



CHILLED WATER DATA ROOM UNITS

Downflow Net Sensible Cooling
79–220kW

Upflow Net Sensible Cooling
66–206kW



DATA CENTER COOLING EXPERTISE



Data Center managers have unique needs.

Nortek Air Solutions listens to your needs and responds with innovative, engineered solutions to meet the specific requirements of your data center applications. Our people have extraordinary experience in the exacting demands of mission critical facilities to provide you with the best and most economical solution for the entire life cycle of your data center.

Your Benefits

- Maximized use of “Free Cooling” designs incorporating direct and indirect evaporative cooling (IDEC) concepts in addition to water and airside economizer systems to minimize or eliminate the energy consumed for mechanical cooling.
- Flexibility to design a system with the lowest possible footprint to maximize available space for computing and/or data storage equipment.
- Close match of operating capacity requirements to avoid the inefficiencies and added electrical demands of over-sized equipment, while often allowing for expansion within the existing footprint.
- N+1 redundancy at the lowest possible connected horsepower and footprint.
- Robust equipment with low maintenance requirements and easy access to components to avoid downtime.
- The manufacturing capacity of 6 facilities in North America and the U.K. to meet your fast-track project requirements.

For more information about Nortek Air Solutions data center solutions, contact us at datacenterinfo@nortek.com.



DATA ROOM UNITS

High Efficiency Cooling for High Density Loads

High efficiency data room units (DRU) are designed for high density load areas where a large cooling duty is required from a compact footprint, and to provide the reliability and redundancy required for the critical application of data center cooling.

The standard range for our downflow and upflow CW units is 79–220 kW and 66–206 kW respectively. Custom size units are available from 85–525 kW providing the flexibility to reduce the number of units, electrical and piping requirements as well as indoor footprint devoted to computer room cooling. All configurations have energy reduction features as well as heating or humidification options. Where required, the units can be supplied with electrode boiler humidifiers providing high efficiency stepless output of sterile steam and electric heaters are available if reheat is required.

The DRU Range has been designed around a modular frame and panel design providing maximum unit strength plus all-around access where applicable. However, all maintenance and service has been designed for front access only where site restrictions dictate.

The units are designed for either downflow or upflow service. FANWALL TECHNOLOGY® provides even, efficient air supply and inherent redundancy. Alternatively, the units can be fitted with speed controllable, electronically commutated (EC) fan/motor assemblies. Multiple fan/motor assemblies and variable frequency drives (VFD) share system load to increase efficiency and reduce system impact in the unlikely event of a key component failure.

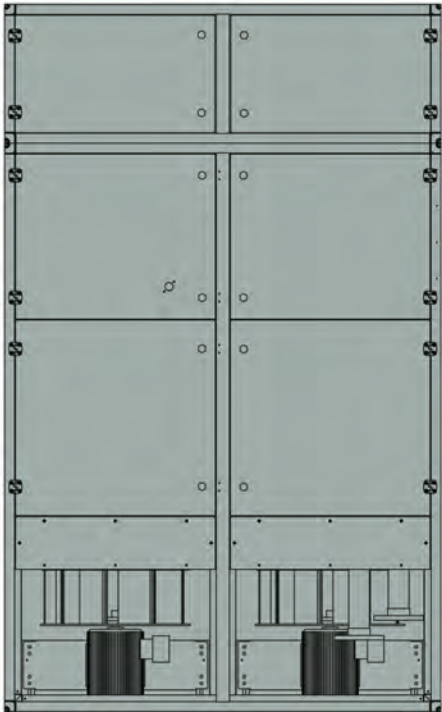
Modular component assemblies are designed for easy and quick component maintenance and replacement.

Unit Features / Controller

The DRU is fitted with a fully programmable direct digital controller (DDC) or industrial PLC controller complete with display/user interface. The controller monitors the temperature and relative humidity and activates cooling humidification or dehumidification to provide precise and efficient conditioning of the supply air.

Additionally, the DDC controller monitors the in-built safety devices of the unit, which constantly monitor the healthy state of key components. In the unlikely event of a component malfunction, the item is automatically isolated to enable the plant to continue running, and an alarm signal will be generated.

Where required, multiple units can be networked together to provide group or run/standby control. Units can be monitored locally or remotely, and if required, an enhanced web-enabled controller can be supplied, providing password-restricted access from a suitable Internet access point.



