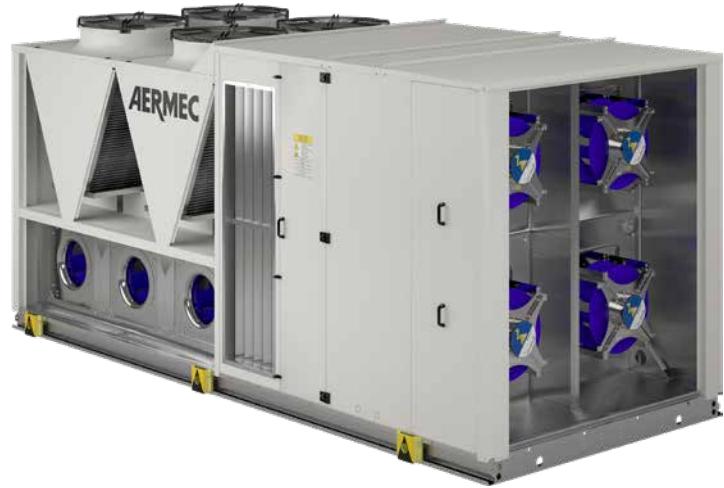


# RTX-17-23

**Roof-Top for applications in medium crowded**

Cooling capacity 151 ÷ 307 kW  
Heating capacity 152 ÷ 310 kW

- For medium crowding applications
- Thermodynamic heat recovery
- Handling section with plug fan coupled with BRUSHLESS EC motors
- Free cooling / Enthalpy free cooling



## DESCRIPTION

Independent Roof-top type air cooled air conditioner, for treatment, filtration and renewal of the air, based on the chosen configuration.

The RTX 09-16 units are designed for installation in places with an average degree of crowding such as shopping centres, shops, offices and production sites, as operation uses 30% outside expelled air (versions MB3 and MB4). Depending on the version and the accessories chosen, the unit can man-

age free cooling mode. Versions MB3 and MB4 feature the thermodynamic recovery of the energy contained in the exhaust air, leading to higher performance and efficiency levels.

## VERSIONS

<b>F</b>	Cooling only
<b>H</b>	Heat pump.

The double flow and exhaust ventilating cross-section allows for partial free-cooling.

As for the MB3 version, it has the thermodynamic recovery function.

### Advantages of thermodynamic recovery (MB3 - MB4 version):

- Energy recovery from the exhaust air flow that would otherwise be lost
- No further components are introduced and, therefore, there are no additional pressure drops
- Cooling circuit functioning with heat sources at more advantageous temperatures
- Reduction of defrosting cycles
- Increase in thermal and cooling efficiency
- Efficiency increase (EER/COP)

## FEATURES

- 2 cooling circuits with electronic thermostatic expansion valve;
- Scroll compressors (UNEVEN tandem) with high capacity and low electrical power consumption;
- Finned pack direct expansion internal and external exchangers;
- Plug fan type (EC) flow and exhaust fans (if any). The impellers are facing so as to ensure that the air flows through all the internal components with minimum noise;
- Axial fan unit for extremely silent functioning positioned on the condensing section.
- Filter with 55% COARSE efficiency (according to EN ISO 16890) on the fresh air flow; Also available: compact filter with ePM1 50% efficiency (according to EN ISO 16890). Positioning upstream of the components to be protected to ensure low pressure drops, having a large surface. Air quality control systems are also available (VOC and CO<sub>2</sub> probe);
- The structure consists of a galvanised sheet metal base, frame in galvanised sheet metal shaped profiles powder coated in RAL9003

## CONFIGURATIONS

### MB1: Single ventilating cross-section for recovery air.

Recovery air only configuration where no fresh air is required.

The useful flow and recovery static pressure is provided by the flow ventilating cross-section.

### MB2: Single ventilating cross-section for recovery and external air.

Recovery and external air configuration. The useful flow and recovery static pressure is provided by the flow ventilating cross-section.

The presence of the recirculation damper (optional) allows for total free-cooling (100% external air).

If there are no extraction systems, the room will be in overpressure.

### MB3: double ventilating cross-section (flow and return) for recovery air, external air and exhaust air, thermodynamic recovery.

