

# HITACHI

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**ADVANCED  
PRODUCT NEWS**

**SUBJECT**  
**Product News: New Econofresh compatibility**

**DATE: APR.-14**  
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## Summary

This advanced product news introduces the launching of new Econofresh.

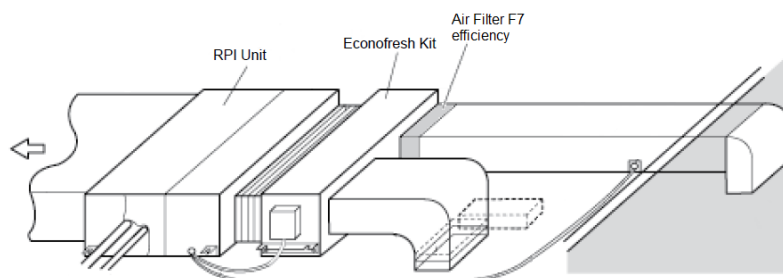
The details are indicated in the description.

## Description

### 1. DESCRIPTION, CODES AND DATE OF SALES

- New models:

MODEL NAME	CODE	DESCRIPTION	DATE OF SALES
EF-456NE	7E560000	Econofresh kit	April 2014
HEF-EF456	7E561000	High efficiency air filter kit	July 2014



- Discontinued models:

MODEL NAME	CODE	DESCRIPTION	DISCONTINUED DATE
EF-5NE	7E774148	Econofresh kit	April 2014

Hitachi Air Conditioning Products Europe, S.A.U.  
Barcelona (Spain)

No

APN-2013033

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## 2. FEATURES OF THE NEW PRODUCT.

### 2.1. Current functions

New Econo-Fresh keeps the functions of the previous model EF-5NE with some new improvements explained in 2.2


### 2.2. Features

1) COOLING ECONOMIZER: External Fresh Cold Air in Cooling mode during intermediate seasons → Energy saving (Compressor Thermo OFF) Standard Process and All Fresh control

2) Enthalpy / CO2 sensor (→ gas density adjustment control)

 3) Connectable RPI units Up line: RPI-(4.0~6.0)FSN4E (before 5HP only).

 4) Fresh Outdoor Air damper minimum opening is selectable by remote control switch

 5) Improvements conditions for Thermo ON in cooling economizer control (see point 6).

 6) Optional filter F7 efficiency accessory (7E561000)

## 3. COMPATIBILITY

The new Econofresh is compatible with the RPI-FSN4E that incorporates the new PCB, these are available as follows:

DESCRIPTION	CODE	DATE OF SALES	Serial Number
RPI-4.0FSN4E	7E424020	April 2014	From 4KE48896
RPI-5.0FSN4E	7E424021	April 2014	
RPI-6.0FSN4E	7E424022	April 2014	

Note: For machines manufactured before, there will be the PCB (E04029) as a spare part.

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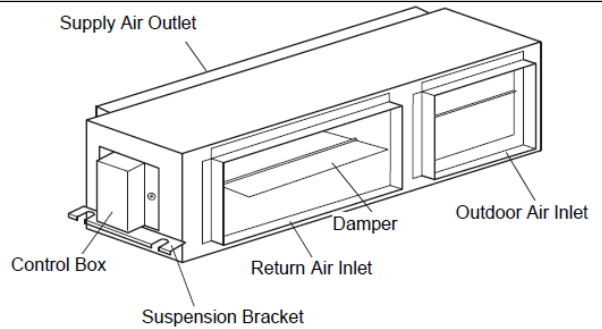
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## 4. NEW PRODUCT GENERAL DATA.

