HiRef

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Platform ***TRF Evolution***

NRG D/K/Q

DATA CENTER | INDUSTRIAL

DUAL COOLING PERIMETER MOUNTED UNITS FOR DATA CENTERS WITH MODULATING COMPRESSORS

NRG D > 12–99 kW

NRG K > 11–101 kW

NRG Q > 13–110 kW

- MULTI-PROTOCOL COMMUNICATION INTERFACE
- SCROLL COMPRESSORS
- EC RADIAL FANS
- MODBUS CONTROLLED FANS
- FAST RESTART
- ON-BOARD HUMIDIFIER
- INVERTER DRIVEN COMPRESSORS
- PLATE HEAT EXCHANGER *

* *Solo Mod. Q e K*

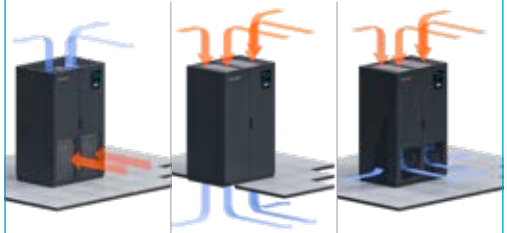
NRG D/K/Q units are Dual Cooling units. They combine the traditional evaporative coil of the cooling circuit with **the cooling effect of chilled water**, coming from an outdoor unit such as a chiller. The use of a dual source guarantees the **continuity of supply to the system** and **the best operational solution in all cases**.

Remote condensers

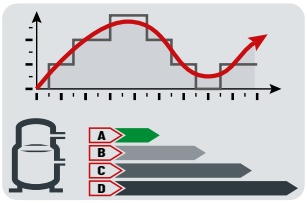
All NRG D units can be combined with HiRef remote condensers, choosing from **different combinations to meet all system needs. Oversize remote condensers** are ideal for warmer environments, where it is necessary to keep the condensing temperature under control, while the **compact condensers** on the other hand are small in terms of both size and consumption. The condensers, used with dual-circuit units, are available with a single cooling circuit **for maximum reliability and redundancy of the system** or with a double cooling circuit, **to reduce installation spaces and costs.**

- Refrigerant R410A
- 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 (ΔP control) ventilation modulation (optional)
- Long distance kits for optimal operation in the case of large distances between indoor and outdoor units (on request, available exclusively for Version D)
- Low temperature kits for optimal operation in the case of installation in particularly cold environments (on request)

AIRFLOW CONFIGURATIONS

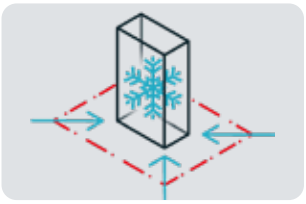


Upflow | Downflow | Displacement



Power modulation

The NRG D units adapt quickly to Data Center cooling requests. Thanks to the inverter-controlled compressor, performance can be modulated to **upto 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 D/K/Q units suitable for applications with **high thermal load density,** typical of latest generation Data Centres.

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 flexibility

The Dual Cooling units combine **the reliability of a dual source with the ease of operation of HiRef cabinets.** The on-board control allows you to select the source according to different logics, at your discretion.

