American Family Field

4N030078

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	Room Schedule Detail
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03.02.01	Detail B – Reheat Coil
DS-1	Damper Schedule
RAC-1	Room/RAC Schedule
VS-1	Valve Schedule

LEGEND

S 20 — Main Air Supply Tube at 20 PSIG

D-N 15-20 — Dual Air Supply Tube at 15/20 PSIG Day=15, Night=20

S 80 — High Pressure Air Supply Tube at 80 PSIG

Air line or Electrical Wire

Connected Lines or Wires

Crossing Lines or Wires, Not Connected

In-Line Restrictor

7 — Pneumatic Tube indicating Tube Number

2/18 — Wire Symbol indicating: number of wires and size (E.G. 2 #18 wires)

3 2/18 — Wire Symbol indicating: Cable Destination (DA-T), Cable number (3), Number of wires and size (E.G. 2 #18 wires)

1 — Electrical Wire Terminal with Appropriate Number

Item Located on Panel Face

1 — Drawing Revision Symbol with Appropriate Number

NO — Opposed Blade Damper

NO — Parallel Blade Damper

Filter

Air Flow Measuring Station

Humidifier

Fan

Pump

H C — Heating or Cooling Coil

Ductwork or Piping with Flow Direction Shown

Gage

Device

Bulb Type Temperature Sensing Element Located under Shield in Outside air

Humidity Sensing Element Located under Shield in Outside air

Bulb Type Temperature Sensing Element Located inside Separable Socket/Well

Strap-on Bulb Type Temperature Sensing Element

Combination Bulb Type Temperature Sensing Element and Humidity Sensor (Duct Mount)

Bulb Type Temperature Sensing Element

Pressure Sensing Device

Paddle Type Flow Switch

Vapor Tension Temperature Sensing Element (Hi Limit)

Vapor Tension Temperature Sensing Element (Low Limit)

Current Sensing Switch or Combination Current Sensing switch & Command Relay

Duct Detector (Smoke, CO, CO2)

2-Way Valve with Actuator

NC

3-Way Valve with Actuator

C NC

NO

Johnson Controls

Creating a better climate for business.

- ☐ **Environmental Control System**
- ☐ **Facility Management System**
- ☐ **Air and Water System Balancing**
- ☐ **Fire Management System**
- ☐ **Security System**
- ☐ **Lighting Services**
- ☐ **Instrumentation System Installation**
- ☐ **Building Operations Management**
- ☐ **Energy Conservation Control**
- ☐ **Training Programs**
- ☐ **Performance Contracting**
- ☐ **Planned Service Agreements**

Air Conditioning
Heating
Diagnostic Services
Coil Cleaning
Refrigeration
Automatic Temperature Controls
Facility Management Systems
Fire Management
Security Management
Building Operations and Management
Water Treatment
Electrical Equipment
Emergency Generator / Lighting Equipment
Industrial Controls / Recording / Indication Equipment

PROJECT TITLE

American Family Field
First Aid AHU
1 Brewers Way
Milwaukee, WI 53214

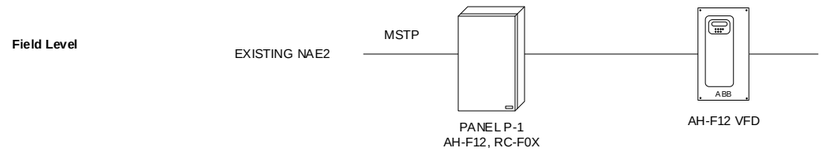
ARCHITECT	ENGINEER
, **Phone:**	, **Phone:**
MECHANICAL CONTRACTOR	**ELECTRICAL CONTRACTOR**
, **Phone:**	, **Phone:**

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Johnson Controls

Branch Information
Johnson Controls
12000 W. Wirth Street, Suite 102,
Wauwatosa, Wisconsin 53222
Phone:

SALES ENGINEER	PROJECT MANAGER	APPLICATION ENGINEER	DATE	CONTRACT NUMBER
KC	DH	JK	**2024-03-12**	**4N030078**



METASYS NETWORK LAYOUT

THIS DRAWING SHOWS THE OVERALL NETWORK LAYOUT. SEE THE INDIVIDUAL ENG/ ENG RISER DRAWING(S) FOR MORE SPECIFIC DEVICE DETAILS. IT IS ASSUMED THAT THE ETHERNET SHOWN IS THE CUSTOMERS ETHERNET BACKBONE. NO ADDITIONAL SWITCHES, ROUTERS, FIREWALLS, ETC ARE PROVIDED.

Drawing Title

COMM BUS - Network Riser

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
KC	DH	JK	BY	DATE	BY	DATE

Project Title

American Family Field
First Aid AHU
1 Brewers Way
Milwaukee, WI 53214

Johnson Controls

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CONTRACT NUMBER

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DRAWING NUMBER

00.01.01

NOTE: LIST THE ORDER OF THE DEVICES AS THEY ARE INSTALLED FOR RECORD PURPOSES.

INSTALLING ELECTRICIAN TO PROVIDE THE FOLLOWING:
SPREADSHEET NOTING TRUNK, ADDRESS & ENGINES.
PANEL SCHEDULE FOR POWER SUPPLIES.

Drawing Title

COMM BUS - Network Riser

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
			BY	DATE	BY	DATE
KC	DH	JK				

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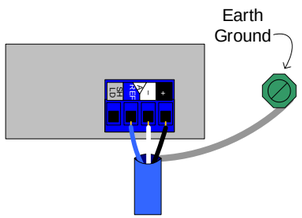
00.01.02

METASYS MSTP NETWORK INSTALLATION DETAILS

The information in this document is not intended to replace the published Technical Product Literature for the Johnson Controls systems and products presented. The Installation Instructions that are packed with products, and the Technical Bulletins and Product Bulletins released with Johnson Controls systems and products supersede the information on this page. It is the responsibility of the product installer and product user to obtain and follow the product installation, operation, and safety procedures provided with the products or project specific information required by specification or local codes.

Category	Rules / Maximums Allowed
General	Typically daisy-chained; branch or star configuration acceptable when repeaters are used. See End of Line Switching and Repeater Guideline graphic.
Number of Devices	**When all of the devices connected on the FC Bus are Metasys FECs, VMAs, and/or IOMs, the device and bus segment limits are:** 100 devices total per FC Bus (maximum) 3 bus segments per FC Bus (maximum) 50 devices per bus segment (maximum, not to exceed 100 devices per FC Bus) **When one or more TEC26xx Series thermostat or third-party MS/TP device is connected on the FC Bus, the device and bus segment limits are:** 64 devices total per FC Bus (maximum) 3 bus segments per FC Bus (maximum) 32 devices per bus segment (maximum, not to exceed 64 devices per FC Bus) **Note:** Metasys MS/TP devices generate less data traffic than third-party MS/TP devices and TEC26xx thermostats. Connecting third-party devices or TEC26xx thermostats to the FC Bus increases data traffic, reduces bus performance, and reduces the number of devices that can be connected to the bus. Bus segments on an FC Bus are connected with repeaters (only). Up to two cascaded repeaters may be applied to an FC Bus (to connect three bus segments).
Line Length and Type	**When all of the devices connected on the FC Bus are Metasys FECs, VMAs, and/or IOMs, the cable length limits are:** Each bus segment can be up to 1520 m (5000 ft) in length (using 22 AWG 3-wire twisted, shielded cable). Each FC Bus can be up to 4750 m (15,000 ft) in length (using 22 AWG 3-wire twisted, shielded cable). **When one or more TEC26xx Series thermostat or third-party MS/TP device is connected on the FC Bus, the device and bus segment limits are:** Each bus segment can be up to 1220 m (4000 ft) in length (using 22 AWG 3-wire twisted, shielded cable) Each FC Bus can be up to 3660 m (12,000 ft) in length (using 22 AWG 3-wire twisted, shielded cable). When using fiber-optic connections: 2,010 m (6,600 ft.) between two fiber modems 22 AWG Stranded, 3-Wire Twisted, Shielded Cable
Cable	22 AWG stranded, 3-wire, twisted shielded cable
EOL Termination	End-of-Line (EOL) termination is required on the FC Bus to reduce signal reflection when data transmissions reach the end of a bus segment and bounce back. EOL termination is built into some Metasys FC devices and is enabled with a switch or jumper on the device. **EOL Termination on SNEs** An EOL switch on an SNE enables EOL termination. For those SNEs with two FC Bus connections, two EOL double-pole switches are provided. Set the EOL switch to the ON (up) position to set the controller as an EOL termination device. **EOL Termination on Switch-Terminating Devices** Some field controllers have an EOL switch or jumper. Such devices include FECs, IOMs, VMAs, ZFR1810s, and repeaters. Set the EOL termination to On for any of these devices when it is the last device on a bus segment. **EOL Termination on Devices Without EOL Provision** For the devices such as TECs and third-party controllers in which no EOL provision is provided, install the MS-BACEOL-0 RS485 End-of-Line Terminator at the device if at the end of the bus segment. **EOL Termination Across the FC Bus** The FC Bus may consist of up to three bus segments. Each bus segment on an FC Bus requires two EOL termination devices, one at each end of the bus segment. All other devices on the FC Bus should have their EOL termination disabled (EOL switches Off) . If only one device on an FC segment has an EOL termination, it must be set to On. **EOL on FC Bus Repeaters** When using repeaters in the FC Bus, set the EOL jumpers based on the position of the repeater in the run.



