

AFC *neo*
COLOR DISPLAY AIRFLOW CONVERTER

Instruction Manual



We, Apex, are greatly thankful to you for selecting the AFC neo (product code:401-A018:hereafter "the product").

Please read this instruction manual (hereafter "the manual") carefully so that you will be able to use the product correctly. Please keep the manual in a place that enables quick reference to it whenever the product is used.

For further information regarding the product's compatibility with specific types of vehicles, please contact our Customer Service, the contact details of which are shown on the back cover of the manual.

If you pass the product on to someone, please ensure that the manual goes with the product.

* The term "use" in the manual refers to "installation" and "operation" in general

APEXi[®]

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1. Safety Precautions

Please read “Safety Precautions” carefully to operate the product with safety.

Explanation of indications

As you read through the manual, you will find the following safety messages. These messages are intended to prevent injury to you and those around you, as well as damage to property, allowing you to use the produce in a safe manner.

There are several types of messages as explained below, each having a specific meaning. Please understand their meanings before reading the manual.

WARNING

This indicates the existence of a potential hazard that may result in death or serious injury of the operator or third persons if the product is wrongly operated in disregard of this indication.

CAUTION

This indicates the existence of a potential hazard that may result in injury to the operator or third persons, and that may result in only physical damage if the product is wrongly operated in disregard of this indication.

REQUEST

This indicates the contents of a failure in obtaining the full performance of the product, or a product failure or faulty function item if the product is wrongly operated in disregard of this indication.

 Safety Precautions

WARNING

- Do not use this product and its accessories in any way other than specified by this manual.**

This may cause an accident, fire, electric shock, or other failures. In this case, we shall disclaim all responsibility for any damage or loss to the customer and third persons.

- Do not use this product for any application other than applicable vehicles or applicable goods.**

We will not guarantee any operation in vehicles other than indicated in the separate wiring diagram by model. Such an operation may cause an accident, fire, or other failures.

- The driver must neither operate nor view the product during driving.**

This may interfere with driving operations, resulting in an accident.

- Do not tamper, disassemble, or modify this product.**

This may cause an accident, fire, electric shock, or damage.

There is a possibility of electrical shock due to the fact that the unit uses a high voltage.



CAUTION

- Be sure to use this product in the specified operation environment.**

We will not guarantee the product to be used in any place that is beyond the specifications and operation environment(page 7) of this product.

- Do not use this product in a moist or humid place.**

This may cause a malfunction or other failures.

- Do not drop this product or expose it to strong shock.**

This may cause a malfunction, fire, or other failures.

- If you feel that the product is abnormal, stop operating it immediately.**

If this product gives out smoke or offensive smell, stop operating the product immediately and contact the office that is indicated on the back cover of this manual.

REQUEST

When removing a connector, be sure to hold it without pulling on its harness.

Also, use the connector without exposing its harness to excessive force.

This product may cause noise interference with radio, TV, etc. depending on the mounting location and the routing of the signal harness.

This product generates heat in the power ON status. This is normal.

If the product is returned to the manufacturer for repair, it will be delivered back to the customer with the initial plant settings(after clearing any customer settings stored in the memory). Before returning the product to us for repair, note down any customer settings that may have been made.

When the unit is displaying the same pattern for an extended period of time, some brightness on the screen may distort. In order to keep the display functioning properly, please avoid displaying the same pattern for an extended period of time.

2. Introduction

Thank you for purchasing this product.

Please read through this instruction manual to operate this product correctly.

Specifications and operation environment

Operating voltage: 10 to 16 [V] (DC)

Vehicles with a 12 [V] battery voltage listed in the compatible vehicle model list in the attachment.

Operating ambient temperature: -20 to +60 [°C]

Avoid exposure to direct sun-light and condensation.



CAUTION

Do not use this product in a condition beyond these specifications.

This may result in a malfunction, fire, or other accidents.

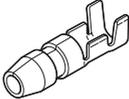
Features of this product

The AFC neo is a sub-computer in which the airflow sensor signal or the pressure sensor signal can be modified to increase/decrease fuel for each engine revolution. Even in light tuning such as an air cleaner/muffler replacement, a shift in air/fuel ratio occurs in greater or lesser degrees. This is due to the difference between the airflow detected by the airflow sensor and the actual airflow caused by a change in the airflow that passes through the airflow sensor. The AFC neo can correct this difference to set the original air/fuel ratio and increase the power. It also has various functions such as a VTEC control function and a function to prevent engine stall. Furthermore, it can be used as a meter to check vehicle conditions with various monitoring functions.

- Adopt color organic EL display.
- Various monitor displays such as multi-display with a combination of digital and analog data in addition to digital/analog display.
- Two patterns, “EASY” for beginners and “PRO” for professionals, are prepared for fuel correction.
- The VTEC control function can set intake pipe pressures and throttle openings in addition to engine revolution.
- Function that enables left/right-side installation.
- Battery-less memory that keeps initial setup data even if the vehicle battery is disconnected.

Parts list

Before installing this product, be sure to check the parts list to confirm that there are no foreign or missing parts. If any difference is found between the actual parts and the parts list, please contact the dealer of purchase or the office that is indicated on the back cover of this manual.

<p>① Main unit</p>  <p>1 Set</p>	<p>② Instruction manual(this manual)</p>  <p>1 volume</p>	<p>③ Wiring diagram by model</p>  <p>1 volume</p>
<p>④ Signal harness</p>  <p>1 piece</p>	<p>⑤ Plug</p>  <p>8 piece</p>	<p>⑥ Male sleeve</p>  <p>8 piece</p>
<p>⑦ Plug receptacle</p>  <p>8 piece</p>	<p>⑧ Female sleeve</p>  <p>8 piece</p>	<p>⑨ Splice</p>  <p>7 piece</p>
<p>⑩ Two-way tape</p>  <p>1 piece</p>		

3. Initial Setup

Procedure before using this product

- Install this product on the vehicle

The details of the installation procedure are described in the separate “Vehicle Specific Wiring Diagram”. Install the product securely referring to that diagram.



- Turn on the ignition switch

Make sure that any abnormal noise or offensive smell is not produced from this product and vehicle. At this point, do not start the engine.



- Perform initial setup

Before starting the engine, perform the following initial setup.

- Select VTEC control “On” or “Off” (page 29).
- Select “EASY” or “PRO” mode (page 30).
- Select the number of cylinders and a throttle sensor characteristic and set a throttle opening (page 31).
- Select an airflow sensor and a sensor characteristic (page 32).



- Start the engine

This finishes the initial setup, so that the monitor mode and setup mode are enabled.

- Do not start the engine before the initial setup is finished.

If the engine is started without initial setup, the engine may be damaged.

- If you feel that the product is abnormal, stop operating it immediately.