### 4.1. System description

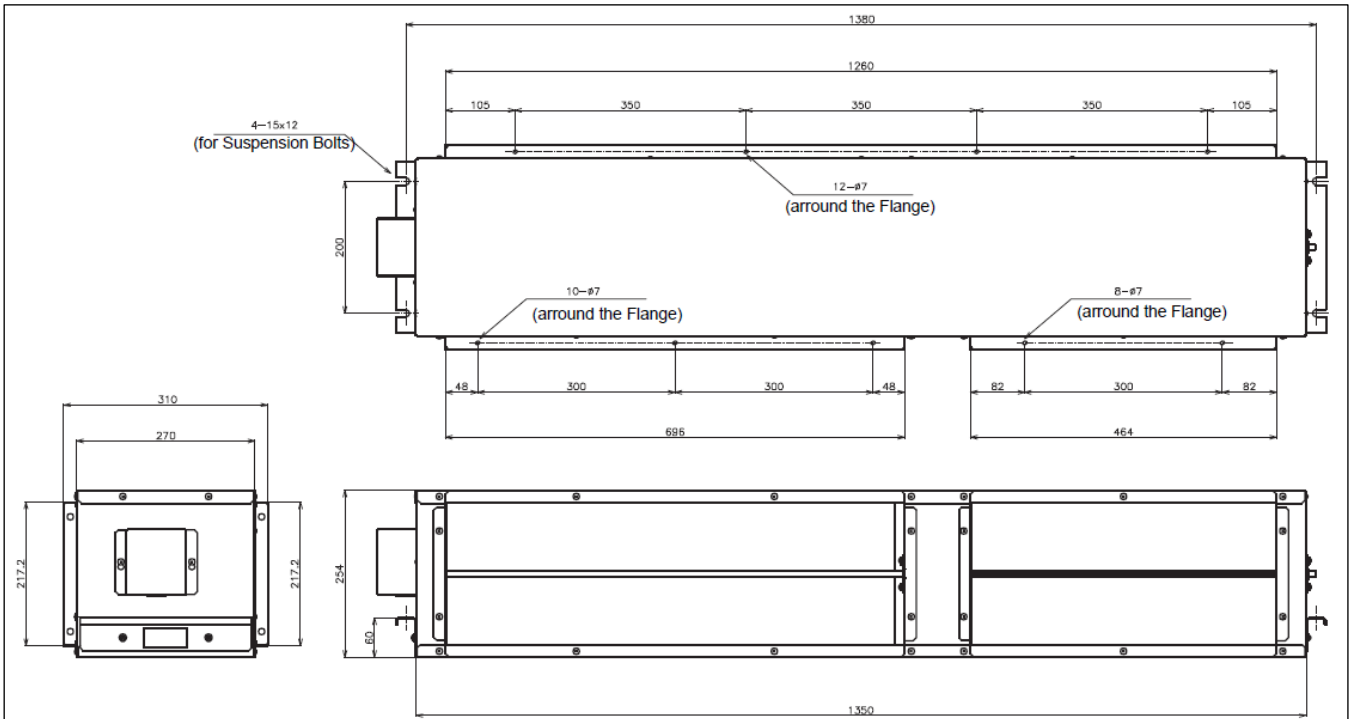
The Econo-Fresh kit is equipped with an outdoor air damper control mechanism, and the system provides various operation modes, such as free cooling, all fresh cooling and heating.

- Refrigerant Cycle:
  - Regarding the structural drawings and the refrigerant cycles diagrams, refer to Installation and Operation Manual.
- Necessary tools:
  - Necessary tools and instruments for Econo-Fresh kit installation are the same as RPI units.
- Transportation:
  - Transport the product as close to the installation location as practical before unpacking.
- Unit's handling:
  - Be careful not to damage the insulation materials of unit's surface when lifting.
  - Do not hold the damper plate when holding or lifting the unit.



**⚠ WARNING:**  
Do not put any foreign material into the unit and check to ensure that none exists in the units before the installation and test run.  
Otherwise, a fire or failure, etc. may occur.

### 4.2. Dimensional drawing



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## 5. TECHNICAL DATA.

### 5.1. Installation

This unit has been designed for positive introduction of the outdoor air for free cooling or other control. Check to ensure that the following points have been previously designed or arranged:

#### 1. Resistance of Outdoor Air Duct.

In order to protect against a shortage of outdoor air intake or excessive intake of outdoor air, which cause and insufficient capacity of free cooling or uncomfortable change of supply air during free cooling operation, keep the resistance of the outdoor air duct within the following guide range:

$$\frac{1}{2} P_R < P_O < 4 \times P_R$$

$P_R$ : Pressure Loss of Return Air Duct at Designed Supply Air Volume

$P_O$ : Pressure Loss of Outdoor Air Duct at Designed Supply Air Volume, Including the Outdoor Air Filter.

