



## **NetCol8000-C(070, 130, 190) In-room Chilled Water Smart Cooling Product**

# **Product Description**

**Issue**            01  
**Date**             2020-01-15

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# About This Document

## Purpose

This document describes the NetCol8000-C cooling product (NetCol8000-C for short) in terms of model information, positioning, features, components, typical application scenarios, usage conditions, and technical specifications, providing systemic knowledge of the NetCol8000-C.






## Intended Audience

This document is intended for:

- Sales engineers
- Technical support engineers
- System engineers

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 <b>DANGER</b>	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
 <b>NOTICE</b>	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 <b>NOTE</b>	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment

Symbol	Description
	deterioration.

## Change History

Changes between document issues are cumulative. The latest document issue contains all updates made in previous issues.

### Issue 01 (2020-01-15)

This issue is the first official release.

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# 1 Model Description

**Figure 1-1** Naming conventions

NetCol	8000	-	C	070	D	4	0	D	0
1	2	3	4	5	6	7	8	9	10
<b>1 Data Center Smart Cooling Product</b>	<b>2 Model Range</b>	<b>3 Hyphen</b>	<b>4 Cooling Mode</b>	<b>5 Mode Code</b>	<b>6 Air Discharge</b>	<b>7 Power Supply</b>	<b>8 Re-Heating &amp; Humidifier Type</b>	<b>9 Packaging</b>	<b>10 Order Special Features</b>
5000 - In-Row smart cooling	8000 - In-Room smart cooling		A - Air Cooled W - Water Cooled G - Glycol Cooled C - Chilled Water F - Free Cooling E - Evaporative Cooling D - Air Cooled + Chilled Water H - Water Cooled + Chilled Water J - Direct + Indirect Cooling L - Direct + Indirect Evaporative Cooling	025 - Mode Code 025 030 - Mode Code 030 042 - Mode Code 042 050 - Mode Code 050 070 - Mode Code 070	U - Up Flow D - Down Flow H - Horizontal Flow	M - 380-415 V, 3PH, 50 Hz N - 208 V, 3PH, 60 Hz P - 220-240 V, 3PH, 50 Hz Q - 380 V, 3PH, 60 Hz R - 440-480 V, 3PH, 60 Hz S - 220-240 V, 1PH, 50 Hz T - 208-230 V, 1PH, 60 Hz U - 277 V, 1PH, 60 Hz W - 380 V, 3PH, 50 Hz D - 48 V DC	0 - None R - Electric Heating 1 Level & Infrared Humidifier E - Electric Heating 1 Level & Electrode Humidifier W - Electric Heating 1 Level & Wet Film Humidifier F - Electric Heating 2 Level & Wet Film Humidifier H - Wet Film Humidifier only	D - China/CHN Package E - International/ITN Package A - Standard Pre-fab. Module B - Reinforced Pre-fab. Module	0 - None 1 - Condensate Pump 2 - Condensate Pump & Dual Power Supply 3 - Condensate Pump & Dual Power Supply 240 V DC 4 - No Condensate Pump & Dual Power Supply A - DX Backup B - CW Backup P - Refrigerant Pump C - Left Pipe Connection D - Right Pipe Connection

# 2 Appearance and Components

## Appearance

The NetCol8000-C has three models: single-door, dual-door, and three-door. The following figures show the appearance of the NetCol8000-C.