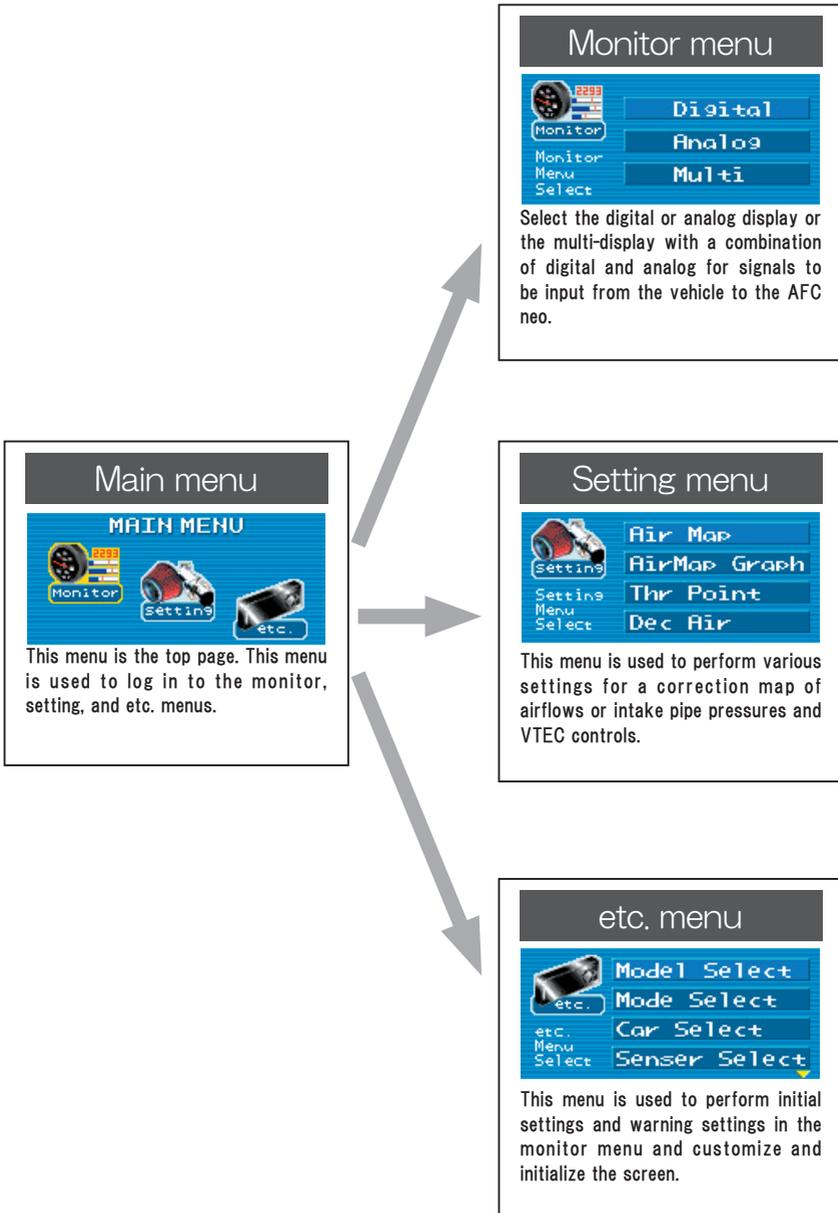


Caution

If no display appears or any abnormal noise or offensive smell is produced from this product despite proper installation, discontinue operation of the product immediately and contact the dealer of purchase or the office that is indicated on the back cover of this manual.

4. Outline of Functions and Operations

List of items



Monitor menu display items

Indication name	Unit	Meaning
Rev	rpm	Engine revolution.
Thr	%	Throttle opening.
Bat	v	Battery voltage.
Cor	%	Correction factor of airflow or intake pipe pressure.
Afl	%	Usage ratio of airflow(hot wire, flap).
Prs	kPa	Intake pipe pressure.
Kar	Hz	Karman sensor frequency.
V/T Monitor (*)	rpm	Genuine VTEC control and main unit VTEC control.

* These items are displayed only when VTEC control On is selected.

Setting menu items

Indication name	Meaning
Air Map	Correction map of airflows or intake pipe pressures.
Air Map Graph	Switches Air Map over to two-dimensional graph.
Thr Point	Sets up correction map for each of two throttle openings.
Dec Air (* 1)	Sets up function to prevent deceleration-time stall.
V/T Control (* 2)	Sets up VTEC control.
V/T Unmatch (* 2)	Corrects shift in air/fuel ratio during setup of VTEC control.

* 1 . Displayed and enabled only when VTEC control Off is selected.

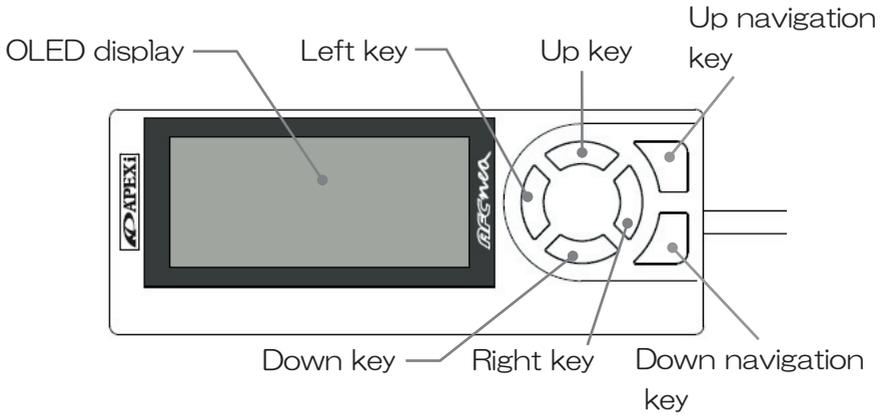
* 2 . Displayed and enabled only when VTEC control On is selected.

etc. menu items

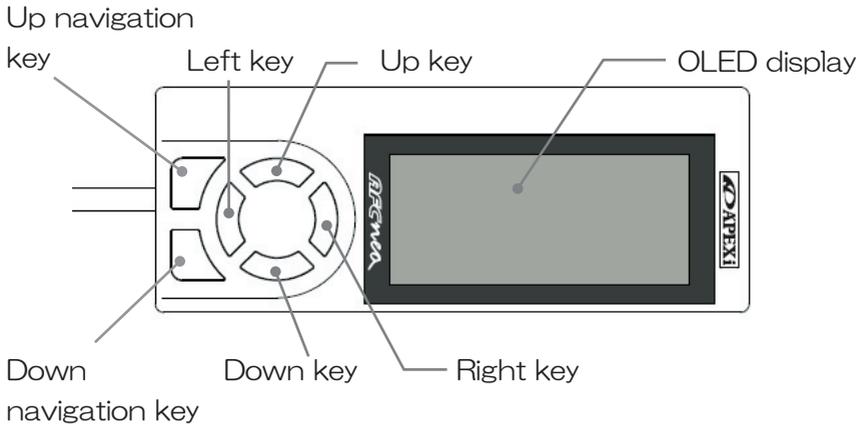
Indication name	Meaning
Model Select	Selects VTEC control function On/Off.
Mode Select	Selects EASY/PRO mode.
Car Select	Selects the number of cylinders and sets a throttle opening.
Sensor Select	Selects an airflow sensor model and a sensor characteristic.
Analog Scale	When the analog display is selected in the monitor menu, sets a dial scale.
Warning Set	Sets various warnings in the monitor menu.
Display Set	Sets a display color and brightness, the function that enables left/right-side installation, and a screen saver.
Sensor Check	Checks input signals.
Initialize	Restores all data to factory-set state.
Program Ver.	Checks program versions.

Names and operations of parts

■ Name of each part



When the left/right-side installation function is set to "Left", the names are assigned as follows.



■ Basic operations

Meaning of each key operation

Up key:Used to move the cursor up and increase a numeric value.

Down key:Used to move the cursor down and decrease a numeric value.

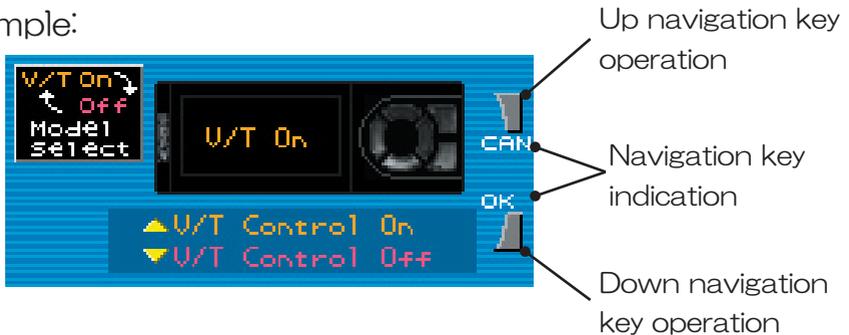
Left key:Used to move the cursor to the left and go back to the previous screen.