Model DRU 8 Shown

Control Features

- Fully programmable
- Data logging
- Standalone or group control
- BMS interface
- Remote monitoring
- Energy saving control strategies

Monitor and Alarm Points

- Temperature
- Relative humidity
- Airflow
- Filter condition
- Drain pan water detection
- Humidifier status
- Heater status
- Fire shutdown
- VFD relay alarms
- Smoke detection

DDC Controller



External Panel Mount HMI

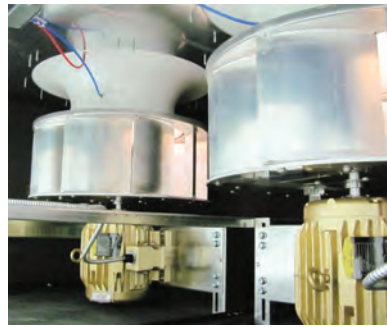
INDUSTRIAL-GRADE

Data Room Unit (DRU)

- Optimized chilled water coil with low air and waterside pressure drop
- Longer filter life and reduced pressure drop due to larger filter area
- More efficient direct-drive fans with higher static pressure capability than EC fans
- Improved uniformity of air flow over coils and in velocity from plenum



Humidifier and chilled water coil



Fan section (backward inclined air foil) with non-obtrusive air flow measuring device



Touch screen controller



Control valves and piping



Internally mounted electrical control panel

DRU COMPONENTS

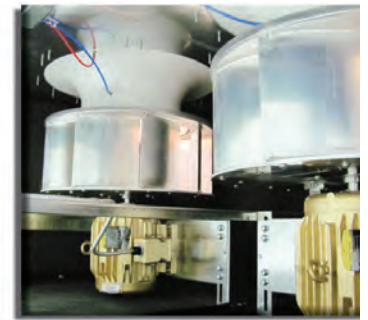
Cabinet

The DRU unit is constructed of galvanized sheet steel panels, insulated with 1-inch thick thermal/acoustical duct liner with enhanced surface with sealed transverse edges. The DRU cabinet is constructed using a steel "pentapost" frame and panel design. Insulated hinged access doors and screwed panels provide all around access, but all service and maintenance items are designed to be performed from the front of the unit. The front access doors are locked using key operated quarter turn latches to seal the doors against a continuous closed cell Poron® urethane foam gasket. All frames and panels shall be coated with a Dry Powder-Baked Polyester coating similar to Tiger #7035, Drylac Series 49 which is both lead and cadmium free.



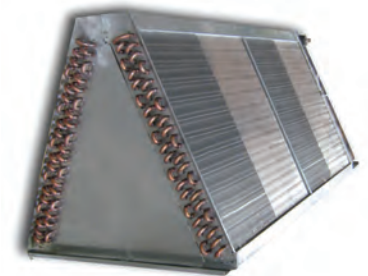
FANWALL® System

Direct driven, Class 3, backward inclined centrifugal fans with air foil blades mounted in the DRU fan base section are constructed of steel pentapost frame and panel, designed to be situated under the raised access floor. The fans are arranged to discharge horizontally to maximize mechanical and static efficiency. The fans are rated by AMCA and balanced to exacting industry standards for specific use in our FANWALL TECHNOLOGY® application. Each fan and inlet cone is fitted with a non-obtrusive airflow measuring device and coupled with a transmitter to send real time volume signal to the DDC for control and transmittal of data to the BMS. The signal results in a digital readout in CFM on the touch screen HMI. Standard motors are AC type, in standard NEMA frame sizes, and TEAO design. Each motor shall employ the use of an Aegis® shaft grounding ring.



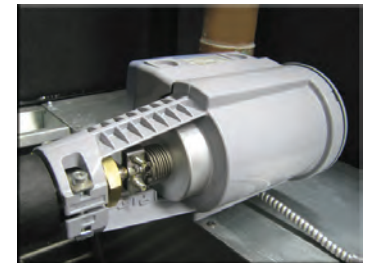
Cooling Coils

Downflow units use dual cooling coils arranged in an A formation. Upflow units use a single coil in a slab configuration. The casing are constructed of minimum 16 gauge galvanized steel. Fins are aluminum plate ripple type. Tubes are copper and are mechanically bonded to aluminum fins. Drain pans are 304 stainless steel with solid welded seams. All coils are tested and rated in accordance with the Air-Conditioning, Heating and Refrigeration Institute (AHRI) Standard 410 and certified in accordance with the AHRI certification program.



