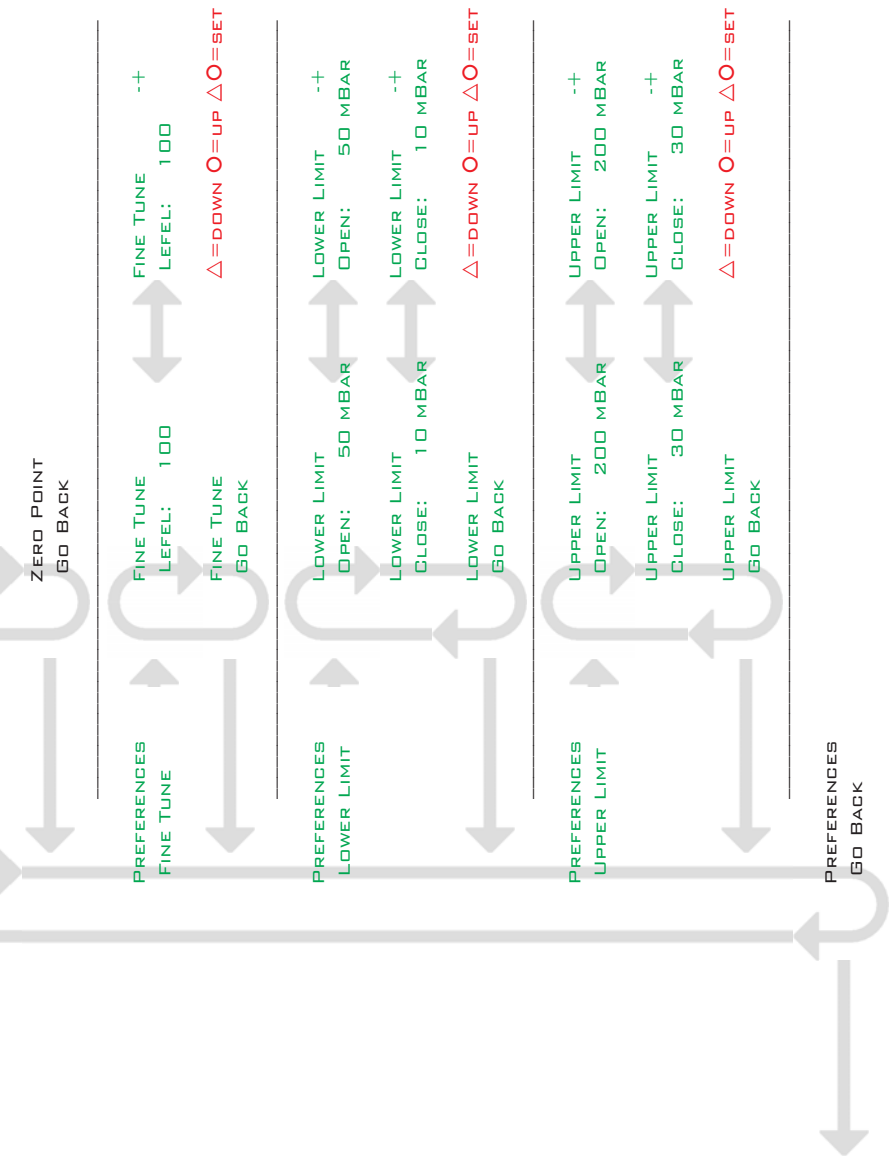
OPEN MODE  
ACTIVATE: NO

OPEN MODE  
ACTIVATE: YES

OPEN MODE  
GO BACK

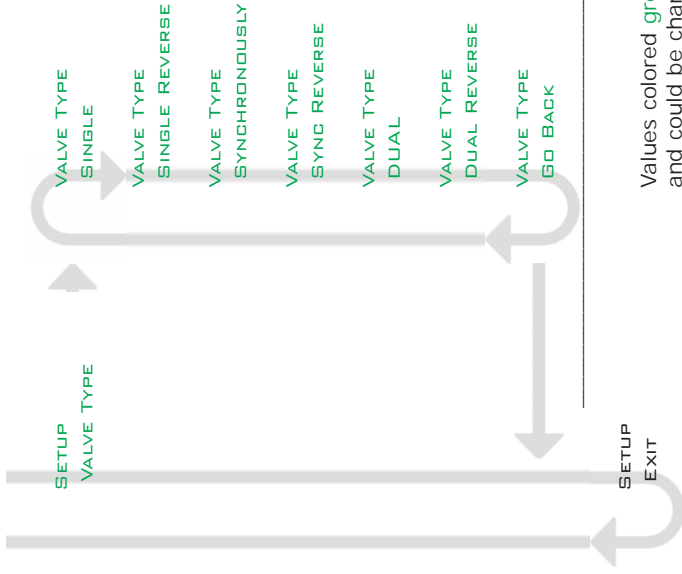
NO PERMISSION ON  
PUBLIC ROADS





## Setup

## SETUP menu (Version CSS2 1.008) Part 3



Values colored green are reserved to the supplier and could be changed only with permission of the manufacturer.