SHIELD GROUNDING

The shield should be earth grounded at one and only one point for the entire bus segment. (Preferably in the SNE Panel.) The shield screws on the controllers are simply a convenient way to continue the daisy chain of the bus. They are not attached to earth ground. You can use the shield terminal or twist together the shield and tape back at each controller.

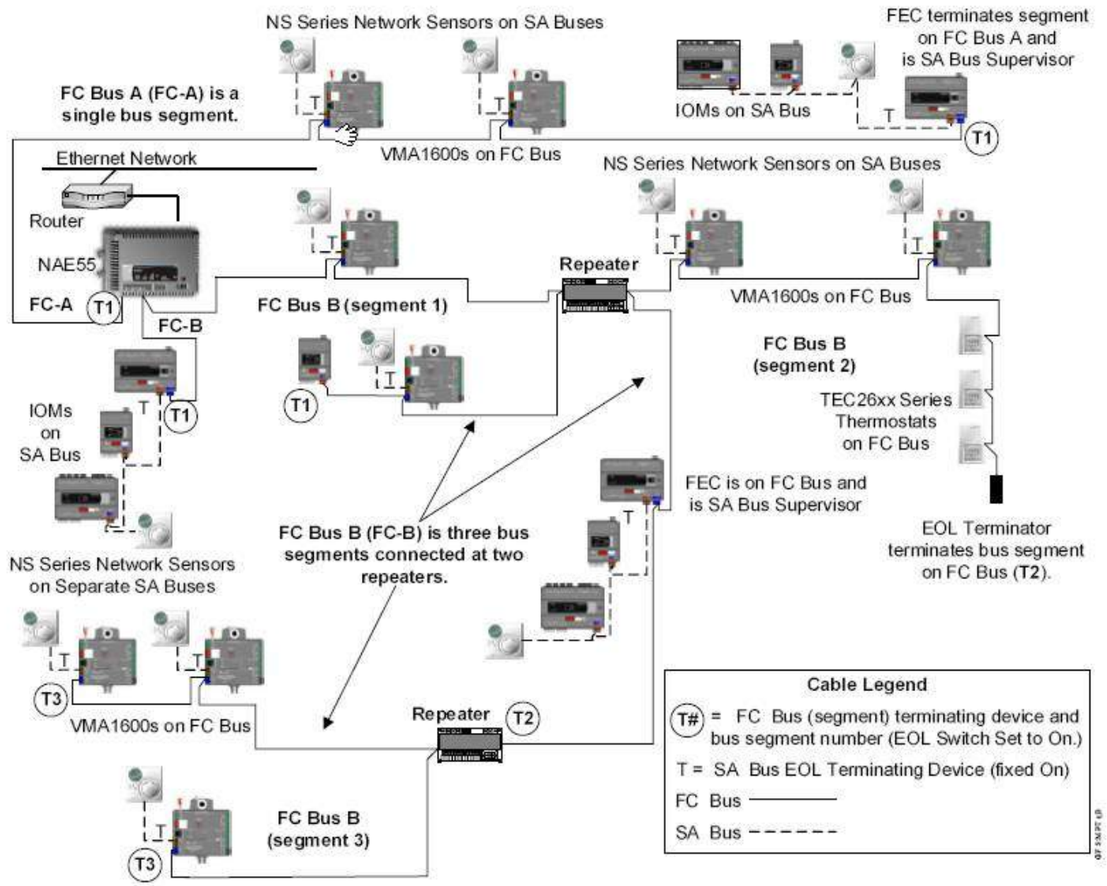
RECOMMENDED MSTP FIELD CONTROLLER BUS CABLE

Type	Typical Usage	Anixter #	Belden #	pF/ft	Area
22/3c Shielded Plenum	Open Plenum Installations. 38400+ Baud RS-485 Communication.	CBL-22/3-FC-PLN	6501FE	25	0.014
22/3c Shielded PVC	EMT (Raceway) Installations. 38400+ Baud RS-485 Communication.	CBL-22/3-FC-PVC	5501FE	31	0.015

RECOMMENDED MSTP SENSOR ACTUATOR BUS CABLE

Type	Typical Usage	Anixter #	Belden #	pF/ft	Area
22/2pr Shielded Plenum	Open Plenum Installations. 38400+ Baud RS-485 Communication.	CBL-22/2P-SA-PLN	6541FE	33	0.033
22/2pr Shielded PVC	EMT (Raceway) Installations. 38400+ Baud RS-485 Communication.	CBL-22/2P-SA-PVC	5541FE	31	0.034

END OF THE LINE SWITCHING AND REPEATER GUIDELINES



Drawing Title
COMM BUS - MSTP Installation Reference

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
KC	DH	JK	BY	DATE	BY	DATE

Project Title
American Family Field
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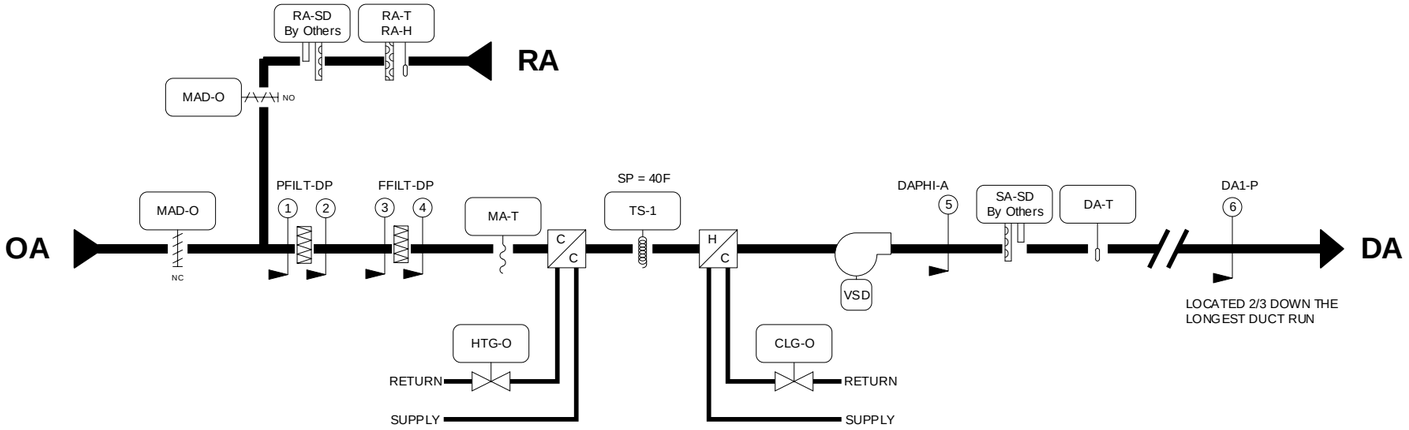
DRAWING NUMBER
00.01.03



