



Product Catalog

CyberRow CW

Row-Based Precision Air Handlers

26 kW - 53 kW / 60 Hz





Introduction

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Model Number Descriptions

Digit 1,2,3,4,5 — System

TR-CRS = CyberRow System

Digit 6,7,8 — Nominal Capacity

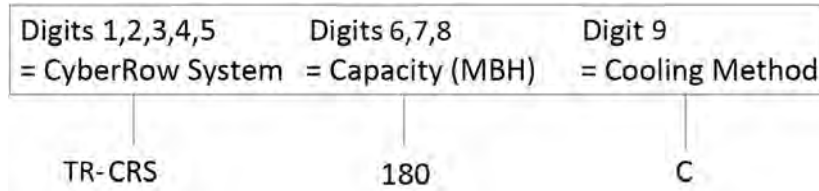
090 = 90 MBh

180 = 180 MBh

Digit 9 — Cooling Method

C = Chilled Water System

Example:



Overview

CyberRow Chilled Water

Chilled Water is supplied to the CyberRow unit via building chiller or other chilled water plant. Chilled water has high affinity for heat, thus making it a very efficient cooling method. Microprocessor controller allows for independent valve and fan control so the unit can adjust immediately and precisely to varying heat loads and optimize energy efficiency.

Figure 1. Traditional

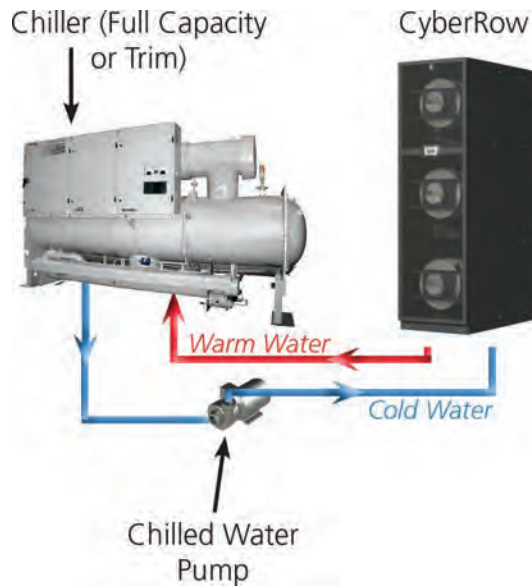
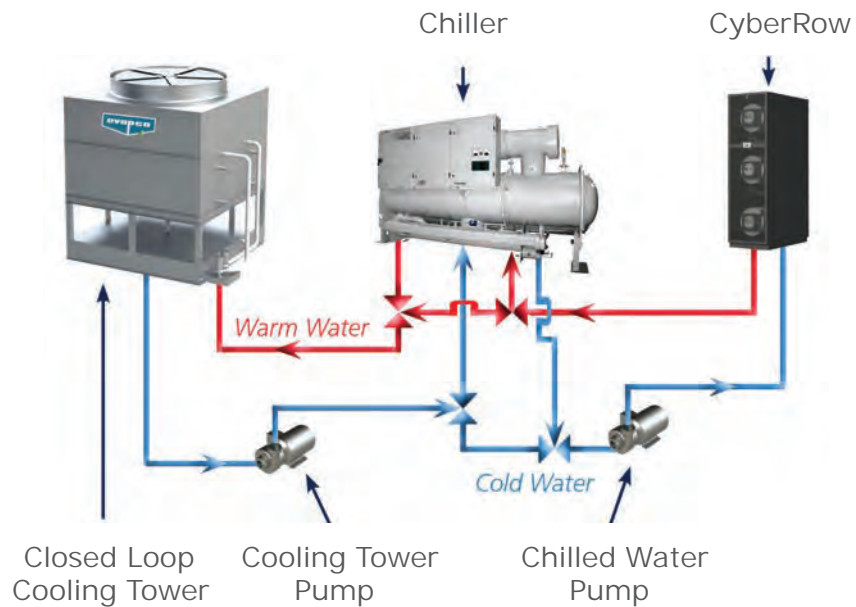


