

CHILLER SYSTEM SEQUENCE OF OPERATIONS

A. GENERAL:

1. THE FUEL CELL HIGH GRADE (HG) HEAT EXCHANGER MAY BE USED IN ALL SEASONS TO POWER THE WORLD ENERGY CHILLER. PROPYLENE GLYCOL MAY BE USED IN THE HIGH GRADE, CHILLED WATER, AND COOLING WATER PIPING. THE CHILLED WATER CAN BE USED FOR A VARIETY OF LOADS, INCLUDING SPACE COOLING COILS AND MANY OTHER USES.

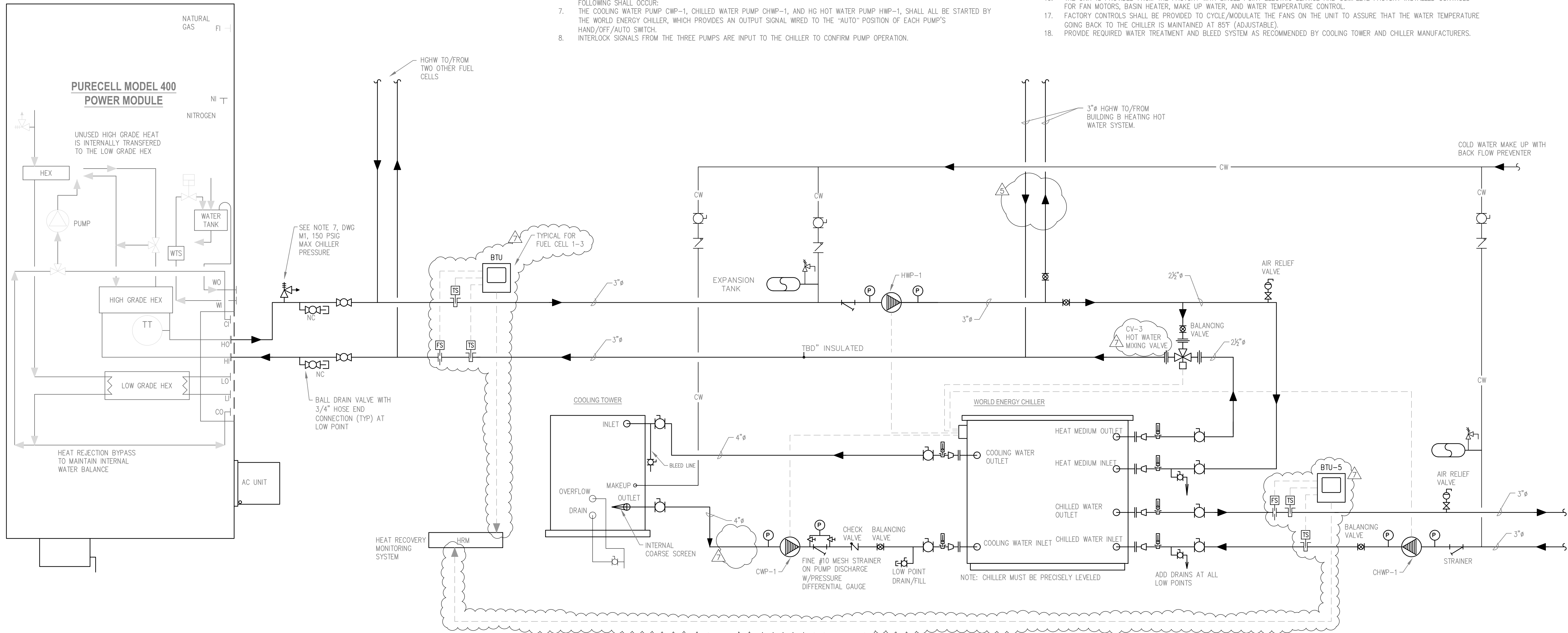
B. CHILLER OPERATION:

1. FACTORY (UTC POWER) CONTROLS SHALL BE SET TO CONTROL THE HG HOT WATER SUPPLY OUTPUT TEMPERATURE TO THE WORLD ENERGY CHILLER TO A SETPOINT OF 203°F (95°C).
2. FACTORY (UTC POWER) CONTROLS SHALL SET FUEL CELL HG HEAT OUTPUT HIGH LIMIT BYPASS TEMPERATURE TO 212°F (100°C).
3. THE CHILLER MAY BE STARTED MANUALLY AT THE WORLD ENERGY CONTROL PANEL BY SELECTING "LOCAL MODE".
4. TO START THE CHILLER REMOTELY FROM A LOCAL SIGNAL, SELECT "REMOTE NOT MODBUS MODE" AT THE WORLD ENERGY CONTROL PANEL. PROVIDE A FIELD WIRE START/STOP INPUT SIGNAL TO THE APPROPRIATE TERMINALS ON THE CHILLER TERMINAL BLOCK FOR INTERFACE CONTROL CONNECTIONS.
5. TO START THE CHILLER REMOTELY BY THE UTC POWER CONTROL CENTER, SELECT "REMOTE MODBUS MODE" AT THE WORLD ENERGY CONTROL PANEL. PROVIDE A CAT 5 CABLE FROM THE CHILLER CONTROL PANEL TO THE RMS PANEL.
6. WHEN THE CUSTOMER'S EQUIPMENT IS IN COOLING MODE THE CHILLER SHALL BE ENERGIZED. UPON A CALL FOR COOLING THE FOLLOWING SHALL OCCUR:
THE COOLING WATER PUMP CWP-1, CHILLED WATER PUMP CHWP-1, AND HG HOT WATER PUMP HWP-1, SHALL ALL BE STARTED BY THE WORLD ENERGY CHILLER, WHICH PROVIDES AN OUTPUT SIGNAL WIRED TO THE "AUTO" POSITION OF EACH PUMP'S HAND/OFF/AUTO SWITCH.
8. INTERLOCK SIGNALS FROM THE THREE PUMPS ARE INPUT TO THE CHILLER TO CONFIRM PUMP OPERATION.

9. THE CHILLED WATER PUMP SHALL PUMP CHILLED WATER THROUGH THE CHILLER AND THE CUSTOMER'S CHILLED WATER LOOP.
10. THE CONDENSER WATER PUMP SHALL PUMP COOLING WATER THROUGH THE CHILLER AND THE COOLING TOWER. COOLING WATER SUPPLY TEMPERATURE TO THE CHILLER SHALL BE CONTROLLED BY THE COOLING TOWER TO MAINTAIN A TEMPERATURE OF 85°F. DESIGN DAY TEMPERATURES WOULD BE 85°F COOLING WATER SUPPLY TO THE CHILLER AND 95.0°F COOLING WATER RETURN FROM THE CHILLER.
11. THE CHILLER INTERNAL CONTROLS MAY CONTINUE TO RUN THE CHILLED WATER PUMP AND COOLING WATER PUMP FOR SEVERAL MINUTES AFTER CHILLER SHUT DOWN, TO PROTECT THE CHILLER.
12. THE HIGH GRADE PUMP SHALL PUMP A CONSTANT FLOW RATE OF HG HOT WATER TO THE 3-WAY MODULATING BYPASS VALVE SERVING THE CHILLER.
13. CAPACITY CONTROL OF THE CHILLER SHALL BE DONE BY MODULATING THE 3-WAY HG HOT WATER MIXING VALVE, WHICH RECEIVES FIELD WIRED POWER AND SIGNAL FROM THE WORLD ENERGY CONTROL PANEL. THE CHILLER DETECTS THE TEMPERATURE OF THE LEAVING CHILLED WATER, AND SENDS A SIGNAL TO THE HOT WATER VALVE TO REGULATE THE FLOW RATE OF HOT WATER INTO THE CHILLER TO MAINTAIN LEAVING CHILLED WATER SETPOINT.
14. THE CHILLER'S SAFETY CONTROLS WILL STOP THE CHILLER AND PUMPS AS REQUIRED IF ABNORMAL CONDITIONS ARE DETECTED.
15. SEE THE WORLD ENERGY FIELD WIRING SCHEMATIC FOR REQUIRED FIELD WIRED CONNECTIONS AND TERMINAL NUMBERS.
16. ALARM CODES ARE DISPLAYED AT THE CHILLER CONTROL PANEL. A CHILLER ALARM CONDITION CAN BE REMOTELY INDICATED BY WIRING TO THE ALARM SIGNAL OUTPUT TERMINALS.

