

LON COMMUNICATION TRUNK
TO EXISTING TRANE SUMMIT SYSTEM



CHILLER 1



CHILLER 2



CHWP-1 VFD



CHWP-2 VFD

Little Rock AFB
Chilled Water System Design
Control Sequence

Three modes of operation will be defined for the chilled water system.

Summer Mode

The outdoor air dry & wet bulb temperatures (enthalpy) are to warm and humid to be used. The condenser water heat exchangers will be locked out. All chilled water will be provided by the chillers.

Economizer Mode

When the outdoor air dry & wet bulb temperatures (enthalpy) is suitable to use. This will allow the heat exchanger to reduce the load of the chiller by cooling down the chilled water return temperature before it is returned to the chiller.

Winter Mode

The outdoor air temperature and humidity (enthalpy) is at a level where air handling unit economizers can handle the cooling load of the building. All mechanical chilled water equipment will be turned off and locked out.

Summer Mode:

The HX diverting valve will be positioned for full chiller flow. The lead chiller will provide chilled water to the system. System load through the chilled water supply and return temperatures as well as the chilled water flow sensors will be utilized to allow optimization of the chiller lead lag sequencing to provide the best use of part load efficiencies.

The lead CHW pump will run with the lead chiller and the lag pump with the lag chiller. The pump VFD(s) will be modulated to maintain the system differential pressure. If the pump(s) ramp down to minimum flow based on the chiller requirements, the VFD will continue to provide minimum flow and the end of line bypass valve will be modulated to maintain the system differential pressure. This will assure the chiller(s) receive their minimum flow rates at all times.

Economizer Mode:

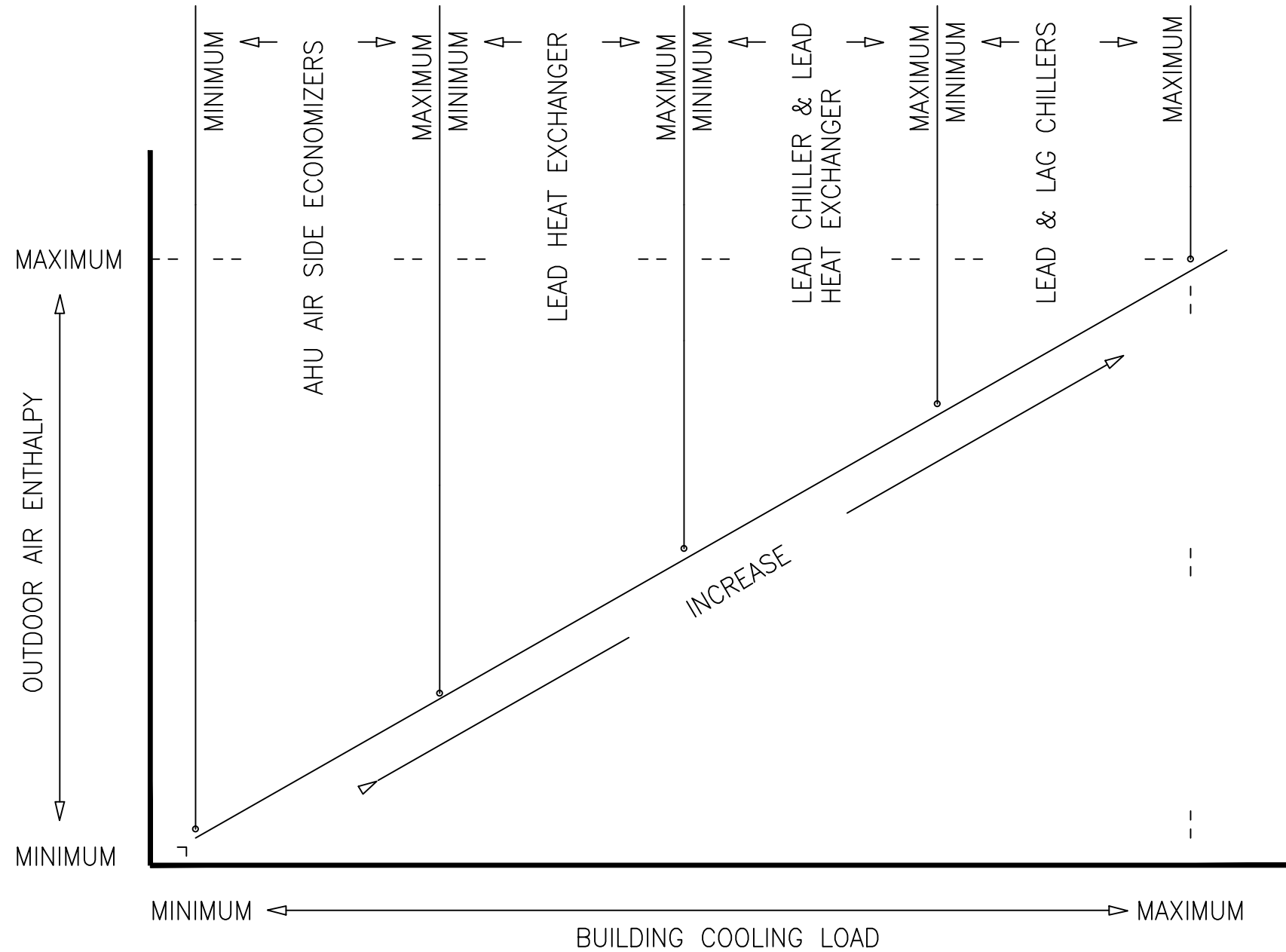
The lag chiller and chilled water pump will be stopped. It's isolation valve will be closed as the lead heat exchanger isolation valve opens and the HX diverting valve is positioned to flow the lead heat exchanger. The timing of these valve positions is critical as not to starve the lead chiller and cause the CHW to drop below minimum flow.

