

Project: WHATCOM TRANSIT AUTHORITY
Contract: WTA

DRAWING

1 OF 30 RSR1-1
2 OF 30 FPB1-1
3 OF 30 FPB1-2
4 OF 30 FPB1-3
5 OF 30 EF1-1
6 OF 30 VHEF1-1
7 OF 30 VHEF1-2
8 OF 30 F1-1
9 OF 30 F1-2
10 OF 30 FC1-1
11 OF 30 RAC1-1
12 OF 25 RAC1-2
13 OF 30 RAC2-1
14 OF 30 RAC2-2
15 OF 30 MAH1-1
16 OF 30 MAH1-2
17 OF 30 MAH2-1
18 OF 30 MAH2-2
19 OF 30 MAH3-1
20 OF 30 MAH3-2
21 OF 30 RHU1-1
22 OF 30 RHU1-2
23 OF 30 UH1-1
24 OF 30 UH1-2
25 OF 30 RS-1
26 OF 30 RS-2

DRAWING DESCRIPTION

**RISER DIAGRAM
FPB W/HEAT FLOW DIAGRAM
FPB W/O HEAT FLOW DIAGRAM
FPB POINT SCHEDULE
EF FLOW DIAGRAM
VEHICLE EXHAUST / HOSE REEL FLOW DIAGRAM
VEHICLE EXHAUST / HOSE REEL POINT SCHEDULE
FURNACE #1 FLOW DIAGRAM
FURNACE #1 POINT SCHEDULE
FC-1/HP-1 FLOW DIAGRAM
RAC-1 FLOW DIAGRAM
RAC-1 POINT SHCEDULE
RAC-2 FLOW DIAGRAM
RAC-2 POINT SCHEDULE
MAH-1 FLOW DIAGRAM
MAH-1 POINT SHCEDULE
MAH-2 FLOW DIAGRAM
MAH-2 POINT SHCEDULE
MAH-3 FLOW DIAGRAM
MAH-3 POINT SHCEDULE
RHU-1 FLOW DIAGRAM
RHU-1 POINT SHCEDULE
UNIT HEATER FLOW DIAGRAM
UNIT HEATER POINT SCHEDULE
1ST FLOOR ROOM SCHEDULE
2ND FLOOR ROOM SCHEDULE**

CONTROL SYSTEMS

Creating a better climate for business.

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

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

PROJECT TITLE

WTB

ARCHITECT

Zervas Group Architects
206 Prospect St. Suite One
Bellingham, WA 98225
(360) 734-4744
(360) 733-2696

ENGINEER

Berona Engineers Inc.
19400 3rd Ave. W Suite 100
Lynnwood, WA 98036
(425) 744-6033
(360) 744-6322

GENERAL CONTRACTOR

IMPERO CONTRACTING CO. LLC
1971 Midway Lane, Suite N
Bellingham, WA 98226-8175
(360) 733-7052
(360) 733-7141

	ELECTRICAL CONTRACTOR
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		AS-BUILT		05/16/02	MWK
REFERENCE DRAWING	NO.	REVISION LOCATION	ECN	DATE	BY

CONTROL SYSTEMS



JOHNSON
CONTROLS
IBCS
AUTHORIZED
BUILDING
CONTROLS
SPECIALIST

2100 196TH ST. SW
SUITE 125
LYNNWOOD WA, 98036
Ph. 425/873-4448
Fax 425/873-2886

SALES ENGINEER
D.D.

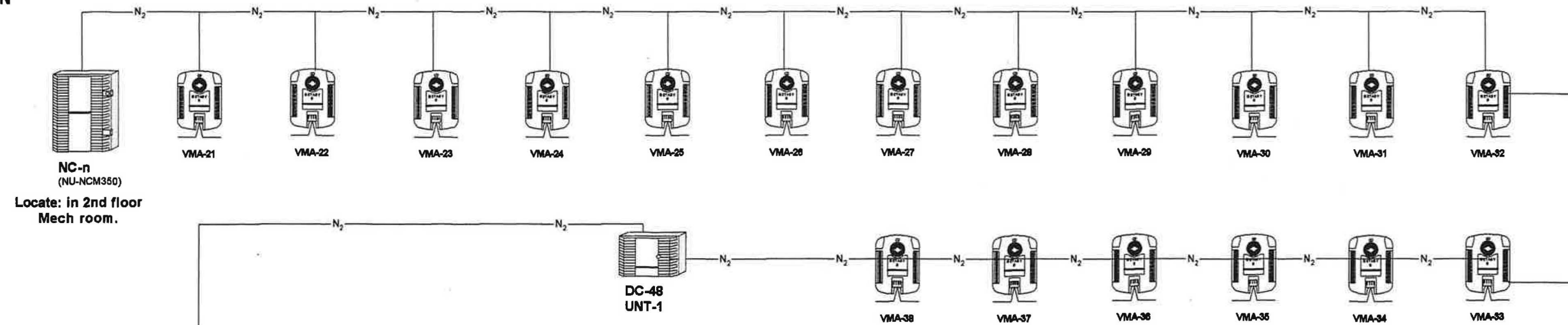
PROJECT MANAGER	DD
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APPLICATION ENGINEER
M.S

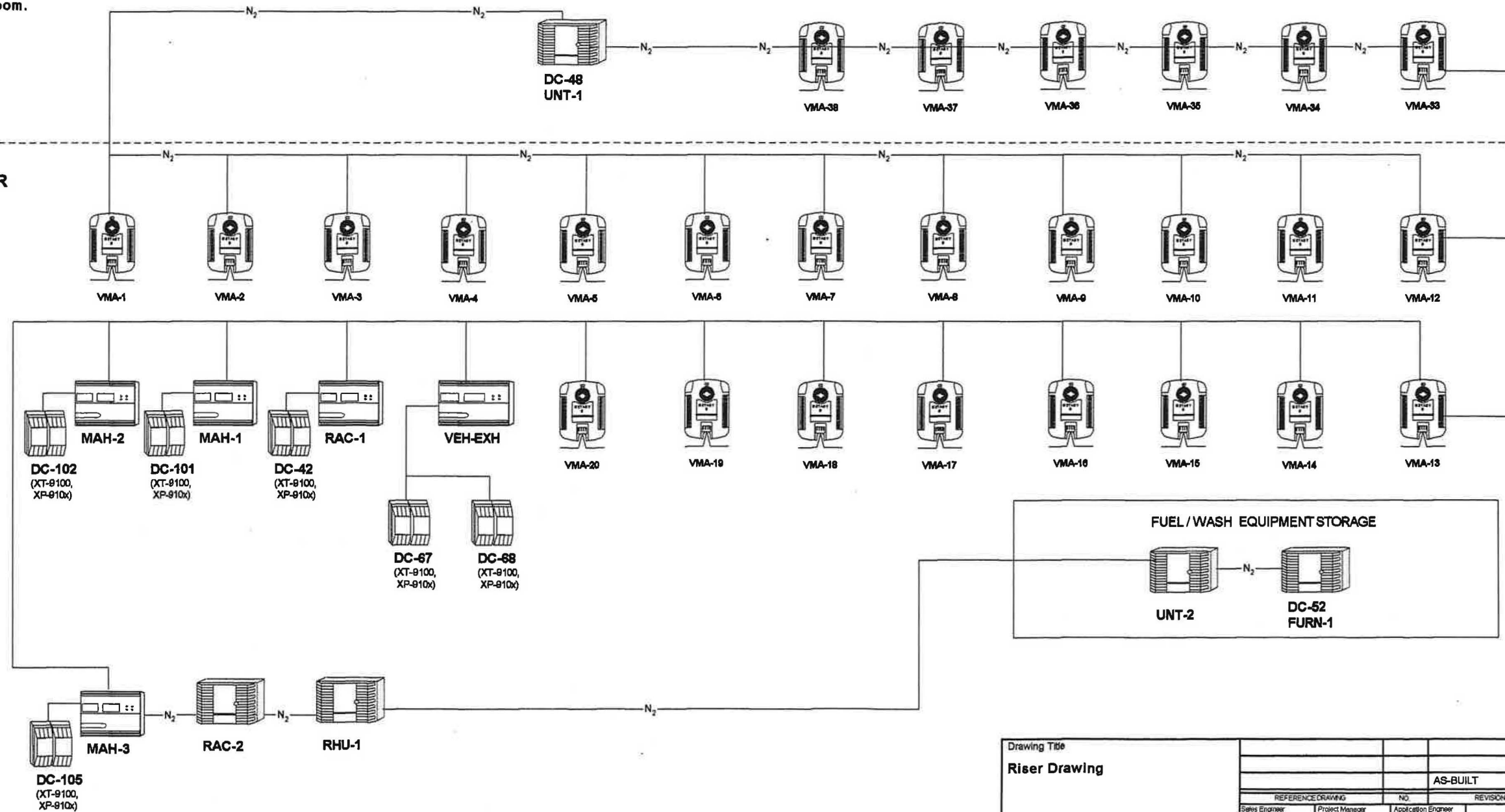
DATE
05/15/02

CONTRACT NUMBER
WTA

**2ND FLOOR
ADMIN**



**1ST FLOOR
ADMIN**



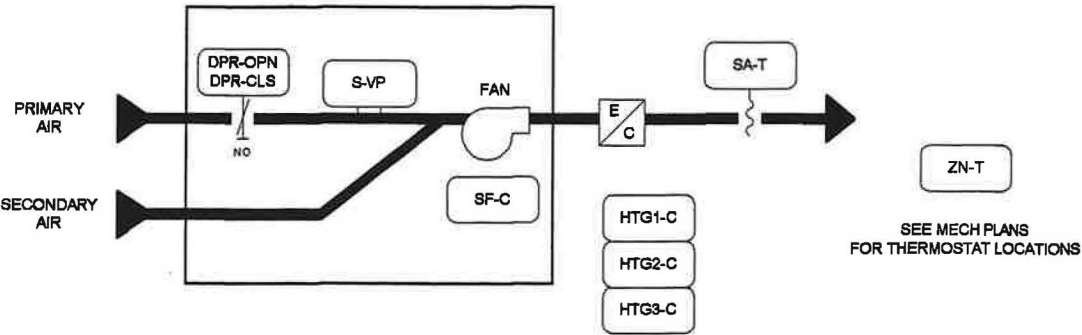
Drawing Title									
Riser Drawing									
					AS-BUILT			5/15/02	MWK
	REFERENCE DRAWING	NO	REVISION/LOCATION				EDN	DATE	BY
	Sales Engineer D.D	Project Manager D.D	Application Engineer M.S		DRAWN BY MAS DATE 02/01/01		APPROVED BY DATE 0		
Project Title					Branch information:		CONTRACT NUMBER		
WTA	CONTROL SYSTEMS 				2100 190TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4448 Fax 425/673-2888		2000-026		
							DRAWING NUMBER		
							1 of 30 RSR1-1		

SINGLE DUCT FPB'S

WITH 3 STAGE OF ELECTRIC HEAT
AND SERIES FAN

TYPICAL OF 31

SEE ROOM SCHEDULE FOR BOX INFORMATION



BILL OF MATERIALS

Designation	Qty	Part Number	Description
Field Devices:			
VMA CONTROLLER	31	AP-VMA1420-0	VAV MODULAR ASSY - CLG W/ REHEAT
SA-T	31	TE-6300-601	SENSOR ELEMENT, NICKEL, 8IN, 1K
Other Devices:			
ZN-T	31	TMZ-1600	T-STAT

SEQUENCE OF OPERATION

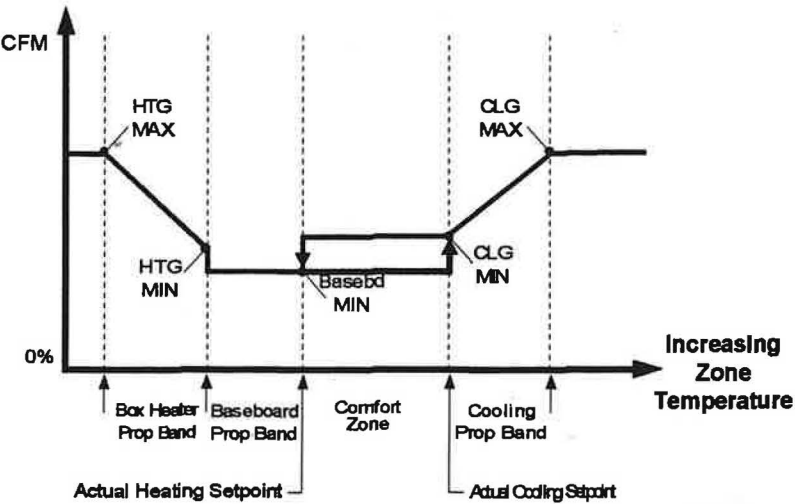
UNOCCUPIED MODE: VAV boxes will be commanded to the unoccupied mode when the occupied point in RAC-1 is scheduled to the unoccupied mode. Series fan will be commanded off and will cycle on with the electric heat to maintain the unoccupied setpoints.

OCCUPIED MODE: VAV boxes will be commanded to the occupied mode when the occupied point in RAC-1 is schedule to the occupied mode. Series fan will be commanded on and the vav box controller will modulate the variable volume damper to maintain the space temperatures at the occupied temperature setpoints.

On a call for cooling the variable volume damper will be modulated from minimum cfm flow to maximum cooling cfm flow to maintain space conditions. On a drop in space temperature the variable volume damper will be modulated to its minimum flow position. On a further call for heat, the electric heat will cycle on to maintain setpoint.

TEMPORARY OCCUPANCY MODE: The metastats are equipped with a pushbutton for temporary occupancy. When the button is pressed, the vav box will operate with the same sequence as the occupied mode for a user defined period of time.

SERIES FAN: The series fan is off during the shutdown and auto zero modes. The fan is always on during the occupied and standby modes and is cycled on during the unoccupied and warmup modes.



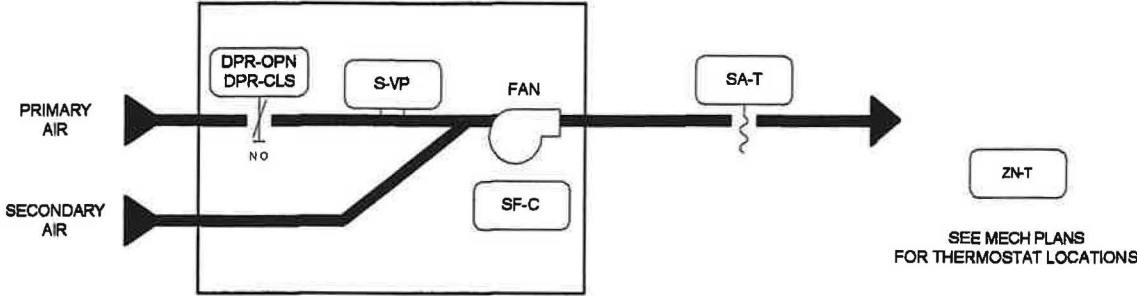
VGRP16-1

Drawing Title																		
FPB With Heat Flow Diagram																		
											1	AS-BUILT				5/15/02	MVK	
	REFERENCE DRAWING										NO.	REVISION/LOCATION				ECH	DATE	BY
	Sales Engineer		Project Manager		Application Engineer		DRAWN				APPROVED							
	D.D		D.D		M.S		BY MAS DATE 01/02/01				BY		DATE 0					
Project Title											Branch Information				CONTRACT NUMBER			
WTA	CONTROL SYSTEMS 										2100 190TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4446 Fax 425/673-2886				2000-026			
															DRAWING NUMBER 2 of 30 FPB1-1			

SINGLE DUCT FPB'S

SERIES FAN
TYPICAL OF 8

SEE ROOM SCHEDULE FOR BOX INFORMATION



BILL OF MATERIALS

Designation	Qty	Part Number	Description
Field Devices:			
VMA CONTROLLER	8	AP-VMA1420-0	VAV MODULAR ASSY - CLG W/ REHEAT
	0	TE-8300-801	SENSOR ELEMENT, NICKEL, 8IN, 1K
Other Devices:			
ZN-T	8	TMZ-1800	T-STAT

SEQUENCE OF OPERATION

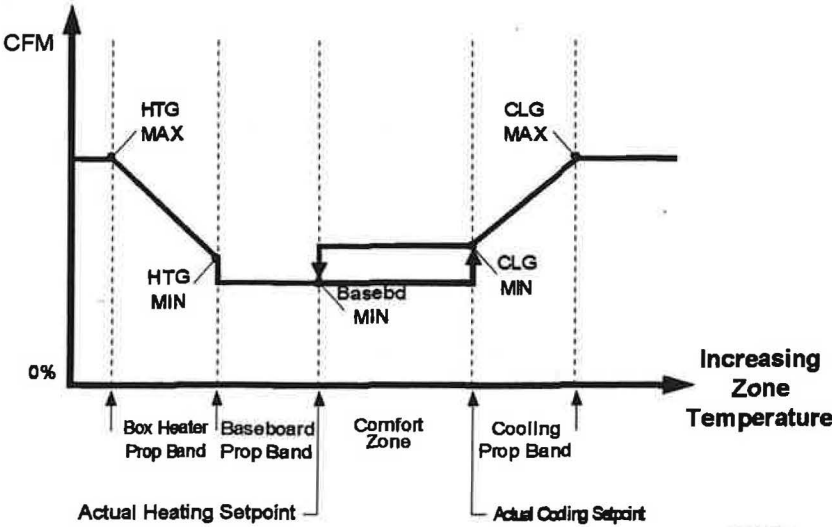
UNOCCUPIED MODE: VAV boxes will be commanded to the unoccupied mode when the occupied point in RAC-1 is scheduled to the unoccupied mode. Series fan will be commanded off and will cycle on to maintain the unoccupied setpoints.

OCCUPIED MODE: VAV boxes will be commanded to the occupied mode when the occupied point in RAC-1 is schedule to the occupied mode. Series fan will be commanded on and the vav box controller will modulate the variable volume damper to maintain the space temperatures at the occupied temperature setpoints.

