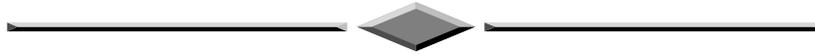


MIDDLETON, INC

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LICENSE # 0225670417



Project Submittals

09/13/2023

/23

PROJECT: **Regions Tower 18th floor remodel**

CONTRACTOR: **Comfort Systems USA**

PREPARED BY: **Middleton, Inc.**

CONTENTS

1. Distech ECB-203
2. Functional Device Current Sensor
3. Supply Air Temp Sensor
4. Project Visio

ECB-203 Series

BACnet B-ASC 14-Point Programmable Controllers



Overview

The ECB-203 Series controllers are microprocessor-based programmable controllers designed to control units such as RTUs, FCUs, UVs, HPUs, AHUs, and chilled ceilings. This controller uses the BACnet[®] MS/TP LAN communication protocol and is BTL[®]-Listed as BACnet Application Specific Controllers (B-ASC).



Features & Benefits

- Flexible inputs and outputs support all industry-standard HVAC unitary applications
- Rugged hardware inputs and outputs eliminate the need for external protection equipment
- An optional full-color backlit display with jog dial provides direct access to a wide range of controller functions
- Supports EC-*gfx*Program, making Building Automation System programming effortless
- Open-to-Wireless[™] ready, supporting a wide variety of wireless sensors and switches and helping to reduce installation costs
- Supports the Allure[™] Series Communicating Sensors, providing intelligent sensing and environmental zone control

Model Selection

Example: ECB-203 with environmental protection

Series	Model	Options
ECB-	203: 14 Points, 15 Vdc Power Supply, 6 UI, 5 DO, 3 UO	with environmental protection: Conformal coating for outdoor use UUKL: UL 864, 10 th Edition UUKL and California State Fire Marshal Listed ¹
	253: 14 Points, 15 Vdc Power Supply, 6 UI, 5 DO, 3 UO, Color Display	

1. The UL 864 UUKL Listed Smoke Control Equipment is used only in Distech Controls' UUKL smoke control system. For detailed specifications, requirements and procedures for installing and operating UUKL Listed equipment refer to the Distech Controls' UUKL Smoke Control documentation.

Recommended Applications

Model	ECB-203	ECB-253	ECB-203 with Environmental Protection	ECB-203 UUKL
Rooftop Unit	■		■	■
2 Pipe Fan Coil	■	■		
2 Pipe Fan Coil with Changeover Sensor	■	■		
4 Pipe Fan Coil	■	■		
Heat Pump Unit	■	■	■	
Unit Ventilator	■	■		
Small Air Handling Unit	■	■		■
Chilled Ceiling	■	■		
Exhaust Fan				■

BACnet Objects List

BACnet Objects

Calendar Objects	1
Special events per calendar	25
Schedule Objects	2
Special events per schedule	5
PID Loop Objects	8

Commandable Objects

BV Objects	10
MSV Objects	10
AV Objects	25

Non-Commandable Objects

BV Objects	40
MSV Objects	40
AV Objects	75

Product Specifications

Power Supply Input

Voltage Range	24VAC/DC; ±15%; Class 2
Frequency Range	50/60Hz
Overcurrent Protection	Field replaceable fuse
Fuse Type	2.0A
Power Consumption ECB-203	14 VA typical plus all external loads ¹ , 23 VA max.
Power Consumption ECB-253	17 VA typical plus all external loads ¹ , 26 VA max.

1. External loads must include the power consumption of any connected modules such as an Allure Series Communicating Sensor. Refer to the respective module's datasheet for related power consumption information.

