Living HR

Extract air unit with integrated heat recovery



GB Installation instructions



Document in original language

209535-EN_GB 2015-03-18 A001

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1 Declaration of Conformity

Manufacturer



Systemair UAB Linų st. 101 LT–20174 Ukmergė, LITHUANIA Office: +370 340 60165 Fax: +370 340 60166 www.systemair.com

hereby confirms that the following products:

Heat recovery ventilation units: Living HR 15, Living HR 20, Living HR 25

comply with all applicable requirements in the following directives

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC

The following harmonized standards are applied in applicable parts:

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 13857	Safety of machinery – Safety distances to prevent hazard zones being reached by upper or lower limbs
EN 60204-1	Safety of machinery – Electrical equipment of machines – Part 1: General requirements
EN 60335-1	Household and similar electrical appliances – Safety Part 1: General requirements
EN 60335-2-40	Safety of household and similar electrical appliances - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
EN 50106:2007	Safety of household and similar appliances – Particular rules for routine tests referring to appliances under the scope of EN 60 335-1 and EN 60967
EN 60529	Degrees of protection provided by enclosures (IP Code)
EN 62233	Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-3	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standards for residential, commercial and light-industrial environments

(The declaration applies only to product in the condition it was delivered in and installed in the facility in accordance with the included installation instructions. The insurance does not cover components that are added or actions carried out subsequently on the product)

The complete technical documentation is available.

Ukmergė, 22–10–2014

Mats Sándor Technical Director

2 Warnings

The use of the equipment in the air handling unit can lead to serious mechanical or electrical danger as well as danger in relation to noise and vibrations.

To reduce the risk of these dangers involved, it is absolutely necessary to follow all instructions concerning safety, installation, operation and maintenance.

The following admonitions will be presented in the different sections of the document.

\land Danger

- Make sure that the Mains supply to the unit is disconnected before performing any maintenance or electrical work!
- All electrical connections must be carried out by an authorized installer and in accordance with local rules and regulations.

▲ Warning

- The door handles are lockable. Make sure that the handles are locked during operation of the unit.
- The unit must be duct connected or in some other way provided with protection so that it is not possible to come in contact with the fans through the duct connections.
- The unit is heavy. Be careful during transport and mounting. Risk of injury through pinching. Use protective clothing.
- Beware of sharp edges during mounting and maintenance. Make sure that a proper lifting device is used. Use protective clothing.
- Evaporators and condensers are pressure tested and sealed before leaving the factory. Such equipment must be installed by trained personnel, to avoid leakage.

▲ Important

- Duct connections/duct ends should be covered during storage and installation.
- Take care not to damage the water battery when connecting water pipes to connectors. Use a spanner to tighten the connection.
- · Condensate to be led away needs to be connected properly to the drain.

3 Product information

3.1 General

This installation manual concerns Living HR manufactured by Systemair UAB. Living HR include the following model options:

• Living HR 15, Living HR 20, Living HR 25.

This manual consists of basic information and recommendations concerning the design, installation, start-up and operation, to ensure a proper fail-free operation of the unit.

The key to proper and safe operating of the unit is to read this manual thoroughly, use the unit according to given guidelines and follow all safety requirements.

3.1.1 Left and Right model versions

There are two versions of each model, right (R) and left (L). The different versions are recognized by the placing of the internal components and the extract air inlet , which is situated on the right side of the right (R) unit and on the left side of the left (L) unit.

Note:

This documents describes the right (R) version models. The inside of the left (L) model is mirrored.

3.2 Technical data

3.2.1 Dimensions and weights

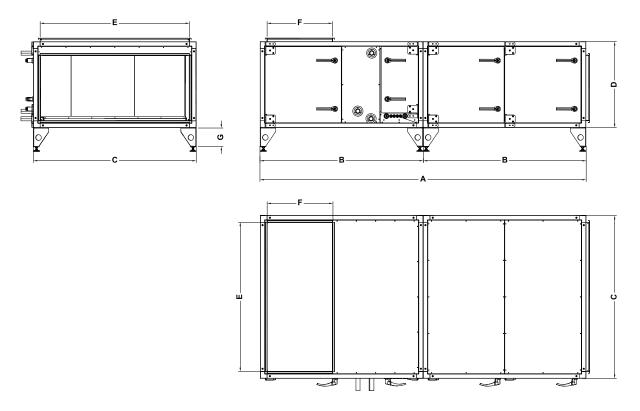


Fig. 1 Dimensions (mm) Living HR 15-25

Model	Α	В	С	D	Е	F	G
15	2240	1120	1120	595	1000	450	150
20	2540	1270	1270	670	1150	500	150
25	2540	1270	1270	745	1300	600	150

