[redacted]

MEDICAL / DENTAL CLINIC

DRAWING INDEX

DWG	DESCRIPTION
0	TITLE SHEET, DWG. INDEX, EQUIP. SCH.
1	NOT USED
2	NOT USED
3	NOT USED
4	NOT USED
5	NOT USED
6	NOT USED
7	NOT USED
8	NOT USED
9	BTI FIP
10	SYSTEM ARCHITECTURE / COMM RISER
11	NOT USED
12	AHU1&2 CONTROL DWG (TYPICAL)
13	AHU1 FIP DWG
14	AHU1 I/O SUMMARY & BOM
15	AHU2 FIP DWG
16	AHU2 I/O SUMMARY & BOM
17	VAV COOL ONLY CONTROL,WIRING & BOM
18.0	VAV BOX W/REHEAT, COND ALARM & BOM
18.1	VAV BOX W/REHEAT, EXHAUST FAN & BOM
18.2	VAV BOX W/ REHEAT
19	BOILER CONTROL DWG
20	BOILER FIP DWG
21	BOILER I/O SUMMARY & BOM
22	CHILLER CONTROL DWG
23	CHILLER FIP DWG
24	CHILLER I/O SUMMARY & BOM
25	SEQUENCE OF OPERATIONS
26	–
27	–
28	–
29	–
30	–
31	–
32	–
33	–
34	

EQUIPMENT SCHEDULE

EQUIPMENT	FLOOR PLAN	SCH. DWG.
AHU 1 &2	–	12
VAV (COOL ONLY)	–	17
VAV W/REHEAT	–	18
BOILER	–	19
CHILLER	–	22
HWP 1 &2	–	19
CWP 1 &2	–	22
–	–	–
–	–	–

SYMBOLS LEGEND

SYMBOLS	DESCRIPTION
(T)	WALL MOUNTED ALERTON SENSOR
	CONDENSATE PAN
	DUCT TEMP. SENSOR
	IMMERSION TEMP. SENSOR
I I CS	CURRENT SWITCH
SP1	DUCT STATIC PRESS. TRANS
	DAMPER ACTUATOR
R	FIELD MOUNTED CONTROL RELAY
LSI	GLOBAL CONTROLLER
	MAGNETIC STARTER
	3-WAY VALVE
(E)	EXISTING
	FLOW SWITCH
CABLES	
C-5	CAT-5
—1 —	COMM. TRUNK, (2)#22 AWG TW/SH, PLN
1A	(2)#18 AWG
1AP	(2)#18 AWG, PLENUM
1B	(3)#18 AWG
1BP	(3)#18 AWG, PLENUM
1C	(2)#18 AWG, TW/SH
1CP	(2)#18 AWG, TW/SH, PLENUM
1E	(2)#16 AWG
1H	(3)#16 AWG
1S	(3)#18 AWG, TW/SH, PLENUM

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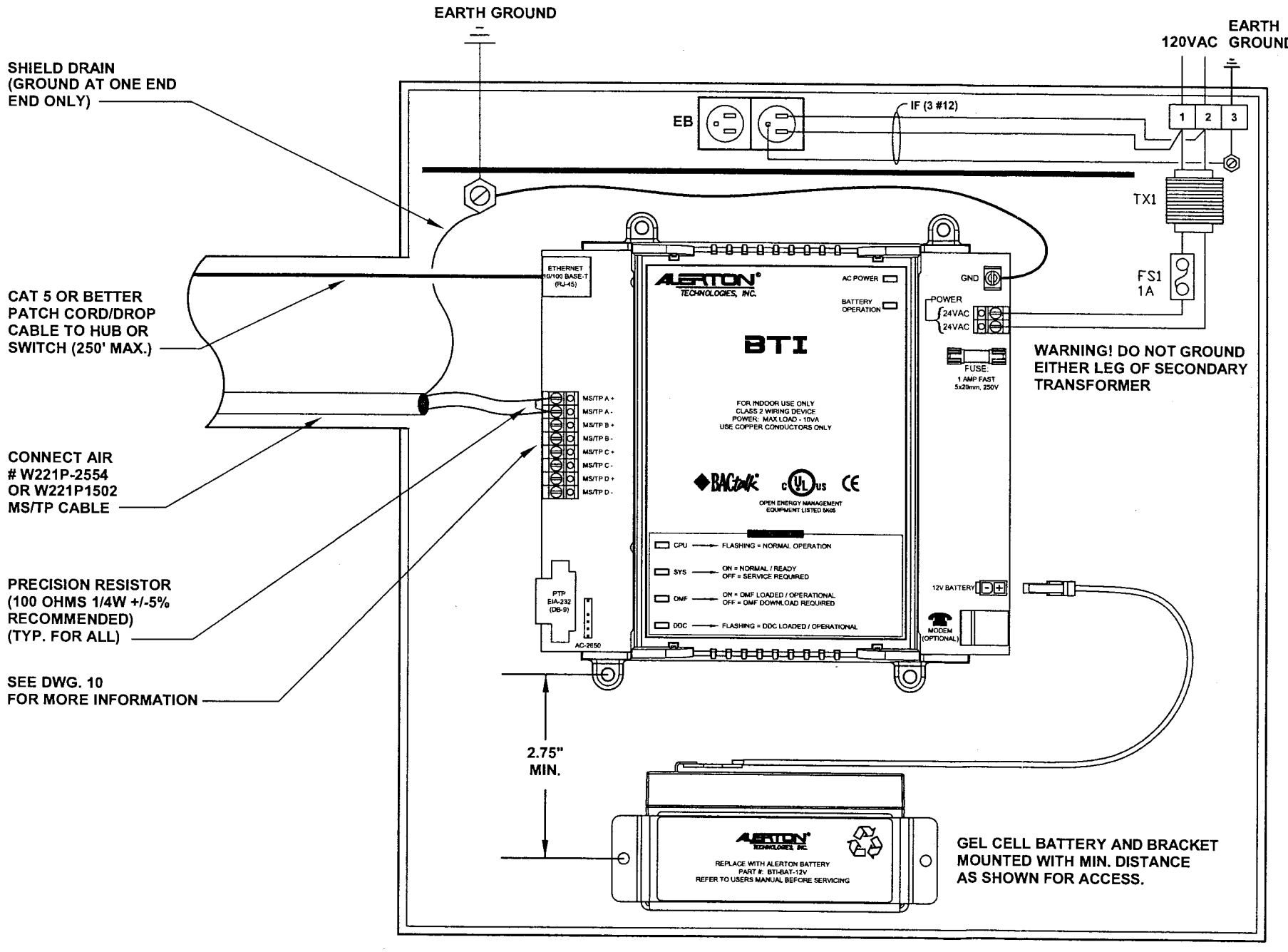
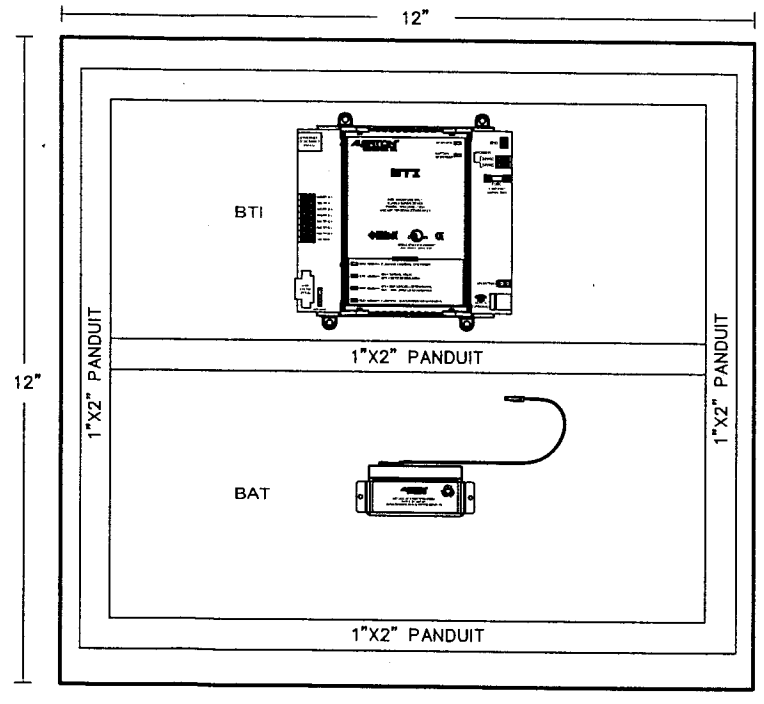


BTI PANEL WIRING LAYOUT

FIELD - BILL OF MATERIAL (PER BUILDING)				
DEVICE	QTY	PART#	DESCRIPTION	MFR
BTI	1	BTI-MDM	BACTALK INTERGRATOR	ALERTON
TB	2	M4/6	TERMINAL BLOCK	KELE
-	1	M10/16FSL	FUSE HOLDER	KELE
TX1	1	691-KOA	TRANSFORMER, 120/24V, 40VA	KELE
FS1	1	AGC1	1 AMP GLASS FUSE	BUSS
FIP	1	C-SD20208	NEMA 4 ENCLOSURE, 20"x20"x8"	HOFFMAN
-	1	C-P2020	SUBPANEL, 18.2"x18.2"	HOFFMAN
EB	1	-	ELECTRICAL BOX	-



BTI-FIP SUBPANEL LAYOUT

AS-BUILT
07/30/02

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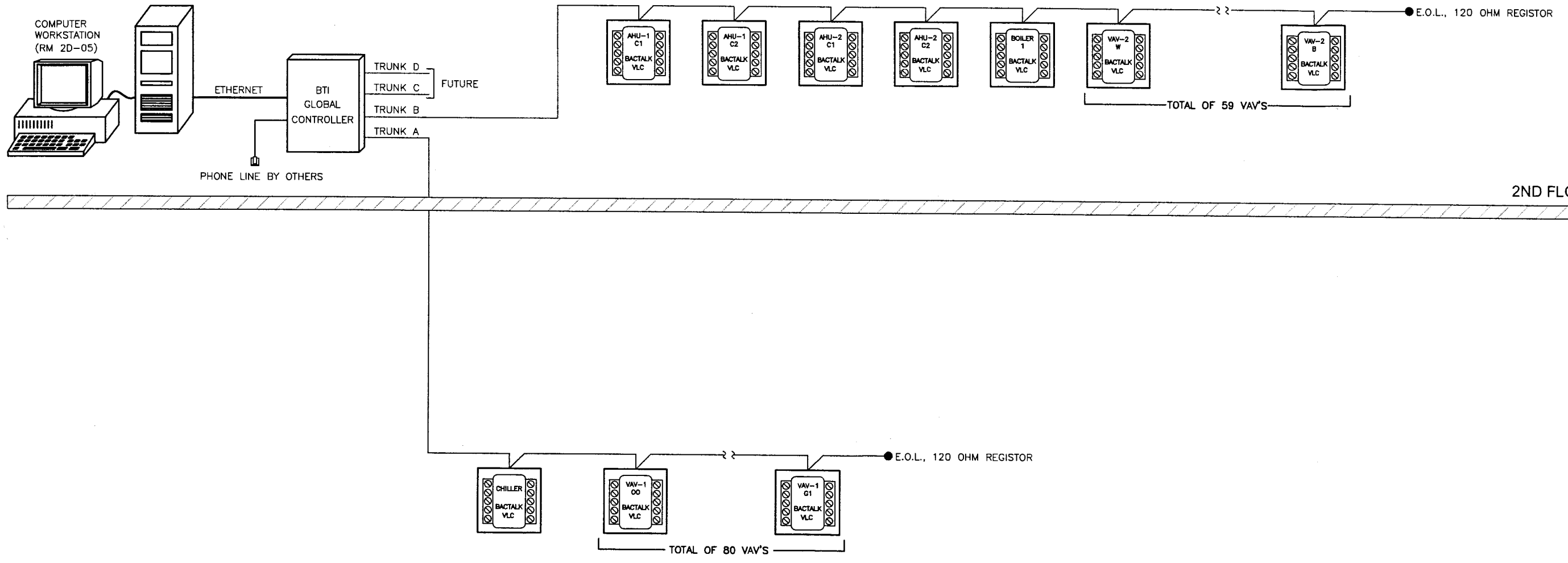
INSTALLATION REQUIREMENTS FOR COMMUNICATIONS TRUNK

- WHEN PULLING CABLE, USE LESS THAN 25 LBS. OF FORCE. MORE FORCE MAY STRETCH THE CABLE AND DISTORT ITS INSULLATION AND TRANSMISSION PROPERTIES.
- DON'T ALLOW THE CABLE TO KINK, KNOT, SNAG, OR FRAY WHEN ROLLING IT OUT OR SECURING IT.
- DON'T RUN CABLE IN THE SAME CONDUIT AS ELECTRICAL CABLE.
- IF YOU CROSS ELECTRICAL CABLE, CROSS AT A 90 DEGREE ANGLE.
- DON'T SPLICE CABLE SEGMENTS; USE CONTINUOUS RUNS OF CABLE FROM ONE DEVICE TO ANOTHER.
- DON'T CINCH CABLES TIES TOO TIGHTLY; TIE-WRAP CABLE BUNDLES LOOSELY. DON'T CRUSH CABLES WHEN SECURING THEM WITH STAPLES OR SUPPORTS. STAPLE BY HAND OR USE STAPLES WITH DEPTH STOPS.



SYSTEM ARCHITECTURE

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07/30/02

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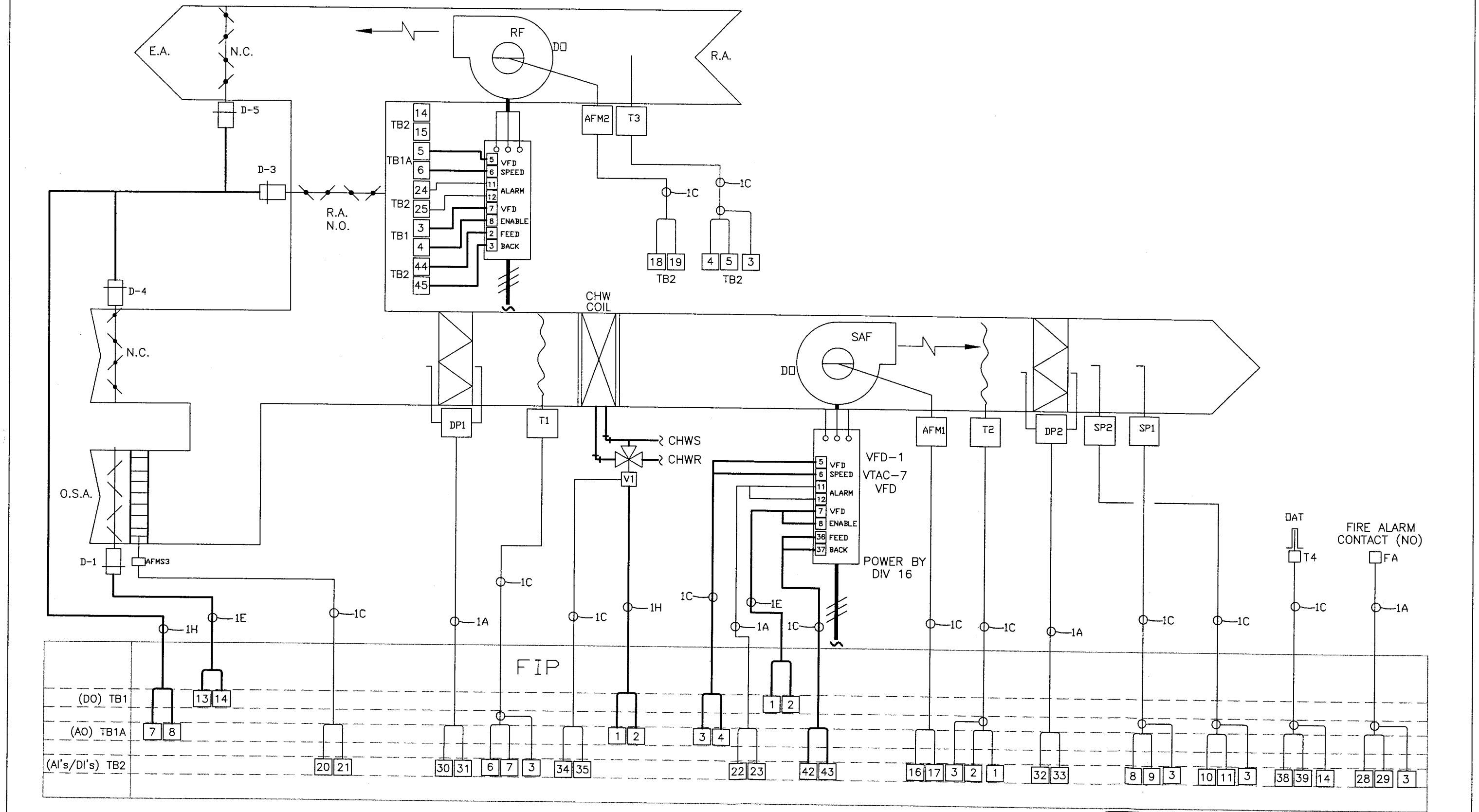

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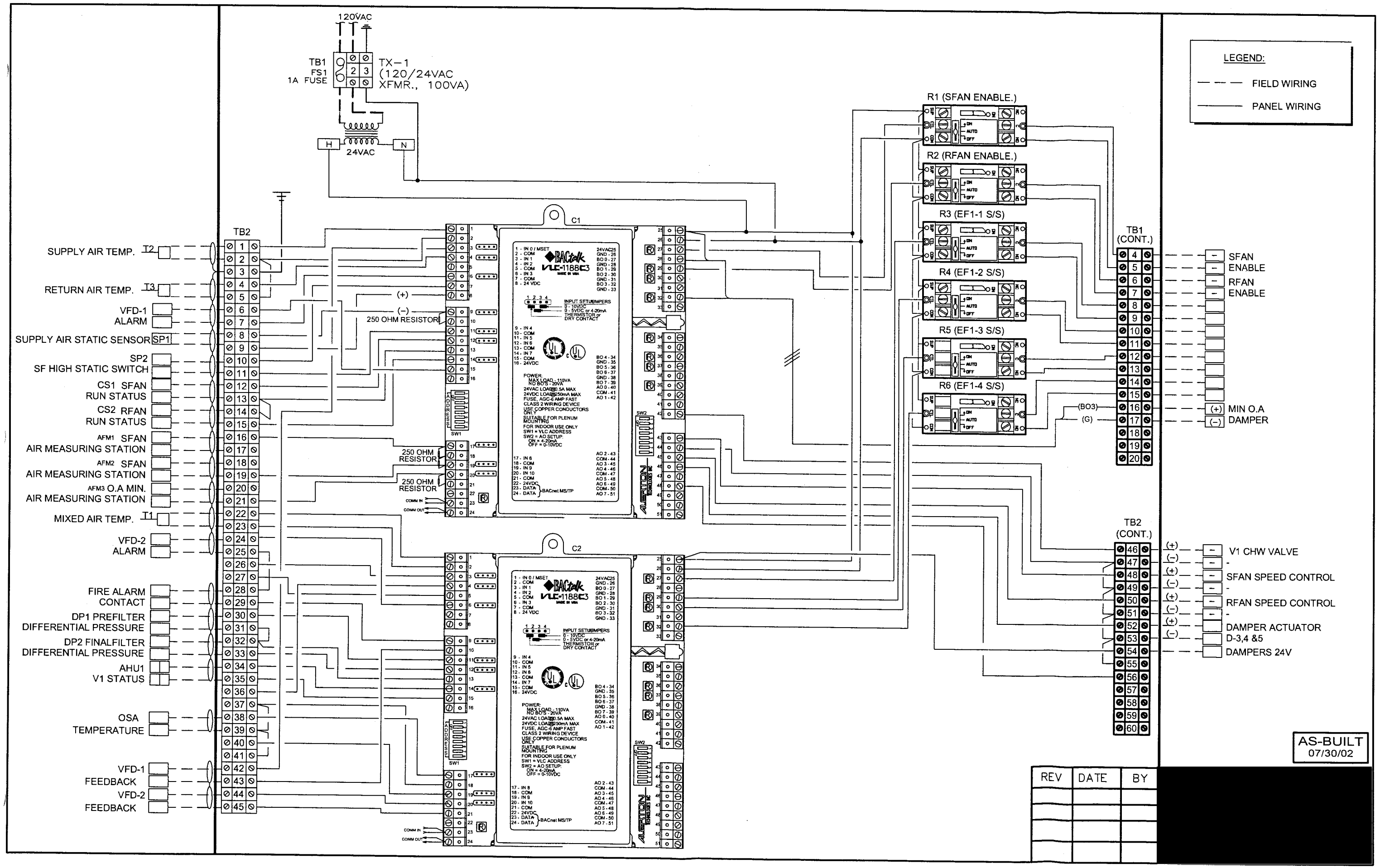

120VAC
TB1
FS1
1A FUSE
TX-1
(120/24VAC
XFMR., 100VA)
H
N
24VAC
TB2
C1
C2
SUPPLY AIR TEMP. T2
RETURN AIR TEMP. T3
VFD-1 ALARM
SUPPLY AIR STATIC SENSOR SP1
SP2
SF HIGH STATIC SWITCH
CS1 SFAN RUN STATUS
CS2 RFAN RUN STATUS
AFM1 SFAN AIR MEASURING STATION
AFM2 SFAN AIR MEASURING STATION
AFM3 O.A MIN. AIR MEASURING STATION
MIXED AIR TEMP. T1
VFD-2 ALARM
FIRE ALARM CONTACT
DP1 PREFILTER DIFFERENTIAL PRESSURE
DP2 FINALFILTER DIFFERENTIAL PRESSURE
AHU1 V1 STATUS
OSA TEMPERATURE
VFD-1 FEEDBACK
VFD-2 FEEDBACK
(+)
(–)
250 OHM RESISTOR
250 OHM RESISTOR
250 OHM RESISTOR
COMM IN
COMM OUT
SW1
SW2
R1 (SFAN ENABLE.)
R2 (RFAN ENABLE.)
R3 (EF1-1 S/S)
R4 (EF1-2 S/S)
R5 (EF1-3 S/S)
R6 (EF1-4 S/S)
ON
AUTO
OFF
TB1 (CONT.)
(BO3)
(G)
SFAN ENABLE
RFAN ENABLE
MIN O.A DAMPER
TB2 (CONT.)
V1 CHW VALVE
SFAN SPEED CONTROL
RFAN SPEED CONTROL
DAMPER ACTUATOR D-3,4 &5
DAMPERS 24V
LEGEND:
FIELD WIRING
PANEL WIRING
AS-BUILT
07/30/02
REV
DATE
BY

CONTROLLER SCHEDULE

CONTROLLER: *C1* | TYPE: *VLC–1188C3* | ADDRESS: *(SEE SCH.)*

LOCATION: *MAIN MECH. RM–2D–05*

SYSTEM: *AHU–1*

IN	TYPE	AUX	POINT	OUT	AUX	POINT
0	THERM.	T2	SUPPLY AIR TEMP.	*B00*	R1	SFAN ENABLE
1	-	VFD-1	FEEDBACK	*B01*	R2	RFAN VFD ENABLE
2	THERM.	T3	RETURN AIR TEMP.	*B02*		
3	D.C.	VFD-1	ALARM	*B03*	D1	MIN. O.A DAMPER
4	4-20mA	SP1	SUPPLY AIR STATIC S.	*B04*		
5	D.C	SP2	FAN HIGH STATIC S.	*B05*		
6	D.C	CS1	SFAN STATUS	*B06*		
7	D.C	CS2	RFAN STATUS	*A01*	V1	CHILLED WATER VALVE
8	4-20mA	AFM1	AIR FLOW SFAN	*A02*	VFD	SFAN SPEED CONTROL
9	4-20mA	AFM2	AIR FLOW RFAN	*A03*	VFD	RFAN SPEED CONTROL
10	4-20mA	AFM3	MIN O.A. FLOW	*A04*	D3,4&5	DAMPER ACTUATORS
				A05		
				A06		
				A07		

CONTROLLER SCHEDULE

CONTROLLER: *C2* TYPE: *VLC–1188C3* ADDRESS: *(SEE SCH.)*

LOCATION: *MAIN MECH. RM–2D–05*

SYSTEM: *AHU–1*

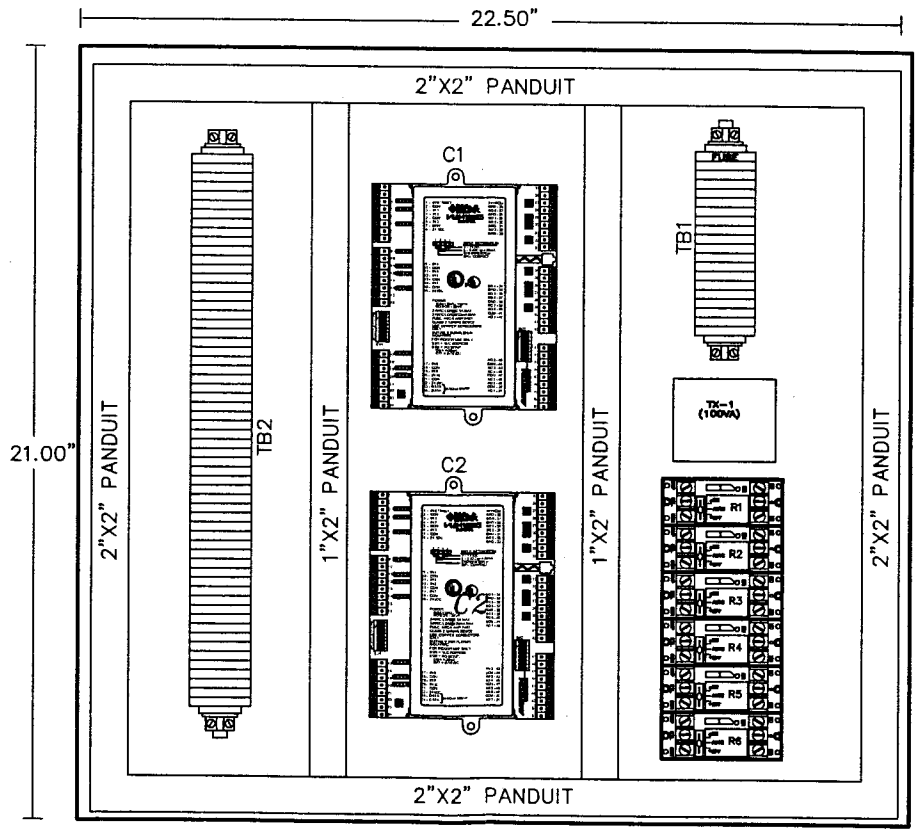
IN	TYPE	AUX	POINT	OUT	AUX	POINT
0	THERM.	T-1	MIXED AIR TEMP	*B00*		
1				*B01*		
2				*B02*		
3	D.C	VFD-2	ALARM	*B03*		
4	D.C	FA	FIRE ALARM	*B04*		
5	D.C	DP1	PRE FILTER	*B05*		
6	D.C	DP2	FINAL FILTER	*B06*		
7	-	V1	CHW VALVE POSITION	*A01*		
8	THERM.	T4	OSA TEMPERATURE	*A02*		
9				*A03*		
10	-	VFD-2	FEEDBACK	*A04*		
				A05		
				A06		
				A07		

FIELD - BILL OF MATERIALS

DEVICE	QUANTITY	PART#	DESCRIPTION	MANUFACTURER
AFM/TRANS	3	2641-005WD-11-TI-C	0-5" STATIC PRESSURE TRANSDUCER	SETRA
SP2	1	1900-5-MR	COMPACT LOW DIFFERENTIAL SWITCH	DWYER
T1/T2	2	ST-FZ3-25	25' AVER. DUCT TEMP. SENSOR	KELE
T3	1	TS-2008BT	8" DUCT TEMP. SENSOR	ALERTON
CS1,CS2	2	H708	CURRENT SENSOR	HAWKEYE
DP1/DP2	6	1910	DIFFERENTIAL PRESSURE SWITCH	DWYER
-	6	A-602	DIFF. PRESSURE SWITCH ACCESSORY	DWYER
V1	1	SEE.VALVE.SCHEDULE	3-WAY VALVE DIVERTING VALVE	BELIMO
SP1	2	I/DP-8-4	DUCT TRANS. 4-20mA, 0-3"	INTEC
-	6	A-302	SP TIP.BARB CONN.	DWYER
-	6	A-345	SP TIP FLANGE	DWYER
D3,4&5	3	-	DAMPER ACTUATORS	-

SUBPANEL - BILL OF MATERIALS

DEVICE	QUANTITY	PART#	DESCRIPTION	MANUFACTURER
C1/C2	2	VLC-1188C3	CONTROLLER	ALERTON
TX-1	1	691-K1	120/24VAC XFMR., 100VA	KELE
R1-R6	6	MR-601T	RELAY W/HOA SWITCH	KELE
TB0-TB3	85	M4/6	TERMINAL BLOCK	KELE
----	8	FEM6	END SECTION	KELE
----	8	BAM	END STOPS	KELE
----	2	M10/16SFL	FUSE W/HOLDER	KELE
FS1	1	AGC 1	1 AMP. GLASS FUSE	KELE
FS2	1	AGC 5	4 AMP. GLASS FUSE	KELE
FIP	1	A-24N24ALP	NEMA 1 ENCLOSURE, 24"WX24"Hx6"D	HOFFMAN
----	1	A-24N24MP	SUBPANEL, 21.00"HX22.50"W	HOFFMAN
-				
-				



FIP AHU-1 SUBPANEL LAYOUT

SEQUENCE OF OPERATIONS

AHU-1& 2

When the system is in operation as indicated the following sequence shall occur. The minimum out side airflow shall be measured through a duct-mounted airflow measuring station located in the outside air duct. When the outside air temperature is at or above 21°C (70°F) the minimum outside air damper (D-1) shall open, the return air and relief air dampers (D-2 & D-3) shall modulate to maintain the minimum outside airflow, the economizer and relief air dampers (D-4 & D-5) shall be closed and cooling coil control valve (V-1) shall modulate to maintain the discharge temperature at 11. 4°C (52.5°F). When the outside air temperature is below 21°C (70°F), the min OA damper (D-1) shall be open, return air; economizer and relief air dampers (D-3, D-4 AND D-5) shall modulate in sequence with the cooling coil control (V-1) to maintain discharge air temperature setpoint of 11.4°C (52.5°F) and the min. outside airflow shall be maintained. When the outside air temperature drops below 11.4°C (52.5°F) the cooling coil control valve (V-1) shall be closed to the cooling coil and economizer, relief and return dampers (D-3, D-4, & D-5) shall modulate in sequence to maintain the discharge air temperature 11.4°C (52.5°F) two duct mounted static pressure sensors/controllers shall modulate the variable frequency drives mounted near the AHU, through a discriminator selector, to maintain a min.static pressure of 250Pa (1" wg) setpoint. The return air fan shall track the operation of supply air fan by maintaining a constant differential airflow equal to that of the min. outside air. Supply and return airflow-measuring stations mounted in the fan inlet/s shall measure airflow's. A high static pressure sensor shall shut down both supply and return air fan drives when the duct pressurizes 1250Pa (5" wg). This controller shall be directly connected to the VFD drives and alarm the DDC system on the high static pressure shut down.