Recovery, external and exhaust air configuration. The flow ventilating cross-section provides the useful flow static pressure while the recovery ventilating cross-section provides the useful recovery static pressure.

The double flow and recovery ventilating cross-section allows for total free-cooling (100% external air) without the need for a dedicated extraction system. The room overpressure or depression can be obtained by unbalancing the flow rates.

Thermodynamic recovery is performed by conveying expelled air on the external heat exchanger.

### MB4: double ventilating cross-section (flow and expulsion) for recovery air, external air and exhaust air, thermodynamic recovery.

Recovery, external and exhaust air configuration. The flow ventilating cross-section provides the flow and recovery useful static pressure. The exhaust ventilating cross-section only controls the air flow rate to be expelled, with consequent reduction of the installed ventilation power.

(self-bearing structure), pre-painted sheet metal panels (external) insulated with 28kg/mc dense adhesive insulation and sandwich type panels insulated with 25 mm thick 45kg/mc polyurethane, eco-friendly "GWP 0" (Global Warming Potential);

— The casing, designed to allow the internal components to be accessed for routine and extraordinary maintenance.

## CONTROL

Microprocessor control able to manage the different functioning modes, ensuring maximum energy savings in any conditions of use. Interfaces to connect to remote supervision and control systems available as options.

## FUNCTIONALITY AND TECHNOLOGICAL ADVANTAGES

RTX units are designed with the aim of reducing the energy consumption that subsequently dictated the technological choices made on the unit we will now introduce in brief.

### Very high ventilation efficiency

As ventilation is one of the major power consumption factors, we dedicated particular attention to designing and constructing the ventilation system. State-of-the-art plug fans with EC brushless motors have been used both in flow and in recovery (if any), which enable high performance and reduced consumption. Furthermore, compared to conventional centrifugal fans, they have no belts or pulleys, thus facilitating flow rate adjustment and resulting in compactness, versatility and easy maintenance.

Special adaptive logic allows you to adjust the air flow rate to actual system demand with further resulting advantages in terms of consumption reduction.

Axial fans for the external section of the unit are helical. Electronic condensation control is available as an accessory, which regulates fan speed based on the load required, allowing for noise reduction. As an option, the motors can have electronic control (EC) to reduce consumption even in the condensing part.

### Maximum seasonal efficiency

To improve the efficiency of the cooling circuit, tandem scroll compressors of different power levels are used (UNEVEN compressors on all sizes). This distinctive trait, combined with the use of next generation fans, means reduced consumption and enhanced adaptability to system requests (particularly in partial load operation), guaranteeing boosted seasonal efficiency levels.

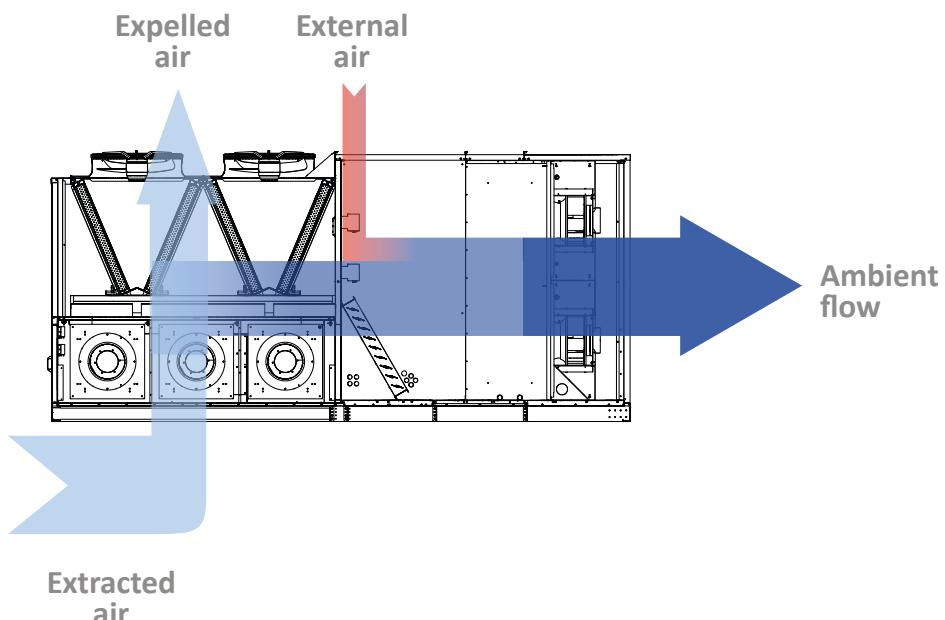
### Room air quality

Special attention has been paid to the quality of the air in the room, entrusted to filters that ensure 55% COARSE efficiency as standard. There is also the option of F7, F9 or electronic filters on the fresh air flow.

