

STULZ

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CyberAir[®] DX

Engineering Manual

**Perimeter Mounted Precision Air Conditioners
21 kW - 105 kW / 60 Hz**

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Nomenclature								
CFX-XXX-XXX-X-XX								
CF	Air Pattern	Capacity (kW)	Cooling Method	Number of Circuits	Heat Rejection	Secondary Cooling Options	Fan Location	Additional Special Options
CyberAiR Floor Mounted Systems	D = Downflow U = Upflow R = Rear Return	021, 028, 035, 042, 053, 070, 088, 105,	D = DX	2 = Dual Circuit	A = Air G = Glycol W = Water	0 = None F = Water Side Economizer W = Alternate Water Source	I = In Unit	0 = Standard T = Tandem Compressors S = Special*
CF	D	105	D	2	W	0	I	0

Call STULZ Product Support at 888 529 1266 or email stulztechnicalsupport@stulz-ats.com for additional information.

Example: 105 kW Capacity, Dual Circuit, Water Cooled, Direct Expansion, Downflow, Floor Mounted System; with Internal EC Fans, and No Additional Options : CFD-105-D2W-0-I0

STULZ CyberAiR CFD/CFU floor mounted A/C's are designed to be the compact solution to your precision air conditioning requirements. DX Systems are available in sizes from 21 to 105 kW in a variety of space saving cabinet footprints.

Efficiently designed for 100% front service access, STULZ CyberAiR units can easily be tucked into a corner or placed side-by-side. STULZ CyberAiR units are especially adaptable to raised floors and are available in both down-flow and up-flow air pattern configurations.

CyberAiR Systems Offer Outstanding Advantages

Flexibility

DX — Air Cooled

DX — Water Cooled

DX — Glycol Cooled (with Remote Drycoolers and Pump Packages)

Free Cooling Systems

Alternate Water Source (AWS) Systems

Versatility

Down-Flow and Up-Flow Air Patterns

Ducted Systems

Raised Floor Mounting with Floor Stands

100% Front Service Access

From 21 to 105 kW, STULZ CyberAiR systems are designed for 100% Front Only Access. The compact footprint requires minimal floor space.

Non-Proprietary Parts

STULZ CyberAiR systems incorporate non-proprietary components where possible. Most major HVAC, refrigeration and electrical distributors stock an exact model cross reference or an alternate to most factory provided components.

Code (UL / CSA) Conformance



Heating and Cooling Equipment UL 1995 / CAN C22.2 No. 236-05 3rd edition

NYC MEA Approved (MEA# 287-01-E)

Microprocessor Control

Precision temperature and/or humidity control with highly versatile and flexible **E²** series controls. Designed primarily for STULZ precision air conditioners, **E²** controllers offer a wide range of expanded control functions and alarms.

The E2 controller features a “menu-driven” operating environment to allow system setup and operation via an easy to read user interface display panel which is typically mounted on the front door of the STULZ CyberAiR system.

Electronically Commutated (EC) Fan

Maintenance free, highly reliable EC Fans offer considerable cost savings and long life.

EC fans offer energy efficient, quiet and low vibration operation.

Complete Temperature and Humidity Control

Electrode Canister Steam Humidification

Dehumidification Mode with

- Staged Electric Reheat
- Optional Hot Gas Reheat
- Optional Hot Water Reheat

Capacity Modulation Options

- Fan Speed Modulation
- Hot Gas Bypass Systems
- Multi-stage Reheat
- Modulating Free Cool/AWS Chilled Water Valves
- Tandem Scroll Compressors (Up to four control stages)

24/7 Year Round Operation

Option offerings available with STULZ CyberAiR systems allow for year-round, 24 hours-a-day A/C operation in any environment in the world.

- Low Ambient Control (DX - Air Cooled)
- -20°F Variable Fan Speed
- -30°F Flooded Head Pressure
- (DX - Air/Water/Glycol Cooled)
- Crankcase heater and receiver kit

Modular Motor Controllers

STULZ CyberAiR systems incorporate modular motor controllers with motor circuit breakers in lieu of inconvenient replaceable fuses, eliminating the need for ANY motor fusing.

Quiet Operation

Low noise scroll compressors coupled with EC Fans, and acoustically lined cabinets provide quiet operation.

Selected Standard Features

- Compact Footprint
- Microprocessor Control
- High Efficiency EC Fans
- MERV 8 Filtration
- Main Power Non-Fused Disconnect Switch
- Modular Motor Controllers (w/ motor circuit breakers)
- Acoustical/Thermal Insulation
- Aluminum Finned / Copper Tube Coils
- Electronic Expansion Valves
- Rotalock Compressor Service Valves *
- Front Filter Access
- Dual / 2-Stage Scroll Compressor Systems

Other Available Options

- Automatic Switchover to Back-Up Power
- Floor Stands
- Condensate Pumps
- Firestats
- Smoke Detectors
- Water Leak Detectors
- MERV 11 Filtration
- Free-Cooling or Alternate Water Source Units
- High Short Circuit Current Rating (KAIC)
- Drycoolers & Pump Packages
- 2 & 3-way Grilled Plenum Boxes
- Many more options available!

Space Saving Configuration

With 100% front access, the STULZ CyberAiR CFD/DFU is suitable for standalone, side-by-side, or corner installations.



STULZ CyberAiR CFD/CFU
Model CFU-105-D shown

* N/A with Tandem

Product Features Index

CFD/CFU- D MODELS		021 thru 105 kW
SELECTED FEATURES		
TEMPERATURE CONTROL		
2-Stage Cooling Mode		Standard
4-Stage Cooling Mode (Tandem Compressors)		Optional (Models CFD/U-053 thru CFD/U-105)
Electric Reheating		Standard
Cooling Only (No Humidity Control)		Optional
Hot Water Reheat		Optional
Hot Gas Reheat		Optional
SCR Fired Electric Reheating		Optional
HUMIDITY CONTROL		
Electrode Canister Steam Humidifier		Standard
Dehumidification Mode - Electric Reheat		Standard
Hot Gas Reheat		Optional
CONTROLS		
Full-Color Touchscreen Graphic Microprocessor w/ Alarms		Standard
MIB - Multi-Interface BMS Communication		Optional
CABINET		
Galvannealed Steel, Powder Coated Finish		Standard
Stainless Steel Condensate Drain Pan		Standard
2 lb/ft ² Density Thermal & Sound Insulation		Standard
Floor Stand		Optional
FILTERS / PLENUMS		
2 or 3-Way Plenum Box (Up-Flow Units)		Optional
4", MERV8 Rated Pleated Filters		Standard
4", MERV11 Rated Pleated Filters		Optional
DX REFRIGERATION CIRCUIT		
Evaporator side feed hot gas bypass		Optional (not available on models with Tandem Compressors)
R410A Refrigerant		Standard

Dual Scroll Compressors w/ Rotalock Service Valves *	Standard
Tandem Scroll Compressors	Optional (Models CFD/U-053 thru CFD/U-105)
High Efficiency Aluminum Fin/ Copper Tube Coils	Standard
Electronic Expansion Valves	Standard
Refrigerant Sight Glasses & Filter/ Drier Strainers	Standard
BLOWERS / MOTORS	
Backward Inclined, Plenum Style Fan, With an EC Motor	Standard
ELECTRICAL	
3-Phase Power Supply	See Electrical Table
Multi-Voltage Control Transformer (24V)	Standard
Modular Motor Controllers with Integral Circuit Breakers	Standard
SAFETY FEATURES	
Audible/ Visual Local & Remote Alarms	Standard
Main Power Disconnect, unit mounted	Standard
High/ Low Refrigerant Pressure Switches	Standard
Motor Overload Protection	Standard
SPECIFIC MODEL STANDARD FEATURES:	
Air Cooled	
Remote Outdoor, Air Cooled Condenser rated for -20°F to 95°F Ambient	Standard
Low Ambient Control to -30°F and High Ambient to 105°F	Optional
Water / Glycol Cooled	
2-Way, 600 psig Water / Glycol Regulating Valves	Standard
3-Way, 600 psig Water / Glycol Regulating Valves	Optional
Free Cooling / Alternate Water Source Systems	
2-Way, 600 psig Water/ Control Valve	Standard (AWS)
3-Way, 400 (042-105 kW systems) or 600(021-035 kW systems) psig Water/ Control Valve	Standard (FC) Optional (AWS)
CODE CONFORMANCE	
NRTL Conformance Compliance to UL 1995 Standard	Standard
CSA/ NYC MEA-433-00-E; MEA-287-01-E	Standard

* N/A with Tandem

Performance/Capacity Specifications — Air Cooled Systems

Model:	CFD-021-D2A	CFU-021-D2A	CFD-028-D2A	CFU-028-D2A	CFD-035-D2A	CFU-035-D2A	CFD-042-D2A	CFU-042-D2A
Evaporator Blower / Motor - Backward Inclined Direct Driven EC								
Nominal Horsepower per Blower, hp	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Rated Air Flow, CFM @ .2 in. H ₂ O ESP	6,000	6,000	6,000	6,000	6,000	6,000	8,000	8,000
Quantity of Blowers	1	1	1	1	1	1	2	2
Evaporator Coil - Aluminum Fin, Copper Tube								
Direct Expansion (DX) Coil								
Rows / (Face Area, ft ²)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	3 / (24.7)	3 / (24.7)
Face Velocity, fpm	278	278	278	278	278	278	323	323
Alternate Water Source (AWS) Coil (Optional)								
Coil Rows / (Face Area, ft ²)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (24.7)	4 / (24.7)
Face Velocity, fpm	278	278	278	278	278	278	323	323
CV (AWS valve, 3-way 400 PSI)	11	11	11	11	11	11	20	20
Compressors - R-410A								
Type / (Qty)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)
Input per Compressor, W	3,900	3,900	4,710	4,710	5,340	5,340	5,880	5,880
Total Heat of Rejection, kW (MBH)	38.1 (130)	38.1 (130)	44.1 (151)	44.1 (151)	48.3 (165)	48.3 (165)	58.1 (199)	58.1 (199)
Reheat - Performance Capacities DO NOT Include Evaporator Motor Heat @ Rated CFM & ESP								
Electric Reheat - Finned Tubular Heater (Standard)								
Number of Stages	1	1	1	1	1	1	2	2
Total Nominal Capacity, kW (MBH)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	18.0 (61)	18.0 (61)
Hot Gas Reheat - with 3-Way Heat Reclaim Valve (Optional)								
Total Capacity, kW (MBH)	3.9 (13)	3.9 (13)	4.7 (16)	4.7 (16)	5.3 (18)	5.3 (18)	5.8 (20)	5.8 (20)
Hot Water Reheat - Rated at 180°F EWT / 160°F LWT & 72°FDB/60.0°FWB EAT (Optional)								
Total Capacity, kW (MBH)	19.4 (66)	23.8 (81)	19.4 (66)	23.8 (81)	19.4 (66)	23.8 (81)	24.2 (82)	29.8 (101)
Flow Rate, GPM / (Pressure Drop, ft H ₂ O)	7 / (4)	9 / (5)	7 / (4)	9 / (5)	7 / (4)	9 / (5)	9 / (5)	11 / (8)
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Steam Reheat - Rated at 5 psig & 72°FDB EAT (Optional)								
Total Capacity, kW (MBH)	44.5 (152)	61.9 (211)	44.5 (152)	61.9 (211)	44.5 (152)	61.9 (211)	58.2 (198)	79.2 (270)
Condensate, lbs/hr	158	220	158	220	158	220	207	281
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Humidification - Electrode Steam Canister with Adjustable Output (Standard)								
Steam Output, lbs/hr / (Power Input, kW)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)
Std Control	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Filters - Disposable, MERV 8 Average Dust Spot Efficiency (Standard), MERV 11 Average Dust Spot Efficiency (Optional)								
Actual Size, H in. x W in. x D in. (Qty)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)
Connection Sizes - Copper								
Hot Gas Line, in. OD (2 per Unit)	5/8	5/8	5/8	5/8	5/8	5/8	7/8	7/8
Liquid Line, in. OD (2 per Unit)	1/2	1/2	1/2	1/2	1/2	1/2	5/8	5/8
AWS In & Out, in. OD	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	2 1/8	2 1/8
Condensate Drain without Pump, in. OD	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
Condensate Drain with Pump, in. OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Humidifier Inlet, in. OD	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Hot Water Reheat In & Out, in. OD	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Physical Data								
Approximate Unit Weight, lbs	1,750	1,950	1,750	1,950	1,750	1,950	2,200	2,400
Approximate Shipping Weight, lbs	1,850	2,050	1,850	2,050	1,850	2,050	2,350	2,550
Unit Dimensions, H in. x W in. x D in.	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 89.1 x 40.3	88.1 x 88.2 x 40.3 (91.1 x 88.2 x 40.3 w/ Hot Gas/Water Reheat)
Shipping Dimensions, H in. x W in. x D in.	83 x 80 x 46	95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 80 x 46	95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 80 x 46	95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 95 x 46	95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)