On a call for cooling the variable volume damper will be modulated from minimum cfm flow to maximum cooling cfm flow to maintain space conditions. On a drop in space temperature the variable volume damper will be modulated to its minimum flow position.

TEMPORARY OCCUPANCY MODE: The metastats are equipped with a pushbutton for temporary occupancy. When the button is pressed, the vav box will operate with the same sequence as the occupied mode for a user defined period of time.

SERIES FAN: The series fan is off during the shutdown and auto zero modes. The fan is always on during the occupied and standby modes and is cycled on during the unoccupied and warmup modes.



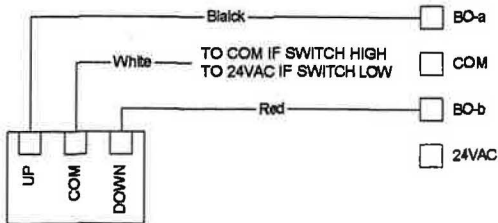
VGRP15-1

Drawing Title FPB FLOW DIAGRAM										
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	REFERENCE DRAWING		NO	REVISION-LOCATION			ECON	DATE	BY	
	Sales Engineer D.D	Project Manager D.D	Application Engineer M.S	DRAWN			APPROVED			
Project Title WTA				BY	MAS	DATE	01/02/01	BY	DATE	0
	CONTROL SYSTEMS 			Branch information 2100 196TH ST. SW SUITE 128 LYNNWOOD WA, 98036 Ph. 425/673-4446 Fax 425/673-2886			CONTRACT NUMBER 2000-026			
							DRAWING NUMBER 3 of 30 FPB1-2			

Electrician/Filter		Point Information			Controller Information						Panel
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	
		VMA			VMA	VMA 1420					VAV
		VMA			VMA	VMA 1420		1	1		VAV
	AI-1	VMA	ZN-T	Zone Temperature	VMA	VMA 1420	N2	1	1	AI-1	VAV
	AI-2	VMA			VMA	VMA 1420	N2	1	1	AI-2	VAV
	AI-3	VMA			VMA	VMA 1420	N2	1	1	AI-3	VAV
	AI-4	VMA	AI 4	AI 4	VMA	VMA 1420	N2	1	1	AI-4	VAV
	AI-5	VMA	S-VP	Supply Delta P	VMA	VMA 1420	N2	1	1	AI-5	VAV
	BI-1	VMA	TEMP-OCC	Occupancy Button	VMA	VMA 1420	N2	1	1	BI-1	VAV
	BI-2	VMA			VMA	VMA 1420	N2	1	1	BI-2	VAV
	BI-3	VMA			VMA	VMA 1420	N2	1	1	BI-3	VAV
	BO-1	VMA	SER-F-C	Fan	VMA	VMA 1420	N2	1	1	BO-1	VAV
	BO-2	VMA			VMA	VMA 1420	N2	1	1	BO-2	VAV
	BO-3	VMA			VMA	VMA 1420	N2	1	1	BO-3	VAV
	BO-4	VMA			VMA	VMA 1420	N2	1	1	BO-4	VAV
	BO-5	VMA			VMA	VMA 1420	N2	1	1	BO-5	VAV
	AO-1	VMA			VMA	VMA 1420	N2	1	1	AO-1	VAV
	AO-2	VMA			VMA	VMA 1420	N2	1	1	AO-2	VAV
		VMAHEAT			VMA	VMA 1420					VAV
		VMAHEAT			VMA	VMA 1420		1	1		VAV
	AI-1	VMAHEAT	ZN-T	Zone Temperature	VMA	VMA 1420	N2	1	1	AI-1	VAV
	AI-2	VMAHEAT			VMA	VMA 1420	N2	1	1	AI-2	VAV
	AI-3	VMAHEAT			VMA	VMA 1420	N2	1	1	AI-3	VAV
	AI-4	VMAHEAT	AI 4	AI 4	VMA	VMA 1420	N2	1	1	AI-4	VAV
	AI-5	VMAHEAT	S-VP	Supply Delta P	VMA	VMA 1420	N2	1	1	AI-5	VAV
	BI-1	VMAHEAT	TEMP-OCC	Occupancy Button	VMA	VMA 1420	N2	1	1	BI-1	VAV
	BI-2	VMAHEAT			VMA	VMA 1420	N2	1	1	BI-2	VAV
	BI-3	VMAHEAT			VMA	VMA 1420	N2	1	1	BI-3	VAV
	BO-1	VMAHEAT	SER-F-C	Fan	VMA	VMA 1420	N2	1	1	BO-1	VAV
	BO-2	VMAHEAT	BOXHTG	Box Heating Cmd	VMA	VMA 1420	N2	1	1	BO-2	VAV
	BO-3	VMAHEAT	BOXHTG	Box Heating Cmd	VMA	VMA 1420	N2	1	1	BO-3	VAV
	BO-4	VMAHEAT	BOXHTG	Box Heating Cmd	VMA	VMA 1420	N2	1	1	BO-4	VAV
	BO-5	VMAHEAT			VMA	VMA 1420	N2	1	1	BO-5	VAV
	AO-1	VMAHEAT			VMA	VMA 1420	N2	1	1	AO-1	VAV
	AO-2	VMAHEAT			VMA	VMA 1420	N2	1	1	AO-2	VAV

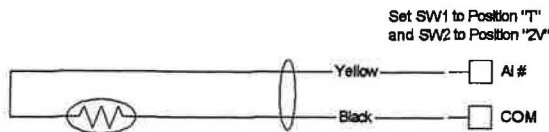
DETAIL VMA70

INCREMENTAL CONTROL TO VA-80x0



DETAIL VMA1

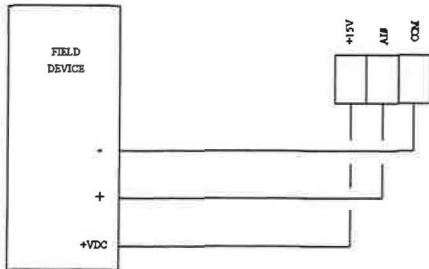
TEMPERATURE SENSOR INPUT



DETAIL VMA5:

SEE TERMINAL BOARD LAYOUT DETAIL FOR JUMPER SETTINGS

0-10VDC INPUT INTERNAL SOURCE

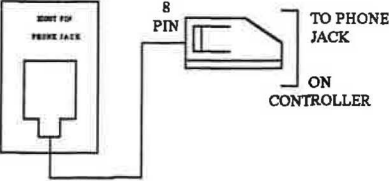


DETAIL VMA2:

SEE TERMINAL BOARD LAYOUT DETAIL FOR JUMPER SETTINGS.

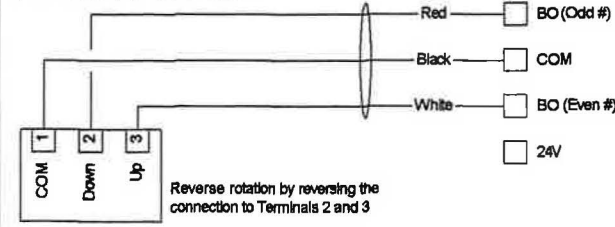
METASTAT INPUT

METASTAT



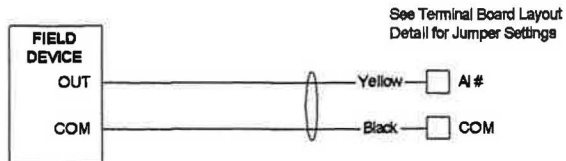
DETAIL VMA51

INCREMENTAL CONTROL TO VA-7150 / VA-7200



DETAIL VMA7

0-10 VDC INPUT - EXTERNAL SOURCE



Drawing Title

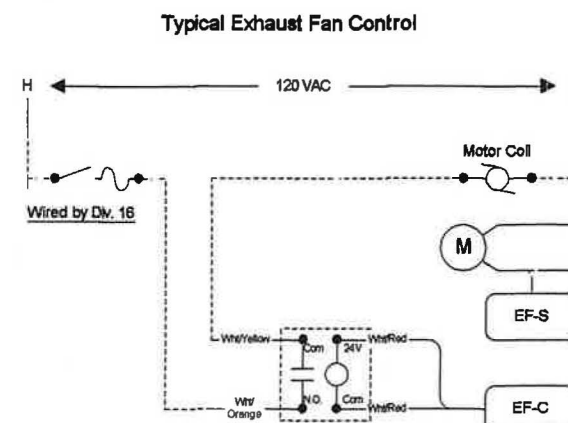
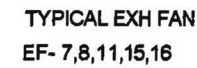
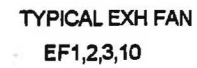
FPB Point Schedules

Project Title

WTA

CONTROL SYSTEMS
2100 106TH ST. SW
SUITE 125
LYNNWOOD WA, 98036
Ph. 425/673-4445
Fax 425/673-2886

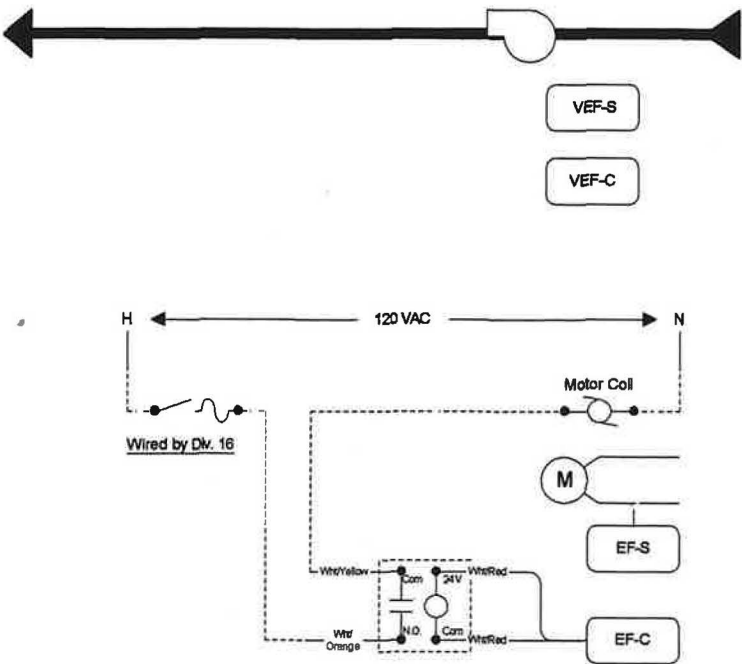
1 AS-BUILT 5/15/02 MWK
REFERENCE DRAWING NO. REVISION/LOCATION ECU DATE BY
Sales Engineer Project Manager Application Engineer D.D. M.S.
By DATE 0 By DATE 0
Branch Information 2100 106TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4445 Fax 425/673-2886
CONTRACT NUMBER 2000-026
DRAWING NUMBER 4 of 30 FPB1-3



Drawing Title EF Flow Diagram								
			1	AS-BUILT			5/15/02	MWK
	REFERENCE DRAWING		NO.	REVISION/LOCATION		ECH	DATE	BY
	Sales Engineer D.D	Project Manager D.D	Application Engineer M.S	DRAWN BY MAS DATE 1/02/01		APPROVED BY DATE		
Project Title WTA			Branch Information: 2100 196TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4446 Fax 425/673-2886			CONTRACT NUMBER 2000-026 DRAWING NUMBER 5 of 30 EF1-1		

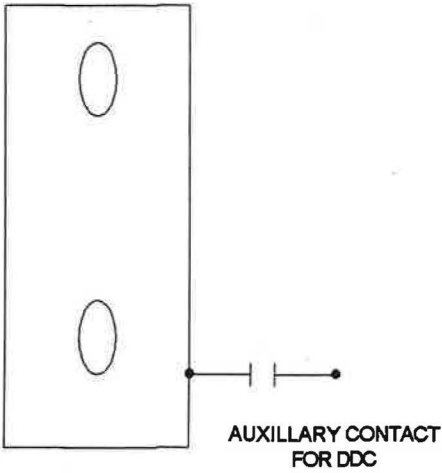
VEHICLE EXHAUST
FAN

TYPICAL OF 3



EF WIRING

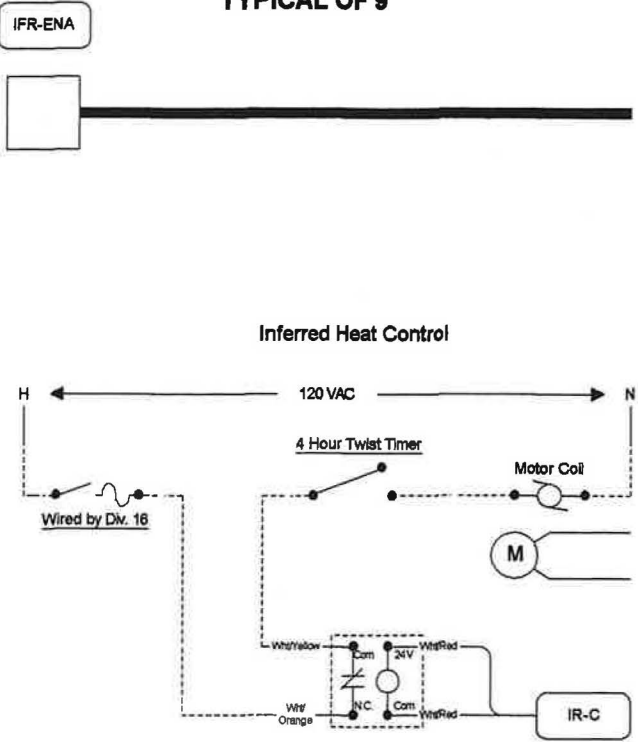
HOSEREEL



HOSEREEL	VEHICLE EXHAUST FAN
H.R. #1	VEH-1
H.R. #2	VEH-1
H.R. #3	VEH-1
H.R. #4	VEH-2
H.R. #5	VEH-2
H.R. #6	VEH-3
H.R. #7	VEH-3
H.R. #8	VEH-3
H.R. #9	VEH-3
H.R. #10	VEH-2

INFRARED HEATERS

TYPICAL OF 9



SEQUENCE OF OPERATION

VEHICLE EXHAUST FAN/HOSEREEL: The exhaust fan will start via a switch provided by the manufacture of the hose reel.

INFRARED HEATERS: Infrared heaters are enabled to operate from wall mounted timer switches.

BILL OF MATERIALS

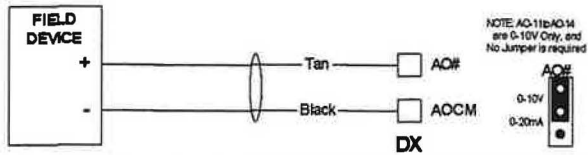
Designation	Qty	Part Number	Description
Field Devices:			
STATUS	3	H-720	SENS,CURR,4-20MA,HI-ACC,SOLID RELAY
FAN-C,INF-ENA	12	RIBU1C	
Panel Devices:			
CONTROLLER	1	DX-9100-8454	CNTRLR,DIG,DX,8AI,8AO,8BO,8BI
	1	DX-9100-8990	CNTRLR,DIG,DX,MTG BASE,F/ DX-9170-8454
	1	DX-9100-8991	KIT,CNTRLR,DIG,DX,WIRING PROTECTION
	1	XP-9105-8304	CNTRLR,DIG,DX EXPN MOD,8BI,TRIACS,2/XT
	1	XT-9103-8304	CNTRLR,DIG,DX EXTENSION MODULE,8/DX

Drawing Title Vehicle Exhaust / Hose Reel Infrared Heat Flow Diagram	1	AS-BUILT	5/15/02	MWK
Project Title WTA	REFERENCE DRAWING NO.	REVISION/LOCATION	DATE	BY
	Sales Engineer D.D.	Project Manager D.D.	Application Engineer M.S.	DRAWN BY MAS DATE 01/02/01
	Branch Information CONTROL SYSTEMS 2100 106TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4448 Fax 425/673-2888		CONTRACT NUMBER 2000-026 DRAWING NUMBER 6 of 30 VHEF1-1	