CONDENSATO AD ARIA CON DUAL COOLING

NRG D		0131	0201	0251	0301	0381	0441	0501	0551	0641	0701	0801	0852	0962
R410A - Indoor air 24°C - 50% / Outdoor air 35°C / Chilled water In 7°C Out 12°C														
Cooling capacity	kW	11.7	18.8	22.4	28.8	33.4	38.5	43	51.3	51.6	64	69	73.6	82.8
Total absorbed power	kW	3.7	6.1	7.1	8.9	11.2	14	14.4	17.2	17.6	22.1	24.5	24.5	26.9
EER		3.57	3.81	3.77	3.91	3.47	3.1	3.55	3.44	3.46	3.3	3.48	3.72	3.72
SHR		0.9	1	1	1	0.93	0.87	0.96	0.88	0.94	0.84	0.95	0.94	0.87
Chilled water cooling capacity	kW	8.2	29.1	29.1	40.8	40.8	40.8	56	56	65.8	65.8	90	90	90
SHR Chilled water		1	0.82	0.82	0.81	0.81	0.81	0.8	0.8	0.8	0.8	0.8	0.8	0.8
R410A - Indoor air 30°C - 35% / Outdoor air 35°C/ Chilled water In 10°C Out 15°C														
Cooling capacity	kW	13	21.4	25.3	32.5	37.2	42	48.4	56.2	57.7	69.7	77.5	82.3	90.1
Total absorbed power	kW	3.8	6.1	7.2	9.1	11.4	14.3	14.8	17.4	17.9	22.5	25.1	25	27.4
EER		3.89	4.26	4.19	4.33	3.77	3.31	3.87	3.72	3.79	3.51	3.8	4.05	3.96
SHR		1	1	1	1	1	1	1	1	1	1	1	1	1
Chilled water cooling capacity	kW	10.5	31.4	31.4	42.3	42.3	42.3	57.5	57.5	67.5	67.5	92.5	92.5	92.5
SHR Chilled water		1	1	1	1	1	1	1	1	1	1	1	1	1
R410A - Indoor air 35°C - 30% / Outdoor air 35°C/ Chilled water In 15°C Out 20°C														
Cooling capacity	kW	14.4	23.5	27.9	36	41	46.1	52.9	61.4	63.3	75.7	85	90.4	98.9
Total absorbed power	kW	3.9	6.2	7.3	9.2	11.6	14.7	15.2	17.7	18.2	23.1	25.7	25.5	27.9
EER		4.2	4.63	4.56	4.73	4.1	3.51	4.1	3.99	4.09	3.71	4.04	4.33	4.25
SHR		1	1	1	1	1	1	1	1	1	1	1	1	1
Chilled water cooling capacity	kW	10.7	31.6	31.6	42.7	42.7	42.7	57.9	57.9	68	68	93.1	93.1	93.1
SHR Chilled water		1	1	1	1	1	1	1	1	1	1	1	1	1
Rated air flow	m^3/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 combined with standard HiRef remote condenser. | Also available with 60 Hz power supply. | Model height Displacement 2125 mm for size 0131.

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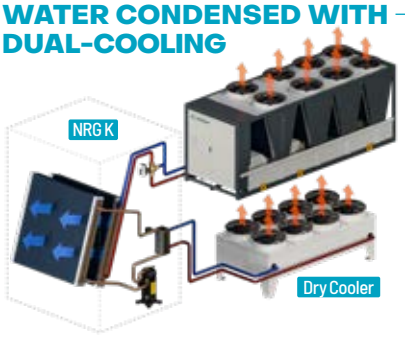
Platform ***TRF Evolution***

NRG D/K/Q

WATER CONDENSED WITH DUAL-COOLING



NRG K		0131	0201	0251	0301	0381	0441	0501	0551	0641	0701	0801	0852	0962
R410A - Indoor air 24°C - 50% / Water 40°C - 45°C / Chilled water In 7°C Out 12°C														
Cooling capacity	kW	11.4	19.3	23	29.4	33.8	40.1	43.6	51.2	52	64.5	69.7	76	83.1
Total absorbed power	kW	4	5.8	6.7	8.6	10.9	13.2	14	17.2	17.4	22	24.1	23.2	26.8
EER		3.23	4.16	4.1	4.16	3.61	3.46	3.72	3.44	3.54	3.35	3.59	4.1	3.75
SHR		0.91	1	0.99	1	0.92	0.85	0.95	0.88	0.94	0.84	0.95	0.93	0.87
Chilled water cooling capacity	kW	8.2	29.1	29.1	40.8	40.8	40.8	56	56	65.8	65.8	90	90	90
SHR Chilled water		1	0.82	0.82	0.81	0.81	0.81	0.8	0.8	0.8	0.8	0.8	0.8	0.8
R410A - Indoor air 30°C - 35% / Water 40°C - 45°C / Chilled water In 10°C Out 15°C														
Cooling capacity	kW	12.7	22.2	26.1	33.4	38.1	43.7	49.4	56.3	58.6	69.9	78.8	86	91
Total absorbed power	kW	4	5.7	6.7	8.6	10.9	13.3	14.1	17.2	17.4	22.2	24.3	23.2	26.9
EER		3.57	4.89	4.71	4.77	4.08	3.75	4.18	3.77	3.98	3.59	4.01	4.65	4.1
SHR		1	1	1	1	1	1	1	1	1	1	1	1	1
Chilled water cooling capacity	kW	10.5	31.4	31.4	42.3	42.3	42.3	57.5	57.5	67.5	67.5	92.5	92.5	92.5
SHR Chilled water		1	1	1	1	1	1	1	1	1	1	1	1	1
R410A - Indoor air 35°C - 30% / Water 40°C - 45°C / Chilled water In 15°C Out 20°C														
Cooling capacity	kW	14.1	24.7	29.1	37.2	42.1	48.2	55.1	62.4	64.5	77	87	94.4	100.8
Total absorbed power	kW	4	5.6	6.6	8.5	10.9	13.3	14.1	17.2	17.4	22.3	24.5	23	26.9
EER		3.93	5.56	5.32	5.41	4.54	4.11	4.65	4.18	4.38	3.92	4.38	5.14	4.54
SHR		1	1	1	1	1	1	1	1	1	1	1	1	1
Chilled water cooling capacity	kW	10.7	31.6	31.6	42.7	42.7	42.7	57.9	57.9	68	68	93.1	93.1	93.1
SHR Chilled water		1	1	1	1	1	1	1	1	1	1	1	1	1
Rated air flow	m^3/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		