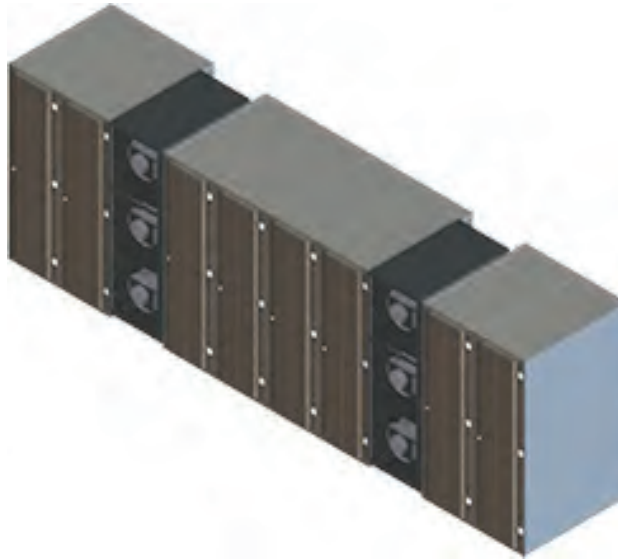
Figure 2. Hybrid free cooling



Configurations

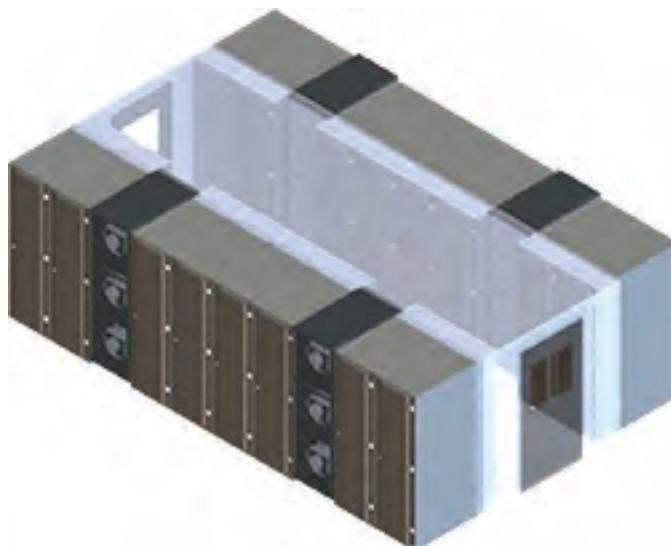
Open Aisle

Open aisle configuration organizes racks in a single row or in hot and cold aisle rows, but without containment. The CyberRow draws hot air from the external environment or hot aisle, removes the heat, and supplies cooled air to the front of IT equipment in the cold aisle.



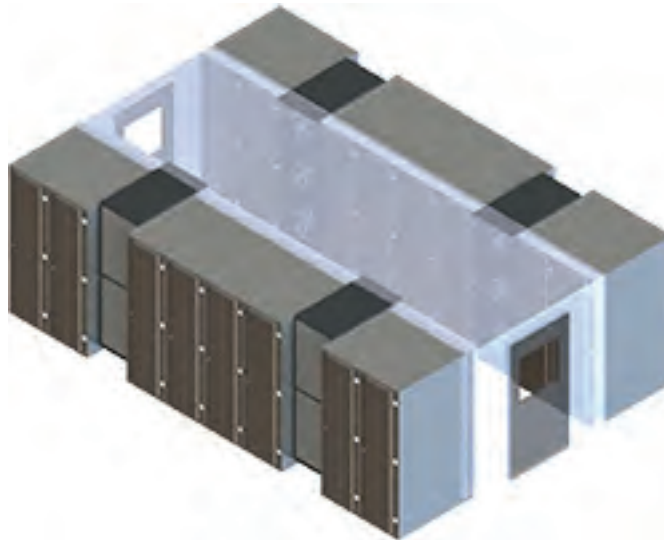
Hot Aisle

Hot aisle containment captures the hot exhaust air from IT equipment and prevents from mixing with cool air. The front of IT equipment is accessed in the external cold aisle. The CyberRow draws the contained hot air from the hot aisle, removes the heat, and supplies cooled air into the external cold aisle.



Cold Aisle

Cold aisle containment captures cooled air from the CyberRow and prevents it from mixing with hot air. The front of IT equipment is accessed in the contained cold aisle. The CyberRow draws hot air from the external environment, removes the heat, and supplies cooled air back into the contained cold aisle.