Communications

Communication Bus	BACnet MS/TP
BACnet Profile	B-ASC ¹
EOL Resistor	Built-in, jumper selectable
Baud Rates	9600, 19 200, 38 400, or 76 800 bps
Addressing	Dip switch or with an Allure EC-Smart-View Series Communicating Sensor

1. Refer to Distech Controls' Protocol Implementation Conformity Statement for BACnet.

Subnetwork

Communication	RS-485
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain

Room Devices Support

Maximum combined number of devices per controller	4 ¹
Allure EC-Smart-View Series	Up to 4
Allure EC-Smart-Comfort Series (not supported by UUKL)	Up to 4
Allure EC-Smart-Air Series (not supported by UUKL)	Up to 4

1. A controller can support a maximum of 2 Allure sensor models equipped with a CO₂ sensor. Any remaining connected sensors must be without a CO₂ sensor.

Hardware

Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	68 MHz
Applications Memory	384 kB Non-volatile Flash
Storage Memory	1 MB Non-volatile Flash
Memory (RAM)	64 kB RAM
Real Time Clock (RTC)	Built-in Real Time Clock without battery Network time synchronization is required at each power-up cycle before the RTC become available
Green LEDs	Power status & LAN Tx
Orange LEDs	Controller status & LAN Rx
Communication Jack	BACnet 1/8" (3.5mm) stereo audio jack

Wireless Receiver

Communication Protocol	EnOcean wireless standard ¹
Number of Wireless Inputs ²	24
Supported Wireless Receivers	Refer to the Open-to-Wireless Application Guide
Cable	Telephone cord
Connector	4P4C modular jack
Length (maximum)	2m (6.5ft)



1. Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Application Guide for a list of supported EnOcean wireless modules.
2. Some wireless modules may use more than one wireless input from the controller.

Mechanical

Dimensions ECB-203 (H × W × D)	4.7 × 5.7 × 2.03" (119.38 × 144.78 × 51.47 mm)
Dimensions ECB-253 (H × W × D)	4.7 × 5.7 × 2.55" (119.38 × 144.78 × 64.68 mm)
Shipping Weight ECB-203	0.97lbs (0.44 kg)
Shipping Weight ECB-253	1.08lbs (0.49 kg)
Enclosure Material ¹	FR/ABS
Enclosure Rating	Plastic housing, UL94-5VB flammability rating Plenum rating per UL1995
Installation	Direct DIN-rail mounting or wall mounting through mounting holes (see figure above for hole positions)

1. All materials and manufacturing processes comply with the RoHS directive and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive

Environmental

Operating Temperature ECB-203 with Environmental Protection	-40°F to 158°F (-40°C to 70°C)
Operating Temperature ECB-203 and ECB-253	32°F to 122°F (0°C to 50°C)
Storage Temperature	-4°F to 122°F (-20°C to 50°C)
Relative Humidity	0 to 90% Non-condensing

Standards and Regulation

CE Emission	EN61000-6-3: 2007; A1:2010
CE Immunity	EN61000-6-1: 2007
FCC	Compliance with FCC rules part 15, subpart B, class B
UL Listed (CDN & US)	UL916 Energy management equipment UL 864 UL 864, 10 th Edition, UUKL Listed Smoke Control Equipment (ECB-203 UUKL model only) ¹
California State Fire Marshal Listing	CSFM: 7300-2187:0100 (ECB-203 UUKL model only) ¹
CEC Appliance Database	Appliance Efficiency Program ²



1. For detailed specifications regarding the ECB-203 UUKL model, refer to the Distech Controls UUKL Smoke Control Design Guide.
2. California Energy Commission's Appliance Efficiency Program: The manufacturer has certified this product to the California Energy Commission in accordance with California law.

ECB-253 Display

Display Type	Backlit-color LCD
Display Resolution	400 W x 240 H pixels (WQVGA)
Effective Viewing Area (W × H)	2.4 × 1.4" (61.2 × 36.7mm) diagonal: 2.8" (71mm)
Menu Navigation	Jog dial turn, select navigation with Exit button

Universal Inputs (UI)

General

Input Type	Universal; software configurable
Input Resolution	16-Bit analog / digital converter
Power Supply Output	15VDC; maximum 120mA

Contact

Type	Dry contact
------	-------------

Counter

Type	Dry contact
Maximum Frequency	1Hz maximum
Minimum Duty Cycle	500milliseconds On / 500milliseconds Off

