



Product Catalog

CyberRow DX

Row-Based Precision Air Conditioners

12 kW - 33 kW / 60 Hz



SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.



Introduction

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs and HCFCs such as saturated or unsaturated HFCs and HCFCs.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING**Personal Protective Equipment (PPE) Required!**

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING**Follow EHS Policies!**

Failure to follow instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

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Model Number Descriptions

Digit 1,2,3,4,5 — System

TR-CRS = CyberRow System (Row Based Cooling)

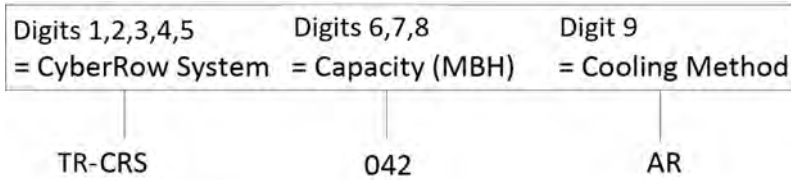
Digit 6,7,8 — Nominal Capacity (in 1,000 of BTU/H) (MBh)

042 = 42 kW
084 = 84 kW
085 = 85 kW
090 = 90 kW

Digit 9 — Cooling Method

AR = Remote (Split) Air Cooled
W = Water Cooled
G = Glycol Cooled
GFC= Glycol Free Cooling

Example:





Specifications and Configurations

Model Nomenclature Specifications

Air Cooled Remote Evaporator (Models TR-CRS-__-AR)

The floor mounted precision air conditioner system shall be a split air cooled evaporator with remote air cooled condenser. The evaporator section shall house, at a minimum, the evaporator coil, expansion valve, compressor, evaporator blower/motor and associated electrical and refrigeration components.



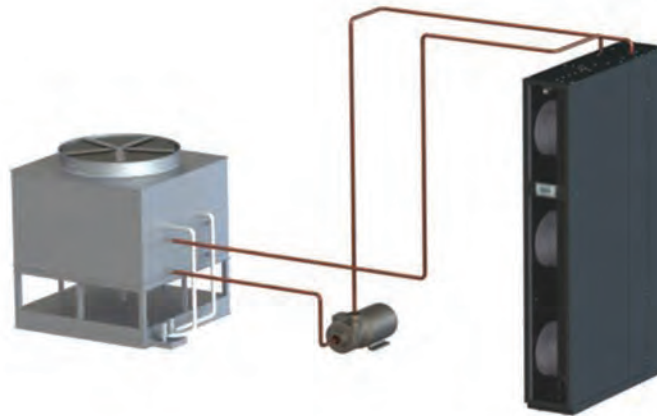
Air Cooled Heat Rejection

The remote outdoor air-cooled condenser shall be sized to provide the total heat of rejection of the system and incorporate low ambient head pressure control method, -20°F or -30°F.

DX Water Cooled (Models TR-CRS-__-W)

The floor mounted precision air conditioner system shall be self-contained to include an integral water cooled, plate-fin condenser with factory installed head pressure water regulating control valve(s).

Condenser (source) water shall be provided by a cooling tower or some other remote water source.

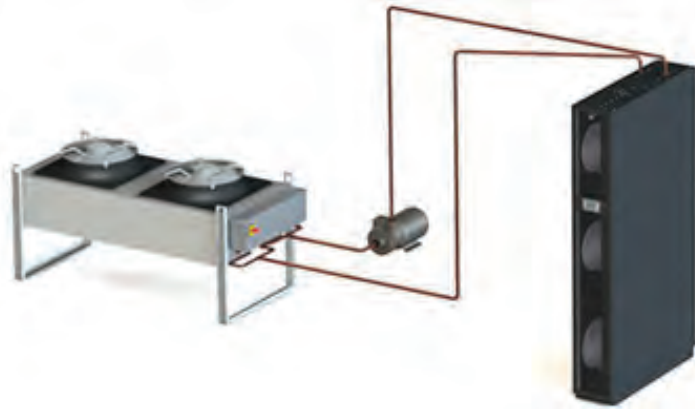


Head Pressure Control

Head pressure shall be automatically controlled by factory installed 2-way, or 3-way water regulating valves rated for 600 psig w.w.p.

DX Glycol Cooled (Models TR-CRS-___-G)

The floor mounted precision air conditioner system shall be self-contained to include an integral glycol cooled, plate-fin condenser with factory installed head pressure glycol regulating control valve. Condenser (source) glycol solution shall be provided via Trane model GPS - _ - _ remote glycol pump package and F _ S _ dry cooler system.



