

Platform **TRF Evolution**

# NRG F

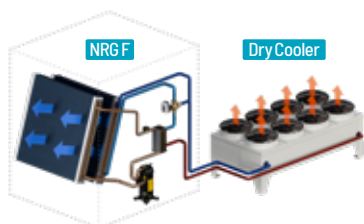
**PERIMETER MOUNTED UNITS  
FOR DATA CENTERS WITH MODULATING COMPRESSORS  
WITH INDIRECT FREE-COOLING**

11-99 kW

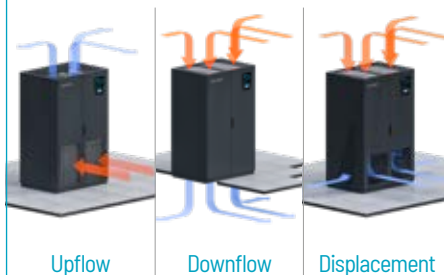


NRG F units are water-condensed perimeter-mounted cabinets that are able to exploit the **effect of indirect water-based Free-Cooling**. The F Series uses Dry Cooler water as both a cooling source for free-cooling and a heat exchange fluid for condensing the cooling circuit. NRG F units are "monobloc" units inside which the **entire cooling circuit** is concentrated. Cooling is via a **brazed plate exchanger made of stainless steel AISI 304**.

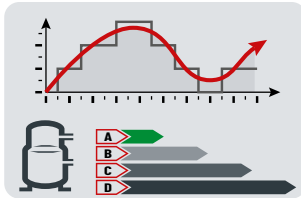
## INDIRECT WATER-SIDE FREE-COOLING



## AIRFLOW CONFIGURATIONS

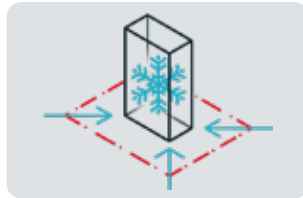


- Refrigerant R410A or R513A
- EC Fans
- Scroll inverter compressors
- Electronic expansion valves (optional)
- Advanced programmable microprocessor control with LCD display
- Temperature control through heating and post-heating systems with electric heating elements (optional)
- Humidity control through dehumidification and humidification (optional)
- Broad choice of accessories, including base modules and plenums for ducting
- Air filter class G3 as standard. Air Filters G4, M5, F7 (optional)
- Double power supply with automatic switch (optional)
- Constant-flow (airflow control) or constant available overpressure ( $\Delta P$  control) ventilation modulation (optional)



## Power modulation

NRG F units adapt quickly to Data Center cooling requests. Thanks to the inverter-controlled compressor, performance can be modulated to **up to 25%** of the rated value, thus reducing consumption. This ensures **continuous operation of the unit even at low loads**, without switching cycles on and off.



## Maximised power density

The internal design and the special arrangement of the components of the TRF Evolution platform, used in the NRG units, have been designed to **maximise the exchange surface of the evaporating coil**. These characteristics, combined with the use of latest-generation electronic switching EC fans with high air flow rate, have allowed the **power density to be increased**. The space available in the server room is made the most of and this makes the NRG F units suitable for applications with **high thermal load density**, typical of latest generation Data Centers.



## Aiming at maximised system efficiency

Design choices include, in addition to the use of electronically controlled expansion valves, the management of variable-speed Scroll compressors and EC (electronically commutated) fans via Modbus. Thanks to these features it is possible to **acquire, manage and adjust operating parameters and therefore thermo-hygrometric values in the server room very accurately, with high levels of energy efficiency**.

## Maximum energy saving

In periods when the air outside is cooler than the warm air inside the Data Center, the cold water produced by the dry cooler directly feeds the heat exchange coil, which is able to provide a part or all of the required cooling capacity. Before returning to the dry cooler, the water is reused inside the plate exchanger, serving the compressor. The entire process is regulated by a 3-way valve **directly controlled by HiRef software, which maximizes the Free-Cooling effect and checks the cooling circuit**. In this way the work of the compressor is significantly reduced, and shuts down when a state of Free-Cooling is fully reached, **with a significant reduction in the system's PUE**.

