



Trane Direct Digital Controls

GENERAL NOTES

- GENERAL:**
1. INSTALLATION AND DEMOLITION SHALL COMPLY WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS OF MUNICIPAL, STATE AND FEDERAL AUTHORITIES INCLUDING BOCA ASH, ASTM, ANSI, ASHRAE, SMACNA AND NFPA.
 2. ALL EQUIPMENT SELECTED TO COMPLY WITH PLANS AND SPECIFICATIONS.
 3. DRAWINGS TO BE COORDINATED WITH ALL OTHER TRADES BEFORE FABRICATION AND INSTALLATION.

- SUMMARY OF WORK:**
1. THE DRAWINGS INDICATE DIAGRAMMATICALLY THE EXTENT, GENERAL CHARACTER AND LOCATION OF THE WORK INCLUDED. OFFSETS AND/OR CHANGES IN ELEVATION OR OTHER INTERFERENCES SHALL BE PROVIDED WITHOUT EXTRA COST.
 2. CONTRACTOR SHALL VERIFY AND EVALUATE ALL EXISTING CONDITIONS PRIOR TO THE COMMENCEMENT OF WORK.
 3. PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE AND OPERATING SYSTEM.
 4. PROVIDE ONE YEAR GUARANTEE AGAINST DEFECTIVE MATERIALS AND WORKMANSHIP AFTER FINAL ACCEPTANCE BY OWNER.

- RESPONSIBILITY:**
1. SUBCONTRACTORS SHALL PROVIDE CUTTING AND PATCHING OF FLOORS AND WALL OPENINGS, INCLUDING LINTELS AND SECONDARY STEEL AS REQUIRED.
 2. ALL 120 POWER WIRING BY TEMPERATURE CONTROL CONTRACTOR.
 3. ALL CONTROL WIRING BY TEMPERATURE CONTROL CONTRACTOR.
 4. ALL STARTERS AND DISCONNECTS TO BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR, UNLESS AN INTEGRAL PART OF THE EQUIPMENT.

- IDENTIFICATION:**
1. PROVIDE IDENTIFICATION OF ALL PANELS COMPONENTS AND WIRING.

Execution

The system will be installed by trained mechanics.

All conduit and wiring will be installed in a neat and workman like manner parallel or perpendicular to the building structure. All conduit and wiring will be installed per local and applicable codes.

120vac power circuits for the new control panels will connect directly to a new circuit at the closest existing power panel. Tapping off of an existing circuit will not be accepted. Label each 120vac power feed at the source and the destination with appropriate descriptions of the source and destination.

Fastening shall be secured to walls or ceilings by means of the appropriate screws, expansion screw anchors, toggle bolts, hollow wall screws, expansion anchors or expansion shields. Plastic anchors or "twists" will not be accepted.

Splices shall not be accepted. Wiring shall be of sufficient length to terminate to field devices and panel or controller terminal strips without the need to lengthen the cable with a splice.

All line voltage wiring shall be protected in a metal raceway. All low voltage wiring that is concealed accessible wiring can be run exposed with the proper support system. Plenum cable will be used in the appropriate locations. All concealed non-accessible wiring will be in conduit. All conduit inside will be EMT with compression fittings.

All control panels shall be mounted on vibration free surfaces or a uni-strut frame. Multiple systems may be incorporated in a common enclosure.

All cabling run free air in concealed accessible spaces will be run in a separate and stand-alone braid rine system in a neat and workman like manner. Stripping or draping cables above ceiling tiles or on top of ductwork will not be accepted.

EMT conduit and green-field flexible conduit will be used in all indoor exposed locations. Rigid conduit and seat-tight flexible conduit will be used in all exposed outdoor locations.

Greenfield and Seal-tight flexible whips will have a maximum length of 24".

All Communications cabling will be new. Use approved lo-cap shielded cable approved by the component manufacturer.

Penetrations:

Install sleeves for conduit passing through penetrations in floors, partitions, roofs, and walls.

For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide annular clear space between piping and concrete slabs and walls.

Sleeves are not required for core-drilled holes. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.

Cut sleeves to length for mounting flush with both surfaces.

Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas above finished floor level.

Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

Install sleeves that are large enough to provide annular clear space between sleeve and pipe or pipe insulation.

Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Division 7 Section "Joint Sealants."

Fire-Barrier Penetrations: Maintain fire rating of walls, partitions, ceilings, and floors at conduit penetrations. Seal pipe penetrations with fires top materials. Comply with local requirements for fire stopping.

Patching & Painting:

This contractor will be responsible for all patching and painting required by the demolition and installation of the DDC system. The contractor will to the best of his ability, coordinate with the facility to choose paint colors to match existing conditions

Emergency Stop:

Provide one maintained red mushroom pushbutton switch labeled "Emergency Ventilation System Stop" with its contact as an input to the DDC system. If activated, All air moving equipment will shut down in a normal manner and remain off until the pushbutton is pulled out. This switch will be located near the facilities office at the direction of the facility manager.

Schedule:

This project is on a schedule. The contractor will comply with the schedule and provide the necessary man power throughout the time line to complete the project on time. Overtime charges at the end of the project will not be accepted. This contractor shall plan labor accordingly to eliminate "rush to finish" protocol.