Glycol Regulating Valve

Head pressure shall be automatically controlled by factory installed 2-way, or 3-way, water regulating valve rated for 600 psig w.w.p.

Configurations

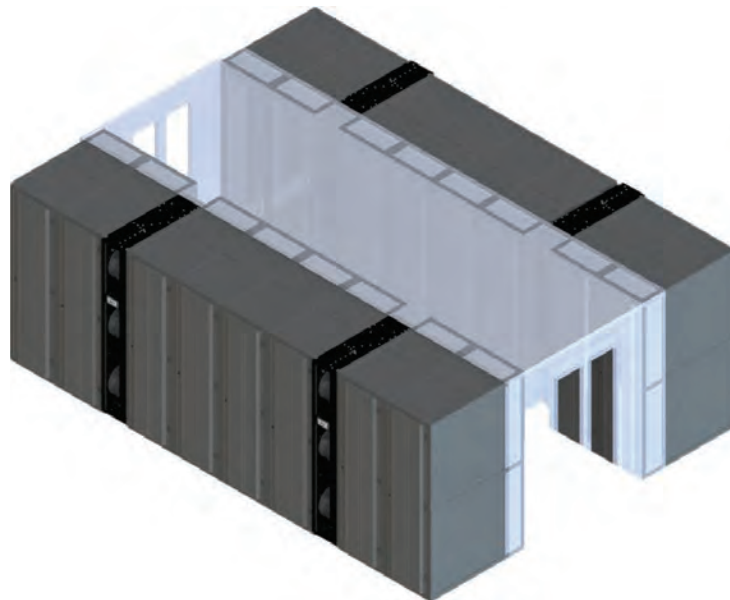
Open Aisle

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.



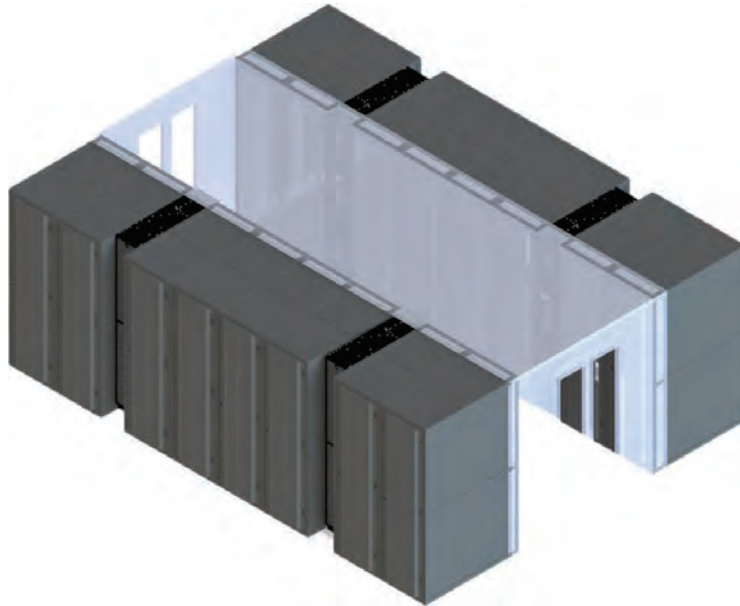
Hot Aisle

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-042 - TR-CRS-090

Models	TR-CRS-042	TR-CRS-084	TR-CRS-085	TR-CRS-090
Cabinet				
Galvannealed Steel, Black Powder Coated Finish	Standard	Standard	Standard	Standard
Air Pattern and Filtration				
Front Discharge	Standard	Standard	Standard	Standard
Front Diverted Plenum Discharge	Optional	Optional	Optional	Optional
Permanent Washable Filters	Standard	Standard	Standard	Standard
Mechanical Components				
Backward Inclined, Plenum Style Fan, with an EC Motor	Standard	Standard	Standard	Standard
R410A Refrigerant	Standard	Standard	Standard	Standard
Scroll Compressor	Standard	Standard	Standard	Standard
Variable Compressor Speed Control	N/A	N/A	N/A	Standard
Proportional Electronic Expansion Valve	Standard	Standard	Standard	Standard
Electronic Hot Gas Bypass Valve	Standard	Standard	Standard	N/A
Piping Configuration (Top, or Bottom)	Selectable ^(a)	Selectable ^(a)	Selectable ^(a)	Selectable ^(a)
Condensate Pump	Standard	Standard	Standard	Standard
Electrical System				
Voltage and Power Supply	Standard	Standard	Standard	Standard
Single Point Power Connection	Standard	Standard	Standard	Standard
Dual Power Connection	N/A	N/A	N/A	N/A
Remote Stop/Start Contacts	Standard	Standard	Standard	Standard
Main Power Switch	Standard	Standard	Standard	Standard
Humidity Control				
5 lb Electrode Canister Steam Humidifier	N/A	N/A	N/A	N/A
9 kW Electric Heat/Reheat	N/A	N/A	N/A	N/A
Microprocessor Controller				
A/C Grouping pLAN Interface	Optional	Optional	Optional	Optional
BMS Interface	Optional	Optional	Optional	Optional
Common Alarm, Dry Contact	Standard	Standard	Standard	Standard
Optional Accessories				
Smoke Detection	Optional	Optional	Optional	Optional
Code Conformance				
Certified to UL 1995 and CSA C22.2 No. 236	Standard	Standard	Standard	Standard