0 to 10VDC

Range	0 to 10VDC (40kΩ input impedance)
-------	--------------------------------------

0 to 5VDC

Range	0 to 5VDC (high input impedance)
-------	-------------------------------------

0 to 20mA

Range	0 to 20mA
-------	-----------

249Ω external resistor wired in parallel

Resistance/Thermistor

Range 0 to 350 KΩ

Supported Thermistor Types Any that operate in this range

Pre-configured Temperature Sensor Types:

- Thermistor 10KΩ Type 2, 3 (10KΩ @ 77°F; 25°C)
- Platinum Pt1000 (1KΩ @ 32°F; 0°C)
- Nickel RTD Ni1000 (1KΩ @ 32°F; 0°C)
RTD Ni1000 (1KΩ @ 69.8°F; 21°C)

Universal Outputs (UO)

General

- Output Type Universal; software configurable
- Output Resolution 10-bit digital to analog converter
- Output Protection Built-in snubbing diode to protect against back-EMF, for example when used with a 12VDC relay
Output is internally protected against short circuits
- Load Resistance Minimum 200 Ω for 0-10VDC and 0-12VDC outputs
Maximum 500 Ω for 0-20mA output
- Auto-reset fuse Provides 24VAC over voltage protection

0 or 12VDC (On/Off)

- Range 0 or 12VDC
- Source Current Maximum 60 mA at 12VDC (minimum load resistance 200Ω)

PWM

- Range Adjustable period from 2 to 65 seconds
- Thermal Actuator Management Adjustable warm up and cool down time

Floating

- Minimum Pulse On/Off Time 500 milliseconds
- Drive Time Period Adjustable

0 to 10VDC

- Range 0 to 10VDC
- Source Current Maximum 60 mA at 10VDC (minimum load resistance 200Ω)

Digital Outputs (DO)

General

- Output Type 24VAC Triac; software configurable
- Maximum Current per Output 0.5A continuous
1A @ 15% duty cycle for a 10-minute period
- Power Source External

0 or 24VAC (On/Off)