CLIN OBJECTIVES

CLIN 0001:

Replace Building Chillers 1 and 2

- Perform building cooling load calculation to right size new chillers
- New refrigerant monitoring system for new refrigerant
- Re-alignment of heat exchangers from series with chillers to parallel
- Re-balance chilled water and condenser water flows at chillers.
- New fill for cooling towers (Optional)

CLIN 0002 (Option):

Replace IT Cooling System

- Install right sized units
- Connect units to chilled water system as back-up and to take advantage of water side economizer system

CLIN 0003 (Option):

Re-commission Building Automation System (BAS)

- Conduct point by point check
- Replace "lost" graphics
- Re-commission BAS

CONTRACTOR RESPONSIBILITIES

Responsibility Matrix

	KROESCHELL	MECH	VENT	DDC PRIME	ELEC	OWNER
Specified Task						
Demolition of Existing Units and Ductwork			X			
Demolition of Existing Piping & Control Valves		X				
Demolition of Existing Controls				X		
Demolition of Asbestos if Required						X
Demolition of Electrical from AHUs					X	
Provide New Control Valves	X					
Install All new Control Valves		X				
Provide New Control Dampers	X					
Install New Control Dampers			X			
Clean and Lube All Existing Control Dampers			X			
Provide New AHUs & VAV's	X					
Provide New Piping and Specialties		X				
Provide Installation of New AHUs		X	X			
Provide Connection of Existing Ductwork to New Units			X			
Provide VFD's & Motors	X					
Provide VFD & Motor Installation and All 3-phase Wiring					X	
Provide Airflow Measuring Stations	X					
Provide Installation of AFMS			X			
Provide and Install all new Controls				X		
Provide 24V Power to VAV's				X		
Engineering, Drawings, Submittals DDC				X		
Programming, Graphics, Control Components				X		
Commissioning, Start-up, Training	X	X	X	X	X	

ABBREVIATIONS

AI	ANALOG INPUT
AO	ANALOG OUTPUT
BMS	BUILDING MANAGEMENT SYSTEM
BLR	BOILER
C/O	CHANGE-OVER
CD	COLD DECK
CONV	CONVERTER
CT	COOLING TOWER
CLG	COOLING
CHLR	CHILLER
COMM	COMMUNICATIONS
COMB	COMBUSTION
COND	CONDENSER
COND	CONDENSATE
CTRL	CONTROL / CONTROLLER
CHW	CHILLED WATER
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CUH	CABINET UNIT HEATER
DISCH	DISCHARGE
DA	DIRECT ACTING
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DMPR	DAMPER
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EMS	ENERGY MANAGEMENT SYSTEM
FB	FACE & BYPASS
FS	FLOW SWITCH
HD	HOT DECK
HW	HOT WATER
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
HTG	HEATING
HUM	HUMIDITY
ISO	ISOLATION
LOC	LOCATION
LTG	LIGHTING
MA	MIXED AIR
OA	OUTDOOR AIR
PR	PRESSURE
RET	RETURN AIR
RA	REVERSE ACTING
RF	RETURN FAN
SS	START / STOP
SF	SUPPLY FAN
SW	SWITCH
SOL	SOLENOID
STM	STEAM
TC	TEMPERATURE CONTROL
TCC	TEMPERATURE CONTROL CONTRACTOR
TCP	TEMPERATURE CONTROL PANEL
TEMP	TEMPERATURE
UH	UNIT HEATER
UV	UNIT VENTILATOR

REQUIRED CLOSEOUT DOCUMENTATION

- A complete set of drawings is required to be on location throughout the project. They are to be designated as the "RED LINE SET" and must be updated with changes as the project progresses.
- If there is a change that affects the Sequence of Operations, the sequence also must be marked up to reflect the change.
- Trends are to be scheduled with 5 minute samples as soon as possible for the following:
 - Outside air temperature
 - Return air temperature
 - Return air humidity (or space humidity)
 - Mixed air temperature
 - Leaving coil(s) air temperature
 - Supply air temperature
 - Heating valve(s) position
 - Chilled water valve position
 - Return fan speed
 - Supply fan speed
 - Supply duct static pressure
 - Return air damper position
 - Outside air damper position
 - Set points for:
 - Supply air temperature
 - Supply duct static pressure
 - Mixed air temperature
 - Chiller chill water entering and leaving temperatures
 - Chiller condenser water entering and leaving temperatures
 - Chiller percent load (compressor amperes)
 - Cooling tower fan speed
 - Cooling tower bypass valve position
 - Any pump fan or other motor controlled by a VFD
 - Boiler water return and supply temperatures
 - Boiler water setpoint

- Record RPIE number identifiers of all equipment to be removed before it is removed
- Collect Installation/Operation manuals that ship with equipment
- Download electronic version of equipment Installation/Operation manuals as equipment is received.
- Obtain equipment submittal data from engineer that ordered the equipment
- Record all new equipment data plate information. The complete assembly and the motor and the pump or fan. (This must be turned over at project end)
 - Assembly (pump package or AHU)
 - Startup date
 - Manufacture
 - Model #
 - Serial #
 - CFM/GPM

CAD Filename: controls.dwg	
ORIGINAL SHEET SIZE: D SIZE 36x24	DATE REVISED
ADDITIONS AND REVISIONS	
65% DESIGN DRAWINGS	11/27/2013
65% DESIGN DRAWINGS REV 1	1/10/2014
100% DESIGN DRAWINGS	2/21/2014

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LITTLE ROCK AFB 19TH MEDICAL SUPPORT GROUP JACKSONVILLE, AR REPAIR OF BUILDING INFRASTRUCTURE SYSTEMS		
DRAWN BY CHECKED BY APPROVED BY SCALE DATE	LJE - - SEE PAGE NOVEMBER 2013	DDC SYSTEM GENERAL NOTES JOB No. 14462-600
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