#### NOTE:

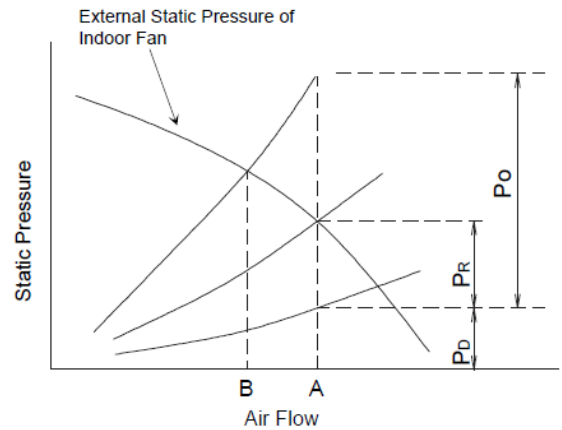
*The balance between the outdoor air volume and the return air volume depends on the arrangement of the discharge air duct, return air duct, and installed duct arrangement. Refer to point 3 for obtaining the general idea and Technical Catalogue for details.*

#### 2. Pressure Relief Damper

When the building is of an air-tight structure, positive pressure inside the building will be created during the free cooling or all-fresh operation.

#### 3. Outdoor Air Filter

Provide a field-supplied outdoor air filter in the outdoor air duct.



Balance of Air Flow and Resistance of each Duct.

A: Supply Air Flow when Fresh Outdoor Air damper is fully closed (Return Air Damper is fully opened)

B: Supply Air Flow when Fresh Outdoor Air damper is fully opened (Return Air Damper is fully closed)

$P_D$ : Pressure Loss of Supply Air Duct.

$P_O$ : Pressure Loss of Fresh Outdoor Duct.

$P_R$ : Pressure Loss of Return Air Duct.

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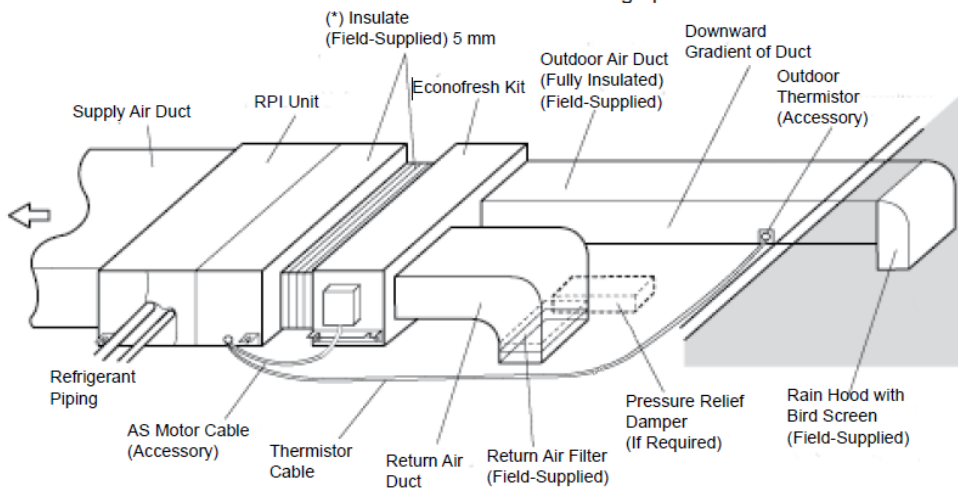
**1 Ducting Connection**

Pre-drilled duct flanges are provided at the supply, return and outdoor air intake connections. It is recommended that a flexible duct connection be installed to minimize sound and vibration transmission.

**2 Insulation**

All ducts should be insulated

- Especially the outdoor air duct, through which the cold outdoor air flows in, must be sufficiently insulated.
- The lowest temperature of the entering outdoor air flowing through the outdoor air duct is the lowest temperature for heating operation at the installation site.

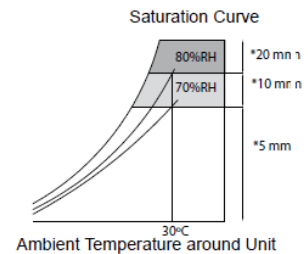


In the case that the unit is used under the following condition, perform additional insulation (\*) or prepare a drain pan underneath the unit.