BILL OF MATERIALS

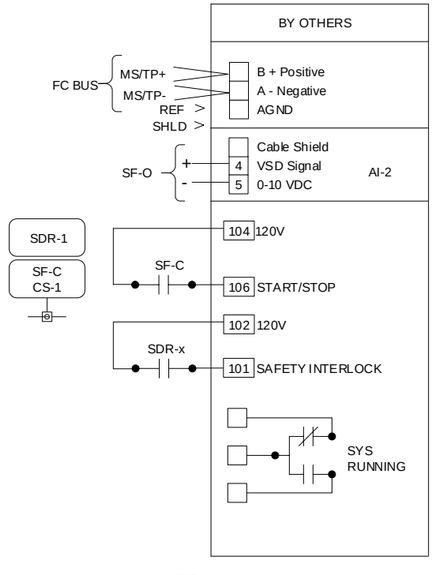
Designation	Qty	Part Number	Description
DA1-P	1	FTG18A-600R	SENSING TUBE KIT FOR P32
DAPHI-A	1	FTG18A-600R	SENSING TUBE KIT FOR P32
DA-T	1	TE-6311M-1	1000 OHM NICKEL - METAL ENCLOSURE
FFILT-DP	1	FTG18A-600R	SENSING TUBE KIT FOR P32
MA-T	1	TE-6001-8	AVER ELEMENT HLDR QTY =10
MA-T	1	TE-6316M-1	NICKEL DUCT AVERAGE SENSO
PFILT-DP	1	FTG18A-600R	SENSING TUBE KIT FOR P32
RA-T,-H	1	HE-69130NP-0	DUCT PROBE, 3%RH, NI TEMP
SDR-1	1	RR10NN	PILOT RELAY, 10A, SPDT
SF-C,CS-1	1	CSDSC-C50100L1	CURR SW SELF CAL CLMP 0.50A-100A RLY OPT
24V NO			
TS-1	1	A70GA-1C	15/55F, DIFF 5 FIXED,1NO/1NC MAIN OPEN LOW,1/
8 X 20' BULB,			
TS-1	1	TE-6000-1	STRAP ON APPL.
MAD-O	1	DAMPER	SEE DAMPER SCHEDULE
CLG-O,HTG-O	1	VALVE	SEE VAVLE SCHEDULE

FIRE ALARM CONTROL MODULE

FACM

BY OTHERS

SUPPLY FAN SF-7240A/B VFD
TYPICAL OF 1



NOTE:
- SEE MANUFACTURER'S WIRING DIAGRAM FOR COMPLETE WIRING DETAILS. DO NOT TERMINATE MS/TP REFERENCE TO DRIVE. WIRE NUT REFERENCE TO CONTINUE TO THE NEXT DEVICE.
- MONITOR STATUS, ALARM, KWH CONSUMPTION, AND KW DEMAND

Drawing Title

AH-F12 Flow

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
KC	DH	JK	BY	DATE	BY	DATE

Project Title

American Family Field
First Aid AHU
1 Brewers Way
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DRAWING NUMBER

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UNIT ENABLE:
A network unit enable signal (UNITEN-MODE) will control the mode of the unit.

OCCUPIED MODE:
The unit will be energized through the BAS on a Scheduled Basis.

SUPPLY FAN CONTROL:
The unit will utilize a VFD for supply fan control. Provide new safety circuit wiring to supply fan VFD for AHU shutdown.

MORNING START UP CONTROL:
Upon morning startup of the occupied mode, mechanical cooling (CLG-O) will be locked out, the heating coil control valve (HTG-O) will be fully open, the outside damper (OAD-O) will move to the closed position, and any interlocked exhaust fans will be de-energized. When the return air temperature (RA-T) reaches the warm-up setpoint, the air handler will return to normal operation.

ECONOMIZER CONTROL:
Position the economizer dampers (MAD-O) for maximum economy and sequenced with the heating and cooling valves (CLG-O, HTG-O). The economizer dampers will be controlled off of the same output and shall modulate opposite of each other. Unless the economizer controller is overridden by the warm-up cycle, the controller will verify the that the air handling unit is running via a fan proof of flow controller (SF-S) and open the outside air damper (MAD-O) to the minimum required ventilation position (OAD-MIN). The minimum required ventilation position shall be decided by the TAB contractor. When the outside air dry bulb temperature is less than outside air dry bulb setpoint, the economizer dampers (MAD-O) will be position for maximum free cooling using outside air to meet the cooling demand. The mechanical equipment will only be used if the outside air cannot provide enough free cooling to meet demand.

DISCHARGE AIR TEMP CONTROL
The chilled and hot water control valves (CLG-O, HTG-O) will modulate in sequence to maintain the discharge air temperature (DA-T). The discharge air temperature setpoint (DA-SP) will be reset based on the AHU return air temperature (RA-T)

ZONE TEMP CONTROL:
Each zone sensor or group of zone sensors (ZNx-T) modulate the reheat coil hot water control valve (RHVx-O) to satisfy the required room temperature setpoint (ZNx-SP). See the reheat coil sequence. When the zone temperature is below setpoint, the hot water valve shall modulate open to maintain the space temperature. The reverse shall occur when the space temperature is above setpoint. When the zone temperature is between the heating and cooling setpoints, the heating valve shall be closed.

A new controller is to be provided for VAV-F01. The VAV shall be controlled equally to the existing reheat coils. Provide a fixed discharge air setpoint as shown on mechanical schedules. Extend communication trunk to VAV-F01 controller. VAV sequence to be revised when the remainder of the AHU-F12 zones are configured for VAV operation.

UNOCCUPIED MODE:
In off hours, the supply fan (SF-C) will cycle intermittently at night by the zone sensor (ZNx-T) to maintain 60^{0}F. In off hours, the chilled water control valve (CLG-O) and outside air damper (OAD-O) will be at a fully closed position and the heating coil control valve (HTG-O) will be at a fully open position. The reheat heating coil (RHVx-O) shall be commanded closed whenever the AHU is off.

UNIT PROTECTION:
Discharge Air High Duct Pressure Alarm (DAPHI-A) - When in "Alarm", the control sequence will stop running and the fan(s) will be disabled via a hard-wired shutdown circuit.
Low Temp Alarm (LT-A) – When in alarm, the control sequence will stop running and the fan will be disabled via a hard wired shut down circuit.
Ducts - Smoke Detector (FIRE-A) - Smoke detectors located in the supply and return ducts will on detection of smoke shut down the air handler supply fan (SF-C) via a hard-wire interlock with fan starters. Smoke detector status will be indicated at the EMCS.