Right key:Used to move the cursor to the right and go to the next screen.

Up navigation key:Used to go back to the previous screen when the navigation key is displayed on the screen.

Down navigation key:Used to go to the next screen when the navigation key is displayed on the screen.

Example:



Meaning of navigation key indications

PRV:Use to go back to the previous screen.

SEL:Used to select an item and move the cursor.

CAN:Used to cancel settings.

OK:Used to execute settings.

5. Monitor Menu

The monitor menu makes it possible to select three displays, “Digital” , “Analog” and “Multi” . “Digital” displays signals, input to and output from the AFC neo in numeric values and graphs. “Analog” is a display like an analog meter. “Multi” is a combination of these two displays.

Basic operations

The basic operations to select “Digital” , “Analog” and “Multi” in the monitor menu are as follows.

- ① Point the cursor at “Monitor” with the Left and Right keys in “MAIN MENU” . Later, press the Down navigation key to go to the next “Monitor Menu Select” .



The cursor is at the yellow part around the icon.

- ② In “Monitor Menu Select” ,use the Up and Down keys to point the cursor to a menu that you want to display and then select it with the Right key or Down navigation key(SEL).



The cursor is at the bright part in the menu.

These are the basic operations in the monitor menu. The subsequent operations are explained for each display.

Digital

“Digital” makes it possible to select “1 Channel” to “4 Channel” . “1 Channel” displays one item, and “4 Channel” displays four items. Items selected from each channel are displayed in numeric values and graphs. For details on these items, see “Monitor menu display items” on page 11.

Operations

After “Digital” is selected as described in basic operation ②, use the Up and Down keys to point the cursor at the number of channels that you want to display in “Digital Channel Select” . Then, select it with the Right key or Down navigation key(SEL). Now, the selected monitor display is started.



The cursor is at the bright part in the menu.

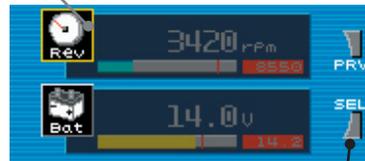
If the Up key is pressed with the monitor displayed, a peak is displayed. To cancel the peak display, press the Down key. Operating the right key during peak display clears the peak value. If a numeric value set in “Warning set” in the etc. mode is exceeded, a numeric value and graph displayed on the monitor will blink.



The present value

Peak value

The cursor is at the yellow part around the icon.



Changes indication item.

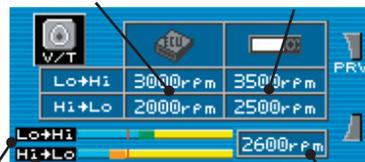
When you want to change an indication item to another, press the Down navigation key(SEL). Now, only the icon remains bright. Use the Up and Down keys to move the cursor over the channel you want to change. Change the indication item that you want to change with the Left and Right keys. After the change is finished, press the Down navigation key(SEL) to go back to the usual monitor display.

V/T Monitor

When VTEC control On is selected, you can monitor genuine VTEC controls and VTEC controls set by the AFC neo. Position the cursor at the bottom layer of “Digital Channel Select” .

Engine revolution at which cam is switched.

Engine revolution set by AFC neo at which cam is switched.



VTEC status bar

Current engine speed

The engine speed at which Lo changed to Hi or Hi changed to Lo is bar-displayed. For the bar display colors, refer to “V/T Unmatch” on page 27.

■ Analog

“Analog” can be selected from “1 Channel “ and “2 Channel” . Indication items selected from each channel is displayed with the analog meters. For details on the indication items, see “Monitor menu display items” on page 11.

□ Operations

After “Analog” is selected as described in basic operation ②, use the Up and Down keys to point the cursor at the number of channels that you want to display in “Analog Channel Select” . Then, select it with the Right key or Down navigation key(SEL). Now, the selected monitor display is started.



Now, the selected monitor display is started.

If the Up key is pressed with the monitor displayed, a green pointer appears to display a peak. To cancel the peak display, press the Down key. Operating the right key during peak display clears the peak value.

When a numeric value set by “Warning set” is exceeded, the meter pointer blinks in blue, and the lamp on the upper right of the meter blinks in red.



When you want to change an indication item to another, press the Down navigation key(SEL). Now, only the icon remains bright. Use the Up and Down keys to move the cursor over the channel you want to change. Change the indication item that you want to change with the Left and Right keys. After the change is finished, press the Down navigation key(SEL) to go back to the usual monitor display.



The cursor is at the yellow part around the icon.

Multi

“Multi” makes it possible to select two types, “Type-A” and “Type-B”. “Type-A” has one analog indication item and two digital indication items. “Type-B” has two analog indication items and one digital indication item. For details on these indication items, see “Monitor menu display items” on page 11.



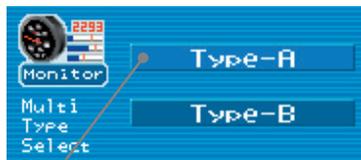
『Type-A』



『Type-B』

Operations

After “Multi” is selected as described in basic operation ②, use the Up and Down keys to point the cursor at the number of channels that you want to display in “Multi Type Select”. Then, select it with the Right key or Down navigation key(SEL). Now, the selected monitor display is started.



The cursor is at the bright part in the menu.

If the Up key is pressed with the monitor displayed, a peak is displayed. To cancel the peak display, press the Down key. Operating the right key during peak display clears the peak value.

The peak value display conforms to the digital and analog displays.

When a numeric value set by “Warning set” is exceeded, a warning conforming to the digital and analog displays is displayed.



It is a green indicator at the time of a peak display.

When you want to change an indication item to another, press the Down navigation key(SEL). Now, only the icon remains bright. Use the Up and Down keys to move the cursor over the channel you want to change. Change the indication item that you want to change with the Left and Right keys. After the change is finished, press the Down navigation key(SEL) to go back to the usual monitor display.



The cursor is at the yellow part around the icon.

6. Setting Menu

This menu is used to make correction-related settings for a correction factor of airflow signals and the stall preventive and VTEC switching functions.

Select “Setting” in basic operation(page 14) ① in the monitor menu.

The operation of “Setting Menu Select” conforms to basic operation ② in the monitor menu.

Air Map

The AFC neo converts an airflow(pressure) signal input to airflow(intake pipe pressure) and corrects it with an air correction factor.

The airflow(pressure) signal, equivalent to the corrected airflow(intake pipe pressure), is output to the ECU.

If the air correction factor is +5%, the AFC neo outputs an airflow(pressure) signal, equivalent to the airflow(intake pipe pressure) increased by 5%, to the ECU.

The ECU recognizes that the airflow(intake pipe pressure) is increased by 5%, and controls the fuel injection rate and ignition timing for the airflow(intake pipe pressure) increased by 5%.

The air correction factor can be set every eight engine revolution in “EASY” mode and 16 engine revolution in “PRO” mode. It can be set in the range from +50% to -50% in steps of 1 %.

The air correction factor is calculated in linear interpolation between the engine revolution. By further making linear interpolation between two points, throttle openings Hi and Lo, for a vehicle with throttle signals, a more modified air correction factor that is adapted to vehicle conditions can be calculated.

It is also possible to temporarily stop correction control(air correction factor $\pm 0\%$) with set values unchanged.

Operations

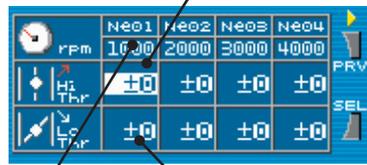
Move from one engine revolution to another with the Left and Right keys.

Increase and decrease a set value with the Up and Down keys.

Every time the Down navigation key(SEL) is pressed, Set Engine revolution, Set Air Correction Factor in “Hi Thr” Mode, and Set Air Correction Factor in “Lo Thr” Mode are selected in that order.