Standard Product Features

Table 1. Models: TR-CRS-042 - TR-CRS-090 (continued)

Models	TR-CRS-042	TR-CRS-084	TR-CRS-085	TR-CRS-090
Specific Model Standard Features				
Remote Air Cooled Condenser Rated for 95° or 105°F High Ambient	Standard	Standard	Optional	Standard
Head Pressure Control (-20°F Low Ambient Variable Fan Speed Control)	Standard	Standard	Optional	Standard
Head Pressure Control (-30°F Low Ambient Flooded and Fan Speed Control)	Optional	Optional	Optional	Optional
Water / Glycol Cooled Systems				
Stainless Steel Brazed-Plate (W/G)	Standard	Standard	Standard	Standard
2-Way 600 psig Regulating Valve (W/G)	Standard	Standard	Optional	Standard
3-Way 600 psig Regulating Valve (W/G)	Optional	Optional	Standard	Optional
Free Cooling / Alternate Water Source Systems				
3-Way Water Controlled Valve with Inherent 2-Way Operation	N/A	N/A	Standard	N/A

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



Technical Data

Table 2. Models: TR-CRS-042 - TR-CRS-090

Models	042	084	085	090
Blower / Motor - Backward Inclined, Plenum Style Fan, with an EC Motor				
Horsepower (Each)	1/4 H.P.	1/4 H.P.	1/4 H.P.	1/4 H.P.
CFM	1,500	2,900	2,900	2,900
Quantity of Blowers	3	3	3	3
Drive Method	Direct	Direct	Direct	Direct
Direct Expansion (DX) Coil				
Evaporator Coil - Aluminum Fin, Copper Tube				
Rows / Face Area (ft ²)	3 / 5.8	4 / 5.8	4 / 5.8	4 / 5.8
Face Velocity, fpm	260	500	500	500
Compressor - Heat Pump Duty Rated Scroll - R410A				
Type (Qty)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)
Watts Input	3,680	7,090	7,090	7,830
Total Heat of Rejection (MBh)	64.6	124	124	131.8
Condenser Type	Remote Air Cooled	Remote Air Cooled	Remote Air Cooled	Remote Air Cooled
Head Pressure Control	See Remote Condenser Selection			
Connection Sizes - Copper				
Condensate Drain with Pump	1/2 FPT	1/2 FPT	1/2 FPT	1/2 FPT
Hot Gas & Liquid Refrigerant Connections (Air Cooled)	5/8 O.D.	5/8 O.D.	5/8 O.D.	5/8 O.D.
Connection Sizes - Copper				
Approximate Weight (lbs)	450	480	550	480
Dimensions: (H x W x D), in. without Side Diverter Panel Option	77.8 x 11.6 x 42.1	77.8 x 11.6 x 42.1	77.8 x 23.4 x 42.1	77.8 x 11.6 x 42.1
Dimensions: (H x W x D), in. with Side Diverter Panel Option	77.8 x 11.6 x 48.3	77.8 x 11.6 x 48.3	77.8 x 23.4 x 48.3	77.8 x 11.6 x 48.3
Approximate Shipping Weight (lbs)	636	665	711	665
Approximate Shipping Dimensions (H x W x D)	84 x 22 x 54	84 x 34 x 54	84 x 22 x 54	84 x 22 x 54