ADDITIONAL POINTS MONITORED BY THE FMS:
Mixed Air Temperature (MA-T)
Prefilter Diff Pressure (PFILT-DP) – an alarm will be generated if the pressure exceeds 1”
Final-filter Diff Pressure (FFILT-DP) – an alarm will be generated if the pressure exceeds 1”

Drawing Title

AH-F12 Sequence

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
			BY	DATE	BY	DATE
KC	DH	JK				

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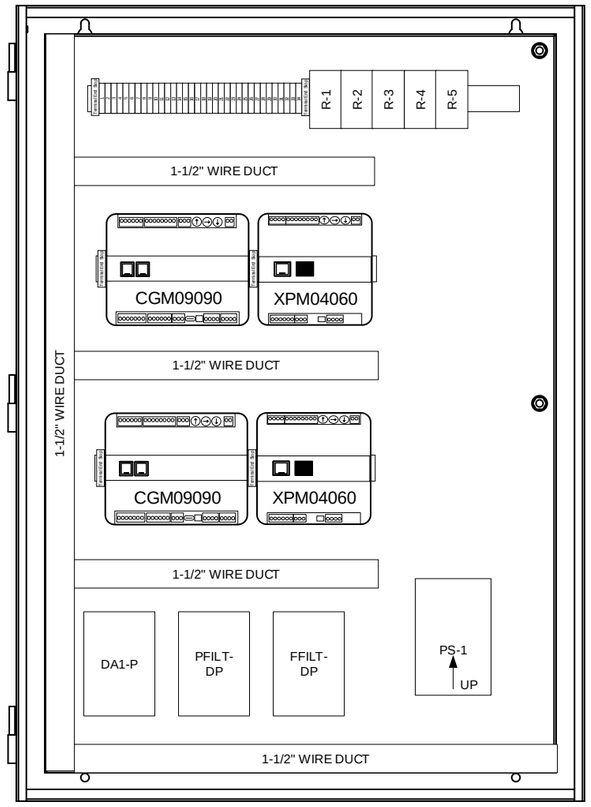
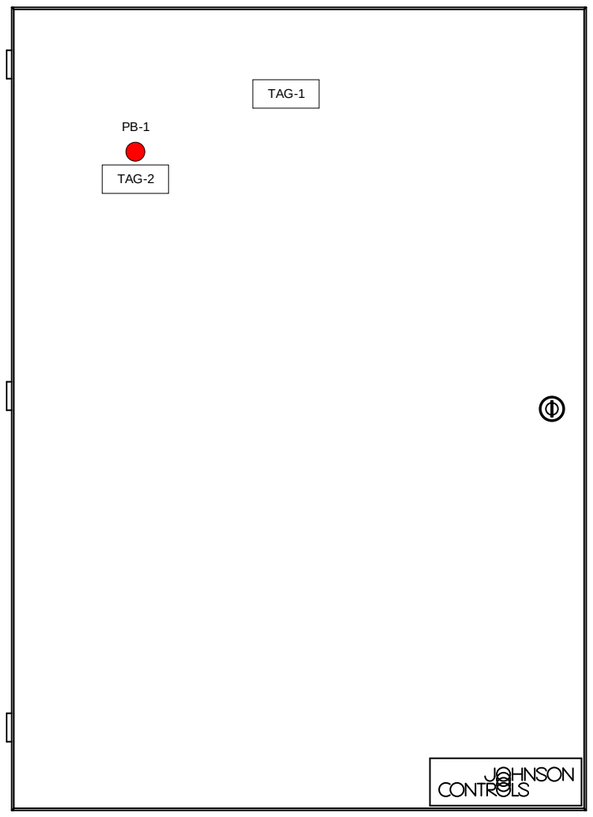
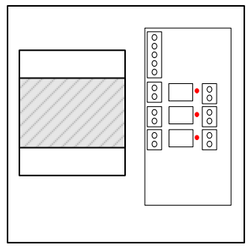


Panel P-1



TX-P



POWER FROM
BREAKER PANEL: _____
CIRCUIT NUMBER: _____

PANEL FACE TAGS:

TAG-1: PANEL 1
CRU-L08
JCI 4N03-0054

TAG-2: LOW TEMP RESET

BILL OF MATERIALS

Designation	Qty	Part Number	Description
CGM-x	2	M4-CGM09090-0	18 PT CNTL GENPURP, MSTP, B-AAC, RTC, 7 UI, 2 BI, 4 CO, 2 AO, 3 BO
DA1-P	1	DP150MR2-SA	STANDARD (BASE MOUNT) 1.0, 2.5, 5.0 AND 10IN.W.C.
PS-1	1	AFS-460	DIFFERENTIAL PRESSURE SWITCH, 0.06-12 WC, ADJUSTABLE, SPST (NC)
R-x	5	RH3B-ULAC24V	RH SERIES 3PDT PLUG-IN GENERAL PURPOSE RELAY WITH INDICATOR - AC24V
R-x	5	SH3B-05	RELAY SOCKET DIN MOUNT SCREW TERMINAL USED WITH RH3B
TXP-1	1	PSH300A-LVC	ENCLOSED 300VA POWER SUPPLY WITH (3) 100VA CLASS 2 OUTPUTS WITH SEPARATE
XFILT-DP	1	DP150MR2-SA	STANDARD (BASE MOUNT) 1.0, 2.5, 5.0 AND 10IN.W.C.
XFILTER-DP	2	DP150MR2-SA	STANDARD (BASE MOUNT) 1.0, 2.5, 5.0 AND 10IN.W.C.
P-1	1	PAN-ENC3042WDP	30X42X9.25 ENCLOSURE SOLID DOOR PERFORATED SUB-PANEL STEEL UL TYPE 1
RC610/1-50	1	RC610/1-50	MARKER CARD (1-50X2) SIDE MNT
XPM-x	2	M4-XPM04060-0	10 PT INPUT/OUTPUT EXPANSION MODULE, 3 UI, 1 BI, 4 CO, 2 BO
TS-1	1	TE-6000-1	STRAP ON APPL.
PB-1	1	ABW111-BRG	KELE – PUSH BUTTON
TB-1	34	M4_6	KELE - LOW VOLTAGE TERMINAL
TB-1	2	BAM4	KELE - END STOP
TB-1	1	FEM6	END SECTION
TB-1	1	RC610/1-50	MARKER CARD SIDE MNT

Drawing Title
AH-F12 Panel

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
KC	DH	JK	BY	DATE	BY	DATE

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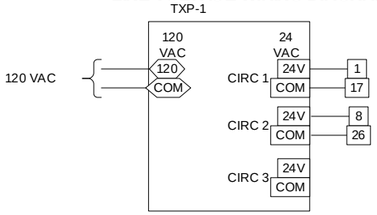
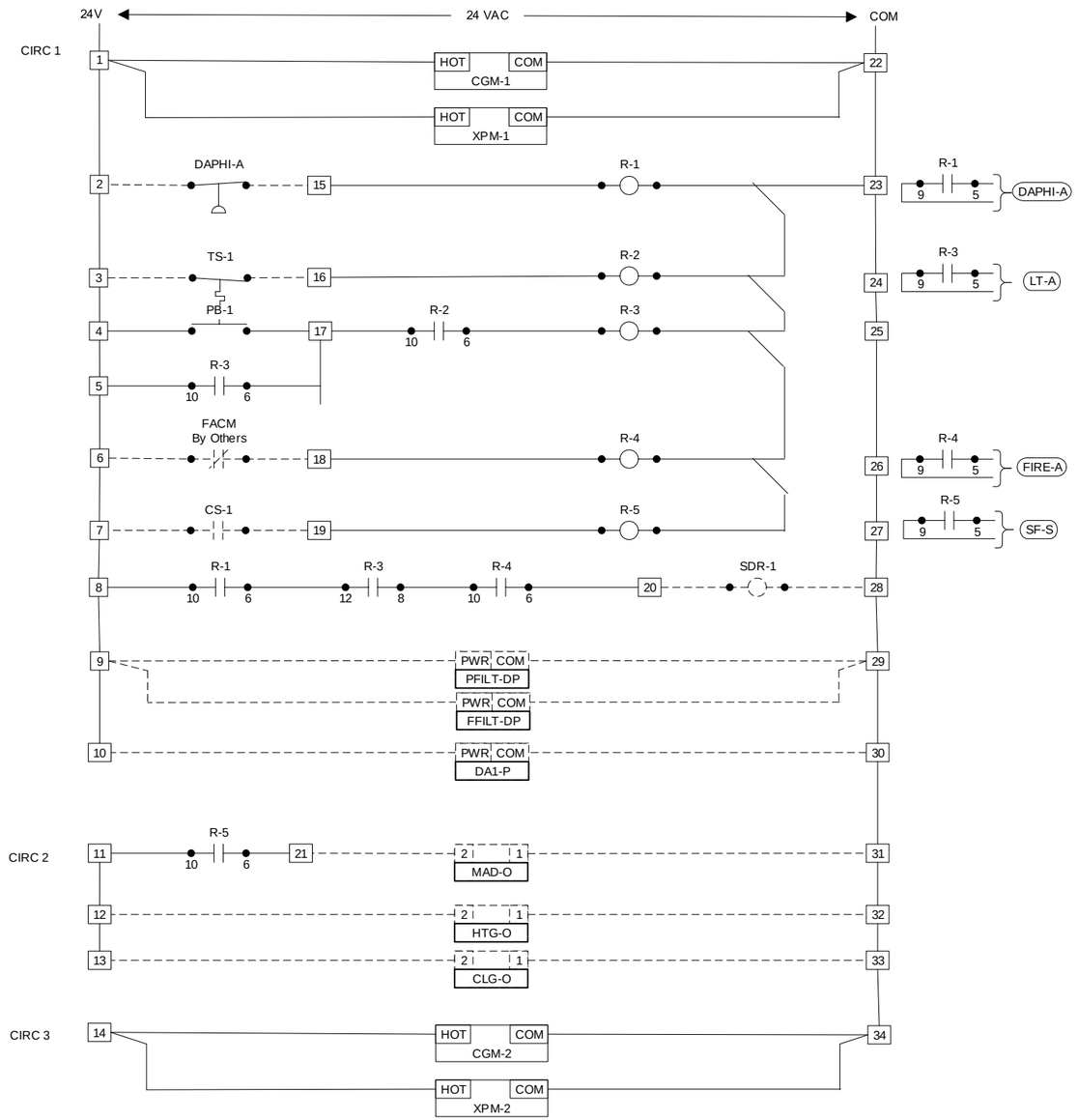
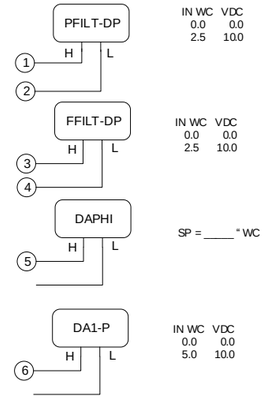
LINE VOLTAGE WIRING DIAGRAM