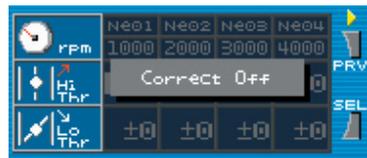
If the left key is pressed at a “Ne01” engine revolution, Hi Thr or Lo Thr is selected. If the Down key is pressed in this state, “Correct Off” is displayed on the screen, and the correction is temporarily set to Off(air correction factor ± 0). However, the set value of the air correction factor in “Air Map” remains saved.

Air correction factor setting with throttle opening Hi(referenced when throttle type is “-”).



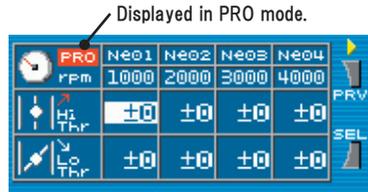
Set value of engine revolution.

Air correction factor setting with throttle opening Lo(used when throttle type is “-”).



When correction is OFF, the screen is displayed as shown at left, and air correction factor ± 0 is assumed.

When the PRO mode is selected in “Mode Select” (see page 30), “PRO” is displayed on the screen.



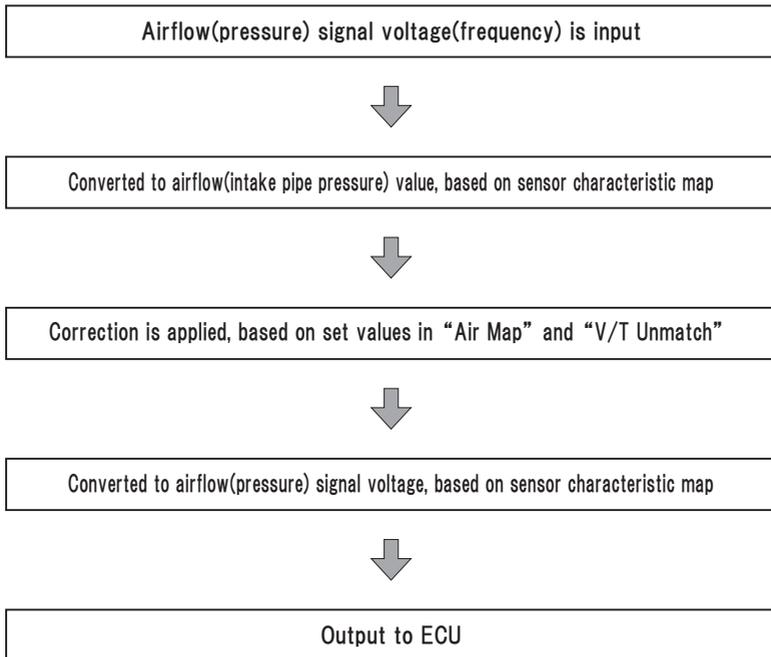
□ Setting range

Engine revolution setting: 500 to 9950 [rpm] (in steps of 50rpm)

* Relationship of Ne01 < Ne02 < Ne03 ... < Ne08 (Ne16)

Air correction factor: +50 [%] to -50 [%] (in steps of 1%); initial value: ± 0

□ The flow of control



■ Air Map Graph

The air correction factor for each engine revolution set in “Air Map” is displayed in a graph so that it is easily understood.

The graph shows engine revolution along the horizontal axis and air correction factors along the vertical axis. The engine revolution at the left end of the horizontal axis is 0 rpm, and that at the right end is 10000 rpm.

± 6 , ± 15 , ± 30 , and ± 50 can be selected for the scales of air correction factors along the vertical axis.

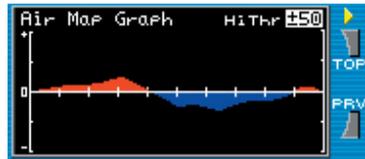
The “Hi Thr” and “Lo Thr” graphs in “Air Map” are displayed as separate graphs.

□ Operations

Select the “Hi Thr” and “Lo Thr” maps with the Left and Right keys.

Select a scale for the vertical axis with the Up and Down keys.

When the “PRO” mode is selected in “Mode Select”, “PRO” is displayed on the screen.



+side correction is red.

-side correction is blue.



Displayed in PRO mode.

Thr Point

To more finely control the calculation of an air correction factor, two throttle openings are set to enable the calculation by interpolation between those openings.

Set the two throttle openings, throttle opening large(Hi Thr)and throttle opening small(Lo Thr).

An air correction factor interpolated by the “Air Map” engine revolution in “Hi Thr” is used for a throttle opening that is larger than the “Hi Thr” setting value.

An air correction factor interpolated by the “Air Map” engine revolution in “Lo Thr” is used for a throttle opening that is smaller than the “Lo Thr” setting value.

For a throttle opening between the “Hi Thr” and “Lo Thr” setting values, the “Hi Thr” and “Lo Thr” air correction factors that are interpolated by the “Air Map” engine revolution, which are further linear-interpolated by the “Air Map” engine revolution, are used.

These setting values are invalid for a vehicle with no throttle signals.

Operations

Select “Lo Thr” or “Hi Thr” with the Left and Right keys.

Increase and decrease a set value with the Up and Down keys.



Setting range

Lo Thr:0 to 99 [%] (in steps of 1%):initial value:10

Hi Thr:1 to 100 [%] (in steps of 1%):initial value:50

* These values can be set as far as the relationship of Lo Thr < Hi Thr is established.

Outline of functions

Change of the rate of correction by setup of the degree of throttle.

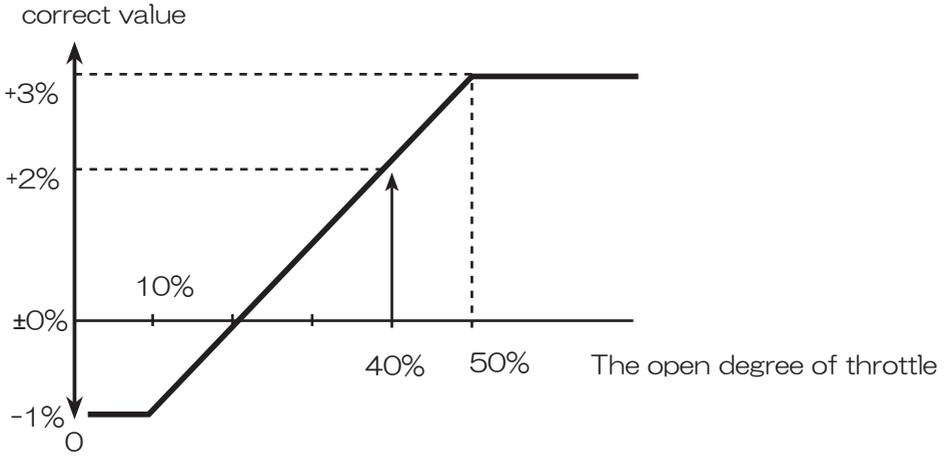
For the throttle openings set to Lo Thr: 10% and Hi Thr: 50%, when actual throttle opening is at 40%, the rate of compensation of the air at an engine speed of 3000rpm is as follows: ...