Table 1: Weights (kg)

Model	Coil section weight, kg	Air handling section weight, kg	Total weight, kg ¹	Total weight with roof, kg ²
15	135,5	121,5	257	328
20	169,5	159,5	329	411
25	194	178	372	463

1. Including dampers

2. with baseframe and without legs



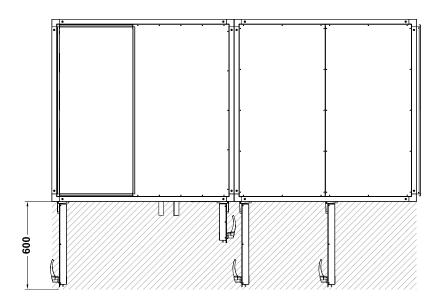


Fig. 2 Required space to open inspection doors

For service and inspection a free space (figure 2) is necessary on the inspection side of the unit. When changing components a free space corresponding to the width of the component in question is necessary.

3.2.2 Electrical data

Model	Voltage	Current (A)	Power (W)	Fuse
Living HR 15	230V 1N~, 50Hz	2,4	500	6A
Living HR 20	400V 3N~, 50Hz	4	2600	6A
Living HR 25	400V 3N~, 50Hz	4	2600	6A

4 Transport and Storage

Λ Warning

The unit is heavy. Be careful during transport and mounting. Risk of injury through pinching. Use protective clothing.

1 Important

During transportation the unit must be held in the upright position.

Loading and unloading as well as transport on the site is possible by fork-lift truck or by crane using suitable lifting straps.

The Living HR should be stored and transported in such a way that it is protected against physical damage that can harm panels, handles, display etc. It should be covered so that dust, rain and snow cannot enter and damage the unit and its components. The appliance is delivered in several sections that should be assembled on site. The appliance contains all necessary components, wrapped in plastic on a pallet for easy transportation.

Living HR unit must be protected from the weather and accidental impact. Plastic packaging must be removed and unit covered with tarpaulin or similar materials. In order to minimize condensation, sufficient air circulation must be ensured between the covering and the unit. During transportation the unit must be in the upright position.

Note:

Necessary parts like control panel, smoke sensor, handles, mounting feet, drainage pipe with drain trap and electrical safety switch are placed loosely inside the unit. The unit must not be put into operation before the enclosed parts are removed and installed properly.

4.1 Lifting/Unloading with forklift

When lifting with forklift trucks or pallet jacks, ensure that the forks go under the entire length of the box, otherwise the underside of the box may be damaged. During transportation the unit must be in the upright position.

The forks of the truck must be sufficiently long to avoid any damage to the AHU underside.

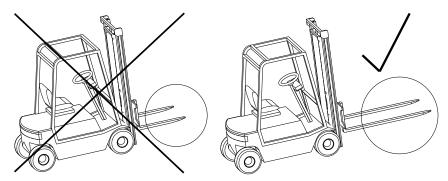


Fig. 3 Unloading with forklift

4.2 Lifting/Unloading with Crane

Living HR unit delivered with legs must be lifted by straps secured to the legs as shown in the illustration (figure 4). When lifting unit sections mounted on pallet or units mounted on a base frame, use metal tubes inserted through the holes in the frame and suspend the unit by soft cables (figure 5). Make sure that



the upper part of the unit will not be damaged. Be particularly aware that the cooling section have a high center of gravity because the compressor is positioned at the top of the cooling section.

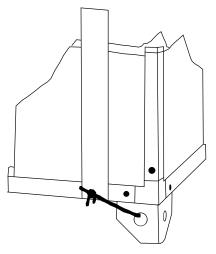


Fig. 4 Secured straps

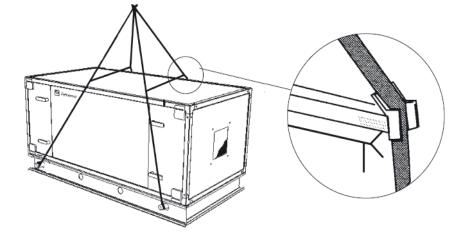


Fig. 5 Lifting by metal tubes

5 Installing the unit

5.1 Unpacking

Verify that all ordered equipment are delivered before starting the installation. Any discrepancies from the ordered equipment must be reported to the supplier of Systemair products.