Table 3. Models: TR-CRS-042 - TR-CRS-090

Models	042		084		085		090	
	- W	- G	- W	- G	- W	- G	- W	- G
Blower / Motor - Backward Inclined, Plenum Style Fan, with an EC Motor								
Horsepower (Each)	1/4 H.P.	1/4 H.P.	1/4 H.P.	1/4 H.P.	1/4 H.P.	1/4 H.P.	1/4 H.P.	1/4 H.P.
CFM	1,500	1,500	2,900	2,900	2,900	2,900	2,900	2,900
Quantity of Blowers	3	3	3	3	3	3	3	3
Drive Method	Direct	Direct	Direct	Direct	Direct	Direct	Direct	Direct
Direct Expansion (DX) Coil								
Evaporator Coil - Aluminum Fin, Copper Tube								
Rows / Face Area (ft ²)	3 / 5.8	3 / 5.8	4 / 5.8	4 / 5.8	4 / 5.8	4 / 5.8	4 / 5.8	4 / 5.8
Face Velocity, fpm	260	260	500	500	500	500	500	500
Head Pressure Control								
Standard Control	Modulating 2-Way Water Valve							
Optional Control	Modulating 3-Way Water Valve							
Compressor - Heat Pump Duty Rated Scroll - R410A								
Type (Qty)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Variable (1)	Variable (1)
Watts Input	2,820	3,940	5,690	7,470	5,690	7,470	6,290	8,250
Total Heat of Rejection (MBh)	66	64	128	124	128	124	135	131
GPM @ 85°F EWT / 95°F LWT 0% Glycol Solution	13.2	N/A	25.6	N/A	25.6	N/A	27.1	N/A
GPM @ 110°F EGT / 120°F LGT 40% Glycol Solution	N/A	13.9	N/A	26.7	N/A	26.7	N/A	28.3
Unit Pressure Drop (ft. wg)	28.6	34.4	21.5	25.2	21.5	25.2	23.7	28.1
Condenser Type	Integral Brazed Plate							
Connection Sizes - Copper								
Condensate Drain with Pump	1/2 FPT	1/2 FPT	1/2 FPT	1/2 FPT	1/2 FPT	1/2 FPT	1/2 FPT	1/2 FPT
Condenser Fluid In / Out (NPT)	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Physical Data								
Approximate Weight (lbs)	520	520	550	550	650	650	550	550
Dimensions: (H x W x D) in. without Side Diverter Panel Option	77.8 x 11.6 x 42.1				77.8 x 23.4 x 42.1		77.8 x 11.6 x 42.1	
Dimensions: (H x W x D) in. with Side Diverter Panel Option	77.8 x 11.6 x 48.3				77.8 x 23.4 x 48.3		77.8 x 11.6 x 48.3	
Approximate Shipping Weight (lbs)	706	706	736	736	836	836	736	736
Approximate Shipping Dimensions (H x W x D)	84 x 22 x 54		84 x 22 x 54		84 x 34 x 54		84 x 22 x 54	



Performance Data

Table 4. Models TR-CRS-042 - TR-CRS-090

Models	MBh / kW	042 - AR	042 - W	042-G	084-AR	084-W	084-G	090-AR	090-W	090-G
Net DX Cooling Capacity - MBh / kW (Includes Motor heat @ Rated CFM)										
100° FDB / 69.2° FWB Entering Air Temperature										
Total	MBh	52.0	55.0	51.0	99.0	107.0	97.0	104.0	112.0	101.0
Sensible		52.0	55.0	51.0	99.0	107.0	97.0	104.0	112.0	101.0
Total	kW	15.1	16.2	14.8	28.9	31.3	28.3	30.0	33.0	30.0
Sensible		15.1	16.2	14.8	28.9	31.0	28.3	30.0	33.0	30.0
95° FDB / 67.7° FWB Entering Air Temperature										
Total	MBh	49.0	53.0	48.0	94.0	101.0	92.0	98.0	106.0	96.0
Sensible		49.0	53.0	48.0	94.0	101.0	92.0	98.0	106.0	96.0
Total	kW	14.3	15.4	14.0	27.4	29.7	26.8	29.0	31.0	28.0
Sensible		14.3	15.4	14.0	27.4	29.7	26.8	29.0	31.0	28.0
90° FDB / 66.1° FWB Entering Air Temperature										
Total	MBh	46.0	50.0	45.0	88.0	97.0	88.0	93.0	102.0	91.0
Sensible		46.0	50.0	45.0	88.0	97.0	88.0	93.0	102.0	91.0
Total	kW	13.5	14.7	13.2	25.8	28.5	25.7	27.0	30.0	27.0
Sensible		13.5	14.7	13.2	25.8	28.5	25.7	27.0	30.0	27.0
85° FDB / 64.5° FWB Entering Air Temperature										
Total	MBh	44.0	49.0	43.0	85.0	95.0	82.p	89.0	99.0	86.0
Sensible		44.0	49.0	43.0	85.0	95.0	82.0	89.0	95.0	86.0
Total	kW	12.8	14.2	12.5	24.9	27.8	23.9	26.0	29.0	25.0
Sensible		12.8	14.1	12.5	24.9	27.8	23.9	26.0	28.0	25.0
80° FDB / 62.8° FWB Entering Air Temperature										
Total	MBh	42.0	47.0	41.0	83.0	92.0	81.0	87.0	97.0	84.0
Sensible		42.0	47.0	41.0	83.0	88.0	81.0	84.0	89.0	84.0
Total	kW	12.4	13.7	12.1	24.2	26.8	23.7	26.0	29.0	25.0
Sensible		12.4	13.7	12.0	24.1	25.8	23.7	25.0	26.0	25.0