* Setting example



* Setting example

	Ne01	Ne02	Ne03	Ne04
rPm	1000	2000	3000	4000
Hi Thr	±0	+0	+3	+1
Lo Thr	±0	±0	-1	±2



It can ask for the rate of air compensation whose grade which the throttle opened is 40% from the following formula.

$$\frac{(3\% - (-1\%)) \times (40\% - 10\%)}{50\% - 10\%} + (-1\%) = 2\%$$

□ How to make a correction by engine revolution setting and throttle opening setting

* Setting example

Thr Point

Hi Thr	80%
Lo Thr	30%

Air Map

(PRO Mode)

	Ne01	Ne02	Ne03	Ne04	Ne05	Ne06	Ne07	Ne08	Ne09	Ne10	Ne11	Ne12	Ne13	Ne14	Ne15	Ne16
Ne	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
HiThr	2	3	4	3	3	6	7	8	9	9	8	7	5	3	2	1
LoThr	-4	-2	-1	0	1	2	2	2	1	1	0	-1	-2	-2	-3	-3

If it is made an arrangement like the example of a setting, a map in practice as shown in the following table will correct.

		engine revolution (rpm)																
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	
Throttle opening (%)	0	-4	-2	-1	0	1	2	2	2	1	1	0	-1	-2	-2	-3	-3	▲ At an opening below "Lo Thr", the same correction factor is applied.
	10	-4	-2	-1	0	1	2	2	2	1	1	0	-1	-2	-2	-3	-3	
	20	-4	-2	-1	0	1	2	2	2	1	1	0	-1	-2	-2	-3	-3	
	30	-4	-2	-1	0	1	2	2	2	1	1	0	-1	-2	-2	-3	-3	▲ At an opening between "Hi Thr" and "Lo Thr", linear interpolation is applied.
	40	-2.8	-1.0	0.0	0.6	1.4	2.8	3.0	3.2	2.6	2.6	1.6	0.6	-0.6	-1.0	-2.0	-2.2	
	50	-1.6	0.0	1.0	1.2	1.8	3.6	4.0	4.4	4.2	4.2	3.2	2.2	0.8	0.0	-1.0	-1.4	
	60	-0.4	1.0	2.0	1.8	2.2	4.4	5.0	5.6	5.8	5.8	4.8	3.8	2.2	1.0	0.0	-0.6	▲ At an opening over "Hi Thr", the same correction factor is applied.
	70	0.8	2.0	3.0	2.4	2.6	5.2	6.0	6.8	7.4	7.4	6.4	5.4	3.6	2.0	1.0	0.2	
	80	2	3	4	3	3	6	7	8	9	9	8	7	5	3	2	1	
	90	2	3	4	3	3	6	7	8	9	9	8	7	5	3	2	1	
100	2	3	4	3	3	6	7	8	9	9	8	7	5	3	2	1		

If the throttle is rapidly released on a vehicle with a hot wire air flow signals, the engine may be stalled by blow-back.

If the throttle is rapidly pushed back, the airflow sensor may react to the blow-back, disturbing its signals, and then failing in fuel injection response to the deceleration, causing the engine to stall.

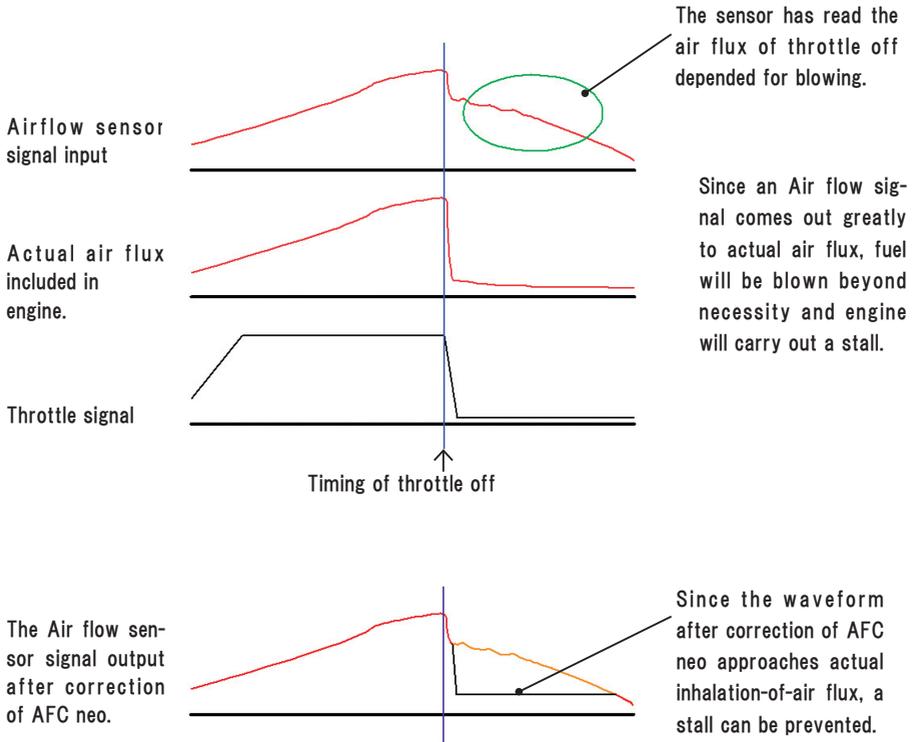
In such a case, it is possible to prevent the engine stall by imposing an upper limit restriction on the airflow signals by setting "Dec Air" and then shutting off the airflow signals disturbed by the reverse blow.

If the throttle opening goes less than the value set by "Dec Air" at an engine revolution lower than "Air Map" engine revolution "Ne O2", airflow signals that are higher than the airflow usage ratio set in "Dec Air" are not output. This is to stabilize the airflow signals.

* This function cannot be used for a vehicle with no throttle signals and one with selective throttle signals.

* The engine stall is not prevented for a mechanical reason other than explained above.

□ Outline of functions



□ Operations

Select “Thr” “Ne01” or “Ne02” with the Left and Right keys.

Increase and decrease the set values with the Up and Down keys.

This function is not enabled when “Thr” is “OFF” .

This correction functions at a throttle opening less than the value set in “Thr” .

The engine revolution set in “Ne01” and “Ne02” are those set in “Ne01” and “Ne02” in “Air Map” . If a engine revolution in “Air Map” is changed, the one in “Dec Air” is also changed.(This change is enabled by “Air Map” only.)

Set an output upper limit for the airflow signals that are at the engine revolution in “Ne01” and “Ne02” . If an engine revolution is between “Ne01” and “Ne02” , calculate the upper limit for the airflow signals by linear interpolation. If the engine revolution is lower than that of Ne01 the upper limit for the “Ne01” airflow signals is adopted.

This function is not enabled at an engine revolution that is higher than that of “Ne02”



Set values of Air Map Ne01 and Ne02 engine revolution.

Set value of upper limit of airflow signal output.

Set value of control start throttle opening.

□ Setting range

Thr:OFF, 0.1 to 20.0 [%] (in steps of 0.1%);initial value:OFF

Ne01 and Ne02:0.0 to 20.0 [%] (in steps of 0.1%);initial value:10.0

* Setting of engine revolution conforms to that of Air Map engine revolution Ne01 and Ne02

VTEC setting points of a VTEC-installed engine can optionally be set.

Two points can separately be set. One is an engine revolution at which the VTEC is switched from the Lo cam to the Hi cam. The other is one at which the VTEC is switches from the Hi cam to the Lo cam. These points can optionally be set irrespective of genuine switching points.

When a specific intake pipe pressure(or airflow usage ratio) and throttle opening are exceeded in addition to the VTEC switching by engine revolution, the VTEC can be switched from the Lo cam to Hi cam.

□ Operations

Use the left and right keys to toggle between items and specified values.

Pressing the Down key while the cursor is positioned in “Lo -> Hi” or “Hi -> Lo” displays “No Control” and disables the “V/T Control” function(ECU VTEC control becomes effective).

Pressing the Up key while “No Control” is displayed releases “No Control” and enables the “V/T Control” function.

Pressing the Down key while the cursor is positioned in the “Prs(Afl) And” or “Thr And” cell changes to “Prs(Afl) Or” or “Thr Or” .

When “Prs(Afl) And” or “Thr And” is displayed, VTEC load control is based on the AND condition.

When “Prs(Afl) Or” or “Thr Or” is displayed, VTEC load control is based on the OR condition.