5.2 Where to Install the Unit

The unit without roof is meant for indoor installation. The electronic components should not be exposed to lower temperature than -30° C or higher than $+50^{\circ}$ C.

When mounting; make sure to leave enough space to access the service doors (figure 2).

Note:

If there is not sufficient space to open the inspection doors it is possible to unscrew the hinges to remove the doors completely for inspection and maintenance.

Living HR



General maintenance includes replacing the filters and cleaning fan motor inside the unit.

Avoid placing the unit against a wall, as low frequency noise can cause vibrations in the wall.

The extract air should ideally be led out via a roof cowl away from any outdoor air intakes, windows, balconies etc.

▲ Warning

- The door handles are lockable. Make sure that the handles are locked during operation of the unit.
- The unit must be duct connected or in some other way provided with protection so that it is not possible to come in contact with the fans through the duct connections

5.3 Installation procedure

1

Prepare the surface where the unit is to be mounted. Make sure that the surface is flat, levelled, vibration free and that supports the weight of the unit.Perform the installation in accordance with local rules and regulations.

2

Make sure that the factory mounted rubber gaskets between the sections are undamaged.

🚹 Warning

Beware of sharp edges during mounting and maintenance. Make sure that a proper lifting device is used. Use protective clothing.

3

Position the sections directly in front of each other. Level the unit with help of the enclosed mounting feet to get the sections parallel and at the same height.

\land Important

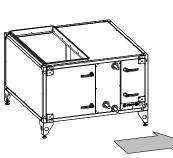
Make sure not to pinch loose cables.

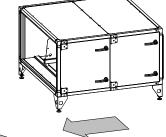
4

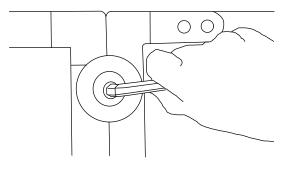
Lock the sections together with the disc-lock system. One disc-lock in every vertical part of the section corner is required. Place all 4 disc-locks loosely over the 2 factory mounted pins before fitting them properly. Lock the sections tightly together with the help of an Allen (hex) key.

\land Important

The disc-lock system must not be used to pull the sections together.







5

🗥 Warning
Make sure that the Mains supply to the unit is disconnected before performing any maintenance or electrical work!

 All electrical connections must be carried out by an authorized installer and in accordance with local rules and regulations.

Connect cables from the air handling section to corresponding connectors from the coil section. All connectors are different and can be connected only one way.

6

Install and connect all external components to the unit, for more information see: 6.6 *Installation of external components*, page 16.

7

/ Warning

The units electrical connection to the mains supply must be preceded by an all pole circuit breaker with a minimum 3 mm gap.

Connect the unit to the mains supply.

6 Connections

6.1 Duct connection principles

When Living HR heat pump section have been joined together with the air handling unit it should be in total 2 duct connections on the unit: Indoor Extract air and Exhaust air.

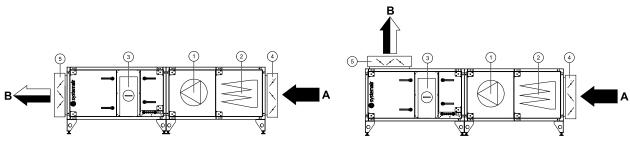


Fig. 6 Right hand connected unit, side and top connected

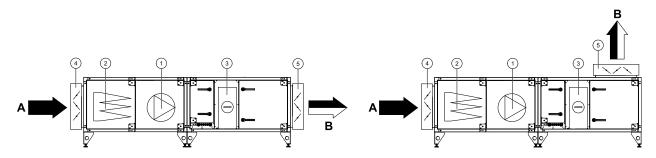


Fig. 7 Left hand connected unit, side and top connected

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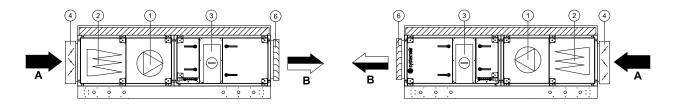


Fig. 8 Left and Right hand units with roof

Position	Position	Symbol	
А	Connection extract air		
В	Connection exhaust air		
1	Fan extract air		
2	Filters extract air		
3	Evaporator		
4	Extract air damper		
5	Exhaust air damper		
6	Exhaust air louvers		

6.2 Condensation and Heat Insulation

Extract and exhaust ducts must always be well insulated against condensation and heat loss. Correct insulation installation on ducts connected to the unit is especially important. All ducts installed in cold rooms/areas must be well insulated. Use insulating covering (minimum 100 mm mineral wool) with plastic diffusion barrier. In areas with extremely low outdoor temperatures during the winter, additional insulation must be installed. Total insulation thickness must be at least 150 mm.

