East Granby High School

Temperature Control Drawings

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	Submittal	7-27-01	

RTU 5, 6, 7, 8, 9, 11 Multizone Control

The **occupied / unoccupied** mode shall be indexed via time schedule by the DDC system. During the occupied mode the supply and return fans shall run continuously. During the unoccupied mode the fans shall cycle to maintain the unoccupied set point. The system shall go into **warm-up** mode when indexed to occupied if the outside air temperature is below 55 °F. (adj.) and the return air temperature is 5 °F. (adj.) lower than the warm up set point. When in the warm up mode the fresh air dampers shall remain closed until the return air temperature is within 3 °F. (adj.) of the warm up set point.

During the occupied mode the **economizer dampers** will open to their minimum fresh air position. When the outside air temperature is below the economizer set point (adj.) the dampers shall be allowed to modulate to maintain the mixed air temperature set point (adj.). If the outside air temperature is above the economizer set point the dampers shall remain at the minimum fresh air position. When in the unoccupied mode the fresh air dampers shall be closed and the return air dampers shall be open.

The **heating coil valve** shall be modulated to maintain the hot deck temperature set point (adj.) as reset by the zone with the greatest heating demand.

When the outside air temperature is below the cooling lockout set point of 55 °F. (adj.) the **mechanical cooling** shall be allowed to operate. The DX cooling shall be staged on to maintain the cold deck temperature set point of 75 °F. (adj.).

Each **zone damper** shall modulate to maintain the space temperature set point as set from the graphic workstation.

When the supply air temperature sensor senses a temperature below the **low limit** set point of 38 ° F. (adj.) the fans shall shut off, the dampers shall close to the outside air, the heating valve shall open to full flow through the heating coil, and an alarm shall be generated at the operator workstation.

RTU 12 Computer Lab

The **occupied / unoccupied** mode shall be indexed via time schedule by the DDC system. During the occupied mode the supply fan shall run continuously. During the unoccupied mode the unit shall cycle to maintain the unoccupied temperature set point (adj.).

During the occupied mode the **economizer dampers** will open to their minimum fresh air position. If the outside air temperature is below the economizer set point (adj.) the dampers shall be allowed to modulate to maintain the mixed air temperature set point (adj.). If the outside air temperature is above the economizer set point the dampers shall remain at the minimum fresh air position. When in the unoccupied mode the fresh air damper shall be closed and the return air damper shall be open.

When the outside air temperature is below the cooling lockout set point of 55 °F. (adj.) the **mechanical cooling** shall be allowed to operate. Th DX cooling shall be staged to maintain the space temperature set point of 75 °F. (adj.) as set from the graphic workstation.

When the supply air temperature sensor senses a temperature below the **low limit** set point of 38 ° F. (adj.) the fans shall shut off, the dampers shall close to the outside air and an alarm shall be generated at the operator workstation.

RTU 1 & 3 and AHU 2 VAV Control

The **occupied / unoccupied** mode shall be indexed via time schedule by the DDC system. During the occupied mode the supply and return fans shall run continuously. During the unoccupied mode the fans shall cycle to maintain the unoccupied set point. The system will go into **warm-up mode** when indexed to occupied if the outside air temperature is below 55℉. (adj.) and the return air temperature is 5 °F. (adj.) lower than the warm-up set point. When in the warm-up mode the fresh air dampers shall remain closed until the return air temperature is within 3 °F. (adj.) of the warm-up set point.

The **fan speed** shall be modulated by variable frequency drives. A static pressure sensor in the supply duct will vary the speed of the supply fan to maintain a constant static pressure of 1" WC. The return fan shall track the supply fan less 10% (adj.) as set by the air balancer to maintain a constant differential between the supply and return ducts. (AHU 2 has a fan discharge damper on the return fan not a variable frequency drive.)

During the occupied mode the **economizer dampers** will open to their minimum fresh air position. When the outside air temperature is below the economizer set point (adj.) the dampers shall be allowed to modulate to maintain the mixed air temperature set point (adj.). If the outside air temperature is above the economizer set point the dampers shall remain at the minimum fresh air position. When in the unoccupied mode the fresh air dampers shall be closed and the return air dampers shall be open. The **return air CO2** shall be monitored by the DDC system. The CO2 sensor shall reset the minimum fresh air position. When the CO2 level is lower than the set point (adj.) the minimum fresh air position will be reduced to a maximum (not exceeding 50%) of the original minimum position as set by the air balancer. As the level of CO2 increases above the set point the minimum damper position shall be increased to admit more fresh air to satisfy the CO2 set point.

The **heating coil valve** will modulate to maintain the supply air set point (adj.) as reset by the outside air temperature.

When the outside air temperature is below the cooling lockout set point of 55 °F. (adj.) the **mechanical cooling** shall be allowed to operate. The DX cooling shall be staged on to maintain the return air temperature set point of 78 °F. (adj.).

When supply air temperature sensor senses a temperature below the **low limit** set point of 38 °F. (adj.) the fans shall shut off, the dampers shall close to the outside air, the heating valve shall open to full flow through the heating coil, and an alarm shall be generated at the operator workstation.

Variable Air Volume Box Control

The VAV Box occupied / unoccupied mode will be initiated by the DDC system. The box damper shall modulate to maintain the occupied / unoccupied space temperature set point as set from the graphic workstation.

Cooling Only Boxes

On a call for cooling the box damper shall modulate open from minimum cfm flow to maximum cfm flow as set by the air balancer. On a drop in space temperature the box damper shall be modulated towards the minimum cfm flow.

Boxes with Reheat Coils

On a call for cooling the box damper shall modulate open from minimum cfm flow to maximum cfm flow. On a drop in space temperature the damper shall be modulated toward s the minimum cfm flow. On a further drop in space temperature the reheat valve shall modulate open to maintain set point.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-376-3000 Fax: 860-376-3060 MADE IN USA	DOC. NO	East Granby High School	DESCRIPTION : Sequence of Operation	
		SCALE :			
		REV LEVEL :	Submittal		

AHU 1, 5, 6 Gym Units

The **occupied / unoccupied** mode shall be indexed via time schedule by the DDC system. During the occupied mode the supply and return fans shall run continuously. During the unoccupied mode the fans shall cycle to maintain the unoccupied set point. The system will go into **warm-up mode** when indexed to occupied if the outside air temperature is below 55℉. (adj.) and the return air temperature is 5 °F. (adj.) lower than the warm-up set point. When in the warm-up mode the fresh air dampers shall remain closed until the return air temperature is within 3 °F. (adj.) of the warm-up set point.

During the occupied mode the **economizer dampers** will open to their minimum fresh air position. When the outside air temperature is below the economizer set point (adj.) the dampers shall be allowed to modulate to maintain the mixed air temperature set point (adj.). If the outside air temperature is above the economizer set point the dampers shall remain at the minimum fresh air position. When in the unoccupied mode the fresh air dampers shall be closed and the return air dampers shall be open. The **return air CO2** shall be monitored by the DDC system. The CO2 sensor shall reset the minimum fresh air position. When the CO2 level is lower than the set point (adj.) the minimum fresh air position will be reduced to a maximum (not exceeding 50%) of the original minimum position as set by the air balancer. As the level of CO2 increases above the set point the minimum damper position shall be increased to admit more fresh air to satisfy the CO2 set point.

The **preheat coil valve (AHU-1 ONLY)** shall modulate to maintain the coil discharge set point of 55 °F. (adj.).

The **heating coil valve** will modulate to maintain the supply air set point (adj.) as reset by the space temperature.

A **local override switch** located in the Gym Office shall place the Gym units in occupied mode in four hour increments. The override time shall be tracked through the DDC system.

When supply air temperature sensor senses a temperature below the **low limit** set point of 38 °F. (adj.) the fans shall shut off, the dampers shall close to the outside air, the heating valve shall open to full flow through the heating coil, and an alarm shall be generated at the operator workstation.

AHU 3 Locker Room

The unit shall be **enabled** by the DDC system. When indexed on by the DDC system the fresh air damper shall open and the unit's own controls shall control the unit operation. The DDC system shall monitor the unit operation.

The **heating coil valve** shall be modulated to maintain the discharge air set point of 80 °F. (adj.) as reset by the space temperature.