BUILDING COOL DOWN CYCLE (COOLING PERIOD ONLY)

Approximately 1- ½ hours before the normal time occupancy of the building occurs, the DDC system shall start the HVAC system as follows: the return damper shall open, the AHU supply fans shall start, all interlocked exhaust fans shall remain off, CWP-1 and CWP-2 shall start and chiller WCI-1 shall operate when water flow is proven. All chilled water control valves for AHU cooling coil shall modulate to maintain their set point temperature. During this period of operation the outside damper shall remain closed. Approximately ½ hour before the normal occupancy period occurs the DDC system shall place the system in the normal occupied position, the outside damper shall open, interlocked exhaust fans shall start and the AHU system and cooling system shall continue to operate in their normal occupied sequence.

BUILDING WARM-UP CYCLE (HEATING PERIOD ONLY)

Approximately 1- ½ hours before the normal time occupancy of the building occurs, the DDC system shall start the HVAC system as follows: the return damper shall open, the AHU supply fans shall start, all interlocked exhaust fans shall remain off, HWP-1 shall start, and the boiler B-1 shall be enabled when then water flow is proven. All H.W. control valves for terminal unit coils shall modulate to maintain their occupied set point temperature. During this period of operation the outside air damper shall remain closed. Approximately ½ hour before the normal occupancy period occurs the DDC system shall place the system in the normal occupied position, the outside air damper shall open, interlocked exhaust fans shall start and the AHU systems and the heating systems shall continue to operate in their normal occupied sequence.

TIMED OVERRIDE CYCLE

Each terminal unit thermostat (TU T-STAT) shall be capable of overriding the system "OFF" cycle to provide periods of system override operation. The TU STAT shall override the operation of the DDC system "OFF" period, when the DDC system has the system off for unoccupied periods. The TU STAT shall have the capability to operate for a maximum period of 4 hours (adjustable from the central processor). When the TU STAT is manually set the associated AHU shall start in its normal sequence, and the heating and /or cooling systems shall start and operate in its normal operating sequence. When the TU STAT has expired the AHU and heating and/or cooling systems shall stop and return to the normal unoccupied sequence.

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07/30/02

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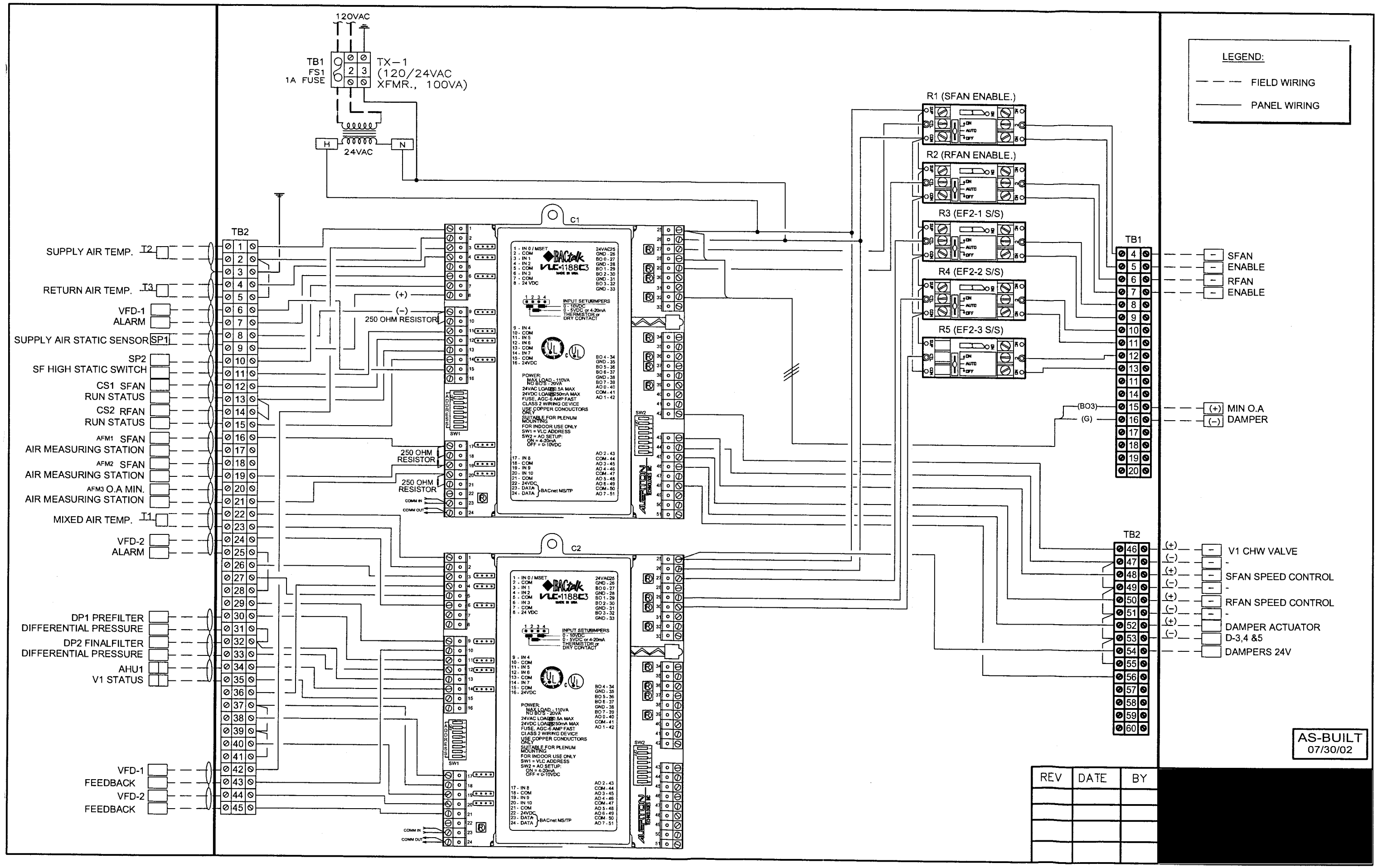
120VAC
TB1
FS1
1A FUSE
TX-1
(120/24VAC
XFMR., 100VA)
H
N
24VAC
TB2
SUPPLY AIR TEMP. T2
RETURN AIR TEMP. T3
VFD-1 ALARM
SUPPLY AIR STATIC SENSOR SP1
SP2
SF HIGH STATIC SWITCH
CS1 SFAN RUN STATUS
CS2 RFAN RUN STATUS
AFM1 SFAN AIR MEASURING STATION
AFM2 SFAN AIR MEASURING STATION
AFM3 O.A MIN. AIR MEASURING STATION
MIXED AIR TEMP. T1
VFD-2 ALARM
DP1 PREFILTER DIFFERENTIAL PRESSURE
DP2 FINALFILTER DIFFERENTIAL PRESSURE
AHU1 V1 STATUS
VFD-1 FEEDBACK
VFD-2 FEEDBACK
(+)
(-)
250 OHM RESISTOR
250 OHM RESISTOR
C1
C2
VLC-1188C3
SW1
SW2
COMM IN
COMM OUT
R1 (SFAN ENABLE.)
R2 (RFAN ENABLE.)
R3 (EF2-1 S/S)
R4 (EF2-2 S/S)
R5 (EF2-3 S/S)
ON
AUTO
OFF
TB1
SFAN ENABLE
RFAN ENABLE
(BO3)
(G)
(+) MIN O.A
(-) DAMPER
TB2
(+) V1 CHW VALVE
(-) -
(+) SFAN SPEED CONTROL
(-) -
(+) RFAN SPEED CONTROL
(-) -
(+) DAMPER ACTUATOR
(-) D-3,4 &5
DAMPERS 24V
LEGEND:
FIELD WIRING
PANEL WIRING
AS-BUILT
07/30/02
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DATE
BY

CONTROLLER SCHEDULE

CONTROLLER: *C1* | TYPE: *VLC-1188C3* | ADDRESS: *(SEE SCH.)*

LOCATION: *MAIN MECH. RM-2D-05*

SYSTEM: *AHU-2*

IN	TYPE	AUX	POINT	OUT	AUX	POINT
0	THERM.	T2	SUPPLY AIR TEMP.	*B00*	R1	SFAN ENABLE
1	-	VFD-1	FEEDBACK	*B01*	R2	RFAN VFD ENABLE
2	THERM.	T3	RETURN AIR TEMP.	*B02*		
3	D.C.	VFD-1	ALARM	*B03*	D1	MIN. O.A DAMPER
4	4-20mA	SP1	SUPPLY AIR STATIC S.	*B04*		
5	D.C	SP2	FAN HIGH STATIC S.	*B05*		
6	D.C	CS1	SFAN STATUS	*B06*		
7	D.C	CS2	RFAN STATUS	*A01*	V1	CHILLED WATER VALVE
8	4-20mA	AFM1	AIR FLOW SFAN	*A02*	VFD	SFAN SPEED CONTROL
9	4-20mA	AFM2	AIR FLOW RFAN	*A03*	VFD	RFAN SPEED CONTROL
10	4-20mA	AFM3	MIN O.A. FLOW	*A04*	D3,4&5	DAMPER ACTUATORS
				A05		
				A06		
				A07		

CONTROLLER SCHEDULE

CONTROLLER: *C2* TYPE: *VLC-1188C3* ADDRESS: *(SEE SCH.)*

LOCATION: *MAIN MECH. RM-2D-05*

SYSTEM: *AHU-2*

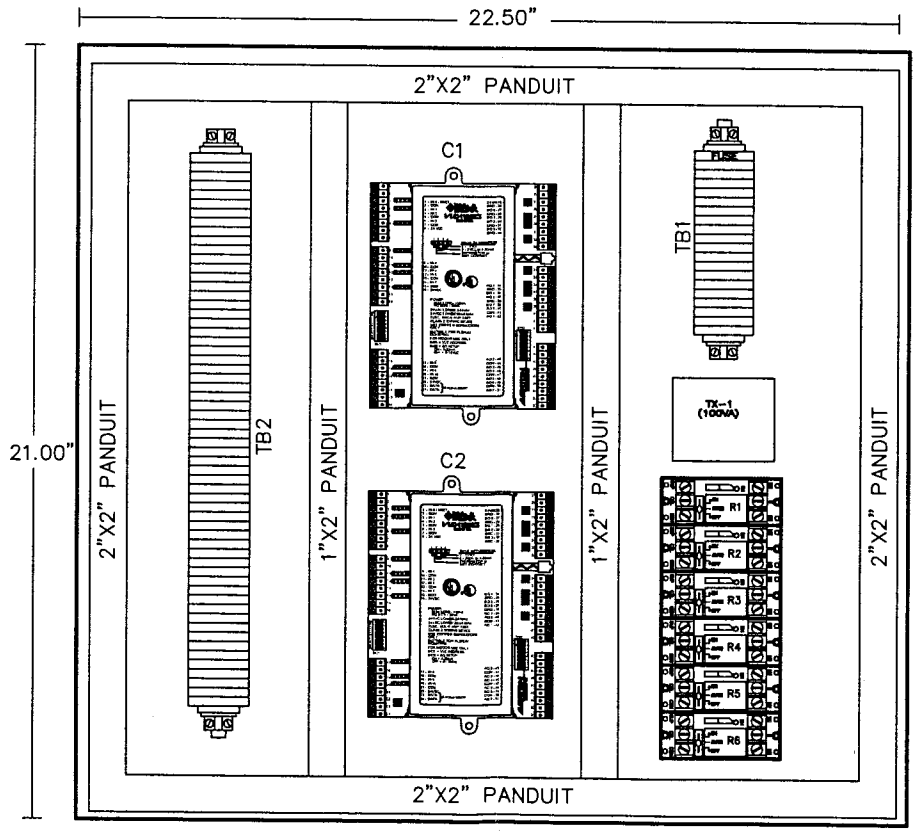
IN	TYPE	AUX	POINT	OUT	AUX	POINT
0	THERM.	T-1	MIXED AIR TEMP	*B00*		
1				*B01*		
2	D.C	DP3	EF2-1 RUN STATUS	*B02*		
3	D.C	VFD-2	ALARM	*B03*		
4				*B04*		
5	D.C	DP1	PRE FILTER	*B05*		
6	D.C	DP2	FINAL FILTER	*B06*		
7	-	V1	CHW VALVE POSITION	*A01*		
8				*A02*		
9				*A03*		
10	-	VFD-2	FEEDBACK	*A04*		
				A05		
				A06		
				A07		

FIELD - BILL OF MATERIALS

DEVICE	QUANTITY	PART#	DESCRIPTION	MANUFACTURER
AFM/TRANS	3	2641-005WD-11-T1-C	O-5" STATIC PRESSURE TRANSDUCER	SETRA
SP2	1	1900-5-MR	COMPACT LOW DIFFERENTIAL SWITCH	DWYER
T1/T2	2	ST-FZ3-25	25' AVER. DUCT TEMP. SENSOR	KELE
T3	1	TS-2008BT	8' DUCT TEMP. SENSOR	ALERTON
CS1,CS2	2	H708	CURRENT SENSOR	HAWKEYE
DP1/DP2	6	1910	DIFFERENTIAL PRESSURE SWITCH	DWYER
-	6	A-602	DIFF. PRESSURE SWITCH ACCESSORY	DWYER
V1	1	SEE.VALVE.SCHEDULE	3-WAY VALVE DIVERTING VALVE	BELIMO
SP1	2	I/DP-8-4	DUCT TRANS. 4-20mA, 0-3"	INTEC
-	6	A-302	SP TIP.BARB CONN.	DWYER
-	6	A-345	SP TIP FLANGE	DWYER
D3,4&5	3	-	DAMPER ACTUATOR	-

SUBPANEL - BILL OF MATERIALS

DEVICE	QUANTITY	PART#	DESCRIPTION	MANUFACTURER
C1/C2	2	VLC-1188C3	CONTROLLER	ALERTON
TX-1	1	691-K1	120/24VAC XFMR., 100VA	KELE
R1-R5	5	MR-601T	RELAY W/HOA SWITCH	KELE
TB0-TB3	85	M4/6	TERMINAL BLOCK	KELE
---	8	FEM6	END SECTION	KELE
---	8	BAM	END STOPS	KELE
---	2	M10/16SFL	FUSE W/HOLDER	KELE
FS1	1	AGC 1	1 AMP. GLASS FUSE	KELE
FS2	1	AGC.5	4 AMP. GLASS FUSE	KELE
FIP	1	A-24N24ALP	NEMA 1 ENCLOSURE, 24"WX24"Hx6"D	HOFFMAN
---	1	A-24N24MP	SUBPANEL, 21.00"HX22.50"W	HOFFMAN
-				
-				



FIP AHU-2 SUBPANEL LAYOUT

SEQUENCE OF OPERATIONS

AHU-1& 2

When the system is in operation as indicated the following sequence shall occur. The minimum out side airflow shall be measured through a duct-mounted airflow measuring station located in the outside air duct. When the outside air temperature is at or above 21°C (70°F) the minimum outside air damper (D-1) shall open, the return air and relief air dampers (D-2 & D-3) shall modulate to maintain the minimum outside airflow, the economizer and relief air dampers (D-4 & D-5) shall be closed and cooling coil control valve (V-1) shall modulate to maintain the discharge temperature at 11. 4°C (52.5°F). When the outside air temperature is below 21°C (70°F), the min OA damper (D-1) shall be open, return air; economizer and relief air dampers (D-3, D-4 AND D-5) shall modulate in sequence with the cooling coil control (V-1) to maintain discharge air temperature setpoint of 11.4°C (52.5°F) and the min. outside airflow shall be maintained. When the outside air temperature drops below 11.4°C (52.5°F) the cooling coil control valve (V-1) shall be closed to the cooling coil and economizer, relief and return dampers (D-3, D-4, & D-5) shall modulate in sequence to maintain the discharge air temperature 11.4°C (52.5°F) two duct mounted static pressure sensors/controllers shall modulate the variable frequency drives mounted near the AHU, through a discriminator selector, to maintain a min.static pressure of 250Pa (1" wg) setpoint. The return air fan shall track the operation of supply air fan by maintaining a constant differential airflow equal to that of the min. outside air. Supply and return airflow-measuring stations mounted in the fan inlet/s shall measure airflow's. A high static pressure sensor shall shut down both supply and return air fan drives when the duct pressurizes 1250Pa (5" wg). This controller shall be directly connected to the VFD drives and alarm the DDC system on the high static pressure shut down.

BUILDING COOL DOWN CYCLE (COOLING PERIOD ONLY)

Approximately 1- ½ hours before the normal time occupancy of the building occurs, the DDC system shall start the HVAC system as follows: the return damper shall open, the AHU supply fans shall start, all interlocked exhaust fans shall remain off, CWP-1 and CWP-2 shall start and chiller WCI-1 shall operate when water flow is proven. All chilled water control valves for AHU cooling coil shall modulate to maintain their set point temperature. During this period of operation the outside damper shall remain closed. Approximately ½ hour before the normal occupancy period occurs the DDC system shall place the system in the normal occupied position, the outside damper shall open, interlocked exhaust fans shall start and the AHU system and cooling system shall continue to operate in their normal occupied sequence.

BUILDING WARM-UP CYCLE (HEATING PERIOD ONLY)

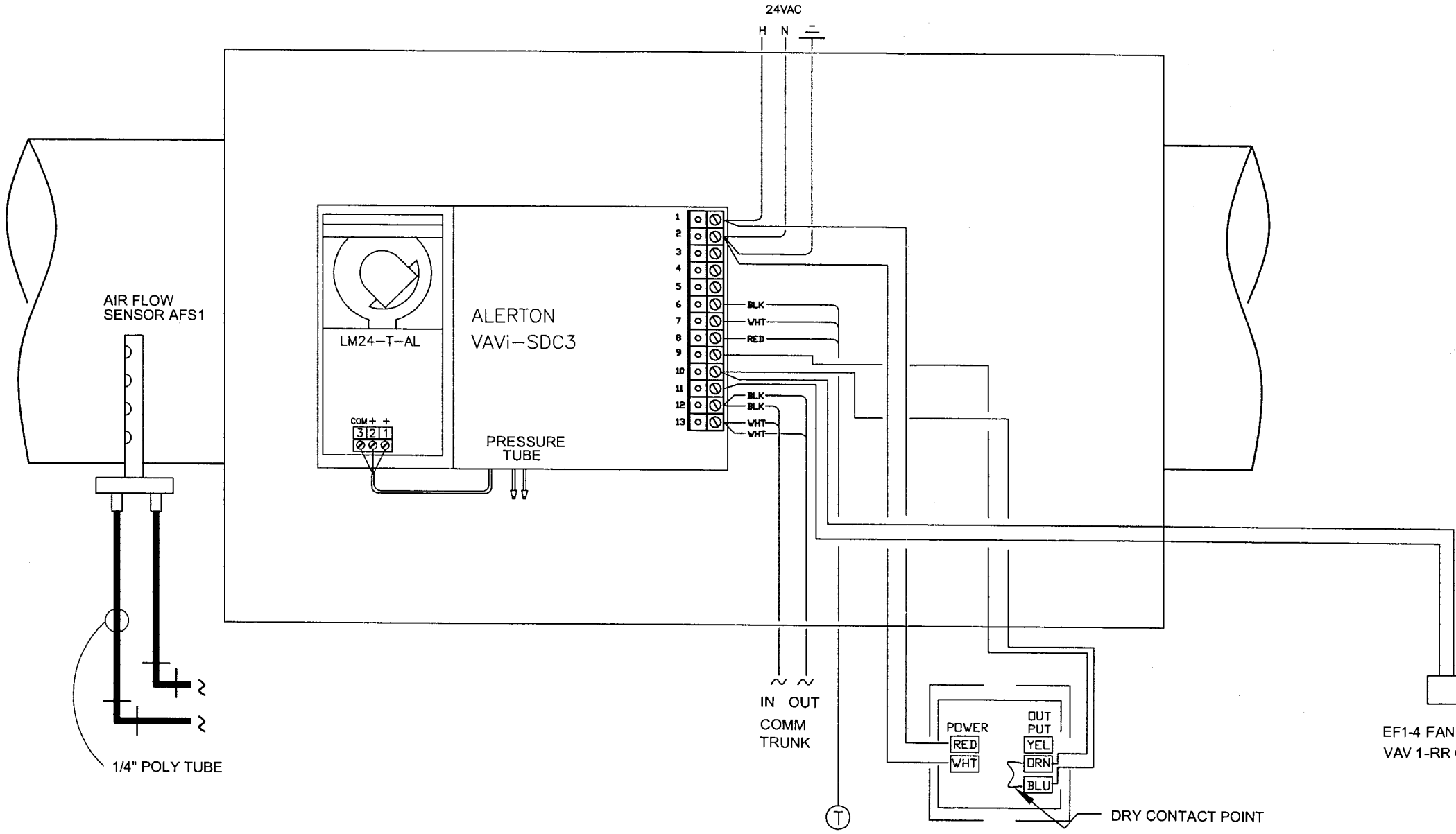
Approximately 1- ½ hours before the normal time occupancy of the building occurs, the DDC system shall start the HVAC system as follows: the return damper shall open, the AHU supply fans shall start, all interlocked exhaust fans shall remain off, HWP-1 shall start, and the boiler B-1 shall be enabled when then water flow is proven. All H.W. control valves for terminal unit coils shall modulate to maintain their occupied set point temperature. During this period of operation the outside air damper shall remain closed. Approximately ½ hour before the normal occupancy period occurs the DDC system shall place the system in the normal occupied position, the outside air damper shall open, interlocked exhaust fans shall start and the AHU systems and the heating systems shall continue to operate in their normal occupied sequence.

TIMED OVERRIDE CYCLE

Each terminal unit thermostat (TU T-STAT) shall be capable of overriding the system "OFF" cycle to provide periods of system override operation. The TU STAT shall override the operation of the DDC system "OFF" period, when the DDC system has the system off for unoccupied periods. The TU STAT shall have the capability to operate for a maximum period of 4 hours (adjustable from the central processor). When the TU STAT is manually set the associated AHU shall start in its normal sequence, and the heating and /or cooling systems shall start and operate in its normal operating sequence. When the TU STAT has expired the AHU and heating and/or cooling systems shall stop and return to the normal unoccupied sequence.

AS-BUILT
07/30/02

REV	DATE	BY



A/C5 UNIT CONDENSATE WATER SENSOR
A/C UNIT LOCATION: RM 1B-21
SEE NOTE ◇1

NOTE ◇1
TYPICAL FOR VAV COOL ONLY # 1-NNN

BILL OF MATERIAL

TAG	QTY	MODEL	DESCRIPTION	MFR
AD	5	VAVi-SDC3	VAV CONTROLLER W/ACTUATOR	ALERTON
T	5	TS-1050BT	WALL MTD TEMP SENSOR	ALERTON
–	1	WD-1B	CONDENSATE WATER DETECTOR	KELE

SEQUENCE OF OPERATION

VAV (VARIABLE AIR VOLUME) COOL ONLY
A SPACE TEMPERATURE SENSOR SHALL MODULE THE AIRFLOW FROM THE MAXIMUM TO THE MINIMUM SET POINT OF 21°C (70°F).

VAV COOL ONLY TYPICAL FOR 1-NNN, 1-PPP, 1-RR, 2-CC, 2-KK.

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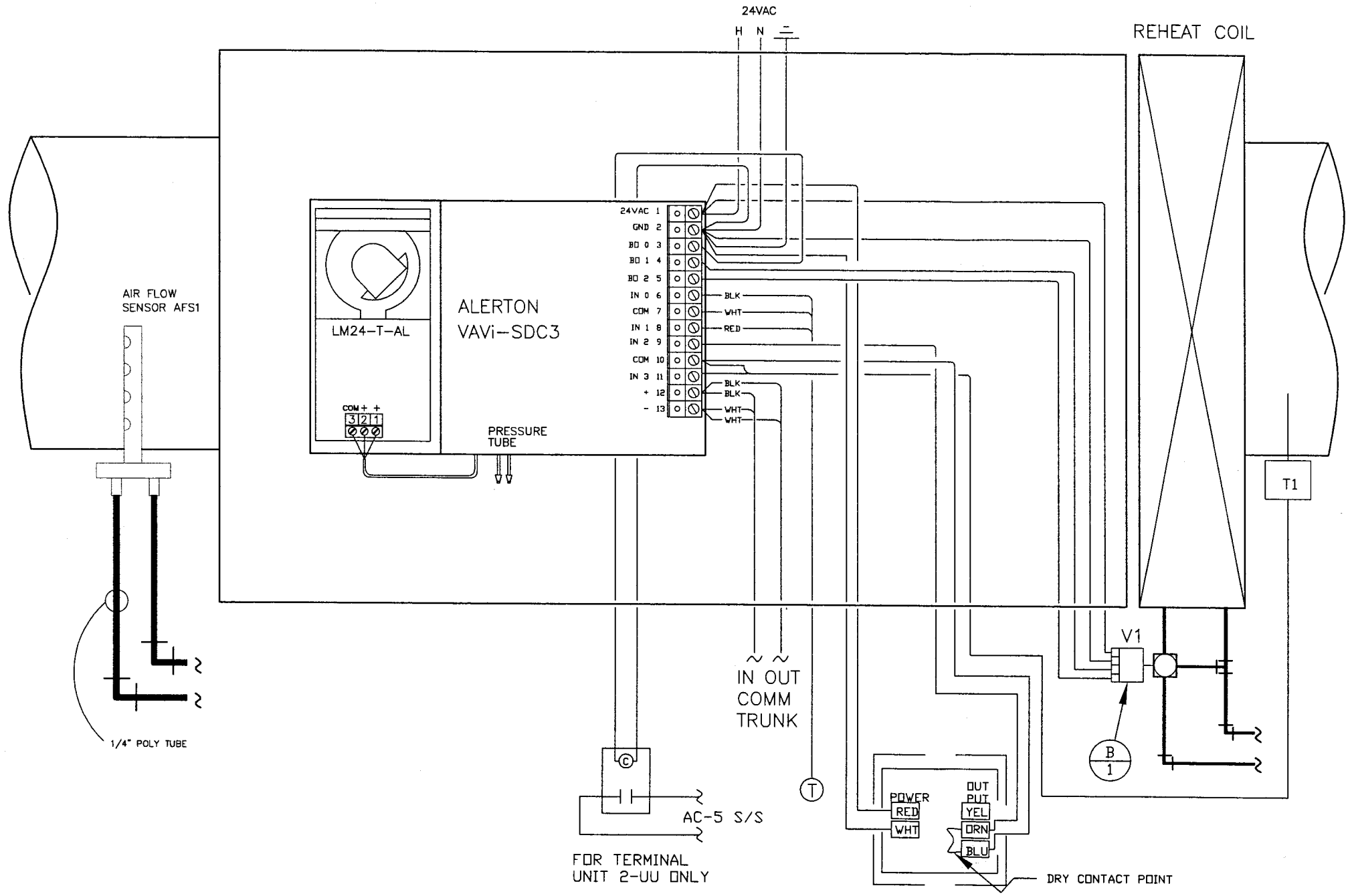
REV	DATE	BY



A/C2-5 UNIT CONDENSATE WATER SENSOR
A/C UNITS LOCATION: A/C2 RM 1C-13, A/C3 RM 2B-12, A/C4 RM 2C-15, A/C5 RM 2D-4
SEE NOTE ⟨1⟩

NOTE ⟨1⟩
TYPICAL FOR VAV W/REHEAT # 1-AA,
2-LLL, 2-AA & 2-UU.