▲ Caution

- If the unit is installed in a cold place make sure that all joints are covered with insulation.
- Duct connections/duct ends should be covered during storage and installation



6.3 Connections to condensation drainage

Sections in which condensation from components may occur are fitted with drain pan and condensate drain. Condensate drains should always be provided with properly designed trap with sufficient height difference. Each condensate drain must be equipped with traps with same diameter as the drain pipe.

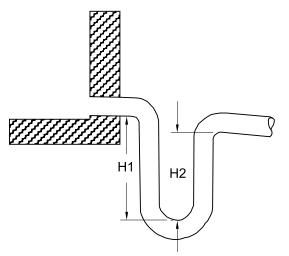


Fig. 9 Drain trap Positive pressure

Positive pressure (Pa)	H1 Min. (mm)	H2 (mm)
500	90	65
750	120	90
1000	150	120

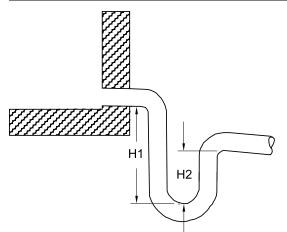
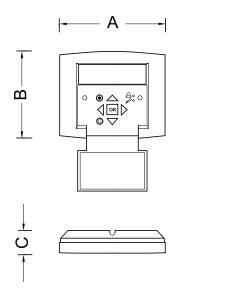


Fig. 10 Drain trap Negative pressure

Negative pressure (Pa)	H1 Min. (mm)	H2 (mm)
500	100	40
750	150	55
1000	190	70

6.4 Installing the Control Panel

6.4.1 Dimensions



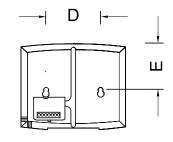


Fig. 11 Control panel dimensions

Position	Dimensions (mm)
A	115.0
В	94.0
С	26.0
D	c/c 60.0
E	50.5

6.4.2 General information

The control panel is delivered connected to the Corrigo control unit situated in the electrical connection box. Cable length is 10 m. In case the control panel needs to be detached from the signal cable it is possible to loosen the wires on the back of the control panel (figure 12).

A set of self-adhesive magnet strips are included in the package to facilitate installation on a metal surface.

6.4.3 Installation

1

Find an appropriate place to install the control panel. Maximum length between control panel and unit is 100 m.

2

If needed, drill two holes in the wall to hang the control panel (center to center: 60 mm) (pos.1, figure 12).

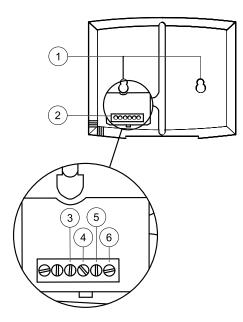


Fig. 12 Control panel wire connections

Position	Description
1	Mounting holes
2	Connection block
3	Connection to brown cable
4	Connection to yellow cable
5	Connection to white cable
6	Connection to black cable

6.5 Electrical connections

/ Danger

- All electrical connections must be carried out in accordance with local rules and regulations.
- Make sure that the Mains supply to the unit is disconnected before performing any maintenance or electrical work!

Living HRunits are delivered with enclosed control. Internal and external wiring is connected to terminals in the enclosed electrical connection box placed on the front of the unit.

The unit must not be put into operation before all the electrical safety precautions have been read and understood. See the enclosed wiring diagram for internal and external wiring.

All external connections to possible accessories and unit control are made to terminals inside the electrical connection box (table 2).

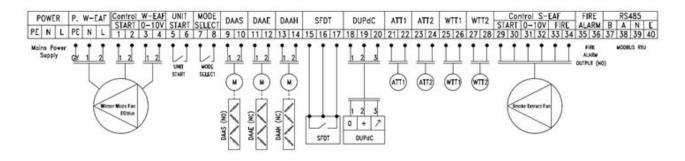


Fig. 13 Terminals

6.5.1 Description of terminals

Unit start

• To start the system terminals [5] and [6] should be shortened. System will operate while connection is present.