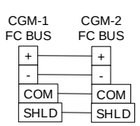
LOW VOLTAGE WIRING DIAGRAM



PNEUMATIC DIAGRAM



COMMUNICATION BUS WIRING DIAGRAM



Drawing Title

AHU - Wiring Details

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
KC	DH	JK	BY	DATE	BY	DATE

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Phone:

CONTRACT NUMBER
4N030078

DRAWING NUMBER
02.01.04

Electrician/Fitter		Point Information			Controller Information							Panel Information					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device	Location	Ref Detail Shape	Comment
		AH-F52			CGM09090							P-5	First Aid 2525		M400							Power to Controller
		AH-F52			CGM09090	MS/TP	5	4				P-5	First Aid 2525	0	M400							BacNet FC Bus
	UI IN-5	AH-F52	DA-T	Discharge Air Temp	CGM09090	MS/TP	5	4	UI IN-5		IN5, ICOM5	P-5	First Aid 2525	0	M400	5-4-UI IN-5	2/22	2-Wire	TE		F131	
	UI IN-2	AH-F52	DA-P	Discharge Air Static Pressure	CGM09090	MS/TP	5	4	UI IN-2		IN2, ICOM2	P-5	First Aid 2525	0	M400	5-4-UI IN-2	2/22	See wiring detail	Voltage Input (External Pwr)		F101	
	UI IN-3	AH-F52	MA-T	Mixed Air Temp	CGM09090	MS/TP	5	4	UI IN-3		IN3, ICOM3	P-5	First Aid 2525	0	M400	5-4-UI IN-3	2/22	2-Wire	TE		F131	
	UI IN-4	AH-F52	RA-T	Return Air Temp	CGM09090	MS/TP	5	4	UI IN-4		IN4, ICOM4	P-5	First Aid 2525	0	M400	5-4-UI IN-4	2/22	2-Wire	TE		F131	
	UI IN-5	AH-F52	RA-H	Return Air Humidity	CGM09090	MS/TP	5	4	UI IN-5		IN5, ICOM5	P-5	First Aid 2525	0	M400	5-4-UI IN-5	2/22	See wiring detail	Voltage Input (External Pwr)		F101	
	UI IN-6	AH-F52	PFILT-DP	PreFilter Diff Pressure	CGM09090	MS/TP	5	4	UI IN-6		IN6, ICOM6	P-5	First Aid 2525	0	M400	5-4-UI IN-6	2/22	See wiring detail	Voltage Input (External Pwr)		F101	
	UI IN-7	AH-F52	FFILT-DP	Final Filter Diff Press	CGM09090	MS/TP	5	4	UI IN-7		IN7, ICOM7	P-5	First Aid 2525	0	M400	5-4-UI IN-7	2/22	See wiring detail	Voltage Input (External Pwr)		F101	
	BI IN-5	AH-F52	LT-A	Low Temp Alarm	CGM09090	MS/TP	5	4	BI IN-5		IN5, ICOM5	P-5	First Aid 2525	0	M400	5-4-BI IN-5	2/22	See wiring detail	Dry Contact		F301	
	BI IN-2	AH-F52	SF-S	Supply Fan Status	CGM09090	MS/TP	5	4	BI IN-2		IN2, ICOM2	P-5	First Aid 2525	0	M400	5-4-BI IN-2	2/22	See wiring detail	Dry Contact		F301	
	BO OUT-5	AH-F52	SF-C	Supply Fan Command	CGM09090	MS/TP	5	4	BO OUT-5		OUT5, 24V COM	P-5	First Aid 2525	0	M400	5-4-BO OUT-5	2/22	See wiring detail	24VAC OUT (Sw Hi, EXT Source)		F501	
	BO OUT-2	AH-F52			CGM09090	MS/TP	5	4	BO OUT-2			P-5	First Aid 2525	0	M400	5-4-BO OUT-2						
	BO OUT-3	AH-F52			CGM09090	MS/TP	5	4	BO OUT-3			P-5	First Aid 2525	0	M400	5-4-BO OUT-3						
	CO OUT-5	AH-F52	SF-O	Supply Fan Output	CGM09090	MS/TP	5	4	CO OUT-5		OUT5, OCOM5	P-5	First Aid 2525	0	M400	5-4-CO OUT-5	2/22	See VFD Detail	VFD Speed Control (Vdc)			
	CO OUT-2	AH-F52	MAD-O	MA Damper Output	CGM09090	MS/TP	5	4	CO OUT-2		OUT-a,OUT-b,24V HOT, 24V COM	P-5	First Aid 2525	0	M400	5-4-CO OUT-2	2/18 / 2/18	ORG, GRY, RED, BLK	M92xx-AGx-x (Incr) (Sw Hi, EXT Sourc		F966	
	CO OUT-3	AH-F52	CLG-O	Cooling Output	CGM09090	MS/TP	5	4	CO OUT-3		OUT3, OCOM3	P-5	First Aid 2525	0	M400	5-4-CO OUT-3	2/22	See wiring detail	Output (Voltage)		F201	
	CO OUT-4	AH-F52	HTG-O	Heating Output	CGM09090	MS/TP	5	4	CO OUT-4		OUT4, OCOM4	P-5	First Aid 2525	0	M400	5-4-CO OUT-4	2/22	See wiring detail	Output (Voltage)		F201	
	AO OUT-5	AH-F52			CGM09090	MS/TP	5	4	AO OUT-5			P-5	First Aid 2525	0	M400	5-4-AO OUT-5						
	AO OUT-2	AH-F52			CGM09090	MS/TP	5	4	AO OUT-2			P-5	First Aid 2525	0	M400	5-4-AO OUT-2						
		AH-F52			XPM04060							P-5	First Aid 2525		M400							Power to Controller
		AH-F52			XPM04060	MS/TP	5	4				P-5	First Aid 2525	0	M400							BacNet FC Bus
	UI IN-5	AH-F52			XPM04060	MS/TP	5	4	UI IN-5			P-5	First Aid 2525	0	M400	5-5-UI IN-5						
	UI IN-2	AH-F52	FIRE-A	Fire Alarm	XPM04060	MS/TP	5	4	UI IN-2		IN2, ICOM2	P-5	First Aid 2525	0	M400	5-5-UI IN-2	2/22	See wiring detail	Dry Contact		F301	
	UI IN-3	AH-F52	EF-S	Exhaust Fan Status	XPM04060	MS/TP	5	4	UI IN-3		IN3, ICOM3	P-5	First Aid 2525	0	M400	5-5-UI IN-3	2/22	See wiring detail	Dry Contact		F301	
	BI IN-5	AH-F52	DAPHI-A	Discharge Air High Duct Pressure	XPM04060	MS/TP	5	4	BI IN-5		IN5, ICOM5	P-5	First Aid 2525	0	M400	5-5-BI IN-5	2/22	See wiring detail	Dry Contact		F305	