Model	CFD-053-D2A	CFU-053-D2A	CFD-070-D2A	CFU-070-D2A	CFD-088-D2A	CFU-088-D2A	CFD-105-D2A	CFU-105-D2A
Evaporator Blower / Motor - Backward Inclined Direct Driven EC								
Nominal Horsepower per Blower, hp	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Rated Air Flow, CFM @ 0.2 in. H ₂ O ESP	9,000	9,000	10,000	10,000	15,750	15,750	15,750	15,750
Quantity of Blowers	2	2	2	2	3	3	3	3
Evaporator Coil - Aluminum Fin, Copper Tube								
Direct Expansion (DX) Coil								
Rows / (Face Area, ft ²)	3 / (24.7)	3 / (24.7)	3 / (24.7)	3 / (24.7)	3 / (39.8)	3 / (39.8)	3 / (39.8)	3 / (39.8)
Face Velocity, fpm	364	364	404	404	395	395	395	395
Alternate Water Source (AWS) Coil (Optional)								
Coil Rows / (Face Area, ft ²)	4 / (24.7)	4 / (24.7)	4 / (24.7)	4 / (24.7)	4 / (39.8)	4 / (39.8)	4 / (39.8)	4 / (39.8)
Face Velocity, fpm	364	364	404	404	395	395	395	395
CV (AWS valve, 3-way 400 PSI)	20	20	20	20	28	28	28	28
Compressors - R-410A								
Type / (Qty)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)
Input per Compressor, W	7,900	7,900	10,390	10,390	13,320	13,320	15,640	15,640
Total Heat of Rejection, kW (MBH)	73.7 (252)	73.7 (252)	92.7 (317)	92.7 (317)	125.7 (429)	125.7 (429)	139.8 (477)	139.8 (477)
Reheat - Performance Capacities DO NOT Include Evaporator Motor Heat @ Rated CFM & ESP								
Electric Reheat - Finned Tubular Heater (Standard)								
Number of Stages	2	2	2	2	3	3	3	3
Total Nominal Capacity, kW (MBH)	18.0 (61)	18.0 (61)	18.0 (61)	18.0 (61)	27.0 (92)	27.0 (92)	27.0 (92)	27.0 (92)
Hot Gas Reheat - with 3-Way Heat Reclaim Valve (Optional)								
Total Capacity, kW (MBH)	7.9 (26)	7.9 (26)	10.3 (35)	10.3 (35)	13.3 (45)	13.3 (45)	15.6 (53)	15.6 (53)
Hot Water Reheat - Rated at 180°F EWT / 160°F LWT & 72°FDB/60.0°FWB EAT (Optional)								
Total Capacity, kW (MBH)	25.5 (87)	31.1 (106)	26.6 (91)	32.2 (110)	45 (153)	56.1 (191)	45 (153)	56.1 (191)
Flow Rate, GPM / (Pressure Drop, ft H ₂ O)	9 / (6)	11 / (9)	10 / (6)	12 / (9)	16 / (18)	20 / (27)	16 / (18)	20 / (27)
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Steam Reheat - Rated at 5 psig & 72°FDB EAT (Optional)								
Total Capacity, kW (MBH)	62.8 (214)	84.7 (289)	66.8 (228)	89.1 (304)	105.2 (359)	146.8 (501)	105.2 (359)	146.8 (501)
Condensate, lbs/hr	223	301	237	316	374	521	374	521
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Humidification - Electrode Steam Canister with Adjustable Output (Standard)								
Steam Output, lbs/hr / (Power Input, kW)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-25 / (8.5)	4-25 / (8.5)	4-25 / (8.5)	4-25 / (8.5)
Std Control	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Filters - Disposable, MERV 8 Average Dust Spot Efficiency (Standard), MERV 11 Average Dust Spot Efficiency (Optional)								
Actual Size, H in. x W in. x D in. (Qty)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (5)	35 7/8 x 24 3/4 x 3 3/4 (3) 24 3/4 x 21 x 3 3/4 (2)	37 x 18 1/2 x 3 3/4 (5)	35 7/8 x 24 3/4 x 3 3/4 (3) 24 3/4 x 21 x 3 3/4 (2)
Connection Sizes - Copper								
Hot Gas Line, in. OD (2 per Unit)	7/8	7/8	7/8	7/8	1 3/8	1 3/8	1 3/8	1 3/8
Liquid Line, in. OD (2 per Unit)	5/8	5/8	5/8	5/8	7/8	7/8	7/8	7/8
AWS In & Out, in. OD	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8
Condensate Drain without Pump, in. OD	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
Condensate Drain with Pump, in. OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Humidifier Inlet, in. OD	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Hot Water Reheat In & Out, in. OD	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Physical Data								
Approximate Unit Weight, lbs	2,200	2,400	2,200	2,400	2,900	3,100	2,900	3,100
Approximate Shipping Weight, lbs	2,350	2,550	2,350	2,550	3,100	3,300	3,100	3,300
Unit Dimensions, H in. x W in. x D in.	76.2 x 89.1 x 40.3	88.1 x 88.2 x 40.3 (91.1 x 88.2 x 40.3 w/ Hot Gas/Water Reheat)	76.0 x 87.3 x 38.4	88.1 x 88.2 x 40.3 (91.1 x 88.2 x 40.3 w/ Hot Gas/Water Reheat)	76.02 x 118.4 x 40.3	88.1 x 118.4 x 40.3 (91.1 x 118.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 118.4 x 40.3	88.1 x 118.4 x 40.3 (91.1 x 118.4 x 40.3 w/ Hot Gas/Water Reheat)
Shipping Dimensions, H in. x W in. x D in.	83 x 95 x 46	95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)	83 x 95 x 46	95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)	83 x 124 x 46	95 x 124 x 46 (98 x 124 x 46 w/ Hot Gas/Water Reheat)	83 x 124 x 46	95 x 124 x 46 (98 x 124 x 46 w/ Hot Gas/Water Reheat)

Model:	CFD-021-D2W	CFU-021-D2W	CFD-028-D2W	CFU-028-D2W	CFD-035-D2W	CFU-035-D2W	CFD-042-D2W	CFU-042-D2W
Evaporator Blower / Motor - Backward Inclined Direct Driven EC								
Nominal Horsepower per Blower, hp	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Rated Air Flow, CFM @ .3 in. H ₂ O ESP	6,000	6,000	6,000	6,000	6,000	6,000	8,000	8,000
Quantity of Blowers	1	1	1	1	1	1	2	2
Evaporator Coil - Aluminum Fin, Copper Tube								
Direct Expansion (DX) Coil								
Rows / (Face Area, ft ²)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	3 / (24.7)	3 / (24.7)
Face Velocity, fpm	278	278	278	278	278	278	323	323
Free Cooling (FC) Water Economizer / Alternate Water Source (AWS) Coil (Optional)								
Coil Rows / (Face Area, ft ²)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (24.7)	4 / (24.7)
Face Velocity, fpm	278	278	278	278	278	278	323	323
CV (FC Valve, 3-way, 400 PSI)	16	16	16	16	20	20	20	20
CV (AWS valve, 3-way, 400 PSI)	11	11	11	11	11	11	20	20
Compressors - R-410A								
Type / (Qty)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)
Input per Compressor, W	2,970	2,970	3,630	3,630	4,250	4,250	4,660	4,660
Water Cooled Condensers - Micro-Plate (Based on 0% Glycol Solution)								
Total Heat of Rejection, kW (MBH)	39.1 (134)	39.1 (134)	45.1 (154)	45.1 (154)	49.9 (170)	49.9 (170)	60.1 (206)	60.1 (206)
Flow Rate, GPM @ 85°F EWT / 95°F LWT	27	27	31	31	35	35	42	42
Unit Pressure Drop, ft H ₂ O	15	15	18	18	21	21	15	15
Reheat - Performance Capacities DO NOT Include Evaporator Motor Heat @ Rated CFM & ESP								
Electric Reheat - Finned Tubular Heater (Standard)								
Number of Stages	1	1	1	1	1	1	2	2
Total Nominal Capacity, kW (MBH)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	18.0 (61)	18.0 (61)
Hot Gas Reheat - with 3-Way Heat Reclaim Valve (Optional)								
Total Capacity, kW (MBH)	2.9 (10)	2.9 (10)	3.6 (12)	3.6 (12)	4.2 (14)	4.2 (14)	4.6 (15)	4.6 (15)
Hot Water Reheat - Rated at 180°F EWT / 160°F LWT & 72°FDB/60.0°FWB EAT (Optional)								
Total Capacity, kW (MBH)	19.4 (66)	23.8 (81)	19.4 (66)	23.8 (81)	19.4 (66)	23.8 (81)	24.2 (82)	29.8 (101)
Flow Rate, GPM / (Pressure Drop, ft H ₂ O)	7 / (4)	9 / (5)	7 / (4)	9 / (5)	7 / (4)	9 / (5)	9 / (5)	11 / (8)
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Steam Reheat - Rated at 5 psig & 72°FDB EAT (Optional)								
Total Capacity, kW (MBH)	44.5 (152)	61.9 (211)	44.5 (152)	61.9 (211)	44.5 (152)	61.9 (211)	58.2 (198)	79.2 (270)
Condensate, lbs/hr	158	220	158	220	158	220	207	281
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Humidification - Electrode Steam Canister with Adjustable Output (Standard)								
Steam Output, lbs/hr / (Power Input, kW)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)
Std Control	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Filters - Disposable, MERV 8 Average Dust Spot Efficiency (Standard), MERV 11 Average Dust Spot Efficiency (Optional)								
Actual Size, H in. x W in. x D in. (Qty)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)
Connection Sizes - Copper								
Condenser In & Out, in. OD	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	2 1/8	2 1/8
AWS In & Out, in. OD	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	2 1/8	2 1/8
Condensate Drain without Pump, in. OD	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
Condensate Drain with Pump, in. OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Humidifier Inlet, in. OD	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Hot Water Reheat In & Out, in. OD	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Physical Data								
Approximate Unit Weight, lbs	1,800	2,000	1,800	2,000	1,800	2,000	2,300	2,500
Approximate Shipping Weight, lbs	1,900	2,100	1,900	2,100	1,900	2,100	2,450	2,650
Unit Dimensions, H in. x W in. x D in.	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 89.1 x 40.3	88.1 x 88.2 x 40.3 (91.1 x 88.2 x 40.3 w/ Hot Gas/Water Reheat)
Shipping Dimensions, H in. x W in. x D in.	83 x 80 x 46	95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 80 x 46	95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 80 x 46	95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 95 x 46	95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)

Model	CFD-053-D2W	CFU-053-D2W	CFD-070-D2W	CFU-070-D2W	CFD-088-D2W	CFU-088-D2W	CFD-105-D2W	CFU-105-D2W
Evaporator Blower / Motor - Backward Inclined Direct Driven EC								
Nominal Horsepower per Blower, hp	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Rated Air Flow, CFM @ .3 in. H ₂ O ESP	9,000	9,000	10,000	10,000	15,750	15,750	15,750	15,750
Quantity of Blowers	2	2	2	2	3	3	3	3
Evaporator Coil - Aluminum Fin, Copper Tube								
Direct Expansion (DX) Coil								
Rows / (Face Area, ft ²)	3 / (24.7)	3 / (24.7)	3 / (24.7)	3 / (24.7)	3 / (39.8)	3 / (39.8)	3 / (39.8)	3 / (39.8)
Face Velocity, fpm	364	364	404	404	395	395	395	395
Free Cooling (FC) Water Economizer / Alternate Water Source (AWS) Coil (Optional)								
Coil Rows / (Face Area, ft ²)	4 / (24.7)	4 / (24.7)	4 / (24.7)	4 / (24.7)	4 / (39.8)	4 / (39.8)	4 / (39.8)	4 / (39.8)
Face Velocity, fpm	364	364	404	404	395	395	395	395
CV (FC Valve, 3-way, 400 PSI)	28	28	35.4	35.4	48	48	48	48
CV (AWS valve, 3-way, 400 PSI)	20	20	20	20	28	28	28	28
Compressors - R-410A								
Type / (Qty)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)
Input per Compressor, W	6,310	6,310	8,140	8,140	10,710	10,710	12,460	12,460
Water Cooled Condensers - Micro-Plate (Based on 0% Glycol Solution)								
Total Heat of Rejection, kW (MBH)	75.7 (259)	75.7 (259)	96.7 (330)	96.7 (330)	129.7 (443)	129.7 (443)	144.7 (494)	144.7 (494)
Flow Rate, GPM @ 85°F EWT / 95°F LWT	52	52	67	67	89	89	99	99
Unit Pressure Drop, ft H ₂ O	15	15	18	18	20	20	24	24
Reheat - Performance Capacities DO NOT Include Evaporator Motor Heat @ Rated CFM & ESP								
Electric Reheat - Finned Tubular Heater (Standard)								
Number of Stages	2	2	2	2	3	3	3	3
Total Nominal Capacity, kW (MBH)	18.0 (61)	18.0 (61)	18.0 (61)	18.0 (61)	27.0 (92)	27.0 (92)	27.0 (92)	27.0 (92)
Hot Gas Reheat - with 3-Way Heat Reclaim Valve (Optional)								
Total Capacity, kW (MBH)	6.3 (21)	6.3 (21)	8.1 (27)	8.1 (27)	10.7 (36)	10.7 (36)	12.4 (42)	12.4 (42)
Hot Water Reheat - Rated at 180°F EWT / 160°F LWT & 72°FDB/60.0°FWB EAT (Optional)								
Total Capacity, kW (MBH)	25.5 (87)	31.1 (106)	26.6 (91)	32.2 (110)	45 (153)	56.1 (191)	45 (153)	56.1 (191)
Flow Rate, GPM / (Pressure Drop, ft H ₂ O)	9 / (6)	11 / (9)	10 / (6)	12 / (9)	16 / (18)	20 / (27)	16 / (18)	20 / (27)
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Steam Reheat - Rated at 5 psig & 72°FDB EAT (Optional)								
Total Capacity, kW (MBH)	62.8 (214)	84.7 (289)	66.8 (228)	89.1 (304)	105.2 (359)	146.8 (501)	105.2 (359)	146.8 (501)
Condensate, lbs/hr	223	301	237	316	374	521	374	521
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Humidification - Electrode Steam Canister with Adjustable Output (Standard)								
Steam Output, lbs/hr / (Power Input, kW)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-25 / (8.5)	4-25 / (8.5)	4-25 / (8.5)	4-25 / (8.5)
Std Control	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Filters - Disposable, MERV 8 Average Dust Spot Efficiency (Standard), MERV 11 Average Dust Spot Efficiency (Optional)								
Actual Size, H in. x W in. x D in. (Qty)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (5)	35 7/8 x 24 3/4 x 3 3/4 (3) 24 3/4 x 21 x 3 3/4 (2)	37 x 18 1/2 x 3 3/4 (5)	35 7/8 x 24 3/4 x 3 3/4 (3) 24 3/4 x 21 x 3 3/4 (2)
Connection Sizes - Copper								
Condenser In & Out, in. OD	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8
AWS In & Out, in. OD	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8
Condensate Drain without Pump, in. OD	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
Condensate Drain with Pump, in. OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Humidifier Inlet, in. OD	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Hot Water Reheat In & Out, in. OD	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Physical Data								
Approximate Unit Weight, lbs	2,300	2,500	2,300	2,500	3,000	3,200	3,000	3,200
Approximate Shipping Weight, lbs	2,450	2,650	2,450	2,650	3,200	3,400	3,200	3,400
Unit Dimensions, H in. x W in. x D in.	76.2 x 89.1 x 40.3	88.1 x 88.2 x 40.3 (91.1 x 88.2 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 89.1 x 40.3	88.1 x 88.2 x 40.3 (91.1 x 88.2 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 118.4 x 40.3	88.1 x 118.4 x 40.3 (91.1 x 118.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 118.4 x 40.3	88.0 x 118.4 x 40.3 (91.0 x 118.4 x 40.3 w/ Hot Gas/Water Reheat)
Shipping Dimensions, H in. x W in. x D in.	83 x 95 x 46	95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)	83 x 95 x 46	95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)	83 x 124 x 46	95 x 124 x 46 (98 x 124 x 46 w/ Hot Gas/Water Reheat)	83 x 124 x 46	95 x 124 x 46 (98 x 124 x 46 w/ Hot Gas/Water Reheat)