When supply air temperature sensor senses a temperature below the **low limit** set point of 38 °F. (adj.) the fans shall shut off, the dampers shall close to the outside air, the heating valve shall open to full flow through the heating coil, and an alarm shall be generated at the operator workstation.

A **local override switch** located in the Gym Office shall place the Gym units in occupied mode in four hour increments. The override time shall be tracked through the DDC system.

Finned Tube Radiation

On a call for heat the control valve shall open to maintain the space temperature set point of 68 °F. (adj.) as set from the graphic workstation.

FCU 1 Computer Room

The DDC system shall monitor room unit status and alarm condition at the operator workstation.

Unit Heater & Cabinet Unit Heaters

A local space thermostat on a drop in temperature below set point shall open the heating valve. A low limit aquastat wil then allow the fan to start as long as the hot water temperature is sufficient.

Exhaust Fans

Toilet & General Exhaust Fans

The fans shall be started by the DDC system. During the occupied mode the fans shall run continuously. During the unoccupied mode the fans shall remain off.

Mechanical & Electrical Room Exhaust Fans

A line voltage space thermostat shall start the fan when the space temperature is above the temperature set point.

Boiler Room Control

The **boilers** and pumps shall be controlled and monitored by the DDC system. Boiler and pump failures shall generate an alarm at the operator workstation. The boilers shall be set up as a lead / lag system. The boilers shall alternate being the lead boiler to equalize run time.

When there is a call for the lead boiler to run, the combustion air damper shall open to its minimum position and the combustion fan **(AHU-4)** shall run on low speed. An end switch shall prove the damper is open and the boiler shall be started by the DDC system. Should the lag boiler also be called to run, the combustion air damper shall open fully and the combustion fan shall run on high speed. An end switch shall prove the damper is open fully and the lag boiler shall be started by the DDC system.

If the room differential pressure exceeds .05: WC. (adj.) the outside air dampers shall open and the **exhaust fan** shall start.

If the lead boiler fails or if the boiler hot water supply temperature is 20° F. below its set point for five minutes the lag boiler shall automatically be started to maintain set point.

. The boilers will be cycled to maintain a boiler temperature of 200° F. (adj.). The hot water supply loop to the building (all but the reheat coils and AHU 5 & 6) shall be reset by the outside air temperature through the **three way valve V-1** (6").

The hot water supply loop to the reheat coils shall be reset by the outside air temperature through the **three way valve V-2** (4").

The loop temperature for AHU 5& 6 shall be maintained by cycling **pump 8**.

Hot Water Pumps 1 & 2 shall both start when the outside air temperature is below 55° F. (adj.). They shall run continuously. If a pump fails to start within 30 seconds (adj.) then an alarm shall be generated at the operator workstation.

Glycol Hot Water Pumps 3 & 4 shall be set up as lead / lag. The lead pump shall be alternated to equalize run time. The lead pump shall start when the outside air temperature is below 55° F. (adj.). If the lead pump fails to start within 30 seconds (adj.) the lag pump shall automatically start and an alarm shall be generated at the operator workstation. The lag pump shall start whenever the outside air temperature is below 32° F.

Reheat coil pump 5 shall run whenever the outside air temperature is below 55° F.

Domestic Hot Water Pump 6 shall run when indexed to the occupied mode by the DDC system.

Pump 7 (AHU 5 & 6) shall run whenever the outside air temperature is below 55° F.

Unit	Valve Type	Application	GPM	Delta P FT WC	Delta P PSI	Valve Delta PSI	Calc CV	Valve CV	Valve Size	Valve Part #	Actuator
RTU-1	3 Way Modulating	Hot Water	47	3.38'	1.46	5	21	29	1 1/2"	Belimo B339	NF24-SR-US
RTU-3	3 Way Modulating	Hot Water	40	2.5'	1.08	5	18	19	1 1/2"	Belimo B338	NF24-SR-US
RTU-5	3 Way Modulating	Hot Water	47.4	4.14'	1.79	5	21	29	1 1/2"	Belimo B339	NF24-SR-US
RTU-6	3 Way Modulating	Hot Water	36	2.48'	1.07	5	16	19	1 1/2"	Belimo B338	NF24-SR-US
RTU-7	3 Way Modulating	Hot Water	60	5.36'	2.32	5	27	29	1 1/2"	Belimo B339	NF24-SR-US
RTU-8	3 Way Modulating	Hot Water	28.5	1.6'	0.69	5	13	19	1 1/2"	Belimo B338	NF24-SR-US
RTU-9	3 Way Modulating	Hot Water	34.2	3.44'	1.49	5	15	19	1 1/2"	Belimo B338	NF24-SR-US
RTU-11	3 Way Modulating	Hot Water	16	4.54'	1.96	5	7	10	1 1/4"	Belimo B329	NF24-SR-US
AHU-1 Preheat	3 Way Modulating	Hot Water	42.4	6.7'	2.9	5	18	19	1 1/2"	Belimo B338	NF24-SR-US
AHU-1 Reheat	3 Way Modulating	Hot Water	53.7	9.9'	4.29	5	25	29	1 1/2"	Belimo B339	NF24-SR-US
AHU-2	3 Way Modulating	Hot Water	26.86	7.1'	3.07	5	12	19	1 1/2"	Belimo B338	NF24-SR-US
AHU-3	3 Way Modulating	Hot Water	14.79	2.28'	0.98	5	6	7.4	1"	Belimo B322	NF24-SR-US
AHU-4	3 Way Modulating	Hot Water	23.5	4'	1.73	5	10	10	1 1/4"	Belimo B329	NF24-SR-US
AHU-5	3 Way Modulating	Hot Water	23.9	4.1'	1.77	5	11	19	1 1/2"	Belimo B338	NF24-SR-US
AHU-6	3 Way Modulating	Hot Water	23.9	4.1'	1.77	5	11	19	1 1/2"	Belimo B338	NF24-SR-US
VAV-A1	3 Way Modulating	Hot Water	3	10'	4.33	2	2.12	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A2	3 Way Modulating	Hot Water	1.4	2.5'	1.08	2	0.98	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A3	3 Way Modulating	Hot Water	1.5	2.8'	1.21	2	1.06	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A4	3 Way Modulating	Hot Water	1.3	1.7'	0.73	2	0.91	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A5	3 Way Modulating	Hot Water	3	10'	4.33	2	2.12	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A6	3 Way Modulating	Hot Water	3	10'	4.33	2	2.12	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A7	3 Way Modulating	Hot Water	3	10'	4.33	2	2.12	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A8	3 Way Modulating	Hot Water	3	10'	4.33	2	2.12	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A9	3 Way Modulating	Hot Water	1.4	2.5'	1.08	2	0.98	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A14	3 Way Modulating	Hot Water	1.4	2.5'	1.08	2	0.98	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A15	3 Way Modulating	Hot Water	1	1.1'	0.47	2	0.7	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-A26	3 Way Modulating	Hot Water	4.4	31.5'	13.65	2	3.11	1.9	1/2"	Belimo B312	LR24-SR-US
VAV-A27	3 Way Modulating	Hot Water	1.6	3.2'	1.57	2	1.13	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C1	3 Way Modulating	Hot Water	1	1.4'	0.6	2	0.7	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C2	3 Way Modulating	Hot Water	1.6	2.6'	1.12	2	1.13	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C3	3 Way Modulating	Hot Water	1.3	1.7'	0.73	2	0.91	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C4	3 Way Modulating	Hot Water	1.1	1.3'	0.53	2	0.77	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C5	3 Way Modulating	Hot Water	2.2	6.8'	2.94	2	1.55	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C6	3 Way Modulating	Hot Water	1	1.1'	0.47	2	0.7	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C7	3 Way Modulating	Hot Water	2.6	9.2'	3.98	2	1.83	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C8	3 Way Modulating	Hot Water	3.3	14.1'	6.11	2	2.33	1.9	1/2"	Belimo B311	LR24-SR-US
VAV-C9	3 Way Modulating	Hot Water	3.2	11.2'	4.85	2	2.26	1.9	1/2"	Belimo B311	LR24-SR-US
1-Unit Heater	3 Way Modulating	Hot Water	6.1	.24'	0.1	2	2.72	4.7	3/4"	Belimo B317	LR24-US
2-Cabinet Heaters	3 Way Modulating	Hot Water	4.9	1.55'	0.67	2	2.19	4.7	3/4"	Belimo B317	LR24-US
2- Fin Tube Rad	2 Way 2 Position	Hot Water				2		4.7	3/4"	Belimo B217	LR24-US
Reheat Reset Valve	3 Way Modulating	Hot Water	53	45'		5	23.7	230	4"	Belimo F7100	2xAF24-SR-US
Main Reset Valve	3 Way Modulating	Hot Water	370	95'		5	165	605	6"	Belimo F7150	

Johnson Controls Facilitator

Select Energy Contracting, Inc.

