

Requires a servo and linkage for use, does not require a radio channel.

- ☞ Controls fuel mixture by monitoring cylinder head temperature.
- ☞ Simplifies mixture adjustment.
- ☞ Helps protect engine
- ☞ Makes mixture less critical to weather changes.
- ☞ Allows higher, more consistent, power output.

CARBSMART



Ratings

Weight: 5g
 Dimensions : 21mm x 30mm x 4mm

Supply voltage range: 4.1 - 7.2v**
 ** Warning: Check your RC system voltage limits as these may be more restrictive.
 Typical current draw: 10mA

**Manufactured in the UK by
 CSM Design Consultancy Ltd**

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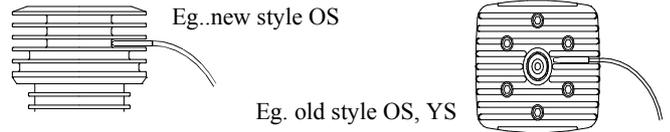
What it does

The unit is used in conjunction with a servo connected to the main needle of the carburettor to adjust the mixture in flight dependant on the cylinder head temperature. The unit has a user selectable target temperature. When the head is below the target temperature the unit moves the mixture towards the leaner direction. The extent to which this is allowed is again user adjustable. As the head reaches the target temperature the mixture is richened to the standard setting and as the head temperature exceeds the target value the mixture continues to richen until a user adjustable limit is reached. The gain of the system is also user adjustable.

Installation

Sensor location

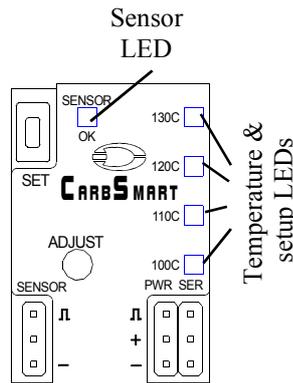
The sensor should be located so that its tip is sensing the temperature of the outer wall of the combustion chamber in the head, this being the hottest part of the engine and the part that changes temperature fastest



with changes in load etc. The diagram shows a typical location. Hold the sensor in position with either RTV silicone or thermal conductive epoxy resin, over the whole length of the heatshrink. This ensures good thermal contact and prevents vibration damage. Make sure that the surface of the head is clean and free from oil before bonding the sensor in place. (RTV silicone available as CSM0053). Please note that the sensor is a little fragile, and cannot usually withstand being moved/removed after fixing.

Mechanical installation

A split clamp arm is supplied to simplify linking the main needle to the mixture servo. If the main needle is too small for the clamp a short length of suitable diameter heat-shrink sleeving should be used to increase the diameter of the valve.



Removal of the ratchet clip from the valve will reduce the load on the servo. The servo is not critical and generally the valve is so easily turned as to need only a low operating torque. A mini or micro servo will usually be powerful enough and will be

easier to locate in a suitable position to link to the valve.

Connections:

The unit can be powered from any spare output from the receiver. If no spare output is available a Y-connector (CSM0047) should be used.

The servo and sensor are connected as shown.

Basic setup

As supplied the unit has no basic setup info and will ripple the LEDs to indicate that it requires basic setup data. In this state the servo is centred to ease the setting up of the linkage between the servo and the needle valve. Bear in mind that the unit can lean and richen the mixture from this point and consider to what extent you wish to allow the unit to lean the mixture from this reference setting.

Once the linkage has been set up press the button once to enter the set-up.

At this point one LED will light – this is the point at which to enter the fully lean servo position. Use the potentiometer to move the servo to the desired lean position and then press the button.

At this point two LEDs will light – this is the point at which to enter the fully rich position.

Use the potentiometer to move the servo to the desired rich position and then press the button.

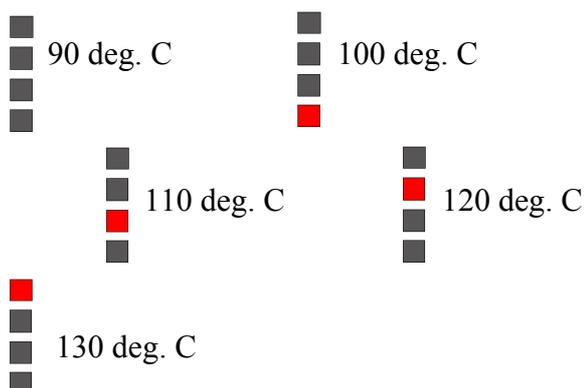
At this point all four LEDs will light – this is the end of the basic setup procedure.

Power down and back up again.

If you should need to re-enter the basic setup then simply hold down the button while the unit is powered up.

Setting the target temperature

The 4 LEDs show the target temperature:



Simply press the button until the the LEDs display the required target temperature. We suggest using 100 deg. initially.

Please note when the button is held down the servo goes to the fully rich position so that this can easily be checked. (This is over-ridden by the sensor failsafe which forces the servo to the centre position regardless)

Adjusting the gain

The gain is controlled by the pot. Turning the pot fully anticlockwise will turn the gain to zero and the servo will sit at the mid position at all temperatures.

With the gain pot at full the servo will travel from fully lean to fully rich for about a 4 deg range of head temperatures.

Initially try the unit with the pot at the mid position and if all is well try increasing the gain watching out for any tendency for a very slow cyclic wander in engine performance which would suggest too much gain.

Sensor Fail-safe

If the sensor should fail or become disconnected the unit will centre the servo to the reference mixture position and the sensor light will extinguish.

By unplugging the sensor this facility can be used as a quick way of centring the servo so that you can check that the reference mixture point is as you require it.

The following spares & accessories are available:

CSM0051	Spare CarbSmart sensor
CSM0052	Spare throttle arm
CSM0053	RTV Silicone
CSM0032	Pair of 100mm leads
CSM0033	Pair of 200mm leads
CSM0034	Pair of 300mm leads
CSM0035	Pair of 400mm leads
CSM0036	Pair of 500mm leads