BILL OF MATERIAL

TAG	QTY	MODEL	DESCRIPTION	MFR
AD	4	VAVi-SDC3	VAV CONTROLLER W/ACTUATOR	ALERTON
T	4	TS-1050BT	WALL MTD TEMP SENSOR	ALERTON
V1	4	SEE VALVE SCHEDULE	REHEAT VALVE	BELIMO
–	4	WD-1B	CONDENSATE WATER DETECTOR	KELE
T1	4	TS-2000BT	DUCT TEMP. SENSOR 5" PROBE	ALERTON

CONTROLLER TERMINALS

VALVE ACTUATOR

OPEN	
CLOSE	Y1
COM	Y2

B / 1

SEQUENCE OF OPERATION

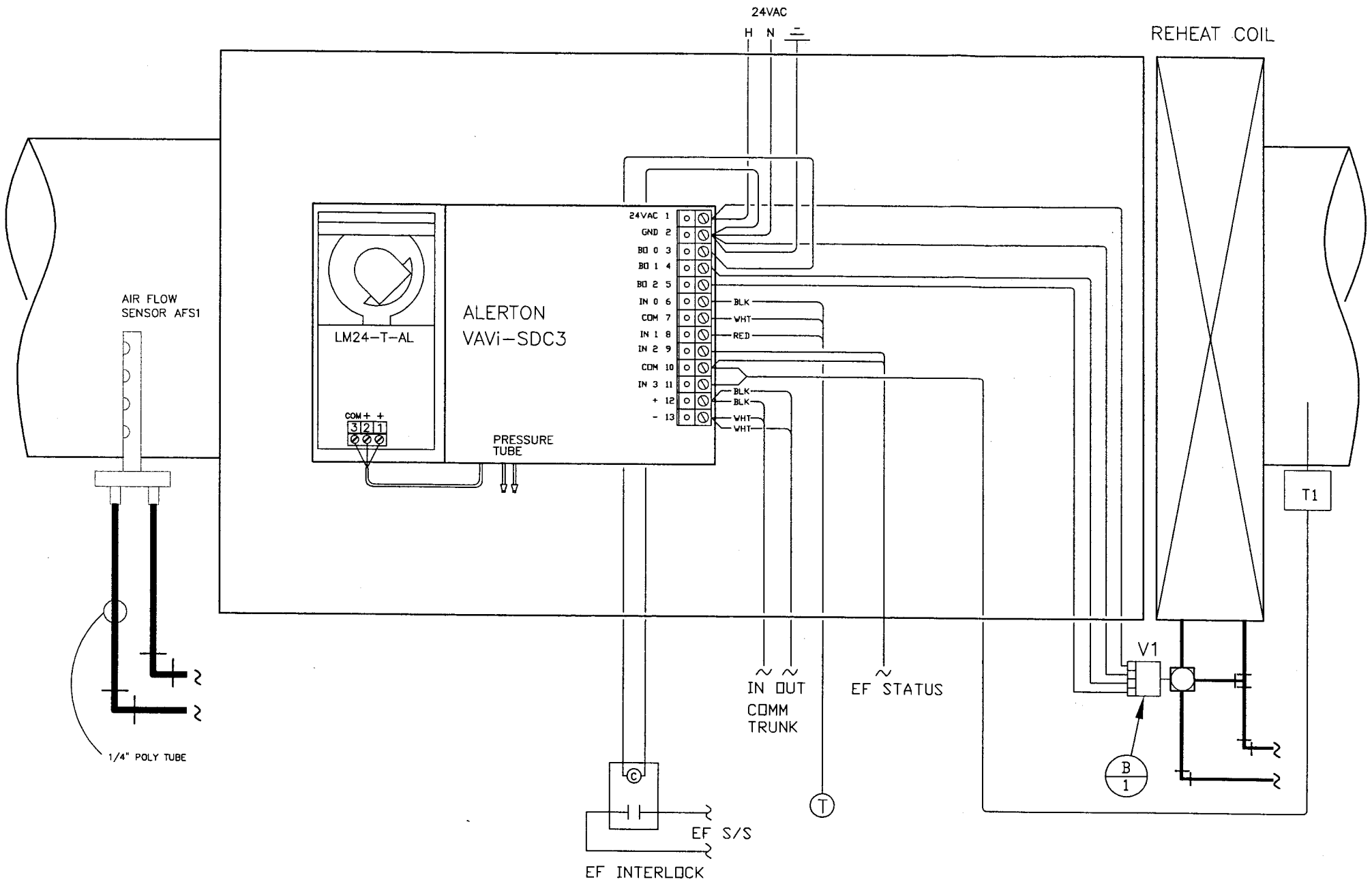
~~VAV (VARIABLE AIR VOLUME) WITH REHEAT~~
A space temperature sensor shall modulate the airflow from the maximum to the minimum airflow to maintain set point of 21°C (70°F). When the minimum airflow set point is reached and on a further fall in space temperature the terminal unit hot water control valve shall modulate to maintain space temperature.

~~CV (CONSTANT AIR VOLUME) WITH REHEAT~~
They shall be the same as VAV with reheat above except controls shall be set for constant volume airflow.

V-1 DETAILS

REV	DATE	BY

AS-BUILT
07/30/02



EF SCHEDULE:

EF 1-2: VAV 1-EEE
EF 1-1: VAV 1-W
EF 1-4: VAV 1-TT
EF 1-3: VAV 1-GGG

SEQUENCE OF OPERATION

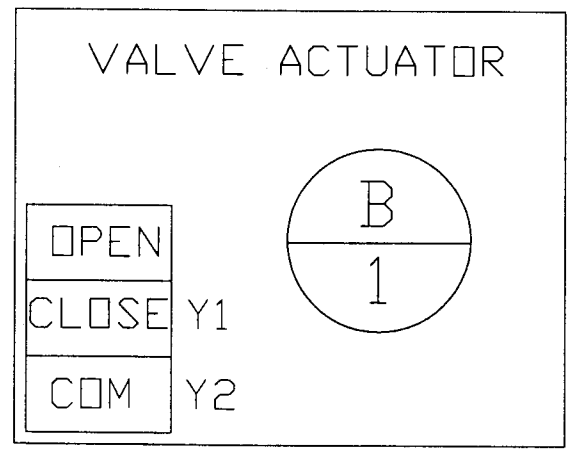
VAV (VARIABLE AIR VOLUME) WITH REHEAT
A space temperature sensor shall modulate the airflow from the maximum to the minimum airflow to maintain set point of 21°C (70°F). When the minimum airflow set point is reached and on a further fall in space temperature the terminal unit hot water control valve shall modulate to maintain space temperature.

CV (CONSTANT AIR VOLUME) WITH REHEAT
They shall be the same as VAV with reheat above except controls shall be set for constant volume airflow.

BILL OF MATERIAL

TAG	QTY	MODEL	DESCRIPTION	MFR
AD	4	VAVi-SDC3	VAV CONTROLLER W/ACTUATOR	ALERTON
T	4	TS-1050BT	WALL MTD TEMP SENSOR	ALERTON
V1	4	SEE VALVE SCHEDULE	REHEAT VALVE	BELIMO
CS	4	H-735	COMBO S/S W/ STATUS	VERIS
T1	4	TS-2000BT	DUCT TEMP. SENSOR 5" PROBE	ALERTON

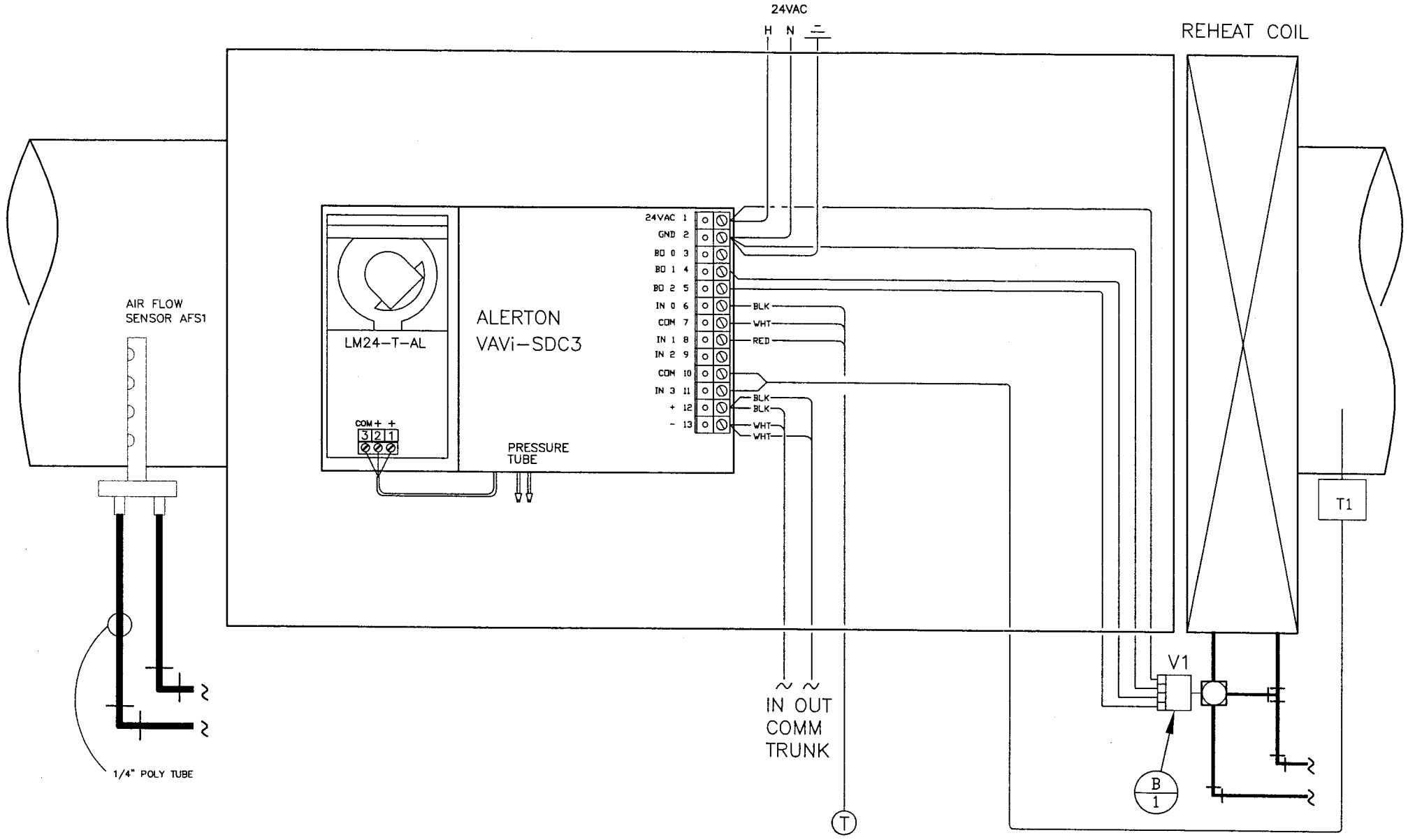
CONTROLLER TERMINALS



V-1 DETAILS

REV	DATE	BY

AS-BUILT
07/30/02



BILL OF MATERIAL

TAG	QTY	MODEL	DESCRIPTION	MFR
AD	–	VAVi-SDC3	VAV CONTROLLER W/ACTUATOR	ALERTON
T	–	TS-1050BT	WALL MTD TEMP SENSOR	ALERTON
V1	–	SEE VALVE SCHEDULE	REHEAT VALVE	BELIMO
T1	–	TS-2000BT	DUCT TEMP. SENSOR 5" PROBE	ALERTON

SEQUENCE OF OPERATION

VAV (VARIABLE AIR VOLUME) WITH REHEAT
A space temperature sensor shall modulate the airflow from the maximum to the minimum airflow to maintain set point of 21°C (70°F). When the minimum airflow set point is reached and on a further fall in space temperature the terminal unit hot water control valve shall modulate to maintain space temperature.

CV (CONSTANT AIR VOLUME) WITH REHEAT
They shall be the same as VAV with reheat above except controls shall be set for constant volume airflow.

CONTROLLER TERMINALS

VALVE ACTUATOR

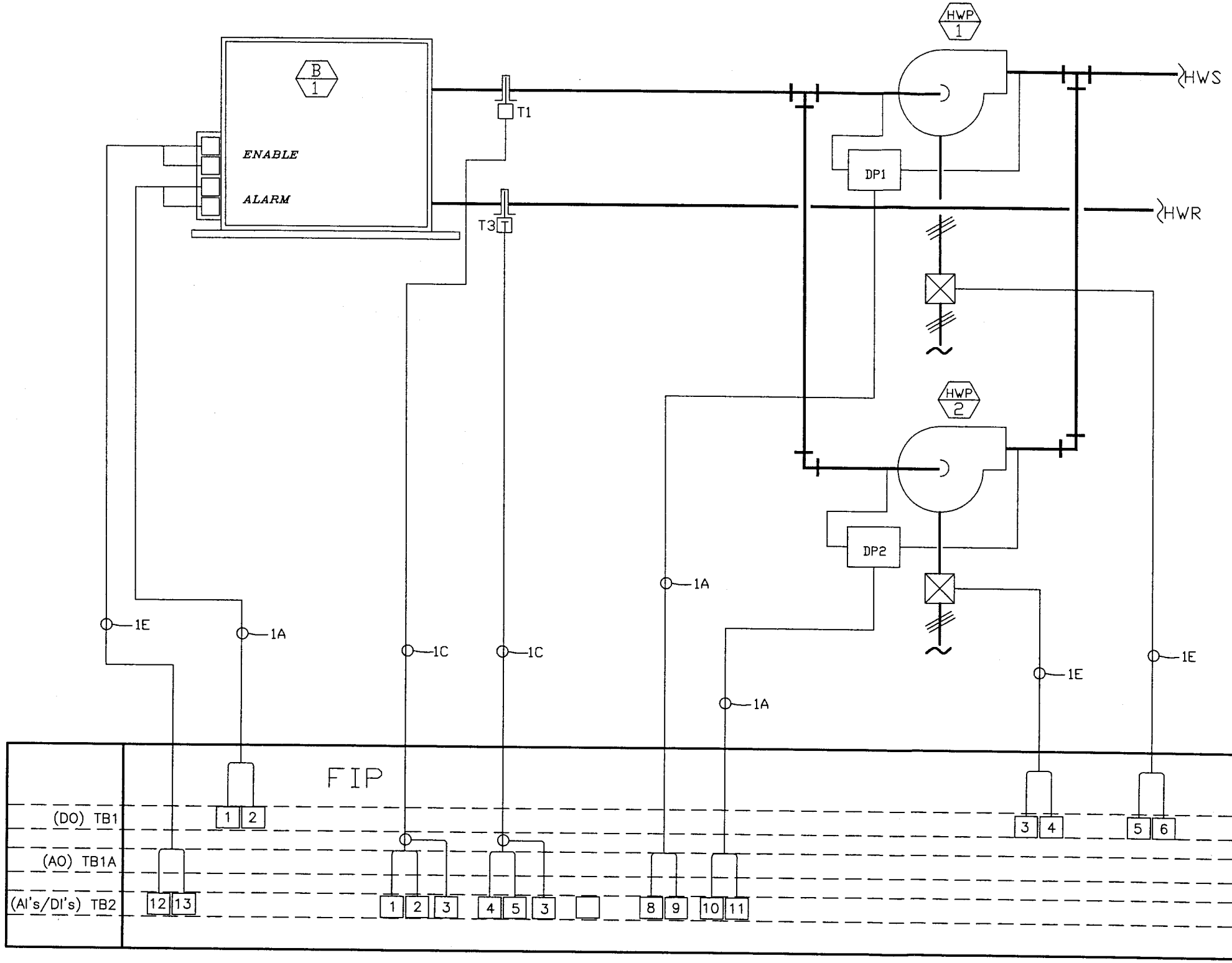
OPEN	
CLOSE	Y1
COM	Y2

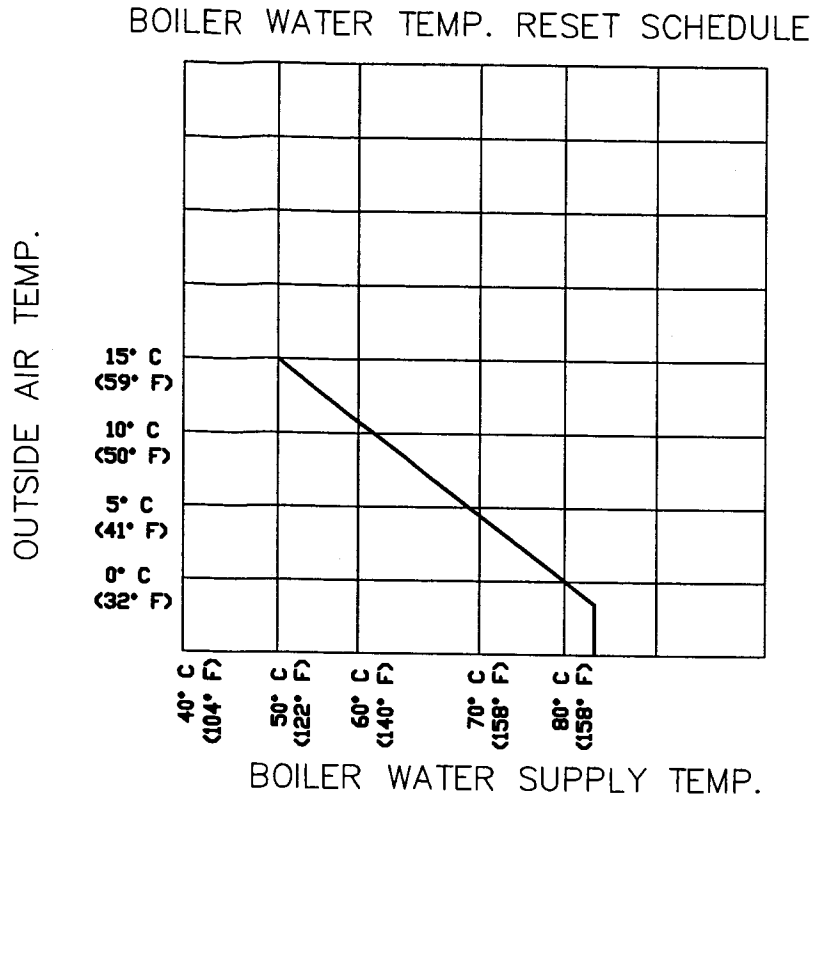
B / 1

V-1 DETAILS

REV	DATE	BY

AS-BUILT
07/30/02





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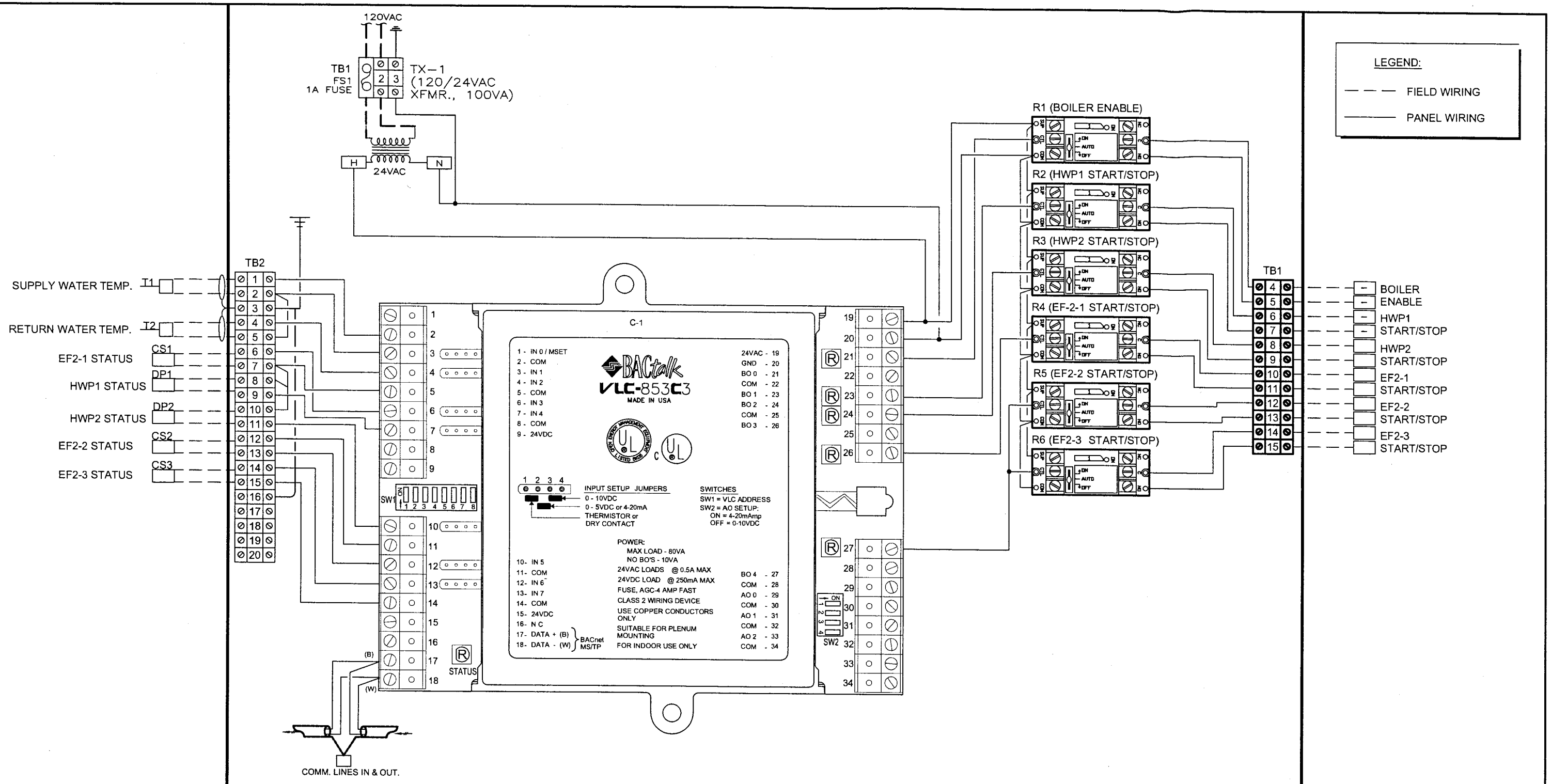


AS-BUILT
07/30/02

REV	DATE	BY

CONTROLLER SCHEDULE		
CONTROLLER: *C1*	TYPE: *VLC–853C3*	ADDRESS: *(SEE SCH.)*
LOCATION: –		
SYSTEM: *BOILER–1*		

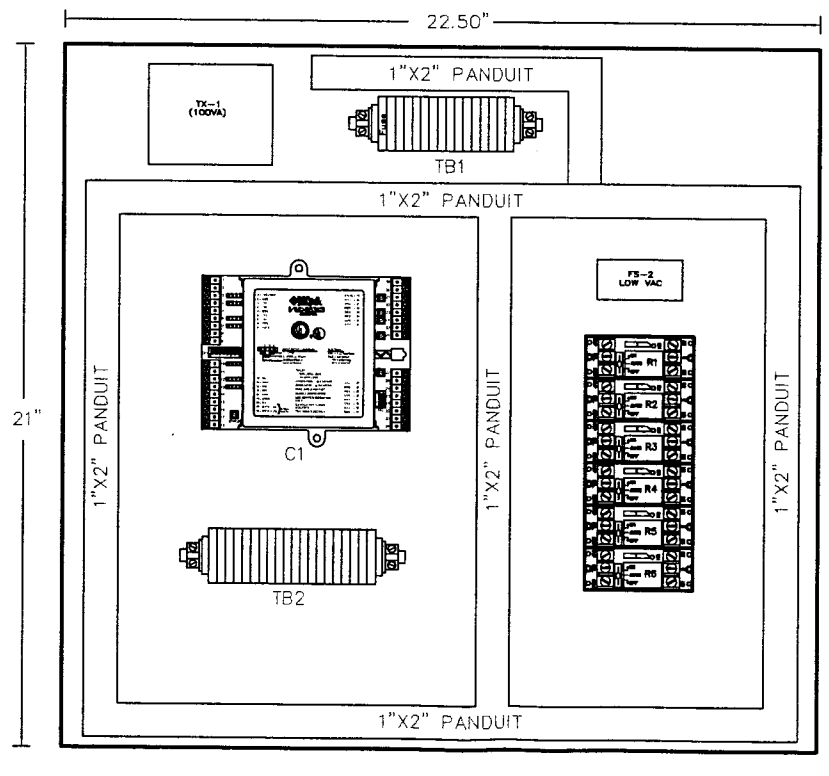
IN	TYPE	AUX	POINT	OUT	AUX	POINT
0	-	-	BOILER ALARM	*B00*	R1	BOILER ENABLE
1	THERM.	T1	SUPPLY WATER TEMP.	*B01*	R2	HWP1 START/STOP
2	THERM.	T2	RETURN WATER TEMP.	*B02*	R3	HWP2 START/STOP
3	D.C	CS1	EF2-1 STATUS	*B03*	R4	EF2-1 START/STOP
4	D.C.	DP1	HWP1 STATUS	*B04*	R5,6	EF2-2 & EF2-3 START/STOP
5	D.C.	DP2	HWP2 STATUS			
6	D.C	CS2	EF2-2 STATUS			
7	D.C.	CS3	EF2-3 STATUS	*A01*	-	-
				A02	-	-

FIELD - BILL OF MATERIALS

DEVICE	QUANTITY	PART#	DESCRIPTION	MANUFACTURER
T1/T2	2	TS-2100BT	2 1/2" IMMERSION TEMP SENSOR	ALERTON
DP1/DP2	2	24-013	DIFFERENTIAL SWITCH	KELE
F1	1	F61KB-11	FLOW SWITCH	KELE
-	2	TS-3100	2 1/2" PIPE WELL	ALERTON
CS1,2,3	3	H735	CURRENT SENSOR	VERIS
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

SUBPANEL - BILL OF MATERIALS

DEVICE	QUANTITY	PART#	DESCRIPTION	MANUFACTURER
-	-	-	-	-
C2	1	VLC-853C3	CONTROLLER	ALERTON
TX-1	1	691-K1	120/24VAC XFMR., 100VA	KELE
R1-R3	3	MR-601T	RELAY W/HOA SWITCH	KELE
TB0-TB3	85	M4/6	TERMINAL BLOCK	KELE
----	8	FEM6	END SECTION	KELE
----	8	BAM	END STOPS	KELE
----	2	M10/16SFL	FUSE W/HOLDER	KELE
FS1	1	AGC 1	1 AMP. GLASS FUSE	KELE
FS2	1	AGC 4	4 AMP. GLASS FUSE	KELE
FIP	1	A-24N24ALP	NEMA 1 ENCLOSURE, 24"WX24"Hx6"D	HOFFMAN
----	1	A-24N24MP	SUBPANEL, 21.00"HX22.50"W	HOFFMAN



FIP BOILER-1 SUBPANEL LAYOUT

SEQUENCE OF OPERATIONS

HEATING SYSTEM

The heating control sequence shall be initiated as follows: when the control system is energized HWP-1 and HWP-2 shall start, through hand-off-auto switches (when in auto position), and shall provide flow to the system. When hot water flow is proven through the flow switches at the boiler then the boiler controls shall be energized and the boiler will operate through its own safety and operating controls to maintain 82°C (180° F). Boiler water temperature sensors located in the HWS and HWR at the boiler shall indicate heating water temperatures at the DDC system. The boiler water temperature shall be reset as indicated on the boiler water reset schedule (see boiler control DWG. #19).