The CDW diverting valve on the lead heat exchanger will be positioned for HX flow. The condenser pump VFD and the cooling tower fan VFD will be modulated in sequence to maintain the heat exchanger return water to the chiller temperature. This setpoint will be adjustable.

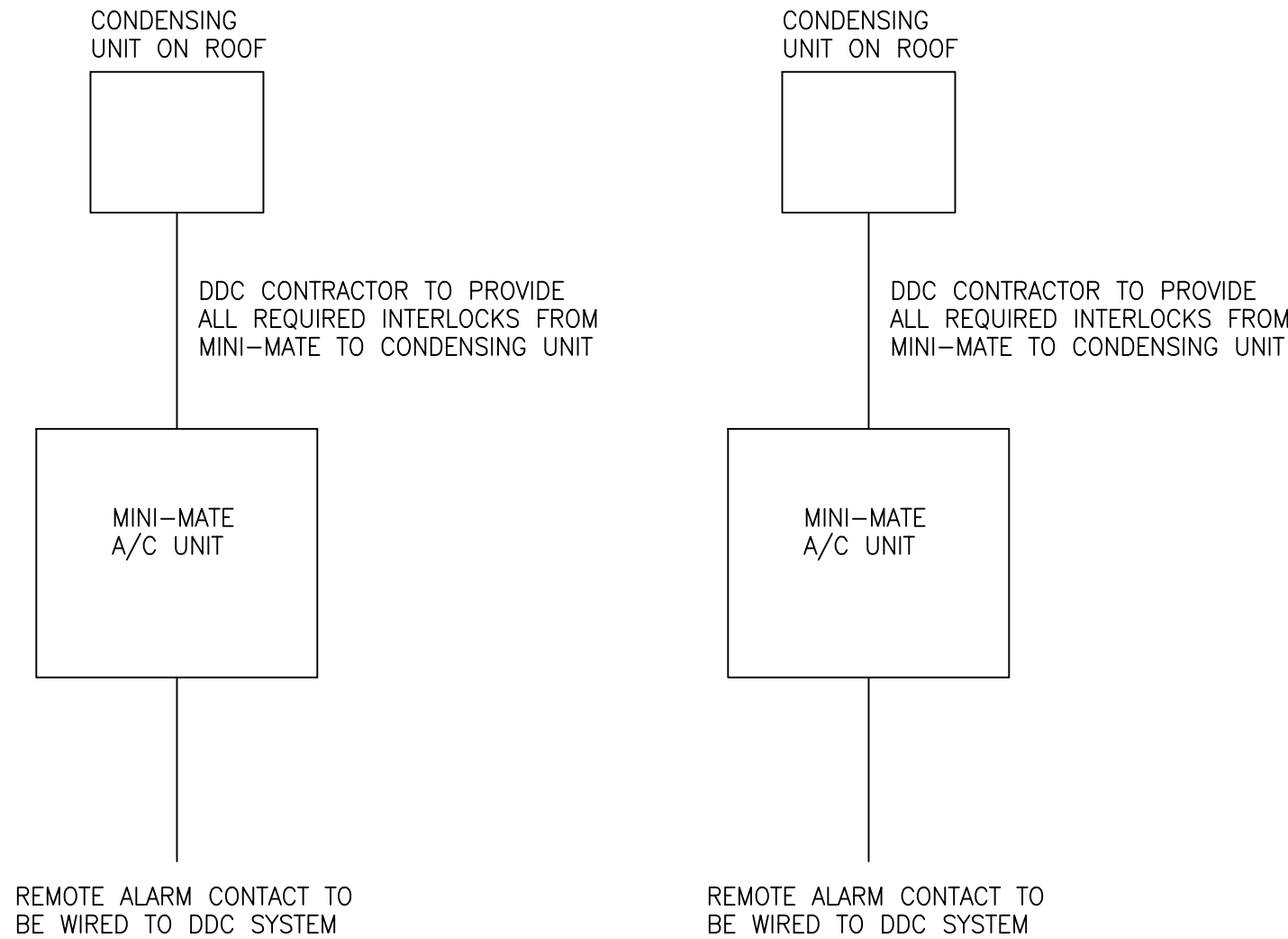
As the load decreases based on chilled water return temp, the lead chiller can be stopped, it's isolation valve closed and the lead heat exchanger can provide chilled water to the system load.