**NOTE:**

Ducting arrangement must comply with local regulations.



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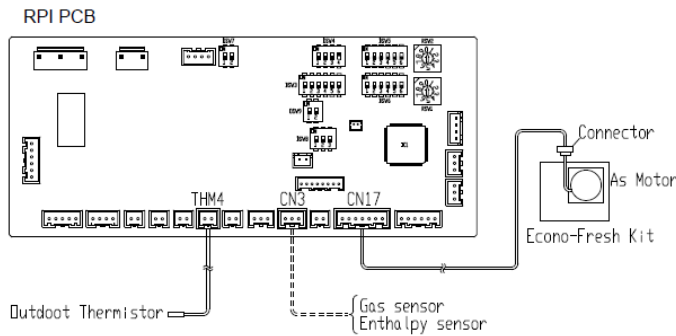
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## 5.2. Electrical wiring connection

The electrical wiring connection for the unit is shown below. Mount the outdoor thermistor at a position near the outdoor air inlet.

Pay attention to the position of the thermistor where the direct sunshine is not radiated or rain water is not touched



### ⚠ WARNING:

- Turn OFF the main power switch to the unit and wait for more than 3 minutes before electrical wiring work or a periodical check is performed.
- Check to ensure that the indoor unit's fan has stopped before electrical wiring work or a periodical check is performed.
- Protect the wires, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and at the worst, a fire will occur.

### ⚠ CAUTION:

Wrap the accessory packing around the wires, and plug the wiring connection hole with the seal material to protect the products from any condensate water or insects.

## 5.3. Setting of DIP Switches

Dip Switch setting shall be performed at RPI PCB's.



### CAUTION:

Turn OFF all power sources before setting the dip switches. Without turning OFF, the contents of setting would be invalid



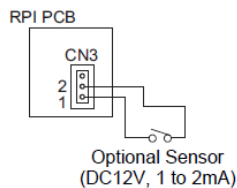
		RPI Dip Switch Factory Setting	RPI + Econo-Fresh Kit installation Dip Switch Setting
RPI-4.0~6.0FSN4E	DSW4		

Mark of "■" indicates the position of dip switches.

## 5.4. Optional sensor connection

When installing the field-supplied sensors, select and connect the sensors as follows.

- The type of the sensor should be of ON/OFF switching type.
- The switch rating should be DC12V.
- Connect the wires to #1 and #2 of CN3 on the RPI PCB. (In this case, the enthalpy sensor cannot be applied.)
- Lead the wires through the connecting hole for the control circuit.



### 1. Enthalpy Sensor (Field-Supplied)

- The switching arrangement should be as follows.  
OFF: for Calling Free Cooling (Compressor OFF)  
ON: for Calling Mechanical Cooling (Compressor ON)
- Set the enthalpy sensor mode by using remote control switch.

### 2. CO<sub>2</sub> Gas Sensor (Field-Supplied)

- The switch arrangement should be as follows.  
ON: for Increasing Outdoor Air Introduction  
OFF: for Decreasing Outdoor Air Introduction
- Set the CO<sub>2</sub> Gas sensor mode by using remote control switch.

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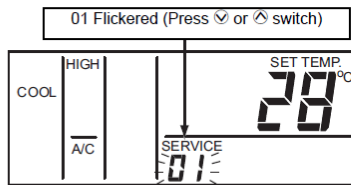
## 5.5. Optional function setting by remote control switch (PC-ART)

The optional function can be set by remote control switch. Follow the instruction below.

### Step 1

#### Changing to Optional Setting Mode

Press the CHECK switch and the RESET switch together more than 3 seconds while the unit is stopped. The operation mode is changed to the field setting mode, "SERVICE" is indicated and "01" flickers. When "01" is not indicated, press the ⏴ or ⏵ switch and set "01". In this condition, press the CHECK switch and the mode is changed to the optional setting mode.



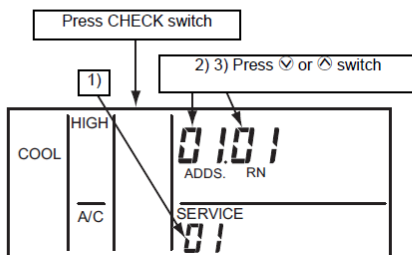
### Step 2

#### Selection of Indoor Unit for Optional Setting

When the mode is changed to the optional setting mode, the indication on the liquid crystal display is as shown below.