Table 5. Model TR-CRS-085

Models	MBh / kW	085-W	085-G
Net DX Cooling Capacity - MBh / kW (Includes Motor heat @ Rated CFM)			
100° FDB / 69.2° FWB Entering Air Temperature			
Total	MBh	104.4	94.8
Sensible		104.4	94.8
Total	kW	30.6	27.8
Sensible		30.6	27.8
Net Free Cooling Capacity - MBh (Based on 50°F Entering Glycol Temperature)			
Total	MBh	99.0	82.9
Sensible		99.0	82.9
Total	KW	29.0	24.3
Sensible		29.0	24.3
GPM		25.0	27.0
Coil PD FT		13.7	19.1
FC PD FT (note1)		22.1	28.7
Unit PD FT (note1)		42.7	54.4
Net DX Cooling Capacity - MBh / kW (Includes Motor heat @ Rated CFM)			
95° FDB / 67.7° FWB Entering Air Temperature			
Total	MBh	99.8	90.1
Sensible		99.8	90.1
Total	kW	29.2	26.4
Sensible		29.2	26.4
Net Free Cooling Capacity - MBh (Based on 50°F Entering Glycol Temperature)			
Total	MBh	89.2	74.0
Sensible		89.2	74.0
Total	KW	26.1	21.7
Sensible		26.1	21.7
GPM		24.1	26.0
Coil PD FT		12.8	17.8
FC PD FT (note1)		21.0	27.0
Unit PD FT (note1)		41.1	50.8
Net DX Cooling Capacity - MBh / kW (Includes Motor heat @ Rated CFM)			
90° FDB / 66.1° FWB Entering Air Temperature			
Total	MBh	94.7	85.3
Sensible		94.3	85.3
Total	kW	27.8	25.0
Sensible		27.6	25.0
Net Free Cooling Capacity - MBh (Based on 50°F Entering Glycol Temperature)			
Total	MBh	79.2	65.2
Sensible		79.2	65.2
Total	KW	23.2	19.1
Sensible		23.2	19.1
GPM		23.1	25.0
Coil PD FT		11.8	16.6
FC PD FT (note1)		19.5	25.4



Performance Data

Table 5. Model TR-CRS-085 (continued)

Models	MBh / kW	085-W	085-G
Unit PD FT (note1)		38	48.2
Net DX Cooling Capacity - MBh / kW (Includes Motor heat @ Rated CFM)			
85° FDB / 64.5° FWB Entering Air Temperature			
Total	MBh	92.0	80.5
Sensible		85.9	80.5
Total	kW	27.0	23.6
Sensible		25.2	23.6
Net Free Cooling Capacity - MBh (Based on 50°F Entering Glycol Temperature)			
Total	MBh	69.3	56.2
Sensible		69.3	56.2
Total	KW	20.3	16.5
Sensible		20.3	16.5
GPM		22.6	24.0
Coil PD FT		11.4	10.5
FC PD FT (note1)		18.9	18.2
Unit PD FT (note1)		37.6	40.2
Net DX Cooling Capacity - MBh / kW (Includes Motor heat @ Rated CFM)			
80° FDB / 62.8° FWB Entering Air Temperature			
Total	MBh	89.7	77.7
Sensible		77.9	72.8
Total	kW	26.3	22.8
Sensible		22.8	21.3
Net Free Cooling Capacity - MBh (Based on 50°F Entering Glycol Temperature)			
Total	MBh	59.4	47.9
Sensible		59.4	47.9
Total	KW	17.4	14.1
Sensible		17.4	14.1
GPM		22.1	23.2
Coil PD FT		10.9	10.0
FC PD FT (note1)		18.3	17.4
Unit PD FT (note1)		36.4	38.4