148 Norton Street Milldale, CT 06467

Tel: 860-378-3000 Fax: 860-378-3060

DOC. NO: East Granby High School

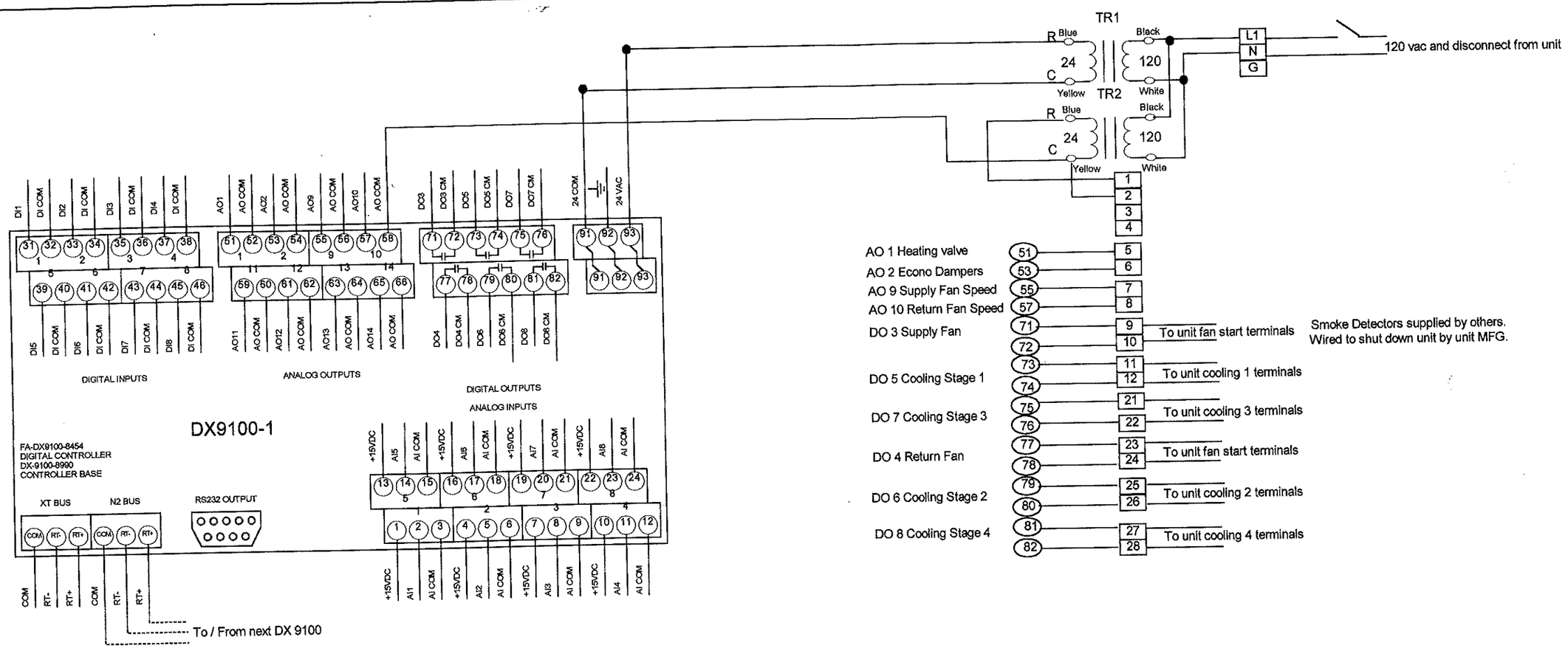
SCALE:

REV LEVEL:

Submittal

DESCRIPTION:

Control Valve Schedule



22 Control Panel Terminal

(22) DX 9100 Terminal

[(22)] XP 9100 Terminal

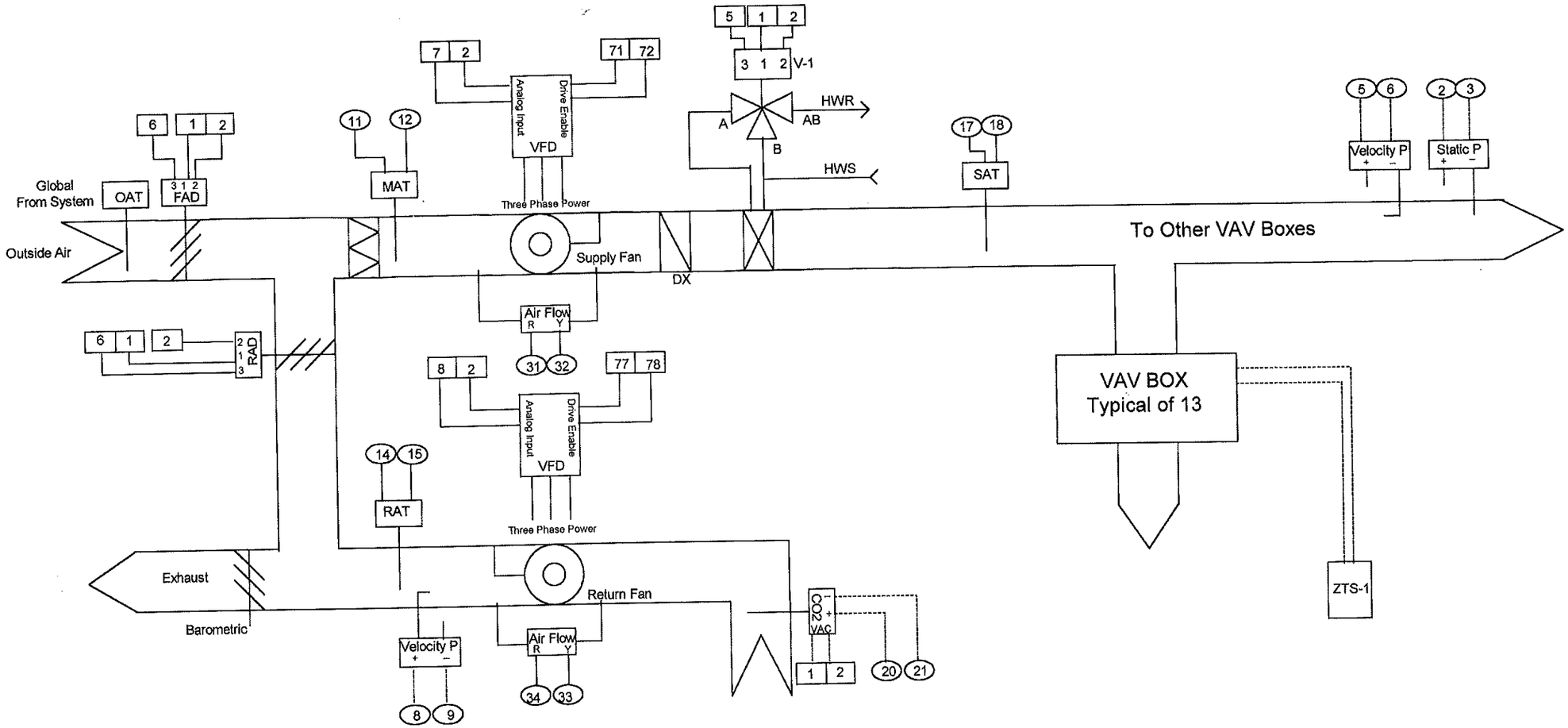
---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : RTU 1 Contol Panel	