Control Valve

Control valves are two or three way, cast iron or brass depending on size and application. Actuators are proportional type with an operating voltage of 24v.



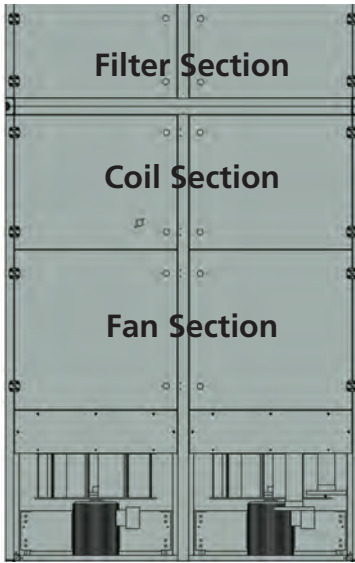
Control Panel

Each unit ships complete with an independent or integral control panel. The control panel houses a main input fused disconnect with individual fused disconnect, DDC controller or programmable logic controller (PLC), and human mechanical interface device (HMI). The controller and HMI are factory mounted and installed for user connections and setup. It has options available for BMS interface via Modbus®, LonWorks® and BACnet®. It can monitor all status points in the system necessary for maintaining room conditions such as humidity, temperature, raised floor differential pressure or duct static pressure; and airflow with optional inputs available for customer connections and monitoring.

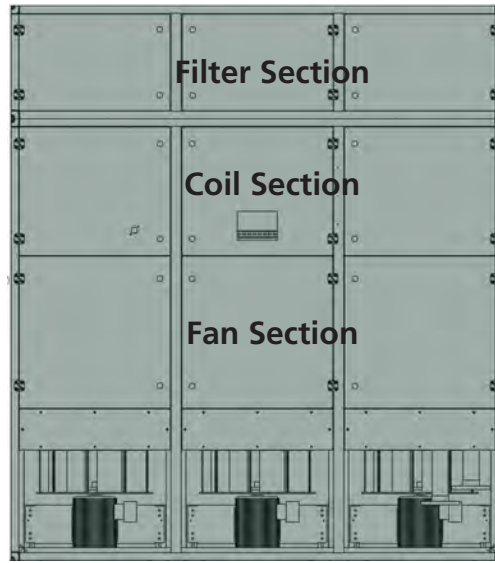


DOWNFLOW AND UPFLOW MODELS

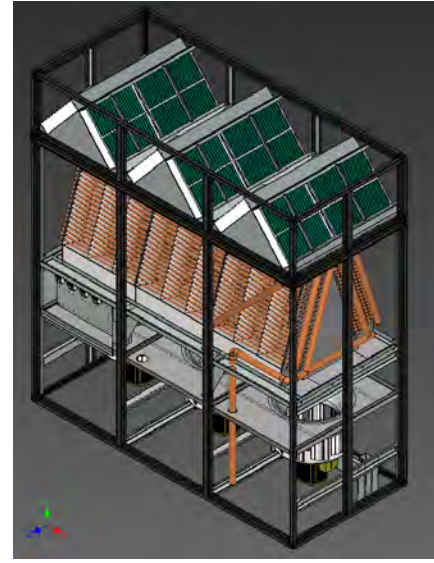
Downflow Cooling Units



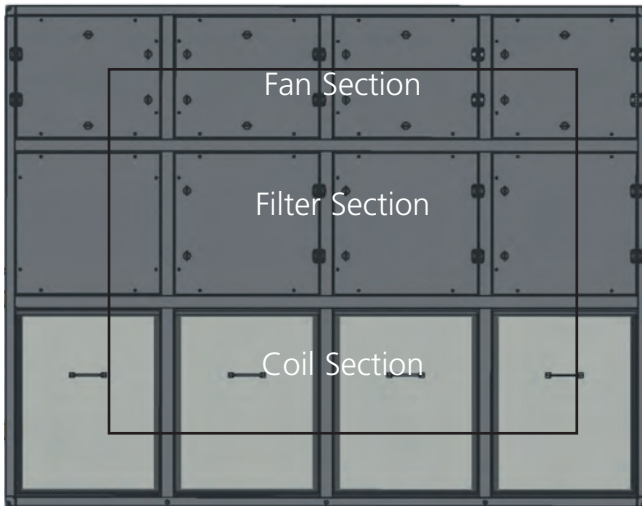
Model DRU 8
(66" W x 100" H x 47.5" D)