Note: 40% ethylene glycol



Electrical Data

Table 6. Electrical Data

Models	TR-CRS-042-__		TR-CRS-084-__		TR-CRS-085-__		TR-CRS-090-__	
Voltages	MCA	MFS	MCA	MFS	MCA	MFS	MCA	MFS
Cooling Only (Includes Condensate Pump)								
208 V~	30.6	50	37.9	60	37.9	60	N/A	N/A
208 V 3~	24.3	40	36.8	60	36.8	60	N/A	N/A
460 V 3N~	12.9	20	19.5	30	19.5	30	32.2	50
575V 3~	9.3	15	12.9	20	12.9	20	N/A	N/A

Note: Standard 1 KAIC rating, consult factory for alternative KAIC ratings.

Dimensional Drawings

TR-CRS-042/084/090-A, -W, -G

Figure 1. Top piping option

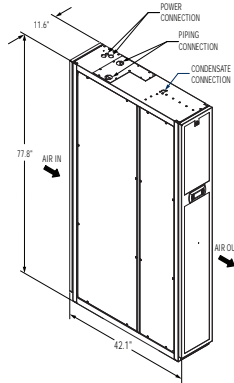


Figure 2. Bottom piping option

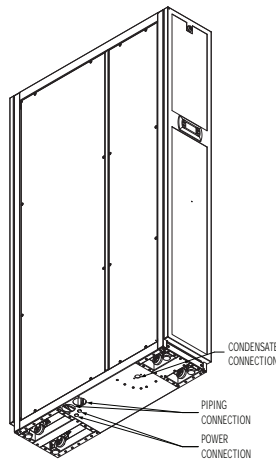
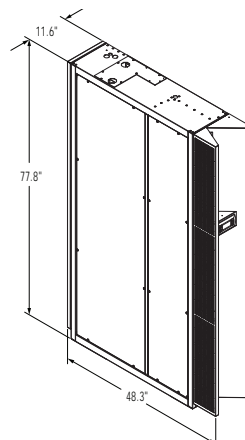
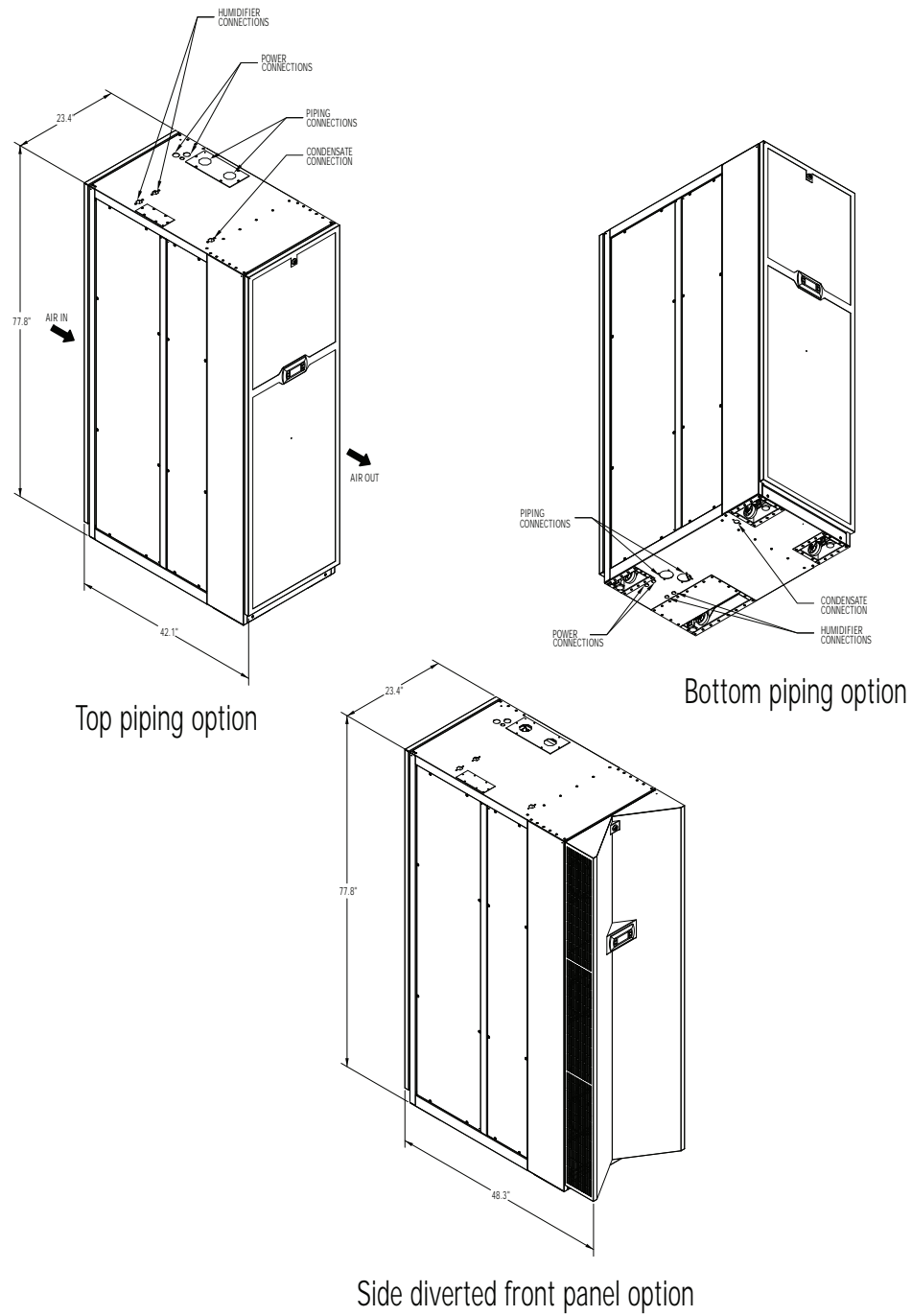