BUILDING WARM-UP CYCLE (HEATING PERIOD ONLY)

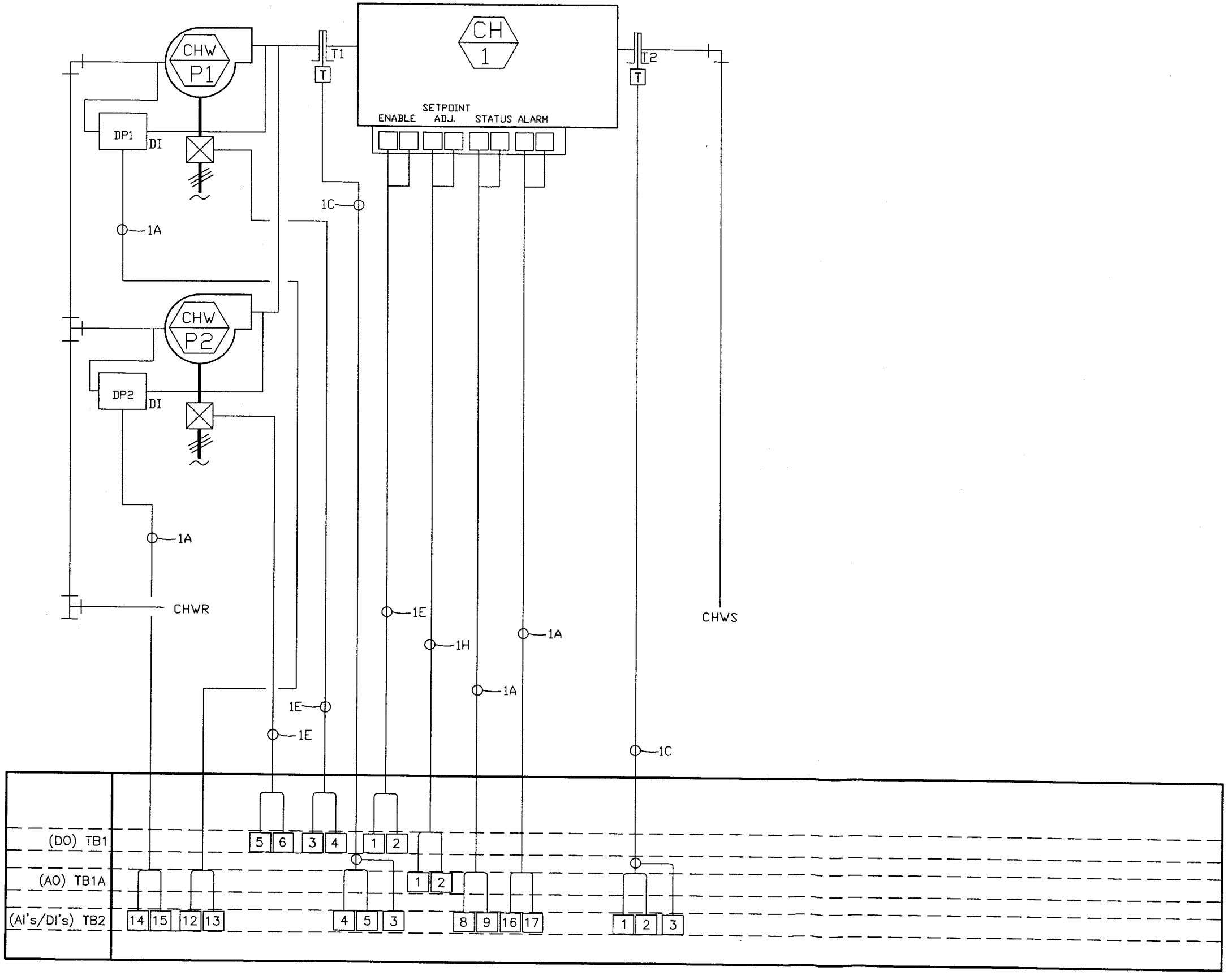
Approximately 1 - ½ hours before the normal time occupancy of the building occurs, the DDC system shall start the HVAC system as follows: the return damper shall open, the AHU supply fans shall start, all interlocked exhaust fans shall remain off, HWP-1 shall start, and the boiler B-1 shall be enabled when then water flow is proven. All H.W. control valves for terminal unit coils shall modulate to maintain their occupied set point temperature. During this period of operation the outside air damper shall remain closed. Approximately ½ hour before the normal occupancy period occurs the DDC system shall place the system in the normal occupied position, the outside air damper shall open, interlocked exhaust fans shall start and the AHU systems and the heating systems shall continue to operate in their normal occupied sequence.

TIMED OVERRIDE CYCLE

Each terminal unit thermostat (TU T-STAT) shall be capable of overriding the system "OFF" cycle to provide periods of system override operation. The TU STAT shall override the operation of the DDC system "OFF" period, when the DDC system has the system off for unoccupied periods. The TU STAT shall have the capability to operate for a maximum period of 4 hours (adjustable from the central processor). When the TU STAT is manually set the associated AHU shall start in its normal sequence, and the heating and /or cooling systems shall start and operate in its normal operating sequence. When the TU STAT has expired the AHU and heating and/or cooling systems shall stop and return to the normal unoccupied sequence.

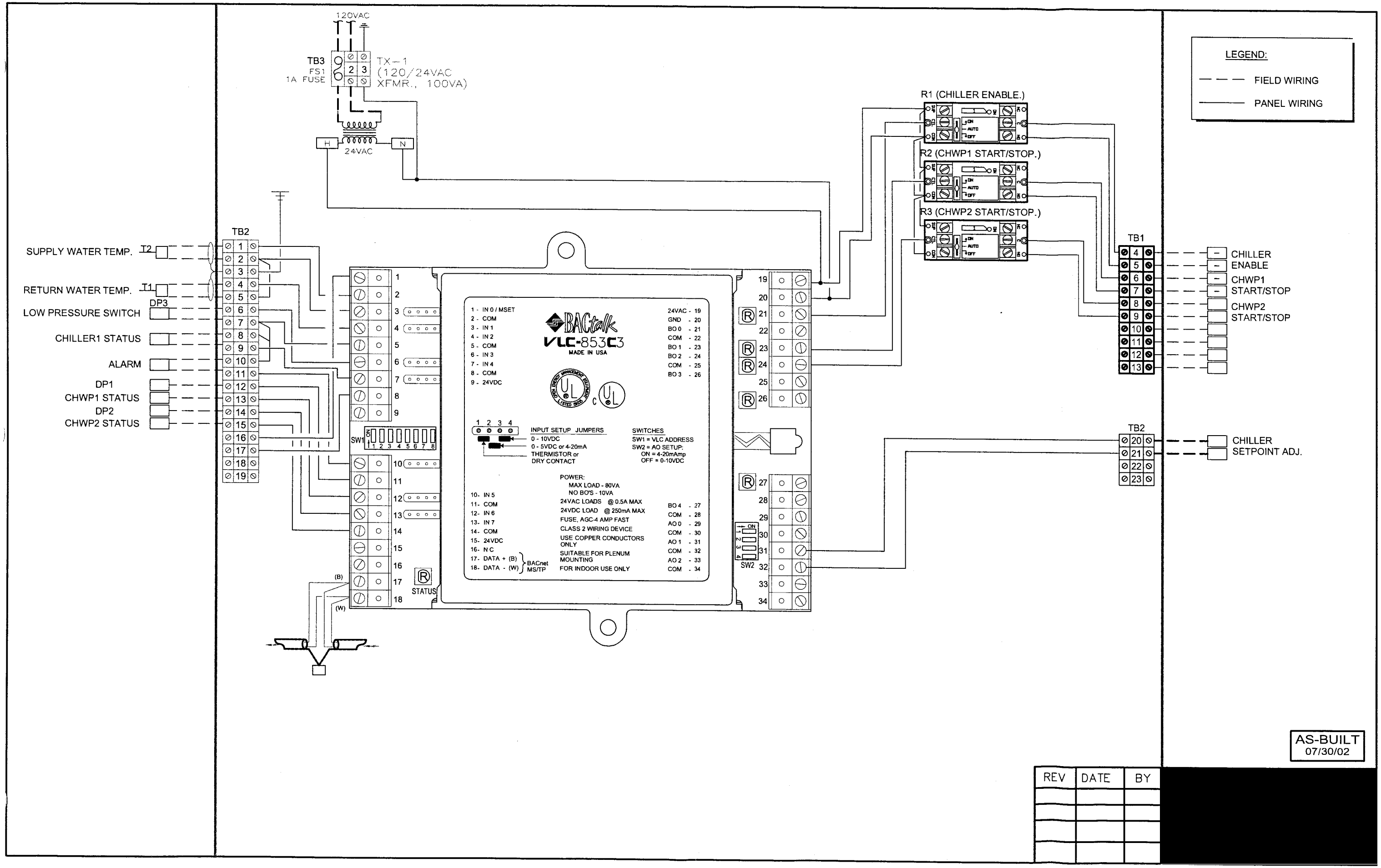
AS-BUILT
07/30/02

REV	DATE	BY	[redacted]



AS-BUILT
07/30/02

REV	DATE	BY	[redacted]


120VAC
TB3
FS1
1A FUSE
TX-1
(120/24VAC
XFMR., 100VA)
H
N
24VAC
TB2
SUPPLY WATER TEMP. I2
RETURN WATER TEMP. I1
DP3
LOW PRESSURE SWITCH
CHILLER1 STATUS
ALARM
DP1
CHWP1 STATUS
DP2
CHWP2 STATUS
1 - IN 0 / MSET
2 - COM
3 - IN 1
4 - IN 2
5 - COM
6 - IN 3
7 - IN 4
8 - COM
9 - 24VDC
BACtalk
VLC-853C3
MADE IN USA
24VAC - 19
GND - 20
BO 0 - 21
COM - 22
BO 1 - 23
BO 2 - 24
COM - 25
BO 3 - 26
INPUT SETUP JUMPERS
0 - 10VDC
0 - 5VDC or 4-20mA
THERMISTOR or
DRY CONTACT
SWITCHES
SW1 = VLC ADDRESS
SW2 = AO SETUP:
ON = 4-20mAmp
OFF = 0-10VDC
POWER:
MAX LOAD - 80VA
NO BO'S - 10VA
24VAC LOADS @ 0.5A MAX
24VDC LOAD @ 250mA MAX
FUSE, AGC-4 AMP FAST
CLASS 2 WIRING DEVICE
USE COPPER CONDUCTORS ONLY
SUITABLE FOR PLENUM MOUNTING
FOR INDOOR USE ONLY
10- IN 5
11- COM
12- IN 6
13- IN 7
14- COM
15- 24VDC
16- N C
17- DATA + (B)
18- DATA - (W)
BACnet MS/TP
BO 4 - 27
COM - 28
AO 0 - 29
COM - 30
AO 1 - 31
COM - 32
AO 2 - 33
COM - 34
SW1
SW2
STATUS
(B)
(W)
R1 (CHILLER ENABLE.)
R2 (CHWP1 START/STOP.)
R3 (CHWP2 START/STOP.)
TB1
CHILLER ENABLE
CHWP1 START/STOP
CHWP2 START/STOP
TB2
CHILLER SETPOINT ADJ.
LEGEND:
FIELD WIRING
PANEL WIRING
AS-BUILT
07/30/02
REV
DATE
BY

CONTROLLER SCHEDULE		
CONTROLLER: *C1*	TYPE: *VLC–853C3*	ADDRESS: *(SEE SCH.)*
LOCATION: *MAIN MECH. RM–2D–05*		
SYSTEM: *CHILLER–1*		

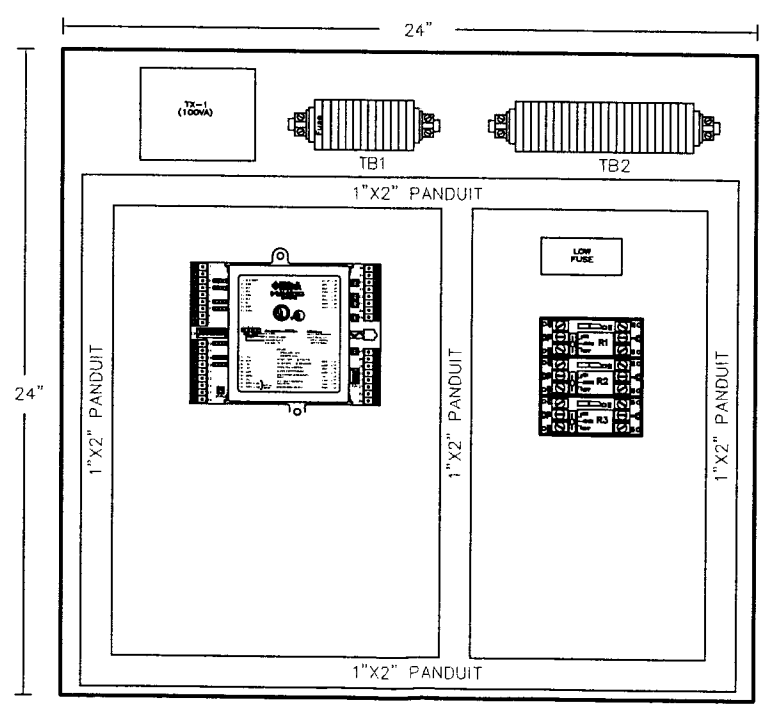
IN	TYPE	AUX	POINT	OUT	AUX	POINT
0	D.C.	-	ALARM	*B00*	R1	CHILLER1 ENABLE
1	THERM.	T2	SUPPLY WATER TEMP.	*B01*	R2	CHWP1 START/STOP
2	THERM.	T1	RETURN WATER TEMP.	*B02*	R3	CHWP2 START/STOP
3	-	-	LOW PSI SW	*B03*	-	-
4	D.C	-	CHILLER STATUS	*B04*		
5				*B05*		
6	D.C	DP1	CHWP1 STATUS	*B06*		
7	D.C	DP2	CHWP2 STATUS	*A01*	-	-
8				*A02*	-	-
9	-	-	-	*A03*	-	-
10	-	-	-	*A04*	-	-
				A05	-	-
				A06	-	-
				A07	-	-

FIELD - BILL OF MATERIALS

DEVICE	QUANTITY	PART#	DESCRIPTION	MANUFACTURER
T1/T2	2	-	6" IMMERSION SENSOR	ALERTON
DP1/DP2	2	24-013	DIFFERENTIAL PRESSURE SWITCH	KELE
-	2	TS-3100	2 1/2" PIPE WELL	ALERTON
DP3	1	AFS460	LOW PRESSURE SWITCH	KELE
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

SUBPANEL - BILL OF MATERIALS

DEVICE	QUANTITY	PART#	DESCRIPTION	MANUFACTURER
-	-	-	-	-
C2	1	VLC-853C3	CONTROLLER	ALERTON
TX-1	1	691-K1	120/24VAC XFMR., 100VA	KELE
R1-R3	3	MR-601T	RELAY W/HOA SWITCH	KELE
TB0-TB3	85	M4/6	TERMINAL BLOCK	KELE
----	8	FEM6	END SECTION	KELE
----	8	BAM	END STOPS	KELE
----	2	M10/16SFL	FUSE W/HOLDER	KELE
FS1	1	AGC 1	1 AMP. GLASS FUSE	KELE
FS2	1	AGC 5	5 AMP. GLASS FUSE	KELE
FIP	1	A-24N24ALP	NEMA 1 ENCLOSURE, 24"WX24"Hx6"D	HOFFMAN
----	1	A-24N24MP	SUBPANEL, 21.00"HX22.50"W	HOFFMAN



FIP CHILLER-1 SUBPANEL LAYOUT

SEQUENCE OF OPERATIONS

COOLING SYSTEM
The cooling control sequence shall be initiated from the DDC system as follows: when the outside air temperature is above 13°C (55.4°F) and when the control system is energized, CWP-1 and CWP-2 pumps shall start, through hand-off-auto switches (when in auto position), and shall provide flow to the system. When chilled water flow is proven through the flow switch at the chiller then the chiller controls shall be energized and the chiller shall operate through its own safety and operating controls to maintain 7°C (44.6°F) discharge temperature. Temperature sensors located in the CWS and CWR at the chiller shall indicate the chiller water temperature at the DDC system. When the outside temperature drops below 13°C (55.4°F) the chiller system shall be deenergized.

BUILDING COOL DOWN CYCLE (COOLING PERIOD ONLY)
Approximately 1 - ½ hours before the normal time occupancy of the building occurs, the DDC system shall start the HVAC system as follows: the return damper shall open, the AHU supply fans shall start, all interlocked exhaust fans shall remain off, CWP-1 and CWP-2 shall start and chiller WCI-1 shall operate when water flow is proven. All chilled water control valves for AHU cooling coil shall modulate to maintain their set point temperature. During this period of operation the outside damper shall remain closed. Approximately ½ hour before the normal occupancy period occurs the DDC system shall place the system in the normal occupied position, the outside damper shall open, interlocked exhaust fans shall start and the AHU system and cooling system shall continue to operate in their normal occupied sequence.

TIMED OVERRIDE CYCLE
Each terminal unit thermostat (TU T-STAT) shall be capable of overriding the system "OFF" cycle to provide periods of system override operation. The TU STAT shall override the operation of the DDC system "OFF" period, when the DDC system has the system off for unoccupied periods. The TU STAT shall have the capability to operate for a maximum period of 4 hours (adjustable from the central processor). When the TU STAT is manually set the associated AHU shall start in its normal sequence, and the heating and /or cooling systems shall start and operate in its normal operating sequence. When the TU STAT has expired the AHU and heating and/or cooling systems shall stop and return to the normal unoccupied sequence.

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07/30/02

REV	DATE	BY	[redacted]

SEQUENCE OF OPERATIONS FOR ALL HVAC SYSTEMS AND UNITS

SEQUENCE OF CONTROL

1. GENERAL:

(A) The DDC System shall place the systems in operation. When placed in operation the control system/s shall be energized thru hand– off auto switches (when in auto position), dampers shall open to their respective positions (See warm-up and cool down cycles indicated on M9-3) and after a variable time delay, Air Handling Unit Fan/s and their interlock fans shall start.

(B) Whenever the air handling unit/s are stopped, the control system shall be de-energized, all dampers shall close, Air Handling Unit/s and interlocked fan/s shall stop.

(C) Any space/duct smoke detector sensing smoke shall signal the fire alarm control panel. The fire alarm control panel shall signal all air handling unit's with-in the affected zone (smoke compartment) that an alarm exists. **The above control is furnished and installed under the electrical section.** When an alarm is received the air handling unit/s with-in the affected zone (smoke compartment) shall stop, unless otherwise indicated, and all dampers shall close. The system may only be restarted by the fire department or other qualified personnel for the fire alarm panel. When an all-clear signal is received, all smoke detectors, Etc. shall be automatically reset, dampers shall open to their respective position. After a variable time delay, Air Handling Unit Fan/s and interlocked fans shall restart. See (D) below for VFD Drive contactor for bypass drive operation.

(D) The Air Handling Unit Fan shall operate subject to the fire alarm system control. Any time the VFD Drive Supply or Return Air Fan is placed in the bypass position, all terminal units associated with that AHU Supply or Return Air Fan should open to 100% airflow.

(E) Exhaust Fans EF1-1 through EF1-4 and EF2-1 through EF2-3 operation shall be monitored through the DDC system.

AHU-1& 2

When the system is in operation as indicated the following sequence shall occur. The minimum out side airflow shall be measured through a duct-mounted airflow measuring station located in the outside air duct. When the outside air temperature is at or above 21°C (70°F) the minimum outside air damper (D-1) shall open, the return air and relief air dampers (D-2 & D-3) shall modulate to maintain the minimum outside airflow, the economizer and relief air dampers (D-4 & D-5) shall be closed and cooling coil control valve (V-1) shall modulate to maintain the discharge temperature at 11. 4°C (52.5°F). When the outside air temperature is below 21°C (70°F), the min OA damper (D-1) shall be open, return air, economizer and relief air dampers (D-3, D-4 AND D-5) shall modulate in sequence with the cooling coil control (V-1) to maintain discharge air temperature setpoint of 11.4°C (52.5°F) and the min. outside airflow shall be maintained. When the outside air temperature drops below 11.4°C (52.5°F) the cooling coil control valve (V-1) shall be closed to the cooling coil and economizer, relief and return dampers (D-3, D-4, & D-5) shall modulate in sequence to maintain the discharge air temperature 11.4°C (52.5°F) two duct mounted static pressure sensors/controllers shall modulate the variable frequency drives mounted near the AHU, through a discriminator selector, to

TERMINAL UNIT CONTROL:

VAV (VARIABLE AIR VOLUME) WITH REHEAT

A space temperature sensor shall modulate the airflow from the maximum to the minimum airflow to maintain set point of 21°C (70°F). When the minimum airflow set point is reached and on a further fall in space temperature the terminal unit hot water control valve shall modulate to maintain space temperature.

CV (CONSTANT AIR VOLUME) WITH REHEAT

They shall be the same as VAV with re-heat above except controls shall be set for constant volume airflow.

VAV (VARIABLE AIR VOLUME) COOL ONLY

A space temperature sensor shall module the airflow from the maximum to the minimum set point of 21°C.

COMPUTER ROOM (2D-04) CONTROL TERMINAL UNIT 2UU & AC-5

AC-5 shall be provided with a microprocessor control system. In addition to controlling room temperature it shall also control room humidification and dehumidification. AC-5 and ACC-5 system shall provide supplemental cooling when AHU-2 system is off. Terminal unit 2-UU shall be controlled same as VAV with reheat above except as herein modified. When AHU-2 is in operation, AC-5 and ACCU-5 shall cycle only when T.U. 2-UU airflow is at 100% of its maximum design airflow capacity and T.U 2-UU space temperature rises above the thermostat set point temperature of 23°C. When the space temperature drops below the thermostat set point AC-5 AND ACCU-5 shall be de-energized. When AHU-2 is off AC-5 and ACCU-5 shall operate through T.U. 2-UU thermostat control as follows: when space temperature rises above 23°C (73.4°F) AC-5 and ACCU-5 shall cycle to maintain space temperature, when room temperature is satisfied then AC-5 and ACC-5 shall stop. A condensate sensor/switch shall be mounted in the unit drain pan so that it will alarm the DDC system if condensate overflows the drain pan.

OPTIMUM BUILDING START COOL DOWN CYCLE (COOLING PERIOD ONLY)

Approximately 1- ½ hours before the normal time occupancy of the building occurs, the DDC system shall start the HVAC system as follows: the return damper shall open, the AHU supply fans shall start, all interlocked exhaust fans shall remain off, CWP-1 and CWP-2 shall start and chiller WCI-1 shall operate when water flow is proven. All chilled water control valves for AHU cooling coil shall modulate to maintain their set point temperature. During this period of operation the outside damper shall remain closed. Approximately ½ hour before the normal occupancy period occurs the DDC system shall place the system in the normal occupied position, the outside damper shall open, interlocked exhaust fans shall start and the AHU system and cooling system shall continue to operate in their normal occupied sequence.

COOLING SYSTEM

The cooling control sequence shall be initiated from the DDC system as follows: when the outside air temperature is above 13°C (55.4°F) and when the control system is energized, CWP-1 and CWP-2 pumps shall start, through hand-off-auto switches (when in auto position), and shall provide flow to the system. When chilled water flow is proven through the flow switch at the chiller then the chiller controls shall be energized and the chiller shall operate through its own safety and operating controls to maintain 7°C (44.6°F) discharge temperature. Temperature sensors located in the CWS and CWR at the chiller shall indicate the chiller water temperature at the DDC system. When the outside temperature drops below 13°C (55.4°F) the chiller system shall be deenergized.

HEATING SYSTEM

The heating control sequence shall be initiated as follows: when the control system is energized HWP-1 and HWP-2 shall start, through hand-off-auto switches (when in auto position), and shall provide flow to the system. When hot water flow is proven through the flow switches at the boiler then the boiler controls shall be energized and the boiler will operate through its own safety and operating controls to maintain 82°C (180° F). Boiler water temperature sensors located in the HWS and HWR at the boiler shall indicate heating water temperatures at the DDC system. The boiler water temperature shall be reset as indicated on the boiler water reset schedule (see boiler control DWG. #19).

BUILDING WARM-UP CYCLE (HEATING PERIOD ONLY)

Approximately 1- ½ hours before the normal time occupancy of the building occurs, the DDC system shall start the HVAC system as follows: the return damper shall open, the AHU supply fans shall start, all interlocked exhaust fans shall remain off, HWP-1 and HWP-2 shall start, and the boiler B-1 shall operate when then water flow is proven. All H.W. control valves for terminal unit coils shall modulate to maintain their occupied set point temperature. During this period of operation the outside air damper shall remain closed. Approximately ½ hour before the normal occupancy period occurs the DDC system shall place the system in the normal occupied position, the outside air damper shall open, interlocked exhaust fans shall start and the AHU systems and the heating systems shall continue to operate in their normal occupied sequence.

TIMED OVERRIDE CYCLE

Each terminal unit thermostat (TU T-STAT) shall be capable of overriding the system "OFF" cycle to provide periods of system override operation. The TU STAT shall override the operation of the DDC system "OFF" period, when the DDC system has the system off for unoccupied periods. The TU STAT shall have the capability to operate for a maximum period of 4 hours (adjustable from the central processor). When the TU STAT is manually set the associated AHU shall start in its normal sequence, and the heating and /or cooling systems shall start and operate in its normal operating sequence. When the TU STAT has expired the AHU and heating and/or cooling systems shall stop and return to the normal unoccupied sequence.