### Active thermodynamic recovery

In the MB3-MB4 configuration, the unit with thermodynamic recovery function also takes advantage of the energy contained in the exhaust air, which would otherwise be lost; this ensures better performance and efficiency. All of these technological advantages are controlled by a thermoregulation that is able to manage the different functioning modes, ensuring maximum energy savings in all conditions of use via dedicated software.

## MB3 CONFIGURATION WITH TWIN FAN SECTION FOR RECIRCULATION AIR, OUTSIDE AIR AND EXHAUST AIR. TOTAL FREE COOLING FUNCTION (WITH 100% OUTSIDE AIR) AND THERMODYNAMIC RECOVERY FUNCTION AS STANDARD.



## ACCESSORIES

**AXEC:** Axial fans with EC motors with speed control function according to the pressure of condensation and evaporation.

**AXECP:** EC axial fans with available useful static pressure.

**BAC:** Interface card BACnet MS/TP pConet.

**BE:** Electric heating coil 2 stages.

**BEM:** Modulating electric heating coil.

**BIP:** Interface card Ethernet-pCOweb (BACNET IP)

**BPGC:** After heating coil with hot gas.

**BW:** 2-rows-heating coil with hot water.

**BWV2V:** 2 -rows -heating coil with hot water, with 2-way modulating valve.

**BWV3V:** 2-rows heating coil with hot water, with 3-way modulating valve.

**CA:** Waterproof covers on external air intake.

**CF:** Flue, only on unit with gas burner module.

**CUR:** Humidification control (humidity probe in recovery, limit humidity probe in supply, contact ON/OFF and modulating analog output).

**DCPR:** AC fans with pressure switch device of speed control function of the pressure of condensation and evaporation.

**DP:** Dehumidification control (humidity probe in recovery) and of after-heating (if present).

**FCT:** Partial Temperature Free-Cooling for MB2, MB4 versions.

**FT7:** F7 efficiency pocket filters positioned on the supply air flow.

**FT9:** Pocket filters F9 efficiency placed on the flow of supply air.

**FTE:** Electronic filters placed on the flow of supply air.

**FTH:** Enthalpy free-cooling.

**GP:** External coil protection grid.

**Gx:** Heating module with gas burner.

**LFX:** Device with photocatalytic effect.

**LW:** Interface card LonWorks.

**MAN:** High and low pressure gauges.

**MSSM:** Flow silencer module, only for rear flow.

**MSSR:** Recovery silencer module, only for rear air recovery.  
**PRT1:** Wall/recessed (up to 50 m) remote control panel.  
**PRT2:** Wall/recessed (up to 200 m) remote control panel.  
**PSFT:** Differential pressure switch signalling dirty filters.  
**PSTEP:** Adjusting constant flow, step flow in function of the modulation of the cooling circuit.  
**RF:** Smoke detector.  
**RFC:** Smoke detector and damper management.  
**RS:** Serial card BMS RS485.

**SCM:** Modulating servo-controls (standard on MB3 model or if temperature or enthalpic free-cooling is present).  
**SCMRM:** Modulating Servo-control with spring return.  
**SCO2:** Probe CO<sub>2</sub> (not available on MB1 fittings).  
**STA:** Room temperature probe  
**SUA:** Room humidity probe.  
**SVOC:** Probe VOC (not available on MB1 fittings).  
**UP:** Manufacturer of immersed electrodes supplied and steam ramp installed.  
**VT:** Antivibration mounts.

