

NRV

MODULAR CHILLERS FEATURING INTEGRATED FREE COOLING OPERATION



The most compact free cooling chiller
Modular design
High efficiency and redundancy levels



The compact modular free cooler

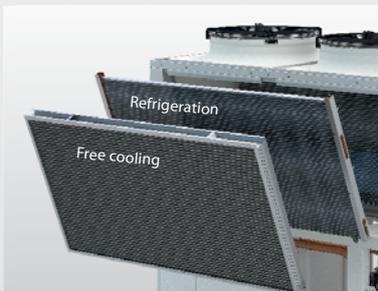
A fast changing world is asking for new and intelligent solutions. An increased need for lower energy consumptions and reduced carbon footprints comes hand in hand with a search for solutions which adapt to Users' continuously changing needs. All this with a desire for guaranteed performance at all times without downtimes, mated with simple and quick maintenance.

NRV offers all these benefits, thanks to unique design solutions and a modular configuration allowing multiple NRV modules to be effortlessly interconnected.



Efficient & ecological

NRV features twin scroll compressors within a single refrigeration circuit, optimizing efficiency especially at partial loads. The microchannel condensers allow a 40% lower charge of zero ODP R410A refrigerant. A free source of hot water is available using the desuperheater option.



Integral free cooling coils

Guaranteed peace of mind

Every module, prior to leaving the factory, goes through a functionality and a performance test at AERMEC's certified climatic test chamber. AERMEC's unmatched dedication to quality ensures that every unit leaves the factory ready for use. Factory witness tests are available upon request.



Aermec's advanced test facilities

Easy to install, easy to use

NRV easily fits through doors and into elevators. Quick connect couplings between the onboard headers allow for quick and easy installation. With a standard ambient operating range of -10°C (-20°C for freecooling version) to 46°C, NRV can be applied to nearly any application.



Fits through doors and into elevators

Quick and easy servicing

NRV service access is from the ends of the unit, allowing in-row servicing of a module without interrupting adjacent modules. Each unit features chilled water and refrigeration circuit isolation valves for ease of service. Condenser filters keep coils clean and operating efficiently.



Hinged electrical panel

Advanced user friendly control

The Multichiller microprocessor controller optimizes the operation of mechanical cooling and free cooling to ensure lowest overall energy consumptions. NRV allows Bacnet, ModBus and LON serial connection, as well as Double set point programming.



User friendly microprocessor

Lowest noise levels

NRV provides a solution to noise sensitive applications. Extensive acoustical testing has allowed sound level reductions through compressor enclosures and specially designed low noise inverter driven fans. The Night Mode program offers significant noise reductions during crucial night hours.



Enclosed compressor compartment

Multiply your benefit

NRV allows you to multiply your benefits when applying multiple modules together. All the notable advantages of the single NRV module are retained and transformed into a unique solution which perfectly combines the plus points of both a single large free cooling chiller and multiple smaller units.

Highest safety and redundancy, excellent energy efficiency and an extremely flexible solution truly meet any and all User needs. Furthermore multiple NRV modules retain a 100% free cooling capacity, and add no added dimensions despite the modular concept.





All the benefits of a single large chiller

When interconnecting multiple NRV modules you obtain all the benefits of a single large chiller of up to 970 kW. As many as 9 modules can be interconnected to a single microprocessor controller, transforming NRV into a single unit with 18 compressors within 9 refrigeration circuits, plus 9 independent free cooling circuits. The microprocessor manages and optimizes these to perfectly achieve the desired temperatures whilst modulating partial load savings across the multiple cooling steps. Quick and easy hydraulic interconnection using quick connect couplings offer fast installation. The single modules can be placed against each other thereby taking up no more space than a single larger chiller.

All the benefits of multiple smaller chillers

Each NRV module within a multiple connection is still able to act fully independently. Each module features its own electrical connection and main switch, in the unlikely event of any malfunction within a single module it can be easily isolated from the others, which can then continue to operate as the faulty module is repaired. NRV also offers scalability, further modules can be simply added at a later date as and when capacity requirements increase.

Highest redundancy offers even greater peace of mind

Multiple NRV modules offer total peace of mind. Beyond the safety of multiple compressors, refrigeration circuits, free cooling circuits and electrical panels, if desired it is even possible to add a further module to act as a safety back-up; in this case full performance is guaranteed even if a single module fails, which can be repaired whilst the unit is running.