# SETUP

## Introduction

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The SETUP serves for the setting of all the properties of Exhaust Control. The operation is made via the hand-held transmitter. Therefore a view to the display of the control unit is required.

### Starting SETUP

**Use with extreme caution!**

The SETUP menu is accessible by simultaneously pressing and holding of both switches  $\Delta O$  for a minimum of 3 seconds. As a consequence the display shows the text **SETUP ....see manual**.

### Navigation

In SETUP menu using the right button  $O$  you always move to the next menu item and using the left button  $\Delta$  you move to the previous menu item at the same level. The simultaneous pressing of both buttons  $\Delta O$  selects the actually displayed menu item and changes to the next level. At the selection **GO BACK** you change back to the prior level.

If a value shall be changed, so please press at first  $\Delta O$ , and afterwards,  $\Delta$  means *decreasing the value* or  $O$  means *increasing the value*. In conclusion you press once more  $\Delta O$  to store the newly set value.

### Select a language (exemplarily for one menu selection)

The SETUP menu provides the possibility of the selection between English, German or Italian language. To set the desired language select the SETUP by keeping pressed both buttons  $\Delta O$  of the hand-held transmitter for at least 3 seconds. When **SETUP** appears on the display, release the buttons. Then you navigate with the right button  $O$  to the selection **SETUP LANGUAGE**, shortly press both buttons  $\Delta O$  and move by using the right button  $O$  to the desired language. This selection you confirm by simultaneous pressing of both buttons  $\Delta O$ . You are now again at the first level (see SETUP menu on the previous pages). Move by using  $O$  until you reach **SETUP EXIT** and leave there the SETUP with  $\Delta O$ .

## Settings in detail

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The menu guide is explained by means of the menu language English which is preset ex factory. You can change the language as described on the previous page.

At the first SETUP level there are six selection options which are now explained in detail. Selection options illustrated in **green** can be set only after prior release for safty reasons.

### SHOW INFO - Display of metered values and settings

Here 3 different displays inform on system values:

#### MAX PRESSURE - memory for displaying the maximum pressure

The control unit Exhaust Control constantly monitors the actual back pressure in the exhaust system. The highest value ever gained is stored. It can be displayed using this menu item. The value remains stored also after cutting off the power supply. It can be erased only by the supplier.

#### FIRMWARE - Display of program version

Exhaust Control is continuously enhanced. Firmware means the actually stored work program on the control unit. On demand the manufacturer is able to update the program. The actual program version is displayed here. At the time of printing these instructions the actual version was CSS2 1.010.

#### SETTINGS - Display of settings

The basic settings for both automatic modes CRUISE and SPORT can be taken readings here without the risk to change vital values accidentally. Please select one of the both modes for this purpose.

CRUISE	150 mBar
3.0 s	20 mBar

In the top line appears the back pressure to the right from the selected mode at which the butterflies open. Beneath is the pressure at which the butterflies close again. At the bottom left there is the time displayed retarding the closing procedure.

## SET LANGUAGE

Select the used menu language. You have got a choice between **ENGLISH**, **GERMAN** and **ITALIANO**. After the corresponding selection the SETUP menu and the display of the mode is indicated in the selected language.

In case of accidentally changing the language, please search in SETUP at the first level the menu item **SET LANGUAGE**, **SPRACHE WÄHLEN** or **IMPOSTI LINGUA** to cancel the setting.

## SET MODES -set characteristics

Under this menu item substantial settings of the various modes can be accomplished. Please alter the values only in case that you are aware of the consequences.

### CRUISE MODE and SPORT MODE - The two automatic modes

The back pressure required for opening the butterflies **OPEN**: can be set here within a limited range for both modes. In **SPORT MODE** the value is more less, since the butterflies open earlier than in **CRUISE MODE**. The values for closing the butterflies **CLOSE**: and the delay time **DELAY**: can only be changed by the supplier.