1. The flickering indication of "01" stops.
2. The address of the indoor unit for optional setting is indicated.
3. The address of the refrigerant system for optional setting is indicated.

Select the indoor unit to set by pressing the ⏴ or ⏵ switch and indicate the address of the indoor unit. In this condition, press the CHECK switch and the indication is changed to the indication of optional setting.



#### NOTE:

- A. In case that both indications of the ADDS. (Address) and RN. (Refrigerant Cycle Number) show "AA", this means the same setting is performed to all the indoor units.  
B. The indoor units not connected are not indicated.

### Step 3

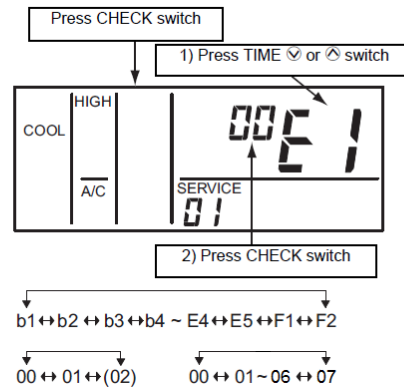
#### Optional Setting Items and Changing Setting Conditions

The indication of optional setting is as shown below.

1. The code of optional setting is as shown below.
2. The indications of ADDS. and RN. are turned OFF and the optional setting condition is indicated.

The item code of optional setting is changed by pressing the TIME ⏴ or ⏵ switch. The optional setting condition is changed by pressing the CHECK switch. Set the item code to "E1".

In case of setting other indoor unit, press the ⏴ or ⏵ switch and the indication is changed to the condition of the item 2.



Code	Functions	Setting Conditions	Description
E1	All Fresh Operation	00: Not Available 01, 02: Available	Able to fully open the outdoor air damper
E2	Enthalpy Sensor	00: Not Available 01: Available	Enthalpy Sensor Input can be set.
E4	Gas Sensor	00: Not Available 01, 02: Available	Gas Sensor Input can be set.
d7	Damper minimum opening	00: Step1 (6°) 01: Step2 (12°) 02: Step3 (18°) 03: Step4 (24°) 04: Step5 (30°) 05: Step6 (36°) 06: Step7 (42°) 07: Step8 (48°)	Fresh Outdoor Air damper minimum opening selection

### Step 4

#### Return from Optional Function Setting Mode

Press the RESET switch, the optional function setting is memorized and the mode is returned to the normal condition.

#### NOTE:

The label for checking the contents of the setting is attached to the holding bracket. Write down the contents of the setting on the label

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## 6. CONTROL IMPROVEMENTS.

6.1. Fresh Outdoor Air damper minimum opening is selectable by remote control switch

It's possible setting the minimum damper opening with remote control switch. As explained in the previous "4.5 Optional function setting by remote control switch".

6.2. Conditions for Thermo ON in cooling economizer control

Conditions for thermo ON (mechanical cooling), when the RPI unit cannot make the room temperature reach the setting temperature in cooling economizer mode.

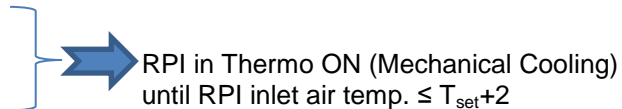
### Previous status:

- . RPI in Economizer cooling mode
- . Thermo off (cool mode)
- . Econofresh damper is fully open

### (BEFORE) ECONOMIZER control in the Econofresh EF-5NE assembled in the previous RPI series FSN(1/2/3)

If the following conditions are met:

- RPI inlet air temp.  $\geq T_{set}+3$ ; For 6 min  
( $T_{set}$  cannot be reached)
- Outdoor Temp.  $\geq 17^{\circ}\text{C}$ ?



### (AFTER) ECONOMIZER control in the new Econofresh EF-456NE assembled in the new RPI FSN4E series

If the following conditions are met:

- RPI inlet air temp.  $\geq T_{set}+3$ ; For 6 min  
( $T_{set}$  cannot be reached)
- (No Outdoor temp conditions)