	BO OUT-5	AH-F52	EF-C	Exhaust Fan 1 Command	XPM04060	MS/TP	5	4	BO OUT-5		OUT5, 24V COM	P-5	First Aid 2525	0	M400	5-5-BO OUT-5	2/18	See wiring detail	24VAC OUT (Sw Hi, EXT Source)		F501	
	BO OUT-2	AH-F52			XPM04060	MS/TP	5	4	BO OUT-2			P-5	First Aid 2525	0	M400	5-5-BO OUT-2						
	CO OUT-5	AH-F52			XPM04060	MS/TP	5	4	CO OUT-5			P-5	First Aid 2525	0	M400	5-5-CO OUT-5						
	CO OUT-2	AH-F52			XPM04060	MS/TP	5	4	CO OUT-2			P-5	First Aid 2525	0	M400	5-5-CO OUT-2						
	CO OUT-3	AH-F52			XPM04060	MS/TP	5	4	CO OUT-3			P-5	First Aid 2525	0	M400	5-5-CO OUT-3						
	CO OUT-4	AH-F52			XPM04060	MS/TP	5	4	CO OUT-4			P-5	First Aid 2525	0	M400	5-5-CO OUT-4						
		RC-F0x			CGM09090							P-5	First Aid 2525		M400							Power to Controller
		RC-F0x			CGM09090	MS/TP	5	5				P-5	First Aid 2525	0	M400							BacNet FC Bus
	UI IN-5	RC-F0x	ZN2-T	Zone 2 Temp	CGM09090	MS/TP	5	5	UI IN-5		IN5, ICOM5	P-5	First Aid 2525	0	M400	5-5-UI IN-5	2/22	2-Wire	TE		F131	
	UI IN-2	RC-F0x	ZN3-T	Zone 3 Temp	CGM09090	MS/TP	5	5	UI IN-2		IN2, ICOM2	P-5	First Aid 2525	0	M400	5-5-UI IN-2	2/22	2-Wire	TE		F131	
	UI IN-3	RC-F0x	ZN4-T	Zone 4 Temp	CGM09090	MS/TP	5	5	UI IN-3		IN3, ICOM3	P-5	First Aid 2525	0	M400	5-5-UI IN-3	2/22	2-Wire	TE		F131	
	UI IN-4	RC-F0x	ZN5-T	Zone 5 Temp	CGM09090	MS/TP	5	5	UI IN-4		IN4, ICOM4	P-5	First Aid 2525	0	M400	5-5-UI IN-4	2/22	2-Wire	TE		F131	
	UI IN-5	RC-F0x			CGM09090	MS/TP	5	5	UI IN-5			P-5	First Aid 2525	0	M400	5-5-UI IN-5						
	UI IN-6	RC-F0x			CGM09090	MS/TP	5	5	UI IN-6			P-5	First Aid 2525	0	M400	5-5-UI IN-6						
	UI IN-7	RC-F0x			CGM09090	MS/TP	5	5	UI IN-7			P-5	First Aid 2525	0	M400	5-5-UI IN-7						
	BI IN-5	RC-F0x			CGM09090	MS/TP	5	5	BI IN-5			P-5	First Aid 2525	0	M400	5-5-BI IN-5						
	BI IN-2	RC-F0x			CGM09090	MS/TP	5	5	BI IN-2			P-5	First Aid 2525	0	M400	5-5-BI IN-2						
	BO OUT-5	RC-F0x	HTG2-OP	Htg Stage 2 Command	CGM09090	MS/TP	5	5	BO OUT-5		OCOM-b,OCOM-a, 24V HOT	P-5	First Aid 2525	0	M400	5-5-BO OUT-5	3/18	3, 2, 1	VA-7150 (Incr) (Sw Low, INT Source)		F781	
	BO OUT-2	RC-F0x	HTG2-CL	Htg Stage 2 Command	CGM09090	MS/TP	5	5	BO OUT-2			P-5	First Aid 2525	0	M400	5-5-BO OUT-2						
	BO OUT-3	RC-F0x			CGM09090	MS/TP	5	5	BO OUT-3			P-5	First Aid 2525	0	M400	5-5-BO OUT-3						
	CO OUT-5	RC-F0x	HTG3-OP	Htg Stage 3 Command	CGM09090	MS/TP	5	5	CO OUT-5		OCOM-b,OCOM-a, 24V HOT	P-5	First Aid 2525	0	M400	5-5-CO OUT-5	3/18	3, 2, 1	VA-7150 (Incr) (Sw Low, INT Source)		F781	
	CO OUT-2	RC-F0x	HTG3-CL	Htg Stage 3 Command	CGM09090	MS/TP	5	5	CO OUT-2			P-5	First Aid 2525	0	M400	5-5-CO OUT-2						
	CO OUT-3	RC-F0x	HTG4-OP	Htg Stage 4 Command	CGM09090	MS/TP	5	5	CO OUT-3		OCOM-b,OCOM-a, 24V HOT	P-5	First Aid 2525	0	M400	5-5-CO OUT-3	3/18	3, 2, 1	VA-7150 (Incr) (Sw Low, INT Source)		F781	
	CO OUT-4	RC-F0x	HTG4-CL	Htg Stage 4 Command	CGM09090	MS/TP	5	5	CO OUT-4			P-5	First Aid 2525	0	M400	5-5-CO OUT-4						
	AO OUT-5	RC-F0x			CGM09090	MS/TP	5	5	AO OUT-5			P-5	First Aid 2525	0	M400	5-5-AO OUT-5						
	AO OUT-2	RC-F0x			CGM09090	MS/TP	5	5	AO OUT-2			P-5	First Aid 2525	0	M400	5-5-AO OUT-2						
		RC-F0x			XPM04060							P-5	First Aid 2525		M400							Power to Controller
		RC-F0x			XPM04060	SA Bus	5	5				P-5	First Aid 2525	0	M400							BacNet SA Bus
	UI IN-5	RC-F0x			XPM04060	SA Bus	5	5	UI IN-5			P-5	First Aid 2525	0	M400	5-5-5-UI IN-5						
	UI IN-2	RC-F0x			XPM04060	SA Bus	5	5	UI IN-2			P-5	First Aid 2525	0	M400	5-5-5-UI IN-2						
	UI IN-3	RC-F0x			XPM04060	SA Bus	5	5	UI IN-3			P-5	First Aid 2525	0	M400	5-5-5-UI IN-3						
	BI IN-5	RC-F0x			XPM04060	SA Bus	5	5	BI IN-5			P-5	First Aid 2525	0	M400	5-5-5-BI IN-5						
	BO OUT-5	RC-F0x	HTG5-OP	Htg Stage 5 Command	XPM04060	SA Bus	5	5	BO OUT-5		OCOM-b,OCOM-a, 24V HOT	P-5	First Aid 2525	0	M400	5-5-5-BO OUT-5	3/18	3, 2, 1	VA-7150 (Incr) (Sw Low, INT Source)		F781	
	BO OUT-2	RC-F0x	HTG5-CL	Htg Stage 5 Command	XPM04060	SA Bus	5	5	BO OUT-2			P-5	First Aid 2525	0	M400	5-5-5-BO OUT-2						
	CO OUT-5	RC-F0x			XPM04060	SA Bus	5	5	CO OUT-5			P-5	First Aid 2525	0	M400	5-5-5-CO OUT-5						
	CO OUT-2	RC-F0x			XPM04060	SA Bus	5	5	CO OUT-2			P-5	First Aid 2525	0	M400	5-5-5-CO OUT-2						
	CO OUT-3	RC-F0x			XPM04060	SA Bus	5	5	CO OUT-3			P-5	First Aid 2525	0	M400	5-5-5-CO OUT-3						
	CO OUT-4	RC-F0x			XPM04060	SA Bus	5	5	CO OUT-4			P-5	First Aid 2525	0	M400	5-5-5-CO OUT-4						