22 Control panel Terminal

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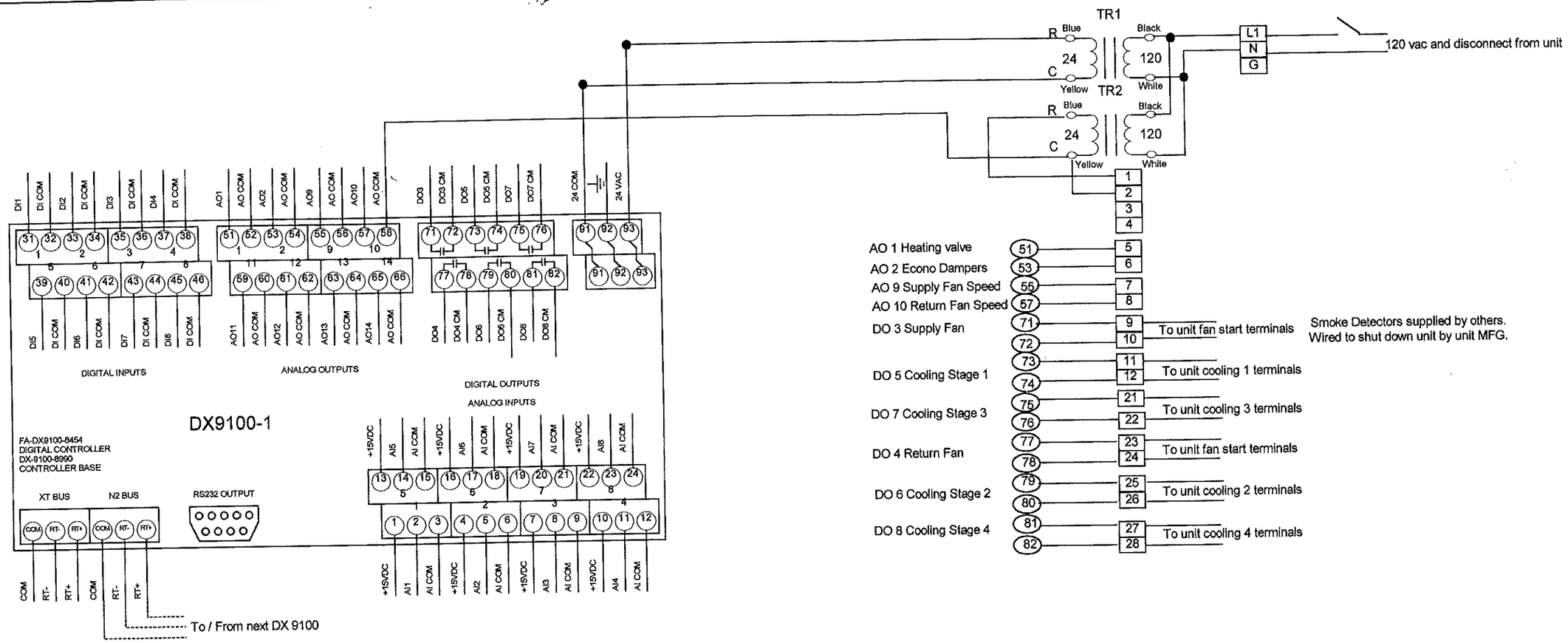
		SCALE :			
		REV LEVEL :	Submittal		

	Analog Inputs: DX9100-1			Device
1	AI1	Inches WC	Supply Static Press.	Modus T-30-005
2	AI2	Inches WC	Supply Velocity Press.	Modus T-30-005
3	AI3	Inches WC	Return Velocity Press.	Modus T-30-005
4	AI4	Deg F.	Mixed Air Temp	JC TE 6316P-1
5	AI5	Deg F.	Return Air Temp	JC TE 6311P-1
6	AI6	Deg F.	Supply Air Temp	JC TE 6316P-1
7	AI7	PPM	Return Air CO2	CD-1D
8	AI8		Unused	

	Digital Inputs:			
1	DI1	Off-On	Supply Fan Air Flow	JC P32AF-2C
2	DI2	Off-On	Return Air Flow	JC P32AF-2C
3	DI3		Unused	
4	DI4		Unused	
5	DI5		Unused	
6	DI6		Unused	
7	DI7		Unused	
8	DI8		Unused	

	Outputs: DX9100-1			Device
1	AO1	0-100 %	Heating Valve	Belmo B339/NF24-SR-US
2	AO2	0-100 %	Economizer Dampers	Belimo NF24-SR (2)
3	DO3	Off-On	Supply Fan Start	
4	DO4	Off-On	Return Fan Start	
5	DO5	Off-On	Cooling Stage 1	
6	DO6	Off-On	Cooling Stage 2	
7	DO7	Off-On	Cooling Stage 3	
8	DO8	Off-On	Cooling Stage 4	
9	AO9	0-100 %	Supply Fan Speed	
10	AO10	0-100 %	Return Fan Speed	
11	AO11		Unused	
12	AO12		Unused	
13	AO13		Unused	
14	AO14		Unused	
			TR1, TR2	AT175F1023

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESCRIPTION :	RTU-1 CONTROL POINT LIST



22 Control Panel Terminal

(22) DX 9100 Terminal

[(22)] XP 9100 Terminal

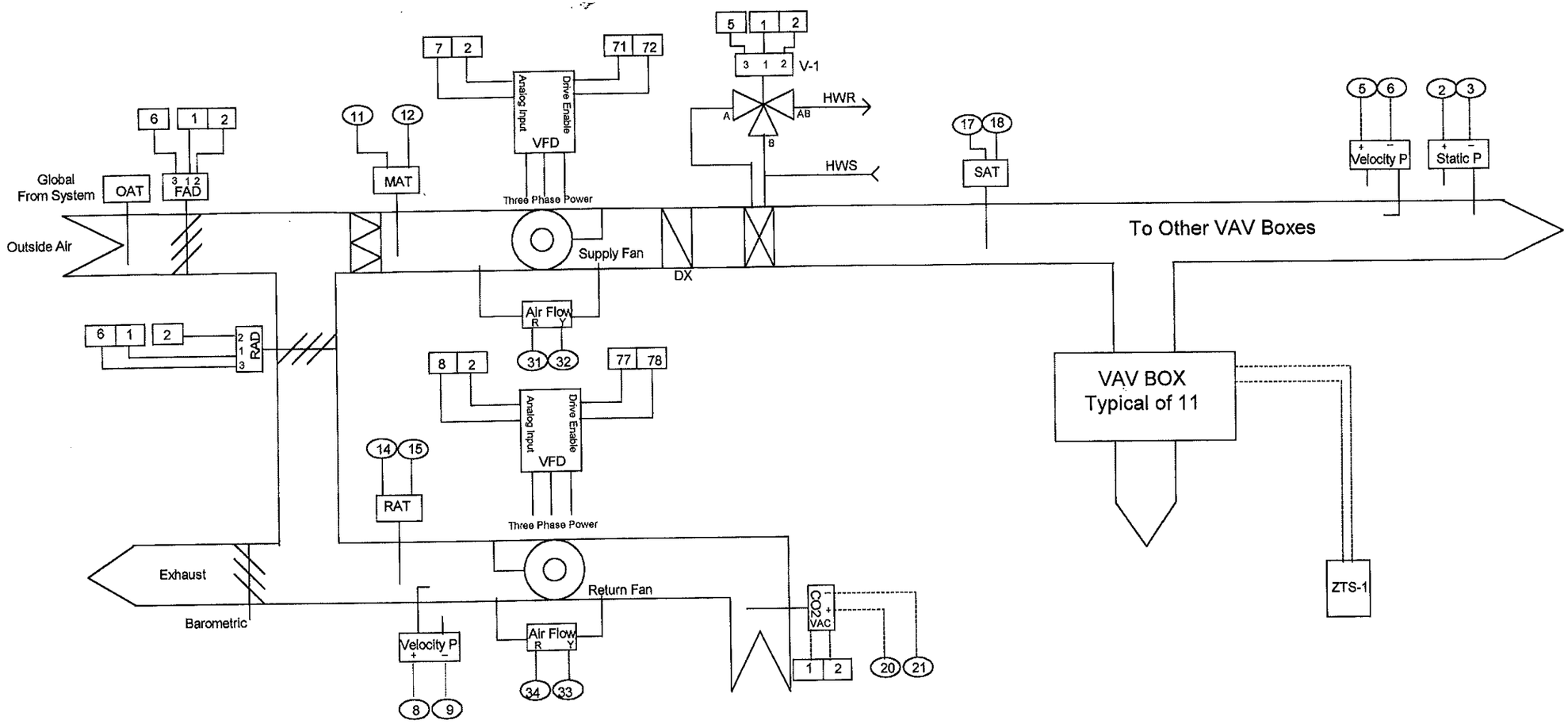
---------- Field Wiring

_____ Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : RTU 3 Contol Panel	



22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

---------- Field Wiring

———— Unit Wiring by MFG.