Mode select

System can operate in two basic modes:

- Summer mode (terminals [7], [8] open) Living HR unit is stopped. Smoke extract damper is open and smoke extract fan is running in controlled way to keep constant air pressure in the duct.
- Winter mode (terminals [7], [8] closed) Living HR unit is running to keep constant air pressure in the duct. Smoke damper is closed and smoke extract fan is stopped.

Fire alarm

• Fire alarm output (terminals [35], [36]) indicates if system is in fire mode.

Fire mode

- Fire mode activates if smoke is detected (smoke detector SFDT). In case of smoke Living HR unit stops and smoke extract fan activates at full speed (terminals [34], [35]).
- To reset the system to normal operation smoke detector has to be reset and "fire alarm" alarm acknowledged

Terminal			Description
POWER	PE		
	Ν		Mains power to the unit
	L		
POWER	PE		
W-EAF	Ν		Power for Winter mode fan
	L		
CONTROL	STA-	1	Start signal for Winter mode fan
W-EAF	RT	2	
	0-10	3	GND – Fan speed control
	V	4	0-10V – Fan speed control
UNIT START		5	Open – unit stopped;
		6	Closed – unit start;

Table 2: Electrical connections

Electrical connections cont'd

Terminal			Description							
MODE SELEC	т	7	Open – Summer mode							
		8	Closed – Winter mode							
DAAS		9	Smoke extract/Summer mode damper control							
		10								
DAAE		11	Extract air damper control							
		12								
DAAH	DAAH		Exhaust air damper control							
		14								
SFDT		15	Smoke detector [15] – Power smoke detector 24VAC (G)							
		16		[16] – Power smoke detector 24VAC (G0)						
		17		[17] – Smoke detector output ([15] 24VAC (G))						
DUPdC		18	Diff. Duct pressure transmitter	[18] – GND						
		19		[19] – 24V						
		20		[20] – 0-10V						
ATT1		21	Extract air temperature							
		22								
ATT2		23	Exhaust air temperature							
		24								
WTT1		25	Brine in temperature							
		26								
WTT2		27	Brine out temperature							
		28								
CONTROL S-EAF	STA- RT	29	Start signal for Smoke extract/Summer mode fan							
0 _/		30								
	0-10 V	31	GND – Fan speed control							
		32	0-10V – Fan speed control							
	FIRE	33 34	Fire mode initiation							
	MO- DE									
FIRE ALARM		35	Fire alarm output							
		36								
RC485/ EXOLINE	В	37	Modbus RTU/ Exoline connection							
	А	38								
	Ν	39	4							
	E	40								

6.6 Installation of external components

/ Danger

- Make sure that the Mains supply to the unit is disconnected before performing any maintenance or electrical work!
- All electrical connections must be carried out by an authorized installer and in accordance with local rules and regulations.

Living HR have in total 4 external components that are delivered loosely with the unit and must be connected manually:

- 1. Differential pressure transmitter on duct (DUPdT);
- 2. Fire/Smoke fan (optional, needs to be ordered separately);
- 3. Fire/Smoke sensor (SFDT);
- 4. Fire/Smoke damper actuator (DAAS) (optional, needs to be ordered separately);

Other sensors are built in to the unit.

Differential pressure transmitter (DPT) on duct (DUPdT)

Use DPT supplied together with the unit. Probe of DPT (pos 1) must be installed before duct intersection (pos 2). Connect it to the control unit with three-wire cable according to attached wiring diagram.

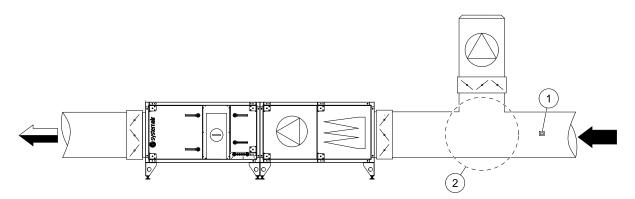


Fig. 14 Differential pressure transmitter installation location

Fire/Smoke fan

Note:

Fire/Smoke fan needs external power supply. Unit provides only control functions.

Connect it to the control unit with six-wire cable according to attached wiring diagram.

Fire/Smoke sensor (SFDT)

Use Fire/Smoke sensor supplied together with the unit. The sensor must be mounted in the duct before fire/smoke damper B. Connect it to the control unit with four-wire cable according to attached wiring diagram.