Electrician / Fitter		Point Information			Controller Information						Panel
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	
		VEH EXH			DX 9100	DX 9100					DX ENCLOSURE
		VEH EXH			DX 9100	DX 9100					DX ENCLOSURE
	DO -3	VEH EXH	VEF1-C	VEF1-COMMAND	DX 9100	DX 9100	N2	1	66	DO -3	DX ENCLOSURE
	DO -4	VEH EXH	VEF2-C	VEF2-COMMAND	DX 9100	DX 9100	N2	1	66	DO -4	DX ENCLOSURE
	DO -5	VEH EXH	VEF3-C	VEF3-COMMAND	DX 9100	DX 9100	N2	1	66	DO -5	DX ENCLOSURE
	DO -6	VEH EXH	VEF1-DPC	VEF1 DAMPER COMMAND	DX 9100	DX 9100	N2	1	66	DO -6	DX ENCLOSURE
	DO -7	VEH EXH	VEF2-DPC	VEF2 DAMPER COMMAND	DX 9100	DX 9100	N2	1	66	DO -7	DX ENCLOSURE
	DO -8	VEH EXH	VEF3-DPC	VEF3 DAMPER COMMAND	DX 9100	DX 9100	N2	1	66	DO -8	DX ENCLOSURE
	DI -1	VEH EXH	VEH1-S	VEH1 HOSEREEL	DX 9100	DX 9100	N2	1	66	DI -1	DX ENCLOSURE
	DI -2	VEH EXH	VEH2-S	VEH2 HOSEREEL	DX 9100	DX 9100	N2	1	66	DI -2	DX ENCLOSURE
	DI -3	VEH EXH	VEH3-S	VEH3 HOSEREEL	DX 9100	DX 9100	N2	1	66	DI -3	DX ENCLOSURE
	DI -4	VEH EXH	VEH4-S	VEH4 HOSEREEL	DX 9100	DX 9100	N2	1	66	DI -4	DX ENCLOSURE
	DI -5	VEH EXH	VEH5-S	VEH5 HOSEREEL	DX 9100	DX 9100	N2	1	66	DI -5	DX ENCLOSURE
	DI -6	VEH EXH	VEH6-S	VEH6 HOSEREEL	DX 9100	DX 9100	N2	1	66	DI -6	DX ENCLOSURE
	DI -7	VEH EXH	VEH7-S	VEH7 HOSEREEL	DX 9100	DX 9100	N2	1	66	DI -7	DX ENCLOSURE
	DI -8	VEH EXH	VEH8-S	VEH8 HOSEREEL	DX 9100	DX 9100	N2	1	66	DI -8	DX ENCLOSURE
	AI -1	VEH EXH	VEF1-SP	VEF1 STATIC PRESSURE	DX 9100	DX 9100	N2	1	66	AI -1	DX ENCLOSURE
	AI -2	VEH EXH	VEF2-SP	VEF2 STATIC PRESSURE	DX 9100	DX 9100	N2	1	66	AI -2	DX ENCLOSURE
	AI -3	VEH EXH	VEF3-SP	VEF3 STATIC PRESSURE	DX 9100	DX 9100	N2	1	66	AI -3	DX ENCLOSURE
	AI -4	VEH EXH	VEF1-S	VEF1 STATUS	DX 9100	DX 9100	N2	1	66	AI -4	DX ENCLOSURE
	AI -5	VEH EXH	VEF2-S	VEF2 STATUS	DX 9100	DX 9100	N2	1	66	AI -5	DX ENCLOSURE
	AI -6	VEH EXH	VEF3-S	VEF3 STATUS	DX 9100	DX 9100	N2	1	66	AI -6	DX ENCLOSURE
	AI -7	VEH EXH			DX 9100	DX 9100	N2	1	66	AI -7	DX ENCLOSURE
	AI -8	VEH EXH			DX 9100	DX 9100	N2	1	66	AI -8	DX ENCLOSURE
	AO -1	VEH EXH	VEF1-%	VEF1 VFD %	DX 9100	DX 9100	N2	1	66	AO -1	DX ENCLOSURE
	AO -2	VEH EXH	VEF2-%	VEF2 VFD %	DX 9100	DX 9100	N2	1	66	AO -2	DX ENCLOSURE
	AO -9	VEH EXH	VEF3-%	VEF3 VFD %	DX 9100	DX 9100	N2	1	66	AO -9	DX ENCLOSURE
	AO -10	VEH EXH			DX 9100	DX 9100	N2	1	66	AO -10	DX ENCLOSURE
	AO -11	VEH EXH			DX 9100	DX 9100	N2	1	66	AO -11	DX ENCLOSURE
	AO -12	VEH EXH			DX 9100	DX 9100	N2	1	66	AO -12	DX ENCLOSURE
	AO -13	VEH EXH			DX 9100	DX 9100	N2	1	66	AO -13	DX ENCLOSURE
	AO -14	VEH EXH			DX 9100	DX 9100	N2	1	66	AO -14	DX ENCLOSURE
		VEH EXH			XT 9100	XT (Expansion Module)					DX ENCLOSURE
		VEH EXH			XT 9100	XT (Expansion Module)					DX ENCLOSURE
	XT1DI1	VEH EXH	VEH9-S	VEH9 HOSEREEL	XP 9105NC	XP 9105NC (8N2)		1	67	DI -1	DX ENCLOSURE
	XT1DI2	VEH EXH	VEF1-DPR	VEF1 DAMPER	XP 9105NC	XP 9105NC (8N2)		1	67	DI -2	DX ENCLOSURE
	XT1DI3	VEH EXH	VEF2-DPR	VEF2 DAMPER	XP 9105NC	XP 9105NC (8N2)		1	67	DI -3	DX ENCLOSURE
	XT1DI4	VEH EXH	VEF3-DPR	VEF3 DAMPER	XP 9105NC	XP 9105NC (8N2)		1	67	DI -4	DX ENCLOSURE
	XT1DI5	VEH EXH			XP 9105NC	XP 9105NC (8N2)		1	67	DI -5	DX ENCLOSURE
	XT1DI6	VEH EXH			XP 9105NC	XP 9105NC (8N2)		1	67	DI -6	DX ENCLOSURE
	XT1DI7	VEH EXH			XP 9105NC	XP 9105NC (8N2)		1	67	DI -7	DX ENCLOSURE
	XT1DI8	VEH EXH			XP 9105NC	XP 9105NC (8N2)		1	67	DI -8	DX ENCLOSURE
		VEH EXH			XT 9100	XT (Expansion Module)					DX ENCLOSURE
		VEH EXH			XT 9100	XT (Expansion Module)					DX ENCLOSURE
	XT1DO1	VEH EXH	IRH-1	INFRARED HEATER	XP 9103	XP 9103	N2	1	68	DO -1	DX ENCLOSURE
	XT1DO2	VEH EXH	IRH-2	INFRARED HEATER	XP 9103	XP 9103	N2	1	68	DO -2	DX ENCLOSURE
	XT1DO3	VEH EXH	IRH-3	INFRARED HEATER	XP 9103	XP 9103	N2	1	68	DO -3	DX ENCLOSURE
	XT1DO4	VEH EXH	IRH-4	INFRARED HEATER	XP 9103	XP 9103	N2	1	68	DO -4	DX ENCLOSURE
	XT1DO5	VEH EXH	IRH-5	INFRARED HEATER	XP 9103	XP 9103	N2	1	68	DO -5	DX ENCLOSURE
	XT1DO6	VEH EXH	IRH-6	INFRARED HEATER	XP 9103	XP 9103	N2	1	68	DO -6	DX ENCLOSURE
	XT1DO7	VEH EXH	IRH-7	INFRARED HEATER	XP 9103	XP 9103	N2	1	68	DO -7	DX ENCLOSURE
	XT1DO8	VEH EXH	IRH-8	INFRARED HEATER	XP 9103	XP 9103	N2	1	68	DO -8	DX ENCLOSURE

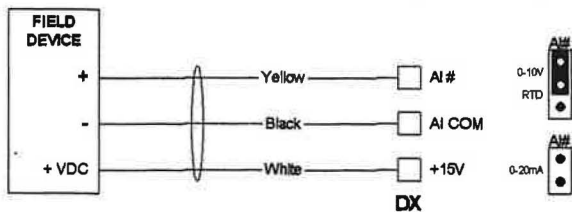
DETAIL DX22

0-10VDC ANALOG OUTPUT



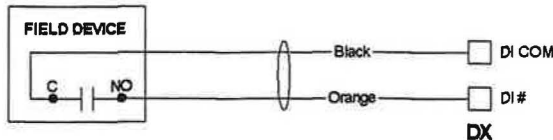
DETAIL DX7

0-10 VDC INPUT - INTERNAL SOURCE



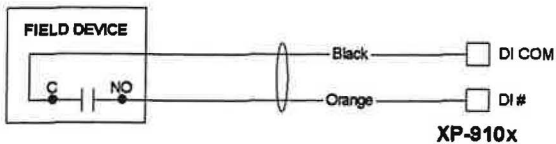
DETAIL DX70

N.O. BINARY INPUT



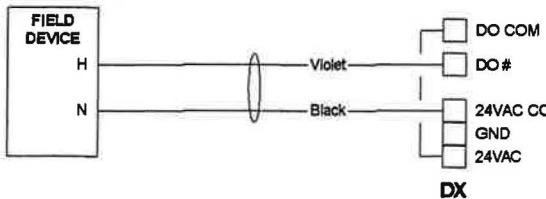
DETAIL XP40

N.O. BINARY INPUT



DETAIL D51

24 VAC BINARY OUTPUT



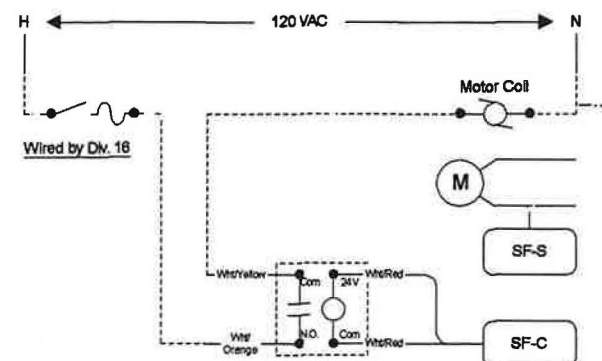
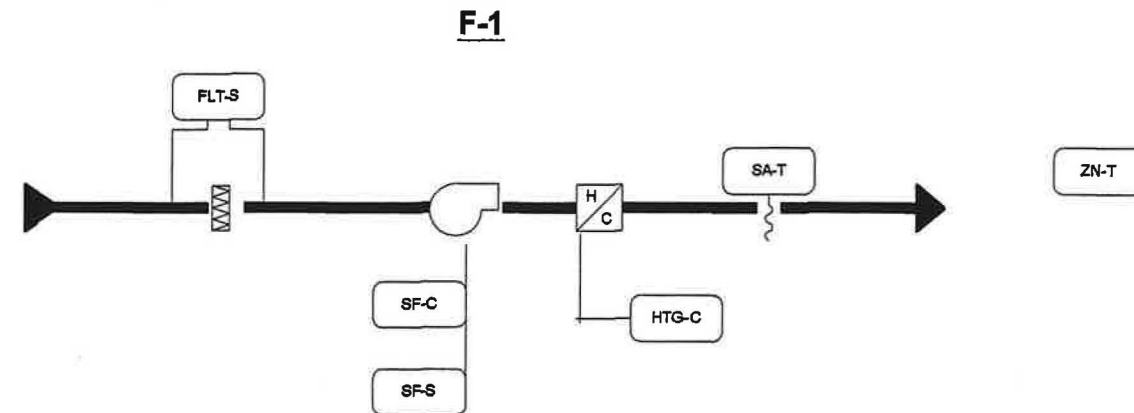
Drawing Title
Vehicle Exhaust / Hose Reel
Point Schedule

Project Title
WTA

CONTROL
SYSTEMS
JOHNSON
BUILDING
CONTROLS
SPECIALIST

2100 190TH ST. SW
SUITE 126
LYNNWOOD WA, 98036
Ph. 425/673-4448
Fax 425/673-2888

CONTRACT NUMBER
2000-026
DRAWING NUMBER
7 of 30 VHEF1-2



BILL OF MATERIALS

Designation	Qty	Part Number	Description
Field Devices:			
CONTROLLER	1	AS-UNT111-101	CNTRLR,DIG,UNT,8AI,4BI,8BO,2AO,ENCL,50VA
FILTER	1	DPT-2015-1	0-1.5" DIFF PRESS TO ELECTRIC TRANSP
STATUS	1	H-720	SENS,CURR,4-20MA,HI-ACC,SOLID
SA-T	1	TE-6311P-1	SENSOR,T-NI,0.1%,8IN DUCT
Other Devices:			
FAN-C	1	RIB1US	RIB W/HOA
HEAT-C	1	RIBU1C	RELAY
RM-T	1	TMZ-1800	

SEQUENCE OF OPERATION

FURNACE #1: The furnace will be scheduled for occupied and unoccupied time periods.

OPTIMAL START: The system start time shall be reset by a program resident in the NCM350. This program shall reset the start time of Furnace # 1 based on system performance.

Morning Warm-up: The morning warm-up time is defined as the time where Furnace # 1 is running prior to occupancy. During this time Furnace # 1 shall provide full heating until the occupied set point is reached.

OCCUPIED: Furnace will be started and duct heater will be commanded on to maintain desired room temperature setpoint. Once set point initially set at 68 Degrees Fahrenheit (Adjustable) has been met the Heat will be commanded off.

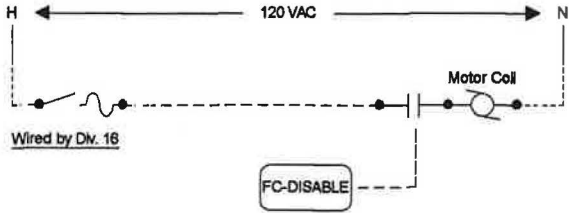
UNOCCUPIED: During the unoccupied mode, the unit supply fan will be off. When the area space temperature falls below 60 Degrees Fahrenheit the fan motor will start, the heat will be fully energized until the space temperature is satisfied, at which time the supply fan will turn off.

FILTER STATUS: An alarm will be issued when the differential pressure across the filter reaches alarm condition.

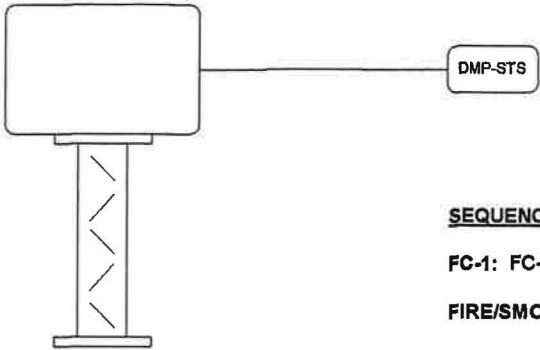
LOW TEMPERATURE LIMIT ALARM: An alarm will be initiated at the operator workstation when the room falls below the alarm set point of 60 Degrees Fahrenheit (Adjustable).

Drawing Title									
Furnace 1 Flow Diagram									
			1	AS-BUILT				5/15/02	MWK
	REFERENCE DRAWING		NO.	REVISION/LOCATION				ECN	DATE
	Sales Engineer		Project Manager	Application Engineer		DRAWN		APPROVED	
	D.D		D.D	M.S		BY MAS	DATE 01/02/01	BY	DATE 0
Project Title					Branch Information		CONTRACT NUMBER		
WTA			CONTROL SYSTEMS		2100 100TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4446 Fax 425/673-2886		2000-026		
			CONTROL SYSTEMS		DRAWING NUMBER		8 of 30 F1-1		

Computer Room Air Conditioner



Smoke Damper Status



DAMPER	CONTROLLER	INPUT
I-54-2B	VMA-34	BI-1
I-54-2A	UNT-1	BI-4
I-54-1A	VMA-15	BI-2
I-54-1B	VMA-13	BI-2
FSD1	VEH-EXH	XT1D6
FSD2	VEH-EXH	XT1D7
FSD3	VEH-EXH	XT1D8

BILL OF MATERIALS

Designation	Qty	Part Number	Description
Other Devices: FC-DISABLE	1	RIBU1C	RELAY

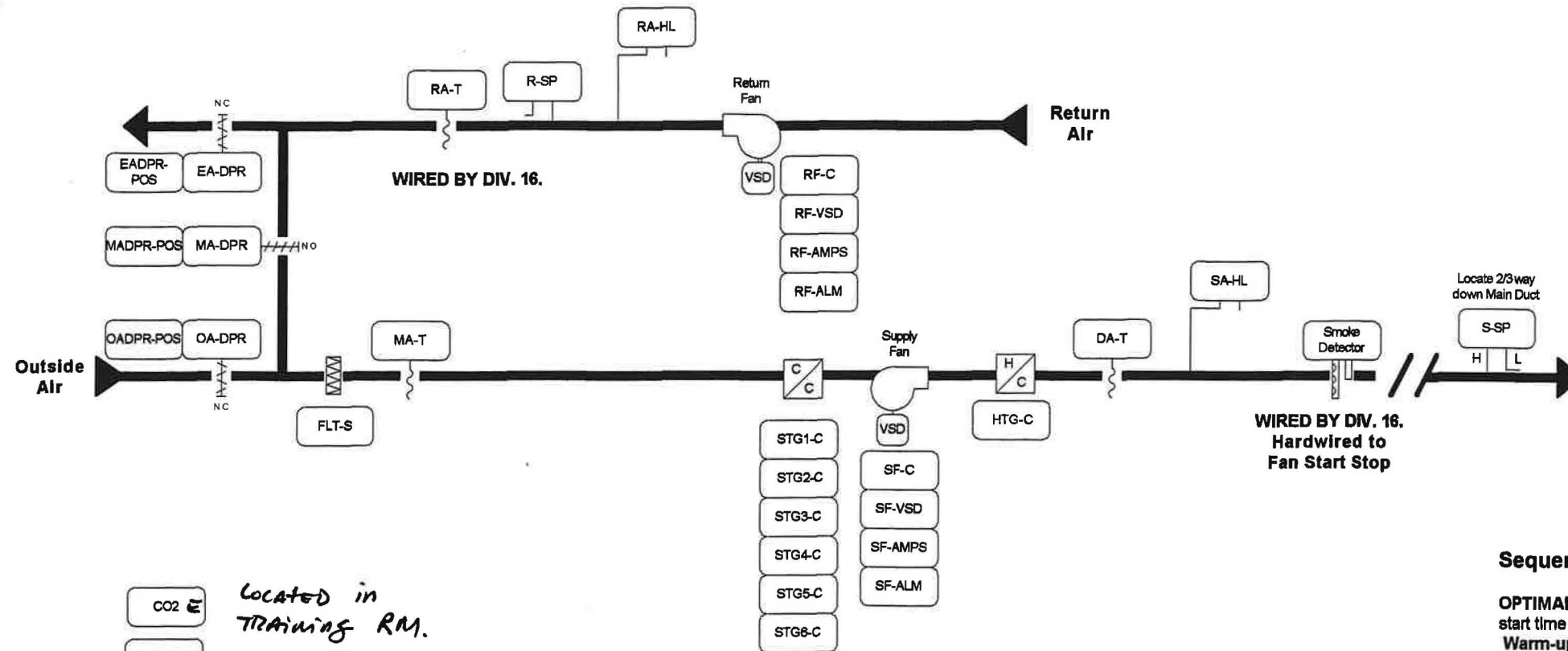
SEQUENCE OF OPERATION

FC-1: FC-1 will operate under its own integral control package. DDC will disable FC-1 when VMA2-1 calls for heat.

FIRE/SMOKE DAMPERS: Fire/Smoke dampers are monitored for status.