C. COOLING TOWER

16. THE UNIT IS PROVIDED FROM THE FACTORY WITH SINGLE POINT ELECTRIC SERVICE AND COMPLETE FACTORY INSTALLED CONTROLS FOR FAN MOTORS, BASIN HEATER, MAKE UP WATER, AND WATER TEMPERATURE CONTROL.
17. FACTORY CONTROLS SHALL BE PROVIDED TO CYCLE/MODULATE THE FANS ON THE UNIT TO ASSURE THAT THE WATER TEMPERATURE GOING BACK TO THE CHILLER IS MAINTAINED AT 85°F (ADJUSTABLE).
18. PROVIDE REQUIRED WATER TREATMENT AND BLEED SYSTEM AS RECOMMENDED BY COOLING TOWER AND CHILLER MANUFACTURERS.

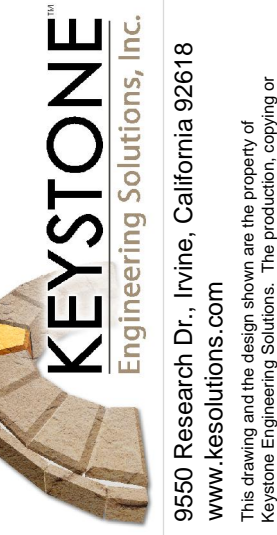
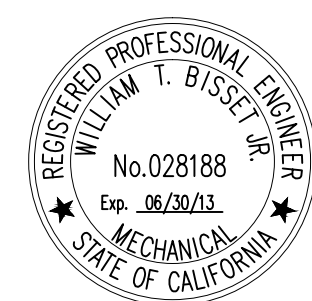


CHILLER NOMINAL RATING AND DESIGN FLOW RATES

DESIGN CONDITIONS		100% WATER		40% PROP GLYCOL/ 60% WATER	
		RATED TONS:	50 TONS	90 TONS	
HEAT MEDIUM INLET/OUTLET TEMPERATURE	203° F/ 179° F (50 TONS) 203° F/ 176° F (90 TONS)	HEAT MEDIUM FLOW (P3):	75 GPM	112 GPM	
COOLING WATER INLET/OUTLET TEMPERATURE	85° F/ 95° F	COOLING WATER FLOW (P2):	286 GPM	515 GPM	
CHILLED WATER INLET/OUTLET	54° F/ 44° F	CHILLED WATER FLOW (P1):	120 GPM	216 GPM	

UTC POWER SUPPLIED EQUIPMENT

POWER MODULE	STANDARD
COOLING MODULE (INCLUDES FACTORY MOUNTED EXPANSION TANK AND DISCONNECT SWITCH)	STANDARD
REMOTE MONITORING SYSTEM (ENCLOSURE INDOOR RATED ONLY)	STANDARD
NITROGEN MANIFOLD (FREESTANDING OR WALL MOUNT)	STANDARD
HEAT RECOVERY MONITORING SYSTEM (HRM-INCLUDES FLOW METERS, TEMPERATURE SENSORS, THERMOWELLS, AND DATA LOGGER)	STANDARD
TIE DOWN BRACKETS	STANDARD
CHILLER	STANDARD
COOLING TOWER	STANDARD



CBS TELEVISION CITY FUEL CELL INSTALLATION PROJECT

7800 BEVERLY BLVD.
LOS ANGELES, CALIFORNIA 90036

ABSORPTION CHILLER P&ID DIAGRAM

ID	DATE	REMARKS
1	11/02/12	PRELIMINARY DESIGN REVIEW
2	11/15/12	PLAN CHECK CORRECTIONS
3	12/20/12	PLAN CHECK
4	12/10/12	FIELD CLARIFICATIONS
5	12/10/12	FIELD CLARIFICATIONS
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ENGR:	WTB
DRWN BY:	KAP
CHK'D BY:	WTB
DATE:	9/19/12
JOB NO.:	12-010
SCALE:	AS NOTED