Even higher energy efficiency

NRV's leading energy efficiency characteristics are fully exploited in modular configurations. As each module features its own integrated free cooling section so multi-module units maintain a 100% free cooling capacity. And thanks to multiple compressors (2 per module, so 18 for a 9 module configuration offering 5,5% cooling steps) NRV can perfectly partialize its performance, including free cooling, with a single advanced microprocessor managing the process with optimal precision.

Features

NRV is made of independent 108kW, modules which can be connected together up to 970kW cooling capacity. Every single module is an external chiller producing chilled water with high efficiency scroll compressors, axial fans, microchannel coils, system side plate heat exchanger. Units with the desuperheater option can also produce hot water for free. The base, the structure and the panels are made of treated galvanised steel with rustproof polyester paint.

With NRV it is possible to couple up to 9 chillers designed to reduce overall unit dimensions to a minimum. This modularity adapts the installation to actual system development requirements. This way, the cooling capacity can be increased over time in a simple and economic manner. To respond to multiple system requirements, a Free cooling version is also available, particularly indicated if the requirement for chilled water is significant even during the winter period. In fact, the greater the difference between the outside air and requested water temperature, the greater the economical advantage of using freecooling.

Models

NRV_° Cooling Only

NRV_F Free cooling

Versions

NRV_A High Efficiency

NRV_E High Efficiency Silenced

Operating range:

Operation at up to 46°C outdoor air temperature at full load.

- NRV is made up of cooling circuits. The careful choice of components, the particular configuration and the option of connecting multiple independent modules and managing them as if they were a single unit, allows maximum yield at full load, but also with partial loads thanks to the partialisation steps that increase as the connected modules increases, ensuring continual adaptation to actual system requests.
- The electrical control panel, present in every unit, together with the control logic implemented, allows each module to operate in synergy with the others, whilst ensuring continued operation if one or more modules fail. Modularity is essential for component redundancy, as it allows a safer system design and increased reliability.
- The modules are easy to install and connect to each other from a hydraulic standpoint, thanks to the connections with grooved joints.
- The chiller module uses aluminium microchannel coils, ensuring very high

levels of efficiency. These coils use less refrigerant compared to traditional copper/aluminium coils.

- NRV is already equipped with a water filter, differential pressure switch and butterfly check valves, useful to cut off the hydraulic circuit for maintenance; for instance, to clean the filter. In the event of variable flow rate, the motorised hydronic valves can intercept one or more modules to reduce the flow rate in low heat load conditions.

- The microprocessor, with keyboard and LCD display, allows easy consultation and intervention on the unit via a menu, available in several languages. Adjustment includes complete management of the alarms and their log.
- The presence of a programmable timer allows operation time bands setting and programming of a possible second set-point.
- The temperature control takes place with the integral proportional logic, based on the water outlet temperature.
- With night Mode it is possible to set a silent mode profile. Perfect for night operation, it guarantees greater acoustic comfort, nonetheless offering, a high efficiency in the time of greater load.

Night Mode is standard in the unit with J inverter fan, in the E silenced version and freecooling versions. Either a DCPX or inverter fan is necessary for the High Efficiency version.

Accessories

- **AER485P1**: RS-485 interface for supervising systems with MODBUS protocol.
- **PGD1**: Allows you to control the chiller at a distance.
- **MULTICHILLER_PCO**: Control, switch-on and switch-off system of the individual chillers when multiple units are installed in parallel, always ensuring constant flow rate to the evaporators.
- **DCPX**: Condensation temperature control device with continuous

modulation of the fan speed via pressure transducer. Standard supplied in silenced versions and in units with Desuperheater

- **GPNYB_BACK**: kit with 1 anti-intrusion grid for the short side of the unit.
- **GPNYB_SIDE**: kit with 2 anti-intrusion grids for the long side of the unit. Accessories mounted in the factory;
- **DRE**: Plate peak current reduction electronic device.
- **REF**: Current power factor correction. Connected in parallel to the motor, it

allows a reduction of the input current (approx. 10%).

- **KNYB**: Pair of caps with grooved joints assembled on the unit manifold.
- **KREC**: Accessory kit to remote the electric power supply input to the back (see documents)

COMPATIBILITY with VMF SYSTEM

For further information on system, refer to specific documentation.