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Isolate and tape one end

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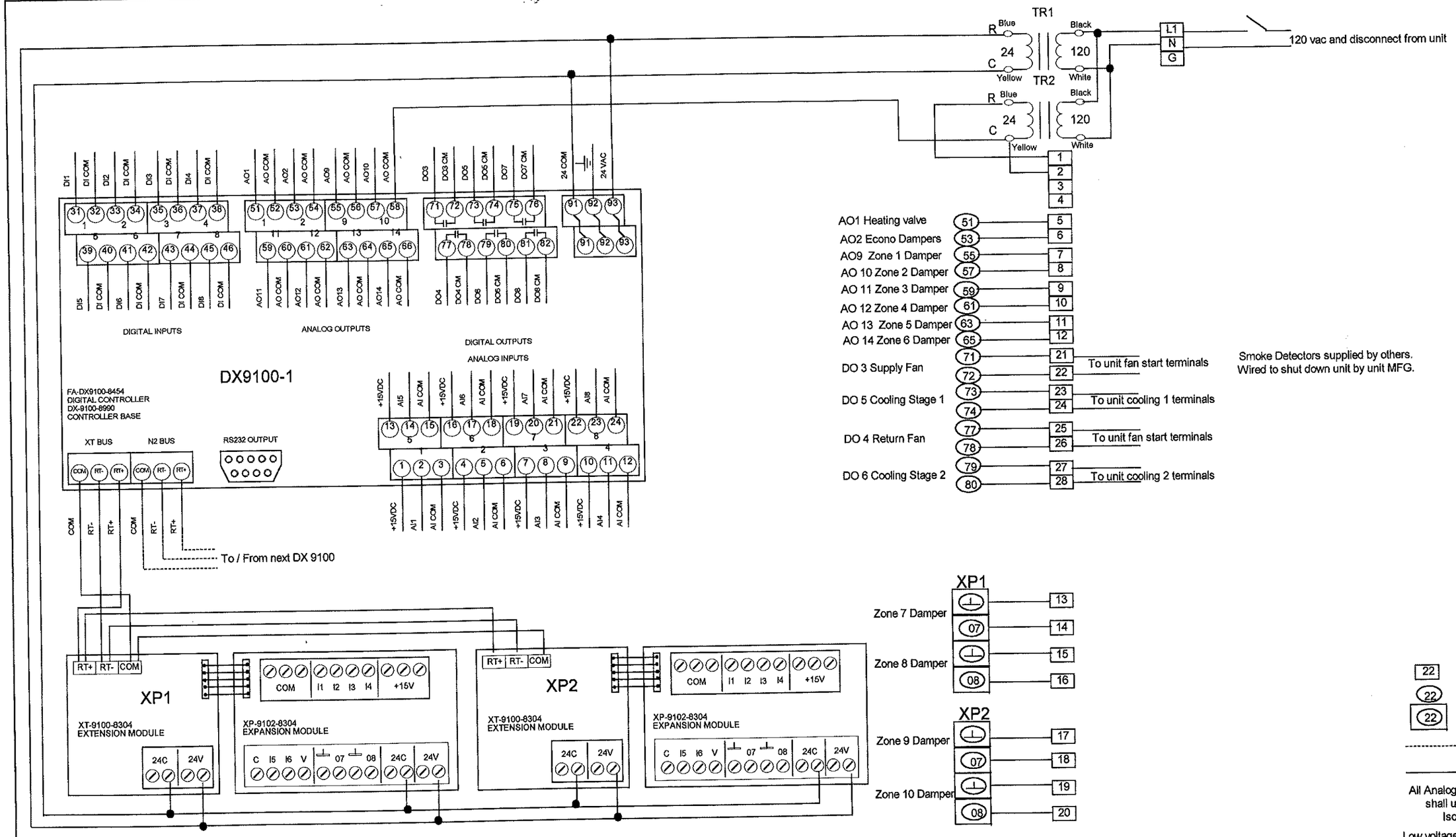
Analog Inputs: DX9100-1			Device
1 AI1	Inches WC	Supply Static Press.	Modus T30-005
2 AI2	Inches WC	Supply Velocity Press.	Modus T30-005
3 AI3	Inches WC	Return Velocity Press.	Modus T30-005
4 AI4	Deg F.	Mixed Air Temp	JC TE-6316P-1
5 AI5	Deg F.	Return Air Temp	JC TE 6311P-1
6 AI6	Deg F.	Supply Air Temp	JC TE 6316P-1
7 AI7	PPM	Return Air CO2	CD-1D
8 AI8		Unused	

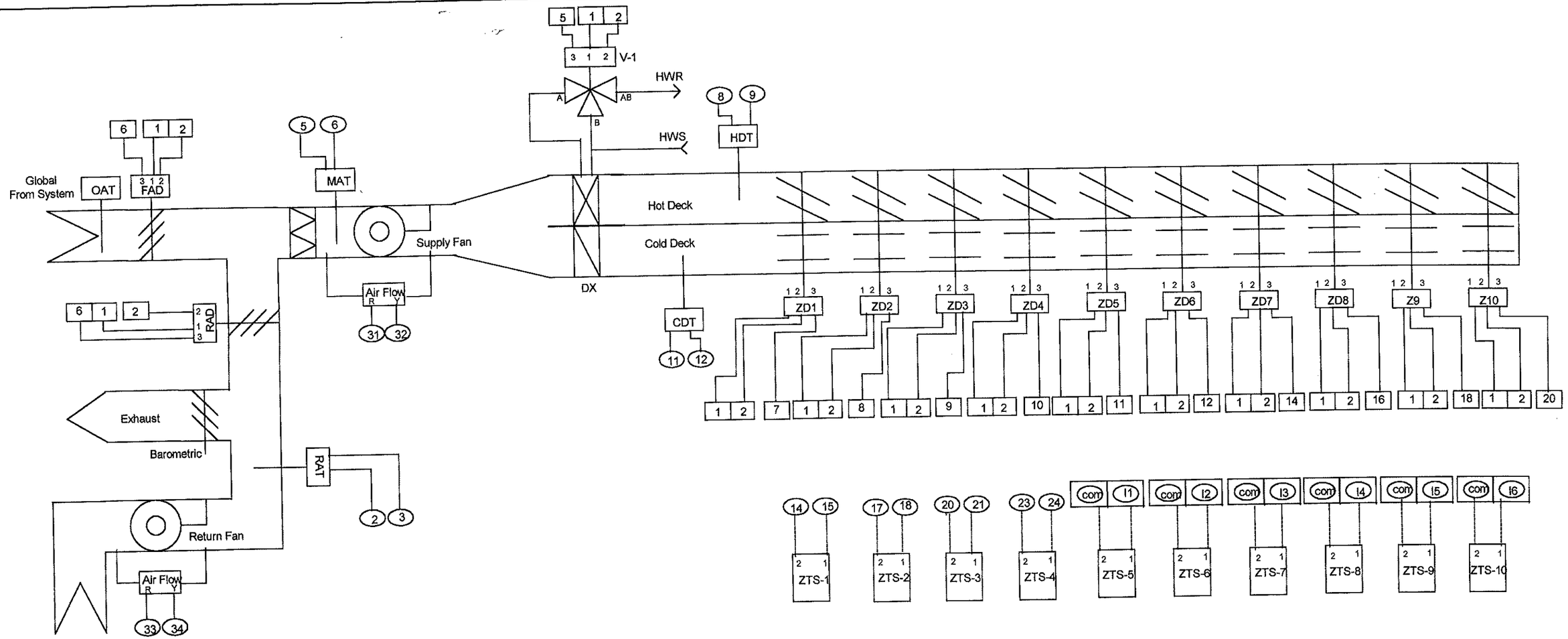
Digital Inputs			
1 DI1	Off-On	Supply Fan Air Flow	JC P32AF-2C
2 DI2	Off-On	Return Air Flow	JC P32AF-2C
3 DI3		Unused	
4 DI4		Unused	
5 DI5		Unused	
6 DI6		Unused	
7 DI7		Unused	
8 DI8		Unused	