AS-BUILT
07/30/02

REV	DATE	BY	[redacted]

[redacted]

Medical / Dental Clinic

SECTION 3

Control Program Listings

Controller Matrix BTi100 Trunk1

Job Name: [redacted]
Location:
Job #:

Date: 10/10/2000
Revision: 1/23/2002

MS/TP Network # : 1001
MS/TP Baud Rate : 38400
Ethernet Network # : 1
LSI Ethernet MAC #:

Area Served	Controller Type	MS/TP MAC #	Device Instance	Unit Controlled	Reheat	Max CFM	Min CFM	Max LPS	Min LPS	Box Size (in)	Box Size (mm)
LSI Router/Controller	LSI	000	100	N/A	N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
Patient Admin/Reception	VAVSDC3	001	100101	VAV-1A	Hot Water	**212**	**127**	100	60	**0**	150
RMO Analysist	VAVSDC3	002	100102	VAV-1B	Hot Water	**540**	**180**	255	85	**9**	225
Tricare Office	VAVSDC3	003	100103	VAV-1C	Hot Water	**191**	**85**	90	40	**6**	150
Tricare Office	VAVSDC3	004	100104	VAV-1D	Hot Water	**445**	**148**	210	70	**8**	200
	VAVSDC3	005	100105		N/A	**0**	**0**			**0**	
Tricare Office	VAVSDC3	006	100106	VAV-1F	Hot Water	**392**	**222**	185	105	**8**	200
Central Waiting	VAVSDC3	007	100107	VAV-1G1	Hot Water	**562**	**180**	265	85	**9**	225
Central Waiting	VAVSDC3	008	100108	VAV-1G2	Hot Water	**975**	**328**	460	155	**12**	300
Pharmacy	VAVSDC3	009	100109	VAV-1H	Hot Water	**498**	**191**	235	90	**9**	225
Pharmacy	VAVSDC3	010	100110	VAV-1I	Hot Water	**625**	**350**	295	165	**10**	250
Lounge	VAVSDC3	011	100111	VAV-1J	Hot Water	**138**	**74**	65	35	**5**	125
Corridor	VAVSDC3	012	100112	VAV-1K	Hot Water	**350**	**350**	165	165	**8**	200
Corridor	VAVSDC3	013	100113	VAV-1L	Hot Water	**805**	**763**	380	360	**12**	300
Opt. Exam Office	VAVSDC3	014	100114	VAV-1M	Hot Water	**265**	**180**	125	85	**7**	175
TRMT Rm/Dirty Proc	VAVSDC3	015	100115	VAV-1N	Hot Water	**445**	**445**	210	210	**8**	200
Interaction Station	VAVSDC3	016	100116	VAV-1O	Hot Water	**477**	**434**	225	205	**9**	225
Waiting/Activity Area	VAVSDC3	017	100117	VAV-1P	Hot Water	**636**	**318**	300	150	**10**	250
Interaction Station	VAVSDC3	018	100118	VAV-1Q	Hot Water	**381**	**222**	180	105	**8**	200
Interaction Station	VAVSDC3	019	100119	VAV-1R	Hot Water	**275**	**275**	130	130	**7**	175
Opt. Exam Office	VAVSDC3	020	100120	VAV-1S	Hot Water	**159**	**106**	75	50	**5**	125
Fundas Camera Rm	VAVSDC3	021	100121	VAV-1T	Hot Water	**318**	**180**	150	85	**8**	200
Visual Field	VAVSDC3	022	100122	VAV-1U	Hot Water	**466**	**222**	220	105	**9**	225
Screen Eye Test	VAVSDC3	023	100123	VAV-1V	Hot Water	**212**	**117**	100	55	**6**	150
Audio	VAVSDC3	024	100124	VAV-1W	Hot Water	**180**	**85**	85	40	**6**	150
Hist/INTV	VAVSDC3	025	100125	VAV-1X	Hot Water	**498**	**233**	235	110	**9**	225
Physical Exam	VAVSDC3	026	100126	VAV-1Y	Hot Water	**360**	**159**	170	75	**8**	200
Chief Areo Med	VAVSDC3	027	100127	VAV-1Z	Hot Water	**170**	**85**	80	40	**5**	125
PES Admin Office	VAVSDC3	028	100128	VAV-1AA	Hot Water	**180**	**95**	85	45	**6**	150
Physical Exam	VAVSDC3	029	100129	VAV-1BB	Hot Water	**339**	**159**	160	75	**8**	200
Waiting	VAVSDC3	030	100130	VAV-1CC	Hot Water	**275**	**201**	130	95	**7**	175
Provider Cubicles	VAVSDC3	031	100131	VAV-1DD	Hot Water	**477**	**212**	225	100	**9**	225
Interaction Station	VAVSDC3	032	100132	VAV-1EE	Hot Water	**360**	**318**	170	150	**8**	200
Waiting/Activity Area	VAVSDC3	033	100133	VAV-1FF	Hot Water	**752**	**678**	355	320	**10**	250
Team Interaction	VAVSDC3	034	100134	VAV-1GG	Hot Water	**487**	**212**	230	100	**9**	225
Group IS	VAVSDC3	035	100135	VAV-1HH	Hot Water	**286**	**170**	135	80	**7**	175
Provider Cubicles	VAVSDC3	036	100136	VAV-1II	Hot Water	**392**	**222**	185	105	**8**	200
	VAVSDC3	037	100137			**0**	**0**			**0**	
Waiting/Activity Area	VAVSDC3	038	100138	VAV-1KK	Hot Water	**593**	**593**	280	280	**9**	225
Admin Wk Station	VAVSDC3	039	100139	VAV-1LL	Hot Water	**265**	**138**	125	65	**7**	175
Group IS	VAVSDC3	040	100140	VAV-1MM	Hot Water	**286**	**170**	135	80	**7**	175
Medical Rediness	VAVSDC3	041	100141	VAV-1NN	Hot Water	**191**	**148**	90	70	**6**	150
Provider Cubicles	VAVSDC3	042	100142	VAV-1OO	Hot Water	**858**	**392**	405	185	**12**	300
ISO Interaction Station	VAVSDC3	043	100143	VAV-1PP	Hot Water	**275**	**275**	130	130	**7**	175
BMET Wk Station	VAVSDC3	044	100144	VAV-1QQ	Hot Water	**869**	**434**	410	205	**12**	300
Electrical Room	VAVSDC3	045	100145	VAV-1RR	N/A	**562**	**0**	265	0	**9**	225
	VAVSDC3	046	100146		N/A	**0**	**0**			**0**	
BEE Equipment Storage	VAVSDC3	047	100147	VAV-1TT	Hot Water	**360**	**297**	170	140	**8**	200
Interaction Station	VAVSDC3	048	100148	VAV-1UU	Hot Water	**434**	**286**	205	135	**8**	200
Staff Lounge	VAVSDC3	049	100149	VAV-1VV	Hot Water	**159**	**85**	75	40	**5**	125
Pediatrics	VAVSDC3	050	100150	VAV-1WW	Hot Water	**233**	**138**	110	65	**7**	175
Pediatrics Waiting	VAVSDC3	051	100151	VAV-1XX	Hot Water	**127**	**127**	60	60	**5**	125

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Controller Matrix BTi100 Trunk1

Job Name: [redacted]
Location:
Job #:

Date: 10/10/2000
Revision: 1/23/2002

MS/TP Network # : 1001
MS/TP Baud Rate : 38400
Ethernet Network # : 1
LSI Ethernet MAC #:

Area Served	Controller Type	MS/TP MAC #	Device Instance	Unit Controlled	Reheat	Max CFM	Min CFM	Max LPS	Min LPS	Box Size (in)	Box Size (mm)
Interaction Station	VAVSDC3	052	100152	VAV-1YY	Hot Water	**350**	**212**	165	100	**8**	200
	VAVSDC3	053	100153			**0**	**0**			**0**	
Conference/Library	VAVSDC3	054	100154	VAV-1AAA	Hot Water	**275**	**138**	130	65	**7**	175
Receiving/Storage	VAVSDC3	055	100155	VAV-1BBB	Hot Water	**1197**	**742**	565	350	**14**	350
Tech Wk Station	VAVSDC3	056	100156	VAV-1CCC	Hot Water	**381**	**275**	180	130	**8**	200
ADP Equipment Space	VAVSDC3	057	100157	VAV-1DDD	Hot Water	**201**	**85**	95	40	**6**	150
Chief Log Office	VAVSDC3	058	100158	VAV-1EEE	Hot Water	**339**	**212**	160	100	**8**	200
HK Supervisor	VAVSDC3	059	100159	VAV-1FFF	Hot Water	**699**	**286**	330	135	**10**	250
Fac Mgr Office	VAVSDC3	060	100160	VAV-1GGG	Hot Water	**328**	**148**	155	70	**8**	200
Corridor	VAVSDC3	061	100161	VAV-1HHH	Hot Water	**636**	**318**	300	150	**10**	250
Corridor	VAVSDC3	062	100162	VAV-1III	Hot Water	**117**	**117**	55	55	**4**	100
Treatment Room	VAVSDC3	063	100163	VAV-1JJJ	Hot Water	**222**	**222**	105	105	**6**	150
Immuniztion Room	VAVSDC3	064	100164	VAV-1KKK	Hot Water	**201**	**106**	95	50	**6**	150
Interaction Station	VAVSDC3	065	100165	VAV-1LLL	Hot Water	**127**	**74**	60	35	**5**	125
Central Waiting	VAVSDC3	066	100166	VAV-1MMM	Hot Water	**487**	**180**	230	85	**9**	225
Elevator Equipment	VAVSDC3	067	100167	VAV-1NNN	N/A	**1144**	**0**	540	0	**14**	350
Corridor	VAVSDC3	068	100168	VAV-1OOO	Hot Water	**286**	**244**	135	115	**7**	175
Electrical Room	VAVSDC3	069	100169	VAV-1PPP	N/A	**106**	**0**	50	0	**4**	100
Radio Graphic Room	VAVSDC3	070	100170	VAV-1QQQ	Hot Water	**826**	**328**	390	155	**12**	300
Tech Wk Room	VAVSDC3	071	100171	VAV-1RRR	Hot Water	**360**	**360**	170	170	**8**	200
Reception	VAVSDC3	072	100172	VAV-1SSS	Hot Water	**625**	**403**	295	190	**10**	250
Central Waiting	VAVSDC3	073	100173	VAV-1TTT	Hot Water	**975**	**328**	460	155	**12**	300
Staff Lounge	VAVSDC3	074	100174	VAV-1UUU	Hot Water	**583**	**583**	275	275	**9**	225
LAB Office	VAVSDC3	075	100175	VAV-1VVV	Hot Water	**233**	**106**	110	50	**7**	175
Corridor	VAVSDC3	076	100176	VAV-1WWW	Hot Water	**244**	**244**	115	115	**7**	175
LAB	VAVSDC3	077	100177	VAV-1XXX	Hot Water	**1547**	**1547**	730	730	**16**	400
Reception	VAVSDC3	078	100178	VAV-1YYY	Hot Water	**424**	**328**	200	155	**8**	200
Specimen Toilet	VAVSDC3	079	100179	VAV-1ZZZ	Hot Water	**551**	**180**	260	85	**9**	225
Chiller	VLC-853C3	080	100180	CH-1	N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
		081	100181		N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
		082	100182		N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
		083	100183								
		084	100184								
		085	100185								
		086	100186								
		087	100187								
		088	100188								
		089	100189								
		090	100190								
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		093	100193								
		094	100194								
		095	100195								
		096	100196								
		097	100197								
		098	100198								
		099	100199								
		100	100200								
		101	100201								
		102	100202								
		103	100203								

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Controller Matrix BTi100 Trunk2

Job Name: [redacted]
Location:
Job #:

Date: 10/10/2000
Revision: 1/23/2002

MS/TP Network # : 1002
MS/TP Baud Rate : 38400
Ethernet Network # : 1
LSI Ethernet MAC #:

Area Served	Controller Type	MS/TP MAC #	Device Instance	Unit Controlled	Reheat	Max CFM	Min CFM	Max LPS	Min LPS	Box Size (in)	Box Size (mm)
LSI Router/Controller	LSI	000	100	N/A	N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
Library/Conf	VAVSDC3	001	100201	VAV-2A	Hot Water	**572**	**180**	270	85	**9**	225
Admin	VAVSDC3	002	100202	VAV-2B	Hot Water	**445**	**265**	210	125	**8**	200
Super Office	VAVSDC3	003	100203	VAV-2C	Hot Water	**159**	**74**	75	35	**5**	125
Sec Office	VAVSDC3	004	100204	VAV-2D	Hot Water	**307**	**148**	145	70	**8**	200
Dental Surgeon	VAVSDC3	005	100205	VAV-2E	Hot Water	**275**	**106**	130	50	**7**	175
OH Dir # 1	VAVSDC3	006	100206	VAV-2F	Hot Water	**339**	**148**	160	70	**8**	200
X-Ray	VAVSDC3	007	100207	VAV-2G	Hot Water	**773**	**636**	365	300	**10**	250
OH Dir # 2	VAVSDC3	008	100208	VAV-2H	Hot Water	**339**	**148**	160	70	**8**	200
OH Dir # 3	VAVSDC3	009	100209	VAV-2I	Hot Water	**339**	**148**	160	70	**8**	200
Dental Waiting Room	VAVSDC3	010	100210	VAV-2J	Hot Water	**625**	**509**	295	240	**10**	250
Gen. Dent. DTR #4	VAVSDC3	011	100211	VAV-2K	Hot Water	**339**	**148**	160	70	**8**	200
Corridor	VAVSDC3	012	100212	VAV-2L	Hot Water	**445**	**212**	210	100	**8**	200
Gen. Dent. DTR #5	VAVSDC3	013	100213	VAV-2M	Hot Water	**339**	**148**	160	70	**8**	200
DTR Support	VAVSDC3	014	100214	VAV-2N	Hot Water	**604**	**540**	285	255	**10**	250
Gen. Dent. DTR#6	VAVSDC3	015	100215	VAV-2O	Hot Water	**360**	**148**	170	70	**8**	200
Consult	VAVSDC3	016	100216	VAV-2P	Hot Water	**456**	**191**	215	90	**9**	225
Gen. Dent. DTR#7	VAVSDC3	017	100217	VAV-2Q	Hot Water	**424**	**148**	200	70	**8**	200
Lounge	VAVSDC3	018	100218	VAV-2R	Hot Water	**191**	**85**	90	40	**6**	150
Gen. Dent. DTR	VAVSDC3	019	100219	VAV-2S	Hot Water	**424**	**148**	200	70	**8**	200
Staff Lockers/Toilet	VAVSDC3	020	100220	VAV-2T	Hot Water	**434**	**434**	205	205	**8**	200
Gen. Dent. DTR #9	VAVSDC3	021	100221	VAV-2U	Hot Water	**424**	**148**	200	70	**8**	200
Central Issue	VAVSDC3	022	100222	VAV-2V	Hot Water	**297**	**201**	140	95	**7**	175
DIPC Decon	VAVSDC3	023	100223	VAV-2W	Hot Water	**456**	**456**	215	215	**9**	225
DIPC Clean	VAVSDC3	024	100224	VAV-2X	Hot Water	**551**	**551**	260	260	**9**	225
Corridor	VAVSDC3	025	100225	VAV-2Y	Hot Water	**318**	**318**	150	150	**8**	200
Ceramic Lab	VAVSDC3	026	100226	VAV-2Z	Hot Water	**466**	**466**	220	220	**9**	225
Prosth Lab	VAVSDC3	027	100227	VAV-2AA	Hot Water	**1187**	**1187**	560	560	**14**	350
Gen. Dent. DTR #10	VAVSDC3	028	100228	VAV-2BB	Hot Water	**424**	**222**	200	105	**8**	200
Electrical	VAVSDC3	029	100229	VAV-2CC	N/A	**562**	**0**	265	0	**9**	225
PH Super	VAVSDC3	030	100230	VAV-2DD	Hot Water	**244**	**106**	115	50	**7**	175
BEE Tech	VAVSDC3	031	100231	VAV-2EE	Hot Water	**456**	**180**	215	85	**9**	225
Water Lab	VAVSDC3	032	100232	VAV-2FF	Hot Water	**148**	**85**	70	40	**5**	125
Trash	VAVSDC3	033	100233	VAV-2GG	Hot Water	**307**	**307**	145	145	**8**	200
		034	100234			**0**	**0**	0		**0**	
PH Tech	VAVSDC3	035	100235	VAV-2II	Hot Water	**477**	**180**	225	85	**9**	225
Waiting	VAVSDC3	036	100236	VAV-2JJ	Hot Water	**509**	**371**	240	175	**9**	225
Electrical	VAVSDC3	037	100237	VAV-2KK	N/A	**551**	**0**	260	0	**9**	225
Office	VAVSDC3	038	100238	VAV-2LL	Hot Water	**297**	**170**	140	80	**7**	175
Conf/Group Tharapy	VAVSDC3	039	100239	VAV-2MM	Hot Water	**339**	**201**	160	95	**8**	200
		040	100240			**0**	**0**			**0**	
Tech Office	VAVSDC3	041	100241	VAV-2OO	Hot Water	**392**	**201**	185	95	**8**	200
Office Exam Room	VAVSDC3	042	100242	VAV-2PP	Hot Water	**148**	**74**	70	35	**5**	125
Reception	VAVSDC3	043	100243	VAV-2QQ	Hot Water	**170**	**95**	80	45	**5**	125
Waiting	VAVSDC3	044	100244	VAV-2RR	Hot Water	**328**	**244**	155	115	**8**	200
Corridor	VAVSDC3	045	100245	VAV-2SS	Hot Water	**95**	**95**	45	45	**4**	100
Dir Info Mgr	VAVSDC3	046	100246	VAV-2TT	Hot Water	**328**	**180**	155	85	**8**	200
Computer Room	VAVSDC3	047	100247	VAV-2UU	Hot Water	**1059**	**456**	500	215	**14**	350
Corridor	VAVSDC3	048	100248	VAV-2VV	Hot Water	**381**	**297**	180	140	**8**	200
Lib/Class Room	VAVSDC3	049	100249	VAV-2WW	Hot Water	**424**	**148**	200	70	**8**	200
Conf Room	VAVSDC3	050	100250	VAV-2XX	Hot Water	**636**	**233**	300	110	**10**	250
		051	100251			**0**	**0**			**0**	

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Controller Matrix BTi100 Trunk2

Job Name: [redacted]
Location:
Job #:

Date: 10/10/2000
Revision: 1/23/2002

MS/TP Network # : 1002
MS/TP Baud Rate : 38400
Ethernet Network # : 1
LSI Ethernet MAC #:

Area Served	Controller Type	MS/TP MAC #	Device Instance	Unit Controlled	Reheat	Max CFM	Min CFM	Max LPS	Min LPS	Box Size (in)	Box Size (mm)
Credentials Mgr	VAVSDC3	052	100252	VAV-2ZZ	Hot Water	**699**	**297**	330	140	**10**	250
RMO Director	VAVSDC3	053	100253	VAV-2AAA	Hot Water	**222**	**85**	105	40	**6**	150
OPS Squad Mgr	VAVSDC3	054	100254	VAV-2BBB	Hot Water	**286**	**106**	135	50	**7**	175
		055	100255			**0**	**0**			**0**	
Tech Office	VAVSDC3	056	100256	VAV-2DDD	Hot Water	**392**	**222**	185	105	**8**	200
CMDR Office	VAVSDC3	057	100257	VAV-2EEE	Hot Water	**275**	**106**	130	50	**7**	175
Sec/Waiting	VAVSDC3	058	100258	VAV-2FFF	Hot Water	**265**	**117**	125	55	**7**	175
Admin Office	VAVSDC3	059	100259	VAV-2GGG	Hot Water	**191**	**85**	90	40	**6**	150
QA/HRD Director	VAVSDC3	060	100260	VAV-2HHH	Hot Water	**138**	**74**	65	35	**5**	125
Super	VAVSDC3	061	100261	VAV-2III	Hot Water	**350**	**159**	165	75	**8**	200
Tech Office	VAVSDC3	062	100262	VAV-2JJJ	Hot Water	**381**	**222**	180	105	**8**	200
		063	100263			**0**	**0**			**0**	
Corridor	VAVSDC3	064	100264	VAV-2LLL	Hot Water	**275**	**180**	130	85	**7**	175
		065	100265			**0**	**0**			**0**	
AH-1	VLC-1188C3	066	100266	AH-1	N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
AH-1 Misc Pts	VLC-1188C3	067	100267	AH-1	N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
AH-2	VLC-1188C3	068	100268	AH-2	N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
AH-2 Misc Pts	VLC-1188C3	069	100269	AH-2	N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
Boiler	VLC-853C3	070	100270	B-1	N/A	**N/A**	**N/A**	N/A	N/A	**N/A**	N/A
		071	100271			**0**	**0**			**0**	
		072	100272			**0**	**0**			**0**	
		073	100273			**0**	**0**			**0**	
		074	100274			**0**	**0**			**0**	
		075	100275			**0**	**0**			**0**	
		076	100276			**0**	**0**			**0**	
		077	100277			**0**	**0**			**0**	
		078	100278			**0**	**0**			**0**	
		079	100279			**0**	**0**			**0**	
		080	100280								
		081	100281								
		082	100282								
		083	100283								
		084	100284								
		085	100285								
		086	100286								
		087	100287								
		088	100288								
		089	100289								
		090	100290								

[redacted]

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Medical / Dental Clinic

SECTION 4

Current Operating Parameters

[redacted]

Current Operating Parameters

AHU-1:		AHU-2:		Reheat VAV Box:		Cooling Only VAV Box	
Point	Value	Point	Value	Point	Value	Point	Value
Temperature (°F)		Temperature (°F)		Temperature (°F)		Temperature (°F)	
Man. Supply Air Temp StPt	55.0	Man. Supply Air Temp StPt	55.0	Occupied Setpoint	72.0	Occupied Setpoint	72.0
Auto-Reset SA StPt Hi Limit	65.0	Auto-Reset SA StPt Hi Limit	65.0	Occ StPt Hi Limit	74.0	Occ StPt Hi Limit	74.0
Auto-Reset SA StPt Low Limit	50.0	Auto-Reset SA StPt Low Limit	50.0	Occ StPt Low Limit	70.0	Occ StPt Low Limit	70.0
Warmup Supply Temp StPt	80.0	Warmup Supply Temp StPt	80.0	Microtouch Bias	2.0	Microtouch Bias	2.0
Supply Temp Low Limit	35.0	Supply Temp Low Limit	35.0	Heating offset	2.0	Heating offset	2.0
Pressure (in w.c.)		Pressure (in w.c.)		Cooling Offset	0.0	Cooling Offset	0.0
Manual Supply Pressure StPt	1.0	Manual Supply Pressure StPt	1.0	Unoccupied Htg StPt	55.0	Unoccupied Htg StPt	55.0
Auto-Reset Supply Pressure Hi Limit	2.0	Auto-Reset Supply Pressure Hi Limit	2.0	Unoccupied Clg StPt	85.0	Unoccupied Clg StPt	85.0
Auto-Reset Supply Pressure Low Limit	0.5	Auto-Reset Supply Pressure Low Limit	0.5	Zone Mode Control		Zone Mode Control	
Supply Pressure Warmup Setpoint	1.0	Supply Pressure Warmup Setpoint	1.0	Afterhours Limit	2.0	Afterhours Limit	2.0
Max Supply Return Fan Differential	10%	Max Supply Return Fan Differential	10%	Damper Control		Damper Control	
				Max CFM Setpoint	Note 1	Max CFM Setpoint	Note 1
Economizer		Economizer		Min CFM Setpoint	Note 1	Min CFM Setpoint	Note 1
OSA Economizer Lockout Setpoint	75.0	OSA Economizer Lockout Setpoint	75.0	Reheat CFM Setpoint	Note 1		
Economizer Minimum Position	10%	Economizer Minimum Position	10%	Box Size	Note 1	Box Size	Note 1
				Damper Motor Speed (sec.)	100.0	Damper Motor Speed (sec.)	100.0
Filter Runtime Hours Alarm Setpoint	3000	Filter Runtime Hours Alarm Setpoint	3000	Reheat Valve			
				Reheat Valve Motor Speed (sec.)	100.0		

Boiler Control:		Chiller Control:	
Plant Minimum On Time (min)	30.0	Plant Minimum On Time (min)	30.0
Plant Minimum Off Time (min)	10.0	Plant Minimum Off Time (min)	10.0
Outside Air Lockout Setpoint (°F)	80.0	Outside Air Lockout Setpoint (°F)	50.0

NOTES:

1. See Controller Matrix in Section 3 for Min/Max Flows and Box size information.

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Medical / Dental Clinic

SECTION 5

Design Information

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Medical / Dental Clinic

SECTION 6

Control Equipment Cut Sheets

Contents:

[redacted]