Drawing Title											
FC-1 Flow Diagram		1		AS-BUILT		5/14/02		MWK			
REFERENCE DRAWING		NO		REVISION/LOCATION		ECN		DATE		BY	
Sales Engineer		Project Manager		Application Engineer		DRAWN		APPROVED			
D.D		D.D		M.S		BY MAS		DATE 01/02/01		BY DATE 0	
Project Title		CONTROL SYSTEMS		Branch Information		CONTRACT NUMBER					
WTA		2100 166TH ST. SW SUITE 126 LYNNWOOD WA, 98036 Ph. 425/673-4446 Fax 425/673-2886		2000-026		DRAWING NUMBER		10 of 30 FC1-1			

RAC-1



BILL OF MATERIALS

Designation	Qty	Part Number	Description
Field Devices:			
FLT-S	1	DPT-2015-1	0-1.5" DIFF PRESS TO ELECTRIC TRANSP
S-SP, R-SP	2	DPT2640-005D	DP TRANS DIF, 0 TO 5 WC
BLDG-SP	1	DPT2640-0R5B	DP TRANS DIF, -0.5 TO 0.5
SF, RF-AMPS	2	H-720	SENS, CURR, 4-20MA, HI-ACC, SOLID
EA, RA, OA-DPR	3	M8216-HGA-2	ACT, PROP, 140IN #, SR, 0-10V-FB
SA-HL, RA-HL	2	AFS-480-DSS	PRESS SW, DP, DPDT, 12IN WC, L-BRKT
DA-T, RA-T	2	TE-6311P-1	SENSOR, T-NI, 0.1%, 8IN DUCT
MA-T	1	TE-6315P-1	SENSOR, T-NI, 0.1%, 8FT AVG
	3	T-275-101	HOLDER, AVG ELEMENT
	3	TE-6001-8	CLIP F/AVG ELEMENT, QTY 10
Panel Devices:			
CONTROLLER	1	DX-9100-8454	CNTRLR, DIG, DX, 8AI, 8AO, 8BO, 8BI
	1	DX-9100-8990	CNTRLR, DIG, DX, MTG BASE, F/ DX-9170-8454
	1	DX-9100-8991	KIT, CNTRLR, DIG, DX, WIRING PROTECTION
	1	XP-9108-8304	CNTRLR, DIG, DX EXPN MOD, 8AI, 2AO
	1	XT-9100-8304	CNTRLR, DIG, DX EXTENSION MODULE, 8DX
	1	XP-9108-8304	CNTRLR, DIG, DX EXPN MOD, 8AI, 2AO
	1	XT-9100-8304	CNTRLR, DIG, DX EXTENSION MODULE, 8DX
Other Devices:			
SF-C, RF-C	2	RIB1UC	RELAY
STG1-C TO STG8-C	8	RIBU1C	RELAY
CO2	2		CARBON DIOXIDE SENSOR

Sequence of Operations:

OPTIMAL START: The system start time shall be reset by a program resident in the NCM350. This program shall reset the start time of RAC # 1 based on system performance.

Warm-up: The warm-up time is defined as the time where RAC # 1 is running prior to occupancy. During this time RAC # 1 shall start and modulate heat to meet the warm-up discharge air temperature set point initially set at 80 Degrees Fahrenheit (Adjustable). Until such time as the lowest zone temperature reaches 68 Degrees.

Duct Static Pressure Control: During the occupied mode the supply and return air fans operate continuously. The supply and return fans track together to control to a static pressure set point initially set at 1in wc (adjustable). In the event the return duct static pressure setpoint is exceeded the return fan will decrease to meet the return air static pressure setpoint.

Discharge Air Control: During the occupied mode the return and outside air dampers will modulate in sequence with 6 stages of dx cooling and gas heat to maintain the discharge air setpoint. Discharge air setpoint will be reset based on the zone calling for the most cooling. When calling for cooling the return and outside air dampers will modulate to 100% outside air before dx cooling is energized. When the return air temperature is greater than the outside air temperature the outside and return dampers will return to their minimum positions. When calling for heat the return and outside air dampers will modulate to their minimum positions before the gas heat is energized. When the mixed air temperature is less than the mixed air low limit setpoint the outside damper will go below the minimum position.

During the unoccupied mode the outside air damper will be fully closed and the return damper fully open.

Building Static Pressure Control: During the occupied mode the exhaust air damper will modulate open to maintain a building static pressure initially set at .05" w.c.

During the unoccupied mode the exhaust damper will remain closed.

CO2 Monitoring: The Metasys Control System will continuously monitor the space carbon dioxide levels. When the space CO2 level is above the high limit setpoint, the outside air damper minimum position will be increased to a maximum (not exceeding 50%) (adj.) of its minimum outside flow rate.

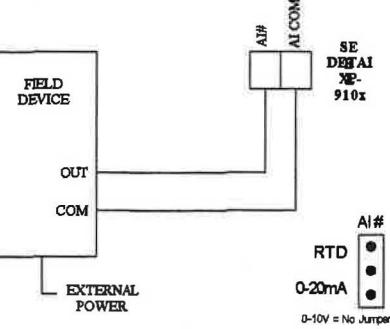
Safeties: Both the supply and return fans have high duct static pressure limits which require a manual reset when the set point is exceeded.

Drawing Title	RAC-1 Flow Diagram							
Project Title	WTA							
REFERENCE DRAWING	NO.				AS-BUILT			
DATE	1/09/02				MWK			
REVISION-LOCATION	ECN				DATE			
DATE	01/02/01				0			
Branch Information	2100 196TH ST. SW				2000-026			
Branch Information	SUITE 125				11 of 30RAC1-1			
Branch Information	LYNNWOOD WA, 98036							
Branch Information	Ph. 425/673-4446							
Branch Information	Fax 425/673-2886							

Electrician / Fitter		Point Information			Controller Information						Panel
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay / Terminal	
		RAC-1			DX 9100	DX 9100	N 2		4 1		RAC-1 Panel
		RAC-1			DX 9100	DX 9100	N 2		4 1		RAC-1 Panel
DO-3		RAC-1	FAN S/S	Sup/Exh Fan Command	DX 9100	DX 9100	N 2		4 1	DO-3	RAC-1 Panel
DO-4		RAC-1	HTG-ENA	Heating Enable	DX 9100	DX 9100	N 2		4 1	DO-4	RAC-1 Panel
DO-5		RAC-1			DX 9100	DX 9100	N 2		4 1	DO-5	RAC-1 Panel
DO-6		RAC-1	CLG-ENA		DX 9100	DX 9100	N 2		4 1	DO-6	RAC-1 Panel
DO-7		RAC-1			DX 9100	DX 9100	N 2		4 1	DO-7	RAC-1 Panel
DO-8		RAC-1			DX 9100	DX 9100	N 2		4 1	DO-8	RAC-1 Panel
D1-1		RAC-1	S-VFD-A	Supply VFD Alarm	DX 9100	DX 9100	N 2		4 1	D1-1	RAC-1 Panel
D1-2		RAC-1	R-VFD-A	Return VFD Alarm	DX 9100	DX 9100	N 2		4 1	D1-2	RAC-1 Panel
D1-3		RAC-1	S-SMOKE	Supply Smoke Detector	DX 9100	DX 9100	N 2		4 1	D1-3	RAC-1 Panel
D1-4		RAC-1	R-SMOKE	Return Smoke Status	DX 9100	DX 9100	N 2		4 1	D1-4	RAC-1 Panel
D1-5		RAC-1	SA-HL	Supply Fan High Limit	DX 9100	DX 9100	N 2		4 1	D1-5	RAC-1 Panel
D1-6		RAC-1			DX 9100	DX 9100	N 2		4 1	D1-6	RAC-1 Panel
D1-7		RAC-1	FLAME-FL	Flame Failure Alarm	DX 9100	DX 9100	N 2		4 1	D1-7	RAC-1 Panel
D1-8		RAC-1			DX 9100	DX 9100	N 2		4 1	D1-8	RAC-1 Panel
A1-1		RAC-1	DA-T	Supply Air Temp	DX 9100	DX 9100	N 2		4 1	A1-1	RAC-1 Panel
A1-2		RAC-1	S-SP	Supply Static	DX 9100	DX 9100	N 2		4 1	A1-2	RAC-1 Panel
A1-3		RAC-1	MA-T	Mixed Air Temp	DX 9100	DX 9100	N 2		4 1	A1-3	RAC-1 Panel
A1-4		RAC-1	RA-T	Return Air Temp	DX 9100	DX 9100	N 2		4 1	A1-4	RAC-1 Panel
A1-5		RAC-1	SF-Amps	Supply Fan Current	DX 9100	DX 9100	N 2		4 1	A1-5	RAC-1 Panel
A1-6		RAC-1	EF-Amps	Exhaust Fan Amps	DX 9100	DX 9100	N 2		4 1	A1-6	RAC-1 Panel
A1-7		RAC-1	FILTR-DP	Filter DP	DX 9100	DX 9100	N 2		4 1	A1-7	RAC-1 Panel
A1-8		RAC-1	BLDG-SP	Building Pressure	DX 9100	DX 9100	N 2		4 1	A1-8	RAC-1 Panel
AO-1		RAC-1	HTG-CMD		DX 9100	DX 9100	N 2		4 1	AO-1	RAC-1 Panel
AO-2		RAC-1	DAMPER		DX 9100	DX 9100	N 2		4 1	AO-2	RAC-1 Panel
AO-9		RAC-1	SF-VFD		DX 9100	DX 9100	N 2		4 1	AO-9	RAC-1 Panel
AO-10		RAC-1	RF-VFD		DX 9100	DX 9100	N 2		4 1	AO-10	RAC-1 Panel
AO-11		RAC-1	EXH-DMP	Exhaust Damper	DX 9100	DX 9100	N 2		4 1	AO-11	RAC-1 Panel
AO-12		RAC-1			DX 9100	DX 9100	N 2		4 1	AO-12	RAC-1 Panel
AO-13		RAC-1			DX 9100	DX 9100	N 2		4 1	AO-13	RAC-1 Panel
AO-14		RAC-1			DX 9100	DX 9100	N 2		4 1	AO-14	RAC-1 Panel
		RAC-1			XT 9100	XT (Expansion Module)					RAC-1 Panel
		RAC-1			XT 9100	XT (Expansion Module)					RAC-1 Panel
XT1A11		RAC-1	OA-FDBK		XP 9102	XP 9102 (8AI, N2)			4 2	A1-1	RAC-1 Panel
XT1A12		RAC-1	RA-FDBK		XP 9102	XP 9102 (8AI, N2)			4 2	A1-2	RAC-1 Panel
XT1A13		RAC-1	EXH-FDBK		XP 9102	XP 9102 (8AI, N2)			4 2	A1-3	RAC-1 Panel
XT1A14		RAC-1	RET-SP		XP 9102	XP 9102 (8AI, N2)			4 2	A1-4	RAC-1 Panel
XT1A15		RAC-1			XP 9102	XP 9102 (8AI, N2)			4 2	A1-5	RAC-1 Panel
XT1A16		RAC-1			XP 9102	XP 9102 (8AI, N2)			4 2	A1-6	RAC-1 Panel
XT1AO7		RAC-1			XP 9102	XP 9102 (8AI, N2)			4 2	AO-7	RAC-1 Panel
XT1AO8		RAC-1			XP 9102	XP 9102 (8AI, N2)			4 2	AO-8	RAC-1 Panel
XT2DO1		RAC-1	CLG-1		XP 9103	XP 9103 (8DO, N2)			4 2	DO-1	RAC-1 Panel
XT2DO2		RAC-1	CLG-2		XP 9103	XP 9103 (8DO, N2)			4 2	DO-2	RAC-1 Panel
XT2DO3		RAC-1	CLG-3		XP 9103	XP 9103 (8DO, N2)			4 2	DO-3	RAC-1 Panel
XT2DO4		RAC-1	CLG-4		XP 9103	XP 9103 (8DO, N2)			4 2	DO-4	RAC-1 Panel
XT2DO5		RAC-1	CLG-5		XP 9103	XP 9103 (8DO, N2)			4 2	DO-5	RAC-1 Panel
XT2DO6		RAC-1	CLG-6		XP 9103	XP 9103 (8DO, N2)			4 2	DO-6	RAC-1 Panel
XT2DO7		RAC-1			XP 9103	XP 9103 (8DO, N2)			4 2	DO-7	RAC-1 Panel
XT2DO8		RAC-1			XP 9103	XP 9103 (8DO, N2)			4 2	DO-8	RAC-1 Panel

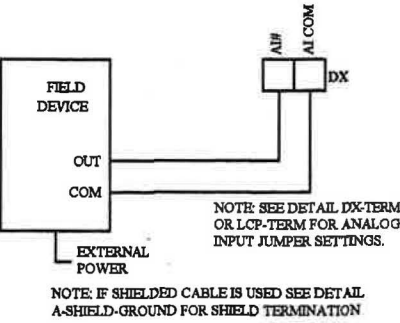
DETAIL XP5:

0-10VDC INPUT EXTERNAL SOURCE



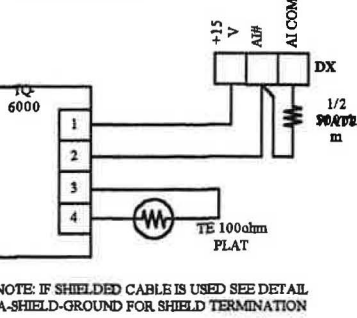
DETAIL DX6:

0-10VDC ANALOG INPUT EXTERNAL SOURCE



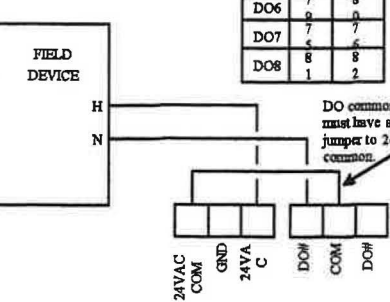
DETAIL DX8:

TQ-6000 0-20mA ANALOG INPUT



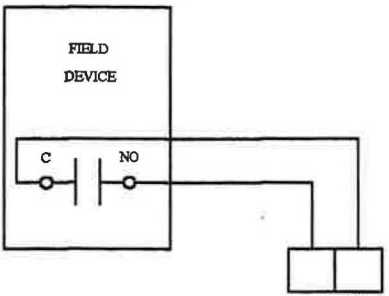
DETAIL DX51:

24VAC BINARY OUTPUT



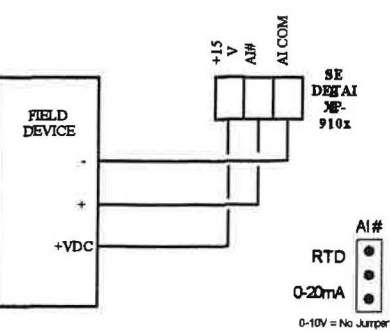
DETAIL DX70:

N.O. BINARY INPUT



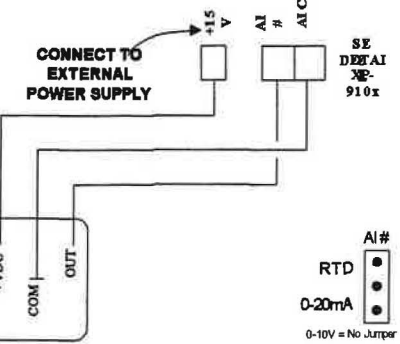
DETAIL XP6:

0-10VDC INPUT INTERNAL SOURCE



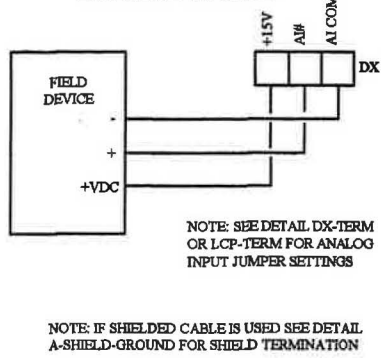
DETAIL XP9:

DPT-2000 INPUT



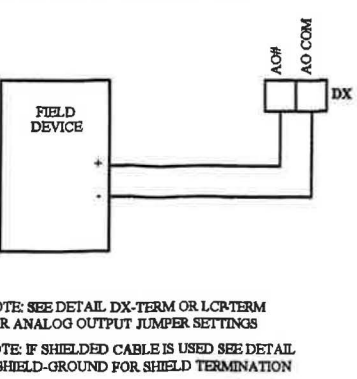
DETAIL DX7:

0-10VDC ANALOG INPUT INTERNAL SOURCE



DETAIL DX22:

0-10VDC ANALOG OUTPUT



Drawing Title
RAC-1 Point Schedule

Project Title
WTA

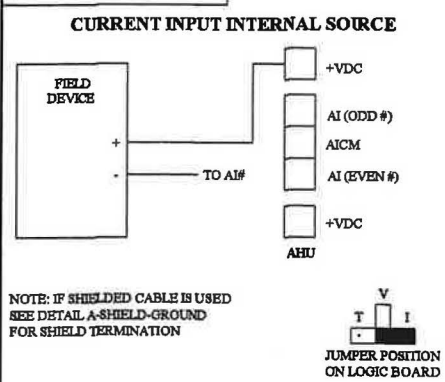
CONTROL SYSTEMS

2100 196TH ST. SW
SUITE 126
LYNNWOOD WA, 98036
Ph. 425/473-4446
Fax 425/473-2886

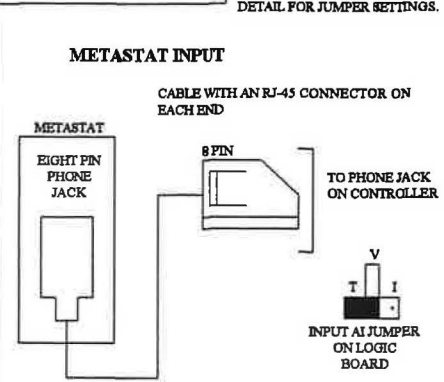
2000-026
12 of 30 RAC1-2

Electrician/Fitter		Point Information			Controller Information						
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Panel
		RAC-2			UNT	UNT 111					RAC-2 Panel
		RAC-2			UNT	UNT 111		1	46		RAC-2 Panel
	AI-1	RAC-2	ZN-T	Zone Temp	UNT	UNT 111	N2	1	46	AI-1	RAC-2 Panel
	AI-2	RAC-2	MA-T	Mixed Air Temp	UNT	UNT 111	N2	1	46	AI-2	RAC-2 Panel
	AI-3	RAC-2	RA-T	Return Air Temp	UNT	UNT 111	N2	1	46	AI-3	RAC-2 Panel
	AI-4	RAC-2	OA-T	Outdoor Air Temp	UNT	UNT 111	N2	1	46	AI-4	RAC-2 Panel
	AI-5	RAC-2	DA-T	Discharge Air Temp	UNT	UNT 111	N2	1	46	AI-5	RAC-2 Panel
	AI-6	RAC-2	Damper F	Damper Feedback	UNT	UNT 111	N2	1	46	AI-6	RAC-2 Panel
	BI-1	RAC-2	SF-S	Supply Airflow	UNT	UNT 111	N2	1	46	BI-1	RAC-2 Panel
	BI-2	RAC-2			UNT	UNT 111	N2	1	46	BI-2	RAC-2 Panel
	BI-3	RAC-2			UNT	UNT 111	N2	1	46	BI-3	RAC-2 Panel
	BI-4	RAC-2			UNT	UNT 111	N2	1	46	BI-4	RAC-2 Panel
	BO-1	RAC-2	HP-C	Heating Pump	UNT	UNT 111	N2	1	46	BO-1	RAC-2 Panel
	BO-2	RAC-2	DX1-C	Cooling Stage 1	UNT	UNT 111	N2	1	46	BO-2	RAC-2 Panel
	BO-3	RAC-2	SF-C	Supply Fan	UNT	UNT 111	N2	1	46	BO-3	RAC-2 Panel
	BO-4	RAC-2			UNT	UNT 111	N2	1	46	BO-4	RAC-2 Panel
	BO-5	RAC-2			UNT	UNT 111	N2	1	46	BO-5	RAC-2 Panel
	BO-6	RAC-2			UNT	UNT 111	N2	1	46	BO-6	RAC-2 Panel
	AO-1	RAC-2	DPR-C	Damper Command	UNT	UNT 111	N2	1	46	AO-1	RAC-2 Panel
	AO-2	RAC-2	HTG-VLV	Heating Valve	UNT	UNT 111	N2	1	46	AO-2	RAC-2 Panel