Fire/Smoke damper actuator (DAAS)

Connect it to the control unit with two-wire cable according to attached wiring diagram.

6.7 Additional Equipment

For information concerning additional external equipment such as valve actuators, motorized dampers, E-tool, roof units, wall grilles etc. see technical catalogue and their enclosed instructions.

For electrical connections of external components see enclosed wiring chart.

7 Commissioning record

7.1 Commissioning Instructions

Systemair assemblies are tested and function tested at the factory before delivery. A thorough inspection of the unit is done by the manufacturer. The unit should still be checked again by an electrician before deployment.

It is important that any changes to settings are recorded in the commissioning protocol.

Before starting the unit

- The unit is delivered in sections, fitted with quick connectors for the control and motor cables between each section. Make sure that these couplings are connected.
- The unit is supplied with a master switch, which is also the point at which the electrician will connect the unit to the mains supply. Check voltage measure between all phases and between all phases and ground.
- **Differential pressure transmitter** supplied together with the unit. Probe of DPT must be installed before duct intersection. Connect it to the control unit with three-wire cable according to attached wiring diagram.
- Fire/Smoke sensor supplied together with the unit. Connect it to the control unit with four-wire cable according to attached wiring diagram
- **Control panel with display** is included with the delivery (pickled in the cabinet) and shall be connected to the bus cable.

Turn on main switch and fuses in the electrical cabinet. Wait a few minutes while the control panel loads all the values. Any error messages are shown on the display.

The unit should now be ready to start.

7.2 General

Company:

Responsible:

Customer:	Date:	Installation:
Object/unit:	Item no:	Installation address:
Model/size	Serial no:	Designation:

7.2.1 Installation control

Moment	Done	Note
All unit parts undamaged.		
Installation carried out according to instructions (see 5.3 <i>Installation procedure</i> , page 8).		
Condensation drain connected.		
All external cables connected and sensors installed in appropriate locations (see 6.6 <i>Installation of external components</i> , page 16).		
Mains supply connected via the Safety switch.		

7.2.2 Heat recovery operation control

Moment	Done	Note
Start the unit. Check the control panel for any alarms		
Run the unit for at least 10 minutes		Extract air temperature°C
If unit working conditions are stable, read the Extract, Exhaust air temperature via Corrigo display		Exhaust air temperature °C
Read brine in and brine out temperatures		Brine in temperature °C
		Brine out temperature °C

Notes:

7.3 Commissioning protocol

 \square

Time and date set:

Function	Default settings		Set value			
Running mode	Auto	\boxtimes	Auto			
	Manual normal		Manual normal			
	Set point:	300 Pa	Pa			
	Manual Reduced		Manual Reduced			
	Set point:	250 Pa	Pa			
	Off		Off			

Setting the weekly program

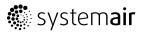
- Times for normal and reduced fan speed is factory set as shown below.
- Period 1. 07:00 to 16:00 Monday to Friday, normal fan speed. 00:00 to 00:00 Saturday-Sunday and holidays.
- Period 2. 00:00 to 00:00 Monday to Sunday and public holidays. 00:00 to 00:00 off period.
- **OBS!** Normal fan speed has priority over a reduced fan speed.

Weekday	Period	Normal fan speed	Reduced fan speed
Monday	1	: – :	: _ :
	2	: :	
Tuesday	1	: :	
	2	: :	
Wednesday	1	: :	
	2	: :	
Thursday	1	: :	
	2	: :	
Friday	1	: :	
	2	: :	
Saturday	1	: :	
	2	: :	
Sunday	1	: :	
	2	: :	

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Holiday (month.day)			Holiday (month.day)				Holiday (month.day)				Holiday (month.day)				
1.		_		7.		_		13.		_		19.		_	
2.			- <u>-</u>	8.		_		14.		_		20.			
3.			- <u>-</u>	9.		_		15.		_		21.			
4.			- <u>-</u>	10.		_		16.		_		22.			
5.				11.		_		17.		_	•	23.			
6.				12.				18.		_		24.			
_								-							

Systemair AB reserves the right to make changes and improvements to the contents of this manual without prior notice.



Systemair UAB Linų st. 101 LT–20174 Ukmergė, LITHUANIA Phone +370 340 60165 Fax +370 340 60166 www.systemair.com