Standard Product Features

Table 1. Models: TR-CRS-090 and TR-CRS-180

Model	12-inch Cabinet	24-inch Cabinet
	090	180
Cabinet		
Galvannealed Steel, Black Powder Coated Finish	Standard	Standard
Air Pattern and Filtration		
Front Discharge	Standard	Standard
Front Diverted Discharge	Optional	Optional
Permanent Washable Filters	Standard	Standard
Mechanical Components		
Backward Inclined, Plenum Style Fan, with an EC Motor	Standard	Standard
Chilled Water Cooling Coil	Standard	Standard
Piping Configuration (Top or Bottom)	Selectable ^(a)	Selectable ^(a)
Condensate Pump	Standard	Standard
2-Way Modulating Chilled Water Control Valve	Standard	Standard
Electrical System		
Automatic Dual Power Transfer Switch	Optional	Optional
Remote Stop / Start Contacts	Standard	Standard
Main Power Switch	Standard	Standard
Microprocessor Controller		
A/C Grouping pLAN Interface	Optional	Optional
BMS Interface	Optional	Optional
Common Alarm, Dry Contact	Standard	Standard
Optional Accessories		
Mechanical Flow Switch	Optional	Optional
Differential Temperature Flow	Optional	Optional
Smoke Detection	Optional	Optional
Firestat	Optional	Optional
Remote Water Detector	Optional	Optional
Code Conformance		
Certified to UL1995 and CSA C22.2 No. 236	Standard	Standard

(a) Piping connection location to be specified at time of order.



Technical Data

Table 2. Models: TR-CRS-090 and TR-CRS-180

Model	12-inch Cabinet	24-inch Cabinet
	090	180
Chilled Water Control Valves		
2-way (standard) - Modulating		
Size, in. / (Cv)	3/4 (24)	1 (46)
Valve Pressure Rating, psi	600	600
Close-off Pressure Rating, psi	200	200
3-way (optional) - Modulating		
Size, in. / (Cv)	3/4 (23)	1 (40)
Valve Pressure Rating, psi	600	600
Close-off Pressure Rating, psi	200	200
Chilled Water Coil - Aluminum Fin, Copper Tube		
Rows (Face Area, ft ²)	4 / 5.8	4 / 11.6
Face Velocity, fpm	500	500
Blower/Motor - Backward Curved Direct Driven EC		
Horsepower-each, hp	1/4 H.P.	1-1/4 H.P.
CFM	2,900 ^(a)	5,800
Quantity of Blowers	3	3
Drive Method	Direct	Direct
Washable Filters		
Nominal Size, in. (Qty.)	10.5 × 37.38 × 0.43 (2)	22.0 × 37.38 × 0.43 (2)
Connection Sizes, in. (Copper)		
Condensate Drain with pump, in. FPT	1/2-in. FPT	1/2-in. FPT
Water In/Out, in. NPT	1-1/4-in. NPT	1-1/2-in. NPT
Physical Data		
Approx. Weight, lb	380	550
Dimensions: (H x W x D), in. without Side Diverter Panel Option	77.80-in. x 11.60-in. x 42.10-in.	77.80-in. x 23.40-in. x 42.10-in.
Dimensions: (H x W x D), in. with Side Diverter Panel Option	77.80-in. x 11.60-in. x 48.30-in.	77.80-in. x 23.42-in. x 48.30-in.
Approx. Shipping Weight, lb	570	711
Approx. Shipping Dimensions, H in. x W in. x D in.	84-in. x 22-in. x 54-in.	84-in. x 32-in. x 54-in.

(a) When 110v/1Ph/60Hz Power Input is selected, unit airflow is decreased by 200 CFM, which will result in capacity reduction of 3.5% or less.