- Range 0 or 24VAC

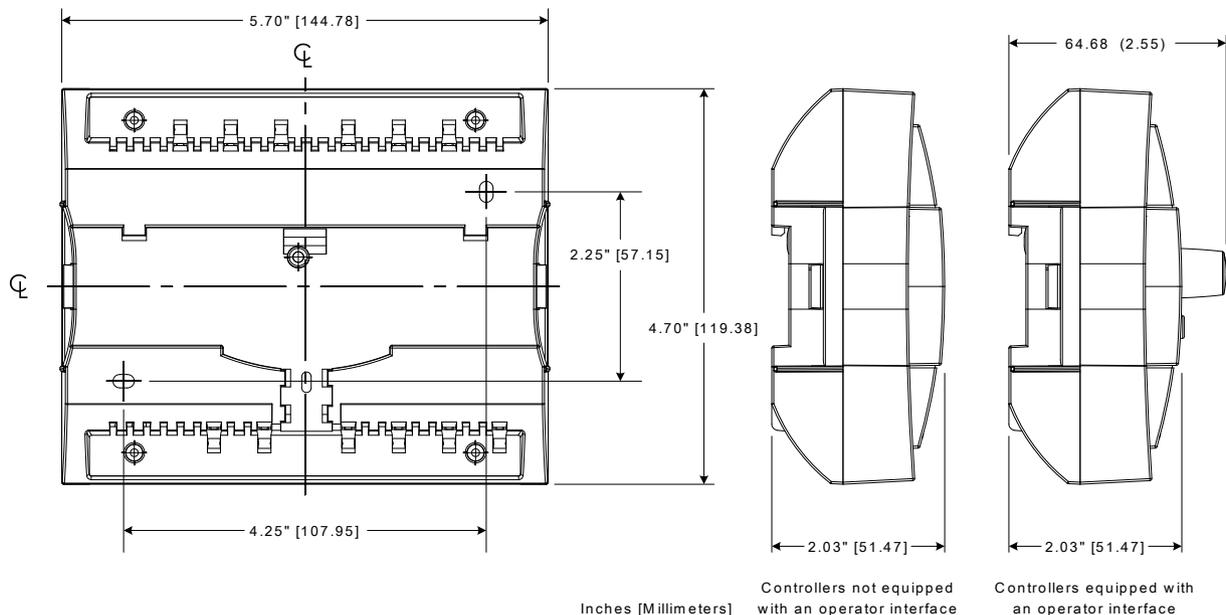
PWM

- Range Adjustable period from 2 to 65 seconds

Floating

- Minimum Pulse On/Off Time 500 milliseconds
- Drive Time Period Adjustable
- Power Source External

Dimensions



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CS-RIBXKTV Series

Current Sensors & Switches



Overview

Enclosed, self-powered, solid core current sensors (voltage and current output) and switches (fixed and adjustable trip points).

Applications

- General Load Status
- Motor Status
- Lighting Circuit Status
- Detecting Belt Loss

Features & Benefits

- Pre Packaged for Convenience
- Adjustable or Fixed Thresholds
- Solid Core Models
- Miniature Size

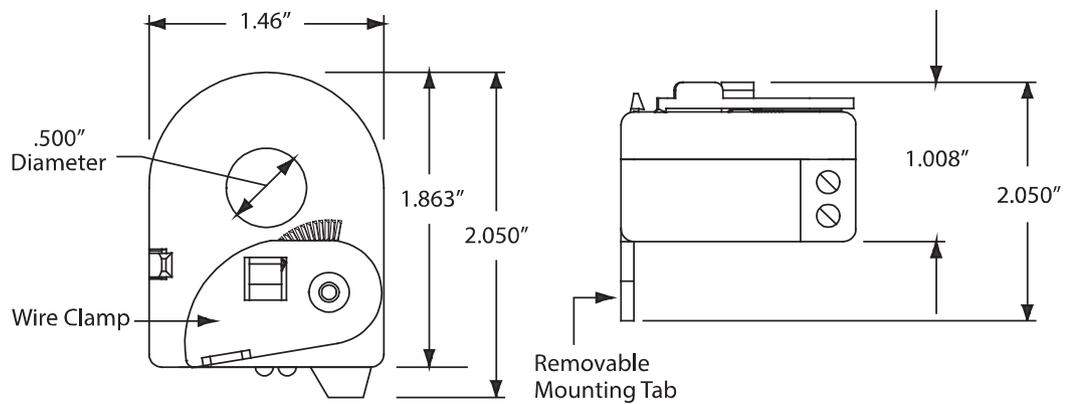
Model Selection

Product Number	Sensor Output	Sensor Contact Termination	Range	Loading
CS-RIBXKTV5-10	0-5 Vdc	Terminals	0-10A	1% Error @ 180 kΩ
CS-RIBXKTV5-20	0-5 Vdc	Terminals	0-20A	1% Error @ 90 kΩ
CS-RIBXKTV5-50	0-5 Vdc	Terminals	0-50A	1% Error @ 40 kΩ
CS-RIBXKTV5-100	0-5 Vdc	Terminals	0-100A	1% Error @ 15 kΩ

Product Specifications

Operating Temperature	-30 to 140° F
Humidity Range	5 to 95% (noncondensing)
Accuracy	96.8% Full Scale
Max Sense Voltage	600 Vac
Approvals	UL Listed, UL916, UL864, California State Fire Marshal, C-UL, CE, RoHS
Mounting/Installation	Removable mounting tab provided The wire clamp locks against the load wire, securing the unit in place
Sensor Type	Solid core with voltage output

Dimensions



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TS-D2X Sensor Series

Duct & Immersion Temperature Sensors, Nema 4X



Overview

TS-D2X Series all-purpose temperature sensors provide precision temperature sensing for ducts. When combined with a TS-TW series S/S thermowell, they can be used to measure liquid temperature in pipes. The TS-D2X single-point temperature sensor uses a precision sensor encapsulated in a 6.00 mm (0.236") OD, a 304-series stainless steel probe, and it is available in various lengths. All probes provide excellent heat transfer, fast response and resistance to moisture penetration.