Medical / Dental Clinic

SECTION 7

Backup of Control Program

Device Settings


TO: 5000
SUBROUTINE CALLER 143

TO: 5000
SUBROUTINE CALLER 144

TO: 5000
SUBROUTINE CALLER 145

TO: 5000
SUBROUTINE CALLER 147

TO: 5000
SUBROUTINE CALLER 148

TO: 5000
SUBROUTINE CALLER 149

TO: 5000
SUBROUTINE CALLER 150

TO: 5000
SUBROUTINE CALLER 151

TO: 5000
SUBROUTINE CALLER 152

TO: 5000
SUBROUTINE CALLER 154

TO: 5000
SUBROUTINE CALLER 155

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SUBROUTINE CALLER 156

TO: 5000
SUBROUTINE CALLER 157

TO: 5000
SUBROUTINE CALLER 158

TO: 5000
SUBROUTINE CALLER 159

TO: 5000
SUBROUTINE CALLER 160

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SUBROUTINE CALLER 161

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SUBROUTINE CALLER 162

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SUBROUTINE CALLER 163

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SUBROUTINE CALLER 164

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SUBROUTINE CALLER 165

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SUBROUTINE CALLER 166

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SUBROUTINE CALLER 167

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SUBROUTINE CALLER 168

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SUBROUTINE CALLER 169

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SUBROUTINE CALLER 170

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SUBROUTINE CALLER 171

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SUBROUTINE CALLER 172

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SUBROUTINE CALLER 173

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SUBROUTINE CALLER 174

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SUBROUTINE CALLER 175

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SUBROUTINE CALLER 176

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SUBROUTINE CALLER 177

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SUBROUTINE CALLER 178

TO: 5000
SUBROUTINE CALLER 179

TO: 6000
SUBROUTINE CALLER 181

TO: 7000
SUBROUTINE CALLER 182

TO: 5000
SUBROUTINE CALLER 201

TO: 5000
SUBROUTINE CALLER 202

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SUBROUTINE CALLER 203

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SUBROUTINE CALLER 204

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SUBROUTINE CALLER 205

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SUBROUTINE CALLER 208

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SUBROUTINE CALLER 216

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SUBROUTINE CALLER 217

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SUBROUTINE CALLER 218

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SUBROUTINE CALLER 219

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SUBROUTINE CALLER 220

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SUBROUTINE CALLER 221

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SUBROUTINE CALLER 222

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SUBROUTINE CALLER 223

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SUBROUTINE CALLER 224

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SUBROUTINE CALLER 225

TO: 5000
SUBROUTINE CALLER 226

TO: 5000
SUBROUTINE CALLER 227


TO: 5000
SUBROUTINE CALLER
228


TO: 5000
SUBROUTINE CALLER
229


TO: 5000
SUBROUTINE CALLER
230


TO: 5000
SUBROUTINE CALLER
231


TO: 5000
SUBROUTINE CALLER
232


TO: 5000
SUBROUTINE CALLER
233


TO: 5000
SUBROUTINE CALLER
235


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SUBROUTINE CALLER
236


TO: 5000
SUBROUTINE CALLER
237


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SUBROUTINE CALLER
238


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SUBROUTINE CALLER
239


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SUBROUTINE CALLER
241


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242


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SUBROUTINE CALLER
243


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244


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245


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246


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SUBROUTINE CALLER
247


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SUBROUTINE CALLER
248


TO: 5000
SUBROUTINE CALLER
249


TO: 5000
SUBROUTINE CALLER
250


TO: 5000
SUBROUTINE CALLER
252


TO: 5000
SUBROUTINE CALLER
253


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SUBROUTINE CALLER
254


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SUBROUTINE CALLER
256


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SUBROUTINE CALLER
257


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SUBROUTINE CALLER
258


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SUBROUTINE CALLER
259


TO: 5000
SUBROUTINE CALLER
260


TO: 5000
SUBROUTINE CALLER
261

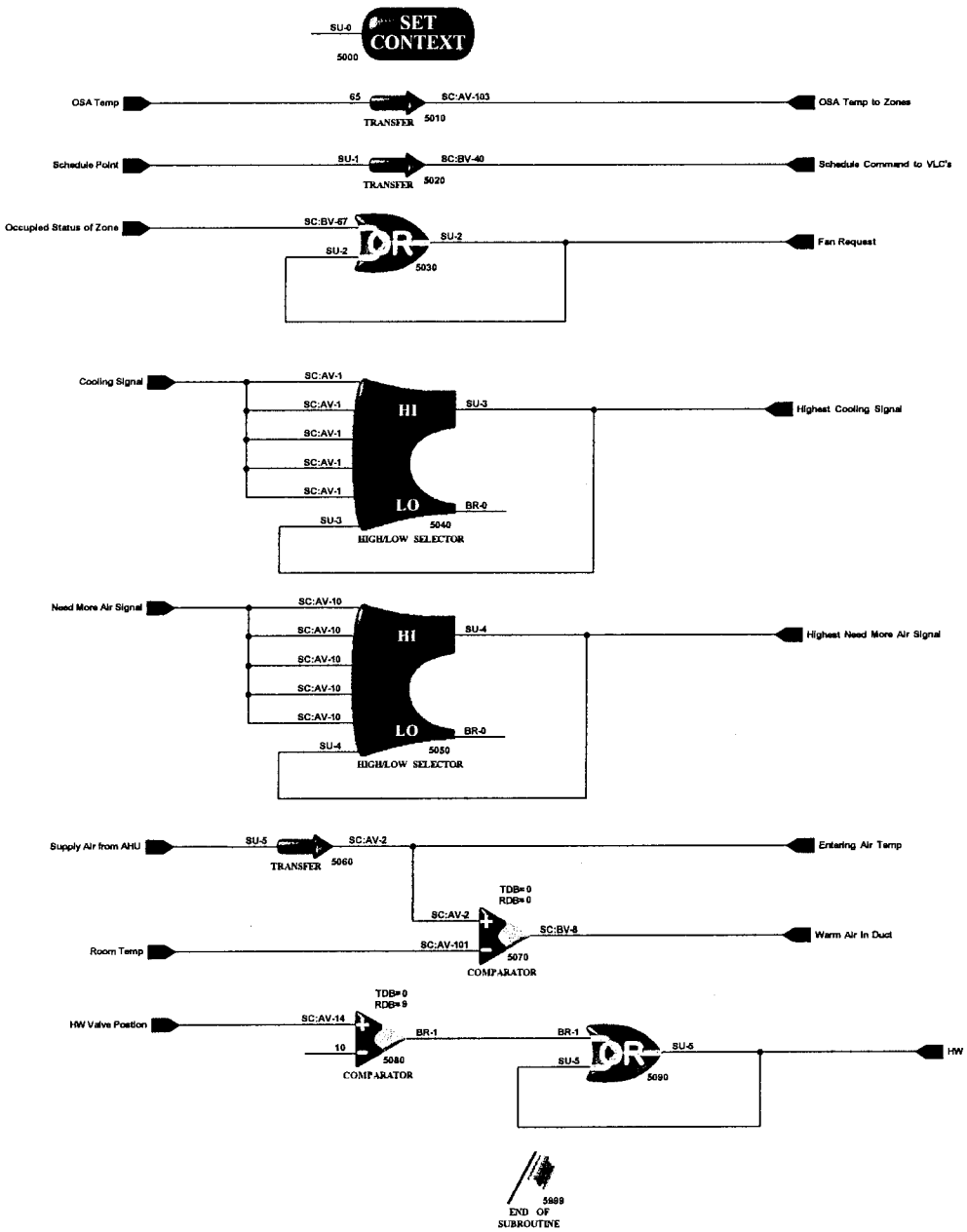

TO: 5000
SUBROUTINE CALLER
262

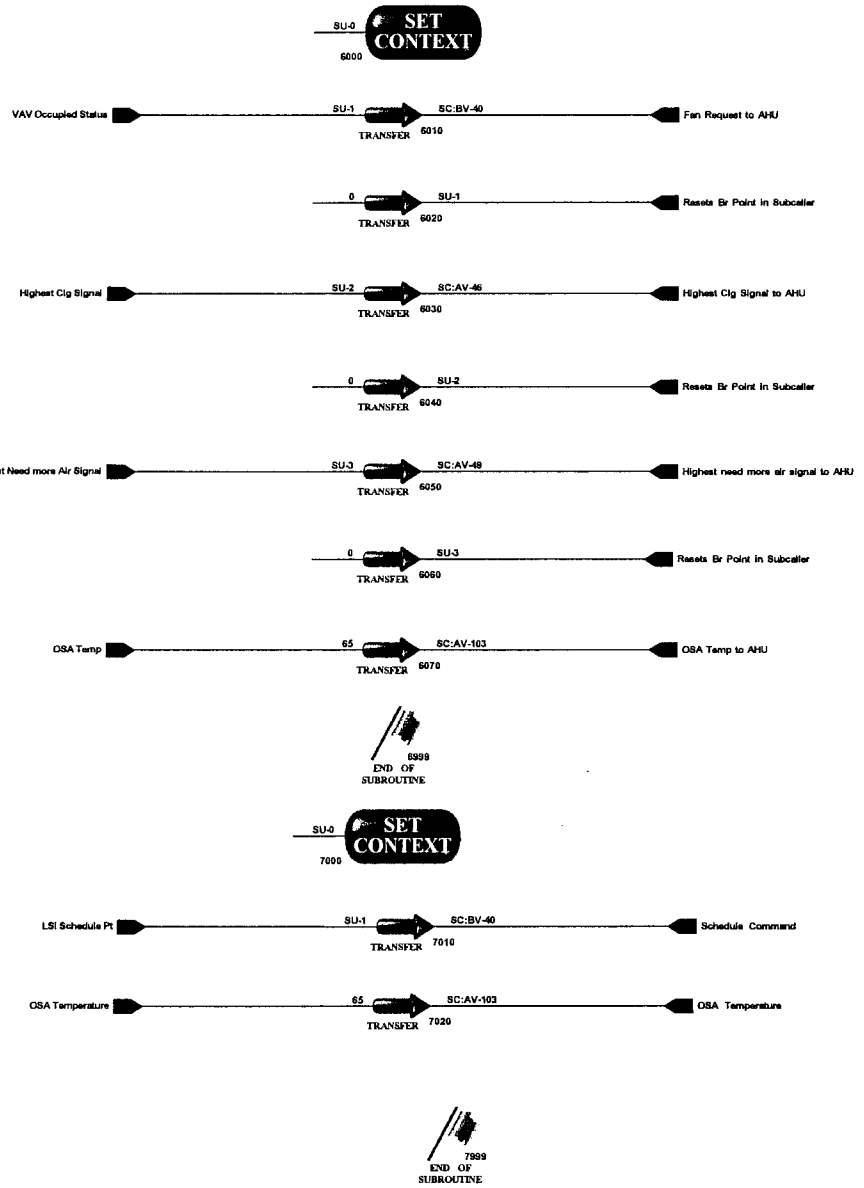

TO: 5000
SUBROUTINE CALLER
264

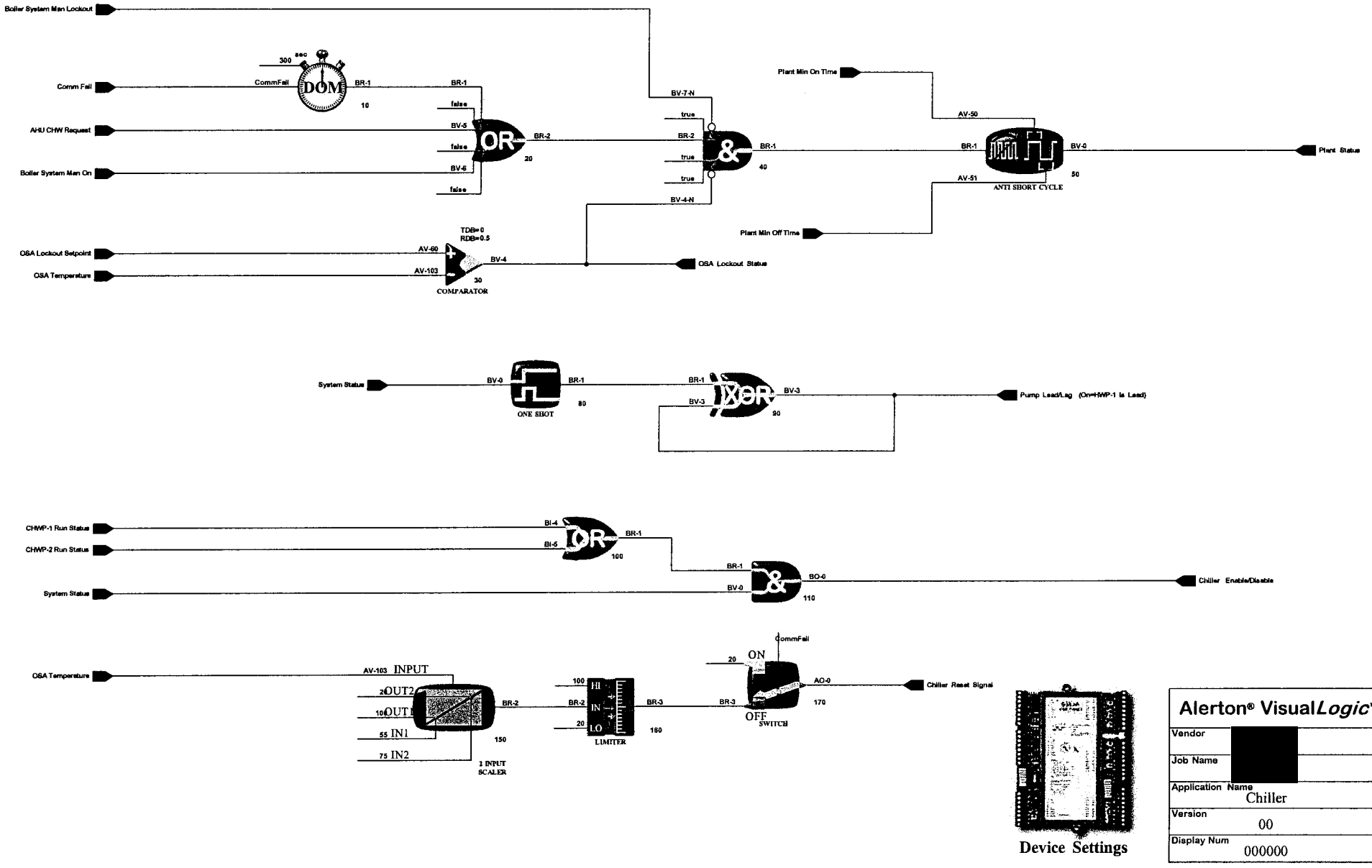

TO: 6000
SUBROUTINE CALLER
266


TO: 7000
SUBROUTINE CALLER
267


4999
END OF
NORMAL

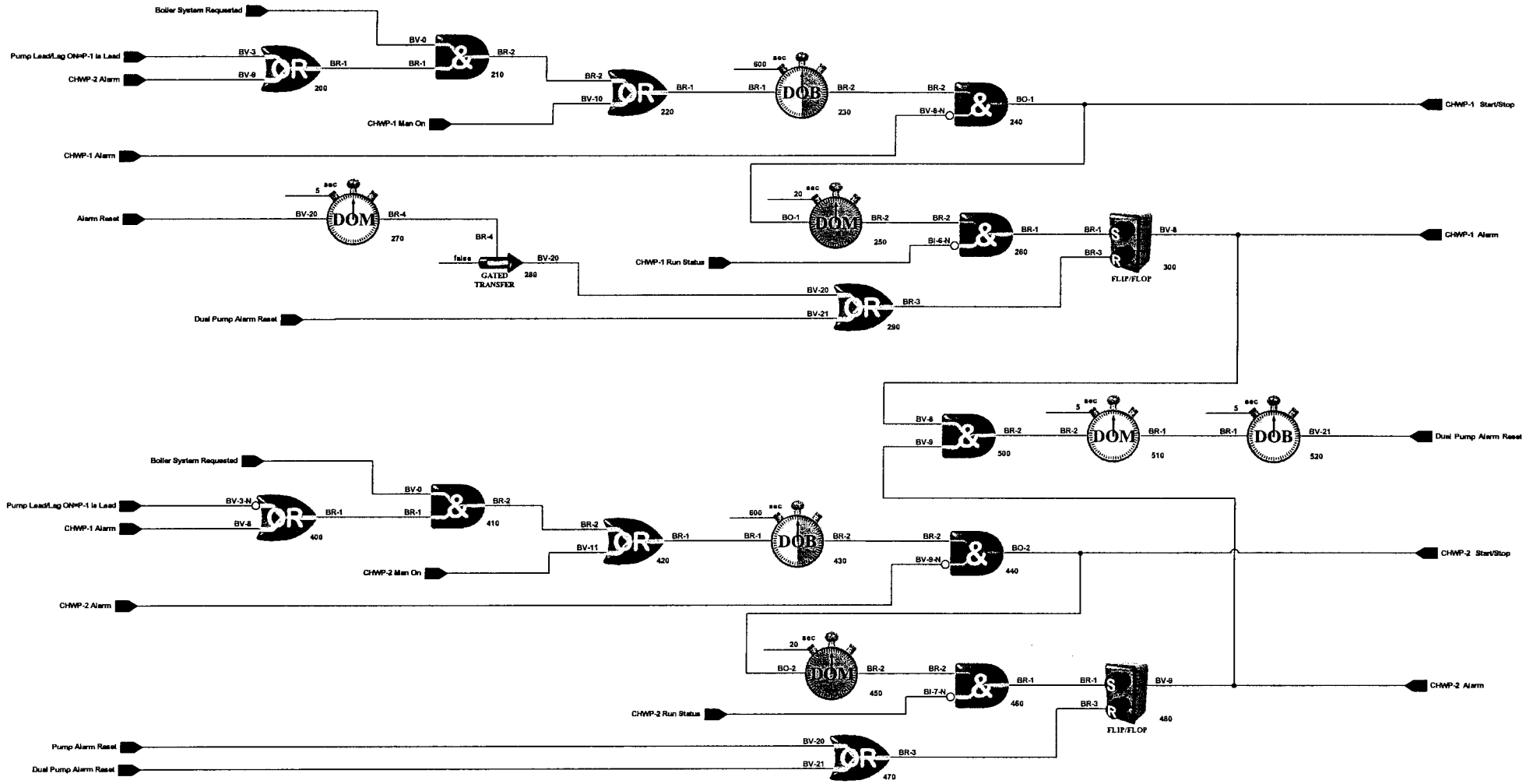

SU-0
SET CONTEXT
5000
OSA Temp
65
SC:AV-103
TRANSFER
5010
OSA Temp to Zones
Schedule Point
SU-1
BC:BV-40
TRANSFER
5020
Schedule Command to VLC's
Occupied Status of Zone
SC:BV-67
OR
SU-2
SU-2
5030
Fan Request
Cooling Signal
SC:AV-1
SC:AV-1
SC:AV-1
SC:AV-1
SC:AV-1
HI
LO
SU-3
BR-0
SU-3
5040
HIGH/LOW SELECTOR
Highest Cooling Signal
Need More Air Signal
SC:AV-10
SC:AV-10
SC:AV-10
SC:AV-10
SC:AV-10
HI
LO
SU-4
BR-0
SU-4
5050
HIGH/LOW SELECTOR
Highest Need More Air Signal
Supply Air from AHU
SU-5
SC:AV-2
TRANSFER
5060
Entering Air Temp
TDB=0
RDB=0
SC:AV-2
SC:AV-101
SC:BV-8
5070
COMPARATOR
Warm Air In Duct
Room Temp
HW Valve Postion
TDB=0
RDB=9
SC:AV-14
10
BR-1
5080
COMPARATOR
BR-1
SU-5
OR
SU-5
5090
HW Request
5999
END OF SUBROUTINE

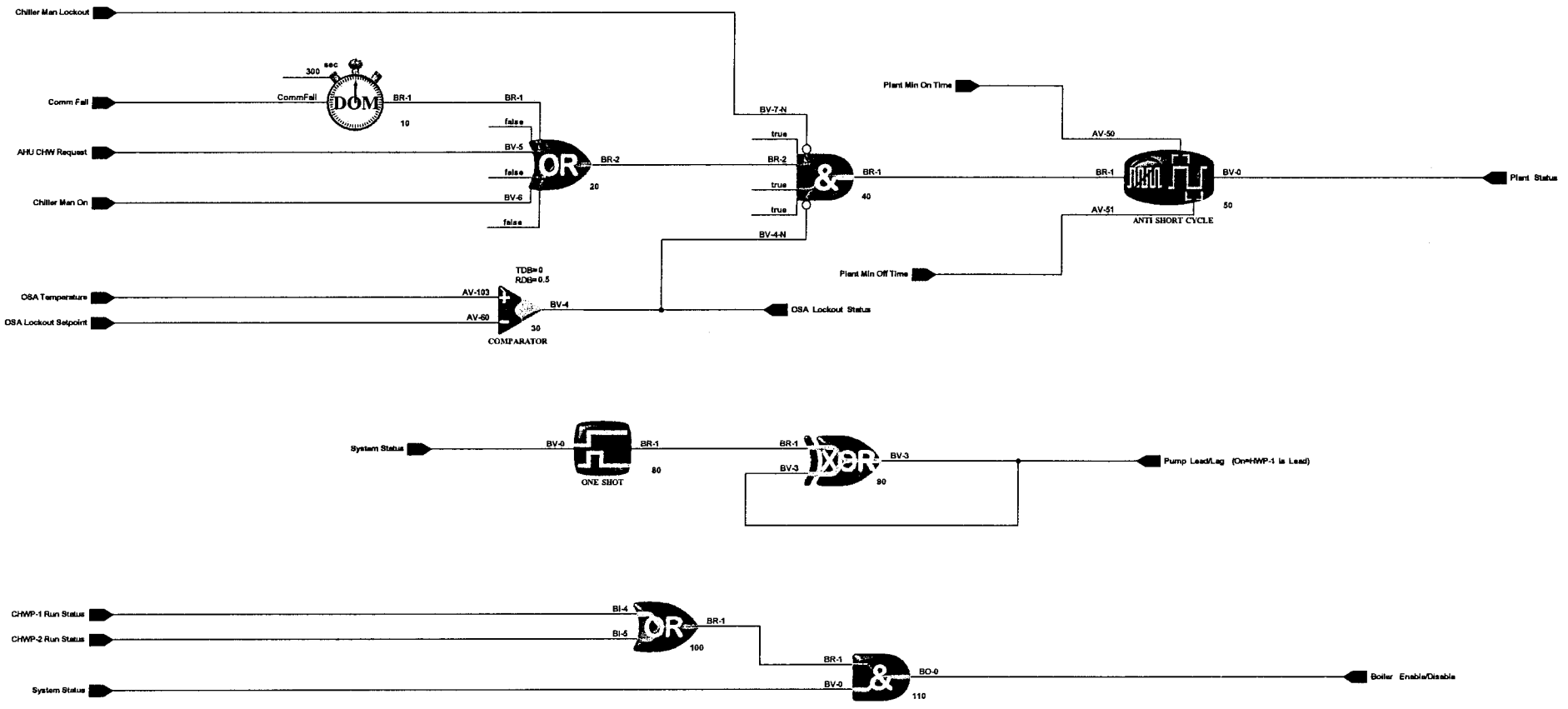

SU-0
SET CONTEXT
6000
VAV Occupied Status
SU-1
SC:BV-40
TRANSFER
6010
Fan Request to AHU
0
SU-1
TRANSFER
6020
Resets Br Point in Subcaller
Highest Clg Signal
SU-2
SC:AV-46
TRANSFER
6030
Highest Clg Signal to AHU
0
SU-2
TRANSFER
6040
Resets Br Point in Subcaller
Highest Need more Air Signal
SU-3
SC:AV-48
TRANSFER
6050
Highest need more air signal to AHU
0
SU-3
TRANSFER
6060
Resets Br Point in Subcaller
OSA Temp
65
SC:AV-103
TRANSFER
6070
OSA Temp to AHU
6999
END OF SUBROUTINE
SU-0
SET CONTEXT
7000
LSI Schedule Pt
SU-1
SC:BV-40
TRANSFER
7010
Schedule Command
OSA Temperature
65
SC:AV-103
TRANSFER
7020
OSA Temperature
7999
END OF SUBROUTINE

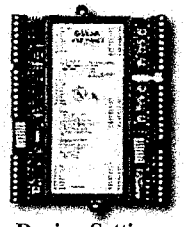


Device Settings

Alerton® VisualLogic™	
Vendor	[redacted]
Job Name	
Application Name	Chiller
Version	00
Display Num	000000

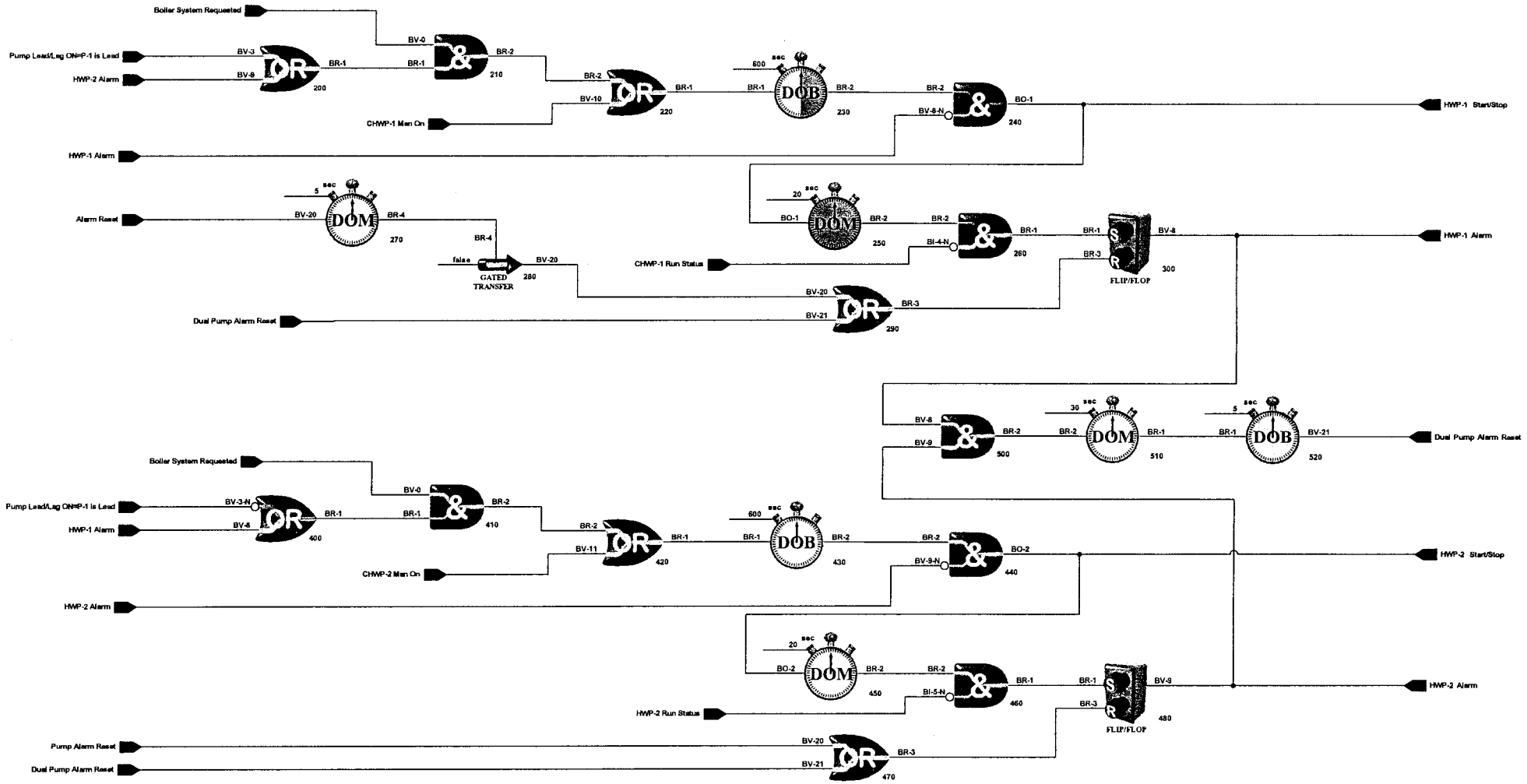

Boiler System Requested
Pump Lead/Lag ON=P-1 is Lead
CHWP-2 Alarm
CHWP-1 Man On
CHWP-1 Alarm
Alarm Reset
Dual Pump Alarm Reset
CHWP-1 Run Status
CHWP-1 Start/Stop
CHWP-1 Alarm
FLIP/FLOP
GATED TRANSFER
Boiler System Requested
Pump Lead/Lag ON=P-1 is Lead
CHWP-1 Alarm
CHWP-2 Man On
CHWP-2 Alarm
CHWP-2 Run Status
Pump Alarm Reset
Dual Pump Alarm Reset
CHWP-2 Start/Stop
CHWP-2 Alarm
FLIP/FLOP
END OF NORMAL