Performance Data

Table 3. Model: TR-CRS-090

12-inch Cabinet		Total Capacity		Sensible Capacity		Flow Rate GPM	Total System Pressure Drop, Ft. H ₂ O
		BTU/H	kW	BTU/H	kW		
100° FDB/69.2° FWB Entering Air Temperature							
40° F EWT	10° F ΔT	129,617	38.0	129,617	38.0	26.2	24.5
	12° F ΔT	125,139	36.7	125,139	36.7	21.0	16.1
45° F EWT	10° F ΔT	117,368	34.4	117,368	34.4	23.7	20.1
	12° F ΔT	113,122	33.2	113,122	33.2	19.1	13.4
50° F EWT	10° F ΔT	105,218	30.8	105,218	30.8	21.4	16.5
	12° F ΔT	100,811	29.5	100,811	29.5	17.0	10.6
95° FDB/67.7° FWB Entering Air Temperature							
40° F EWT	10° F ΔT	121,726	35.7	120,757	35.4	24.6	21.8
	12° F ΔT	112,386	32.9	112,386	32.9	19.0	13.3
45° F EWT	10° F ΔT	104,535	30.6	104,535	30.6	21.2	16.3
	12° F ΔT	100,245	29.4	100,245	29.4	17.0	10.7
50° F EWT	10° F ΔT	92,192	27.0	92,192	27.0	18.7	12.7
	12° F ΔT	88,031	25.8	88,031	25.8	15.0	8.4
90° FDB/66.1° FWB Entering Air Temperature							
40° F EWT	10° F ΔT	109,059	32.0	107,198	31.4	22.0	17.6
	12° F ΔT	99,391	29.1	99,391	29.1	16.8	10.5
45° F EWT	10° F ΔT	91,692	26.9	91,692	26.9	18.7	12.8
	12° F ΔT	87,216	25.6	87,216	25.6	14.8	8.3
50° F EWT	10° F ΔT	79,320	23.2	79,320	23.2	16.2	9.7
	12° F ΔT	74,959	22.0	74,959	22.0	12.8	6.2
85° FDB/64.5° FWB Entering Air Temperature							
40° F EWT	10° F ΔT	96,555	28.3	93,527	27.4	19.5	14.0
	12° F ΔT	86,499	25.4	86,499	25.4	14.7	8.2
45° F EWT	10° F ΔT	78,630	23.0	78,630	23.0	16.0	9.6
	12° F ΔT	74,137	21.7	74,137	21.7	12.6	6.1
50° F EWT	10° F ΔT	66,315	19.4	66,315	19.4	13.6	7.0
	12° F ΔT	61,825	18.1	61,825	18.1	10.6	4.4
80° FDB/62.8° FWB Entering Air Temperature							
40° F EWT	10° F ΔT	84,202	24.7	80,116	23.5	17.2	11.1
	12° F ΔT	80,458	23.6	77,242	22.6	13.7	7.2
45° F EWT	10° F ΔT	65,745	19.3	65,745	19.3	13.5	6.9
	12° F ΔT	61,176	17.9	61,176	17.9	10.5	4.3
50° F EWT	10° F ΔT	53,253	15.6	53,253	15.6	11.0	4.7
	12° F ΔT	48,608	14.2	48,608	14.2	8.4	2.7

Table 4. Model: TR-CRS-180

24-inch Cabinet		Total Capacity		Sensible Capacity		Flow Rate GPM	Total System Pressure Drop, Ft. H ₂ O
		BTU/H	kW	BTU/H	kW		
100° FDB/69.2° FWB Entering Air Temperature							
40°F EWT	10°F ΔT	270,762	79.4	267,158	78.3	56.0	55.2
	12°F ΔT	252,610	74.0	252,610	74.0	43.5	34.3
45°F EWT	10°F ΔT	235,275	69.0	235,275	69.0	49.0	42.6
	12°F ΔT	228,040	66.8	228,040	66.8	39.5	28.4
50°F EWT	10°F ΔT	210,435	61.7	210,435	61.7	44.0	34.5
	12°F ΔT	203,363	59.6	203,363	59.6	35.5	23.1
95° FDB/67.7° FWB Entering Air Temperature							
40°F EWT	10°F ΔT	245,849	72.1	239,969	70.3	51.0	46.4
	12°F ΔT	239,974	70.3	235,218	68.9	41.5	31.5
45°F EWT	10°F ΔT	209,408	61.4	209,408	61.4	43.5	34.1
	12°F ΔT	202,307	59.3	202,307	59.3	35.2	22.9
50°F EWT	10°F ΔT	184,879	54.2	184,879	54.2	39.0	27.6
	12°F ΔT	177,574	52.0	177,574	52.0	31.2	18.1
90° FDB/66.1° FWB Entering Air Temperature							
40°F EWT	10°F ΔT	220,747	64.7	212,936	62.4	46.0	38.2
	12°F ΔT	214,208	62.8	207,808	60.9	37.0	25.4
45°F EWT	10°F ΔT	183,826	53.9	183,826	53.9	38.5	27.1
	12°F ΔT	176,252	51.7	176,252	51.7	31.0	18.1
50°F EWT	10°F ΔT	158,847	46.6	158,847	46.6	33.5	20.7
	12°F ΔT	151,093	44.3	151,093	44.3	26.7	13.5
85° FDB/64.5° FWB Entering Air Temperature							
40°F EWT	10°F ΔT	195,763	57.4	185,634	54.4	41.0	30.8
	12°F ΔT	188,714	55.3	180,359	52.9	33.0	20.5
45°F EWT	10°F ΔT	158,051	46.3	158,051	46.3	33.5	20.9
	12°F ΔT	149,579	43.8	149,579	43.8	26.5	13.5
50°F EWT	10°F ΔT	132,979	39.0	132,979	39.0	28.5	15.3
	12°F ΔT	124,153	36.4	124,153	36.4	22.2	9.6
80° FDB/62.8° FWB Entering Air Temperature							
40°F EWT	10°F ΔT	170,522	50.0	158,384	46.4	36.0	24.2
	12°F ΔT	162,601	47.7	152,689	44.8	28.5	15.6
45°F EWT	10°F ΔT	131,334	38.5	131,334	38.5	28.0	15.0
	12°F ΔT	122,660	35.9	122,660	35.9	22.0	9.5
50°F EWT	10°F ΔT	105,995	31.1	105,995	31.1	23.0	10.3
	12°F ΔT	96,888	28.4	96,888	28.4	17.7	6.3