Model:	CFD-021-D2G	CFU-021-D2G	CFD-028-D2G	CFU-028-D2G	CFD-035-D2G	CFU-035-D2G	CFD-042-D2G	CFU-042-D2G
Evaporator Blower / Motor - Backward Inclined Direct Driven EC								
Nominal Horsepower per Blower, hp	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Rated Air Flow, CFM @ .3 in. H ₂ O ESP	6,000	6,000	6,000	6,000	6,000	6,000	8,000	8,000
Quantity of Blowers	1	1	1	1	1	1	2	2
Evaporator Coil - Aluminum Fin, Copper Tube								
Direct Expansion (DX) Coil								
Rows / (Face Area, ft ²)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	2 / (21.6)	3 / (24.7)	3 / (24.7)
Face Velocity, fpm	278	278	278	278	278	278	323	323
Free Cooling (FC) Glycol Economizer / Alternate Water Source (AWS) Coil (Optional)								
Coil Rows / (Face Area, ft ²)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (21.6)	4 / (24.7)	4 / (24.7)
Face Velocity, fpm	278	278	278	278	278	278	323	323
CV (FC Valve, 3-way, 400 PSI)	16	16	16	16	20	20	20	20
CV (AWS valve, 3-way, 400 PSI)	11	11	11	11	11	11	20	20
Compressors - R-410A								
Type / (Qty)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)
Input per Compressor, W	4,170	4,170	5,040	5,040	5,650	5,650	6,240	6,240
Glycol Cooled Condensers - Micro-Plate (Based on 40% Ethylene Glycol Solution)								
Total Heat of Rejection, kW (MBH)	37.9 (129)	37.9 (129)	43.8 (150)	43.8 (150)	47.9 (164)	47.9 (164)	57.6 (197)	57.6 (197)
Flow Rate, GPM @ 110°F EGT / 120°F LGT	29	29	34	34	36	36	44	44
Unit Pressure Drop, ft H ₂ O	17	17	21	21	24	24	16	16
Reheat / Heat - Performance Capacities DO NOT Include Evaporator Motor Heat @ Rated CFM & ESP								
Electric Reheat - Finned Tubular Heater (Standard)								
Number of Stages	1	1	1	1	1	1	2	2
Total Nominal Capacity, kW (MBH)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	9.0 (30)	18.0 (61)	18.0 (61)
Hot Gas Reheat - with 3-Way Heat Reclaim Valve (Optional)								
Total Capacity, kW (MBH)	4.1 (14)	4.1 (14)	5.0 (17)	5.0 (17)	5.6 (19)	5.6 (19)	6.2 (21)	6.2 (21)
Hot Water Reheat - Rated at 180°F EWT / 160°F LWT & 72°FDB/60.0°FWB EAT (Optional)								
Total Capacity, kW (MBH)	19.4 (66)	23.8 (81)	19.4 (66)	23.8 (81)	19.4 (66)	23.8 (81)	24.2 (82)	29.8 (101)
Flow Rate, GPM / (Pressure Drop, ft H ₂ O)	7 / (4)	9 / (5)	7 / (4)	9 / (5)	7 / (4)	9 / (5)	9 / (5)	11 / (8)
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Steam Reheat - Rated at 5 psig & 72°FDB EAT (Optional)								
Total Capacity, kW (MBH)	44.5 (152)	61.9 (211)	44.5 (152)	61.9 (211)	44.5 (152)	61.9 (211)	58.2 (198)	79.2 (270)
Condensate, lbs/hr	158	220	158	220	158	220	207	281
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Humidification - Electrode Steam Canister with Adjustable Output (Standard)								
Steam Output, lbs/hr / (Power Input, kW)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)
Std Control	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Filters - Disposable, MERV 8 Average Dust Spot Efficiency (Standard), MERV 11 Average Dust Spot Efficiency (Optional)								
Actual Size, H in. x W in. x D in. (Qty)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (1) 35 7/8 x 18 7/8 x 3 3/4 (1) 21 x 18 7/8 x 3 3/4 (1)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)
Connection Sizes - Copper								
Condenser In & Out, in. OD	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	2 1/8	2 1/8
AWS In & Out, in. OD	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	2 1/8	2 1/8
Condensate Drain without Pump, in. OD	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
Condensate Drain with Pump, in. OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Humidifier Inlet, in. OD	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Hot Water Reheat In & Out, in. OD	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Physical Data								
Approximate Unit Weight, lbs	1,800	2,000	1,800	2,000	1,800	2,000	2,300	2,500
Approximate Shipping Weight, lbs	1,900	2,100	1,900	2,100	1,900	2,100	2,450	2,650
Unit Dimensions, H in. x W in. x D in.	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water)	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water)	76.2 x 77.4 x 40.3	88.1 x 77.4 x 40.3 (91.1 x 77.4 x 40.3 w/ Hot Gas/Water)	76.0 x 89.1 x 38.4	88.1 x 89.1 x 40.3 (91.1 x 89.1 x 40.3 w/ Hot Gas/Water)
Shipping Dimensions, H in. x W in. x D in.	83 x 80 x 46	Reheat) 95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 80 x 46	Reheat) 95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 80 x 46	Reheat) 95 x 80 x 46 (98 x 80 x 46 w/ Hot Gas/Water Reheat)	83 x 95 x 46	Reheat) 95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)

Model:	CFD-053-D2G	CFU-053-D2G	CFD-070-D2G	CFU-070-D2G	CFD-088-D2G	CFU-088-D2G	CFD-105-D2G	CFU-105-D2G
Evaporator Blower / Motor - Backward Inclined Direct Driven EC								
Nominal Horsepower per Blower, hp	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Rated Air Flow, CFM @ .3 in. H ₂ O ESP	9,000	9,000	10,000	10,000	15,750	15,750	15,750	15,750
Quantity of Blowers	2	2	2	2	3	3	3	3
Evaporator Coil - Aluminum Fin, Copper Tube								
Direct Expansion (DX) Coil								
Rows / (Face Area, ft ²)	3 / (24.7)	3 / (24.7)	3 / (24.7)	3 / (24.7)	3 / (39.8)	3 / (39.8)	3 / (39.8)	3 / (39.8)
Face Velocity, fpm	364	364	404	404	395	395	395	395
Free Cooling (FC) Glycol Economizer / Alternate Water Source (AWS) Coil (Optional)								
Coil Rows / (Face Area, ft ²)	4 / (24.7)	4 / (24.7)	4 / (24.7)	4 / (24.7)	4 / (39.8)	4 / (39.8)	4 / (39.8)	4 / (39.8)
Face Velocity, fpm	364	364	404	404	395	395	395	395
CV (FC Valve, 3-way, 400 PSI)	28	28	35.4	35.4	48	48	48	48
CV (AWS valve, 3-way, 400 PSI)	20	20	20	20	28	28	28	28
Compressors - R-410A								
Type / (Qty)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)	Scroll / (2)
Input per Compressor, W	8,370	8,370	11,070	11,070	14,090	14,090	16,600	16,600
Glycol Cooled Condensers - Micro-Plate (Based on 40% Ethylene Glycol Solution)								
Total Heat of Rejection, kW (MBH)	73.2 (250)	73.2 (250)	92.4 (316)	92.4 (316)	124.7 (426)	124.7 (426)	138.8 (474)	138.8 (474)
Flow Rate, GPM @ 110°F EGT / 120°F LGT	56	56	70	70	95	95	105	105
Unit Pressure Drop, ft H ₂ O	17	17	20	20	23	23	28	28
Reheat - Performance Capacities DO NOT Include Evaporator Motor Heat @ Rated CFM & ESP								
Electric Reheat - Finned Tubular Heater (Standard)								
Number of Stages	2	2	2	2	3	3	3	3
Total Nominal Capacity, kW (MBH)	18.0 (61)	18.0 (61)	18.0 (61)	18.0 (61)	27.0 (92)	27.0 (92)	27.0 (92)	27.0 (92)
Hot Gas Reheat - with 3-Way Heat Reclaim Valve (Optional)								
Total Capacity, kW (MBH)	8.3 (28)	8.3 (28)	11.0 (37)	11.0 (37)	14.0 (48)	14.0 (48)	16.6 (56)	16.6 (56)
Hot Water Reheat - Rated at 180°F EWT / 160°F LWT & 72°FDB/60.0°FWB EAT (Optional)								
Total Capacity, kW (MBH)	25.5 (87)	31.1 (106)	26.6 (91)	32.2 (110)	45 (153)	56.1 (191)	45 (153)	56.1 (191)
Flow Rate, GPM / (Pressure Drop, ft H ₂ O)	9 / (6)	11 / (9)	10 / (6)	12 / (9)	16 / (18)	20 / (27)	16 / (18)	20 / (27)
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Steam Reheat - Rated at 5 psig & 72°FDB EAT (Optional)								
Total Capacity, kW (MBH)	62.8 (214)	84.7 (289)	66.8 (228)	89.1 (304)	105.2 (359)	146.8 (501)	105.2 (359)	146.8 (501)
Condensate, lbs/hr	223	301	237	316	374	521	374	521
Control Valve	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Humidification - Electrode Steam Canister with Adjustable Output (Standard)								
Steam Output, lbs/hr / (Power Input, kW)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-15 / (5.1)	4-25 / (8.5)	4-25 / (8.5)	4-25 / (8.5)	4-25 / (8.5)
Std Control	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating	Modulating
Filters - Disposable, MERV 8 Average Dust Spot Efficiency (Standard), MERV 11 Average Dust Spot Efficiency (Optional)								
Actual Size, H in. x W in. x D in. (Qty)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)	37 x 21 x 3 3/4 (3)	35 7/8 x 24 3/4 x 3 3/4 (2) 24 3/4 x 21 x 3 3/4 (1)	37 x 18 1/2 x 3 3/4 (5)	35 7/8 x 24 3/4 x 3 3/4 (3) 24 3/4 x 21 x 3 3/4 (2)	37 x 18 1/2 x 3 3/4 (5)	35 7/8 x 24 3/4 x 3 3/4 (3) 24 3/4 x 21 x 3 3/4 (2)
Connection Sizes - Copper								
Condenser In & Out, in. OD	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8
AWS In & Out, in. OD	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8
Condensate Drain without Pump, in. OD	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
Condensate Drain with Pump, in. OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Humidifier Inlet, in. OD	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Hot Water Reheat In & Out, in. OD	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Physical Data								
Approximate Unit Weight, lbs	2,300	2,500	2,300	2,500	3,000	3,200	3,000	3,200
Approximate Shipping Weight, lbs	2,450	2,650	2,450	2,650	3,200	3,400	3,200	3,400
Unit Dimensions, H in. x W in. x D in.	76.2 x 89.1 x 40.3	88.1 x 89.1 x 40.3 (91.1 x 89.1 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 89.1 x 40.3	88.1 x 89.1 x 40.3 (91.1 x 89.1 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 118.4 x 40.3	88.1 x 118.4 x 40.3 (91.1 x 118.4 x 40.3 w/ Hot Gas/Water Reheat)	76.2 x 118.4 x 40.3	88.1 x 118.4 x 40.3 (91.1 x 118.4 x 40.3 w/ Hot Gas/Water Reheat)
Shipping Dimensions, H in. x W in. x D in.	83 x 95 x 46	95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)	83 x 95 x 46	95 x 95 x 46 (98 x 95 x 46 w/ Hot Gas/Water Reheat)	83 x 124 x 46	95 x 124 x 46 (98 x 124 x 46 w/ Hot Gas/Water Reheat)	83 x 124 x 46	95 x 124 x 46 (98 x 124 x 46 w/ Hot Gas/Water Reheat)

Model: CFD/U-	021-D2A	028-D2A	035-D2A	042-D2A	053-D2A	070-D2A	088-D2A	105-D2A
NET DX COOLING CAPACITY - (Includes Motor Heat @ Rated CFM & ESP)								
80°FDB/62.9°FWB, 38% RH, 52.3°FDP								
Total, kW (MBH)	27.1 (92)	31.4 (107)	34.4 (117)	40.1 (136)	51.6 (176)	65.6 (224)	89.7 (306)	99.1 (338)
Sensible, kW (MBH)	27.1 (92)	31.4 (107)	34.4 (117)	40.1 (136)	51.6 (176)	64.1 (218)	89.7 (306)	99.1 (338)
72°FDB/60.0°FWB, 50% RH, 52.3°FDP								
Total, kW (MBH)	24 (82)	28.5 (97)	31.8 (108)	35.1 (120)	46.4 (158)	62.1 (212)	80.9 (276)	92.4 (315)
Sensible, kW (MBH)	23.2 (79)	27.8 (95)	30.2 (103)	33.6 (114)	42 (143)	58.3 (199)	77.3 (263)	88.1 (300)
NET AWS COOLING CAPACITY - Based on 45°F EWT / 55°F LWT, 0% Glycol Solution (Includes Motor Heat @ Rated CFM & ESP)								
80°FDB/62.9°FWB, 38% RH, 52.3°FDP								
Total, kW (MBH)	41.3 (141)	41.3 (141)	41.3 (141)	51.6 (176)	56.3 (192)	60.6 (207)	97.8 (333)	97.8 (333)
Sensible, kW (MBH)	41.3 (141)	41.3 (141)	41.3 (141)	51.6 (176)	56.3 (192)	60.6 (207)	97.8 (333)	97.8 (333)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	31 / (28)	31 / (28)	31 / (28)	40 / (21)	43 / (23)	46 / (26)	74 / (36)	74 / (36)
72°FDB/60.0°FWB, 50% RH, 52.3°FDP								
Total, kW (MBH)	27.2 (93)	27.2 (93)	27.2 (93)	33.7 (115)	36.9 (125)	39.8 (136)	64.2 (219)	64.2 (219)
Sensible, kW (MBH)	27.2 (93)	27.2 (93)	27.2 (93)	33.7 (115)	36.9 (125)	39.8 (136)	64.2 (219)	64.2 (219)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	21 / (15)	21 / (15)	21 / (15)	28 / (13)	30 / (14)	32 / (15)	51 / (20)	51 / (20)