Outputs: DX9100-1			Device
1 AO1	0-100 %	Heating Valve	Belimo B338/NF24-SR-US
2 AO2	0-100 %	Economizer Dampers	Belimo NF24-SR (2)
3 DO3	Off-On	Supply Fan Start	
4 DO4	Off-On	Return Fan Start	
5 DO5	Off-On	Cooling Stage 1	
6 DO6	Off-On	Cooling Stage 2	
7 DO7	Off-On	Cooling Stage 3	
8 DO8	Off-On	Cooling Stage 4	
9 AO9	0-100 %	Supply Fan Speed	
10 AO10	0-100 %	Return Fan Speed	
11 AO11		Unused	
12 AO12		Unused	
13 AO13		Unused	
14 AO14		Unused	
		TR1, TR2	AT175F1023

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESCRIPTION : RTU-3 CONTROL POINT LIST	



Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : RTU 5 Contol Panel	



22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESCRIPTION :	RTU 5 Unit Wiring

	Analog Inputs: DX9100-1			Device
1	AI1	Deg F.	Return Air Temp	TE-6311P-1
2	AI2	Deg F.	Mixed Air Temp	TE-6316P-1
3	AI3	Deg F.	Hot Deck Temp	TE-6311P-1
4	AI4	Deg F.	Cold Deck Temp	TE-6311P-1
5	AI5	Deg F.	Zone 1 Temp	TE-6411W-2110
6	AI6	Deg F.	Zone 2 Temp	TE-6411W-2110
7	AI7	Deg F.	Zone 3 Temp	TE-6411W-2110
8	AI8	Deg F.	Zone 4 Temp	TE-6411W-2110

	Digital Inputs			
1	DI1	Off-On	Supply Fan Air Flow	JC-P32AF-2C
2	DI2	Off-On	Return Air Flow	JC-P32AF-2C
3	DI3		Unused	
4	DI4		Unused	
5	DI5		Unused	
6	DI6		Unused	
7	DI7		Unused	
8	DI8		Unused	

	Analog Input Expansion: XP-1			Device
1	AI1	Deg F.	Zone 5 Temp	TE-6411W-2110
2	AI2	Deg F.	Zone 6 Temp	TE-6411W-2110
3	AI3	Deg F.	Zone 7 Temp	TE-6411W-2110
4	AI4	Deg F.	Zone 8 Temp	TE-6411W-2110
5	AI5	Deg F.	Zone 9 Temp	TE-6411W-2110
6	AI6	Deg F.	Zone 10 Temp	TE-6411W-2110

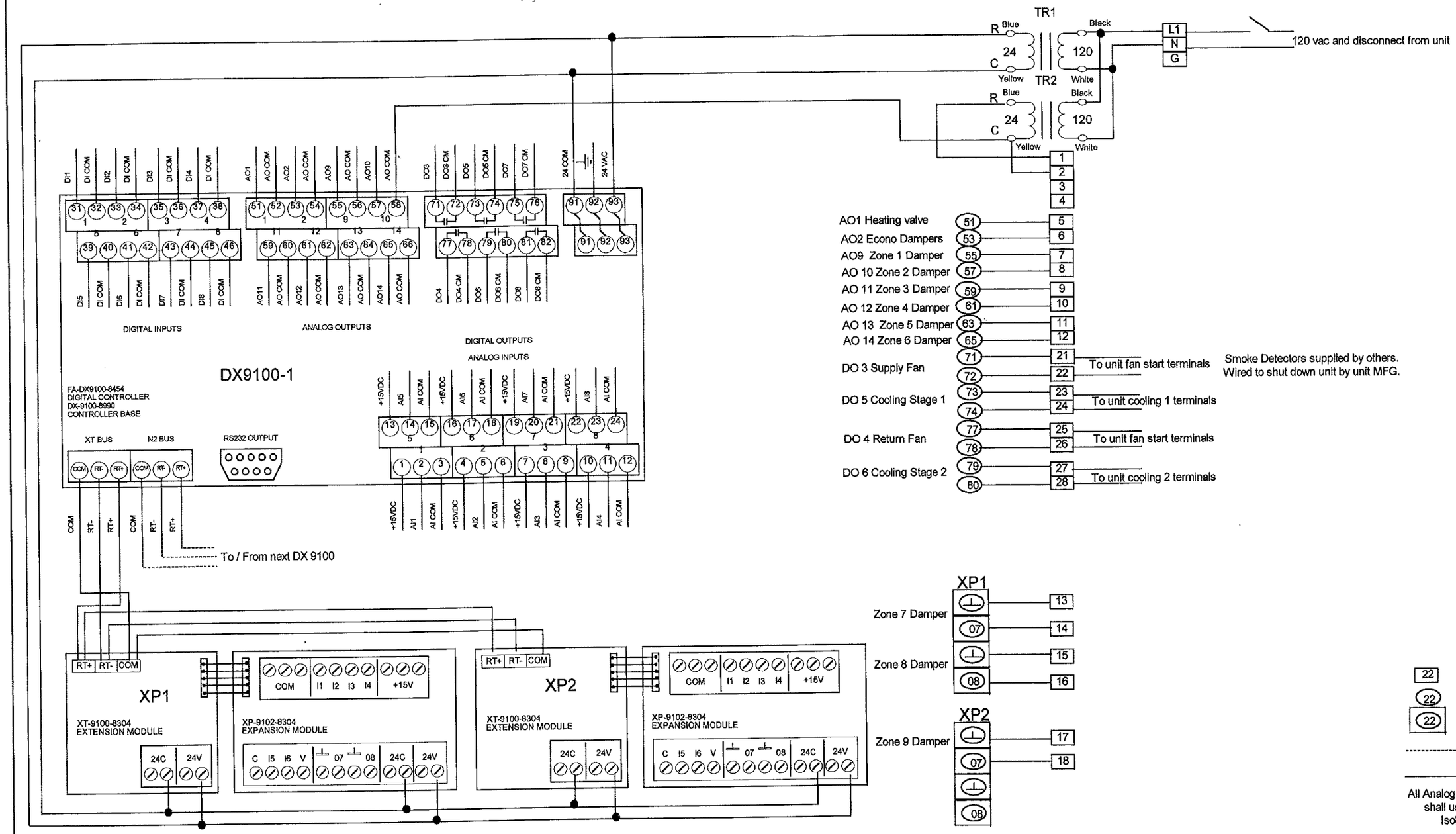
	Analog Output Expansion:			
7	AO7	0-100 %	Zone 7 Damper	Belimo LM24SR
8	AO8	0-100 %	Zone 8 Damper	Belimo LM24SR

	Analog Input Expansion: XP-2		Device
1	AI1	Unused	
2	AI2	Unused	
3	AI3	Unused	
4	AI4	Unused	
5	AI5	Unused	
6	AI6	Unused	