Electrical Data

Table 5. Electrical data

Models	090		180	
	MCA	MFS	MCA	MFS
Cooling Only				
120/1/60	NA	NA	N/A	N/A
208 V~	5.4	15	13.8	15
208 V 3~	5.4	15	10.8	15
460 V 3N~	4.0	15	4.9	15
575 V 3~	1.7	15	3.9	15

Note: Standard 1 KAIC rating, optional 65 KAIC rating available.



Dimensional Drawings

Model: TR-CRS-090-C

Figure 3. Top piping option

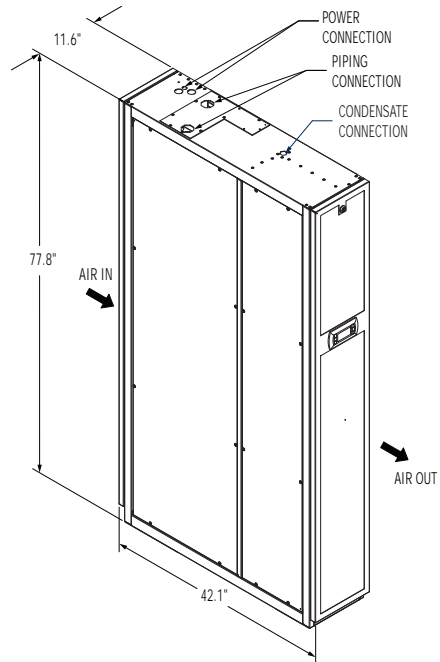


Figure 4. Bottom piping option

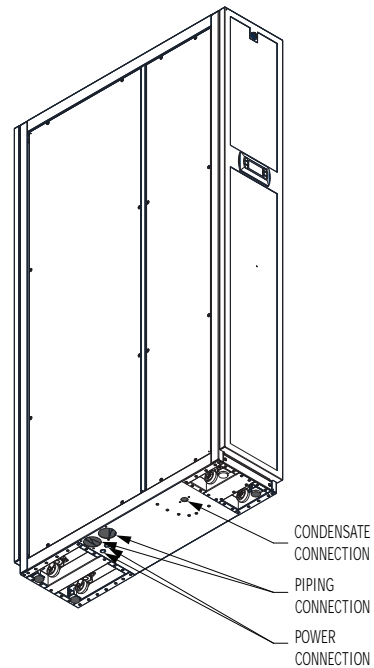


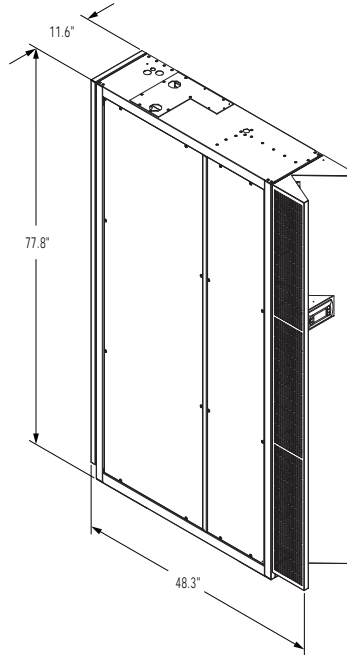
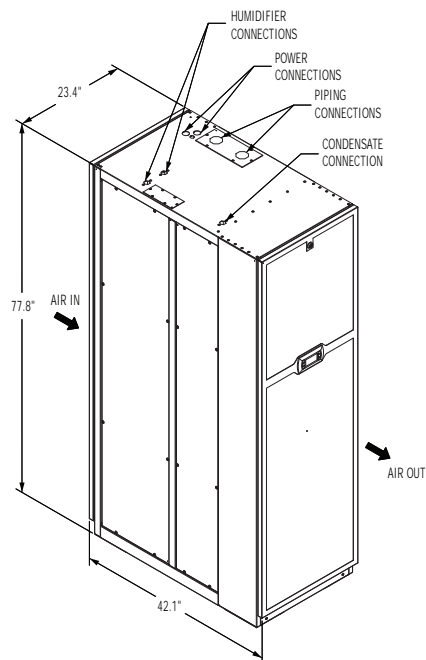
Figure 5. Side diverted front panel option**Model: TR-CRS-180-C****Figure 6. Top piping option**