NRG F		0131	0201	0251	0301	0381	0441	0501	0551	0641	0701	0801	0852	0962
R410A - Indoor air 24°C - 50% / Water 40°C - 45°C / Free-Cooling water 7°C / Glycol 30%														
Cooling capacity	kW	11.4	19.3	22.9	29.3	33.7	39.9	43.7	51	51.8	64.2	69.7	76.2	82.7
Total absorbed power	kW	4	5.8	6.8	8.7	11	13.3	14.1	17.3	17.5	22.1	24.2	23.3	27
EER		3.18	4.14	4.05	4.12	3.57	3.41	3.7	3.4	3.5	3.31	3.56	4.08	3.71
SHR		0.92	1	0.99	1	0.92	0.85	0.95	0.88	0.94	0.84	0.95	0.93	0.87
Free-Cooling capacity	kW	8.8	22.5	24.6	33.3	37.8	40.8	48	52	56.4	65.8	80.4	80.4	86.8
SHR Free-Cooling		0.93	1	0.9	0.9	0.84	0.81	0.87	0.83	0.87	0.8	0.85	0.85	0.81
R410A - Indoor air 30°C - 35% / Water 40°C - 47°C / Free-Cooling water 12°C / Glycol 30%														
Cooling capacity	kW	12.5	21.9	25.7	32.9	37.3	43.1	48.7	55.5	57.8	68.9	77.7	84.2	89.5
Total absorbed power	kW	4.2	5.9	6.9	8.9	11.3	13.7	14.5	17.7	18	22.8	25	24	27.8
EER		3.36	4.6	4.44	4.51	3.85	3.56	3.97	3.59	3.79	3.43	3.82	4.36	3.87
SHR		1	1	1	1	1	1	1	1	1	1	1	1	1
Free-Cooling capacity	kW	8.5	22.6	24	31.5	34.4	35.3	45.5	48	53.4	57.9	73.2	75.2	77.3
SHR Free-Cooling		1	1	1	1	1	1	1	1	1	1	1	1	1
R410A - Indoor air 35°C - 30% / Water 40°C - 47°C / Free-Cooling water 17°C / Glycol 30%														
Cooling capacity	kW	13.9	24.3	28.6	36.6	41.6	47.6	54	61.2	63.6	75.9	85.4	93.2	99.2
Total absorbed power	kW	4.2	5.8	6.8	8.8	11.3	13.8	14.6	17.7	18	23	25.2	23.8	27.8
EER		3.69	5.21	5.01	5.08	4.3	3.9	4.38	3.95	4.17	3.73	4.15	4.86	4.28
SHR		1	1	1	1	1	1	1	1	1	1	1	1	1
Free-Cooling capacity	kW	9	23.5	24.9	33.6	35.5	36.6	48.2	49.7	56.6	58.4	77.5	77.5	80
SHR Free-Cooling		1	1	1	1	1	1	1	1	1	1	1	1	1
R513A - Indoor air 30°C - 35% / Water 40°C - 47°C / Free-Cooling water 12°C / Glycol 30%														
Cooling capacity	kW	-	-	-	31.1	34.6	42.1	49.8	55.9	60.7	-	66.1	75.7	-
Total absorbed power	kW	-	-	-	11.2	12.9	17	17.3	21.2	20.6	-	23.1	26.7	-
EER		-	-	-	3.24	3.07	2.73	3.44	3.05	3.56	-	3.83	3.62	-
SHR		-	-	-	1	1	1	0.99	1	1	-	1	1	-
Free-Cooling capacity	kW	-	-	-	32.4	33.4	35.3	49.3	50.7	57.5	-	69.2	73.6	-
SHR Free-Cooling		-	-	-	1	1	1	1	1	1	-	1	1	-
R513A - Indoor air 35°C - 30% / Water 40°C - 47°C / Free-cooling water 17°C / Glycol 30%														
Cooling capacity	kW	-	-	-	34.9	38.8	46.7	55.8	62.2	67.7	-	74.4	84.6	-
Total absorbed power	kW	-	-	-	11.3	13	17.2	17.5	21.5	20.9	-	23.4	27.1	-
EER		-	-	-	3.61	3.4	3	3.8	3.34	3.9	-	4.22	3.97	-
SHR		-	-	-	1	1	1	1	1	1	-	1	1	-
Free-Cooling capacity	kW	-	-	-	33.6	34.5	36.6	50.9	52.5	61.1	-	74.1	76.2	-
SHR Free-Cooling		-	-	-	1	1	1	1	1	1	-	1	1	-
Rated air flow	m³/h	3700	8000		10800			14300		16800		23000		
Power supply	V/ph/Hz	400/3+N/50												
Number of circuits		1	1	1	1	1	1	1	1	1	1	1	2	2
Number of inverter compressors		1	1	1	1	1	1	1	1	1	1	1	1	1
Number of on/off compressors		-	-	-	-	-	-	-	-	-	-	-	1	1
Lp @ nominal rpm; dist.=2m Q=2	db(A)	54	70	70	70	74	74	75	77	77	75	76	75	75
Dimensions [LxHxD]	mm	900 x1875 x600	1010x2000x890			1270x2000x890		1760x2000x890		2020x2000x890		2510x2000x890		

Performance data relating to Downflow versions. | Also available with 60 Hz power supply. | Model height Displacement 2125 mm for size 0131.