Data Sheet

living eco® sensors with bi-directional valves (Combi Packs)

Application

All living eco® Combi Packs comprise a living eco® sensor and a RA-FS angled or straight pattern bi-directional valve.

living eco® is a stand-alone, intelligent, electronic programmable radiator sensor for residential use. It is easy to install and operate with only three buttons on the front.

living eco® comes with three pre-installed programmes P0, P1 and P2 designed to suit most people. These programmes allow the selection of different temperatures in the home at different times of the day. P0 maintains the same temperature all day, whereas, P1 and P2 will lower the temperature at predefined periods of the day to save energy, and will regulate the heating when the home is occupied to suit the lifestyle of the family.

Main features:
- Energy saving
- Provides high comfort
- Open window function (closes the valve if the room temperature suddenly falls dramatically)
- Valve exercise function
- PID control
- Adaptive learning
- 7-day programmes with adjustable temperature set-backs and up to 3 set-back periods per day
- Battery lifetime: 2 years
- Min./max. temp. limitation
- Child lock
- Holiday function

RA-FS valve bodies are reversible and bi-directional and include a flow-selectable feature to ensure trouble free installation without any risk of water hammer. For optimum performance, Danfoss recommend the sensor to be mounted horizontally.

The valves have a ½” BSP (R½”) tail piece connection to the radiator and are available with 15, 10 or 8 mm compression fitting or an elbow with 10 mm push-fit connection to the pipe work. All valves are supplied with a protective cap, which can be used for manual regulation during the construction phase. The cap must not be used as a manual shut of device.

living eco® Combi Packs are also available with a RLV-D lockshield valve. For further data on the lockshield valve please see separate RLV-D data sheet.
### Data Sheet

**living eco® sensors with bi-directional valves (Combi Packs)**

#### Ordering

<table>
<thead>
<tr>
<th>Combi Pack</th>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>living eco® sensor, RA-FS 8/10/15 straight bi-directional valve</td>
<td>014G005400</td>
</tr>
<tr>
<td>living eco® sensor, RA-FS 8/10/15 angle bi-directional valve</td>
<td>014G005500</td>
</tr>
<tr>
<td>living eco® sensor, RA-FS 8/10/15 straight bi-directional valve, lockshield valve</td>
<td>014G006100</td>
</tr>
<tr>
<td>living eco® sensor, RA-FS 8/10/15 angle bi-directional valve, lockshield valve</td>
<td>014G006200</td>
</tr>
</tbody>
</table>

#### Sensor

<table>
<thead>
<tr>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>014G005100</td>
</tr>
</tbody>
</table>

#### Valve

<table>
<thead>
<tr>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>013G628100</td>
</tr>
<tr>
<td>013G628300</td>
</tr>
</tbody>
</table>

#### Accessory

<table>
<thead>
<tr>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>014G025000</td>
</tr>
<tr>
<td>014G025100</td>
</tr>
<tr>
<td>014G025200</td>
</tr>
</tbody>
</table>

#### Technical Data

**living eco® sensor**

- **Screen/display**: Grey digital with backlight
- **Actuator type**: Electro-mechanical
- **Software classification**: A
- **Control**: Proportional Integral Derivative Control
- **Power supply**: 2x1.5V AA alkaline, class III (SELV)
- **Battery life**: 2 years
- **Low battery signal**: Battery icon and alarm bell will flash in display - if the battery level is critical, the whole display will flash
- **Ambient temperature**: 0 to 40°C
- **Transportation temperature range**: -20 to 65°C
- **Temperature setting range**: 6 to 28°C
- **Recommended use**: Residential
- **Open-window function**: Yes
- **Size**: RA-type: L: 91 mm, Ø: 51 mm K-type: L:78 mm, Ø: 51 mm
- **Noise level**: < 30 dB(A)
- **Weight incl. battery**: 177 g
- **Safety classification**: Type 1
- **Mechanical strength**: 70 N (max. force from valve)
- **Maximum water temperature**: 90°C
- **Movement type**: Linear
- **Spindle movement**: 2-3 mm on valve
- **Maximum extension**: 4.5 mm
- **Temperature sampling**: Measures temperature every minute
- **Speed of adjustment**: 1 mm/s
- **Power consumption**: 3 mW in standby, 1.2 W when active
- **Ball pressure test**: 75°C
- **IP Class**: 20 (the living eco® sensor should not be used in hazardous installations or in places where it will be exposed to water.)
RA-FS bi-directional valves