Figure 7. Bottom piping option

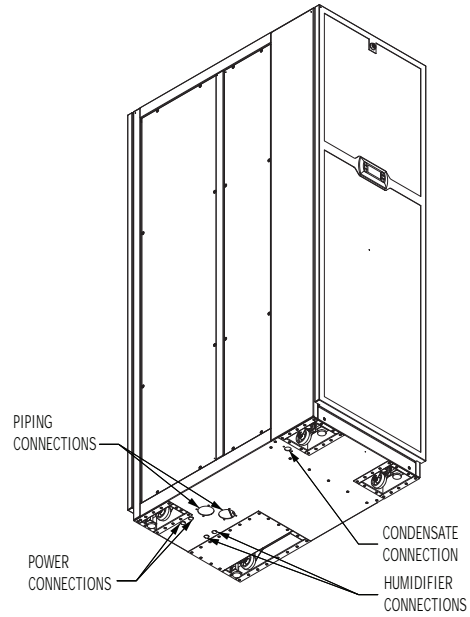
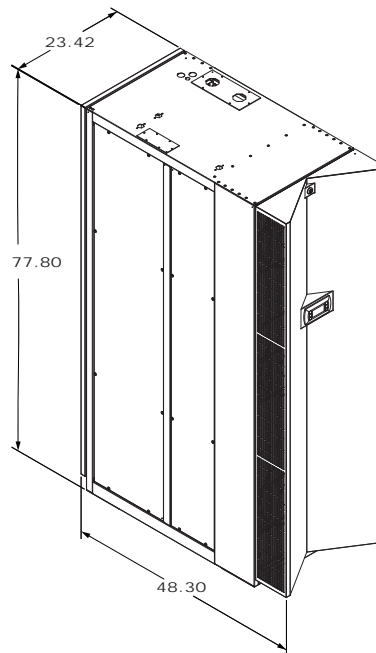


Figure 8. Side diverted front panel option





Guide Specifications

CyberRow CW Row-Based Precision Air Handlers

Summary

This specification describes requirements for a precision environmental control system. The CyberRow is a row-based cooling system that shall provide precision temperature control for computer rooms or rooms containing telecommunications or other highly sensitive heat load equipment where continuous 24 hour a day, 365 days a year air conditioning is required.

Designed with both front and rear access, CyberRow systems require minimum floor space. The CyberRow model number shall be, TR-CRS- - .

Design Requirements

The environmental control system shall be a CyberRow Chilled Water factory-assembled unit. The unit shall be designed for a row-based installation with removable front and rear access panels. No allowance for side service access shall be required, however removable side access panels shall be provided for additional access.

The CyberRow units are especially adapted for both raised and unraised floors. The air handling section shall be specifically designed for high sensible heat ratio.

Quality Assurance

The manufacture shall maintain a set of international standards of quality management to ensure product quality. Each system shall be subjected to a complete operational and functional test procedure at the factory prior to shipment.

Cabinet

Side access panels shall be fabricated from 20 gauge galvanized steel and shall be securely bolted to a 14 gauge base and the top plate. The top plate, front and rear panels shall be fabricated from 16 gauge galvanized steel.

The cabinet shall be powder coated to provide durability, and to protect from corrosion. Armaflex elastomeric thermal insulation shall be used to block noise. Casters and leveling feet shall be included to ease the installation and level the equipment with existing IT solutions.

Air Flow Patterns

All units shall be designed using a front discharge with a rear return airflow pattern. An optional, front diverted discharge plenum is available.

Air Filtration

All units shall be equipped with removable, washable filters. These filters shall consist of an open cell structured polyurethane foam with a roll formed 3000 series aluminum frame. Filters shall meet both UL 900 and UL 94 HF-1 standards.

Mechanical Components

Backward Inclined, Plenum Style Fan, with an EC Motor

The blowers shall be backward inclined plenum style fans with an Electronically Commutated (EC) motor, for maintenance free operation. The motor shall include integrated electronic control board and direct microprocessor control signaling for fan speed control, soft-starting capabilities, and integrated current limitations. Each fan shall be low noise, low vibration manufactured with an aluminum impeller. Each fan impeller shall be dynamically and statically balanced in two planes to minimize vibration during operation.