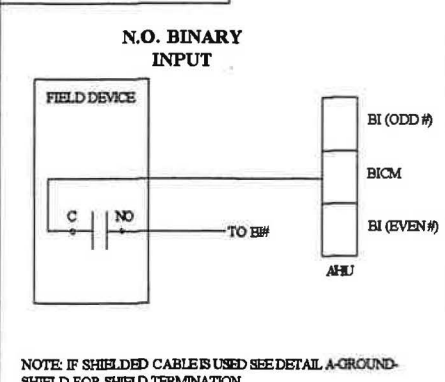
DETAIL AHU2:



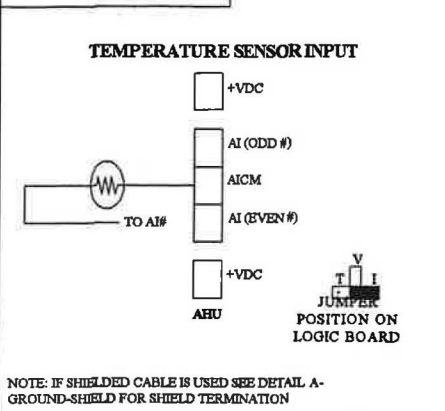
DETAIL AHU5:



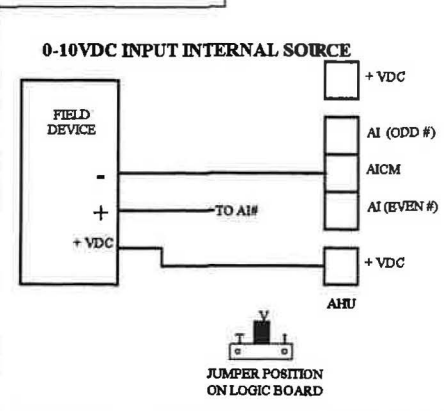
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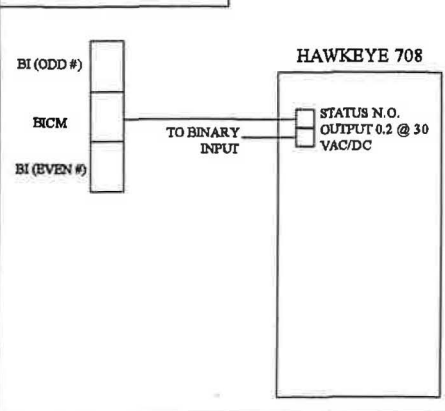
DETAIL AHU4:



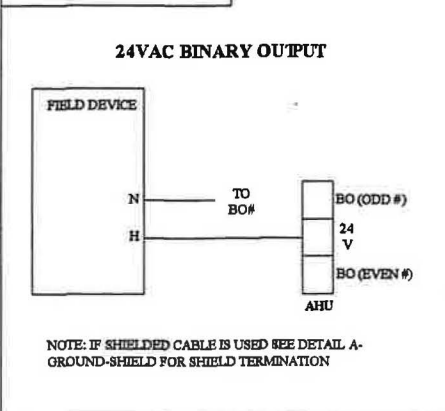
DETAIL AHU11:



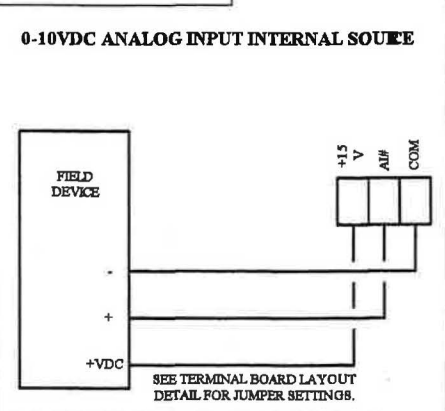
DETAIL AHU44:



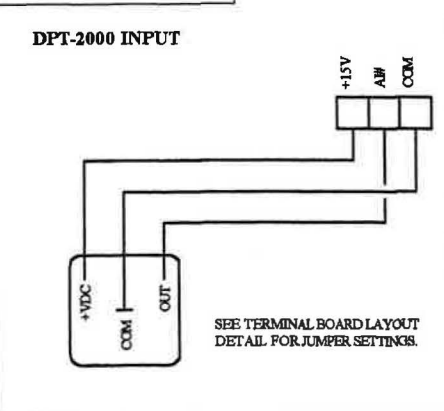
DETAIL AHU50:



DETAIL UV5:

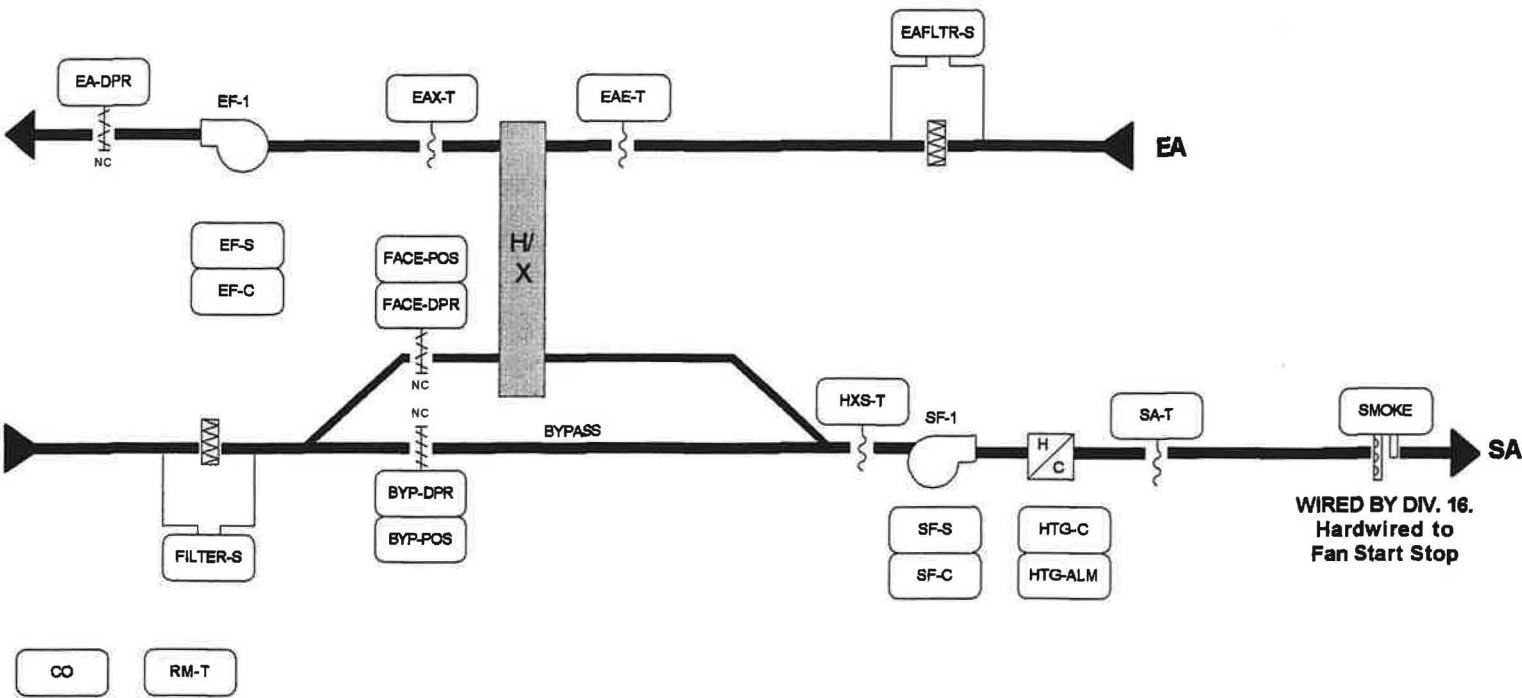


DETAIL UV7:



Drawing Title	RAC-2 Point Schedule	
Project Title	WTA	
Revision	2	AS-BUILT
Reference Drawing	D.D.	D.D.
Project Manager	D.D.	D.D.
Application Engineer	KLB	KLB
Branch Information	2100 100TH ST. SW SUITE 126 LYNNWOOD WA, 98036 Ph. 425/673-4448 Fax 425/673-2888	
Contract Number	2000-026	
Drawing Number	14 of 30 RAC2-2	

MAH-1



BILL OF MATERIALS

Designation	Qty	Part Number	Description
Field Devices:			
CONTROLLER	1	DX-9100-8454	CNTRLR, DIG, DX, 8AI, 8AO, 8BO, 8BI
	1	DX-9100-8980	CNTRLR, DIG, DX, MTG BASE, F/DX-9100-8454
	1	DX-9100-8991	KIT, CNTRLR, DIG, DX, WIRING PROTECTION
	1	XT-9108-8304	CNTRLR, DIG, DX EXPN MOD
	1	XP-9102-8304	CNTRLR, DIG, EXTENSION 6AI, 2AO
FILTER-S	2	DPT-2015-1	0-1.5" DIFF PRESS TO ELECTRIC TRANSP
SF-S, EF-S	2	H-720	SENS, CURR, 4-20MA, HI-ACC, SOLID
FACE, BYP-DPR	2	NF24-SR	ACT, PROP, SR, 2-10V-FB
EA-DPR	1	M9216BGC-2	ACT, 2POS, SR, AUX SWITCH
HXS-T, EAX-T,			
EAE-T, SA-T	4	TE-6311P-1	SENSOR, T-NI, 0.1%, 8IN DUCT
SF-C, EF-C	2	RIBU1C	RELAY
RM-T	1	TE-8411S-2100	METASTAT
CO	1	RTS451	REMOTE CARBON MONOXIDE DETECTOR

SEQUENCE OF OPERATION:

SYSTEM OFF: The supply and exhaust fans will be off, exhaust, face and bypass dampers will be closed.

OCCUPIED MODE: Supply and exhaust fans run continuously during the occupied mode. Upon receiving a signal to start the exhaust damper is commanded open and status must be proven before supply and exhaust fans are enabled.

DISCHARGE AIR CONTROL: The discharge air temperature setpoint will be reset based on the zone temperature deviation setpoint. As the zone temperature drops below setpoint the discharge air setpoint is reset up to the discharge air high limit until zone temperature is at setpoint. As the zone temperature rises above setpoint the discharge air setpoint is reset down to the discharge air low limit setpoint. Zone setpoint is adjustable at the zone sensor. The face and bypass damper will modulate in sequence with the gas heat as necessary to maintain the discharge air setpoint.

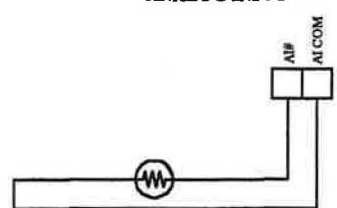
OPTIMAL START: The system start time shall be reset by a program resident in the NCM350. This program shall reset the start time of MAH 1 based on system performance.

MORNING WARM-UP: The morning warm-up time is defined as the time where MAH 1 is running prior to occupancy in order to achieve the occupied space temperature set point. During this time MAH 1 shall start and modulate heat to meet the zone temperature set point.

Drawing Title											
MAH-1 Flow Diagram											
		1		AS-BUILT				5/14/02		MWW	
		REFERENCE DRAWING		NO.		REVISION/LOCATION		EDN		DATE	
		BY									
Sales Engineer		Project Manager		Application Engineer		DRAWN		APPROVED			
D.D		D.D		M.S		BY: MAS DATE 01/02/01		BY: DATE 0			
Project Title						Branch Information		CONTRACT NUMBER			
WTA		CONTROL SYSTEMS				2100 100TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4446 Fax 425/673-2886		2000-026			
								DRAWING NUMBER			
								15 of 30 MAH1-1			

Electrician / Filter		Point Information		Expanded ID	Controller Information						Panel
Tag	Point Type	System Name	Object Name		Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	
		MAH-1			DX9100	DX9100					MAH-1 Panel
		MAH-1			DX9100	DX9100					MAH-1 Panel
	DO-3	MAH-1			DX9100	DX9100	N2	1	100	DO-3	MAH-1 Panel
	DO-4	MAH-1	HTG-ENA	Heating Enable	DX9100	DX9100	N2	1	100	DO-4	MAH-1 Panel
	DO-5	MAH-1	FAN-SS	FAN Command	DX9100	DX9100	N2	1	100	DO-5	MAH-1 Panel
	DO-6	MAH-1	EF-DPR	EF-DPR	DX9100	DX9100	N2	1	100	DO-6	MAH-1 Panel
	DO-7	MAH-1	BLOW-C	BLOW-C	DX9100	DX9100	N2	1	100	DO-7	MAH-1 Panel
	DO-8	MAH-1			DX9100	DX9100	N2	1	100	DO-8	MAH-1 Panel
	D1-1	MAH-1	Temp-Occ	Temp Occupied	DX9100	DX9100	N2	1	100	D1-1	MAH-1 Panel
	D1-2	MAH-1	EA-DMP-S	E.A. Damper Status	DX9100	DX9100	N2	1	100	D1-2	MAH-1 Panel
	D1-3	MAH-1	Flame-A	Flame Failure	DX9100	DX9100	N2	1	100	D1-3	MAH-1 Panel
	D1-4	MAH-1	SMOKE	Supply Smoke Status	DX9100	DX9100	N2	1	100	D1-4	MAH-1 Panel
	D1-5	MAH-1			DX9100	DX9100	N2	1	100	D1-5	MAH-1 Panel
	D1-6	MAH-1			DX9100	DX9100	N2	1	100	D1-6	MAH-1 Panel
	D1-7	MAH-1			DX9100	DX9100	N2	1	100	D1-7	MAH-1 Panel
	D1-8	MAH-1			DX9100	DX9100	N2	1	100	D1-8	MAH-1 Panel
	A1-1	MAH-1	SA-T	Supply Air Temp	DX9100	DX9100	N2	1	100	A1-1	MAH-1 Panel
	A1-2	MAH-1	HXS-T	Heat Exh Supply Temp	DX9100	DX9100	N2	1	100	A1-2	MAH-1 Panel
	A1-3	MAH-1	EAE-T	Exh Air Entering Temp	DX9100	DX9100	N2	1	100	A1-3	MAH-1 Panel
	A1-4	MAH-1	EAX-T	Exhaust Air Leaving Temp	DX9100	DX9100	N2	1	100	A1-4	MAH-1 Panel
	A1-5	MAH-1	SF-Amps	Supply Fan Current	DX9100	DX9100	N2	1	100	A1-5	MAH-1 Panel
	A1-6	MAH-1	EF-Amps	Exhaust Fan Amps	DX9100	DX9100	N2	1	100	A1-6	MAH-1 Panel
	A1-7	MAH-1	CO	Carbon Monoxide	DX9100	DX9100	N2	1	100	A1-7	MAH-1 Panel
	A1-8	MAH-1	Zone-T	Zone Temperature	DX9100	DX9100	N2	1	100	A1-8	MAH-1 Panel
	AO-1	MAH-1	HTG-CMD		DX9100	DX9100	N2	1	100	AO-1	MAH-1 Panel
	AO-2	MAH-1	Face-Dmp	Face Damper Command	DX9100	DX9100	N2	1	100	AO-2	MAH-1 Panel
	AO-9	MAH-1	Byp-Dmp	Bypass Damper	DX9100	DX9100	N2	1	100	AO-9	MAH-1 Panel
	AO-10	MAH-1			DX9100	DX9100	N2	1	100	AO-10	MAH-1 Panel
	AO-11	MAH-1			DX9100	DX9100	N2	1	100	AO-11	MAH-1 Panel
	AO-12	MAH-1			DX9100	DX9100	N2	1	100	AO-12	MAH-1 Panel
	AO-13	MAH-1			DX9100	DX9100	N2	1	100	AO-13	MAH-1 Panel
	AO-14	MAH-1			DX9100	DX9100	N2	1	100	AO-14	MAH-1 Panel
		MAH-1			XT9100	XT (Expansion Module)					MAH-1 Panel
		MAH-1			XT9100	XT (Expansion Module)					MAH-1 Panel
	XT1A11	MAH-1	Face-Fbk	Face-Fbk	XP9102	XP9102 (8AI, N2)		1	101	A1-1	MAH-1 Panel
	XT1A12	MAH-1	Byp-Fbk	Bypass Fbk	XP9102	XP9102 (8AI, N2)		1	101	A1-2	MAH-1 Panel
	XT1A13	MAH-1	Sup-Flt	Supply Filter	XP9102	XP9102 (8AI, N2)		1	101	A1-3	MAH-1 Panel
	XT1A14	MAH-1	Exh-Flt	Exhaust Filter	XP9102	XP9102 (8AI, N2)		1	101	A1-4	MAH-1 Panel
	XT1A15	MAH-1	Slider		XP9102	XP9102 (8AI, N2)		1	101	A1-5	MAH-1 Panel
	XT1A16	MAH-1			XP9102	XP9102 (8AI, N2)		1	101	A1-6	MAH-1 Panel
	XT1AO7	MAH-1			XP9102	XP9102 (8AI, N2)		1	101	AO-7	MAH-1 Panel
	XT1AO8	MAH-1			XP9102	XP9102 (8AI, N2)		1	101	AO-8	MAH-1 Panel