While the cursor is positioned in the set value cell, use the Up and Down keys to increase or decrease the set values.



Item

Setting value



It is displayed as “No Control” and “V/T Control” stops functioning.

	And Condition	
Screen display	Prs(Afl) And Thr And	
Lo to Hi Switch condition	Above a set value of engine RPM. Above a set value of intake pressure (Usage ratio of air flow meter). Above a set value of throttle angle.	Meet all of these conditions.
Hi to Lo Switch condition	Below a set value of engine RPM. Below a set value of intake pressure (Usage ratio of air flow meter). Below a set value of throttle angle.	Meet either one of the condition or when the engine RPM is below 1500.

	Or condition	
Screen display	Prs(Afl) Or Thr Or	
Lo to Hi Switch condition	Above a set value of engine RPM. Above a set value of intake pressure (Usage ratio of air flow meter). Above a set value of throttle angle.	Meet either one of the condition.
Hi to Lo Switch condition	Below a set value of engine RPM. Below a set value of intake pressure (Usage ratio of air flow meter). Below a set value of throttle angle.	Meet all of these condition or when the engine RPM is below 1500.

* When a setting value is OFF, it does not pertain in conditions.

□ Setting range

Lo to Hi: 1600 to 7000[rpm] (in steps of 100rpm); initial value: 4800

Hi to Lo: 1500 to 6900[rpm] (in steps of 100rpm); initial value: 4500

* The setting is enabled as far as the relationship of Lo to Hi > Hi to Lo is established.

Prs And(or): OFF, -70 to 100[kPa] (in steps of 1kPa); initial value: OFF

Afl And(or): OFF, 1 to 99[%] (in steps of 1%); initial value: OFF

Thr And(or): OFF, 1 to 99[%] (in steps of 1%); initial value: OFF

When an optional VTEC switching point is selected in “V/T Control” , the ECU makes fuel injection, assuming a normal cam state, because it cannot recognize the actual cam state.

At this point, the fuel injection rate differs from the one required for the actual cam, but the difference can be removed by setting “V/T Unmatch” to correct the airflow(intake pipe pressure).

In “V/T Unmatch” , the following two cases are assumed:One is that the ECU recognizes the Lo cam, but the Hi cam is actually selected, and the other is that the ECU recognizes the Hi cam, but the Lo cam is actually selected. In either case, the correction can be made in the range of $\pm 50\%$.

The correction factor of “V/T Unmatch” is processed, being added to an air correction factor that is calculated, based on the Air Map settings. The maximum value after the addition is $\pm 50\%$.

□ Operations

Select “Thr” , “Ne01” and “Ne02” with the Left and Right keys.

Increase and decrease the set values with the Up and Down keys.

A set value in the orange column indicates the VTEC unmatched correction factor applied when the ECU recognizes the Hi cam, but the Lo cam is actually used.

A set value in the blue column indicates the VTEC unmatched correction factor applied when the ECU recognizes the Lo cam, but the Hi cam is actually used.

The colors of these columns have the same meanings as those of the VTEC status bar that is indicated below the monitor menu “V/T Monitor” .

The VTEC unmatched correction factors become valid in the orange and blue areas of the VTEC status bar.



□ VTEC Status Bar

Blue : ECU and AFC neo Lo cam outputs.

Orange : ECU Hi cam outputs, AFC neo Lo cam outputs.

Green : ECU Lo cam outputs, AFC neo Hi cam outputs.

Yellow : ECU and AFC neo Hi cam outputs.

□ Setting range

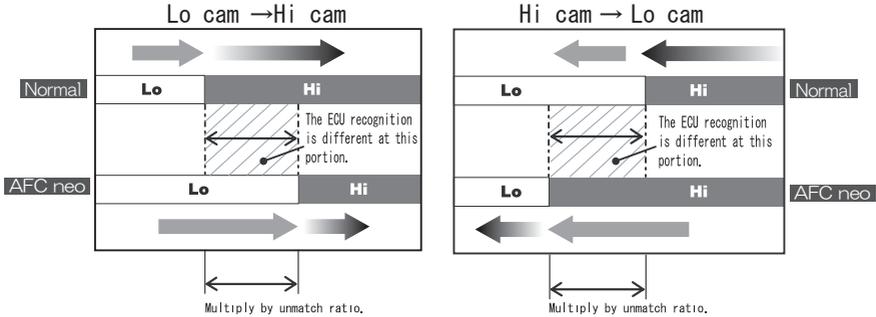
V/T Unmatch correction factor:+50 to -50[%](in steps of 1%);initial value: ± 0

□ Outline of functions

- Fuel correction at VTEC unmatched

Fuel correction is performed when there is a difference in VTEC control between the ECU and the AFC neo.

Fuel correction at VTEC unmatched



When VTEC changeover point has been changed in the AFC neo, improper fuel injection is performed because the ECU does not recognize the actual cam status. This correction is performed so that the fuel adjustment may not be shifted at that time.

This setting permits achieving higher-accuracy fuel correction.

- The correction result is as follows:

Air correction factor(*1)= Correction factor based on the engine RPM and throttle opening
 + Unmatch correction factor.

*1: A value of -50% or less or a value of +50% or more is cut.

7. etc. Menu

This menu is used to set up an AFC neo operation mode and to set up and check various functions of the AFC neo.

Select “etc” .from basic operation(page 14) ① in the monitor menu.

The operation of “etc. Menu Select” conforms to basic operation ② in the monitor menu.

Model Select

This option is used to specify whether to enable VTEC control functions.

For a HONDA VTEC-installed vehicle, select “V/T Control On” , and for other vehicles, select “V/T Control Off” .

For details, see the settings in the Vehicle Specific Wiring Diagram.

A setting cannot be changed during engine running. Note that after the setting is changed, its value in the setting menu is initialized, so the value must be set again.

Operations

To set the VTEC control to On, select “V/T Control On” with the Up key. To set the VTEC control to Off, select “V/T Control Off” with the Down key.

If the selection is OK, press the Down navigation key(OK).

If the selection is not required or you want to cancel a change, press the Up navigation key(CAN).

If the selection is changed and the Down navigation key(OK) is pressed, a confirmation window appears. If the engine is running at this point, a warning window asking you to stop the engine is displayed.

The warning window is displayed until the engine is stopped or the Up navigation key(CAN) is pressed.

If the Down navigation key(OK) is pressed with the confirmation window displayed, the model switches to the other.

When the model is switched, the setting items in the setting menu are initialized.

Take a note of each set value as required.



Mode Select

Select the “EASY” mode where there are eight engine revolution in the “Air Map” setting or the “PRO” mode where there are 16 engine revolution.

Because the “PRO” mode has a larger number of engine revolution, more modified settings can be made.

Select a mode to meet your operation conditions and liking.

A setting cannot be changed during engine running. Note that after the setting is changed, its value in the Air Map is initialized, so the value must be set again.

Operations

Select the “EASY” mode with the Up key and the “PRO” mode with the Down key.

If the selection is OK, press the Down navigation key(OK).

If the selection is not required or you want to cancel a change, press the Up navigation key(CAN).

If the selection is changed and the Down navigation key(OK) is pressed, a confirmation window appears. If the engine is running at this point, a warning window asking you to stop the engine is displayed.

The warning window is displayed until the engine is stopped or the Up navigation key(CAN) is pressed.

If the Down navigation key(OK) is pressed with the confirmation window displayed, the mode switches to the other.

When the mode is switched, the setting values in the setting menu are initialized.

Take a note of each set value as required.



Car Select (Thr Setting)

This option is used to select vehicle information. Select the number of cylinders and a throttle type. For a vehicle with throttle signals, also make throttle settings. If the throttle settings are not made or cannot normally be made, invalid values are assumed as throttle openings required for the setting menu, so that an appropriate correction control cannot be made.