**Figure 2-1** NetCol8000-C (upflow)



NF10H00063

**Figure 2-2** NetCol8000-C (downflow)



NetCol8000-C070D



NetCol8000-C130D



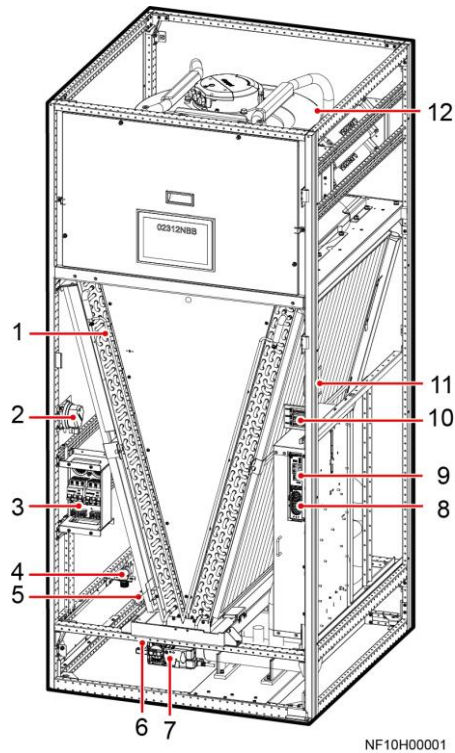
NetCol8000-C190D

NF10H00034



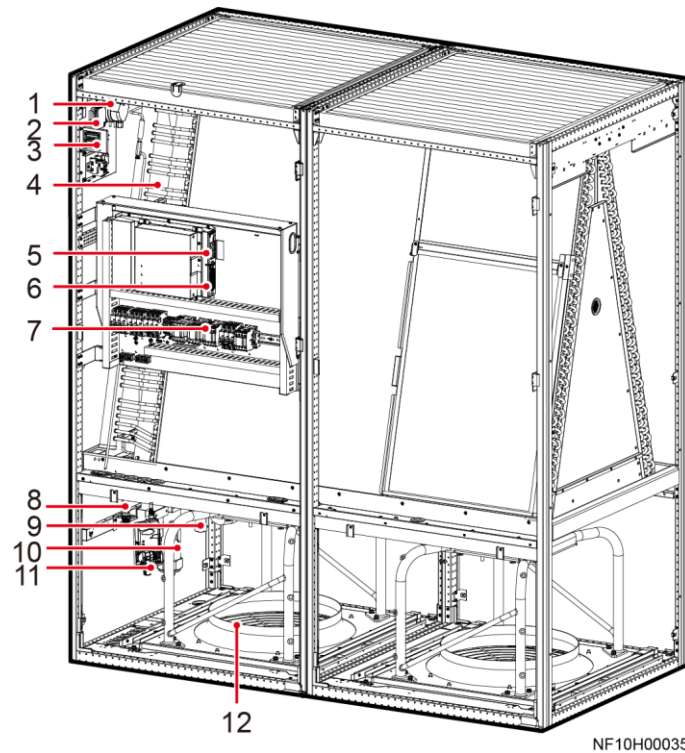
## Components

Figure 2-3 Upflow components



- |                                             |                                      |                                   |
|---------------------------------------------|--------------------------------------|-----------------------------------|
| (1) Heat exchanger                          | (2) Differential pressure switch     | (3) Connection box                |
| (4) Humidifier water inlet pipe             | (5) Drainpipe                        | (6) Water supply and return pipes |
| (7) Water valve actuator                    | (8) Power module                     | (9) Main control module           |
| (10) Wiring terminal for customer equipment | (11) Temperature and humidity sensor | (12) Fan                          |

Figure 2-4 Downflow components



- |                                    |                                     |                          |
|------------------------------------|-------------------------------------|--------------------------|
| (1) Differential pressure switch   | (2) Temperature and humidity sensor | (3) User wiring terminal |
| (4) Heat exchanger                 | (5) Main control module             | (6) Power module         |
| (7) Connection box                 | (8) Humidifier water inlet pipe     | (9) Drainpipe            |
| (10) Water supply and return pipes | (11) Water valve actuator           | (12) Fan                 |

The smart cooling product consists of the heat exchanger, chilled water valve, electronically commutated (EC) fan, air filter, wet film humidifier (optional), electric heater (optional), blocked damper (optional, applicable only to downflow), gravity damper (optional, applicable only to upflow), fresh air free-cooling damper (optional, applicable only to downflow), differential pressure sensor (optional), differential pressure switch, and caps (optional, applicable only to upflow).