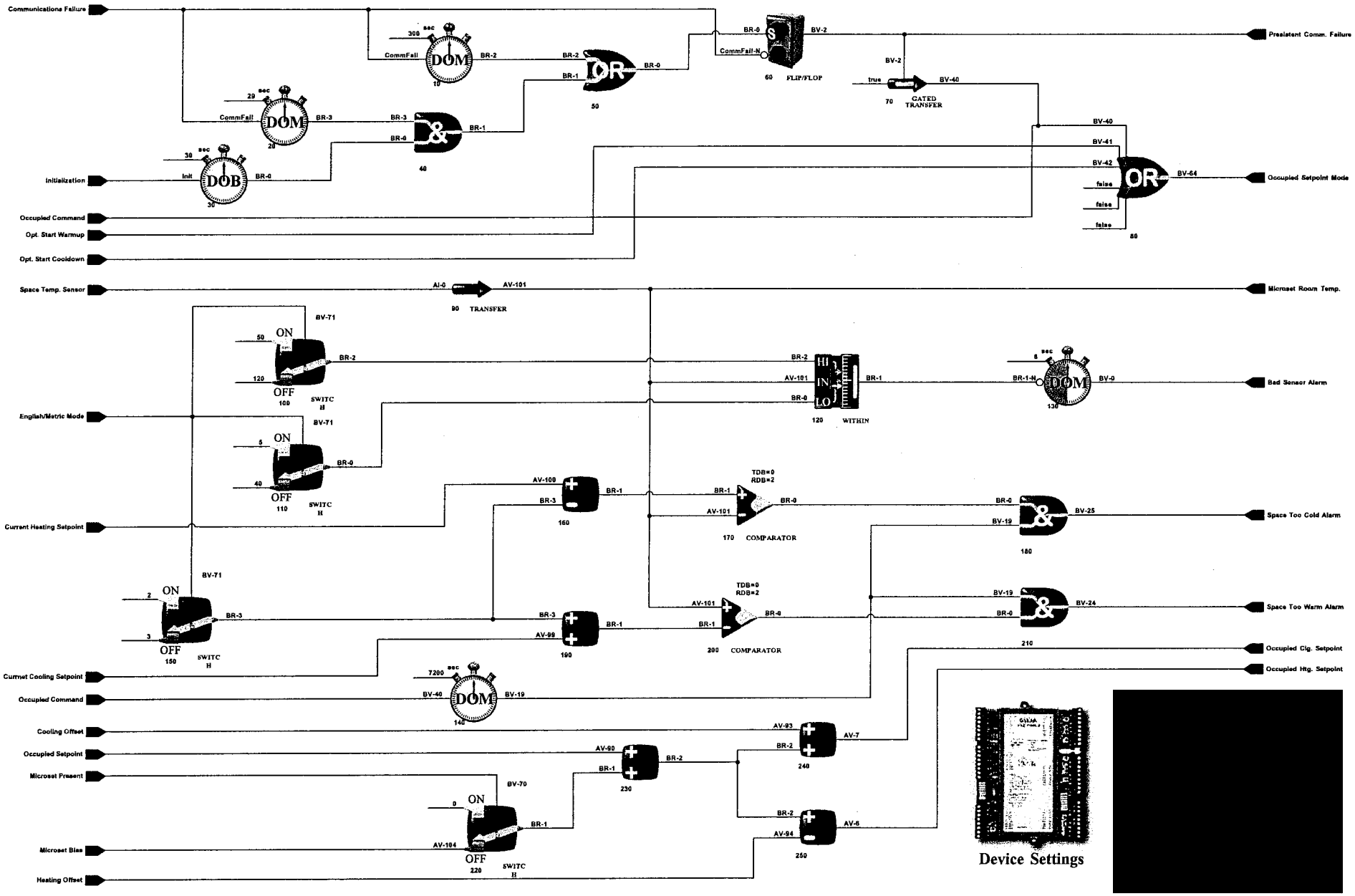


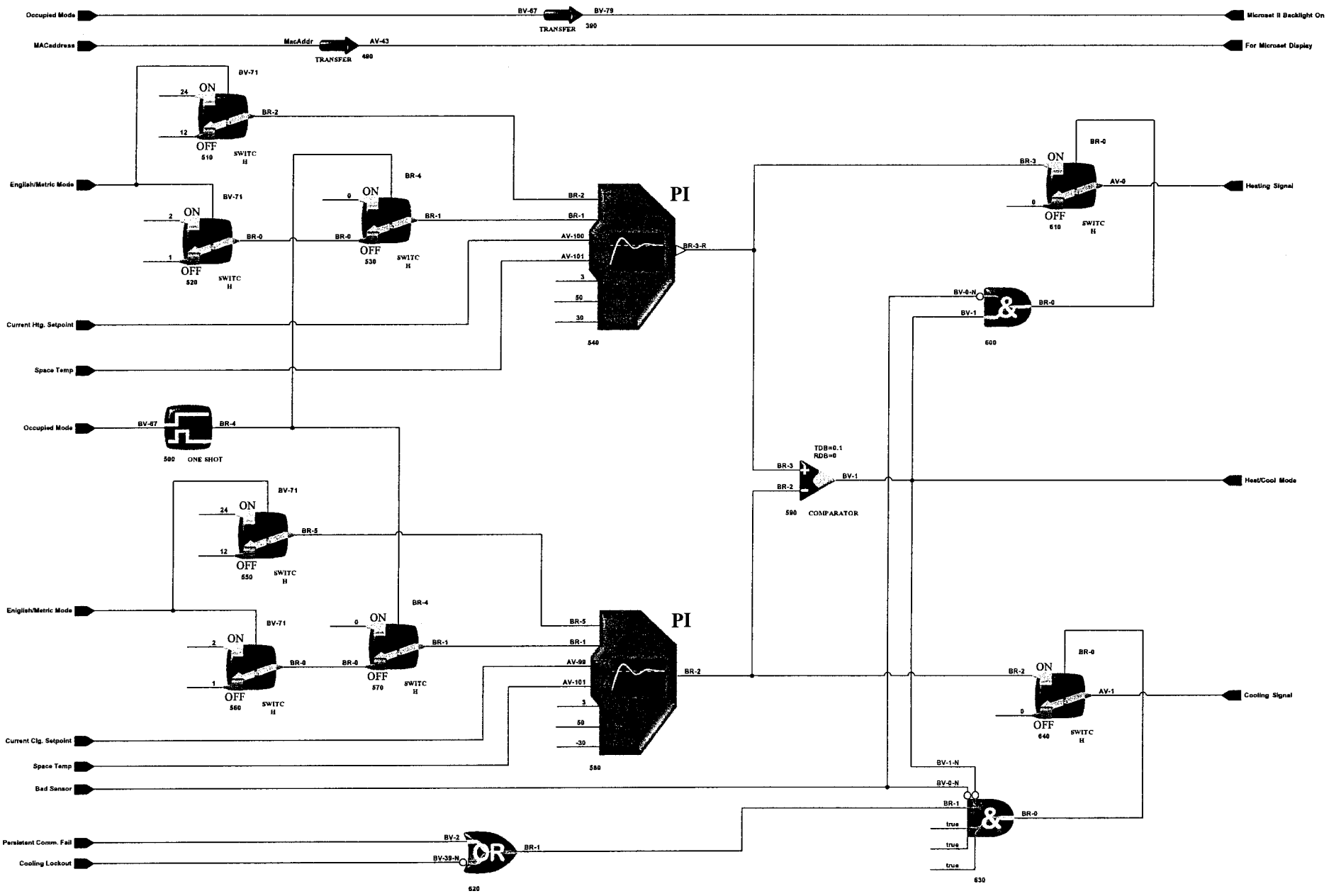


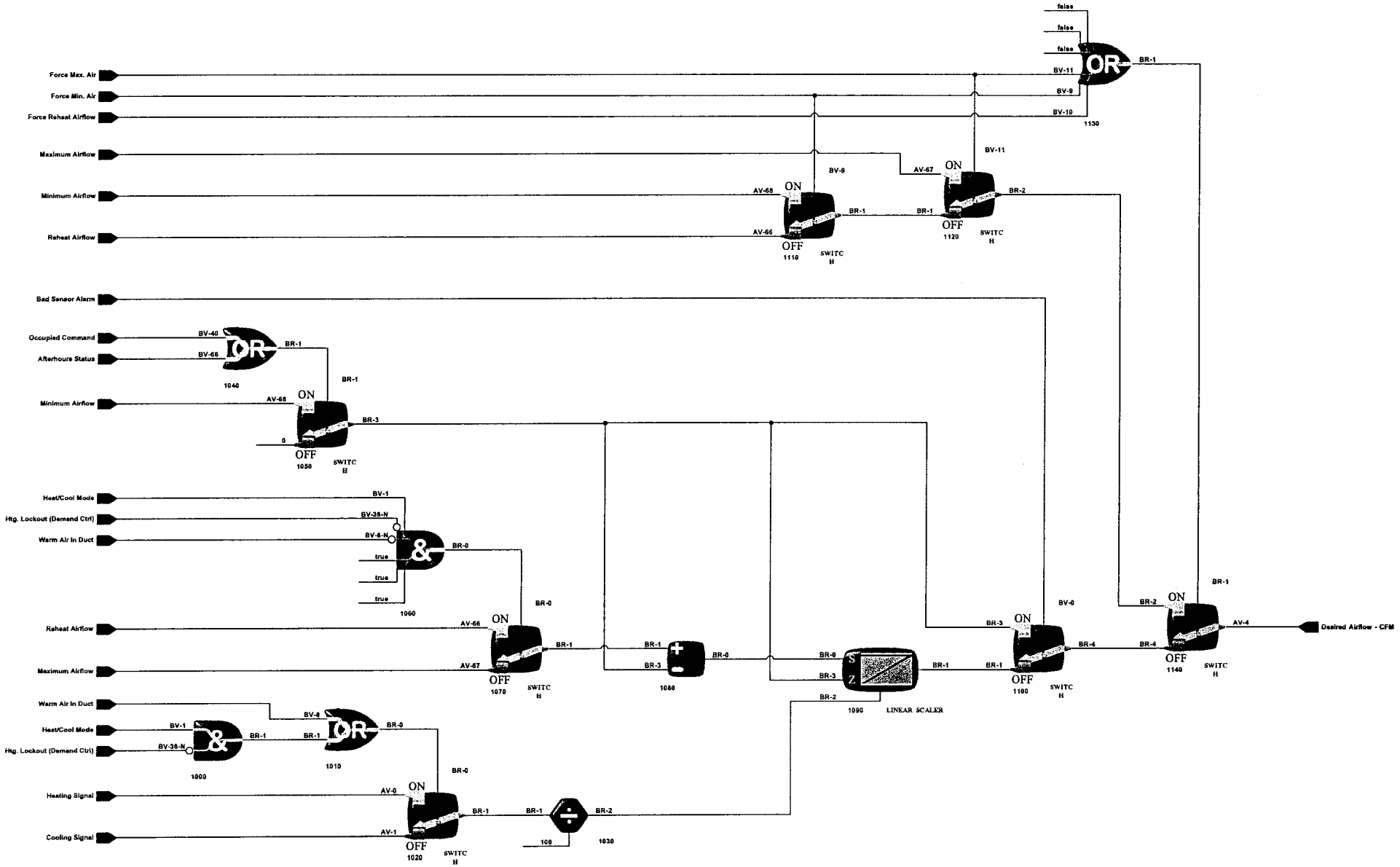
Device Settings

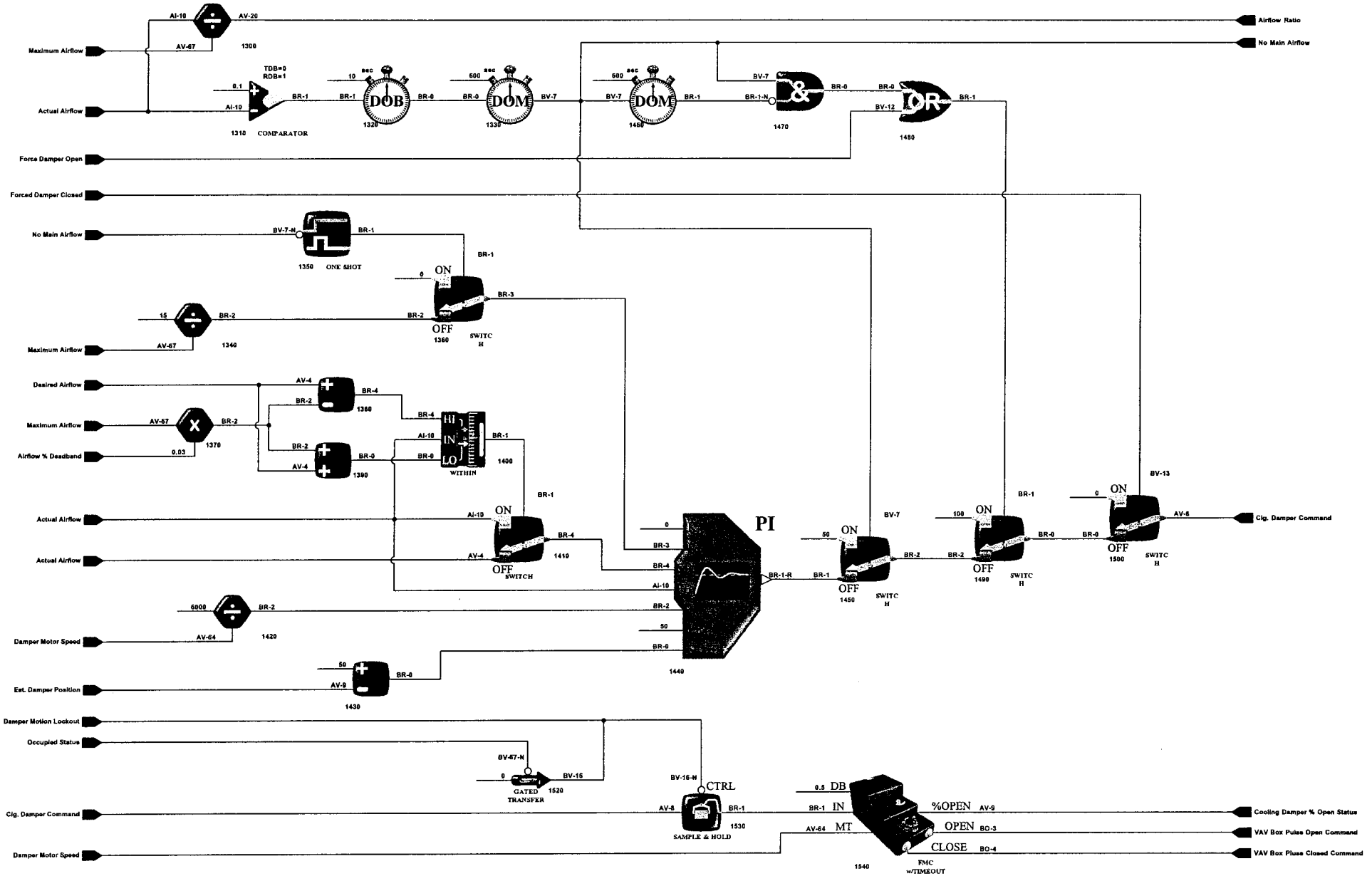
[redacted]


Boiler System Requested
Pump Lead/Lag ON=P-1 is Lead
HWP-2 Alarm
BV-3
BV-9
OR
200
BR-1
BV-0
&
210
BR-2
CHWP-1 Man On
BV-10
220
600 sec
DOB
230
BO-1
BV-8-N
240
HWP-1 Start/Stop
HWP-1 Alarm
Alarm Reset
5 sec
BV-20
DOM
270
BR-4
false
GATED TRANSFER
280
20 sec
250
BI-4-N
260
CHWP-1 Run Status
S
R
FLIP/FLOP
300
BV-8
HWP-1 Alarm
BR-3
Dual Pump Alarm Reset
BV-21
290
30 sec
500
510
5 sec
520
Dual Pump Alarm Reset
Boiler System Requested
Pump Lead/Lag ON=P-1 is Lead
HWP-1 Alarm
BV-3-N
BV-8
400
410
CHWP-2 Man On
BV-11
420
430
BO-2
BV-9-N
440
HWP-2 Start/Stop
HWP-2 Alarm
450
BI-5-N
460
HWP-2 Run Status
BV-9
HWP-2 Alarm
480
Pump Alarm Reset
Dual Pump Alarm Reset
470
END OF NORMAL
9999

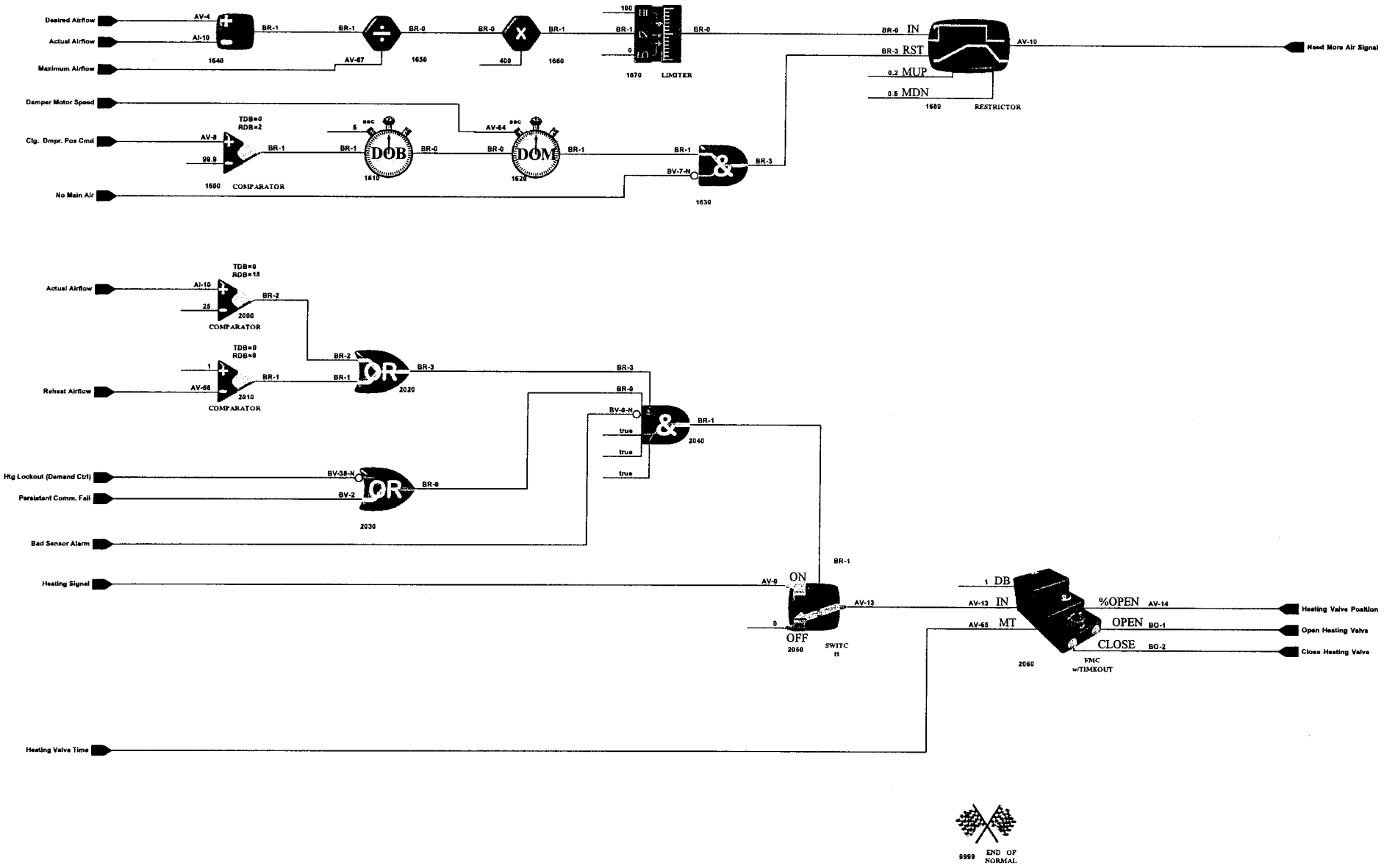

Communications Failure
CommFail
DOM
BR-2
OR
BR-0
BR-1
S
BV-2
CommFail-N
FLIP/FLOP
Presistent Comm. Failure
true
GATED TRANSFER
BV-40
BV-41
BV-42
false
OR
BV-64
Occupied Setpoint Mode
BR-3
&
Initialization
Init
DOB
Occupied Command
Opt. Start Warmup
Opt. Start Cooldown
Space Temp. Sensor
AI-0
AV-101
TRANSFER
Microset Room Temp.
ON
OFF
SWITCH
BV-71
English/Metric Mode
Current Heating Setpoint
HI
IN
LO
WITHIN
BR-1-N
Bad Sensor Alarm
AV-100
AV-99
TDB=0
RDB=2
COMPARATOR
BV-25
Space Too Cold Alarm
BV-19
BV-24
Space Too Warm Alarm
Current Cooling Setpoint
Occupied Clg. Setpoint
Occupied Htg. Setpoint
7200
Cooling Offset
Occupied Setpoint
Microset Present
Microset Bias
Heating Offset
AV-93
AV-90
AV-94
AV-7
AV-8
BV-70
AV-104
Device Settings

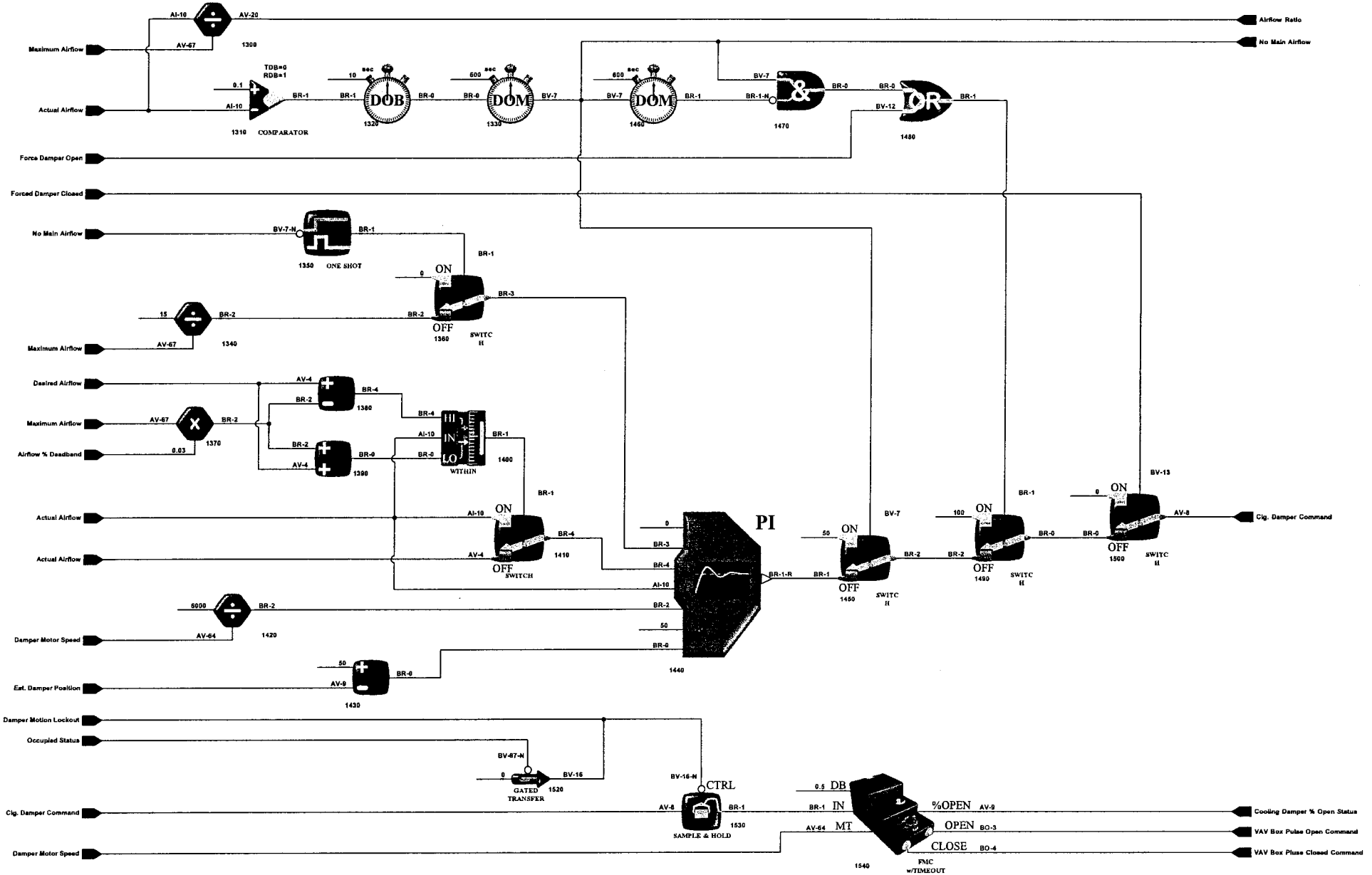

Occupied Mode
BV-67
TRANSFER
BV-79
390
Microset II Backlight On
MACaddress
MacAddr
TRANSFER
AV-43
480
For Microset Display
BV-71
ON
OFF
SWITCH
510
BR-2
English/Metric Mode
BV-71
ON
OFF
SWITCH
520
BR-0
BR-4
ON
OFF
SWITCH
530
BR-1
PI
BR-2
BR-1
AV-100
AV-101
3
50
30
BR-3-R
540
Current Htg. Setpoint
Space Temp
BR-3
ON
OFF
SWITCH
610
BR-0
AV-0
Heating Signal
BV-0-N
BV-1
&
600
Occupied Mode
BV-67
ONE SHOT
500
BR-4
TDB=0.1
RDB=0
BR-3
BR-2
BV-1
COMPARATOR
590
Heat/Cool Mode
BV-71
ON
OFF
SWITCH
550
BR-5
English/Metric Mode
BV-71
ON
OFF
SWITCH
560
BR-0
BR-4
ON
OFF
SWITCH
570
BR-1
PI
BR-5
BR-1
AV-99
AV-101
3
50
-30
BR-2
580
BR-0
BR-2
ON
OFF
SWITCH
640
AV-1
Cooling Signal
Current Clg. Setpoint
Space Temp
Bad Sensor
BV-1-N
BV-0-N
BR-1
true
true
true
&
630
BR-0
Persistent Comm. Fail
Cooling Lockout
BV-2
BV-39-N
OR
620
BR-1


Force Max. Air
Force Min. Air
Force Reheat Airflow
Maximum Airflow
Minimum Airflow
Reheat Airflow
Bad Sensor Alarm
Occupied Command
Afterhours Status
Minimum Airflow
Heat/Cool Mode
Htg. Lockout (Demand Ctrl)
Warm Air In Duct
Reheat Airflow
Maximum Airflow
Warm Air In Duct
Heat/Cool Mode
Htg. Lockout (Demand Ctrl)
Heating Signal
Cooling Signal
false
false
false
OR
1130
ON
OFF
SWITCH
1110
1120
1140
1040
1050
1060
1070
1080
1090
LINEAR SCALER
1100
1000
1010
1020
1030
AND
Desired Airflow - CFM

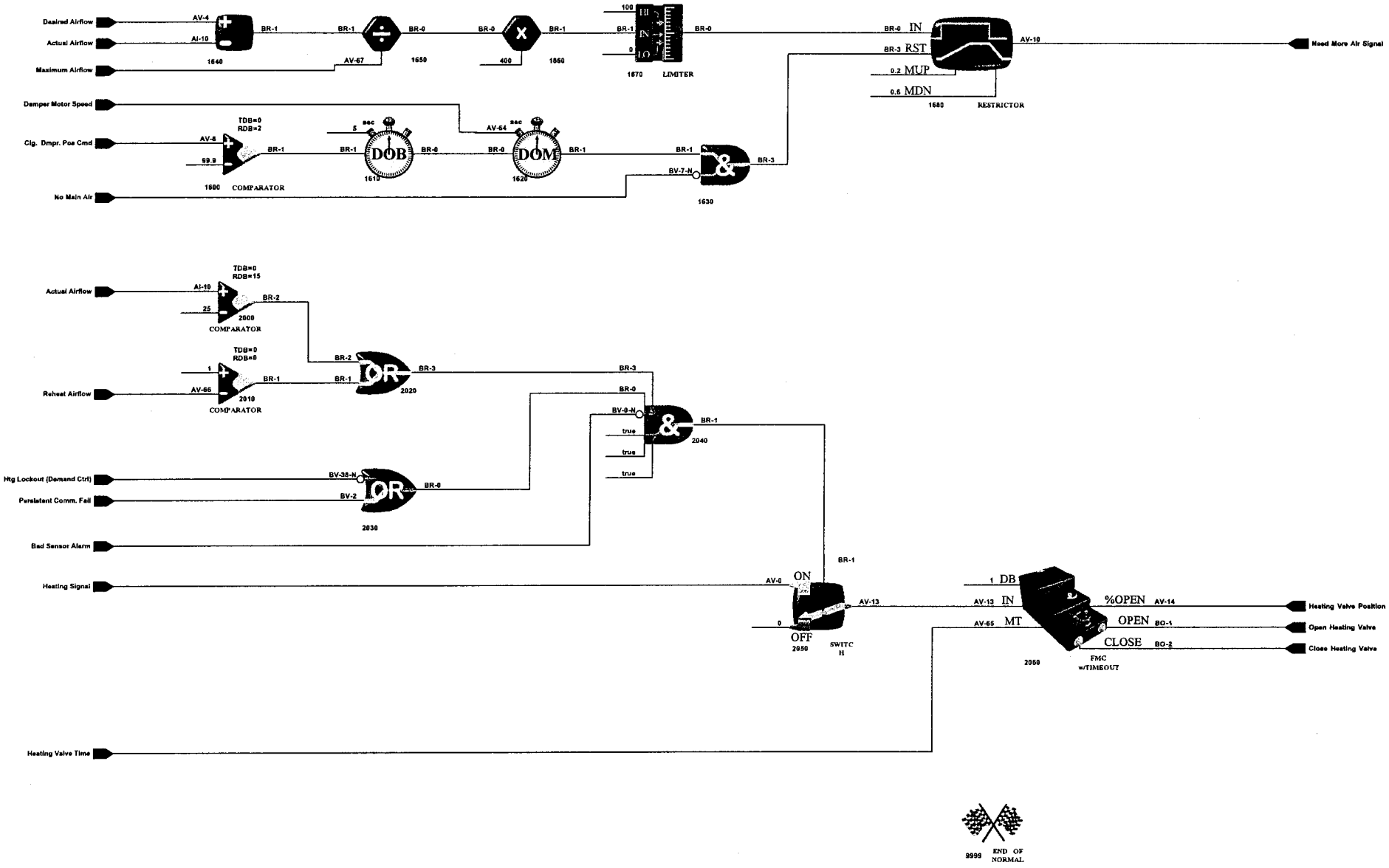

Maximum Airflow
Actual Airflow
Force Damper Open
Forced Damper Closed
No Main Airflow
Desired Airflow
Maximum Airflow
Airflow % Deadband
Actual Airflow
Actual Airflow
Damper Motor Speed
Est. Damper Position
Damper Motion Lockout
Occupied Status
Clg. Damper Command
Damper Motor Speed
Airflow Ratio
No Main Airflow
Cooling Damper % Open Status
VAV Box Pulse Open Command
VAV Box Pluse Closed Command
COMPARATOR
ONE SHOT
SWITCH
WITHIN
SWITCH
PI
GATED TRANSFER
SAMPLE & HOLD
FMC w/TIMEOUT
%OPEN
OPEN
CLOSE
CTRL
DB
IN
MT