<table>
<thead>
<tr>
<th>Type</th>
<th>Design</th>
<th>Connection</th>
<th>Inlet</th>
<th>Outlet</th>
<th>$k_{uv}$</th>
<th>Max. pressure$^1$</th>
<th>Max. temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA-FS 15$^{2}$</td>
<td>Reverse angle</td>
<td>15 mm</td>
<td>½” BSP</td>
<td>0.73</td>
<td>10 bar</td>
<td>0.6 bar</td>
<td>16 bar</td>
</tr>
<tr>
<td>RA-FS 15$^{2}$</td>
<td>Reverse angle</td>
<td>8/10 mm</td>
<td>½” BSP</td>
<td>0.73</td>
<td>3 bar</td>
<td>0.6 bar</td>
<td>6 bar</td>
</tr>
</tbody>
</table>

$^1$ As with any device which imposes a pressure drop in the system, noise may occur under certain flow/pressure conditions. To ensure quiet operation, maximum pressure drop should not exceed 45 kPa (0.45 bar).

$^2$ Only available in Combi Packs.

Quality Standards

All Danfoss radiator sensors and valves are manufactured in factories, assessed and certified by BSI against ISO 9001 / BS 5750.

Installing the RA-FS bi-directional valve

The RA-FS valve is bi-directional and can be installed horizontally or vertically in either the flow or return. A built in flow direction selection feature can be used to eliminate the risk of water hammer.

Close all radiator valves by turning the valve cap clockwise. Leave system to cool down.

Start boiler/heating.

Open a valve and determine flow direction. Which pipe heats up first?

Remove cap and turn setting ring (by hand).

Flow directions - straight valve

Flow directions - angle valve
Installing the living eco® sensor

living eco® is supplied with adapters for Danfoss RA valves and valves with M30X1.5 (K) connections (014G005100), two alkaline batteries and a 2 mm Allen key.

Insert the batteries
Remove the battery cover and insert the batteries. Make sure the batteries are correctly oriented.

Setting time and date for the first time

<table>
<thead>
<tr>
<th>Once the batteries are installed</th>
<th>Time will flash in the display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set time</td>
<td>Set hours using [3] and press [1]</td>
</tr>
<tr>
<td>Set minutes using [3] and press [1]</td>
<td></td>
</tr>
<tr>
<td>Set date</td>
<td>Set date using [3] and press [1], Day/month/year (DD/MM/YYYY)</td>
</tr>
<tr>
<td>Confirm settings</td>
<td>When ✔ flashes, press [1] to confirm</td>
</tr>
</tbody>
</table>

Mount the living eco® sensor

Pre-installed Programmes

- **P₀** Program with **no** automatic temperature reduction – maintains a constant temperature all day and night. You select the temperature.
- **P₁** Saving programme which **lowers** the temperature to 17°C at night (22:30 - 06:00 hrs). Saving programme is configurable.
- **P₂** Extended saving programme which **lowers** the temperature to 17°C at night (22:30 - 06:00 hrs), and during the day on weekdays (08:00 - 16:00 hrs). Saving programme is configurable.
- Holiday programme which **lowers** the temperature when you are away. You select the period and the temperature.

Dimensions

<table>
<thead>
<tr>
<th></th>
<th>109</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>106,5</td>
</tr>
<tr>
<td></td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss Heating Solutions and the Danfoss Heating Solutions logotype are trademarks of Danfoss A/S. All rights reserved.