### OPEN MODE - butterflies constantly open

If this mode is activated, the car can run with open butterflies independent from back pressure at any time.

**Remark:** For activating the **OPEN MODE** while driving, press and keep pressed the right button + for at least one second. Thereby you leave the automatic mode (**CRUISE MODE** or **SPORT MODE**) and the butterflies open. A short pressing on one of the buttons switches back to the respective automatic mode.

**ATTENTION:** The operation in **OPEN MODE** is not permitted on public roads in some countries. If activated the exhaust system may not be in accordance with the legal requirements any more.

### DEFAULT MODE

This is a standard mode, which is always set when the engine is stopped (see **SET TIMER** -> **STANDBY**). You can select between **CRUISE**, **SPORT** or **OPEN** (if activated).

## SET TIMER

Exhaust control has various timer, two of which can be set by you.

### STANDBY - automatic neutral mode

If no back pressure is gauged, the control unit automatically switches over into the neutral mode after a certain period of time which can be set by you. This makes it possible to operate the device on the continuous power supply of the automobile without discharging the battery within shortest time. Once the neutral mode is reached, the electric valves as well as the display illumination cut off. Then the power consumption is below 20 mA.

It is possible to select a time from 1 to 30 minutes until reaching the neutral mode or it can be deactivated. For deactivating please move the value upwards until **STANDBY:OFF** appears on the display.

**Remark:** Deactivate the neutral mode only if the power supply of the control unit with the ignition is cut off. Otherwise the battery of the automobile can be quickly discharged.

### ZERO-ADJ - automatic zero balance

Dependent on certain conditions the pressure sensor can slightly alter. To make sure that constantly exact measurements are carried out, the control unit executes an automatic zero balance. This always happens when the measured pressure remains unchanged during the adjustable period of time. Values less than 10 minutes should not be used here.

**Remark:** The automatic zero balance does not work if the device is switched on together with the ignition. In this case as well as if the display does not show **0 mBar** in case of stopped engine, you should perform a manual zero balance. For this purpose please select **PREFERENCES -> ZERO POINT -> ADJUST NOW!** or wait for the preset time with energized ignition, but with stopped engine.

## PREFERENCES - pre-adjustments

Here are some basic values which are not allowed to be changed in most cases.

### ZERO POINT

If you select **ADJUST NOW!**, an immediate zero balance of the sensor is carried out without waiting for the automatic zero balance.

## FINE TUNE - fine tuning of the pressure sensor

The sensor for the back pressure is balanced ex factory. It is very exact and detects the measured values stably also over a long period. Should the displayed pressure deviate considerably from the actual pressure, an adaption can be made by means of FINE TUNE.

For this purpose a zero balance (see **PREFERENCES** -> **ZERO POINT**) has to be carried out at first. Then a known pressure of about 200 mBar must be charged on the pressure sensor. Please take care that a pressure of maximal 500 mBar is never exceeded. The displayed pressure can be adapted to the actual pressure by means of **FINE TUNE**.

FINE TUNE	--
187 mBar =	-16

At the bottom right you find the correction factor (-100 up to +100), that was adjusted to **0** before leaving the factory.

## LOWER LIMIT / UPPER LIMITS - limit values for SET MODES

In order to prevent inadvertent faulty entries with regard to the pressure values in the modes settings (see **SET MODES**), limit values can be defined. The menu item LOWER LIMITS describes the lower limits for the pressure for the opening (**OPEN**) and closing (**CLOSE**) of the butterflies. UPPER LIMITS refers to the upper limits. When using SET MODES the entered limits here cannot be under-run and exceeded respectively.

**Remark:** The values entered here do not serve for controlling the butterflies. They just represent limit values for the possible settings in SET MODES. The limit values are valid for both the CRUISE MODE and the SPORT MODE.

## VALVE TYPE - mode of valve control

The control unit assists different types of butterfly-controlled exhaust systems. For this purpose the kind and use of the electrovalves can be adjusted. Different types of electrovalves are not allowed to use simultaneously on a certain exhaust system.

### SINGLE - one electrovalve

A valve is connected to output-A of the control unit, which opens the connected butterflies at power supply. It is also possible to operate simultaneously 2 valves at port A. A control lamp can be connected to port B which illuminates when the butterflies are open.

### SINGLE REVERSE - one electrovalve with inversion of direction

A valve is connected to port A of the control unit, which closes the connected butterflies in case of power supply. It is also possible to operate two valves simultaneously at the port A. A control lamp can be connected to port B which illuminates when the butterflies are open.