Model: CFD/U-	021-D2W	028-D2W	035-D2W	042-D2W	053-D2W	070-D2W	088-D2W	105-D2W
NET DX COOLING CAPACITY - (Includes Motor Heat @ Rated CFM & ESP)								
80°FDB/62.9°FWB, 38% RH, 52.3°FDP								
Total, kW (MBH)	29.9 (102)	34.7 (118)	38.1 (130)	44.5 (152)	56.8 (194)	74.1 (252)	98.9 (337)	110.4 (376)
Sensible, kW (MBH)	29.9 (102)	34.7 (118)	38.1 (130)	44.5 (152)	56.8 (194)	73.5 (250)	98.9 (337)	110.4 (376)
72°FDB/60.0°FWB, 50% RH, 52.3°FDP								
Total, kW (MBH)	26.9 (91)	32.3 (110)	35.8 (122)	39.9 (136)	52.9 (180)	69.7 (237)	92.2 (314)	104.8 (357)
Sensible, kW (MBH)	26.9 (91)	30.5 (104)	30.4 (103)	39 (133)	50.2 (171)	54.1 (184)	87.9 (299)	93.1 (317)
NET FC COOLING CAPACITY - Based on 45°F EWT, 0% Glycol Solution (Includes Motor Heat @ Rated CFM & ESP)								
80°FDB/62.9°FWB, 38% RH, 52.3°FDP								
Total, kW (MBH)	39.9 (136)	41.6 (142)	43 (146)	52.5 (179)	59.3 (202)	66.1 (225)	102.9 (351)	104.9 (357)
Sensible, kW (MBH)	39.9 (136)	41.6 (142)	43 (146)	52.5 (179)	59.3 (202)	66.1 (225)	102.9 (351)	104.9 (357)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	27 / (26)	31 / (33)	35 / (36)	42 / (34)	52 / (35)	67 / (46)	89 / (46)	99 / (56)
72°FDB/60.0°FWB, 50% RH, 52.3°FDP								
Total, kW (MBH)	30.2 (103)	34.1 (116)	35 (119)	42.5 (145)	47.6 (162)	52.8 (180)	83 (283)	84.2 (287)
Sensible, kW (MBH)	30.2 (103)	32.5 (111)	33.2 (113)	40.6 (138)	46 (157)	51.4 (175)	80.7 (275)	81.7 (278)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	27 / (26)	31 / (33)	35 / (36)	42 / (34)	52 / (35)	67 / (46)	89 / (46)	99 / (56)
NET AWS COOLING CAPACITY - Based on 45°F EWT / 55°F LWT, 0% Glycol Solution (Includes Motor Heat @ Rated CFM & ESP)								
80°FDB/62.9°FWB, 38% RH, 52.3°FDP								
Total, kW (MBH)	41.3 (141)	41.3 (141)	41.3 (141)	51.6 (176)	56.3 (192)	60.6 (207)	97.8 (333)	97.8 (333)
Sensible, kW (MBH)	41.3 (141)	41.3 (141)	41.3 (141)	51.6 (176)	56.3 (192)	60.6 (207)	97.8 (333)	97.8 (333)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	31 / (28)	31 / (28)	31 / (28)	40 / (21)	43 / (23)	46 / (26)	74 / (36)	74 / (36)
72°FDB/60.0°FWB, 50% RH, 52.3°FDP								
Total, kW (MBH)	27.2 (93)	27.2 (93)	27.2 (93)	33.7 (115)	36.9 (125)	39.8 (136)	64.2 (219)	64.2 (219)
Sensible, kW (MBH)	27.2 (93)	27.2 (93)	27.2 (93)	33.7 (115)	36.9 (125)	39.8 (136)	64.2 (219)	64.2 (219)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	21 / (15)	21 / (15)	21 / (15)	28 / (13)	30 / (14)	32 / (15)	51 / (20)	51 / (20)

Model: CFD/U-	021-D2G	028-D2G	035-D2G	042-D2G	053-D2G	070-D2G	088-D2G	105-D2G
NET DX COOLING CAPACITY - (Includes Motor Heat @ Rated CFM & ESP)								
80°FDB/62.9°FWB, 38% RH, 52.3°FDP								
Total, kW (MBH)	26.3 (89)	30.5 (104)	33.4 (114)	38.8 (132)	50.1 (171)	63.9 (218)	87.1 (297)	96.2 (328)
Sensible, kW (MBH)	26.3 (89)	30.5 (104)	33.4 (114)	38.8 (132)	50.1 (171)	63.9 (218)	87.1 (297)	96.2 (328)
72°FDB/60.0°FWB, 50% RH, 52.3°FDP								
Total, kW (MBH)	23.2 (79)	27.4 (93)	30.7 (104)	34 (116)	44.9 (153)	59.8 (204)	78.3 (267)	89 (303)
Sensible, kW (MBH)	23.2 (79)	27.2 (92)	29.5 (100)	34 (116)	44.3 (151)	57 (194)	78.3 (267)	85.9 (293)
NET FC COOLING CAPACITY - Based on 45°F EGT, 40% Ethylene Glycol Solution (Includes Motor Heat @ Rated CFM & ESP)								
80°FDB/62.9°FWB, 38% RH, 52.3°FDP								
Total, kW (MBH)	30.8 (105)	32.5 (111)	33.1 (113)	41.9 (143)	49.4 (168)	56.7 (193)	84.3 (287)	88 (300)
Sensible, kW (MBH)	30.8 (105)	32.5 (111)	33.1 (113)	41.9 (143)	49.4 (168)	56.7 (193)	84.3 (287)	88 (300)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	29 / (31)	34 / (39)	36 / (40)	44 / (38)	56 / (42)	70 / (56)	95 / (56)	105 / (69)
72°FDB/60.0°FWB, 50% RH, 52.3°FDP								
Total, kW (MBH)	23.1 (78)	24.4 (83)	24.9 (85)	30.9 (105)	36.7 (125)	42.4 (144)	62.9 (214)	65.8 (224)
Sensible, kW (MBH)	23.1 (78)	24.4 (83)	24.9 (85)	30.9 (105)	36.7 (125)	42.4 (144)	62.9 (214)	65.8 (224)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	29 / (31)	34 / (39)	36 / (40)	44 / (38)	56 / (42)	70 / (56)	95 / (56)	105 / (68)
NET AWS COOLING CAPACITY - Based on 45°F EWT / 55°F LWT, 0% Glycol Solution (Includes Motor Heat @ Rated CFM & ESP)								
80°FDB/62.9°FWB, 38% RH, 52.3°FDP								
Total, kW (MBH)	41.3 (141)	41.3 (141)	41.3 (141)	51.6 (176)	56.3 (192)	60.6 (207)	97.8 (333)	97.8 (333)
Sensible, kW (MBH)	41.3 (141)	41.3 (141)	41.3 (141)	51.6 (176)	56.3 (192)	60.6 (207)	97.8 (333)	97.8 (333)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	31 / (28)	31 / (28)	31 / (28)	40 / (21)	43 / (23)	46 / (26)	74 / (36)	74 / (36)
72°FDB/60.0°FWB, 50% RH, 52.3°FDP								
Total, kW (MBH)	27.2 (93)	27.2 (93)	27.2 (93)	33.7 (115)	36.9 (125)	39.8 (136)	64.2 (219)	64.2 (219)
Sensible, kW (MBH)	27.2 (93)	27.2 (93)	27.2 (93)	33.7 (115)	36.9 (125)	39.8 (136)	64.2 (219)	64.2 (219)
Flow Rate, GPM / (Unit Press. Drop, ft H ₂ O)	21 / (15)	21 / (15)	21 / (15)	28 / (13)	30 / (14)	32 / (15)	51 / (20)	51 / (20)

Electrical Data – Dual Compressor Systems

Model	With Condensate Pump	CFU/D-021-D2A/D2W/D2G					CFU/D-028-D2A/D2W/D2G					CFU/D-035-D2A/D2W/D2G					CFU/D-042-D2A/D2W/D2G				
		FLA			MCA	MFS	FLA			MCA	MFS	FLA			MCA	MFS	FLA			MCA	
		A	W	G			A	W	G			A	W	G			A	W	G		
Cooling w/ Electric Reheat & Humidification																					
208/3/60	No	47.1	42.9	48.5	60.3	70	51.3	46.1	52.9	63.3	80	55.5	48.9	57.5	73.4	90	77.5	74.7	78.3	101.6	
208/3/60	Yes	49.0	44.8	50.4	62.2	70	53.2	48.0	54.8	65.2	80	57.4	50.8	59.4	75.3	90	79.4	76.6	80.2	103.5	
460/3/60	No	22.8	20.9	23.6	27.8	30	24.6	21.6	25.6	30.5	35	26.8	23.6	27.8	31.6	40	40.2	38.8	40.7	52.0	
460/3/60	Yes	23.7	21.8	24.5	28.7	35	25.5	22.5	26.5	31.4	40	27.7	24.5	28.7	32.5	40	41.1	39.7	41.6	52.9	
575/3/60	No	18.5	16.8	18.9	24.2	30	19.9	17.5	20.5	23.7	30	21.7	19.1	22.5	25.8	30	32.4	31.4	32.8	40.8	
575/3/60	Yes	19.3	17.6	19.7	25.0	30	20.7	18.3	21.3	24.5	30	22.5	19.9	23.3	26.6	30	33.2	32.2	33.6	41.6	
Cooling w/ Electric Reheat Only (No Humidifier)																					
208/3/60	No	41.8	39.7	42.5	55.5	60	43.9	41.3	44.7	57.2	60	46.0	42.7	47.0	62.8	80	77.5	74.7	78.3	101.6	
208/3/60	Yes	43.7	41.6	44.4	57.4	60	45.8	43.2	46.6	59.1	70	47.9	44.6	48.9	64.7	80	79.4	76.6	80.2	103.5	
460/3/60	No	21.9	20.9	22.3	27.8	30	22.8	21.3	23.3	29.6	35	23.9	22.3	24.4	30.3	35	40.2	38.8	40.7	52.0	
460/3/60	Yes	22.8	21.8	23.2	28.7	30	23.7	22.2	24.2	30.5	35	24.8	23.2	25.3	31.2	35	41.1	39.7	41.6	52.9	
575/3/60	No	17.7	16.8	17.9	23.6	25	18.4	17.2	18.7	23.4	25	19.3	18.0	19.7	24.5	25	32.4	31.4	32.8	40.8	
575/3/60	Yes	18.5	17.6	18.7	24.4	25	19.2	18.0	19.5	24.2	25	20.1	18.8	20.5	25.3	30	33.2	32.2	33.6	41.6	
Cooling w/ Humidification (No Electric Reheat)																					
208/3/60	No	47.1	42.9	48.5	60.3	70	51.3	46.1	52.9	63.3	80	55.5	48.9	57.5	73.4	90	68.3	62.7	69.9	89.8	
208/3/60	Yes	49.0	44.8	50.4	62.2	70	53.2	48.0	54.8	65.2	80	57.4	50.8	59.4	75.3	90	70.2	64.6	71.8	91.7	
460/3/60	No	22.8	20.8	23.6	27.1	30	24.6	21.6	25.6	30.5	35	26.8	23.6	27.8	31.6	40	32.6	29.8	33.6	42.0	
460/3/60	Yes	23.7	21.7	24.5	28.0	35	25.5	22.5	26.5	31.4	40	27.7	24.5	28.7	32.5	40	33.5	30.7	34.5	42.9	
575/3/60	No	18.5	16.7	18.9	24.2	30	19.9	17.5	20.5	23.7	30	21.7	19.1	22.5	25.8	30	26.4	24.4	27.2	32.0	
575/3/60	Yes	19.3	17.5	19.7	25.0	30	20.7	18.3	21.3	24.5	30	22.5	19.9	23.3	26.6	30	27.2	25.2	28.0	32.8	
Cooling Only																					
208/3/60	No	32.9	28.7	34.3	46.1	60	37.1	31.9	38.7	49.1	60	41.3	34.7	43.3	59.2	80	54.1	48.5	55.7	75.6	
208/3/60	Yes	34.8	30.6	36.2	48.0	60	39.0	33.8	40.6	51.0	60	43.2	36.6	45.2	61.1	80	56.0	50.4	57.6	77.5	
460/3/60	No	16.4	14.4	17.2	20.7	25	18.2	15.2	19.2	24.1	30	20.4	17.2	21.4	25.2	30	26.2	23.4	27.2	35.6	
460/3/60	Yes	17.3	15.3	18.1	21.6	25	19.1	16.1	20.1	25.0	30	21.3	18.1	22.3	26.1	35	27.1	24.3	28.1	36.5	
575/3/60	No	13.4	11.6	13.8	19.1	25	14.8	12.4	15.4	18.6	25	16.6	14.0	17.4	20.7	25	21.3	19.3	22.1	26.9	
575/3/60	Yes	14.2	12.4	14.6	19.9	25	15.6	13.2	16.2	19.4	25	17.4	14.8	18.2	21.5	25	22.1	20.1	22.9	27.7	