Drawing Title

AH-F12 Point Schedule

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
KC	DH	JK	BY	DATE	BY	DATE

Project Title

American Family Field
First Aid AHU
1 Brewers Way
Milwaukee, WI 53214

Johnson Controls

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12000 W. Wirth Street,
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Phone:

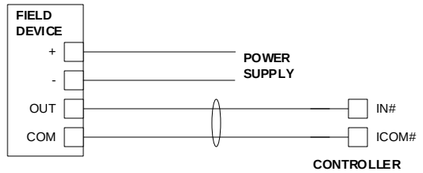
CONTRACT NUMBER

4N030078

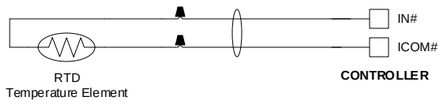
DRAWING NUMBER

02.01.05

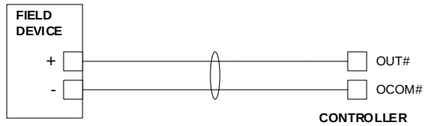
DETAIL F101 VOLTAGE INPUT - EXTERNAL SOURCE



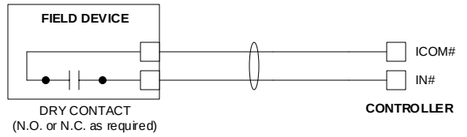
DETAIL F131 TEMPERATURE SENSOR INPUT



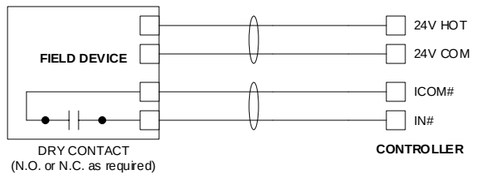
DETAIL F201 ANALOG OUTPUT (VOLTAGE)



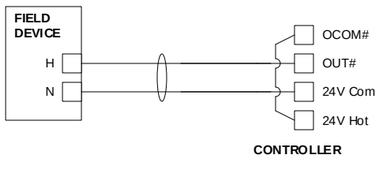
DETAIL F301 BINARY INPUT (DRY CONTACT)



DETAIL F305 BINARY INPUT (DRY CONTACT) DEVICE POWERED 24VAC

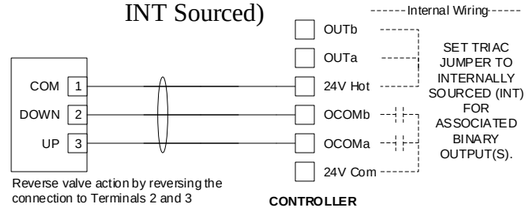


DETAIL F501 24 VAC BINARY OUTPUT (Switch High, EXT Sourced)



SET TRIAC JUMPER TO EXTERNALLY SOURCED (EXT) FOR ASSOCIATED BINARY OUTPUT(S).

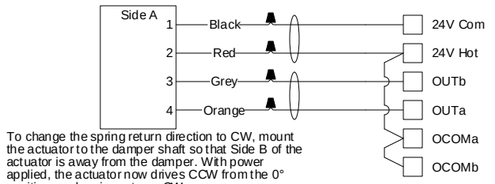
DETAIL F781 INCREMENTAL CONTROL to VA-7150 / VA-7200 (Switch Low, INT Sourced)



SET TRIAC JUMPER TO INTERNALLY SOURCED (INT) FOR ASSOCIATED BINARY OUTPUT(S).

Reverse valve action by reversing the connection to Terminals 2 and 3

DETAIL F966 INCREMENTAL CONTROL to M92xx-AGx-x and VA92xx-AGx-x (Switch High, EXT Sourced)



To change the spring return direction to CW, mount the actuator to the damper shaft so that Side B of the actuator is away from the damper. With power applied, the actuator now drives CCW from the 0° position, and spring returns CW.

Drawing Title

AH-F12 Device Wiring Detail

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
			BY	DATE	BY	DATE
KC	DH	JK				

Project Title

American Family Field
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Johnson Controls

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Phone:

CONTRACT NUMBER

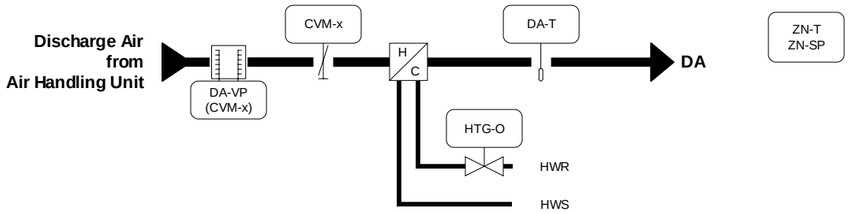
4N030078

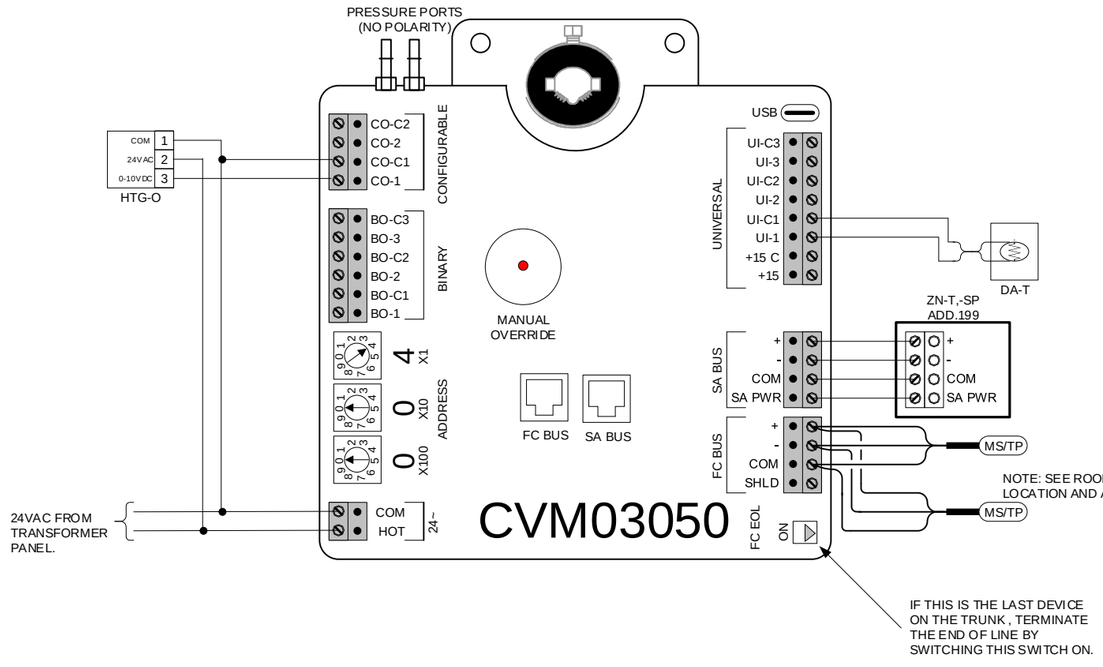
DRAWING NUMBER

02.01.06

DETAIL A

TYPICAL OF 1





BILL OF MATERIALS

Designation	Qty	Part Number	Description
CVM-x	1	M4-CVM03050-0	8PT CNTL VAV W/ ACT and DPT, MSTP, B-AAC, RTC, 3 UI, 2 CO, 3 BO
CVM-x	1	M9000-160	ANTIROTATION BKT M9100 M9216 ACTS
DA-T	1	TE-631GV-2	DUCT PROBE TEMP SENSOR 1K NICKEL SENSOR 4IN PROBE
ZN-X	1	NSB8BTN240-0	NETWORK SENSOR, 3X4.5 MS/TP, TEMP, DISPLAY, SETPOINT, WHITE, LOGO
HTG-O	1	SEE VALVE SCHEDULE	