- Heat exchanger  
The A-type or V-type finned-tube exchanger with a high cooling efficiency adopts the synergy field principle and computational fluid dynamics (CFD) to optimize the flow path design, which greatly improves the heat exchange efficiency.
- Chilled water valve  
The chilled water valve, also known as the chilled water proportional integral regulating valve, features incremental proportional integral and derivative (PID) control with precise adjustment and accurate control.
- EC fan

- The EC fan uses a high-end brand and provides high reliability and long service life.
- The highly efficient EC fan saves more than 30% energy than a common fan.
- The direct drive that the fan adopts has higher transmission efficiency than the belt drive, which reduces belt replacement and routine checks.
- Compared with the fan speed control by the belt drive, the fan speed control by direct drive has a wider application range which is not subject to the transmission ratio.
- The EC fan is controlled over RS485. You can view the fan power and speed status in real time over LCD and can obtain fault information including fan blockage, overvoltage, and undervoltage. The features allow you to view the status and locate a fault.
- Air filter  
The G4 air filter is used, and the F5 air filter is optional. The air filter meets cleanliness requirements for customers' data centers. The air filter of downflow smart cooling products is paved on the heat exchanger, ensuring easy maintenance and reducing air resistance.
- (Optional) Wet film humidifier
  - The wet film humidifier uses wet film for humidification and therefore has low water quality requirements and high environment adaptability. In most cases, household water can be used without being processed specially.
  - It has a simple structure and is easy to remove, clean, and maintain.
  - It can quickly start and bring huge humidification capacity.
  - It consumes low power, saving more than 95% energy compared with a traditional electrode humidifier.
- (Optional) Electric heater
  - The positive temperature coefficient (PTC) electric heater automatically adjusts heating capacity and provides multiple protection measures to ensure secure and reliable operating.
  - The heater features quick start, large heating capacity, and even heating.
- (Optional) Motorized damper/Gravity damper  
When an smart cooling product is powered off, the damper is closed intelligently to prevent loss of air volume and cooling capacity.
- (Optional) Fresh air free-cooling damper  
It fully uses the outdoor natural cooling source, intelligently adjusts the fresh air and return air ratios and fan speed, and saves energy by over 30% a year compared with the traditional chillers.
- (Optional) Differential pressure sensor
  - It adjusts air volume based on the differential pressure to ensure precise air supply. No excessive adjustment helps save energy and reduce power consumption.
  - The air supply volume is also sufficient, which helps eliminate hotspots and improves reliability.
- Differential pressure switch  
When the air filter is dirty or blocked, the differential pressure switch triggers an alarm, prompting for air filter replacement.
- (Optional) Cap  
Used to control the air exhausting from the front and rear of the smart cooling product.

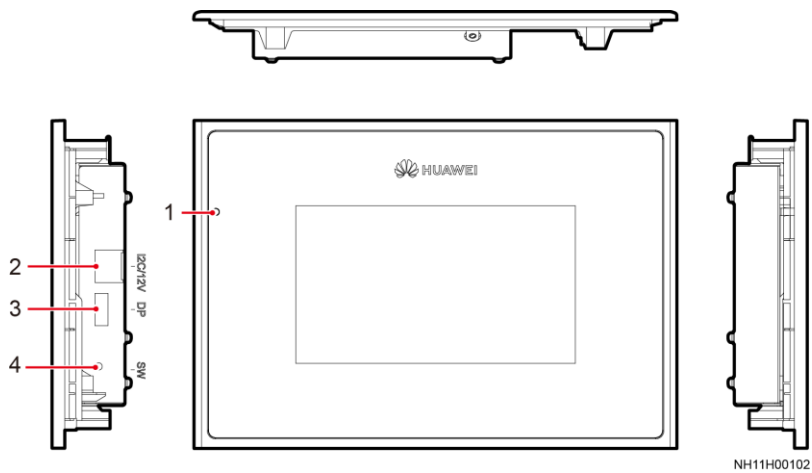
# 3 Controller

## Appearance

The 7-inch display panel with the true-color touchscreen provides user interfaces for query, setting, monitoring, and maintenance.