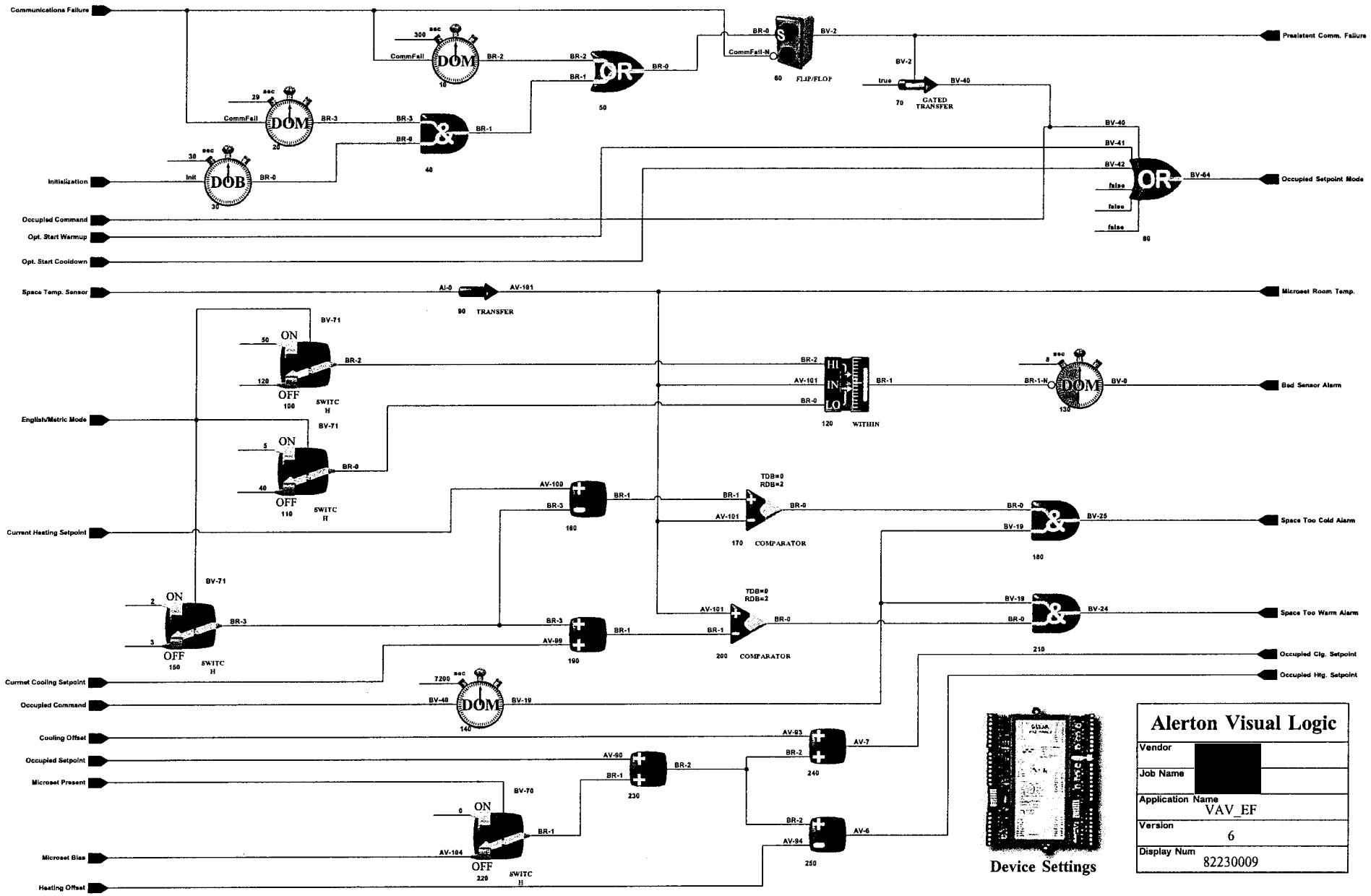
Heat C

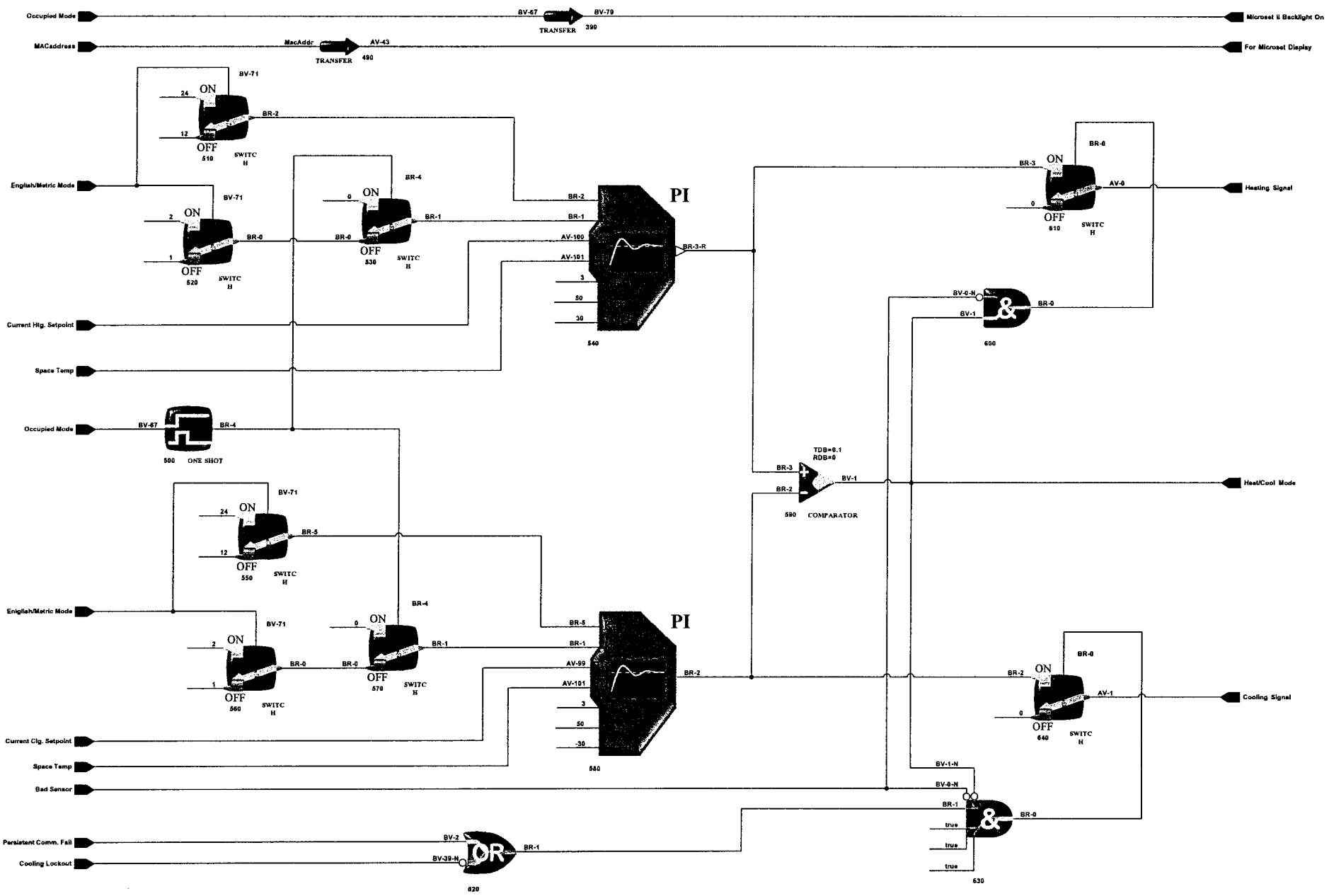

Desired Airflow
Actual Airflow
Maximum Airflow
AV-4
AI-10
1640
BR-1
AV-67
1650
400
1660
100
1670
LIMITER
BR-0 IN
BR-3 RST
0.2 MUP
0.5 MDN
1680
RESTRICTOR
AV-10
Need More Air Signal
Damper Motor Speed
Clg. Dmpr. Pos Cmd
TDB=0
RDB=2
AV-8
99.9
1600
COMPARATOR
DOB
1610
AV-64
DOM
1620
BV-7-N
1630
No Main Air
Actual Airflow
TDB=0
RDB=15
AI-10
25
2000
COMPARATOR
Reheat Airflow
TDB=0
RDB=0
1
AV-66
2010
COMPARATOR
OR
2020
BV-8-N
true
2040
Htg Lockout (Demand Ctrl)
Persistent Comm. Fail
BV-38-N
BV-2
OR
2030
Bad Sensor Alarm
Heating Signal
AV-9
ON
OFF
2050
SWITCH
AV-13
1 DB
AV-13 IN
AV-65 MT
%OPEN AV-14
OPEN BO-1
CLOSE BO-2
2060
FMC
w/TIMEOUT
Heating Valve Position
Open Heating Valve
Close Heating Valve
Heating Valve Time
9999
END OF
NORMAL

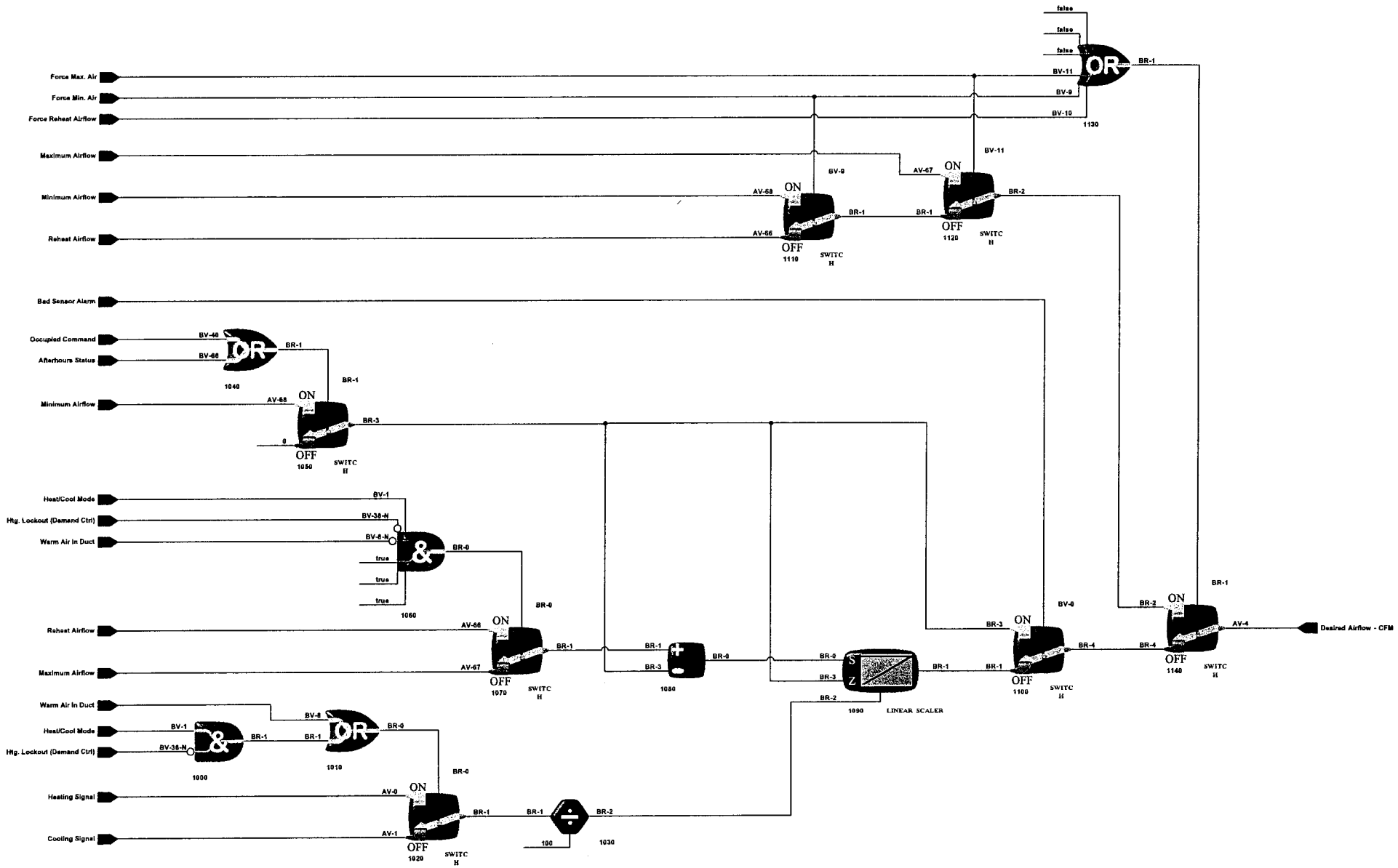

Maximum Airflow
Actual Airflow
Force Damper Open
Forced Damper Closed
No Main Airflow
Maximum Airflow
Desired Airflow
Maximum Airflow
Airflow % Deadband
Actual Airflow
Actual Airflow
Damper Motor Speed
Est. Damper Position
Damper Motion Lockout
Occupied Status
Clg. Damper Command
Damper Motor Speed
Airflow Ratio
No Main Airflow
Cooling Damper % Open Status
VAV Box Pulse Open Command
VAV Box Pluse Closed Command
1300
1310 COMPARATOR
1320
1330
1340
1350 ONE SHOT
1360 SWITCH
1370
1380
1390
1400 WITHIN
1410 SWITCH
1420
1430
1440 PI
1450 SWITCH
1460
1470
1480
1490 SWITCH
1500 SWITCH
1520 GATED TRANSFER
1530 SAMPLE & HOLD
1540 FMC w/TIMEOUT
DOB
DOM
DOM
DR
%OPEN
OPEN
CLOSE
DB
IN
MT

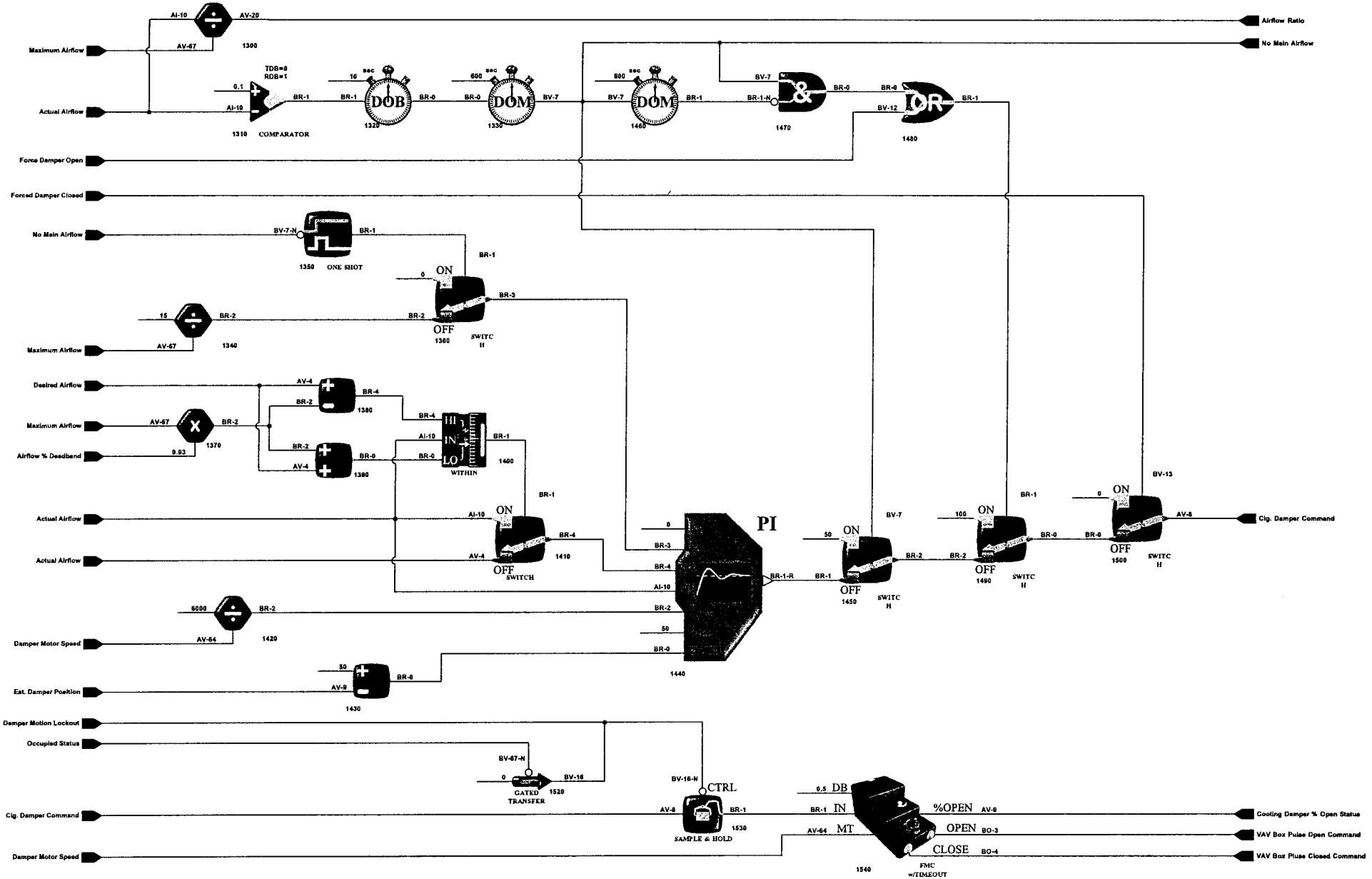
Heat C

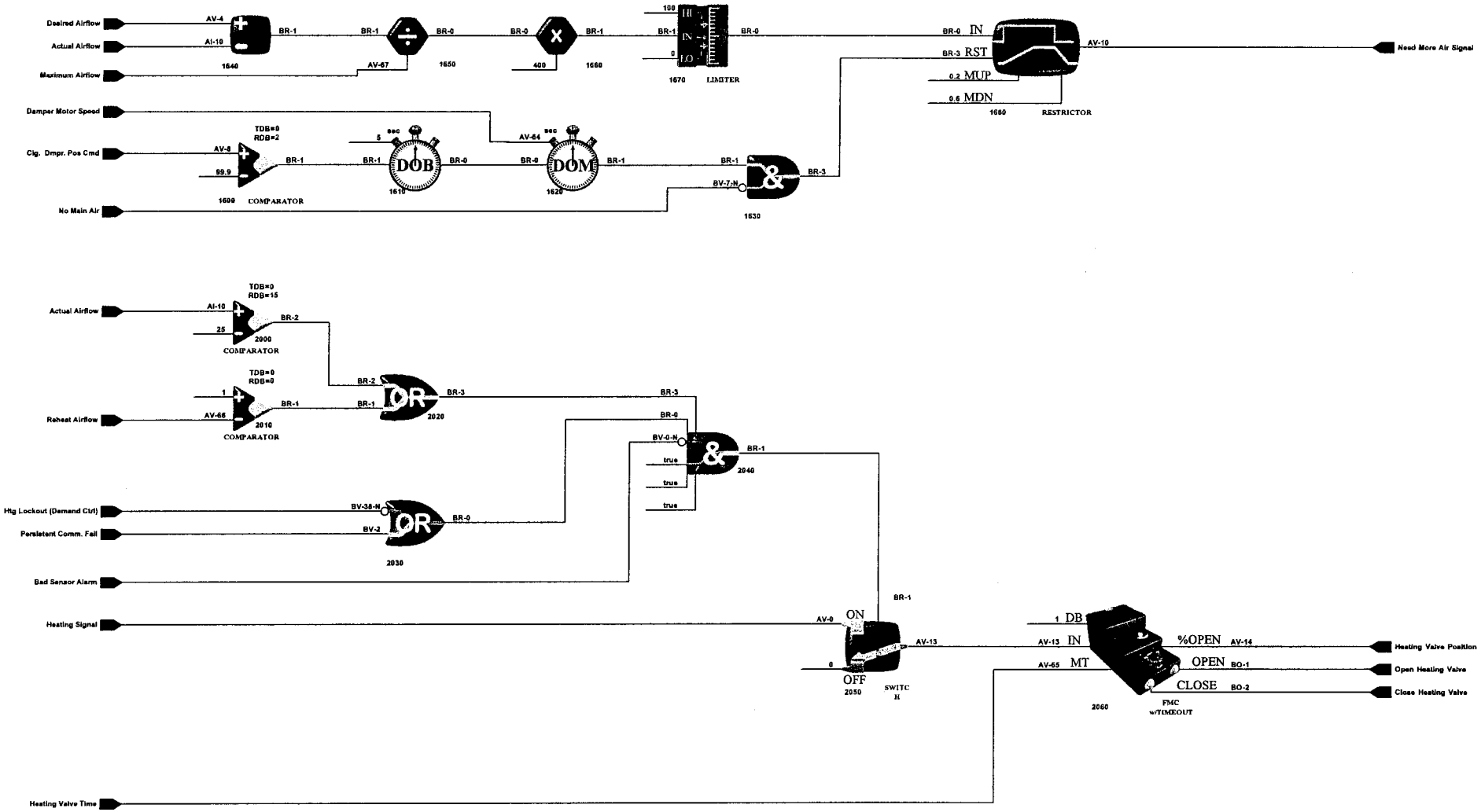

Desired Airflow
Actual Airflow
Maximum Airflow
AV-4
AI-10
AV-67
1640
1650
400
1660
100
0
1670
LIMITER
BR-0 IN
BR-3 RST
0.2 MUP
0.6 MDN
1680
RESTRICTOR
AV-10
Need More Air Signal
Damper Motor Speed
Clg. Dmpr. Pos Cmd
No Main Air
TDB=0
RDB=2
AV-6
99.9
1600
COMPARATOR
5
DOB
1610
AV-64
DOM
1620
BV-7-N
1630
Actual Airflow
TDB=0
RDB=15
AI-19
25
2000
COMPARATOR
Reheat Airflow
TDB=0
RDB=0
1
AV-66
2010
COMPARATOR
2020
2040
true
Htg Lockout (Demand Ctrl)
Persistent Comm. Fail
BV-38-N
BV-2
2030
Bad Sensor Alarm
Heating Signal
AV-0
ON
OFF
2050
SWITCH
1 DB
AV-13 IN
AV-65 MT
%OPEN AV-14
OPEN BO-1
CLOSE BO-2
2060
FMC
w/TIMEOUT
Heating Valve Position
Open Heating Valve
Close Heating Valve
Heating Valve Time
9999
END OF
NORMAL

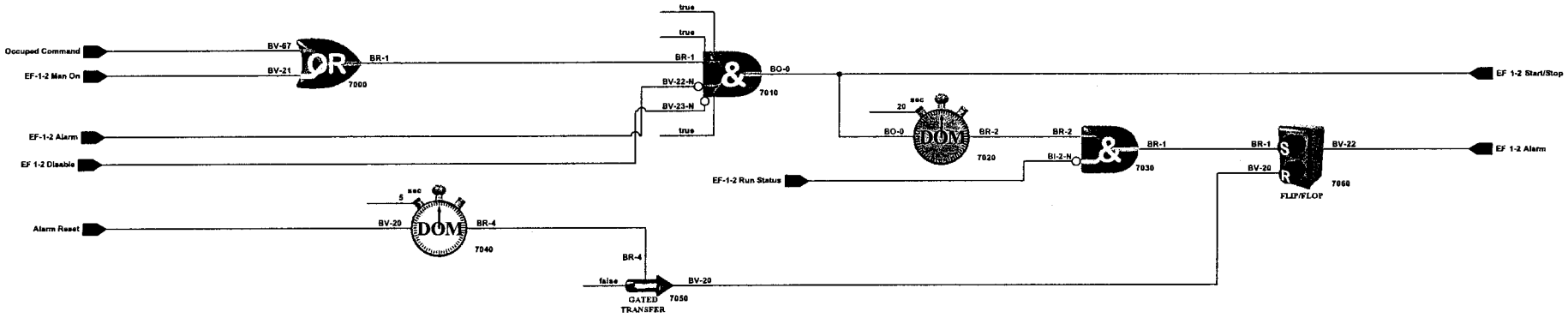

Communications Failure
Initialization
Occupied Command
Opt. Start Warmup
Opt. Start Cooldown
Space Temp. Sensor
English/Metric Mode
Current Heating Setpoint
Current Cooling Setpoint
Occupied Command
Cooling Offset
Occupied Setpoint
Microset Present
Microset Bias
Heating Offset
CommFail
DOM
DOB
OR
&
FLIP/FLOP
GATED TRANSFER
TRANSFER
SWITCH
WITHIN
COMPARATOR
Preaistent Comm. Failure
Occupied Setpoint Mode
Microset Room Temp.
Bad Sensor Alarm
Space Too Cold Alarm
Space Too Warm Alarm
Occupied Clg. Setpoint
Occupied Htg. Setpoint
Device Settings
Alerton Visual Logic
Vendor
Job Name
Application Name
VAV_EF
Version
6
Display Num
82230009


Occupied Mode
BV-67
TRANSFER
390
BV-79
Microset ii Backlight On
MACaddress
MacAddr
TRANSFER
490
AV-43
For Microset Display
BV-71
ON
OFF
SWITCH
510
BR-2
English/Metric Mode
BV-71
ON
OFF
SWITCH
520
BR-0
BR-4
ON
OFF
SWITCH
530
BR-0
BR-1
PI
BR-2
BR-1
AV-100
AV-101
3
50
30
540
BR-3-R
Current Htg. Setpoint
Space Temp
BR-3
ON
OFF
SWITCH
610
BR-0
AV-0
Heating Signal
BV-0-N
BV-1
&
600
BR-0
Occupied Mode
BV-67
ONE SHOT
500
BR-4
TDB=0.1
RDB=0
BR-3
BR-2
COMPARATOR
590
BV-1
Heat/Cool Mode
BV-71
ON
OFF
SWITCH
550
BR-5
Eniglish/Metric Mode
BV-71
ON
OFF
SWITCH
560
BR-0
BR-4
ON
OFF
SWITCH
570
BR-0
BR-1
PI
BR-5
BR-1
AV-99
AV-101
3
50
-30
580
BR-2
BR-2
ON
OFF
SWITCH
640
BR-0
AV-1
Cooling Signal
Current Clg. Setpoint
Space Temp
Bad Sensor
BV-1-N
BV-0-N
BR-1
true
true
true
&
630
BR-0
Persistent Comm. Fail
Cooling Lockout
BV-2
BV-39-N
OR
620
BR-1


Force Max. Air
Force Min. Air
Force Reheat Airflow
Maximum Airflow
Minimum Airflow
Reheat Airflow
Bad Sensor Alarm
Occupied Command
Afterhours Status
Minimum Airflow
Heat/Cool Mode
Htg. Lockout (Demand Ctrl)
Warm Air in Duct
Reheat Airflow
Maximum Airflow
Warm Air in Duct
Heat/Cool Mode
Htg. Lockout (Demand Ctrl)
Heating Signal
Cooling Signal
false
false
false
OR
1130
ON
OFF
SWITCH
1110
1120
1140
1070
1100
1020
AND
1000
1060
1040
1050
1080
1090
LINEAR SCALER
1030
100
Desired Airflow - CFM


Maximum Airflow
Actual Airflow
Force Damper Open
Forced Damper Closed
No Main Airflow
Maximum Airflow
Desired Airflow
Maximum Airflow
Airflow % Deadband
Actual Airflow
Actual Airflow
Damper Motor Speed
Est. Damper Position
Damper Motion Lockout
Occupied Status
Clg. Damper Command
Damper Motor Speed
Airflow Ratio
No Main Airflow
1300
COMPARATOR
1310
DOB
1320
DOM
1330
DOM
1460
1470
OR
1480
ONE SHOT
1350
SWITCH
1360
1340
1380
1370
1390
WITHIN
1400
SWITCH
1410
1420
1430
PI
1440
SWITCH
1450
SWITCH
1490
SWITCH
1500
Clg. Damper Command
GATED TRANSFER
1520
SAMPLE & HOLD
1530
FMC w/TIMEOUT
1540
%OPEN
OPEN
CLOSE
Cooling Damper % Open Status
VAV Box Pulse Open Command
VAV Box Pluse Closed Command


Desired Airflow
Actual Airflow
Maximum Airflow
AV-4
AI-10
AV-67
1640
1650
400
1660
100
0
HI
IN
LO
1670
LIMITER
BR-0 IN
BR-3 RST
0.2 MUP
0.6 MDN
1680
RESTRICTOR
AV-10
Need More Air Signal
Damper Motor Speed
Clg. Dmpr. Pos Cmd
No Main Air
TDB=0
RDB=2
AV-8
99.9
1600
COMPARATOR
5
DOB
1610
AV-64
DOM
1620
BV-7-N
1630
TDB=0
RDB=15
25
2000
COMPARATOR
TDB=0
RDB=0
1
AV-66
2010
COMPARATOR
OR
2020
BV-0-N
true
2040
Htg Lockout (Demand Ctrl)
Persistent Comm. Fail
BV-38-N
BV-2
2030
Bad Sensor Alarm
Heating Signal
AV-0
ON
OFF
2050
SWITCH
1 DB
AV-13 IN
AV-65 MT
%OPEN AV-14
OPEN BO-1
CLOSE BO-2
2060
FMC
w/TIMEOUT
Heating Valve Position
Open Heating Valve
Close Heating Valve
Heating Valve Time


Occupied Command
EF-1-2 Man On
BV-67
BV-21
OR
BR-1
7000
true
true
BR-1
BV-22-N
BV-23-N
true
&
BO-0
7010
EF 1-2 Start/Stop
EF-1-2 Alarm
EF 1-2 Disable
20 sec
BO-0
DOM
BR-2
7020
BR-2
&
BR-1
7030
EF-1-2 Run Status
BI-2-N
BR-1
S
R
BV-22
BV-20
FLIP/FLOP
7060
EF 1-2 Alarm
5 sec
Alarm Reset
BV-20
DOM
BR-4
7040
BR-4
false
BV-20
GATED TRANSFER
7050


END OF NORMAL
9999