ZONE TEMP CONTROL:
Each zone sensor or group of zone sensors (ZNx-T) modulate the reheat coil hot water control valve (RHVx-O) to satisfy the required room temperature setpoint (ZNx-SP). See the reheat coil sequence. When the zone temperature is below setpoint, the hot water valve shall modulate open to maintain the space temperature. The reverse shall occur when the space temperature is above setpoint. When the zone temperature is between the heating and cooling setpoints, the heating valve shall be closed.

A new controller is to be provided for VAV-F01. The VAV shall be controlled equally to the existing reheat coils. Provide a fixed discharge air setpoint as shown on mechanical schedules. Extend communication trunk to VAV-F01 controller. VAV sequence to be revised when the remainder of the AHU-F12 zones are configured for VAV operation.

UNOCCUPIED MODE:
In off hours, the supply fan (SF-C) will cycle intermittently at night by the zone sensor (ZNx-T) to maintain 60^{0}F. The reheat heating coil (RHVx-O) shall be commanded closed whenever the AHU is off.

Drawing Title
VAV-F01 Flow

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
KC	DH	JK	BY	DATE	BY	DATE

Project Title
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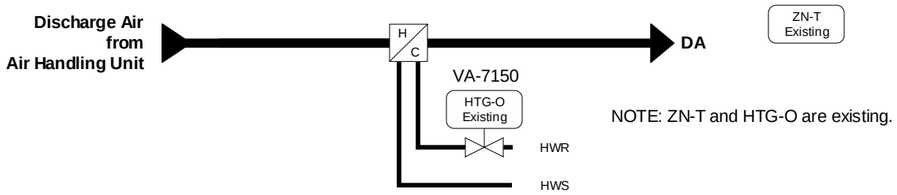
4N030078

DRAWING NUMBER
03.01.01

DETAIL B

TYPICAL OF 4



NOTE: ZN-T and HTG-O are existing.

Drawing Title

RH Flow

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
KC	DH	JK	BY	DATE	BY	DATE

Project Title

American Family Field
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CONTRACT NUMBER

4N030078

DRAWING NUMBER

03.02.01

Tag					Damper Information											Actuator Information					
									Duct Size		Damper Size										
Item	System	Service	Qty	Ref Dwg	Code Number	Type	Shape/Blade	Fail Position	Diameter/ Width	Height	Diameter/ Width	Height	Area (ft^2)	Blade/Frame Type	Bearing/Seals	Qty Ea	Code Number	Actuator Control	Field Mtd Actuator	Mount Loc'n	Comments
1	AH-F12	OAD-O	1	M100D	Dampers By Others	Damper By Others	Any	Normally Closed	64 in	20 in	54 in	22.72 in	8.52	Any	Any	1	NFB24-SR	2-10VDC PROP	True		
2	AH-F12	RAD-O	1	M100D	Dampers By Others	Damper By Others	Any	Normally Open	30 in	30 in	54 in	22.72 in	8.52	Any	Any	1	LF24-SR US	2-10VDC PROP	True		

Drawing Title

Damper Schedule

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
			BY	DATE	BY	DATE
KC	DH	JK				

Project Title

American Family Field
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Phone:

CONTRACT NUMBER

4N030078

DRAWING NUMBER

DS-1

Space Information			Control Drawings		Network / Equipment Tree Information						Sensor	Network Information (MSTP and IP)			Definitions and Templates		Parameters				
Site/Building/Floor (Required)	Room Number (Optional)	Leaf Space (e.g. Room) (Required)	Mechanical Plan Sheet	JCI Control Drawing No.	Device Name (Required)	Device FQR Reference (Required)	Device Description (Optional)	Equipment Name (Required)	Served By Equipment Name (Optional)	Controller Part # (Optional)	Code No.	Engine Name (Required)	Trunk Name (Required)	Controller Host Name (Future)	Equipment Definition Name (Optional)	Controller Template Name (Required)	SA-AREA	SA-KFACTOR	CLG-MAXFLOW	CLGOCC-MINFLOW	HTGOCC-MINFLOW
					Attribute ID												AV3111	AV3112	AV3108	AV3109	AV3110
					Attribute Type												Default Value	Default Value	Default Value	Default Value	Default Value
American Family Field/2nd Floor/Field Level	2521	First Aid Room	M100	02.01.01	AH-F12	021CG007	AHU	AH-F12		M4-CGM09090-0		2	1	7							
										M4-XPM09090-0											
American Family Field/2nd Floor/Field Level	2521	First Aid Room	M100	03.01.01	F01	021CV009	VAV	F01	AH-F12	M4-CVM03050-0	NSB8TN240-0	2	1	9			1.07	2.26	1790	540	540
American Family Field/2nd Floor/Field Level	2526	Open Office	M100	03.02.01	RC-F02	021CG008	RC		AH-F12	M4-CGM09090-0	Use Existing	2	1	8							
	2527	Office	M100	03.02.01	RC-F03		RC		AH-F12	M4-XPM09090-0	Use Existing										
	2528	Media Relations Office	M100	03.02.01	RC-F04		RC		AH-F12		Use Existing										
	2525	IT Office	M100	03.02.01	RC-F05		RC		AH-F12		Use Existing										

Drawing Title

RAC Schedule

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
			BY	DATE	BY	DATE
KC	DH	JK				

Project Title

American Family Field
First Aid AHU
1 Brewers Way
Milwaukee, WI 53214

Johnson Controls

Branch Information

Johnson Controls
12000 W. Wirth Street,
Suite 102,
Wauwatosa, Wisconsin
53222
Phone:

CONTRACT NUMBER

4N030078

DRAWING NUMBER

RAC-1

Tag					Valve Information															Actuator Information	
Item	System	Service	Qty	Ref. Dwg.	Code Number	RCP Length [ft]	Valve Family	Configuration	Fail Position	Inlet Pipe Size	Valve Size	Medium	Flow (gpm)	Design Delta P (psi)	Valve Delta P (psi)	Design Coefficient (Cv)	Valve Coefficient (Cv)	Valve Close Off (psi)	Trim Material	Connection	Code Number	Actuator Control
1	AH-F12	HTG-O	1	M300	B213+LF24-SR US	NA	Ball Valve	2-Way	Fail Open		1/2	Water	10.00			4.50	4.70	200.00	Stainless Steel	Threaded	LF24-SR US	2-10VDC
2	AH-F12	CLG-O	1	M300	B230+LF24-SR US	NA	Ball Valve	2-Way	Fail Closed		1-1/4"	Water	38.30			17.10	19.00	200.00	Stainless Steel	Threaded	LF24-SR US	2-10VDC
3	F01	HTG-O	1	M300	B211+LF24-SR US	NA	Ball Valve	2-Way	Last Position		1/2	Water	4.10			1.80	1.90	200.00	Stainless Steel	Threaded	LF24-SR US	2-10VDC

Drawing Title

Valve Schedule

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
			BY	DATE	BY	DATE
KC	DH	JK				

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DRAWING NUMBER

VS-1