### SYNCHRONOUSLY - two electrovalves

One valve is connected to port A and one valve is connected to port B of the control unit. The valves open the butterflies synchronously at power supply. A control lamp can be parallel connected to one of both outputs. It illuminates when the butterflies are open.

### SYNC REVERSE - two electrovalves with inversion of direction

One valve is connected to port A and one valve is connected to port B of the control unit. The valves close the butterflies synchronously at power supply. A control lamp should not be connected, because it would illuminate when the butterflies are closed.

## Appendix

### Training of a hand-held transmitter (key fob)

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The key fob being part of the scope of supply was already linked with the control device (training) at the factory. A training is required for new or additional key fobs. It is possible to link up to 7 key fobs to the control box. Key fobs no longer used can be erased.

#### To erase all key fobs

key fobs cannot be erased separately. In order to erase all key fobs put a bridge circuit into the connector "training transmitter" next to the main plug. The transmitter control illuminates. Please wait at least 10 seconds before removing the bridge circuit. The transmitter control flashes until all key fobs are erased.

#### Adding a new key fob

For training a new key fob, shortly bridge the connector "training transmitter" next to the main plug. The transmitter control keeps on illuminating. Press shortly a button on the key fob. The transmitter control goes dark. Press the button again. The transmitter control flashes until the new key fob has been stored. The key fob is now ready for use.

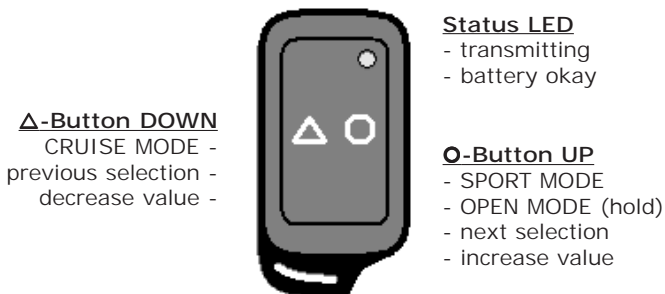
## Specification of the component parts

Please have the Exhaust Control installed by a specialist company. These instructions only serve to give you an outline.

### Control device Exhaust Control



### Transmitter (key fob)



## Available options

### extension cable, 4.50 m

- to be used for lowered installation of the electrovalve

### check valve for back pressure valve

- for avoiding condensate accumulation in long back pressure pipes

For further details please contact your supplier.

## Installation

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### Preconditions

The device can only be used in combination with an exhaust system with back pressure tap.

**Please pay attention to the following:** To avoid the ingress of moisture into the housing, the control device should be installed in a place to be as dry as possible. Please take also into consideration that that a view of the display is required for the adjustment work. At the place of installation there must be 12 volt operating voltage available. The cable length is 150 cm. An optional extension cable of 450 cm is at disposal for the operation of a more remoted electrovalve. The butterflies react faster if the tube length between butterflies and electrovalve is as short as possible.

### Mounting

#### Installation of the control device

The control device (1) is to be fixed in a protected place e.g. by means of cable clips. The connection to the power supply is made via the two longer single cables of the main plug. Thereby please connect the black cable to the ground and the red one to the steady plus of the battery (2). In case of correct connection the display now already shows some information. When pressing the buttons of the remote control you can already switch over between the modes CRUISE and SPORT.