Figure 3. Side diverted front panel option



TR-CRS-085

Figure 4. TR-CRS-085 piping options





Guide Specifications

CyberRow DX Row-Based Precision Air Conditioners

Summary

Row-Based Precision Control Air Conditioners Direct Expansion — Air, Water, Glycol

This specification describes requirements for a precision environmental control system. The Trane 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 hours a day 365 days a year air conditioning is required. Designed with both front and rear access, CyberRow systems require minimum floor space. The supplied system shall be provided with ETL Certification. The CyberRow model number shall be TR-CRS -

Design requirements

The environmental control system shall be a CyberRow Direct Expansion (DX) 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. CyberRow units are especially adapted for both raised and non-raised floors. The air handling system shall be specifically designed for high sensible heat ratio.

Quality assurance

The manufacturer 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 with a satin black finish to provide durability, and to protect from corrosion. Armaflex elastomeric thermal insulation shall be used to insulate the cabinet, dampen noise, and prevent damage from vibration. Casters and leveling feet shall be included to ease the installation and level the equipment with existing IT solutions. 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 plenum with a front diverted discharge pattern 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
- Direct microprocessor control signaling for fan speed control, soft-starting capabilities
- Integrated current limitations

Each fan shall be low noise, low vibration manufactured with an anti-corrosive aluminum impeller. Each fan impeller shall be dynamically and statically balanced in two planes to minimize vibration during operation.

Refrigeration system

All piping and components contained within the refrigeration system shall be rated for use with R410A refrigerant. Each refrigeration circuit shall include, as a minimum a refrigerant drier/strainer, sight glass with moisture detector, an electronic thermal expansion valve, an evaporator coil, a compressor, a high pressure switch with manual reset, and a low pressure switch with automatic reset.

Fixed speed scroll compressor

The compressor shall be a high efficiency, high reliability and low noise scroll compressor. The compressor shall be equipped with internal line break motor protectors, an internal pressure relief valve and external vibration mounting isolation.

Variable speed compressor (TR-CRS-090)

The speed of the compressor shall be controlled with a variable frequency drive (VFD) to match compressor capacity to the actual thermal load. The VFD shall be capable of providing power for the compressor to operate up to 120rpm. The VFD shall proportionally control the compressor motor speed to maintain a constant supply air temperature.

Evaporator coil

The evaporator coil shall be constructed of seamless drawn copper tubes, mechanically bonded to tempered aluminum fins (that have an enhanced design for maximum heat transfer) and mounted in a stainless-steel condensate drain pan. The coil shall be designed for a maximum of 500 ft./min. face velocity.

Proportional electronic expansion valve

An electronically operated thermostatic expansion valve shall be installed to precisely control the flow of liquid refrigerant into the evaporator coil while maintaining the desired superheat across a wide range of operating conditions.