Model	With Condensate Pump	CFU/D-053-D2A/D2W/D2G					CFU/D-070-D2A/D2W/D2G					CFU/D-088-D2A/D2W/D2G					CFU/D-105-D2A/D2W/D2G				
		FLA			MCA	MFS	FLA			MCA	MFS	FLA			MCA	MFS	FLA			MCA	MFS
		A	W	G			A	W	G			A	W	G			A	W	G		
Cooling w/ Electric Reheat & Humidification																					
208/3/60	No	83.8	80.3	84.9	108.7	125	96.1	86.5	99.1	117.0	150	N/A					N/A				
208/3/60	Yes	85.7	82.2	86.8	110.6	125	98.0	88.4	101.0	118.9	150	N/A					N/A				
460/3/60	No	43.6	41.8	44.2	55.1	60	47.3	44.8	48.2	62.3	80	67.2	64.1	68.1	87.6	100	68.7	64.7	69.9	88.5	100
460/3/60	Yes	44.5	42.7	45.1	56.0	60	48.2	45.7	49.1	63.2	80	68.1	65.0	69.0	88.5	100	69.6	65.6	70.8	89.4	110
575/3/60	No	35.3	33.8	35.7	43.4	45	37.6	35.5	38.2	47.9	50	55.7	53.0	56.5	72.4	90	60.7	56.0	62.5	78.9	100
575/3/60	Yes	36.1	34.6	36.5	44.2	50	38.4	36.3	39.0	48.7	50	56.5	53.8	57.3	73.2	90	61.5	56.8	63.3	79.7	100
Cooling w/ Electric Reheat Only (No Humidifier)																					
208/3/60	No	83.8	80.3	84.9	108.7	125	91.4	86.5	92.9	116.7	125	N/A					N/A				
208/3/60	Yes	85.7	82.2	86.8	110.6	125	93.3	88.4	94.8	118.6	125	N/A					N/A				
460/3/60	No	43.6	41.8	44.2	55.1	60	47.3	44.8	48.0	62.3	70	67.2	64.1	68.1	87.6	100	68.7	64.7	69.9	88.5	100
460/3/60	Yes	44.5	42.7	45.1	56.0	60	48.2	45.7	48.9	63.2	70	68.1	65.0	69.0	88.5	100	69.6	65.6	70.8	89.4	100
575/3/60	No	35.3	33.8	35.7	43.4	45	37.6	35.5	38.2	47.9	50	55.7	53.0	56.5	72.4	80	58.6	56.0	59.5	77.8	90
575/3/60	Yes	36.1	34.6	36.5	44.2	50	38.4	36.3	39.0	48.7	50	56.5	53.8	57.3	73.2	80	59.4	56.8	60.3	78.6	90
Cooling w/ Humidification (No Electric Reheat)																					
208/3/60	No	80.9	73.9	83.1	102.6	125	96.1	86.3	99.1	117.0	150	N/A					N/A				
208/3/60	Yes	82.8	75.8	85.0	104.5	125	98.0	88.2	101.0	118.9	150	N/A					N/A				
460/3/60	No	39.4	35.8	40.6	47.6	60	46.8	41.8	48.2	60.4	80	64.2	58.0	66.0	81.8	100	67.2	59.2	69.6	83.4	100
460/3/60	Yes	40.3	36.7	41.5	48.5	60	47.7	42.7	49.1	61.3	80	65.1	58.9	66.9	82.7	100	68.1	60.1	70.5	84.3	110
575/3/60	No	32.2	29.2	33.0	36.7	45	36.8	32.6	38.0	44.8	50	54.9	49.5	56.5	69.2	90	60.7	55.5	62.5	78.9	100
575/3/60	Yes	33.0	30.0	33.8	37.5	45	37.6	33.4	38.8	45.6	50	55.7	50.3	57.3	70.0	90	61.5	56.3	63.3	79.7	100
Cooling Only																					
208/3/60	No	66.7	59.7	68.9	88.4	110	81.9	72.1	84.9	102.8	125	N/A					N/A				
208/3/60	Yes	68.6	61.6	70.8	90.3	110	83.8	74.0	86.8	104.7	125	N/A					N/A				
460/3/60	No	33.0	29.4	34.2	41.2	50	40.4	35.4	41.8	54.0	70	53.5	47.3	55.3	71.1	90	56.5	48.5	58.9	72.7	90
460/3/60	Yes	33.9	30.3	35.1	42.1	50	41.3	36.3	42.7	54.9	70	54.4	48.2	56.2	72.0	90	57.4	49.4	59.8	73.6	90
575/3/60	No	27.1	24.1	27.9	31.6	40	31.7	27.5	32.9	39.7	50	46.4	41.0	48.0	60.7	80	52.2	47.0	54.0	70.4	90
575/3/60	Yes	27.9	24.9	28.7	32.4	40	32.5	28.3	33.7	40.5	50	47.2	41.8	48.8	61.5	80	53.0	47.8	54.8	71.2	90

Electrical Data – Tandem Compressor Systems

Model	With Condensat e Pump	CFU/D-053-D2A/D2W/D2G-()-IT					CFU/D-070-D2A/D2W/D2G-()-IT					CFU/D-088-D2A/D2W/D2G-()-IT					CFU/D-105-D2A/D2W/D2G-()-IT				
		FLA			MCA	MFS	FLA			MCA	MFS	FLA			MCA	MFS	FLA			MCA	MFS
		A	W	G			A	W	G			A	W	G			A	W	G		
Cooling w/ Electric Reheat & Humidification																					
208/3/60	No	83.8	80.3	84.9	108.7	125	96.2	86.5	99.7	123.7	150	N/A					N/A				
208/3/60	Yes	85.7	82.2	86.8	110.6	125	98.1	88.4	101.6	125.6	150	N/A					N/A				
460/3/60	No	43.6	41.8	44.2	55.1	60	47.3	44.8	48.4	62.3	70	68.5	65.7	69.3	87.6	110	71.1	67.5	72.3	88.5	110
460/3/60	Yes	44.5	42.7	45.1	56.0	60	48.2	45.7	49.3	63.2	70	69.4	66.6	70.2	88.5	110	72.0	68.4	73.2	89.4	110
575/3/60	No	35.3	33.8	35.7	43.4	50	38.1	35.5	38.9	47.9	50	55.8	53.6	56.5	72.4	90	59.7	56.0	61.4	77.8	100
575/3/60	Yes	36.1	34.6	36.5	44.2	50	38.9	36.3	39.7	48.7	60	56.6	54.4	57.3	73.2	90	60.5	56.8	62.2	78.6	100
Cooling w/ Electric Reheat Only (No Humidifier)																					
208/3/60	No	83.8	80.3	84.9	108.7	125	91.5	86.5	93.5	116.7	125	N/A					N/A				
208/3/60	Yes	85.7	82.2	86.8	110.6	125	93.4	88.4	95.4	118.6	125	N/A					N/A				
460/3/60	No	43.6	41.8	44.2	55.1	60	47.3	44.8	48.2	62.3	70	68.5	65.7	69.3	87.6	100	71.1	67.5	72.3	88.5	100
460/3/60	Yes	44.5	42.7	45.1	56.0	60	48.2	45.7	49.1	63.2	70	69.4	66.6	70.2	88.5	100	72.0	68.4	73.2	89.4	100
575/3/60	No	35.3	33.8	35.7	43.4	45	38.1	35.5	38.9	47.9	50	55.8	53.6	56.5	72.4	80	58.6	56.0	59.5	77.8	90
575/3/60	Yes	36.1	34.6	36.5	44.2	50	38.9	36.3	39.7	48.7	50	56.6	54.4	57.3	73.2	80	59.4	56.8	60.3	78.6	90
Cooling w/ Humidification (No Electric Reheat)																					
208/3/60	No	80.2	72.5	82.7	104.1	125	96.2	84.7	99.7	123.7	150	N/A					N/A				
208/3/60	Yes	82.1	74.4	84.6	106.0	125	98.1	86.6	101.6	125.6	150	N/A					N/A				
460/3/60	No	39.0	35.2	40.4	47.5	60	46.7	41.0	48.4	58.6	70	65.5	59.6	67.2	84.7	110	69.6	62.0	72.0	85.6	110
460/3/60	Yes	39.9	36.1	41.3	48.4	60	47.6	41.9	49.3	59.5	70	66.4	60.5	68.1	85.6	110	70.5	62.9	72.9	86.5	110
575/3/60	No	31.8	28.5	32.6	39.4	50	37.3	32.6	38.7	45.3	50	55.0	50.1	56.4	68.5	90	59.7	54.1	61.4	73.9	100
575/3/60	Yes	32.6	29.3	33.4	40.2	50	38.1	33.4	39.5	46.1	60	55.8	50.9	57.2	69.3	90	60.5	54.9	62.2	74.7	100
Cooling Only																					
208/3/60	No	66.0	58.3	68.5	89.9	110	82.0	70.5	85.5	109.5	125	N/A					N/A				
208/3/60	Yes	67.9	60.2	70.4	91.8	110	83.9	72.4	87.4	111.4	125	N/A					N/A				
460/3/60	No	32.6	28.8	34.0	41.1	50	40.3	34.6	42.0	52.2	70	54.8	48.9	56.5	74.0	90	58.9	51.3	61.3	74.9	100
460/3/60	Yes	33.5	29.7	34.9	42.0	50	41.2	35.5	42.9	53.1	70	55.7	49.8	57.4	74.9	100	59.8	52.2	62.2	75.8	100
575/3/60	No	26.7	23.4	27.5	34.3	40	32.2	27.5	33.6	40.2	50	46.5	41.6	47.9	60.0	80	51.2	45.6	52.9	65.4	90
575/3/60	Yes	27.5	24.2	28.3	35.1	45	33.0	28.3	34.4	41.0	50	47.3	42.4	48.7	60.8	80	52.0	46.4	53.7	66.2	90

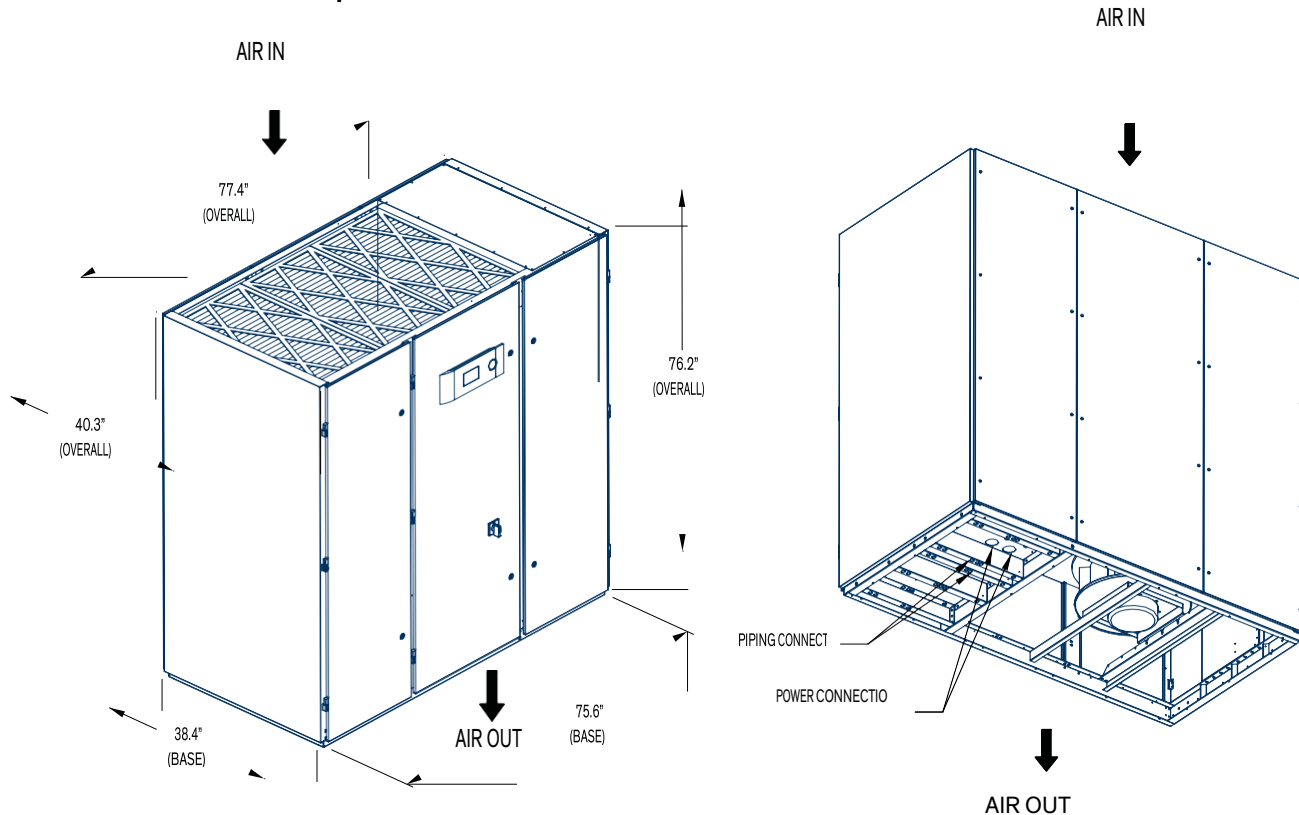
NOTE: High short circuit current rating available on most models. For voltages not shown, call 301.620.2033 for additional information.

Floor Mounted Air Conditioners

Dimensional Data CFD-021/028/035-D

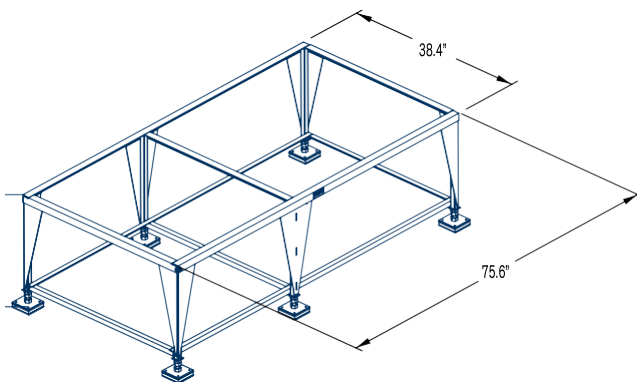
Downflow Vertical Air Conditioner

Free Return or with optional Ducted Return



NOTE Standard piping connections terminate inside the cabinet at the bottom, right hand side.