Applications

- Used for measuring temperature on: supply and return ducts, supply and return hot water pipes of heating systems, domestic hot water tanks and piping, and supply and return lines in chillers
- Incorporated in chillers to monitor temperature gradients
- Used in heat exchangers and air handling units to provide temperature sensing for control of heating / cooling coils

Features & Benefits

- Economical
- Ease of installation
- Sensors are hermetically sealed
- Proven long stability and performance
- Probes made of corrosion-resistant 304 stainless steel
- Accurate temperature monitoring for increased comfort

Model Selection

	TS- D XX 002
Mounting Style	D = Duct / Immersion
Enclosure	XX = No enclosure 2X = Plastic enclosure, Nema 4X
Probe Length	002 = 2" (50mm) 004 = 4" (100mm) 006 = 6" (150mm) 008 = 8" (200mm) 012 = 12" (300mm) 018 = 18" (450mm)

Accessories

Thermal Joint Compound

TS-JC2	Thermal Joint Compound, 2 oz (60ml) Jar
TS-JC5	Thermal Joint Compound, 5 oz (150ml) Tube
TS-JC8	Thermal Joint Compound, 8 oz Jar (240ml)

Thermowells

TS-TWN30402	50mm (2") 304 SS well, NPT
TS-TWN30404	100mm (4") 304 SS well, NPT
TS-TWN30406	150mm (6") 304 SS well, NPT
TS-TWN30408	200mm (8") 304 SS well, NPT
TS-TWN31602	50mm (2") 316 SS well, NPT
TS-TWN31604	100mm (4") 316 SS well, NPT
TS-TWN31606	150mm (6") 316 SS well, NPT
TS-TWN31608	200mm (8") 316 SS well, NPT

Product Specifications

Environmental

Operating Temperature _____ -20°C to 105°C; -4°F to 221°F
Storage Temperature _____ -20°C to 105°C; -4°F to 221°F
Relative Humidity _____ 0 to 95% Non-condensing

Bracket

Material _____ ABS - UL94-5VB
Color _____ Black
Shipping Weight _____ 0.20lbs (0.091kg)
Probe Dimension _____ 6.35 mm (0.25") Diameter

Electrical

Dissipation Factor _____ 2.2mW/K (Thermistor)
Max Power @ 25°C (77°F) _____ 75mW (Thermistor)
Thermal Time Constant _____ Less than 10s (Thermistor)
Wire Material (TS-DXX Series) _____ Plenum rated FT-6
Wire Length (TS-DXX Series) _____ 3.05 m (10')

Temperature Sensor with Enclosure

Sensor Type¹ _____ 10kΩ NTC thermistor, Type 2
Accuracy _____ ±0.2°C; ±0.36°F
Probe Sensing Range _____ -20 to 105°C (-4 to 221°F)
Probe Material _____ 304 Series Stainless Steel
Probe Dimension _____ 6.00 mm (0.236") Diameter
Enclosure Type _____ Material; Grey ABS; UL94-V0, IP65 (NEMA 4X)
Shipping Weight _____ 0.60 lbs (0.2727 kg)