Operations

Select cylinder number setting “Cyl” and throttle type “Thr” with the Left and Right keys. Change the set values with the Up and Down keys.

Enter the number of cylinders of a vehicle in the cylinder number setting “Cyl” . Because the set values of the following vehicles change, set the value, following the instructions.

After the throttle type “Thr” is selected with “↗” or “↘”, press the right key to go to the throttle setting window.

For determining throttle type setting, please refer to following voltage of the throttle sensor:

“↗” = Completely Open → Completely Close(0 → 5 [V]) “↘” = Completely Close → Completely Open(5 → 0 [V])

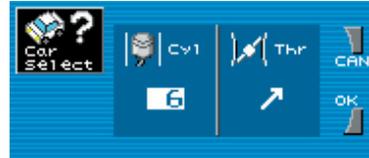
In the throttle setting window, first measure throttle signals with the throttle fully closed(the accelerator pedal not depressed).

Press the Down navigation key(OK) with the throttle fully closed.

Next, measure the throttle signals with the throttle fully opened(the accelerator pedal fully depressed). Press the Down navigation key(OK) with the throttle fully opened.

If the throttle type and measurement result are normal, the window indicating that the setting is successful is displayed and the throttle setting is completed.

If the measurement result is abnormal, the window indicating that the setting is failed is displayed and the throttle setting is initialized. Make the setting again.



- * For a rotary car, set “rotors” × 2
- * For a Toyota car mounting a V8 engine, set 4
- * For Mazda Atenza(GG # S, GG # P, GY # W), set 2

Set up of Full close

Current throttle signal voltage.



Set up of Full open

Throttle signal bar indication.



Successful



No good



■ Sensor Select

Select the airflow sensor type and characteristics of a vehicle.

When “V/T Control Off” is selected in “Model Select”, the airflow sensor can be selected from hot wire, pressure, flap, and Karman types. When “V/T Control On” is selected, it can be selected from hot wire and pressure types.

For the hot wire, pressure, and flap types, sensor characteristics must also be selected from sensor numbers. For the Karman type, a sensor number need not be selected.

For the hot wire type sensor, select the number of sensors from “Single” and “Twin” and then select an AFC neo output calculation system.

Corrective processing is executed by converting a sensor number characteristic to a physical value(example:intake airflow for the hot wire type), which is output, being converted back to the sensor number characteristic signal. If the airflow sensors are of the same type, their characteristics can be changed.

This is used to change a hot wire airflow sensor with a small diameter to one with a large diameter.

□ Operations

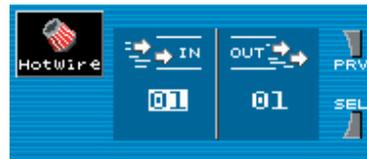
In the “Sensor Type Select” window, select an airflow sensor type with the Up and Down keys.

When “V/T Control Off” is selected, the type can be selected from “Hot Wire”, “Pressure”, “Flap” and “Karman” .



For “Hot Wire”, “Pressure” and “Flap”, press the Right or Down navigation key to go to the sensor number selection window.

For “Karman”, a sensor number need not be selected.



In the “Sensor Type Select” window, select

“Karman” with the Up and Down keys and press the Left or Up navigation key to go back to “etc. Menu Select” . This finishes the setting.

For “Hot Wire” and “Pressure”, a sensor number in “IN” and one in “OUT” can separately be set.

Select the same value unless the airflow sensor is changed to another.

For “Flap”, select the same numbers in “IN” and “OUT” .

To select a sensor number, increase and decrease the current number with the Up and Down keys. Select “IN” and “OUT” with the Left and Right keys.

When the sensor number selection is finished for “Pressure” and “Flap”, press the Up navigation key to go back to “etc. Menu Select” . This finishes the setting.

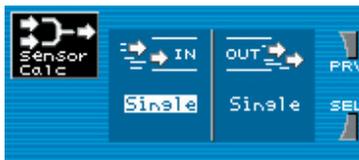
If the Right key is pressed with a sensor number in “OUT” selected in “Hot Wire”, the window to select the number of input sensors and an output calculation system is displayed.

For a vehicle with two airflow sensors like an RB26DETT, select “Twin” . For one airflow sensor, select “Single” .

For “Single” , the following two can be selected as output calculation systems: “Single” for output without calculating the number of sensors and “Half” for output with an intake airflow value reduced to a half.

For “Twin” , the following two can be selected: “Add” in which the intake airflow values of two airflow sensors are added and “Ave” in which the average of the two values is calculated.

Select an item with the Left and Right keys and then select a set value with the Up and Down keys. When the selection is finished, press the Up navigation key to go back to “etc. Menu Select” . This finishes the setting.



For details on setting the type and sensor number of an objective vehicle, see the Vehicle Specific Wiring Diagram.

□ Setting range

Hot Wire:01 to 26:initial value:1

* IN:Single/OUT:Single, Half

* IN:Twin/OUT:Add, Ave

Pressure:01 to 26:initial value:1

Flap:01 to 11:initial value:1

Karman: —

* The number into which sensor data is not registered is not displayed.

Analog Scale

Select scales for the analog meters to be displayed in “Analog” and “Multi” in the monitor menu.

A scale of intake pipe pressures can be selected only for engine revolution, air correction factors, and pressure type airflow sensors.

Select a scale, based on vehicle conditions.

Operations

Select an item to be changed to another with the Left and Right keys and Down navigation key(SEL).

Increase and decrease a set value with the Up and Down keys.

For each item, four types of scales can be selected.



Setting range

Rev:6000, 8000, 9000, and 10000[rpm];initial value:6000

Cor: ± 6.0, ± 15.0, ± 30.0, and ± 50.0[%];initial value: ± 6.0

Prs:0, 100, 150, and 200[kPa];initial value:0

Warning Set

If a value displayed in “Monitor Menu” exceeds its set value, a warning is displayed.

Airflow(pressure) signals, engine revolution, and throttle openings can be set.

If a displayed item exceeds its set value, a warning is displayed.(For details on the display, see page 15 to 17 in the monitor menu.)

Operations

Select an item to be changed to another with the Left and Right keys and Down navigation key(SEL).

Increase and decrease a set value with the Up and Down keys.



Setting range

Afl Warn:OFF, 1 to 100[%](in steps of 1%);initial value:OFF

Prs Warn:-100 to -5, OFF, \pm 0 to 200[kPa](in steps of 5kPa);initial value:OFF

Kar Warn:OFF, 100 to 2000[Hz](in steps of 5Hz);initial value:OFF

Rev Warn:3000 to 9000, OFF[rpm](in steps of 100rpm);initial value:OFF

Thr Warn:OFF, 1 to 100[%](in steps of 1%);initial value:OFF

■ Display Set

Make various display related settings.

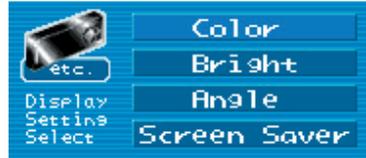
In “Color” , select a basic color tone and backlight color for the display.

In “Bright” , select brightness for the OLED.

In “Angle” , select a positional relationship between the display and keys.

In “Screen Saver” , select each setting of a screen saver.

The operation in “Display Setting Select” conforms to basic operation ② in the monitor menu.



■ Color

Select a basic color tone and backlight color for the display.

When the current key color is changed to another, the specified color is selected out of seven colors.

□ Operations

Select an item with the Left and Right keys.

Select a setting with the Up and Down keys.

Press the Down navigation key(OK) to make the selected setting.

Press the Up navigation key(CAN) to go back to “Display Setting Select” without changing the setting.



Displays color selected for display.

Displays color selected for key.