The indicator on the panel displays operating status of the precision smart cooling product. Figure 3-1 shows the location of the indicator. Table 3-1 lists the relationship of the alarm status, indicator, and buzzer. If critical alarms, major alarms, and warning alarms are generated simultaneously, the indicator shows the status of the alarm with the highest severity level, and the buzzer shows the status of the alarm (not confirmed after the alarm generation) with the highest severity level.

**Figure 3-1** LCD



- (1) Indicator
- (2) I2C/12V (reserved)
- (3) DP (display port)
- (4) SW (reserved)

**Table 3-1** Indicator and buzzer status description

Alarm Status	Indicators	Buzzer
The device is operating properly, or a	Green	Silent

Alarm Status	Indicators	Buzzer
warning alarm occurs.		
The buzzer keeps buzzing if a major alarm is not confirmed after the alarm generation.	Yellow	Beeping intermittently
The buzzer keeps buzzing if a critical alarm is not confirmed after the alarm generation.	Red	Beeping continuously

## Functions

- When only one smart cooling product is running, the controller provides logic control of components in the smart cooling product to adjust the indoor temperature and humidity.
- The 7-inch display panel with the true-color touchscreen allows you to set parameters for the smart cooling product and query its status.
- The smart cooling product has the following three remote functions.
  - Telemetry: supply air temperature, return air temperature, supply air humidity, return air humidity, and working status of the smart cooling product
  - Teleindication: startup/shutdown states, overvoltage/undervoltage, return air overtemperature/undertemperature, return air overhumidity/underhumidity, filter normal/blocked, and fan normal/faulty
  - Teleadjust: smart cooling product startup/shutdown
- A maximum of 32 smart cooling products can be connected in a teamwork group, when multiple smart cooling products work cooperatively, the controller optimally distributes the heat load to reduce power consumption and provides backup to improve reliability.
  - When a smart cooling product in the group is faulty, the backup smart cooling product starts to operate automatically to improve the reliability of the smart cooling product system.
  - Each smart cooling product enters the active mode one by one periodically.
  - The number of operating smart cooling products varies depending on the thermal load in the equipment room to meet requirements promptly, eliminate hot spots, and save energy.
  - A mechanism is adopted to prevent the smart cooling products in the same equipment room operating in opposite status (such as cooling and heating, or humidification and dehumidification), in order to save energy.
- You can monitor, manage, and upgrade one or more smart cooling products using the remote management software provided by Huawei.
- At least 1500 historical alarms can be stored.
- Access logs can be traced back. At least 1000 historical login and setting records can be stored.
- The controller can display 30 days' temperature and humidity in colored curves. O&M personnel can view the smart cooling product operating status onsite.
- A comprehensive power monitoring function is provided. Faults such as power open phase, overvoltage, undervoltage, high frequency, and low frequency are diagnosed and appropriate alarms are reported and recorded. Automatic protection, recovery, and restart are also provided.

## Features

- The controller provides a touchscreen with a user-friendly interface.
- The controller controls the indoor temperature precisely and responds quickly.
- The controller is protected by a multi-level password protection mechanism, avoiding misoperations.
- Password verification is required upon the first startup to ensure the system security. No password verification is required for subsequent startup if the first verification succeeds.
- The controller provides multiple protection functions, such as chilled water valve exception feedback, abnormal power-off self-recovery, and water leakage detection, ensuring system reliability.
- The controller displays the operating status and duration of the smart cooling product components in real time.
- The expert system automatically displays the information of the current fault, which facilitates the maintenance.
- The controller provides abundant external ports such as RS485 ports, CAN ports, FE ports, and USB ports that are protected by a security mechanism.
- The smart cooling product supports communications protocols such as Modbus RTU, Modbus TCP, and SNMP, facilitating connection to the network management system.
- The controller intelligently identifies abnormal parameter settings (incorrect commands) and rejects them automatically.
- If the indoor temperature fluctuates beyond the normal range, an audible and visible alarm signal is sent automatically.