Agency Approvals

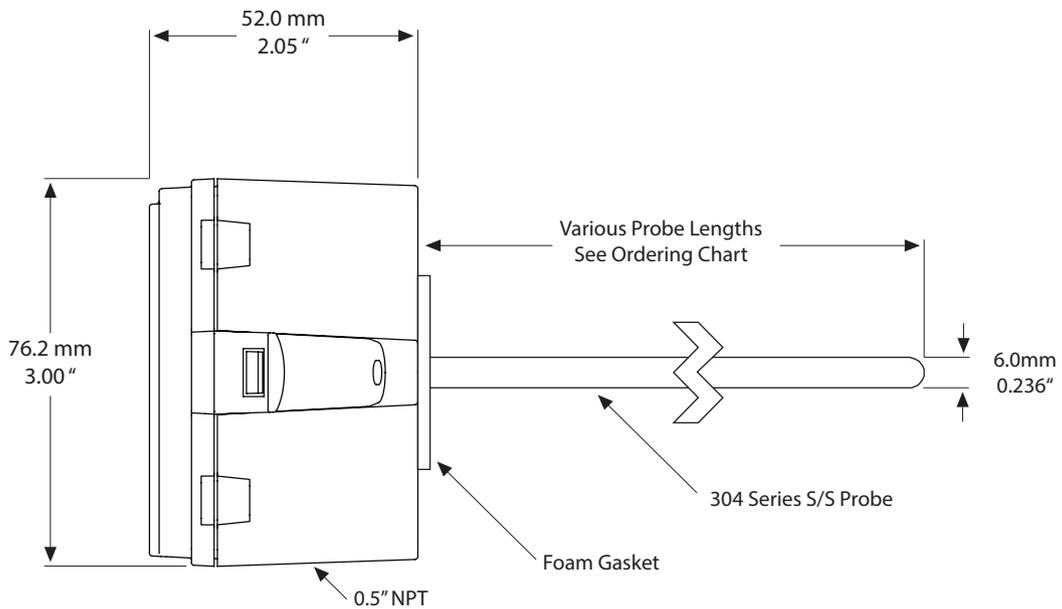
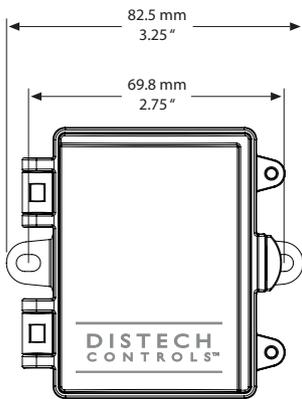
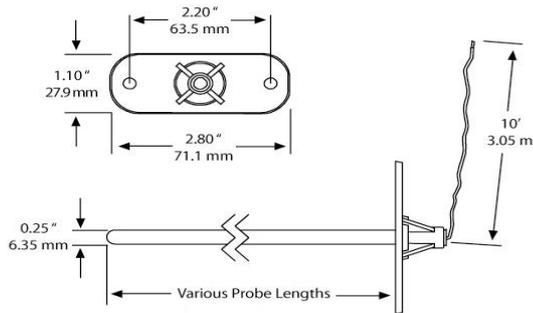
Material² _____ UL94-V0



1. Temperature sensor type stated is standard. Other temperature sensor types are available.
2. All materials and manufacturing processes comply with the RoHS directive.

Dimensions

Bracket



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DISTECH
CONTROLS™

Open System Platforms



Regions Tower 18th Floor
400 W Capitol
Little Rock AR. 72201

Prepared By: Middleton Building Automation Dept.

MIDDLETON INC

P.O. BOX 506
BRYANT, AR 72089

Job Number:

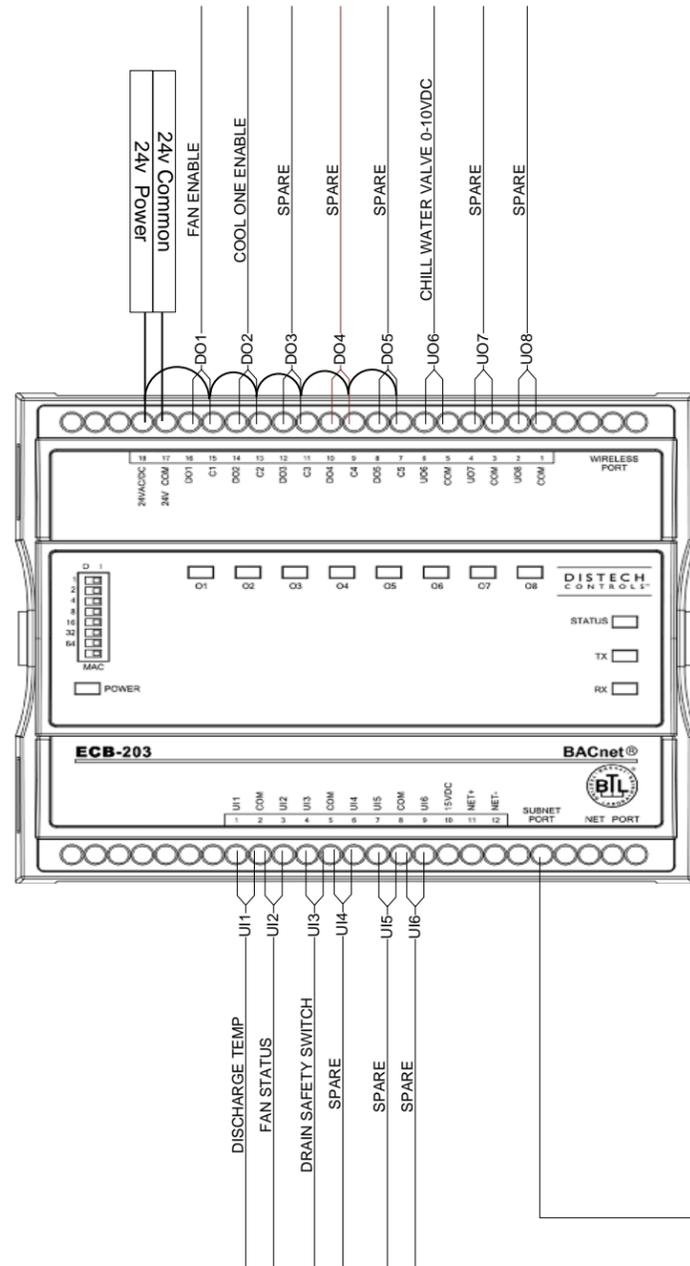
Drawings Revision: 1

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Fan Coil Controller



Outputs
 Fan Enable - DO1
 Cool One - DO2
 Chill Water Valve - UO6

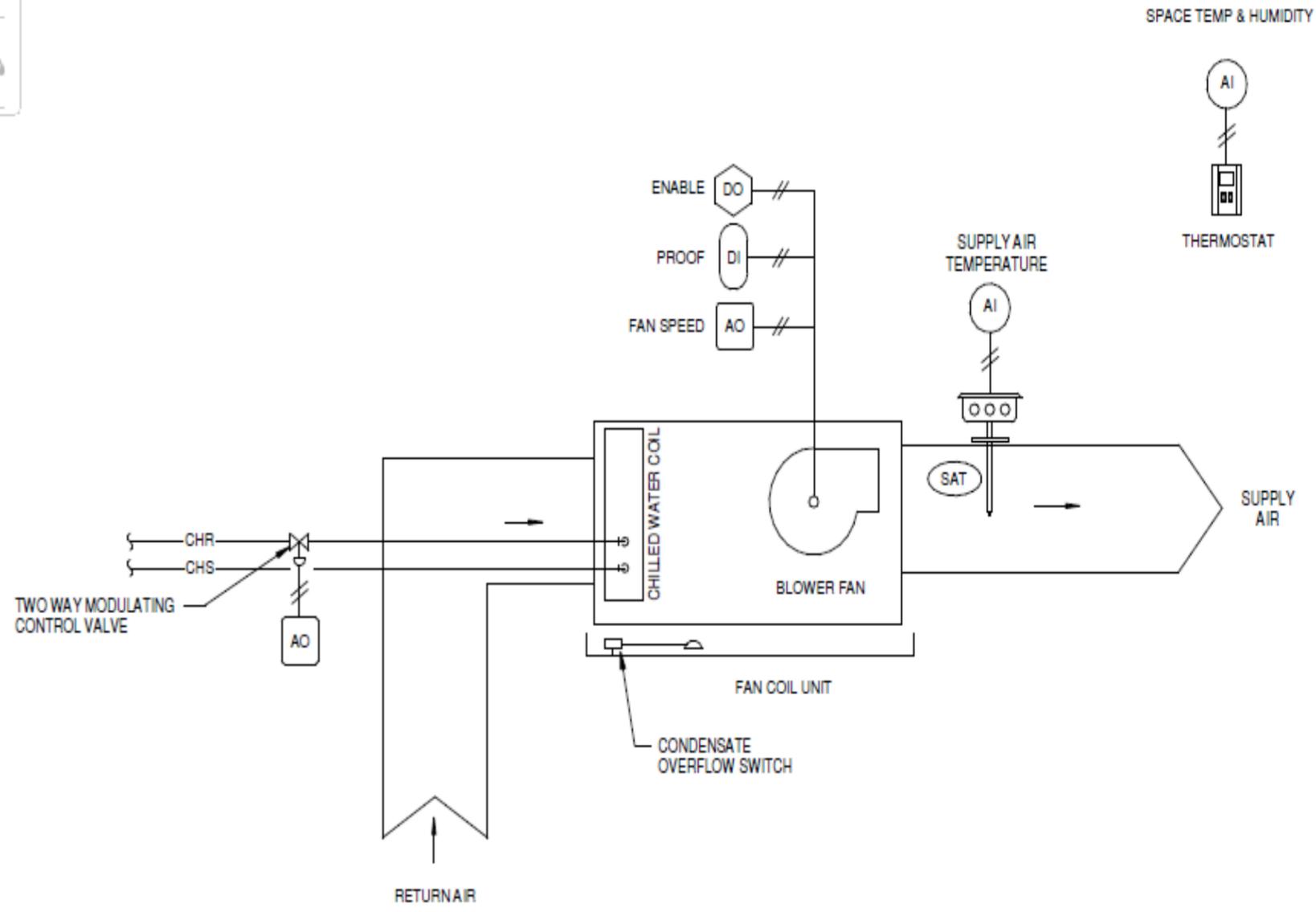
24v Power -Red
 Common- Blue

Inputs
 Supply Air Temp - BI1
 Fan Status - BI2
 Drain Pan Switch - BI3



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Fan Coil Sequence



FAN COIL UNIT - CONTROLS

FAN COIL UNIT - SEQUENCE OF OPERATIONS

AN APPLICATION SPECIFIC DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE FAN COIL UNIT. THE SPACE SERVED BY THE FCU IS CONTROLLED IN OCCUPIED AND UNOCCUPIED MODES AS FOLLOWS:

OCCUPIED
 THE CONTROLLER MONITORS THE ROOM TEMPERATURE SENSOR, IF THERE IS A CALL FOR HEATING OR COOLING, THE FCU FAN SHALL START AND RUN AT LOW SPEED. THE HYDRONIC VALVES SHALL MODULATE OPEN AS CLOSED AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. IF