Adjustable Floor Stand, Non-Seismic



Adjustable Floor Stand Height Dimensions (inches)		
Nominal Height	Dim A Minimum	Dim A Maximum
15.00	14.00	18.00
18.00	17.00	21.00
24.00	23.00	26.00
36.00	35.00	38.00
48.00	47.00	50.00

Seismic Rated Floor Stand is Available

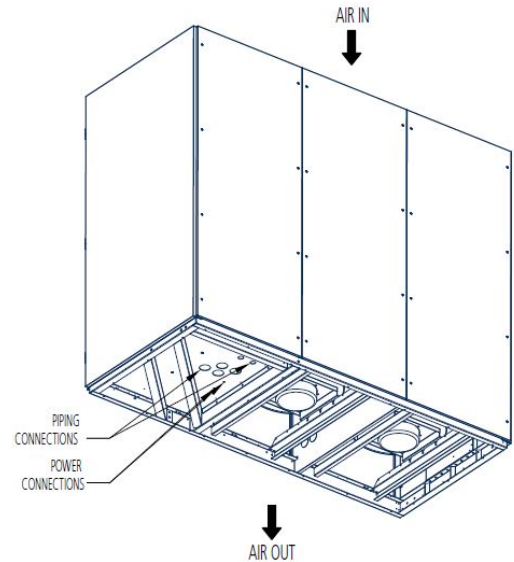
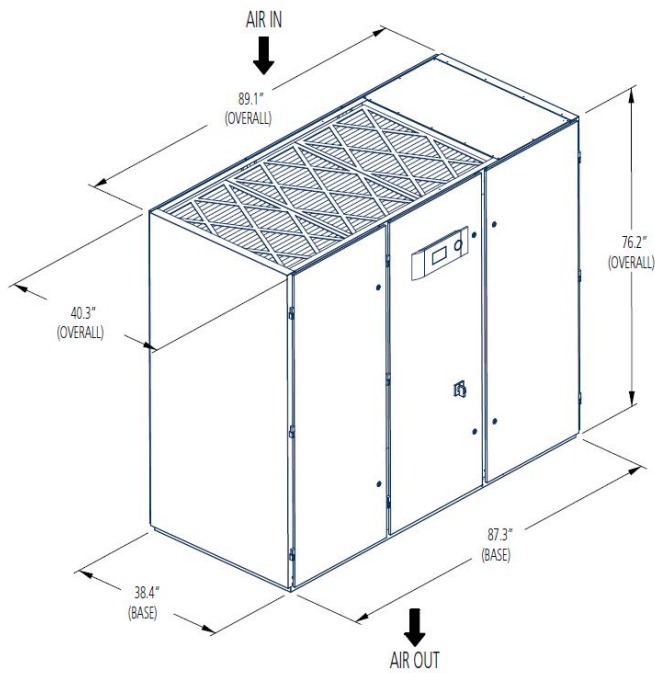
Floor Stands Optionally Available.

Dimensional Data — CyberAiR CFD/CFU-D

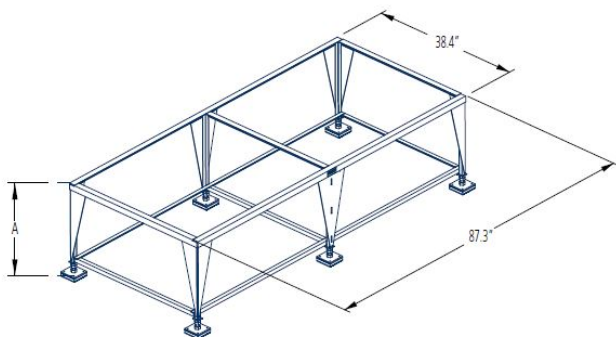
CFD-042/053/070-D

Downflow Vertical Air Conditioner

Free Return or with Optional Ducted Return



Adjustable Floor Stand, Non-Seismic
Seismic Rated Floor Stand is Available



NOTE: Standard piping connections terminate inside the cabinet at the bottom, right hand side.

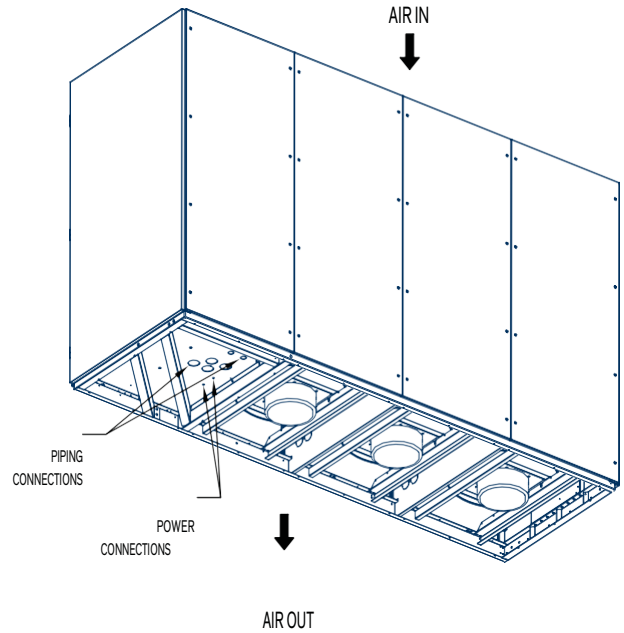
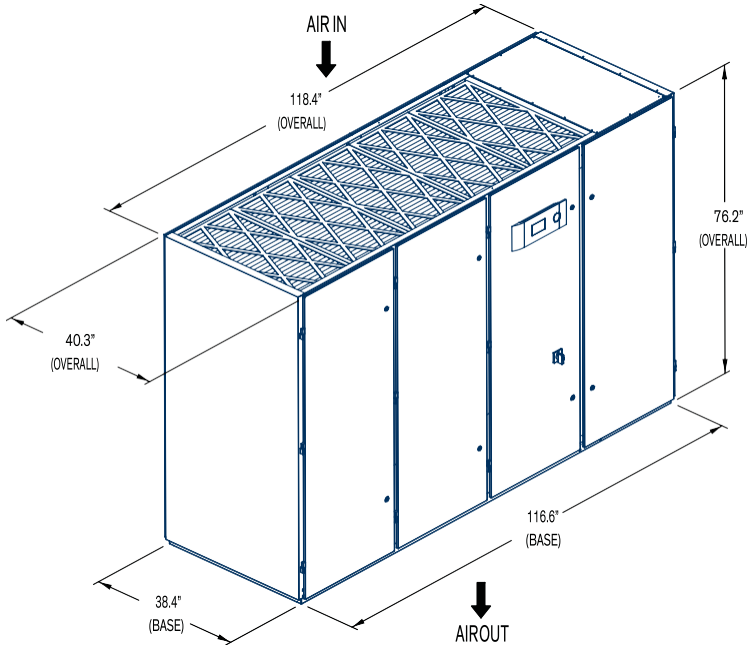
Adjustable Floor Stand Height Dimensions (inches)		
Nominal Height	Dim A Minimum	Dim A Maximum
15.00	14.00	18.00
18.00	17.00	21.00
24.00	23.00	26.00
36.00	35.00	38.00
48.00	47.00	50.00

Higher Floor Stands Optionally Available.

Dimensional Data — CFD-088/105-D

Downflow Vertical Air Conditioner

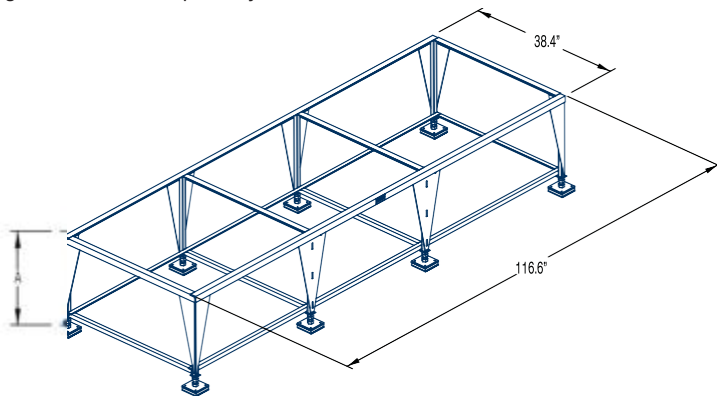
Free Return or with optional Ducted Return



NOTE: Piping connections terminate inside the cabinet at the bottom, right hand side.

Adjustable Floor Stand, Non-Seismic Seismic Rated Floor Stand is Available

Higher Floor Stands Optionally Available.



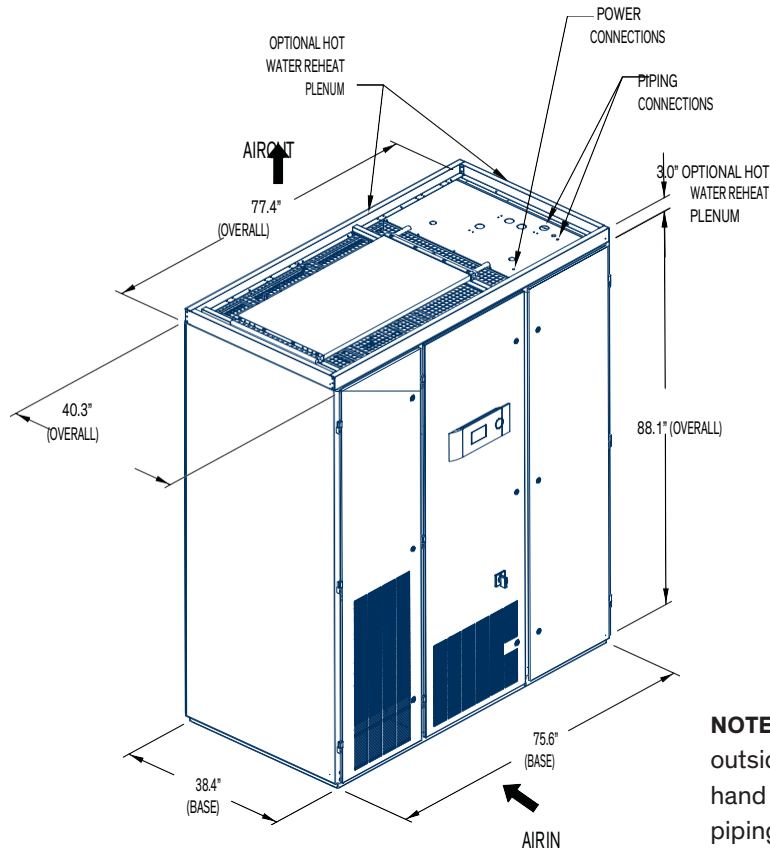
Adjustable Floor Stand Height Dimensions (inches)		
Nominal Height	Dim A Minimum	Dim A Maximum
15.00	14.00	18.00
18.00	17.00	21.00
24.00	23.00	26.00
36.00	35.00	38.00
48.00	47.00	50.00

Dimensional Data — CyberAiR CFD/CFU-D

CFU-021/028/035-D

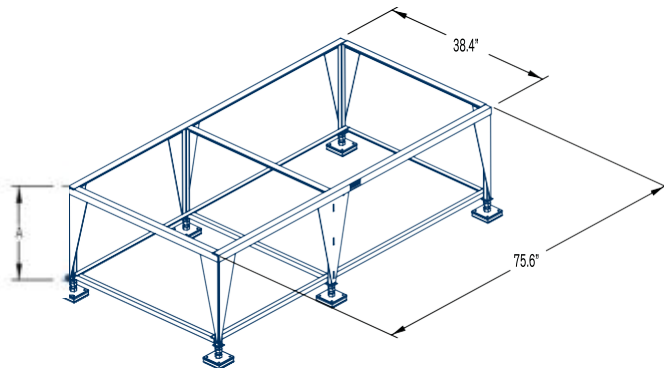
Upflow Vertical Air Conditioner

Ducted or provided with optional 2 or 3-way Plenum Box



NOTE: Piping connections terminate outside the cabinet at the top, right hand side (standard). As an option, piping connections may be furnished inside the cabinet at the bottom right hand side.

Adjustable Floor Stand, Non-Seismic Seismic Rated Floor Stand is Available



Adjustable Floor Stand Height Dimensions (inches)		
Nominal Height	Dim A Minimum	Dim A Maximum
15.00	14.00	18.00
18.00	17.00	21.00
24.00	23.00	26.00
36.00	35.00	38.00
48.00	47.00	50.00

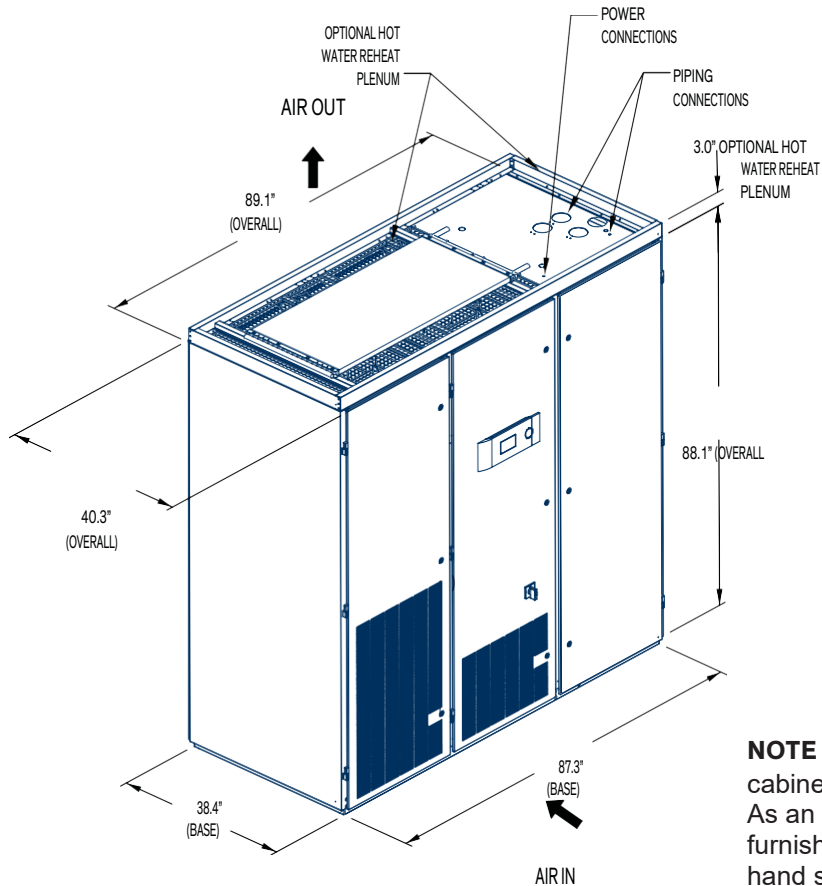
Higher Floor Stands Optionally Available.