# 4 Monitoring System

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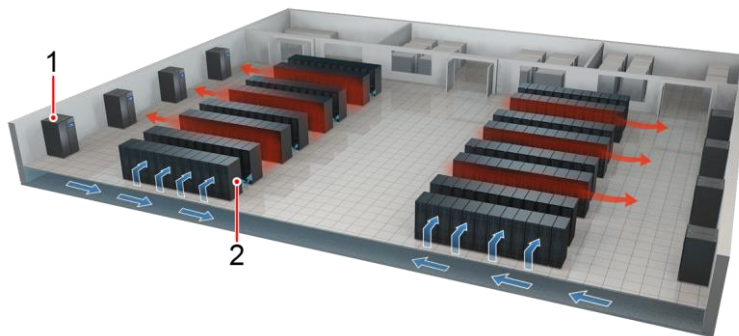
The monitoring system provides logic control, data collection, control demand delivering, alarm reporting, data storage, user right management, and teamwork control. You can connect the smart cooling product monitoring system to your monitoring system over a northbound communications port to perform remote management. The smart cooling product supports remote monitoring ports and provides RS485 ports and FE ports to support Modbus-RTU, Modbus-TCP and SNMP for real-time data collection and alarm reporting.

Smart cooling products can be networked over the CAN bus to realize teamwork control, energy conservation, and service life extension.

# 5 Typical Application Scenarios

The NetCol8000-C typically applies to rooms as well as high-efficiency cold and hot aisle containments. This section describes the application scenario for the NetCol8000-C070D.