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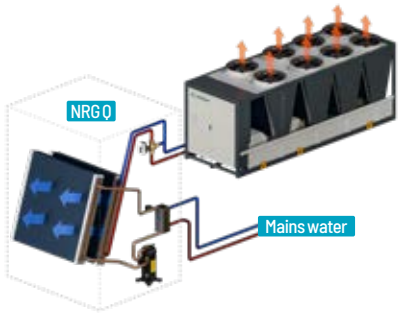
MAINS WATER CONDENSED WITH DUAL COOLING



NRG Q		0131	0201	0251	0301	0381	0441	0501	0551	0641	0701	0801	0852	0962
R410A - Indoor air 24°C - 50% / Water 15°C - 30°C / Chilled water In 7°C Out 12°C														
Cooling capacity	kW	12.9	21.4	25.6	32.4	37.9	45.3	49.6	57.6	57.8	71.5	77.8	86.2	94.3
Total absorbed power	kW	2.9	4.4	5.1	6.6	8.5	10.3	11	13.6	13.8	17.5	19.5	18	20.9
EER		5.15	6.59	6.36	6.41	5.49	5.19	5.69	5.09	5.21	4.84	5.24	6.46	5.82
SHR		0.86	1	0.94	0.97	0.87	0.81	0.89	0.83	0.89	0.8	0.89	0.87	0.82
Chilled water cooling capacity	kW	8.2	29.1	29.1	40.8	40.8	40.8	56	56	65.8	65.8	90	90	90
SHR Chilled water		1	0.82	0.82	0.81	0.81	0.81	0.8	0.8	0.8	0.8	0.8	0.8	0.8
R410A - Indoor air 30°C - 35% / Water 15°C - 30°C / Chilled water In 10°C Out 15°C														
Cooling capacity	kW	13.9	24.5	28.7	36.7	41.7	48.2	54.9	61.8	64.3	76.6	86.5	94.1	101.1
Total absorbed power	kW	2.9	4.2	5	6.4	8.4	10.3	10.9	13.5	13.7	17.5	19.6	17.7	20.7
EER		5.62	8.04	7.48	7.58	6.12	5.52	6.33	5.49	5.84	5.17	5.78	7.19	6.29
SHR		1	1	1	1	1	0.97	1	0.99	1	0.96	1	1	0.98
Chilled water cooling capacity	kW	10.5	31.4	31.4	42.3	42.3	42.3	57.5	57.5	67.5	67.5	92.5	92.5	92.5
SHR Chilled water		1	1	1	1	1	1	1	1	1	1	1	1	1
R410A - Indoor air 35°C - 30% / Water 15°C - 30°C / Chilled water In 15°C Out 20°C														
Cooling capacity	kW	15.4	26.9	31.7	40.5	45.7	52.7	60.2	67.7	70.7	83.4	94.9	103.8	110.3
Total absorbed power	kW	2.9	4	4.8	6.2	8.3	10.3	10.9	13.4	13.5	17.7	19.7	17.3	20.5
EER		6.27	9.47	8.7	8.81	6.85	6.06	7.02	6.08	6.52	5.58	6.29	8.21	6.95
SHR		1	1	1	1	1	1	1	1	1	1	1	1	1
Chilled water cooling capacity	kW	10.7	31.6	31.6	42.7	42.7	42.7	57.9	57.9	68	68	93.1	93.1	93.1
SHR Chilled water		1	1	1	1	1	1	1	1	1	1	1	1	1
Rated air flow	m^3/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		

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