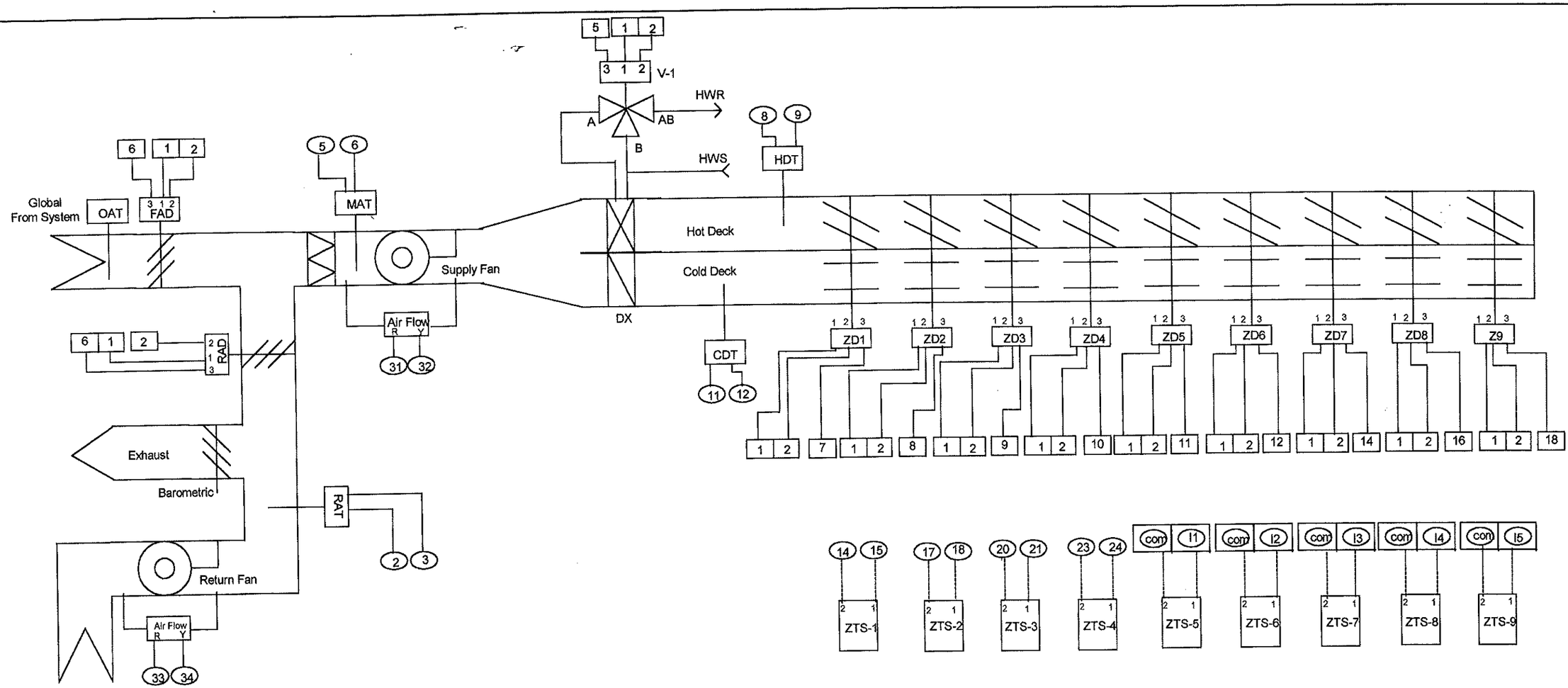
	Analog Output Expansion:			
7	AO7	0-100 %	Zone 9 Damper	Belimo LM24SR
8	AO8	0-100 %	Zone 10 Damper	Belimo LM24SR

	Outputs: DX9100-1			Device
1	AO1	0-100	Heating Valve	Belimo B339/NF24-SR-US
2	AO2	0-100	Economizer Dampers	Belimo NF24-SR-US (2)
3	DO3	Off-On	Supply Fan Start	
4	DO4	Off-On	Return Fan Start	
5	DO5	Off-On	Cooling Stage 1	
6	DO6	Off-On	Cooling Stage 2	
7	DO7		Unused	
8	DO8		Unused	
9	AO9	0-100	Zone 1 Damper	Belimo LM24-SR-US
10	AO10	0-100	Zone 2 Damper	Belimo LM24-SR-US
11	AO11	0-100	Zone 3 Damper	Belimo LM24-SR-US
12	AO12	0-100	Zone 4 Damper	Belimo LM24-SR-US
13	AO13	0-100	Zone 5 Damper	Belimo LM24-SR-US
14	AO14	0-100	Zone 6 Damper	Belimo LM24-SR-US
			TR1, TR2	AT175F1023

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal
DESCRIPTION : RTU-5 CONTROL POINT LIST			



Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : RTU 6 Contol Panel	
		SCALE :			
		REV LEVEL :	Submittal		



22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

---------- Field Wiring

———————— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : RTU 6 Unit Wiring	

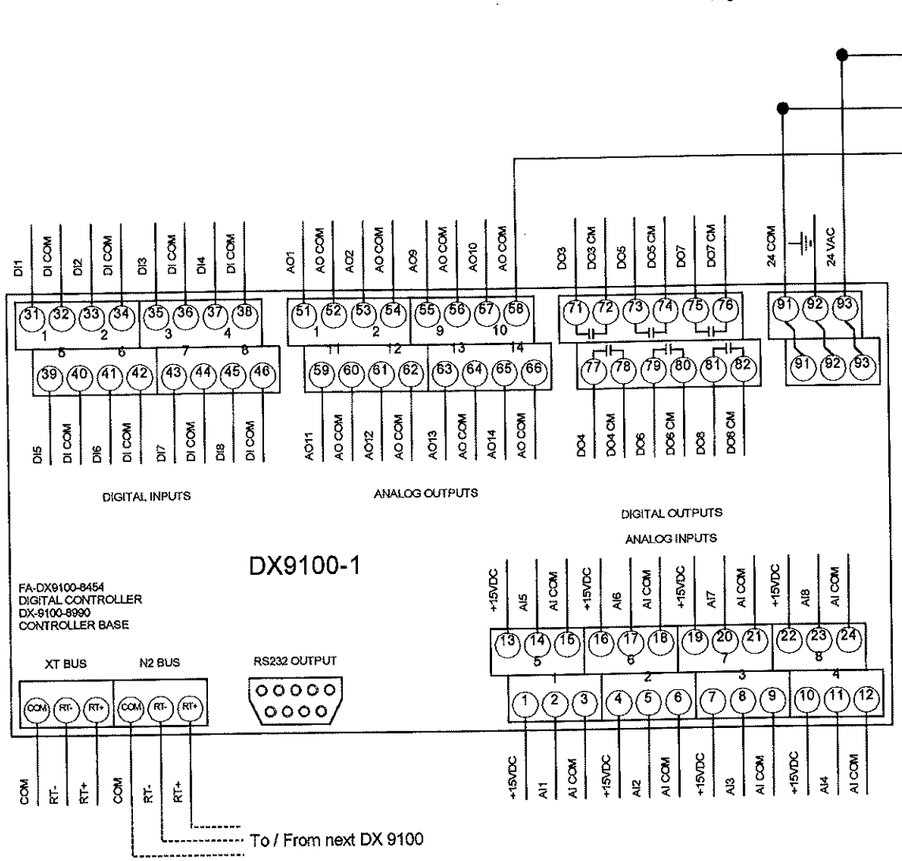
Analog Inputs: DX9100-1			Device
1 AI1	Deg F.	Return Air Temp	TE-6311-P-1
2 AI2	Deg F.	Mixed Air Temp	TE-6316-P-1
3 AI3	Deg F.	Hot Deck Temp	TE-6311-P-1
4 AI4	Deg F.	Cold Deck Temp	TE-6311-P-1
5 AI5	Deg F.	Zone 1 Temp	TE-6411W-2110
6 AI6	Deg F.	Zone 2 Temp	TE-6411W-2110
7 AI7	Deg F.	Zone 3 Temp	TE-6411W-2110
8 AI8	Deg F.	Zone 4 Temp	TE-6411W-2110
Digital Inputs			
1 DI1	Off-On	Supply Fan Air Flow	JC-P32AF-2C
2 DI2	Off-On	Return Air Flow	JC-P32AF-2C
3 DI3		Unused	
4 DI4		Unused	
5 DI5		Unused	
6 DI6		Unused	
7 DI7		Unused	
8 DI8		Unused	