Chilled Water Cooling Coil

The coil shall be constructed of seamless drawn copper tubes, mechanically bonded to tempered aluminum fins, and mounted in a stainless steel condensate drain pan. The coil shall be designed for a maximum of 500 ft./min. face velocity. The water circuit shall be designed to distribute water into the entire coil face area.

Piping Configuration

Top Piping

When top piping is specified, the CyberRow units shall be provided with connections for both the chilled water piping and condensate discharge on the top of the cabinet.

Bottom Piping

When bottom piping is specified (e.g. raised floor applications), the CyberRow units shall be provided with connections for both chilled water piping and condensate pump discharge on the bottom of the cabinet.

Condensate Pump

The CyberRow shall include a factory wired and installed condensate pump. The condensate pump shall have the capacity of 13.5 gal/hr. at 26 ft. of lift. The maximum feet of head is 26 ft. The condensate pump shall be piped with either top or bottom discharge connections, to remain consistent with top or bottom piping connections.

2-Way (Standard)

A 2-way modulating valve rated for a maximum 600 psig w.w.p. shall be factory piped and wired. The 2-way chilled water modulating valve shall automatically meter the flow of chilled water to the cooling coil in response to a proportional signal (0- 10 Vdc) provided to the valve by the microprocessor controller.

3-Way (Optional)

A 3-way modulating valve rated for a maximum 600 psig w.w.p. shall be factory piped and wired. The 2 - 3-way chilled water modulating valve shall automatically meter the flow of chilled water to the cooling coil in response to a proportional signal (0- 10 Vdc) provided to the valve by the microprocessor controller.

Electrical System

The electrical system shall conform to National Electrical Code (NEC) requirements. In accordance with NEC Class II circuits, the control circuit shall be 24 volts AC and control circuit wiring shall not be smaller than 18 AWG. All wiring shall be neatly wrapped, run in conduit or cable trays, and routed in bundles. Each wire shall end with a service loop and be securely fastened by an approved method. Each wire in the unit shall be numbered for ease of service tracing.

All electrically actuated components shall be easily accessible from the front and rear of the unit without reaching over exposed high voltage components or rotating parts. Each high voltage circuit shall be individually protected by circuit breakers or manual motor starters on all three phases. The blower motor shall have thermal and short circuit protection. Line voltage and 24 volt control circuit wiring shall be routed in separate bundles. The electric box shall include all the contactors, starters, fuses, circuit breakers and terminal boards required for operation of the CyberRow unit and shall allow for full service via front and rear access panel.

Automatic Dual Power Transfer Switch (Optional)

Two individual main power input disconnect switches shall be provided, one for each incoming power source. In the event the primary power fails or a phase loss/imbalance occurs, the automatic transfer switch transfers power to the secondary power source. Once the primary power has been restored, the transfer switch automatically shifts the power load back to the primary power. The transfer time from one source to the other is user adjustable to allow staging or sequence restart of load.



Guide Specifications

In addition to the automatic transfer switch function, the local controller display shall indicate which power source has failed. This indication is a visual depiction that allows the user to determine the status of the input source. This status can also be conveyed thru the BMS serial communication link.

Remote Stop/Start Contracts

Included in the system's electrical control circuit shall be a 2-pin terminal connection for remote stop/start of the CyberRow air conditioner by remote source.

Main Power Service Switch

The CyberRow unit shall be provided with a unit mounted main power service switch.

Microprocessor Controller

The advanced microprocessor based controller shall be equipped with flexible software capable of meeting the specific needs of the application. The setpoints shall be default and their ranges shall be easily viewed and adjusted from the user interface display. The program and operating parameters shall be permanently stored on a non-volatile system in the event of power failure.

The controller shall be designed to manage temperature levels to a user defined setpoint via control output signals to the CyberRow unit.

The controller shall receive inputs for measurable temperature control conditions via return air or room mounted sensors. The internal logic will then determine if the conditions require cooling. Control setpoints shall be established to maintain design conditions of the installation. The controller will respond accordingly to changes in these conditions and control the output/demand for the appropriate mode of operation until user defined conditions are achieved.

Field Configurable

The advanced microprocessor based controller shall be equipped with flexible software capable of meeting the specific needs of the application. The setpoints shall be default and their ranges shall be easily viewed and adjusted from the user interface display. The program and operating parameters shall be permanently stored on a non-volatile system in the event of power failure.

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Password Protection

Access to the Info Menu, Alarms Log, and the ability to monitor room conditions shall be allowed without the use of a password. Modifications to the control setpoints shall require the use of a password. The controller shall be programmed to recognize predetermined security levels before allowing access to display screens containing critical variables. Three secured menu levels (Control, Service and Factory) will support unique passwords that must be entered to access the menu screens so only authorized personnel may perform modifications to the settings.