□ Setting range

Display : Sky, Orange, Passion, MosGreen, Deep-Sea, Deep-Red, Prairie, Tiger

Key : Blue, Magenta, Red, Orange, Green, Cyan, Pink, Yellow

■ Bright

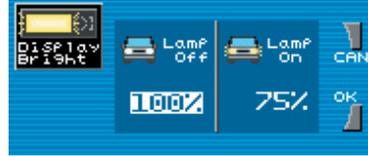
Select brightness for the display OLED.

This setting is enabled when the position lamp is On/Off.

□ Operations

Select an item with the Left and Right keys.
Increase and decrease a setting with the Up and Down keys.

When the set value is changed with the Up and Down keys, the display appears in the specified brightness, so that the brightness can be recognized.



□ Setting range

Bright:25, 50, 75, and 100[%]: initial value:Lamp Off 100, Lamp On 75

■ Angle

Select a positional relationship between the display and keys.

By turning round the display, the key and display locations can be interchanged.

When the display is turned round, the meanings of the keys are also interchanged.

□ Operations

Select a setting with the Up and Down keys.
Press the Down navigation key(OK) to make the selected setting.

Press the Up navigation key(CAN) to go back to the Display Setting Select window without making the selected setting.

When the selected setting is made, the screen is turned round, and the left and right of each navigation key become opposite to each other.

When the display is viewed from the front side, the top and bottom and the left and right of each key location become opposite to each other.(See the name of each part on page 12.)



■ Screen Saver

Select screen saver settings.

Select a time taken until the screen saver appears and a screen saver type.

When the screen saver appears, pressing a key releases it.

□ Operations

Select an item with the left and right keys.

Select a setting with the Up and Down keys.

Press the Down navigation key(OK) to make the selected setting.

Press the Up navigation key(CAN) to go back to the Display Setting Select window without making the selected setting.

When no key is operated for a time that is set in "Time" , the screen saver appears.

Select a screen saver type in "Type" .(Type 1 for screen OFF)

When the setting is "OFF" , the screen saver does not appear.



□ Setting range

Time:OFF, 30 second, 1, 2, 4, 8, 15, and 30 minute;initial value:OFF

Type:1, 2, and 3;initial value:1

☐ Sensor Check

The status of each signal to be input to the AFC neo can be checked.

The following signals are displayed and checked: ignition power voltage, airflow signal input 1 voltage, airflow signal input 2 voltage, throttle signal input voltage, airflow signal output voltage, position lamp, VTEC input, Karman, and engine rotation.

Whether wiring is normally made and the status of each sensor can also be checked.

☐ Operatings

Press the Up navigation key (PRV) to go back to “Display Setting Select” .

Measured voltages are displayed respectively in “IG” , “In1” , “In2” and “Thr” .

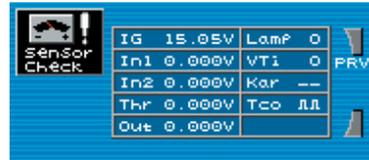
“Out” displays an airflow output signal voltage that is actually output.

“Lamp” and “VTi” display input signal On/Off.

“●” means ON, and “○” means OFF.

“Kar” and “Tco” display pulse input states.

“--” means no input, and “ ” means an input pulse signal.



Indication item	Explanation	Indication item	Explanation
IG	Ignition power voltage	Lamp	Position lamp signal
In1	Airflow(pressure) signal input 1 voltage	VTi	VTEC input signal
In2	Airflow signal input 2 voltage	Kar	Karman sensor signal
Thr	Throttle signal input voltage	Tco	Engine rotation signal
Out	Airflow(pressure) signal output voltage		

Initialize

This option clears all data and returns them to their initial values(factory-set values).

The initialization cannot be executed during engine running. Because all set values are initialized after the initialization, they must be set again.

Operations

Select Yes with the Up key.

If the selection is OK, press the Down navigation key(OK).

If the selection is not required or you want to cancel it, press the Up navigation key(CAN).

When the Down navigation key(OK) is pressed, a confirmation window appears.

If the engine is running at this point, a window warning that the engine be stopped is displayed.

The warning window is displayed until the engine is stopped or the Up navigation key(CAN) is pressed.

If the Down navigation key(OK) is pressed while the confirmation window is displayed, the initialization is performed and the AFC neo is automatically rebooted.

When the initialization is performed, all set items are initialized.

Take a note of each set value as required.



Program Ver.

Confirm the AFC neo program version.

The program version is used when inquiries are addressed to the company.



MEMO

Setting note

Please use, in case you take the arrangement data of AFC neo.

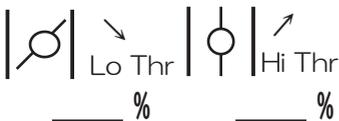
- Model Select V/T : On · Off
- Mode Select Easy · Pro
- Car Select Cyl : ____ Thr : ↗ ↘ —
- Sensor Select Type : Hotwire · Pressuer · Flap · Kalman
 Number : In ____, Out ____
 Calc : In ____, Out ____

Air Map

	Ne01	Ne02	Ne03	Ne04	Ne05	Ne06	Ne07	Ne08
	rpm							
Hi Thr	%	%	%	%	%	%	%	%
Lo Thr	%	%	%	%	%	%	%	%

	Ne09	Ne10	Ne11	Ne12	Ne13	Ne14	Ne15	Ne16
	rpm							
	%	%	%	%	%	%	%	%
	%	%	%	%	%	%	%	%

Thr Point



V/T Control

Lo → Hi	rpm
Hi → Lo	rpm
AFL/PRS	
Thr	

Dec Air

Thr	Ne01	Ne02
	rpm	rpm

V/T Unmatch

	Lo	Hi
	Hi	Lo
	%	%

Analog Scale Rev : 6000 · 8000 · 9000 · 10000

Cor : ± 6.0 · ± 15.0 · ± 30.0 · ± 50.0 [%]

Prs : 0 · 100 · 150 · 200 [kPa]

Warning Set Afl · Prs · Kar Warn _____

Rev Warn _____

Thr Warn _____

8. Troubleshooting

Troubleshooting

Power

- Power cannot be turned on.
Power is interrupted such as by vibration.
Is a battery connected?
Is the signal harness connected securely to the vehicle ECU harness?
Is the signal harness connected to the body harness?

Display

- Each signal is not displayed. The display blinks.
Is the signal harness connected to the proper destination? Check it with the relevant model wiring diagram.
- The screen display is too dark.
Is the brightness of the display set adjusted properly?
- The speed indication is abnormal.
Is the number of cylinders set correctly?
- Throttle opening is abnormal.
Are the throttle settings set correctly?
- The Air Map cannot be changed.
The settings are locked. Consult your dealer.
- The screen changes automatically. Key operation is disabled.
Consult your dealer.

Abnormal engine

- The engine does not start. The engine stalls. Idling is unstable.
The check engine lamp lights. Engine speed does not increase or engine surges.
Is Sensor Type Select correct?
Are the Air Map settings correct?
Is the signal harness connected to the right destination?
Is the signal harness connected securely to the vehicle ECU harness?

MEMO

MEMO

MEMO

9. Other

1. The specifications, price, external appearance, etc. of the product are subject to change without notice.
2. The contents of the manual are subject to revision without notice.
3. The manufacturer declines any responsibility for damages resulting from loss of data stored in the memory due to failure, repair or other reasons.
4. If the product is returned to the manufacturer for repair, it will be delivered back to the customer with the initial plant settings(after clearing any customer settings stored in the memory).
5. The manual may not be reproduced in its entirety or in any part without permission of the manufacturer.
6. The company names and product names described in this document are the registered trademarks or brands of the respective companies.
7. The names, addresses and telephone numbers mentioned as where to contact are as of Dec, 2012. Note that this information is subject to change.

History of revisions

Rev.No	Date of issue	Owner's manual part number	Description
1st edition	Dec 18, 2012	7107-0640-00	

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