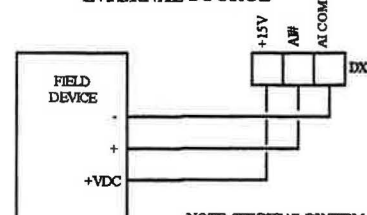
DETAIL DX3:

TEMPERATURE SENSOR
ANALOG INPUT

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG INPUT JUMPER SETTINGS

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

DETAIL DX7:

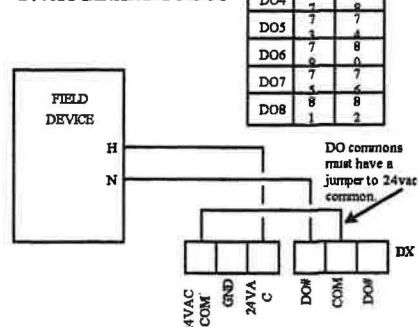
0-10VDC ANALOG INPUT
INTERNAL SOURCE

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG INPUT JUMPER SETTINGS

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

DETAIL DX51:

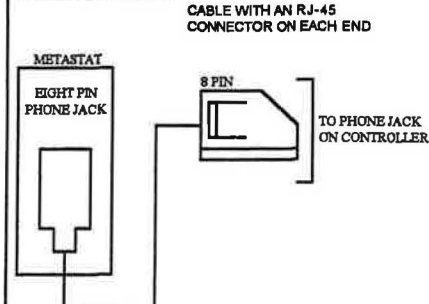
24VAC BINARY OUTPUT



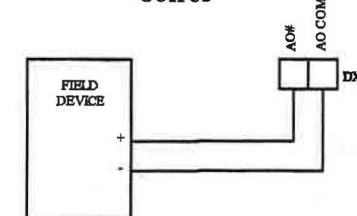
DETAIL DX4:

SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

METASTAT INPUT



DETAIL DX21:

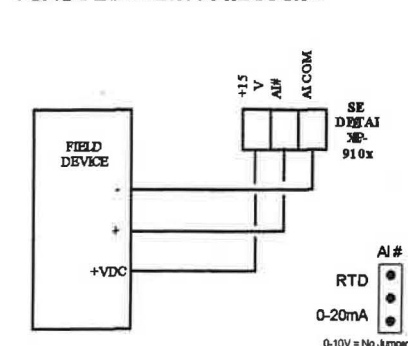
0-20mA ANALOG
OUTPUT

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG OUTPUT JUMPER SETTINGS.

DETAIL XP6:

0-10VDC INPUT INTERNAL SOURCE



Drawing Title

MAH-1 Point Schedule

Project Title

WTA

AS-BUILT

5/15/02

MWK

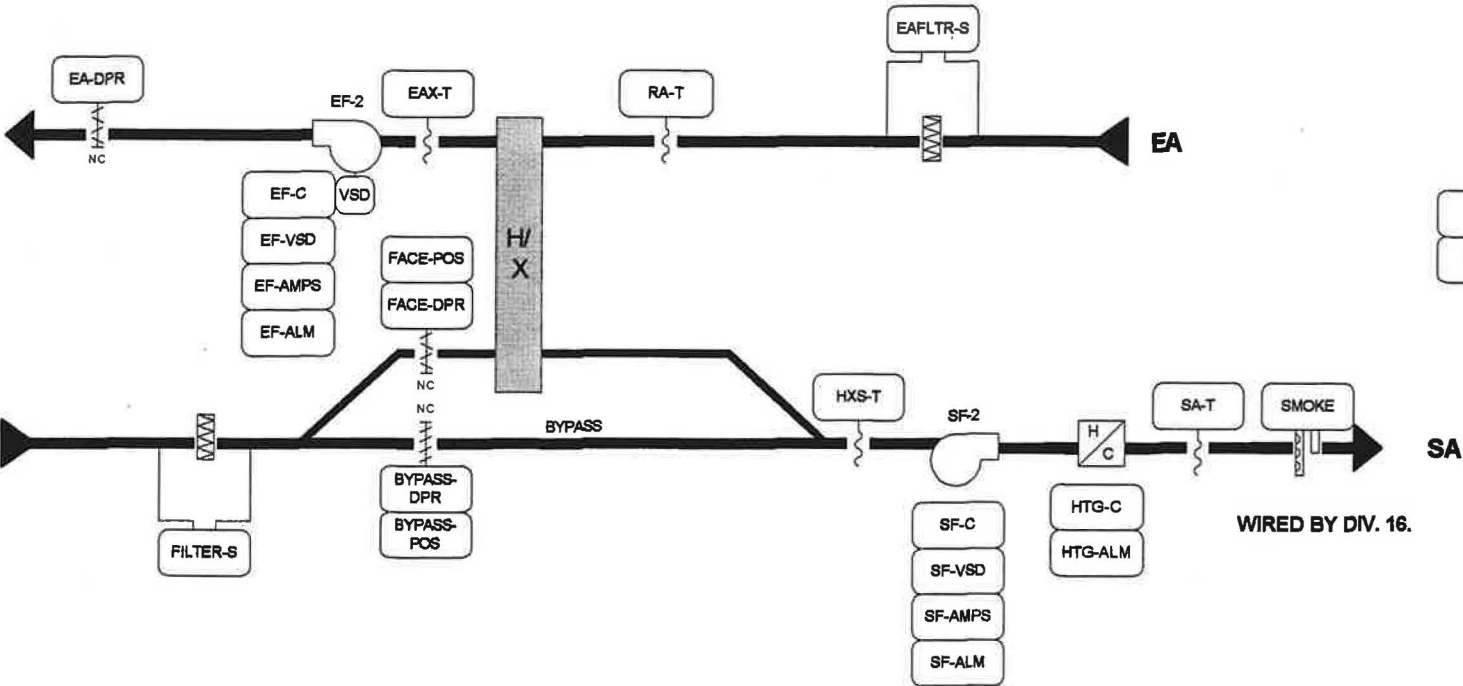
REFERENCE DRAWING	NO.	REVISION/LOCATION	ECN	DATE	BY
D.D	D.D	M.S		01/02/01	

Branch Information	CONTRACT NUMBER
2100 100TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/873-4445 Fax 425/873-2886	2000-026

DRAWING NUMBER
16 of 30 MAH1-2

CONTROL SYSTEMS
ROBINSON BUILDING CONTROLS SPECIALIST

MAH-2



BILL OF MATERIALS

Designation	Qty	Part Number	Description
Field Devices:			
CONTROLLER	1	DX-8100-8454	CNTRLR,DIG,DX,8AI,8AO,8BO,8BI
	1	DX-8100-8990	CNTRLR,DIG,DX,MTG BASE,F/DX8100
	1	DX-8100-8991	KIT,CNTRLR,DIG,DX,WIRING PROTECTION
	1	XT-9106-8004	CNTRLR,DIG,EXTENSION MODULE
	1	XP-9102-8004	CNTRLR,DIG,EXPN MODULE,8AI,2AO
EAFLTR-S, FILTER-S	2	DPT-2015-1	0-1.5" DIFF PRESS TO ELECTRIC TRANSP
BLDG-SP	1	DPT2840-0R5B	DP TRANS DIF, -0.5 TO 0.5
SF-S,EF-S	2	H-720	SENS,CURR,4-20MA,HI-ACC,SOLID
FACE-DPR, BYPASS-DPR	2	NF24-SR	ACT,PROP,S.R.2-10V-FB
EA-DPR	1	M9218-BGC-2	ACT,2-POS,SR,SW
SA-T, RA-T, EAX-T,			
HXS-T	4	TE-8311P-1	SENSOR,T-NI,0.1%,8IN DUCT
SF-C	2	RIBU1C	RELAY
RM-T	1	TE-6411S-2100	METATSTAT
CO	1	RTS451	REMOTE CARBON MONOXIDE DETECTOR

SEQUENCE OF OPERATION:

SYSTEM OFF: The supply and exhaust fans will be off, exhaust, face and bypass dampers will be closed.

OCCUPIED MODE: Supply and exhaust fans run continuously during the occupied mode. Upon receiving a signal to start the exhaust damper is commanded open and status must be proven before supply and exhaust fans are enabled.

DISCHARGE AIR CONTROL: The discharge air temperature setpoint will be reset based on the zone temperature deviation setpoint. As the zone temperature drops below setpoint the discharge air setpoint is reset up to the discharge air high limit until zone temperature is at setpoint. As the zone temperature rises above setpoint the discharge air setpoint is reset down to the discharge air low limit setpoint. Zone setpoint is adjustable at the zone sensor. The face and bypass damper will modulate in sequence with the gas heat as necessary to maintain the discharge air setpoint.

OPTIMAL START: The system start time shall be reset by a program resident in the NCM350. This program shall reset the start time of MAH 2 based on system performance.

MORNING WARM-UP: The morning warm-up time is defined as the time where MAH 2 is running prior to occupancy in order to achieve the occupied space temperature set point. During this time MAH 2 shall start and modulate heat to meet the zone temperature set point.

STATIC PRESSURE CONTROL: The exhaust fan has a variable speed drive that modules as necessary to maintain building static pressure.

Drawing Title											
MAH-2 Flow Diagram											
						AS-BUILT				5/14/02	
										MMVK	
		REFERENCE DRAWING		NO.		REVISION/LOCATION		EON		DATE	
		Sales Engineer		Project Manager		Application Engineer		DRAWN		APPROVED	
		D.D		D.D		M.S		Bf MAS		DATE	
								01/02/01		D	
Project Title						Branch Information		CONTRACT NUMBER			
WTA		CONTROL SYSTEMS				2100 195TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/873-4446 Fax 425/873-2996		2000-026			
								DRAWING NUMBER			
								17 of 30 MAH2-2			

Electrician / Filter		Point Information			Controller Information						Panel
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay / Terminal	
		MAH-2			DX9100	DX9100					MAH-2 Panel
		MAH-2			DX9100	DX9100					MAH-2 Panel
	DO-3	MAH-2	BLOW-C	BLOW-C	DX9100	DX9100	N2	1	102		MAH-2 Panel
	DO-4	MAH-2	HTG-ENA	Heating Enable	DX9100	DX9100	N2	1	102	DO-3	MAH-2 Panel
	DO-5	MAH-2	FAN-SS	FAN Command	DX9100	DX9100	N2	1	102	DO-4	MAH-2 Panel
	DO-6	MAH-2	EF-DPR	EF-DPR	DX9100	DX9100	N2	1	102	DO-5	MAH-2 Panel
	DO-7	MAH-2			DX9100	DX9100	N2	1	102	DO-6	MAH-2 Panel
	DO-8	MAH-2			DX9100	DX9100	N2	1	102	DO-7	MAH-2 Panel
	DI-1	MAH-2	Temp-Occ	Temp Occupied	DX9100	DX9100	N2	1	102	DO-8	MAH-2 Panel
	DI-2	MAH-2	EA-DMP-S	E.A. Damper Status	DX9100	DX9100	N2	1	102	DI-1	MAH-2 Panel
	DI-3	MAH-2	Flame-A	Flame Failure	DX9100	DX9100	N2	1	102	DI-2	MAH-2 Panel
	DI-4	MAH-2	SMOKE	Supply Smoke Status	DX9100	DX9100	N2	1	102	DI-3	MAH-2 Panel
	DI-5	MAH-2	PAINT-S	PAINT-S	DX9100	DX9100	N2	1	102	DI-4	MAH-2 Panel
	DI-6	MAH-2			DX9100	DX9100	N2	1	102	DI-5	MAH-2 Panel
	DI-7	MAH-2			DX9100	DX9100	N2	1	102	DI-6	MAH-2 Panel
	DI-8	MAH-2			DX9100	DX9100	N2	1	102	DI-7	MAH-2 Panel
	AI-1	MAH-2	SA-T	Supply Air Temp	DX9100	DX9100	N2	1	102	DI-8	MAH-2 Panel
	AI-2	MAH-2	BLDG-SP	BLDG-SP	DX9100	DX9100	N2	1	102	AI-1	MAH-2 Panel
	AI-3	MAH-2	EAE-T	Exh Air Entering Temp	DX9100	DX9100	N2	1	102	AI-2	MAH-2 Panel
	AI-4	MAH-2	EAX-T	Exhaust Air Leaving Temp	DX9100	DX9100	N2	1	102	AI-3	MAH-2 Panel
	AI-5	MAH-2	SF-Amps	Supply Fan Current	DX9100	DX9100	N2	1	102	AI-4	MAH-2 Panel
	AI-6	MAH-2	EF-Amps	Exhaust Fan Amps	DX9100	DX9100	N2	1	102	AI-5	MAH-2 Panel
	AI-7	MAH-2	CO	Carbon Monoxide	DX9100	DX9100	N2	1	102	AI-6	MAH-2 Panel
	AI-8	MAH-2	HXS-T	HXS-T	DX9100	DX9100	N2	1	102	AI-7	MAH-2 Panel
	AO-1	MAH-2	HTG-CMD		DX9100	DX9100	N2	1	102	AI-8	MAH-2 Panel
	AO-2	MAH-2	Face-Dmp	Face Damper Command	DX9100	DX9100	N2	1	102	AO-1	MAH-2 Panel
	AO-9	MAH-2	Byp-Dmp	Bypass Damper	DX9100	DX9100	N2	1	102	AO-2	MAH-2 Panel
	AO-10	MAH-2	EFVFD-%	EFVFD COMMAND	DX9100	DX9100	N2	1	102	AO-9	MAH-2 Panel
	AO-11	MAH-2			DX9100	DX9100	N2	1	102	AO-10	MAH-2 Panel
	AO-12	MAH-2			DX9100	DX9100	N2	1	102	AO-11	MAH-2 Panel
	AO-13	MAH-2			DX9100	DX9100	N2	1	102	AO-12	MAH-2 Panel
	AO-14	MAH-2			DX9100	DX9100	N2	1	102	AO-13	MAH-2 Panel
		MAH-2			XT9100	XT (Expansion Module)				AO-14	MAH-2 Panel
		MAH-2			XT9100	XT (Expansion Module)					MAH-2 Panel
	XT1A11	MAH-2	Face-Fbk	Face-Fbk	XP9102	XP9102 (8AI, N2)		1	103		MAH-2 Panel
	XT1A12	MAH-2	Byp-Fbk	Bypass Fbk	XP9102	XP9102 (8AI, N2)		1	103	AI-1	MAH-2 Panel
	XT1A13	MAH-2	Sup-Flt	Supply Filter	XP9102	XP9102 (8AI, N2)		1	103	AI-2	MAH-2 Panel
	XT1A14	MAH-2	Exh-Flt	Exhaust Filter	XP9102	XP9102 (8AI, N2)		1	103	AI-3	MAH-2 Panel
	XT1A15	MAH-2	Slider		XP9102	XP9102 (8AI, N2)		1	103	AI-4	MAH-2 Panel
	XT1A16	MAH-2	ZN-T	ZONE TEMP	XP9102	XP9102 (8AI, N2)		1	103	AI-5	MAH-2 Panel
	XT1AO7	MAH-2			XP9102	XP9102 (8AI, N2)		1	103	AI-6	MAH-2 Panel
	XT1AO8	MAH-2			XP9102	XP9102 (8AI, N2)		1	103	AO-7	MAH-2 Panel
										AO-8	MAH-2 Panel

DETAIL DX3:

TEMPERATURE SENSOR ANALOG INPUT

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG INPUT JUMPER SETTINGS

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

DETAIL DX7:

0-10VDC ANALOG INPUT INTERNAL SOURCE

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG INPUT JUMPER SETTINGS

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

DETAIL DX22:

0-10VDC ANALOG OUTPUT

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG OUTPUT JUMPER SETTINGS

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

DETAIL DX70:

N.O. BINARY INPUT

DETAIL XP6:

0-10VDC INPUT INTERNAL SOURCE

DETAIL XP9:

DPT-2000 INPUT

DETAIL DX4:

METASTAT INPUT

CABLE WITH AN RJ-45 CONNECTOR ON EACH END

TO PHONE JACK ON CONTROLLER

DETAIL DX21:

0-20mA ANALOG OUTPUT

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG OUTPUT JUMPER SETTINGS.