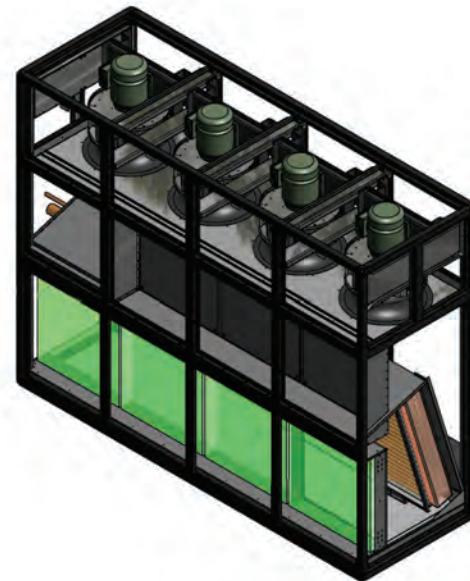
Models DRU 10, 12 and 14
(96" W x 100" H x 47.5" D)



Upflow Cooling Units



99" W x 77" H x 47.5" D



Filter Section

PerfectPleat 2" and 4" optional prefilters offer the efficiency and low initial resistance that you expect and require. Both the Standard and HC (High Capacity) models are rated MERV 7 and MERV 8 (ULTRA made with Intersept® antimicrobial). Standard 4" PerfectPleat has 9 pleats per foot (PPF); HC has 11 PPF. Filter section is optional.

Coil Section

Custom heating and cooling water coils are designed and constructed for maximum efficiency in demanding applications. We offer a full range of sizes to meet specific commercial and industrial uses where high performance is necessary.

Fan Section:

FANWALL TECHNOLOGY®

Designed specifically for to achieve 7% to 9% higher efficiency than other fans in their size range. AMCA certified performance.

Permanent Magnet Motor

The FANWALL® Permanent Magnet (PM) motor is a brushless permanent magnet motor which has proven to be 7% to 15% more efficient when compared to NEMA Premium® efficiency induction motors.

TECHNICAL SPECIFICATIONS

DOWNFLOW MODEL		CW-DRU-8		CW-DRU-10		CW-DRU-12		CW-DRU-14	
Cooling Capacity (TOTAL)	kW	96.2	113.5	139.5	178.1	170.1	225.3	182.1	242.4
Cooling Capacity (SENSIBLE)	kW	79.2	102.6	115.5	161.7	141.8	202.8	153.1	219.8
Air Flow	CFM/m ³ /h	10,000/ 16,990	10,000/ 16,990	16,000/ 27,184	16,000/ 27,184	20,000/ 33,980	20,000/ 33,980	22,000/ 33,378	22,000/ 33,378
Return Air Temperature	°F/°C	75°/24°	86°/30°	75°/24°	86°/30°	75°/24°	86°/30°	75°/24°	86°/30°
Return Air Humidity	%RH	45%	30%	45%	30%	45%	30%	45%	30%
# of Fans per Unit		4				4			
Fan Type - Class 3 Backward Incline Centrifugal						Direct Drive Airfoil			
Total BHP @ Design	HP	2.8		6.04		8.15		10.2	
Operational Motor RPM	RPM	1151		1552		1430		1544	
Total Static Pressure @ Design	In.H ₂ O/kPa	1.25/0.31		1.65/0.41		1.80/0.45		2.0/0.5	
External Total Static Pressure	In.H ₂ O/kPa					0.2/0.05			
Fan Absorbed Power @ Design	kW	2.00		4.50		6.08		7.54	
CHW Entering Temperature	°F/°C					43°F / 6°C CHW			
CHW Flow	GPM/m ³ /h	65.6 / 14.9	78.5 / 17.8	98.1 / 22.3	124.2 / 28.2	120 / 27.2	157.5 / 35.8	129.2 / 29.3	170 / 38.6
Coil Rows						6			
Coil Face Area	Ft ² /m ²	11.3 / 1.05		17 / 1.58		21 / 1.95		21 / 1.95	
CHW Pressure Drop (total)	PSI/kPa	7.26 / 50.0	7.9 / 54.4	11.2 / 77.2	8.7 / 59.75	7.74 / 53.4	8.46 / 58.3	8.9 / 61.4	14.62 / 100.8
CHW Connection size/valve size	Pipe/Valve	2.0" / 2.0"		2.5" / 2.0"		3.0" / 2.5"		3.0" / 2.5"	
Filter Type - PerfectPleat						MERV 7 or 8			
Dimensions (Inc. Fan Base & Filter Box with 2" Filters)	Inches	100T×88W×47.5D		118T×88W×47.5D		118T×100W×47.5D			
Dimensions (Inc. Fan Base & Filter Box with 4" Filters)	Inches	102T×88W×47.5D		120T×88W×47.5D		120T×100W×47.5D			
Dimensions (Inc. Fan Base & Filter Box with 51 mm Filters)	mm	2540T×2236W×1207D		2997T×2235W×1207D		2997T×2540W×1207D			
Dimensions (Inc. Fan Base & Filter Box with 102 mm Filters)	mm	2591T×2236W×1207D		3048T×2235W×1207D		3048T×2540W×1207D			
Coil Section Weight	lbs./kg	1000/454		1300/590		1600/726		1600/726	
Fan Section Weight	lbs./kg	1450/658		1550/703		1700/771		1700/771	
Total Weight	lbs./kg	2450/1112		2850/1293		3300/1497		3300/1497	