Floor Mounted Air Conditioners

Dimensional Data — CFU-042/053/070-D

Upflow Vertical Air Conditioner

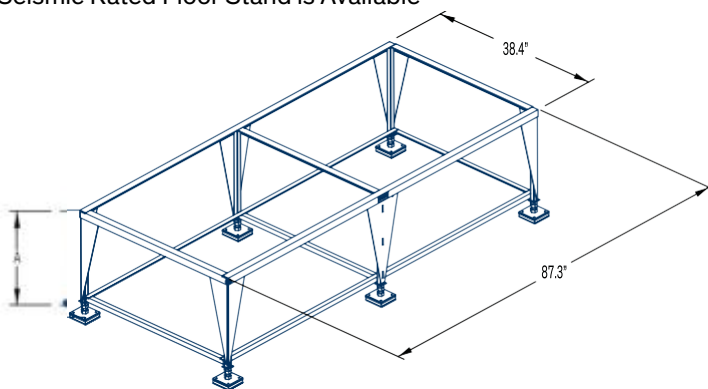
Ducted or provided with optional 2 or 3-way Plenum Box



NOTE Piping connections terminate outside the cabinet at the top, right hand side (standard). As an option, piping connections may be furnished inside the cabinet at the bottom right hand side.

Adjustable Floor Stand, Non-Seismic

Seismic Rated Floor Stand is Available



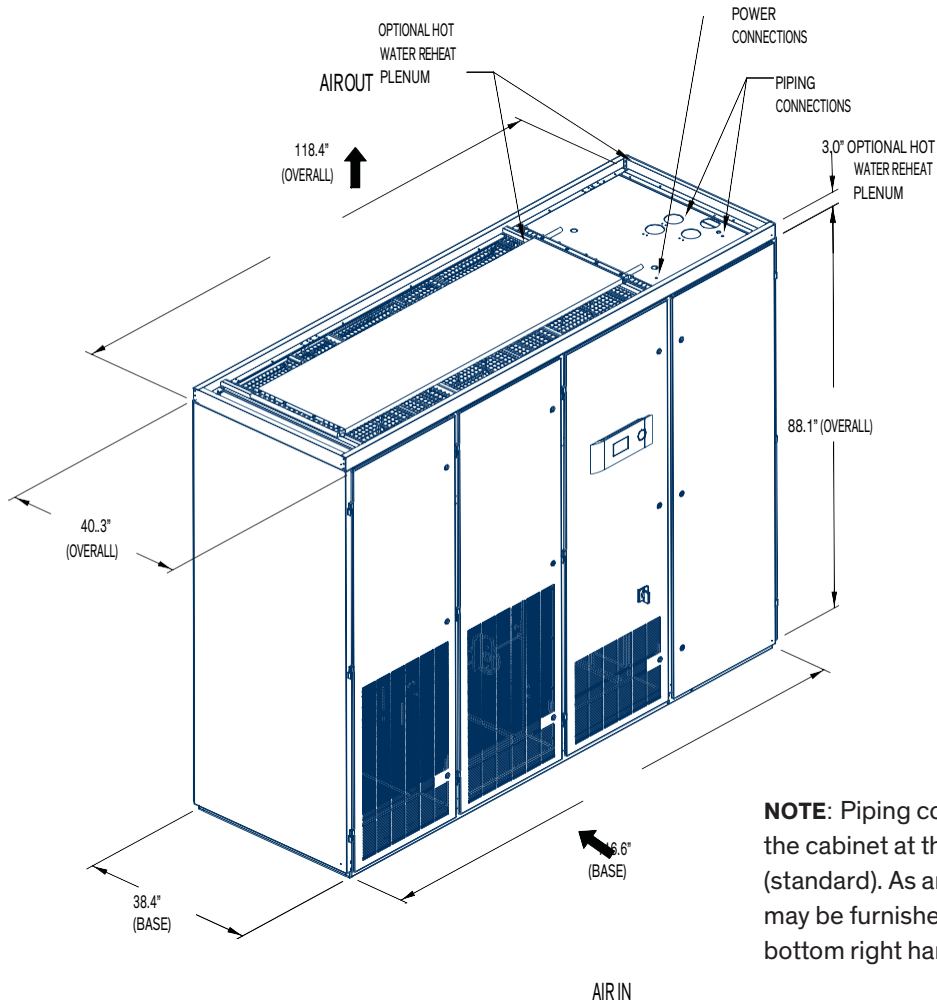
Adjustable Floor Stand Height Dimensions (inches)		
Nominal Height	Dim A Minimum	Dim A Maximum
15.00	14.00	18.00
18.00	17.00	21.00
24.00	23.00	26.00
36.00	35.00	38.00
48.00	47.00	50.00

Higher Floor Stands Optionally Available.

Dimensional Data — CFU-088/105-D

Upflow Vertical Air Conditioner

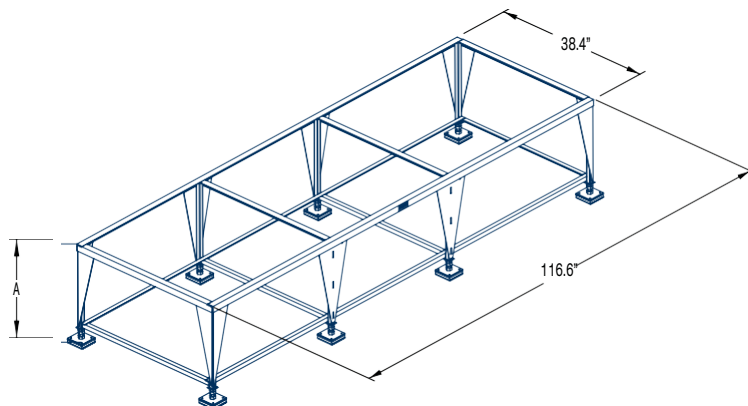
Ducted" or provided with optional 2 or 3-way Plenum Box



NOTE: Piping connections terminate outside the cabinet at the top, right hand side (standard). As an option, piping connections may be furnished inside the cabinet at the bottom right hand side.

Adjustable Floor Stand, Non-Seismic

Seismic Rated Floor Stand is Available



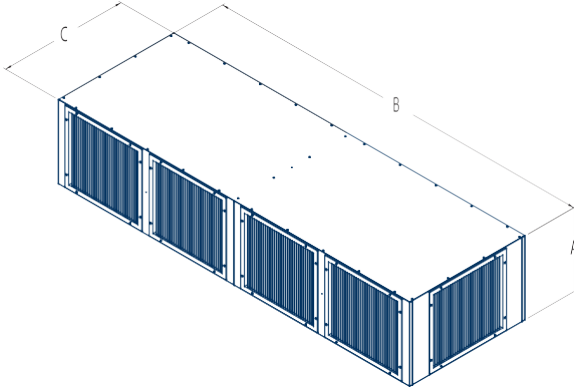
Adjustable Floor Stand Height Dimensions (inches)		
Nominal Height	Dim A Minimum	Dim A Maximum
15.00	14.00	18.00
18.00	17.00	21.00
24.00	23.00	26.00
36.00	35.00	38.00
48.00	47.00	50.00

Higher Floor Stands Optionally Available.

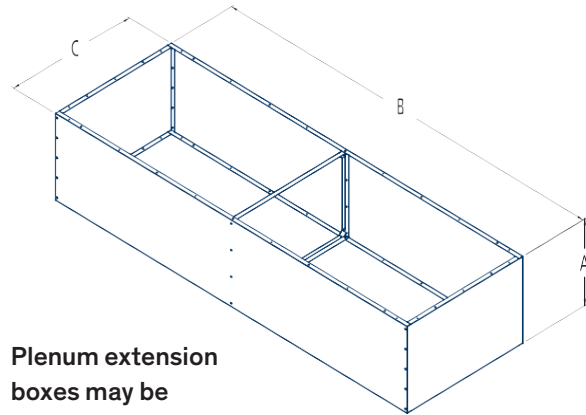
Plenum Box — Upflow Cabinets

Plenums/Seismic Floor Stands Mounted Air Conditioners

Plenum Extension Box



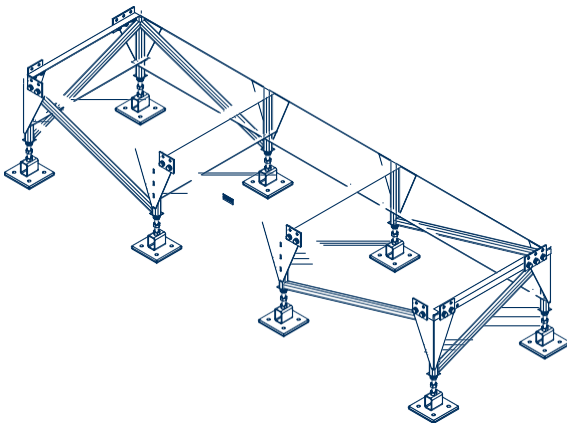
Plenum Boxes (Upflow Units)	Dim A Nominal (inches)	Dim B Minimum (inches)	Dim C Maximum (inches)
CFU-021	18.5	77.4	38.7
CFU-028	18.5	77.4	38.7
CFU-035	18.5	77.4	38.7
CFU-042	18.5	89.1	38.7
CFU-053	18.5	89.1	38.7
CFU-070	18.5	89.1	38.7
CFU-088	18.5	118.4	38.7
CFU-105	18.5	118.4	38.7



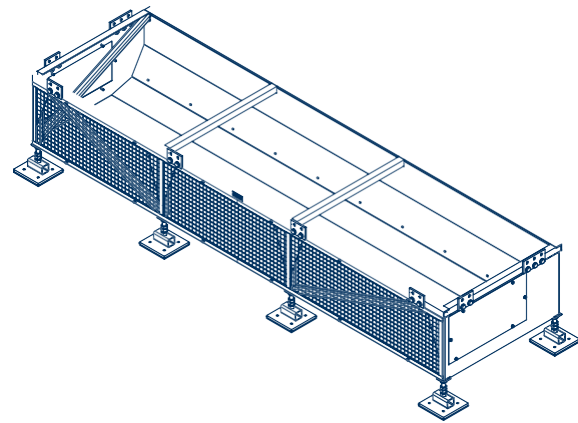
Plenum extension
boxes may be

Plenum Extension Boxes (Downflow Units)	Dim A Nominal (inches)	Dim B Minimum (inches)	Dim C Maximum (inches)
CFU/CFD-021	24, 36 or 48	77.4	38.8
CFU/CFD-028	24, 36 or 48	77.4	38.8
CFU/CFD-035	24, 36 or 48	77.4	38.8
CFU/CFD-042	24, 36 or 48	89.1	38.8
CFU/CFD-053	24, 36 or 48	89.1	38.8
CFU/CFD-070	24, 36 or 48	89.1	38.8
CFU/CFD-088	24, 36 or 48	118.4	38.8
CFU/CFD-105	24, 36 or 48	118.4	38.8

Available For Any Size Cabinet



Typical Seismic Rated Floor Stand



Typical Enclosed, Seismic Rated Floor Stand
Enclosed, non-seismic rated Floor stands also available.

Product Guide Specifications

STULZ CyberAiR Series CFD/CFU - D

Summary

This specification describes requirements for a precision environmental control system. The STULZ CyberAiR CW is a cooling system that provides 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 front access, STULZ CyberAir systems require minimum floor space. The units are designed with a wide range of options to handle both precision and comfort cooling applications.

Design Requirements

The environmental control system shall be a STULZ CyberAiR factory-assembled unit. The unit is designed with removable front access panels and removable screw secured rear access panels. No allowance for side service access shall be required.

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. Prior to shipment, each system shall be subject to complete operational and functional testing based on predefined procedures. The air conditioner manufacturer shall be ISO 9001:2015 certified.

The air conditioner manufacturer shall be International Organization for Standardization (ISO 9001:2015) certified.

Cabinet

Down-Flow/Front Discharge

Access panels shall be fabricated from 18 gauge galvanized steel. Door jambs and top cabinet frame shall be fabricated from 16 gauge galvanized steel. Bottom cabinet frame shall be fabricated from 10 gauge galvanized steel for CFD-060-360

The panels shall be lined with ½" (13 mm), 2 lb (.90 kg), high-density sound and thermal insulation and sealed with a self-extinguishing gasket conforming to NFPA 90A and 90B. The main unit color shall be black, extra fine texture.

The CFD-1080 shall be constructed on a 10-gauge heavy formed and powder-coated steel base adequate to support the full operating weight of the unit and enable transportation and site handling.

Up-Flow

Access panels shall be fabricated from 18 gauge galvanized steel. Door jambs shall be fabricated from 16 gauge galvanized steel. Bottom cabinet frame shall be fabricated from 10 gauge galvanized steel.

The panels shall be lined with 1/2" (13 mm), 2 lb (.90 kg), high-density sound and thermal insulation and sealed with a self-extinguishing gasket conforming to NFPA 90A and 90B. The main unit color shall be black, extra fine texture.

Available with top ducted discharge with front free return (standard) or rear ducted return (optional).

Air Flow Patterns

Down-Flow

The air conditioner shall be configured for a down-flow air pattern with free return air to the top and conditioned supply air discharge through bottom of the system into the raised floor.

Down-Flow/Front Discharge

The air conditioner shall be configured for a down-flow air pattern with free return air to the top and conditioned supply air discharge through the front of the unit.

Up-Flow

The air conditioner shall be configured for an up-flow air pattern with free return air through front filtered grille or rear return air through rear ducted return, and conditioned supply air through the top of the unit.

Air Filtration

All units shall be supplied with disposable air filters classified as UL 900 or UL 586. Filters shall be 4" deep (nominal). Filters shall be pleated with a Minimum Efficiency Reporting Value (MERV) of 8. Filters shall be installed in a front accessible, steel holding frame, and accessible through the front of the unit (except for the rear return configuration).

Optional: Filters rated up to MERV 11 shall be available.

All units shall be supplied with disposable air filters classified as UL 900 or UL 586. Filters shall be 4 in. deep (nominal). Filters shall be pleated with a Minimum Efficiency Reporting Value (MERV) of 8. Filters shall be installed in a front-accessible, steel holding frame, and accessible through the front of the unit.

Optional: Filters rated up to MERV 11 shall be available.

Mechanical Components

Backward Inclined Plenum Style Fan With an EC Motor

The blower(s) shall be direct driven, single inlet, backward curved centrifugal fan(s) with an electronically commutated 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,
- RS-485 bus connection
- Integrated current limitations.

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

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.

Snap-Acting Hot Gas Bypass (Optional)

The CyberAiR floor-mounted air conditioning system shall incorporate a snap acting hot gas bypass system to provide modulation of the unit's cooling capacity and evaporator coil freeze protection under low load conditions.

Air Cooled Heat Rejection

-20°F Variable Fan Speed Control

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

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. The receiver and head pressure control valve ships separately as field installed.