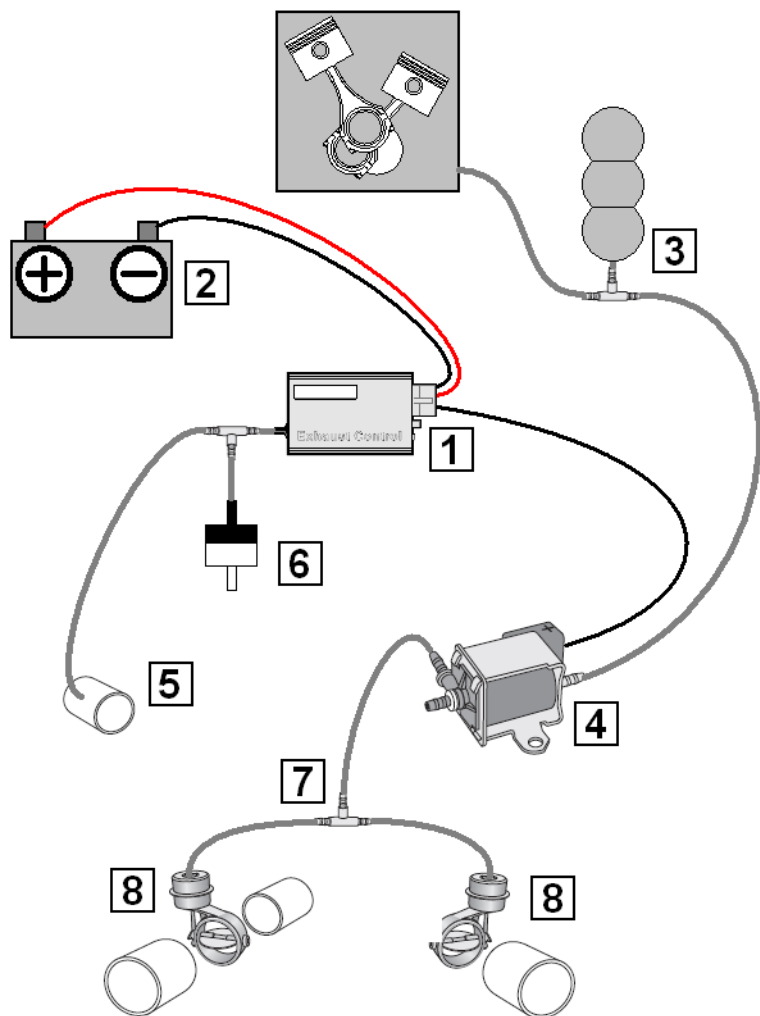
#### Installation of electrovalve

The valve (4) should be mounted in a protected place near the exhaust gas butterflies (8). Please take care that it is not exposed to dirt in the place of installation, as this may impair its functions. Please link the electrical connection of the control device (1) with the suitable connection on the electrovalve.

#### Installation of vacuum tube

Please remove the vacuum tube from the on-board vacuum storage. Please make a breakout by means of a T-piece from which you install a vacuum tube to the silver-coloured plug nipple of the electrovalve (4). Another piece of tube is fitted on the lateral black nipple of the valve and runs to the T-piece (7). From this point install one tube to the left vacuum diaphragm and one tube to the right vacuum diaphragm (8). Secure all connections e.g. by careful mounting of one-ear-clamps.

## Mounting overview



### Installation of back pressure tube

Install one tube made of silicone from the back pressure tap of the exhaust system (5) to the control device (1).

**Attention:** The securing of the tube on the control device (1) must be made highly carefully, because the back pressure sensor is very sensitive.

**Remark:** If the back pressure tube does not run continuously upwards from the tap on the exhaust system to the control device, there may be a condensate accumulation in the tube. To ensure an exact metering of the back pressure also in such a case, please install a check valve (6) directly in front of the control device. For this purpose please use a T-piece as to be taken from the installation outline.

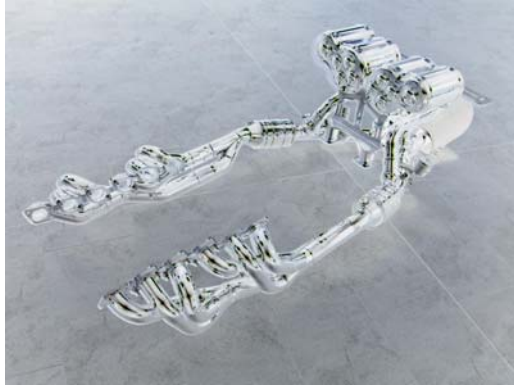
## Placing into operation

Check whether all tube connections fit correctly. The on-board vacuum system may not lose any pressure. Check the electrical connections and the correct polarity (red to plus, black to ground). Make sure that the short antenna cable on the main plug of the control unit has no electrical contact to any parts of the automobile.

Start the engine. Press on the right button + of the remote control for activating the SPORT MODE and check during a test run, whether the butterflies open as requested. If necessary please adjust the modes to adapt the system to your individual requirements. Information on the options of the SETUP are to be taken from page 13.

**Attention:** If the butterflies do not open as requested, it is essential to avoid high revolutions (rpm) to prevent damage. Please check once more all the work carried out as well as the settings. In case of doubt please turn to your supplier.





**Antonio Capristo**

designs and manufactures high performance exhaust systems  
for the most beautiful toys of the world: automobiles

Thank you very much for deciding in favour of Exhaust Control.