## PERFORMANCE SPECIFICATIONS

### MB1

Size	17	18	19	20	21	22	23
<b>Configuration: MB1</b>							
<b>Cooling performances (1)</b>							
Cooling capacity	kW	151,90	170,10	191,70	213,30	231,70	246,10
Sensible cooling capacity	kW	114,30	125,40	136,10	151,60	164,70	178,50
Compressors absorbed power	kW	32,70	39,20	45,30	54,00	60,70	69,00
EER compressors		4,65	4,34	4,23	3,95	3,82	3,57
<b>Heating performances (2)</b>							
Heating capacity	kW	152,70	170,80	192,80	216,20	230,80	245,50
Compressors absorbed power	kW	28,20	33,90	39,20	43,90	46,30	51,20
Compressor COP		5,41	5,04	4,92	4,92	4,98	4,79

(1) Ambient air 27°C d.b./19°C w.b.; External air 35°C/24°C w.b.; Functioning with 30% of external and expelled air.  
(2) Ambient air 20°C D.B./15°C W.B.; Outside air 7°C D.B./6°C W.B. (EN14511); Operation with 30% outside and expelled air.

### MB2

Size	17	18	19	20	21	22	23
<b>Configuration: MB2</b>							
<b>Cooling performances (1)</b>							
Cooling capacity	kW	160,20	179,40	201,80	224,60	243,90	258,90
Sensible cooling capacity	kW	120,90	132,60	143,20	159,70	173,50	188,30
Compressors absorbed power	kW	33,10	39,50	45,60	54,60	61,60	69,80
EER compressors		4,84	4,54	4,43	4,11	3,96	3,71
<b>Heating performances (2)</b>							
Heating capacity	kW	155,10	174,20	195,50	219,50	234,00	248,60
Compressors absorbed power	kW	25,80	31,10	35,70	40,40	42,50	47,00
Compressor COP		6,01	5,60	5,48	5,43	5,51	5,29

(1) Ambient air 27°C d.b./19°C w.b.; External air 35°C/24°C w.b.; Functioning with 30% of external and expelled air.  
(2) Ambient air 20°C D.B./15°C W.B.; Outside air 7°C D.B./6°C W.B. (EN14511); Operation with 30% outside and expelled air.

### MB3

Size	17	18	19	20	21	22	23
<b>Configuration: MB3</b>							
<b>Cooling performances (1)</b>							
Cooling capacity	kW	161,30	181,10	203,70	226,90	246,70	262,10
Sensible cooling capacity	kW	121,30	133,30	143,80	160,50	174,50	189,20
Compressors absorbed power	kW	32,50	38,80	44,50	53,20	59,90	67,70
EER compressors		4,96	4,67	4,58	4,27	4,12	3,87
<b>Heating performances (2)</b>							
Heating capacity	kW	159,10	179,00	202,30	227,70	243,60	259,90
Compressors absorbed power	kW	26,20	31,40	36,30	41,00	43,30	47,90
Compressor COP		6,07	5,70	5,57	5,55	5,63	5,43

(1) Ambient air 27°C d.b./19°C w.b.; External air 35°C/24°C w.b.; Functioning with 30% of external and expelled air.  
(2) Ambient air 20°C D.B./15°C W.B.; Outside air 7°C D.B./6°C W.B. (EN14511); Operation with 30% outside and expelled air.

### MB4

Size	17	18	19	20	21	22	23
<b>Configuration: MB4</b>							
<b>Cooling performances (1)</b>							
Cooling capacity	kW	161,30	181,10	203,70	226,90	246,70	262,10
Sensible cooling capacity	kW	121,30	133,30	143,80	160,50	174,50	189,20
Compressors absorbed power	kW	32,50	38,80	44,50	53,20	59,90	67,70
EER compressors		4,96	4,67	4,58	4,27	4,12	3,87
<b>Heating performances (2)</b>							
Heating capacity	kW	159,10	179,00	202,30	227,70	243,60	259,90
Compressors absorbed power	kW	26,20	31,40	36,30	41,00	43,30	47,90
Compressor COP		6,07	5,70	5,57	5,55	5,63	5,43

(1) Ambient air 27°C d.b./19°C w.b.; External air 35°C/24°C w.b.; Functioning with 30% of external and expelled air.  
(2) Ambient air 20°C D.B./15°C W.B.; Outside air 7°C D.B./6°C W.B. (EN14511); Operation with 30% outside and expelled air.