Restorable Parameters / Factory Defaults

Upon initial start-up the CyberRow system shall operate using the setpoints programmed by the factory. The customer may enter new operating parameters in the Control menu and the system will then operate accordingly.

The new setpoints may be stored as, "Customer Default Setpoints". The primary setpoints entered by the factory still remain stored in the controllers' memory as, "Factory Setpoints". The setpoints for the system may be re-adjusted in the Control menu at any time. If it becomes necessary, the customer may restore the setpoints back to the Customer Default setpoint values or to the original Factory (primary) setpoint values.

Timer Feature

The timer shall allow the user to set up an operating schedule to automatically scale back or shut down the air conditioner during low demand or unoccupied periods. This is an energy saving feature offering the user the ability to create an operating schedule tailored to the needs of the building. An evening (night-setback) schedule may also be created, allowing the CyberRow unit to operate at night with relaxed temperature setpoints and offsets.

A/C Grouping pLAN Operation

Multiple CyberRow system controllers shall be able to be connected (grouped) to a pLAN local network, allowing the communication of data and information from each controller to a central control terminal or Lead controller. The Lead controller display screens can be used to monitor and adjust group control variables for the individual system controllers. Each microprocessor controller connected to the pLAN network shall be identified with its own unique address.

Multiple CyberRow units consisting of up to eight Trane precision air conditioners equipped with like controllers may be controlled and monitored via the microprocessor controller. With multiple CyberRow® units each unit can selectively be configured as “Active” to operate as a primary A/C, “Capacity Assist” for staged operation, or as “Standby” to come online in case of a failed air conditioning unit to ensure continuous availability.

The controller may also be configured to rotate units with timed duty cycling to promote equal run-time and assure that each CyberRow unit within the rotating group is operationally exercised on a periodic timed basis.

BMS Interface

The microprocessor controller may incorporate a 10 Mbps communication interface port that can be field connected through a serial interface to a Building Management System via Modbus, BACnet, SNMP, or HTTP as configured by the factory. A controller interfaced to a network must be configured for BMS communication.

Alarms

Alarm conditions shall activate a red LED indicator that backlights the alarm function key. As an option, an alarm condition may also be enunciated by an audible alarm signal. An alarm is acknowledged by pressing the alarm key.

This calls up alarm display screens that provide a text message detailing the alarm conditions. After an alarm condition is corrected, the alarm can be cleared by pressing the alarm key.

Small Bezel Display Panel

The small bezel user interface display panel features an easy to read, backlit liquid-crystal alphanumeric display equipped with contrast adjustment and LED illuminated function keys. The screens that appear on the user interface display panel present data that originates from the controller I/O module. The controller is operated via a 6-key menu-driven loop structure and offers an alarm log plus four different interface menu levels to the operator: Information, Control, Service, and Factory. These menus permit the user to easily view, control, and configure operating parameters for the CyberRow unit.

Optional Accessories

Mechanical Flow Switch (Optional)

A shipped loose flow switch shall activate a loss of flow alarm in the event of chilled water flow interruption.

Differential Temperature Flow (Optional)

A factory mounted and wired temperature sensor for inlet and outlet water temperatures shall permit a loss of flow alarm in the event the temperature difference is within 1° F (adjustable) during chilled water valve operation.



Guide Specifications

Smoke Detection

A photo-electric smoke detector shall be factory installed and wired in the return air stream. The air conditioner will shut down upon sensing smoke in the return air stream.

Firestat

The air conditioner shall be provided with a factory wired and mounted firestat. The firestat will shut down the air conditioner upon sensing a high return air temperature.

Remote Water Detector Spot Type

A remote single point water/leak detector shall be factory supplied and shall ship separately for field installation. Upon sensing a water leak, the normally closed water detector control circuit shall open, thereby shutting down the CyberRow's water producing components.

Remote Water Detector Strip Type

A 20 ft. in length remote strip/cable type water/leak detector shall be provided for remote field installation. In addition to the 20 ft. sensing cable, a 24 volt water detector power module shall require field mounting and wiring to the factory provided terminal connection. Upon sensing a water leak, the normally closed water detector control circuit shall open, thereby shutting down the CyberRow's water producing components.

Code Conformance

The unit shall be designed and built to conform to UL STD 1995, certified to CAN/CSA C22.2 No. 236. and listed with ETL.



Notes

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.