

## Data Sheet

# living eco<sup>®</sup> sensors with bi-directional valves (Combi Packs)

### Application



living eco<sup>®</sup> sensor



RA-FS bi-directional valve  
- angle pattern



RLV-D Lockshield Valve

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

*living eco*<sup>®</sup> 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*<sup>®</sup> 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

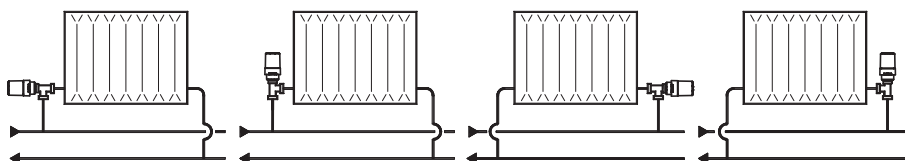
- Adaptive learning
- 7-day programmes with adjustable temperature set-backs and up to 3 set-back periods per day
- Battery lifetime: 2 years
- Min./max. temp. limitation
- Child lock
- Holiday function

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*<sup>®</sup> 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.

### System



**Ordering**

<b>Combi Pack</b>	<b>Code no.</b>
<i>living eco</i> ® sensor, RA-FS 8/10/15 straight bi-directional valve	<b>014G005400</b>
<i>living eco</i> ® sensor, RA-FS 8/10/15 angle bi-directional valve	<b>014G005500</b>
<i>living eco</i> ® sensor, RA-FS 8/10/15 straight bi-directional valve, lockshield valve	<b>014G006100</b>
<i>living eco</i> ® sensor, RA-FS 8/10/15 angle bi-directional valve, lockshield valve	<b>014G006200</b>

<b>Sensor</b>	<b>Code no.</b>
<i>living eco</i> ® sensor with adapters for Danfoss RA and valves with M30 x 1.5 mm connection	<b>014G005100</b>

<b>Valve</b>	<b>Code no.</b>
RA-FS 15 reverse angle valve, 15 mm inlet	<b>013G628100</b>
RA-FS 15 reverse angle valve, 8/10 mm inlet	<b>013G628300</b>

<b>Accessory</b>	<b>Code no.</b>
Adapter for RAV / RAVL valves	<b>014G025000</b>
Adapter for RA valves	<b>014G025100</b>
Adapter for valves with M30 x 1.5 mm connection	<b>014G025200</b>

**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 <i>living eco</i> ® sensor should not be used in hazardous installations or in places where it will be exposed to water.	

**RA-FS bi-directional valves**

Type	Design	Connection		k <sub>vs</sub>	Max. pressure <sup>1)</sup>			Max. temp.
		Inlet	Outlet		Work	Diff.	Test	
RA-FS 15 <sup>2)</sup>	Reverse angle	15 mm	½" BSP	0.73	10 bar	0.6 bar	16 bar	120°C
		8/10 mm						
RA-FS 15 <sup>2)</sup> push-fit	Reverse angle	10 mm	½" BSP	0.73	3 bar	0.6 bar	6 bar	92°C

<sup>1)</sup> 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).

<sup>2)</sup> 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.

<p>Close all radiator valves by turning the valve cap clockwise. Leave system to cool down.</p>	<p>Start boiler/heating.</p>	<p>Open a valve and determine flow direction. Which pipe heats up first?</p>	<p>Remove cap and turn setting ring (by hand).</p>
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Flow directions - straight valve		Flow directions - angle valve	

**Installing the living eco<sup>®</sup> sensor**

living eco<sup>®</sup> 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.

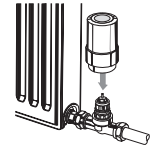


**Setting time and date for the first time**

Once the batteries are installed	Time will flash in the display
Set time	Set hours using  and press . Set minutes using  and press .
Set date	Set date using  and press . Day/month/year (DD/MM/YYYY).
Confirm settings	When  flashes, press  to confirm.

**Mount the living eco<sup>®</sup> sensor**

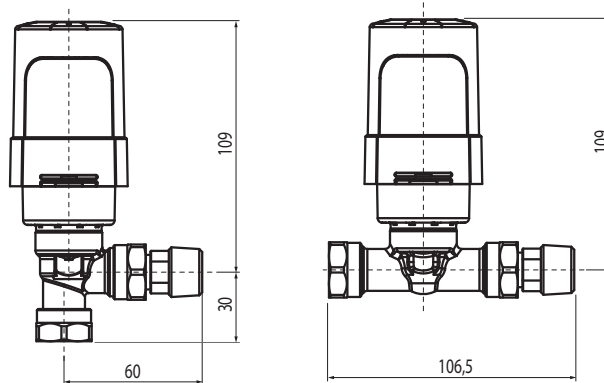
Mount a suitable adapter. Mount the living eco<sup>®</sup> sensor and tighten with the supplied Allen key. Press for approx. 3 seconds. When flashes, press again to fix the sensor.



**Pre-installed Programmes**

- P<sub>0</sub>** Programme with **no** automatic temperature reduction – maintains a constant temperature all day and night. You select the temperature.
- P<sub>1</sub>** Saving programme which **lowers** the temperature to 17°C at night (22:30 - 06:00 hrs). Saving programme is configurable.
- P<sub>2</sub>** 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**



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