Select your NRV unit

By appropriately combining the variety of options available, every model can be configured in order to meet all specific system requirements.

Field	Description
1,2,3	NRV
4,5,6,7	Size 0550
8	Scope of application <ul style="list-style-type: none"> ° Mechanical Thermostatic Valve (produced water up to +4?) X Electronic Thermostatic Valve
9	Model <ul style="list-style-type: none"> ° Cooling Only F Free cooling
10	Heat recovery <ul style="list-style-type: none"> ° Without Heat Recovery D With Desuperheater:
11	Version <ul style="list-style-type: none"> A High Efficiency E Silenced High Efficiency

Field	Description	
12	Condensing Coils <ul style="list-style-type: none"> ° Aluminium micro-channel O Aluminium micro-channel with cataphoresis treatment R Copper - Copper S Copper - Thinned V Painted Aluminium Copper 	Free Cooling Water Coils Copper Aluminium Copper Aluminium Painted Copper - Copper Copper - Thinned Painted Aluminium Copper
13	Fans <ul style="list-style-type: none"> ° Standard J Inverter 	
14	Power supply <ul style="list-style-type: none"> ° 400V/3/50Hz with magnet circuit breakers 	
15-16	Integrated hydronic kit <ul style="list-style-type: none"> 00 Without hydronic kit 	

(1) The DCPX is unnecessary with the "J" fan

NRV mod. standard		0550A	0550E
Cooling capacity	kW	108,1	103,5
Input power	kW	34,9	36,3
EER	W/W	3,10	2,85
ESEER	W/W	4,10	4,06
Eurovent Class during cooling function		A	C
Water flow rate	l/h	18646	17862
Head drops	kPa	32	30

NRV mod. free cooling		0550FA	0550FE
Cooling capacity	kW	105,4	99,9
Input power	kW	36,6	38,2
EER	W/W	2,88	2,61
Water flow rate	l/h	18104	17104
Head drops	kPa	31	27
Cooling capacity	kW	90,1	75,0
Input power	kW	3,75	2,63
EER	W/W	24,0	28,6
Water flow rate	l/h	18104	17164
Head drops	kPa	73	66

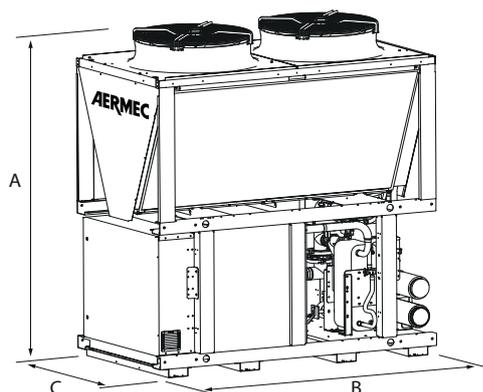
■ **NRV standard model (14511:2013)**
 Evaporator water temperature (in/out) 12°C/7°C;
 Outdoor air temperature 35°C;

■ **NRV free cooling model**
 Evaporator water temperature (in/out) 12°C/7°C;
 Outdoor air temperature 35°C;

Electrical data			
Total input current (Chiller mode)	400V/3/50Hz	A	62
Total input current (Freecooling mode)	400V/3/50Hz	A	65
Compressors		type	scroll
Compressors / Circuit		no./no.	2/1
Refrigerant		type	R410A
System side heat exchanger		type/no.	plates/1
Fans		type/no.	axial/2
Air flow rate (Chiller)	A	m³/h	32000
	E	m³/h	24000
Air flow rate (Freecooling)	FA	m³/h	28600
	FE	m³/h	22000
Sound data			
Sound power (Chiller and Freecooling)	A / FA	dB(A)	85
Sound power (Chiller and Freecooling)	E / FE	dB(A)	82

■ **Cooling mode - free cooling (100%)**
 Evaporator water temperature (in) 15°C;
 Outdoor air temperature 2°C

Sound power
 Aermec determines sound power values on the basis of measurements made in accordance with UNI EN ISO 9614-2, as required for Eurovent certification.



DIMENSIONS

Height	A	mm	2480
Width	B	mm	2200
Depth	C	mm	1190
Weight (Chiller) ⁽¹⁾		Kg	1105
Weight (Freecooling) ⁽¹⁾		Kg	1389

⁽¹⁾: Weight referred to standard version without accessories

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