## ENERGY INDEX

Size	17	18	19	20	21	22	23	
<b>Energy index</b>								
SEER	W/W	4,01	3,94	4,18	3,92	4,15	3,94	3,85
$\eta_{sc}$	%	157.6%	154.6%	164.3%	153.8%	162.9%	154.5%	150.9%
Pdesignh	kW	89	98	109	123	130	141	168
SCOP	W/W	3,47	3,31	3,45	3,36	3,49	3,43	3,26
$\eta_{sh}$	%	135.7%	129.4%	134.8%	131.5%	136.4%	134.2%	127.3%

## GENERAL TECHNICAL DATA

Size	17	18	19	20	21	22	23
<b>Power supply</b>							
Power supply	V/Ph/Hz	400V~3 50Hz					
<b>Compressor</b>							
Type	type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Number	no.	4	4	4	4	4	4
Circuits	no.	2	2	2	2	2	2
Refrigerant	type	R410A	R410A	R410A	R410A	R410A	R410A
Partialisation step	no.	6	6	6	6	6	6

## FANS

### External fans

Size	17	18	19	20	21	22	23
<b>Configuration: MB1, MB2, MB3, MB4</b>							
External fans							

Type	type	Assiali AC					
Number	no.	4	4	4	4	4	4

### Internal fans

Size	17	18	19	20	21	22	23
<b>Configuration: MB1, MB2, MB3, MB4</b>							
Internal fans							

Nominal air flow rate	$m^3/h$	26.000	29.000	33.000	37.000	40.000	44.000	48.000
Minimum air flow rate	$m^3/h$	18.200	20.300	23.100	25.900	28.000	30.800	33.600
Maximum air flow rate	$m^3/h$	36.000	36.000	44.000	44.000	53.000	53.000	53.000

### Internal recovery fans

Size	17	18	19	20	21	22	23
<b>Configuration: MB3</b>							
Recovery							

Type	type	RAD EC					
Number	no.	3	3	3	3	3	3

### Expulsion fan

Size	17	18	19	20	21	22	23
<b>Configuration: MB4</b>							
Exhaust							

Type	type	RAD EC					
Number	no.	2	2	2	2	2	2

### Internal flow fans

Size	17	18	19	20	21	22	23
<b>Configuration: MB1</b>							
Delivery							

Type	type	RAD EC					
Number	no.	2	2	3	3	3	4
Maximum useful head (1)	Pa	700	475	520	580	520	690
High static pressure (EN14511) (1)	Pa	350	350	350	350	350	350

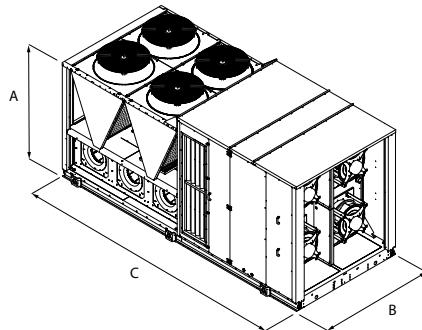
(1) At the nominal/maximum flow rate with a new, clean air filter.

Size	17	18	19	20	21	22	23
<b>Configuration: MB2, MB3, MB4</b>							
Delivery							

Type	type	RAD EC					
Number	no.	2	2	3	3	4	4
Maximum useful head (1)	Pa	519	341	330	470	460	636
High static pressure (EN14511) (1)	Pa	350	350	350	350	350	350

(1) At the nominal/maximum flow rate with a new, clean air filter.

## DIMENSIONS



Size	17	18	19	20	21	22	23
<b>Dimensions and weights</b>							
A	mm	2.430	2.430	2.430	2.430	2.430	2.430
B	mm	2.200	2.200	2.200	2.200	2.200	2.200
C	mm	5.210	5.210	5.210	5.210	7.750	7.750

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**Aermec S.p.A.**  
 Via Roma, 996 - 37040 Bevilacqua (VR) - Italia  
 Tel. 0442633111 - Telefax 044293577  
[www.aermec.com](http://www.aermec.com)