Winter Mode:

In this mode the outdoor air temperature and humidity (enthalpy) is low enough to use for the buildings cooling load. The air handling unit air side economizer cycles will be active and the chilled water plant including all pumps and cooling towers will be shut down.



NEW IT CLOSET COOLING SYSTEMS



TRANE SYSTEM RECOMMISSIONING

THE DDC CONTRACTOR WILL RECOMMISSION THE ENTIRE EXISTING TRANE DDC SYSTEM. PROVIDE ALL POINT TO POINT VERIFICATION, PROGRAMMING AND GRAPHICS TO RESTORE THE SYSTEM TO A FULLY FUNCTIONAL STATE.

PROVIDE TRAINING TO THE FACILITY ON THE OPERATION OF THE SYSTEM. ALSO PROVIDE BACK-UPS OF THE DDC PROGRAMMING AND THE DISPLAYS TO FACILITIES FOR AN ON-SITE BACK-UP COPY.

LITTLE ROCK Air Force Base			Base Building DDC Points List												Chilled Water System													
Point Name	Quantity	INPUTS						OUTPUTS						VIRTUAL / PROGRAM												Comments		
		Digital	Analog	Pulse	Accumulator	Status	Failure	Alarm	Digital	Analog	Tri-State	Pulse Width	VFD Control	Start Stop	Enable Disable	EP On Off Control	Setpoint	Schedule	PID Control	Optimal Start	Min OA Position	Enthalpy Control	Changeover	Static Control	Bldg Press Control		System Shutdown	Chiller Optimization
Outdoor Air Temperature	1	X																									X	Global
Outdoor Air Humidity	1	X																									X	Global
CHW / CDW Pump VFD's	4	X				X	X	X	X	X			X	X			X	X	X								X	
Cooling Tower Fan VFD's	2	X				X	X	X	X	X			X	X			X	X	X								X	
Cooling Tower 3-way Valve	2									X							X		X								X	
CDWST	2	X															X		X								X	
CDWRT	2	X															X		X								X	
HX CHWST	2	X																									X	
HX CHWRT	2	X																									X	
HX ISO Valve	2								X													X					X	
Chiller CHWST	2	X																								X	X	
Chiller CHWRT	2	X																								X	X	
Chiller GPM Flow	2	X														X	X	X								X	X	
Chiller ISO Valve	2								X													X					X	
HX Changeover Diverting Vlv	1									X												X					X	
Common CHWST	1	X																								X	X	
Common CHWRT	1	X																								X	X	
CHWS DP Sensor	1	X															X		X								X	
CHW System Bypass Vlv	1									X							X		X								X	
Chillers	2	X	X			X	X		X	X							X	X	X	X			X				X	
Chiller DP	2	X						X									X		X							X	X	
Secondary CHW Flow	1	X						X									X		X							X	X	

Little Rock AFB - Variable Frequency Drive Schedule											
Tag	Unit	Service	Hp	V	A	Mfgr	Model	Eclipse Bypass	Internal Disc	Enc	Comm
VFD-1	CHWP-1	Chilled Water	25	460	38	ABB	ACH550-VDR-038A-4	Yes	Yes	Nema 1	LON
VFD-2	CHWP-2	Chilled Water	25	460	38	ABB	ACH550-VDR-038A-4	Yes	Yes	Nema 1	LON

CAD Filename: controls.dwg	
ORIGINAL SHEET SIZE: D SIZE 36x24	DATE
ADDITIONS AND REVISIONS	REVISED
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 RISER, IT AND NOTES JOB No. 14462-600	Sheet No. TC-3
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