**Figure 5-1** Typical in-room scenario

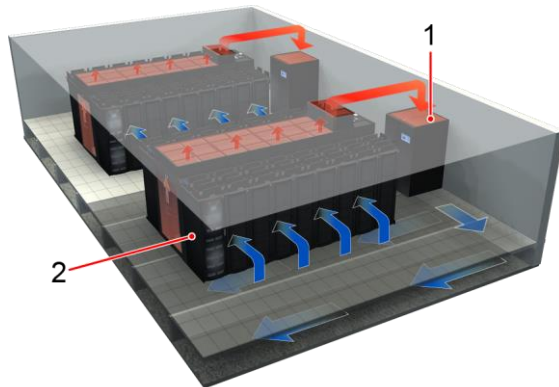


DT01000017

(1) NetCol8000-C070D

(2) Equipment

**Figure 5-2** High-efficiency hot aisle containment scenario



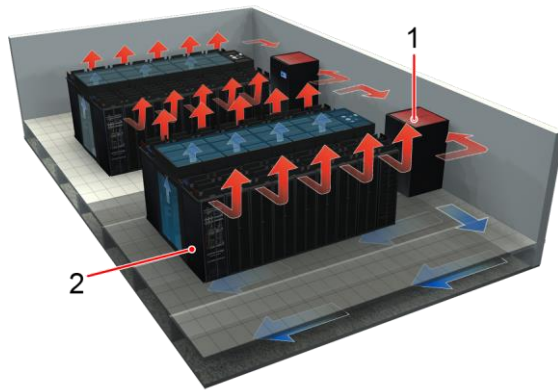
DT01000018

(1) NetCol8000-C070D

(2) Equipment



**Figure 5-3** High-efficiency cold aisle containment scenario

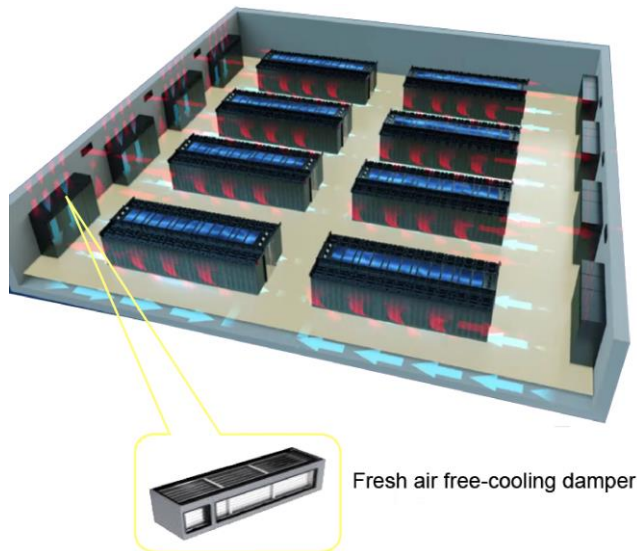


DT01000019

(1) NetCol8000-C070D

(2) Equipment

**Figure 5-4** Scenario with fresh air free-cooling damper



Fresh air free-cooling damper

# 6 Operating Conditions

## NOTICE

If the water inlet temperature exceeds 10 °C or the total load is less than 30% of the cooling capacity of a single smart cooling product, the humidity may be high. The customer is advised to add a dehumidifier (engineering procurement).

## Pipe Dimensions

The following table lists the reserved pipe dimensions of a NetCol8000-C.

**Table 6-1** Pipe dimensions

Item	Specifications
Water outlet pipe	G 2 inch port with inner threads
Water inlet pipe	G 2 inch port with inner threads
Humidifier water inlet pipe	G 1/2 inch port with outer threads
Drainpipe	BSPP 3/4 inch port with inner threads

## Installation Requirements

**Table 6-2** Installation requirements

Item	Specifications
Door	Width $\geq$ 1.3 m; height $\geq$ 2.3 m
Floor	Floor bearing capacity $\geq$ 400 kg/m <sup>2</sup>
Pipe routing	Left and bottom pipe routing, and left pipe routing
Maintenance distance	Front maintenance distance $\geq$ 900 mm

Item	Specifications
Power distribution requirements	Leakage circuit breakers are not recommended for the active power supply route. If a leakage circuit breaker is required by the customer or local regulations, select the residual current circuit breaker (RCCB) that is insensitive to single-phase DC pulsation and transient impulse current.

## Operating Specifications

**Table 6-3** Operating specifications

Item	NetCol8000-C070	NetCol8000-C130	NetCol8000-C190
Operating temperature	4–45 °C	0–40 °C	0–40 °C
Operating humidity	20%–80% RH		
Temperature of inlet chilled water (or glycol) <sup>a</sup>	4–20 °C		
Storage temperature	–40 °C to +70 °C		
Storage humidity	5%–95% RH (non-condensing)		
Altitude	0–4000 m (derated when the altitude is in the range of 1000–4000 m)		
Temperature adjustment range	15–45 °C		
Temperature adjustment precision	1 °C; temperature change rate < 5 °C/h		
Humidity adjustment range	20%–80% RH		
Humidity adjustment precision	5% RH		

# 7 Technical Specifications

**Table 7-1** Downflow smart cooling product specifications

Parameter	NetCol8000-C070D	NetCol8000-C130D	NetCol8000-C190D
Power system	380–415V AC, 3PH, 50/60Hz Dual route		
Maximum current (cooling only/full configuration)	7.3A/16.5A	14A/32.3A	20.7A/39A
Number of fans	1	2	3
Air volume (m <sup>3</sup> /h)	13200	24000	36500
Air filter level	G4	G4	G4
Dimensions (H x W x D, mm)	2000 x 900 x 1000 (single-door)	2000 x 1800 x 1000 (double-door)	2000 x 2700 x 1000 (triple-door)
Net weight (kg)	300	500	690

**Table 7-2** Upflow smart cooling product specifications

Parameter	NetCol8000-C070U	NetCol8000-C130U	NetCol8000-C190U
Power system	380–415V AC, 3PH, 50/60Hz Dual route		
Maximum current (cooling only/full configuration)	7.3A/16.5A	14A/32.3A	20.7A/39A
Number of fans	1	2	3
Air volume (m <sup>3</sup> /h)	12800	23500	35400
Air filter level	G4	G4	G4
Dimensions (H x W x D, mm)	2000 x 900 x 1000 (single-door)	2000 x 1800 x 1000 (double-door)	2000 x 2700 x 1000 (triple-door)

<b>Parameter</b>	<b>NetCol8000-C070 U</b>	<b>NetCol8000-C130 U</b>	<b>NetCol8000-C190 U</b>
Net weight (kg)	300	500	690