UPFLOW MODEL		CW-DRU-8		CW-DRU-10		CW-DRU-12		CW-DRU-14	
Cooling Capacity (TOTAL)	kW	72.0	90.0	107.6	147.9	139.8	189.8	154.5	209.5
Cooling Capacity (SENSIBLE)	kW	66.1	90.0	101.2	147.9	129.0	187.2	142.4	206.5
Air Flow	CFM/m ³ /h	10,200/17,330	10,200/17,330	16,000/27,184	16,000/27,184	20,000/33,980	20,000/33,980	22000/33378	22000/33378
Return Air Temperature	°F/°C	75°/24°	86°/30°	75°/24°	86°/30°	75°/24°	86°/30°	75°/24°	86°/30°
Return Air Humidity	%RH	45%	30%	45%	30%	45%	30%	45%	30%
# of Fans per Unit						4			
Fan Type - Class 3 Backward Incline Centrifugal						Direct Drive Airfoil			
Total BHP @ Design	HP	2.8		5		5.84		6.0	
Operational Motor RPM	RPM	1621		1891		1446		1174	
Total Static Pressure @ Design	In.H ₂ O/kPa					1.2 / 0.3			
External Total Static Pressure	In.H ₂ O/kPa					0.2 / 0.05			
Fan Absorbed Power @ Design	kW	2.10		3.70		4.40		4.5	
CHW Entering Temperature	°F/°C					43°F / 6°C CHW			
CHW Flow	GPM/m ³ /h	50.4 / 11.5	62.7 / 14.2	75.7 / 17.2	103 / 23.4	98 / 22.3	132 / 30.0	108.1 / 24.6	145.5 / 33.0
Coil Rows						4			
Coil Face Area	Ft ² /m ²	20.1 / 1.87		32.0 / 2.3		40.0 / 3.7		44.1 / 4.1	
CHW Pressure Drop (total)	PSI/kPa	9.4 / 64.8	10.5 / 72.7	7.5 / 51.5	12.5 / 86.6	11.75 / 81.0	11.2 / 76.9	13.6 / 93.7	12.5 / 86.4
CHW Connection Size / Valve Size	Pipe/Valve	2.0" / 1.5"		2.5" / 2.0"		2.5" / 2.0"		3.0" / 2.5"	
Filter Type - PerfectPleat						MERV 7 or 8			
Dimensions (inc. Fan Base & Filter Box with 2 in. Filters)	Inches	75T×100W×33D		92T×112W×36D		100T×134W×40D		100T×144W×40D	
Dimensions (inc. Fan Base & Filter Box with 51 mm Filters)	mm	1905T×2540W×839D		2337T×2845W×915D		2540T×3404W×1016D		2540T×3658W×1016D	
Total Weight	lbs./kg	2900/1315		3650 / 1655		4150 / 1882		4700 / 2131	

Note for both models: Project-specific fan and coil selections are available based on customer-specific conditions upon request.

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