THE VALVES REACHES 100% OPEN AND THE TEMPERATURE CONTINUES TO DEVIATE FROM THE SPACE TEMPERATURE SETPOINT, THE FAN SHALL MODULATE ITS SPEED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT.

UNOCCUPIED
 THE FCU'S SHALL BE IN THE OCCUPIED MODE DURING WORKING HOURS OF 7 AM TO 5 PM (ADJ.) FAN COILS SHALL BE ABLE TO OVERRIDE UNOCCUPIED MODE VIA OVERRIDE SWITCH ON THE THERMOSTAT. OVERRIDE SHALL LAST 2 HOURS (ADJ.)

A CONDENSATE OVERFLOW SWITCH, LOCATED IN EACH DRAIN PAN, WILL STOP THE FAN COIL UNIT, CLOSE THE COOLING COIL VALVE AND GENERATE AN ALARM AT THE BAS WHENEVER AN OVERFLOW OCCURS.

CONTROLS VENDOR NOTE:

THE EXISTING BUILDING AUTOMATION SYSTEM VENDOR IS MIDDLETON/DISTECH. NO OTHER VENDORS SHALL BE ALLOWED. ALL NEW WORK SHALL BE CONNECTED TO THE BUILDING AUTOMATION SYSTEM AND INCORPORATED INTO THE DISTECH GRAPHICS.

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