Water/Glycol Cooled Heat Rejection

Stainless Steel Micro Plate Heat Exchangers The refrigerant circuit shall be provided with a factory installed single pass, counterflow, micro plate heat exchanger. 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 (Standard)

Each 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 (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.

Free-Cooling Mode (Optional)

DX Water/Glycol Cooled systems with Free-Cooling are provided with the following standard DX head pressure and Free-Cooling valve combination:

DX Valves – 3-way, 600 psig

FC Valve – 3-way, 600 psig (021-035 kW Systems) 3-way, 400 psig (042-105 kW Systems)

A Free-Cooling economizer cycle shall be provided to take advantage of low ambient air temperature conditions to provide compressor less cooling. The air conditioner shall have three modes of operation:

- 100% Free-Cooling cycle during low ambient air conditions
- Assis FC + Stage DX Mode to provide partial free-cooling with one DX compressor as an assist mode
- 2-stage DX operation without Free-Cooling active due to higher ambient temperatures

Alternate Water Source (Optional)

This is chilled water by day and DX backup by night.

An alternative water source cooling cycle shall be provided to use building chilled water supply when available as the primary cooling cycle with dual compressor, DX refrigerant cooling as a backup. The air conditioner shall have two cooling systems: The primary code of cooling shall be chilled water/glycol circuit with alternative water source cooling coil and the secondary/backup mode of cooling shall be a dual compressor, DX refrigerant circuit.

The *E²* microprocessor's Alternative Water Source program algorithm shall analyze input data from factory provided and installed room air temperature and relative humidity sensors.

Bas on this data, the *E²* controller shall automatically control the sequencing of the primary AWS chilled water to and from the secondary /backup dual compressor DX modes of operation. IF chilled water is available the system will operate like a chilled water unit, without the compressor operating. When the water temperature is too high, or the water flow rate is not sufficient, the air conditioner automatically switches to the dual compressor, DX refrigerant cycle.

Alternate water source cooling shall be controlled by the following standard and optional control valves:

2-way, 600 psig (Standard)

3-way (Optional) 600 psig Rated (021-035 kW Systems)

400 psig Rated (042-105 kW Systems)

A 2/3-way modulating AWS cooling control valve shall be factory installed. Precision cooling control shall be accomplished via an analog control signal to the proportionally actuating control valve.

Steam Generating Humidifier (Standard)

The humidifier shall be a self-contained atmospheric steam generator. The humidifier assembly shall include an integral fill cup, fill and drain valves, disposable steam cylinder and associated piping. The humidifier shall be equipped with an auto-adaptive control system to optimize water conductivity, control automatic drain/ flush cycles, minimize energy waste and maximize cylinder life. Drain water tempered fill water shall insure drains do not exceed 140°F during operation. The humidifier shall have modulating output between 20% and 100% of rated capacity.

Dehumidification Cycle (Standard)

The system shall be provided with a refrigeration-based dehumidification mode. Moisture is

condensed on the cooling coil and discharged through the condensate drain. Reheat (electric, hot gas, steam or hot water) shall be provided to offset sensible cooling during the dehumidification cycle.

Electric Reheat

A factory mounted and wired low-watt density, plated fin- tubular design electric resistance heater shall be included to provide automatic sensible reheating as required during the dehumidification cycle and automatic heating mode. Electric heaters shall be provided with miniature thermal/magnetic circuit breakers that shall protect each ungrounded conductor. Also included will be one automatic reset and one manual reset over-temperature safety device (pilot duty).

Hot Gas Reheat (Optional)

A factory-installed copper tube, aluminum-fin hot gas reheat coil and control valve shall be provided for automatic

Cooling

Chilled Water Cooling Coil

The coil shall be constructed of seamless drawn copper tubes, mechanically bonded to tempered aluminum fins with enhanced fin design for maximum heat transfer and mounted in a stainless steel condensate drain pan. The coil shall be designed for a maximum of 50 ft/min face velocity. The water circuit shall be designed to distribute water into the entire coil face area.

Modulating CW Control Valves

Way Chilled Water Control Valve (Standard)

A 2-way fully modulating control valve shall be factory installed 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. The pressure rating of the valve shall be maximum of 600 psig w.w.p. Manual override capabilities shall be included on the actuator drive.

Way Chilled Water Control Valve (Optional)

A 3-way modulating control valve shall be factory installed and wired. The 3-way modulating valve shall automatically meter the flow of chilled water to the cooling coil as needed for cooling load control, the remaining flow shall bypass the chilled water coil.

A proportional control signal (0-10 VDC) is provided to the valve by the unit's controller. The pressure rating of the valve shall be maximum of 400 psig w.w.p. Manual override capabilities shall be included on the actuator drive.

Differential Temperature Flow (Standard)

Factory mounted and wired NTC temperature sensors for inlet and outlet chilled water temperatures shall be provided. The sensors shall supply input signals to the system controller to indicate the entering and leaving CW temperature in a status display screen.

The controller shall provide a loss of flow alarm in the event the inlet/outlet temperature difference is within 3 °F (adjustable) during chilled water valve operation.

Electric Heat/Reheat (Standard)

A factory mounted and wired low-watt density, plated fin tubular design electric resistance heater shall be included to provide automatic sensible re-heating as required during the dehumidification cycle and automatic heating mode.

Electric heaters shall be provided with miniature thermal/magnetic circuit breakers, which shall protect each ungrounded conductor. Also included will be one automatic reset and one manual reset over-temperature safety device (pilot duty).

Dehumidification Cycle (Standard)

The system shall be provided with a dehumidification control mode. The chilled water valve shall be opened to allow chilled water flow when a dehumidification demand exists. Moisture is condensed on the cooling coil and discharged through the condensate drain. Reheat (electric) shall be provided to offset sensible cooling during the dehumidification cycle.

Hot Water Reheat/Heat (Optional)

A factory-installed, copper tube, aluminum fin heat/reheat coil and 2-way control valve shall be provided to control the flow of hot water for automatic sensible reheating mode during the dehumidification cycle and automatic heating mode as required.

SCR Fired Reheat/Heat (Optional)

The electric heat/reheat shall be controlled through a zero crossing silicon controlled rectifier (SCR) with an extruded aluminum heat sink and solid-state logic system to provide close dry bulb temperature control.

Steam Generating Humidifier (Standard)

The humidifier shall be a self-contained atmospheric steam generator. The humidifier assembly shall include an integral fill cup, fill and drain valves, disposable steam cylinder and associated piping. The humidifier shall be equipped with an auto adaptive control system to optimize water conductivity, control automatic drain/flush cycles, minimize energy waste and maximize cylinder life.

Drain water tempered fill water shall insure drains do not exceed 140 °F during operation. The humidifier shall have modulating output between 20% and 100% of rated capacity.

Backward Inclined Plenum Style Fan with an EC Motor

The blower(s) shall be direct driven, single inlet, backward curved centrifugal fan with an electronically commutated 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
- RS-485 BUS connection
- 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 dryer/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.

Scroll Compressor

The DX systems shall be provided with two independently circuited high efficiency, high reliability, low noise scroll compressor. The compressor shall be complete with internal vibration isolation, internal thermal overloads, an internal pressure relief valve, an internal discharge gas vibration eliminator, and external vibration mounting isolation.

Optional: Tandem scroll compressors are also available on STULZ models CFD-053 and larger for additional capacity control and energy savings.

Electrical Systems

The electrical system shall conform to National Electrical Code requirements. The control circuit shall be 24 volts AC, wired in accordance with NEC Class II requirements. The control circuit wire shall not be smaller than 18 AWG. All wiring shall be neatly wrapped 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 be positioned for service convenience and shall include all the contactors, starters, fuses, circuit breakers, terminal boards and control transformer required for operation of the STULZ unit and shall allow for full service access.

Main Power Service Switch

The unit shall be provided with a unit mounted main power service non-fused disconnect switch.

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 CyberAiR CW air conditioner by remote source.

Automatic Dual Power Transfer Switch (Optional)

Two individual main power input disconnect switches shall be provided, one for each incoming power source. If power fails, or a phase loss/imbalance occurs, the automatic transfer switch immediately

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 adjustable to enable staging or sequence restart of load.

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 shall be conveyed through the BMS serial communications link. A through-the-door indicator lights shall be included for a fast and local notification of available power sources.

E2 Series Controller

Large Bezel Display Panel — Touch Screen

The large bezel touch screen user interface display panel features a high-resolution backlit liquid-crystal graphical display equipped with contrast adjustment and LED illuminated function keys. The screens that appear on the user interface display panel present data that is from the controller.

The controller 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 STULZ CyberAiR system.

Field Configurable

The program for the E2 Series controller shall be field configurable, allowing the operator the capability of selecting control setpoints specific to the application. Operator interface for the E2 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 CW 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 remain stored in the controller's memory as Factory setpoints.

The setpoints for the system may be re-adjusted in the Control menu at any time. If required, 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 enables 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 that offers the ability to create an operating schedule tailored to the needs of the building.

An evening (night-setback) schedule may also be created to enable the CW system to operate at night with relaxed temperature/humidity setpoints and offsets.

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.

A/C Grouping pLAN Operation (Optional)

Multiple STULZ CyberAiR system controllers shall be able to be connected (grouped) to a pLAN local network to enable 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 E2 controller connected to the pLAN network shall be identified with its own unique address.

Multiple STULZ CyberAiR systems consisting of up to eight STULZ precision air conditioners equipped with like controllers may be controlled and monitored via the E2 series controller.

With multiple STULZ CyberAiR systems, each unit can be selectively 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 STULZ CyberAiR system within the rotating group is operationally exercised on a periodic timed basis.

Remote BMS Communications (Optional)

The E2 series controller shall incorporate a 10 Mbps communication interface port that can be field connected to a Building Management System via Modbus, BACnet, SNMP, HTTP, or MODEM as configured by the factory. A controller interfaced to a network must be configured for BMS communication.

Air Control

EC Fan Speed Control

The system shall include a variable fan speed control package. The unit's controller shall permit control of the fan speed from 100% rated air volumetric flow rate to a user define minimum fan speed setting. Minimum and maximum fan speed settings shall be user adjustable. User configured control sequences shall be available for fan speed energy savings control.

Fail Safe Mode

If a fan stops working, the controller shall automatically enable all remaining EC fans to increase to the maximum fan speed setting.

Supply Air Control (Optional)

The STULZ CyberAiR floor-mounted air conditioning system controller shall be provided with a temperature and humidity sensor factory unit mounted in the return air stream and a field installed supply air temperature and humidity sensor for supply air control capabilities. The controller shall provide the user an adjustable supply air control setpoint.

Under Floor Pressure Control (Optional)

The STULZ CyberAiR floor-mounted air conditioning system shall permit variable fan speed control to a user defined by external static pressure setting. A remote differential pressure transducer shall be provided to determine the static pressure, and the system controller shall modulate fan speed to maintain an external static pressure setpoint.

Optional Features

STULZ CyberAiR floor-mounted air conditioning system non-standard features which can added to allow you the flexibility to select the configuration best suited for your application.

Top Discharge Plenum Box (Upflow Units Only)

A 2- or 3-way plenum discharge box shall be provided. The plenum box shall include double-deflecting, adjustable grilles.

Adjustable Floor Stand

An adjustable floor stand shall be provided to enable ease of installation of the STULZ CyberAiR floor-mounted air conditioning system onto a raised floor environment. Floor stand height shall be adjustable. The floor stand shall ship separately for field installation.

Enclosed Floor Stand

A factory provided enclosed floor stand shall be factory constructed full cabinet length and pre-fabricated within the support structure for one-way front air discharge.

Seismic Rated Floor Stand

The unit floor stand shall be constructed and rated for use to the install site's seismic performance requirements.

Condensate Pump

A condensate pump shall be factory installed within the STULZ CyberAiR floor-mounted air conditioning system for automatic removal of condensate and humidifier flush water (if applicable). The condensate

pump shall include an internal overflow safety float which, when wired to the STULZ CyberAiR unit's remote stop/start terminals, shall open the unit's control circuit, thereby shutting the unit down in the event of a condensate overflow.

The condensate pump shall be specifically designed to operate with the higher condensate temperatures caused by the flush and drain cycle of the electrode canister humidifiers.

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 STULZ CyberAiR floor-mounted air conditioning unit's water producing components.

Remote Water Detector — Dual Spot Type

A dual 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 STULZ CyberAiR floor-mounted air conditioning unit's water producing components.

Remote Water Detector — Strip Type

A 20 foot length remote strip and 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 STULZ CyberAiR floor-mounted air conditioning unit's water producing components.

Smoke Detection

A photo-electric smoke detector shall be factory installed and wired in the return air section of the STULZ CyberAiR floor-mounted air conditioning system. The photo-electric detector shall include built-in circuitry that performs a functional test of all detection circuits at least once every 40 seconds without the need for generating smoke. The UL-listed velocity range shall be 0-3000 fpm. The air conditioner will shut down upon sensing smoke in the return air stream.

Firestat

The STULZ CyberAiR floor-mounted air conditioning system 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.

High Short Circuit Current Rating

The STULZ CyberAiR floor-mounted air conditioning system shall be rated for a short circuit current rating for a minimum of 2K. The higher short circuit current rating shall include safe touch fusing upstream of the unit's main power disconnect switch.

E² Constant Contact

The control package shall include a short term power supply for the E² Series Controller to allow the controller to manage the power transfer switch from one primary power source to another while maintaining communications with an active monitoring system. The E² Controller shall permit a minimum of one-minute ride through period.

Air-Side Economizer Controls

The STULZ CyberAiR floor-mounted air conditioning system controller shall be equipped with a unique air-side economizer mode for applications using outdoor air-side economizing.

The STULZ Air-Side economizer control package shall include an outdoor temperature and humidity sensor, remote space return air sensor, and supply air sensor for proper control during economizer operation. Individual discrete analog output signals (0-10 VDC) are available to allow control of the external outdoor air intake damper and exhaust relief provisions.

Control settings shall be included for both temperature and humidity properties of the outdoor air. A damper signal lockout shall be included if the outdoor air conditions reaches user adjustable limits. The economizing damper signal shall allow a minimum output setting for minimum outside air control to meet ventilation requirements.

Code Conformance

The system shall be a STULZ factory-assembled unit. The unit shall be certified by a Nationally Recognized Testing Laboratory to the coordinated U.S. and Canadian product safety standard UL 1995/CSA C22.2 No 236 for Heating and Cooling Equipment.



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