DETAIL DX51:

24VAC BINARY OUTPUT

DO	COM
DO3	7
DO4	7
DO5	7
DO6	7
DO7	7
DO8	7

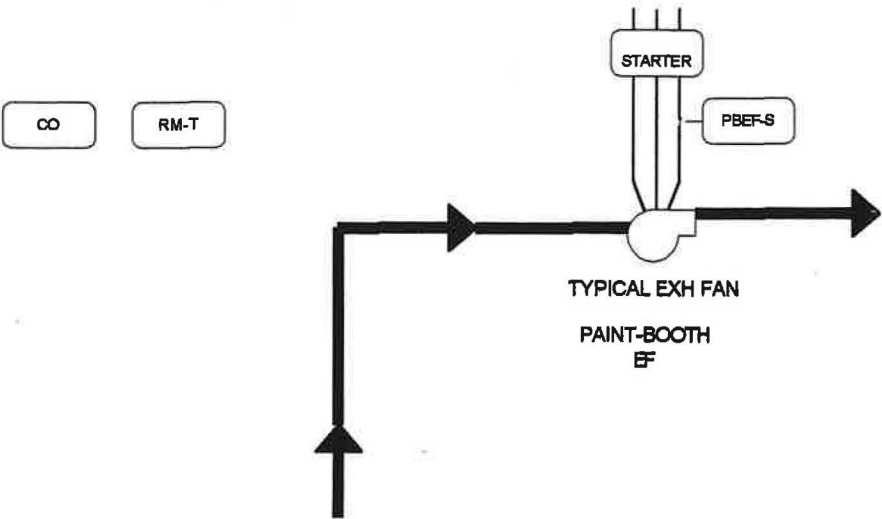
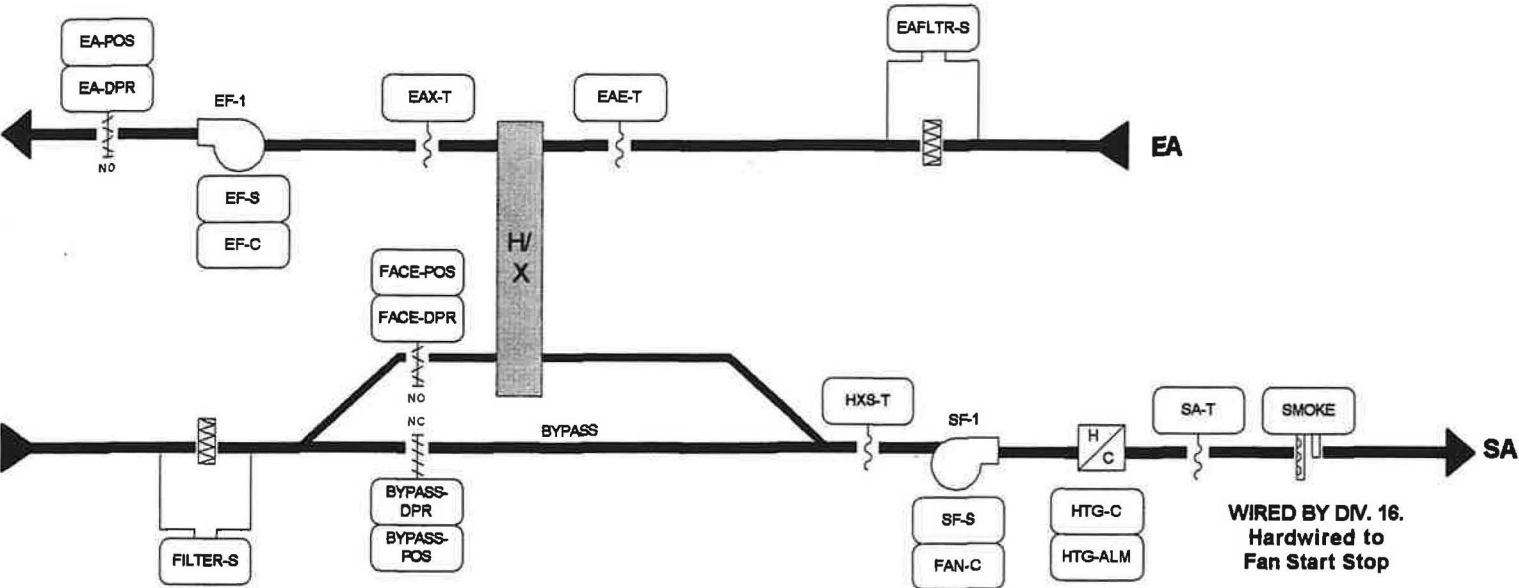
DO commons must have a jumper to 24vac common.

DETAIL XP5:

0-10VDC INPUT EXTERNAL SOURCE

Drawing Title		AS-BUILT		5/15/02		MWK	
MAH-2 Flow Diagram		NO		REVISION LOCATION		EON DATE BY	
Project Title		D.D		D.D		M.S	
WTA		DATE		01/02/01		APPROVED	
Branch Information		2100 105TH ST. SW		SUITE 125		LYNNWOOD WA, 98036	
Ph. 425/673-4448		Fax 425/673-2886		CONTRACT NUMBER		2000-026	
DRAWING NUMBER		18 of 30		MAH2-2			

MAH-3



BILL OF MATERIALS

Designation	Qty	Part Number	Description
Field Devices:			
CONTROLLER	1	DX-9100-8454	CNTRLR,DIG,DX,8AI,8AO,680,8BI
	1	DX-9100-8990	CNTRLR,DIG,DX,MTG BASE,F/DX-9100-8454
	1	DX-9100-8991	KIT, CNTRLR,DIG,DX,WIRING PROTECTION
	1	XT-9108-8304	CNTRLR,DIG,DX EXPN MOD
	1	XP-9102-8304	CNTRLR,DIG,EXTENSION 6AI,2AO
FILTER-S	2	DPT-2015-1	0-1.5" DIFF PRESS TO ELECTRIC TRANSP
SF-S, EF-S	2	H-720	SENS,CURR,4-20MA,HI-ACC,SOLID
FACE,BYP-DPR	2	NF24-SR	ACT,PROP,SR,2-10V-FB
EA-DPR	1	M9216BGC-2	ACT.2POS.SR,AUX SWITCH
HXS-T, EAX-T,			
EAE-T, SA-T	4	TE-6311P-1	SENSOR,T-NI,0.1%,8IN DUCT
SF-C,EF-C	2	RIBU1C	RELAY
RM-T	1	TE-6411S-2100	METASTAT
CO	1	RTS451	REMOTE CARBON MONOXIDE DETECTOR

SEQUENCE OF OPERATION:

SYSTEM OFF: The supply and exhaust fans will be off, exhaust, face and bypass dampers will be closed.

OCCUPIED MODE: Supply and exhaust fans run continuously during the occupied mode. Upon receiving a signal to start the exhaust damper is commanded open and status must be proven before supply and exhaust fans are enabled.

DISCHARGE AIR CONTROL: The discharge air temperature setpoint will be reset based on the zone temperature deviation setpoint. As the zone temperature drops below setpoint the discharge air setpoint is reset up to the discharge air high limit until zone temperature is at setpoint. As the zone temperature rises above setpoint the discharge air setpoint is reset down to the discharge air low limit setpoint. Zone setpoint is adjustable at the zone sensor. The face and bypass damper will modulate in sequence with the gas heat as necessary to maintain the discharge air setpoint.

OPTIMAL START: The system start time shall be reset by a program resident in the NCM350. This program shall reset the start time of MAH 1 based on system performance.

MORNING WARM-UP: The morning warm-up time is defined as the time where MAH 1 is running prior to occupancy in order to achieve the occupied space temperature set point. During this time MAH 1 shall start and modulate heat to meet the zone temperature set point.

Drawing Title	MAH-3 FLOW DIAGRAM							
Project Title	WTA							
REFERENCE DRAWING	NO.	REVISION	LOCATION	EQN	DATE	BY	DATE	BY
Sales Engineer	D.D	Project Manager	D.D	Application Engineer	M.S	By	MAS	DATE 01/02/01
Project Title				Branch Information				CONTRACT NUMBER
WTA				CONTROL SYSTEMS				2100 100TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4446 Fax 425/673-2888
								2000-026
								19 of 30 MAH3-1

Electrician / Fitter		Point Information			Controller Information					
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal
		MAH-3			DX9100	DX9100				MAH-3 Panel
		MAH-3			DX9100	DX9100				MAH-3 Panel
	DO-3	MAH-3	BLOW-C	Blower S/S	DX9100	DX9100	N2		104	DO-3
	DO-4	MAH-3	HTG-ENA	Heating Enable	DX9100	DX9100	N2		104	DO-4
	DO-5	MAH-3	FAN-SS	FAN Command	DX9100	DX9100	N2		104	DO-5
	DO-6	MAH-3	EF-DPR	EF-DPR	DX9100	DX9100	N2		104	DO-6
	DO-7	MAH-3			DX9100	DX9100	N2		104	DO-7
	DO-8	MAH-3			DX9100	DX9100	N2		104	DO-8
	DI-1	MAH-3	Temp-Occ	Temporary Occupied	DX9100	DX9100	N2		104	DI-1
	DI-2	MAH-3	EA-DMP-S	E.A. Damper Status	DX9100	DX9100	N2		104	DI-2
	DI-3	MAH-3	HTG-ALM	Flame Failure	DX9100	DX9100	N2		104	DI-3
	DI-4	MAH-3	SMOKE	Supply Smoke Status	DX9100	DX9100	N2		104	DI-4
	DI-5	MAH-3			DX9100	DX9100	N2		104	DI-5
	DI-6	MAH-3			DX9100	DX9100	N2		104	DI-6
	DI-7	MAH-3			DX9100	DX9100	N2		104	DI-7
	DI-8	MAH-3			DX9100	DX9100	N2		104	DI-8
	AI-1	MAH-3	SA-T	Supply Air Temp	DX9100	DX9100	N2		104	AI-1
	AI-2	MAH-3	HXS-T	Heat Exh Supply Temp	DX9100	DX9100	N2		104	AI-2
	AI-3	MAH-3	EAE-T	Exh Air Entering Temp	DX9100	DX9100	N2		104	AI-3
	AI-4	MAH-3	EAX-T	Exhaust Air Leaving Temp	DX9100	DX9100	N2		104	AI-4
	AI-5	MAH-3	SF-Amps	Supply Fan Current	DX9100	DX9100	N2		104	AI-5
	AI-6	MAH-3	EF-Amps	Exhaust Fan Amps	DX9100	DX9100	N2		104	AI-6
	AI-7	MAH-3	CO	Carbon Monoxide	DX9100	DX9100	N2		104	AI-7
	AI-8	MAH-3	Zone-T	Zone Temp	DX9100	DX9100	N2		104	AI-8
	AO-1	MAH-3	HTG-CMD		DX9100	DX9100	N2		104	AO-1
	AO-2	MAH-3			DX9100	DX9100	N2		104	AO-2
	AO-9	MAH-3			DX9100	DX9100	N2		104	AO-9
	AO-10	MAH-3			DX9100	DX9100	N2		104	AO-10
	AO-11	MAH-3			DX9100	DX9100	N2		104	AO-11
	AO-12	MAH-3			DX9100	DX9100	N2		104	AO-12
	AO-13	MAH-3			DX9100	DX9100	N2		104	AO-13
	AO-14	MAH-3			DX9100	DX9100	N2		104	AO-14
		MAH-3			XT9100	XT (Expansion Module)				MAH-3 Panel
		MAH-3			XT9100	XT (Expansion Module)				MAH-3 Panel
	XT1A11	MAH-3	FACE-FBK		XP9102	XP9102 (8AI, N2)			105	AI-1
	XT1A12	MAH-3	BYP-FBK		XP9102	XP9102 (8AI, N2)			105	AI-2
	XT1A13	MAH-3	SUP-FLT		XP9102	XP9102 (8AI, N2)			105	AI-3
	XT1A14	MAH-3	EXH-FLT		XP9102	XP9102 (8AI, N2)			105	AI-4
	XT1A15	MAH-3	SLIDER		XP9102	XP9102 (8AI, N2)			105	AI-5
	XT1A16	MAH-3			XP9102	XP9102 (8AI, N2)			105	AI-6
	XT1AO7	MAH-3			XP9102	XP9102 (8AI, N2)			105	AO-7
	XT1AO8	MAH-3			XP9102	XP9102 (8AI, N2)			105	AO-8

DETAIL DX3:

TEMPERATURE SENSOR ANALOG INPUT

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG INPUT JUMPER SETTINGS

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

DETAIL DX7:

0-10VDC ANALOG INPUT INTERNAL SOURCE

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG INPUT JUMPER SETTINGS

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

DETAIL DX51:

24VAC BINARY OUTPUT

DO	COM
DO3	1
DO4	2
DO5	3
DO6	4
DO7	5
DO8	6

DO commons must have a jumper to 24vac common.

DETAIL XP3:

TEMPERATURE SENSOR INPUT

SEE DETAIL XP-910x

RTD 0-20mA

0-10V = No Jumper

DETAIL DX4:

METASTAT INPUT

SEE TERMINAL BOARD LAYOUT DETAIL FOR JUMPER SETTINGS.

DETAIL DX22:

0-10VDC ANALOG OUTPUT

NOTE: SEE DETAIL DX-TERM OR LCP-TERM FOR ANALOG OUTPUT JUMPER SETTINGS

NOTE: IF SHIELDED CABLE IS USED SEE DETAIL A-SHIELD-GROUND FOR SHIELD TERMINATION

DETAIL DX70:

N.O. BINARY INPUT

DETAIL XP6:

0-10VDC INPUT INTERNAL SOURCE

SEE DETAIL XP-910x

RTD 0-20mA

0-10V = No Jumper

DETAIL XP9:

DPT-2000 INPUT

SEE DETAIL XP-910x

RTD 0-20mA

0-10V = No Jumper

Drawing Title

MAH3-2 POINT SCHEDULE

Project Title

WTA

AS-BUILT

5/15/02 MWK

REFERENCE DRAWING NO. LOCATION

SALES ENGINEER D.D. PROJECT MANAGER D.D. APPLICATION ENGINEER M.S.

BY MAS DATE 01/02/01

CONTRACT NUMBER

2000-026

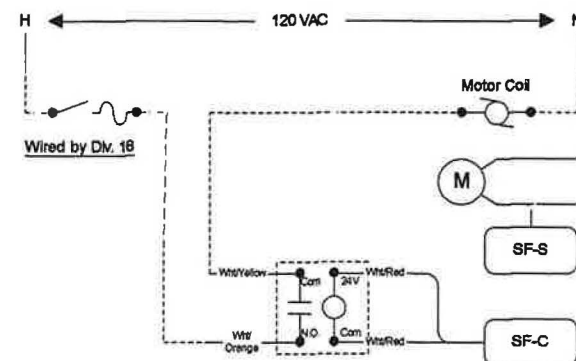
DRAWING NUMBER

20 of 30 MAH3-2

CONTROL SYSTEMS

2100 195TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/573-4445 Fax 425/573-2888

The diagram illustrates a power distribution system. The main line starts from OA (Onboard Air) and passes through several components in sequence: a switch labeled NC, a connection to RA (Reactor Assembly), a switch labeled NO, a switch labeled FLT-DP, a switch labeled SF-S/SF-C, a switch labeled H/C, and finally a switch labeled SA-T, which leads to ZN-T (Zinc Treatment).



<u>Designation</u>	<u>Qty</u>	<u>Part Number</u>	<u>Description</u>
Field Devices:			
CONTROLLER	1	AS-UNT111-101	CNTRLR,DIG,UNT,6AI,4BI,8BO,2AO,ENCL,60VA
FLT-DP	1	DFT-2015-1	0-1.5" DIFF PRESS TO ELECTRIC TRANSP
STATUS	1	H-720	SENS,CURR,4-20MA,HI-ACC,SOLID
DPR-C	1	NF24-SR	ACT,PROP,140IN #,SR,2-10V-FB
SAT	1	TE-6311P-1	SENSOR,T-NI,0.1%,8IN DUCT
Other Devices:			
SF-C	1	RIB1US	RIB W/HOA
HTG1-C	1	RIBU1C	RELAY
ZN-T	1	TMZ-1600	

OPTIMAL START: The system start time shall be reset by a program resident in the NCM350. This program shall reset the start time of RHU-1 based on system performance.

Morning Warm-up: The morning warm-up time is defined as the time where RHU-1 is running prior to occupancy. During this time RHU-1 shall start and stage heat to meet the zone temperature set point.

Occupied mode: Supply fan will run continuously during the occupied mode. Outside and return dampers will modulate in sequence with the dx gas heat to maintain zone temperature.

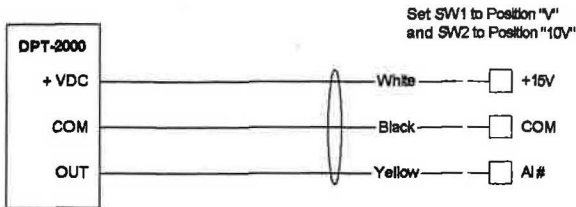
Unoccupied mode: During the unoccupied mode, the unit supply fan will be off, the outdoor air damper will be fully closed, and the heat will be full off. When the area space temperature falls below 60°F the fan motor will start, the heat will be modulated and the outdoor air damper will be full closed, until the space temperature is satisfied, at which time the supply fan will turn off.