Electronic hot gas bypass (TR-CRS-042/084)

An electronically operated hot gas bypass valve shall be installed. The hot gas bypass valve shall provide modulation of the unit's cooling capacity, and evaporator coil freeze protection under low load conditions.

Piping configuration

Top Piping: When top piping is specified, the CyberRow units shall be provided with connections for water/glycol or refrigerant piping and condensate discharge on the top of the cabinet.

Bottom Piping: When bottom piping is specified (raised floor applications, for example), the CyberRow units shall be provided with connections for water/glycol or refrigerant piping and condensate pump discharge through 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.

Return air sensor

A factory mounted and wired temperature sensor (NTC) mounted in the return air stream temperatures shall be provided.

Supply Air Control (Optional)

The Trane CyberRow shall be provided with a temperature and humidity sensor factory unit mounted in the return air stream and a field installed supply air temperature (optional) and humidity sensor for supply air temp control capabilities. The controller shall provide the user an adjustable supply air control setpoint.

Air Cooled Heat Rejection**-20°F Variable Fan Speed Control (AR)**

The air-cooled system shall incorporate a low ambient, variable speed fan, head pressure control. The pressure control shall be for year-round air conditioning system operation down to -20°F DB minimum ambient air temperature.

-30°F Flooded Control (AR)

The air-cooled system shall incorporate a low ambient, flooded head, pressure control. The pressure control shall be for year-round system operation down to -30°F DB minimum ambient air temperature. Liquid refrigerant receivers, with receiver liquid-level sight glass and head pressure regulator valves (for flooded condenser operation) shall be included, but not factory installed.

Water/Glycol Cooled Heat Rejection**Stainless Steel Brazed-Plated (W/G)**

The evaporator refrigerant circuit shall be provided with a factory installed single pass, counterflow configured, brazed plate heat exchanger, with integral sub-cooler. It shall be constructed of type 316 stainless steel; designed and tested for a 650 psig. w.w.p.

2-Way, 600 psig Regulating Valve (W/G) (Standard)

The refrigerant circuit head pressure shall be controlled by a factory installed 2-way water/glycol regulating valve rated for 600 psig. w.w.p. The 2-way condenser water modulating valve shall automatically meter the flow of water to the condenser. It shall do so, in response to a proportional signal (0-10 Vdc) provided to the valve by the microprocessor controller.

3-Way, 600 psig Regulating Valve (W/G) (Optional)

The refrigerant circuit head pressure shall be controlled by a factory installed 3-way water/glycol regulating valve rated for 600 psig w.w.p. The 3-way condenser water modulating valve shall automatically meter the flow of water/glycol to the condenser. It shall do so, 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 requirements, the control circuit shall be 24 volts AC wire, and shall not be smaller than 18 AWG. All wiring shall be neatly wrapped on 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 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, terminal boards, and transformers required for operation of the CyberRow unit. It shall also allow for full service via front and rear access panels.

Remote Stop/Start Contacts

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 Switch 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 to a user defined setpoint via control output signals to the CyberRow unit.

The controller shall receive inputs for measurable control conditions (temperature, relative humidity, and dewpoint) via return air or remote mounted supply air 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 program for the microprocessor controller shall be field configurable, allowing the operator the capability of selecting control setpoints specific to the application. Operator interface for the microprocessor controller is provided via a door mounted user interface display panel. The display panel shall have a backlit LCD graphical display and function keys giving the user complete control and monitoring capability of the precision cooling system. The menu driven interface shall provide users the ability to scroll through and enter various menu screens.

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 controller's memory as, Factory Setpoints.

The setpoints for the system may be readjusted 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) set point values.

A/C Grouping pLAN Operation

A/C Grouping pLAN Operation

Multiple CyberRow system controllers shall be able to connect (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 ensure that each CyberRow unit within the rotating group is operationally exercised on a periodic timed basis.

BMS Interface (Optional)

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, Dry Contact

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.

User Interface Display Panel

The 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

Smoke Detection

A photo-electric smoke detector shall be factory installed and wired in the evaporator section of the suction's side of the evaporator blower. 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 and 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.

Remote Water Detector Strip Type

A 20 ft. long remote strip/cable type water and leak detector shall be provided for remote field installation. Upon sensing a water leak, the normally closed water detector control circuit shall open, thereby shutting down the CyberRow unit's water producing components.

Code Conformance

The supplied system shall be provided with the following compliance approvals:
Heating and Cooling Equipment UL 1995 / CAN C22.2 No. 236- 11 4th edition



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.

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