Drawing Title RHU-1 Flow Diagram									
	AS-BUILT							5/15/02	MWK
	REFERENCE DRAWING		NO.	REVISION LOCATION		ECN	DATE	BY	
	Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED			
	D.D	D.D	M.S	By MAS	DATE 01/02/01	By	DATE	0	
Project Title WTA	CONTROL SYSTEMS 			Branch information 2100 196TH ST. SW SUITE 126 LYNNWOOD WA, 98036 Ph. 425/673-4444 Fax 425/673-2886			CONTRACT NUMBER 2000-026 DRAWING NUMBER 21 of 30 RHU1-1		

Electrician/Fitter		Point Information			Controller Information						
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Panel
		RHU-1			UNT	UNT 111					RHU-1 Panel
		RHU-1			UNT	UNT 111	N2	1	47		RHU-1 Panel
	AI-1	RHU-1	ZN-T	Zone Temp	UNT	UNT 111	N2	1	47	AI-1	RHU-1 Panel
	AI-2	RHU-1	AI - 2	AI - 2	UNT	UNT 111	N2	1	47	AI-2	RHU-1 Panel
	AI-3	RHU-1	DA-T	Dis Air Temp	UNT	UNT 111	N2	1	47	AI-3	RHU-1 Panel
	AI-4	RHU-1	AI - 4	AI - 4	UNT	UNT 111	N2	1	47	AI-4	RHU-1 Panel
	AI-5	RHU-1	AI - 5	AI - 5	UNT	UNT 111	N2	1	47	AI-5	RHU-1 Panel
	AI-6	RHU-1	AI - 6	AI - 6	UNT	UNT 111	N2	1	47	AI-6	RHU-1 Panel
	BI-1	RHU-1	SF-S	Air Flow Interlk	UNT	UNT 111	N2	1	47	BI-1	RHU-1 Panel
	BI-2	RHU-1			UNT	UNT 111	N2	1	47	BI-2	RHU-1 Panel
	BI-3	RHU-1			UNT	UNT 111	N2	1	47	BI-3	RHU-1 Panel
	BI-4	RHU-1			UNT	UNT 111	N2	1	47	BI-4	RHU-1 Panel
	BO-1	RHU-1	SF-C	Fan	UNT	UNT 111	N2	1	47	BO-1	RHU-1 Panel
	BO-2	RHU-1	HTG1-C	Htg Stage 1	UNT	UNT 111	N2	1	47	BO-2	RHU-1 Panel
	BO-3	RHU-1	HTG2-C	Htg Stage 2	UNT	UNT 111	N2	1	47	BO-3	RHU-1 Panel
	BO-4	RHU-1			UNT	UNT 111	N2	1	47	BO-4	RHU-1 Panel
	BO-5	RHU-1			UNT	UNT 111	N2	1	47	BO-5	RHU-1 Panel
	BO-6	RHU-1			UNT	UNT 111	N2	1	47	BO-6	RHU-1 Panel
	AO-1	RHU-1	OA-READO	OA-READOUT	UNT	UNT 111	N2	1	47	AO-1	RHU-1 Panel
	AO-2	RHU-1	OA-DPR	Damper	UNT	UNT 111	N2	1	47	AO-2	RHU-1 Panel

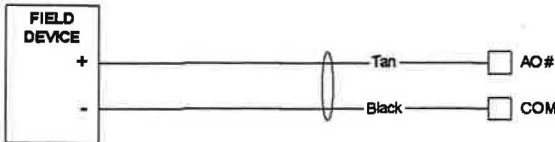
DETAIL UV9

DPT-2000 ANALOG INPUT



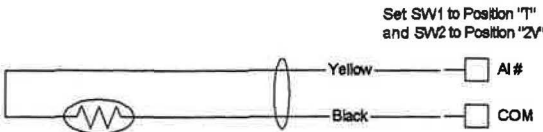
DETAIL UV23

0-10V ANALOG OUTPUT



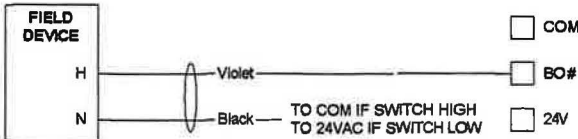
DETAIL UV1

TEMPERATURE SENSOR INPUT



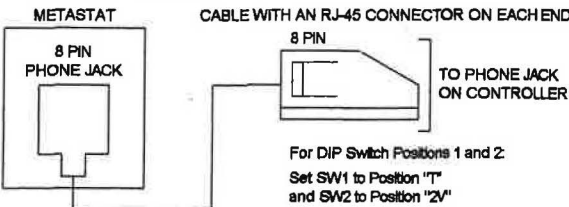
DETAIL UV51

24 VAC BINARY OUTPUT



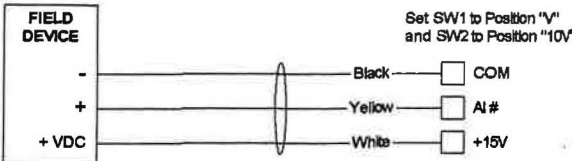
DETAIL UV2

METASTAT INPUT



DETAIL UV5

0-10 VDC INPUT - INTERNAL SOURCE



Drawing Title																
RHU-1 Point Schedule																
											AS-BUILT		5/15/02	MVVK		
	REFERENCE DRAWING					NO.		REVISION/LOCATION			ECN	DATE	BY			
Project Title	Sales Engineer		Project Manager		Application Engineer			DRAWN			APPROVED					
	D.D		D.D		M.S			BY MAS DATE 01/02/01			BY DATE 0					
WT A	CONTROL SYSTEMS JOHNSON CONTROL SYSTEMS CORPORATION 2100 100TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4448 Fax 425/673-2888					Branch Information					CONTRACT NUMBER					
2100 100TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4448 Fax 425/673-2888						2000-026										
						DRAWING NUMBER										
						22 of 30 RHU1-2										

<u>Designation</u>	<u>Qty</u>	<u>Part Number</u>	<u>Description</u>
Field Devices:			
UH-C	8	CVR11C-0	BOX RELAY SINGLE POLE SINGLE THROW
LUBE-ALM, RECL-ALM			
WASH-ALM	3	TMZ-1800	T-STAT
CONTROLLER	2	AS-UNT111-1	APPLICATION SPECIFIC CONTROLLER

WASH-ALM

UNIT HEATER	CONTROLLER	OUTPUT
UH-1	UNT-2	BO-3
UH-2	UNT-2	BO-4
UH-3	UNT-1	BO-4

MODE OF OPERATION: The Unit heaters are controlled by packaged controls provided with the units. In addition these Unit heaters can be commanded on and off by the DDC system. The status of the Unit heaters is also monitored by the DDC system as well as a low limit alarm.

120 VAC

H

Wired by Div. 18

F

Motor Coil

M

UH-S

24V

H.O.

Com

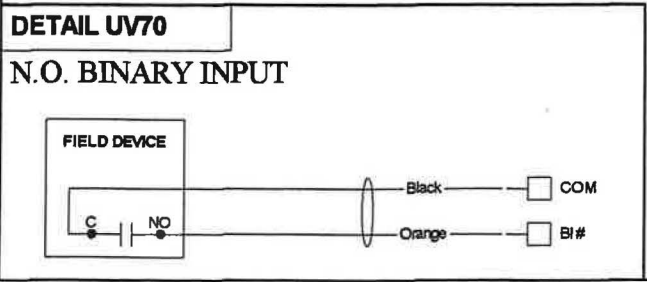
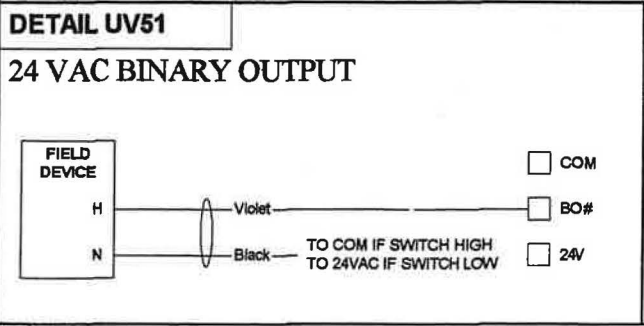
Wired Orange

Wired Red

UH-C

Drawing Title											
Unit Heater Flow Diagram											
		1		AS-BUILT				5/15/02		MWW	
REFERENCE DRAWING		NO.		REVISION/LOCATION		ECN		DATE		BY	
Sales Engineer		Project Manager		Application Engineer		DRAWN		APPROVED			
D.D		D.D		M.S		BY MAS DATE 01/02/01		BY		DATE 0	
Project Title				Branch Information				CONTRACT NUMBER			
WTA				2100 190TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/673-4446 Fax 425/673-2886				2000-026 DRAWING NUMBER 23 of 30 UH1-1			

Tag	Point Information			Expanded ID	Controller Information							Termination Out	Panel Information					Intermediate Device					Field Device					Comment		
	Point Type	System Name	Object Name		Controller Type	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	DO Type		Module Type	Panel	Panel Location	Bit Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device	Termination Out	Location	Wiring /Tubing	Termination In	Device	Location		Ref Detail Stencil Name	Ref Detail Shape
		UH1-2			UNT	UNT 111							BN-1	EQUIP STORAGE		M12														Power to Controller N2 Trunk
		UH1-2			UNT	UNT 111	N2	1	66				BN-1	EQUIP STORAGE		0/M12														
	AL-1	UH1-2			UNT	UNT 111	N2	1	66/AL-1				BN-1	EQUIP STORAGE		0/M12	1-66-AL-1													
	AL-2	UH1-2			UNT	UNT 111	N2	1	66/AL-2				BN-1	EQUIP STORAGE		0/M12	1-66-AL-2													
	AL-3	UH1-2			UNT	UNT 111	N2	1	66/AL-3				BN-1	EQUIP STORAGE		0/M12	1-66-AL-3													
	AL-4	UH1-2			UNT	UNT 111	N2	1	66/AL-4				BN-1	EQUIP STORAGE		0/M12	1-66-AL-4													
	AL-5	UH1-2			UNT	UNT 111	N2	1	66/AL-5				BN-1	EQUIP STORAGE		0/M12	1-66-AL-5													
	AL-6	UH1-2			UNT	UNT 111	N2	1	66/AL-6				BN-1	EQUIP STORAGE		0/M12	1-66-AL-6													
	BL-1	UH1-2	UH1-S	UH-1 STATUS	UNT	UNT 111	N2	1	66/BL-1			BI1 24VAC	BN-1	EQUIP STORAGE		0/M12	1-66-BL-1					2/18	Device dependent	Hardwired			UNT_VAV/VSS	UV70		
	BL-2	UH1-2	UH2-S	UH-2 STATUS	UNT	UNT 111	N2	1	66/BL-2			BI2 24VAC	BN-1	EQUIP STORAGE		0/M12	1-66-BL-2					2/18	Device dependent	Hardwired			UNT_VAV/VSS	UV70		
	BL-3	UH1-2			UNT	UNT 111	N2	1	66/BL-3				BN-1	EQUIP STORAGE		0/M12	1-66-BL-3													
	BL-4	UH1-2			UNT	UNT 111	N2	1	66/BL-4				BN-1	EQUIP STORAGE		0/M12	1-66-BL-4													
	BO-1	UH1-2	UH1-C	UH-1 CONTROL	UNT	UNT 111	N2	1	66/BO-1			BO1.COM	BN-1	EQUIP STORAGE		0/M12	1-66-BO-1		2/18	COIL	RELAY	NO.COM	2/14	See starter detail	Starter (NO-few hi)		UNT_VAV/VSS	UV51		
	BO-2	UH1-2	UH2-C	UH-2 CONTROL	UNT	UNT 111	N2	1	66/BO-2			BO2.COM	BN-1	EQUIP STORAGE		0/M12	1-66-BO-2		2/18	COIL	RELAY	NO.COM	2/14	See starter detail	Starter (NO-few hi)		UNT_VAV/VSS	UV51		
	BO-3	UH1-2			UNT	UNT 111	N2	1	66/BO-3				BN-1	EQUIP STORAGE		0/M12	1-66-BO-3													
	BO-4	UH1-2			UNT	UNT 111	N2	1	66/BO-4				BN-1	EQUIP STORAGE		0/M12	1-66-BO-4													
	BO-5	UH1-2			UNT	UNT 111	N2	1	66/BO-5				BN-1	EQUIP STORAGE		0/M12	1-66-BO-5													
	BO-6	UH1-2			UNT	UNT 111	N2	1	66/BO-6				BN-1	EQUIP STORAGE		0/M12	1-66-BO-6													
	AO-1	UH1-2			UNT	UNT 111	N2	1	66/AO-1				BN-1	EQUIP STORAGE		0/M12	1-66-AO-1													
	AO-2	UH1-2			UNT	UNT 111	N2	1	66/AO-2				BN-1	EQUIP STORAGE		0/M12	1-66-AO-2													
		UH1-2			UNT	UNT 111							BN-1	LUBE / COMP		M12														Power to Controller N2 Trunk
		UH1-2			UNT	UNT 111	N2	1	61				BN-1	LUBE / COMP		0/M12														
	AL-1	UH1-2			UNT	UNT 111	N2	1	61/AL-1				BN-1	LUBE / COMP		0/M12	1-61-AL-1													
	AL-2	UH1-2			UNT	UNT 111	N2	1	61/AL-2				BN-1	LUBE / COMP		0/M12	1-61-AL-2													
	AL-3	UH1-2			UNT	UNT 111	N2	1	61/AL-3				BN-1	LUBE / COMP		0/M12	1-61-AL-3													
	AL-4	UH1-2			UNT	UNT 111	N2	1	61/AL-4				BN-1	LUBE / COMP		0/M12	1-61-AL-4													
	AL-5	UH1-2			UNT	UNT 111	N2	1	61/AL-5				BN-1	LUBE / COMP		0/M12	1-61-AL-5													
	AL-6	UH1-2			UNT	UNT 111	N2	1	61/AL-6				BN-1	LUBE / COMP		0/M12	1-61-AL-6													
	BL-1	UH1-2	UH3-S	UH-3 STATUS	UNT	UNT 111	N2	1	61/BL-1			BI1 24VAC	BN-1	LUBE / COMP		0/M12	1-61-BL-1					2/18	Device dependent	Hardwired			UNT_VAV/VSS	UV70		
	BL-2	UH1-2			UNT	UNT 111	N2	1	61/BL-2				BN-1	LUBE / COMP		0/M12	1-61-BL-2													
	BL-3	UH1-2			UNT	UNT 111	N2	1	61/BL-3				BN-1	LUBE / COMP		0/M12	1-61-BL-3													
	BL-4	UH1-2			UNT	UNT 111	N2	1	61/BL-4				BN-1	LUBE / COMP		0/M12	1-61-BL-4													
	BO-1	UH1-2	UH3-C	UH-3 CONTROL	UNT	UNT 111	N2	1	61/BO-1			BO1.COM	BN-1	LUBE / COMP		0/M12	1-61-BO-1					2/18	Device dependent	24VAC OUT (sw hi)			UNT_VAV/VSS	UV51		
	BO-2	UH1-2			UNT	UNT 111	N2	1	61/BO-2				BN-1	LUBE / COMP		0/M12	1-61-BO-2													
	BO-3	UH1-2			UNT	UNT 111	N2	1	61/BO-3				BN-1	LUBE / COMP		0/M12	1-61-BO-3													
	BO-4	UH1-2			UNT	UNT 111	N2	1	61/BO-4				BN-1	LUBE / COMP		0/M12	1-61-BO-4													
	BO-5	UH1-2			UNT	UNT 111	N2	1	61/BO-5				BN-1	LUBE / COMP		0/M12	1-61-BO-5													
	BO-6	UH1-2			UNT	UNT 111	N2	1	61/BO-6				BN-1	LUBE / COMP		0/M12	1-61-BO-6													
	AO-1	UH1-2			UNT	UNT 111	N2	1	61/AO-1				BN-1	LUBE / COMP		0/M12	1-61-AO-1													
	AO-2	UH1-2			UNT	UNT 111	N2	1	61/AO-2				BN-1	LUBE / COMP		0/M12	1-61-AO-2													



Drawing Title	Unit Heater Point Schedule			AS-BUILT		5/15/02	MWK
Project Title	WTA			CONTROL SYSTEMS		2000-026	
Branch Information		2100 186TH ST. SW SUITE 125 LYNNWOOD WA, 98036 Ph. 425/873-4446 Fax 425/873-2886		DRAWING NUMBER		24 of 30 UH1-2	

Location					Room Controller/Sensor						Reheat Valve						Box Information							
Bldg./Flr.	Room	Name	System Name	Ref. dwg.	Pt Sched N2 Addr	Controller				CS Model	Sensor	Device Code	Valve	Size	Valve	Flow	Delta P	Box Type						
	No.					Code No.	NCM Addr	N2 Trunk	N2 Addr		Code No.		Body Style	in.	Cv	GPM lb/hr	psi	Box ID	Box Type	K Factor	Inlet Size (Inches)	Inlet Size (Area)	Ctg Min Flow	Ctg Max Flow
MAIN/1	142	DIR OPS	FPB 1-1	MO.3	1	VMA1420	1	1	1									FPB1-1			8	0.350	210	600
MAIN/1	138	DISP	FPB1-2	MO.3	2	VMA1420	1	1	2									FPB1-2			10	0.545	275	750
MAIN/1	136	OFFICE	FPB1-3	MO.3	3	VMA1420	1	1	3									FPB1-3			8	0.196	200	600
MAIN/1	137	MGR.	FPB1-4	MO.3	4	VMA1420	1	1	4									FPB1-4			6	0.196	100	310
MAIN/1	132	TRAINING SUP.	FPB1-5	MO.3	5	VMA1420	1	1	5									FPB1-5			6	0.196	100	250
MAIN/1	135	TRAINING	FPB1-6	MO.3	6	VMA1420	1	1	6									FPB1-6			12	0.785	400	1000
MAIN/1	131	CONF	FPB1-7	MO.3	7	VMA1420	1	1	7									FPB1-7			12	0.785	400	1000
MAIN/1	101	LOBBY	FPB1-8	MO.3	8	VMA1420	1	1	8									FPB1-8			12	0.785	360	1200
MAIN/1	106	HR.	FPB1-9	MO.3	9	VMA1420	1	1	9									FPB1-9			10	0.545	250	800
MAIN/1	108	LOCKER ALCOV	FPB1-10	MO.3	10	VMA1420	1	1	10									FPB1-10			10	0.545	525	700
MAIN/1	109	MEN'S LOCK	FPB1-11	MO.3	11	VMA1420	1	1	11									FPB1-11			10	0.545	750	750
MAIN/1	116	WOM. LOCK	FPB1-12	MO.3	12	VMA1420	1	1	12									FPB1-12			6	0.196	325	325
MAIN/1	119	OPS COORD.	FPB1-13	MO.3	13	VMA1420	1	1	13									FPB1-13			8	0.350	150	420
MAIN/1	144	CAFÉ	FPB1-14	MO.3	14	VMA1420	1	1	14									FPB1-14			8	0.350	250	800
MAIN/1	118	OPS SUPS.	FPB1-15	MO.3	15	VMA1420	1	1	15									FPB1-15			8	0.350	270	600
MAIN/1	120	TEAM ROOM	FPB1-16	MO.3	16	VMA1420	1	1	16									FPB1-16			16	1.400	720	2400
MAIN/1	136	PT CSRS	FPB1-17	MO.3	17	VMA1420	1	1	17									FPB1-17			10	0.545	220	700
MAIN/1	129	TRAINING	FPB1-18	MO.3	18	VMA1420	1	1	18									FPB1-18			10	0.545	240	740
MAIN/1	126	TOILETS	FPB1-19	MO.3	19	VMA1420	1	1	19									FPB1-19			8	0.350	480	480
MAIN/1	121	STORAGE	FPB1-20	MO.3	20	VMA1420	1	1	20									FPB1-20			8	0.350	100	400