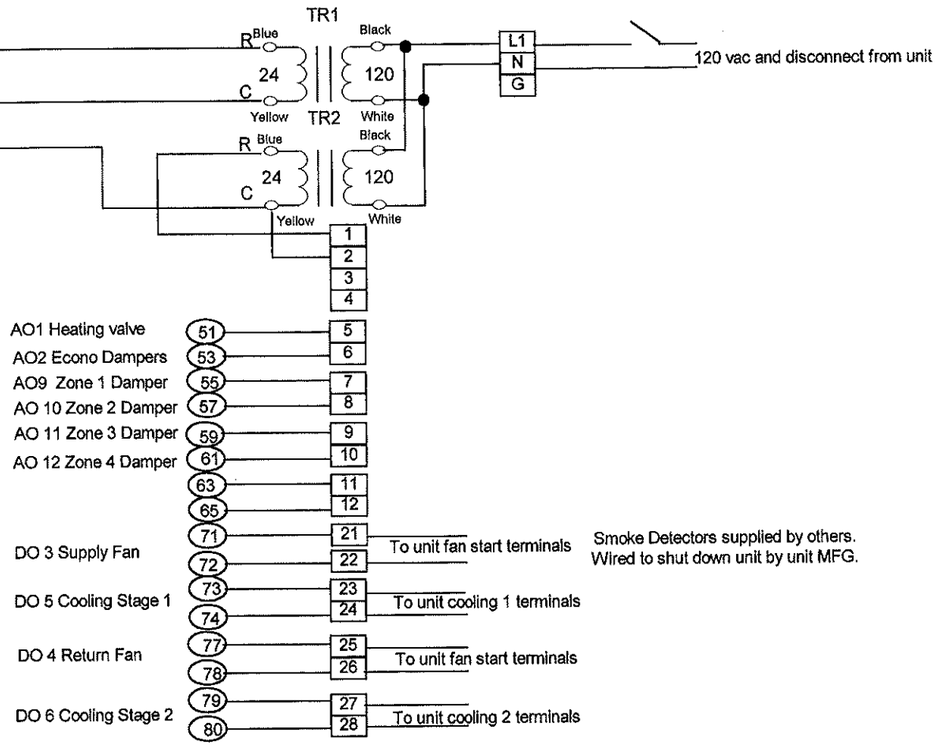
Outputs: DX9100-1			Device
1 AO1	0-100	Heating Valve	Belimo B338/NF24-SR-US
2 AO2	0-100	Economizer Dampers	Belimo NF24-SR-US (2)
3 DO3	Off-On	Supply Fan Start	
4 DO4	Off-On	Return Fan Start	
5 DO5	Off-On	Cooling Stage 1	
6 DO6	Off-On	Cooling Stage 2	
7 DO7		Unused	
8 DO8		Unused	
9 AO9	0-100	Zone 1 Damper	Belimo LM24-SR-US
10 AO10	0-100	Zone 2 Damper	Belimo LM24-SR-US
11 AO11	0-100	Zone 3 Damper	Belimo LM24-SR-US
12 AO12	0-100	Zone 4 Damper	Belimo LM24-SR-US
13 AO13	0-100	Zone 5 Damper	Belimo LM24-SR-US
14 AO14	0-100	Zone 6 Damper	Belimo LM24-SR-US
		TR1, TR2	AT175F1023

Analog Input Expansion: XP-1			Device
1 AI1	Deg F.	Zone 5 Temp	TE-6411W-2110
2 AI2	Deg F.	Zone 6 Temp	TE-6411W-2110
3 AI3	Deg F.	Zone 7 Temp	TE-6411W-2110
4 AI4	Deg F.	Zone 8 Temp	TE-6411W-2110
5 AI5	Deg F.	Zone 9 Temp	TE-6411W-2110
6 AI6		Unused	
Analog Output Expansion:			
7 AO7	0-100 %	Zone 7 Damper	Belimo LM24-SR-US
8 AO8	0-100 %	Zone 8 Damper	Belimo LM24-SR-US

Analog Input Expansion: XP-2			Device
1 AI1		Unused	
2 AI2		Unused	
3 AI3		Unused	
4 AI4		Unused	
5 AI5		Unused	
6 AI6		Unused	
Analog Output Expansion:			
7 AO7	0-100 %	Zone 9 Damper	Belimo LM24-SR-US
8 AO8		Unused	

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESCRIPTION : RTU-6 CONTROL POINT LIST





22 Control Panel Terminal

(22) DX 9100 Terminal

(22) XP 9100 Terminal

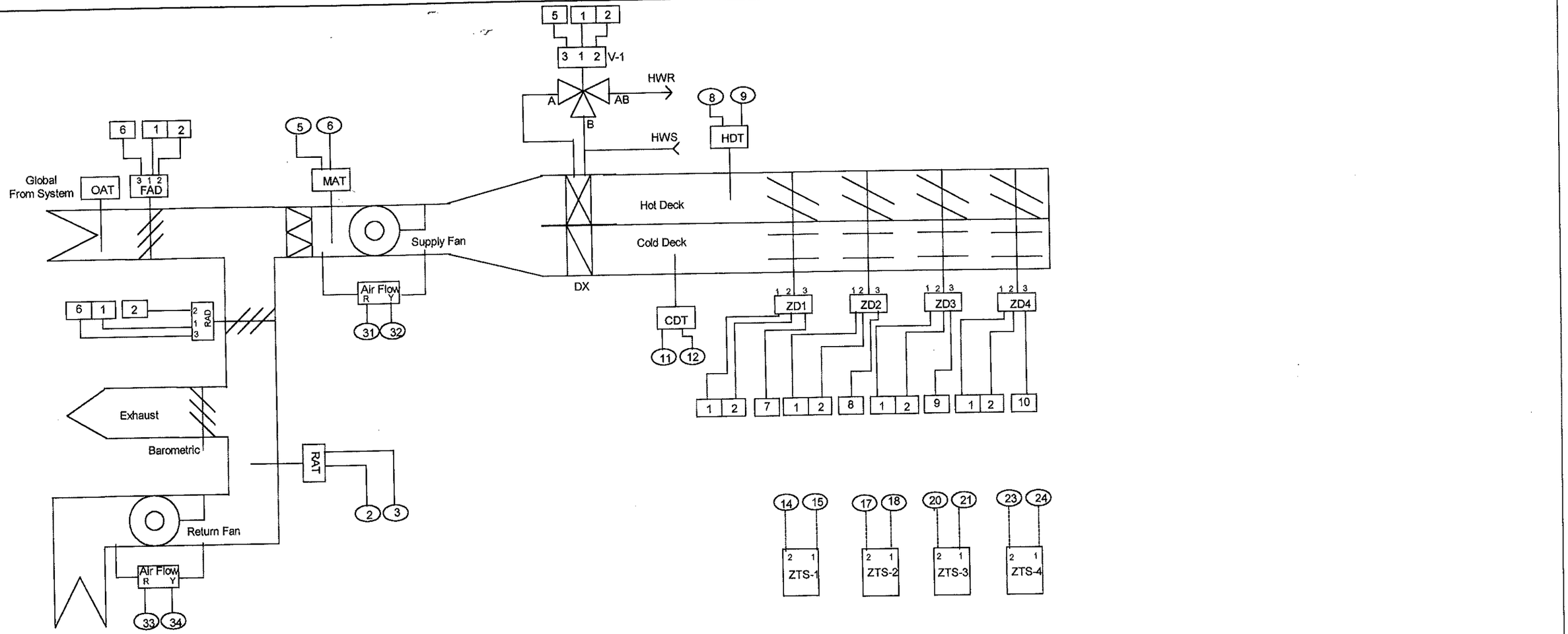
---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060 MADE IN USA	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : RTU 7 Contol Panel	



22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : RTU 7 Unit Wiring	
		SCALE :			
		REV LEVEL :	Submittal		

Analog Inputs: DX9100-1			Device
1 AI1	Deg F.	Return Air Temp	TE-6311P-1
2 AI2	Deg F.	Mixed Air Temp	TE-6316P-1
3 AI3	Deg F.	Hot Deck Temp	TE-6311P-1
4 AI4	Deg F.	Cold Deck Temp	TE-6311P-1
5 AI5	Deg F.	Zone 1 Temp	TE-6411W-2110
6 AI6	Deg F.	Zone 2 Temp	TE-6411W-2110
7 AI7	Deg F.	Zone 3 Temp	TE-6411W-2110
8 AI8	Deg F.	Zone 4 Temp	TE-6411W-2110

Digital Inputs			
1 DI1	Off-On	Supply Fan Air Flow	JC-P32AF-2C
2 DI2	Off-On	Return Air Flow	JC-P32AF-2C
3 DI3		Unused	
4 DI4		Unused	
5 DI5		Unused	
6 DI6		Unused	
7 DI7		Unused	
8 DI8		Unused	

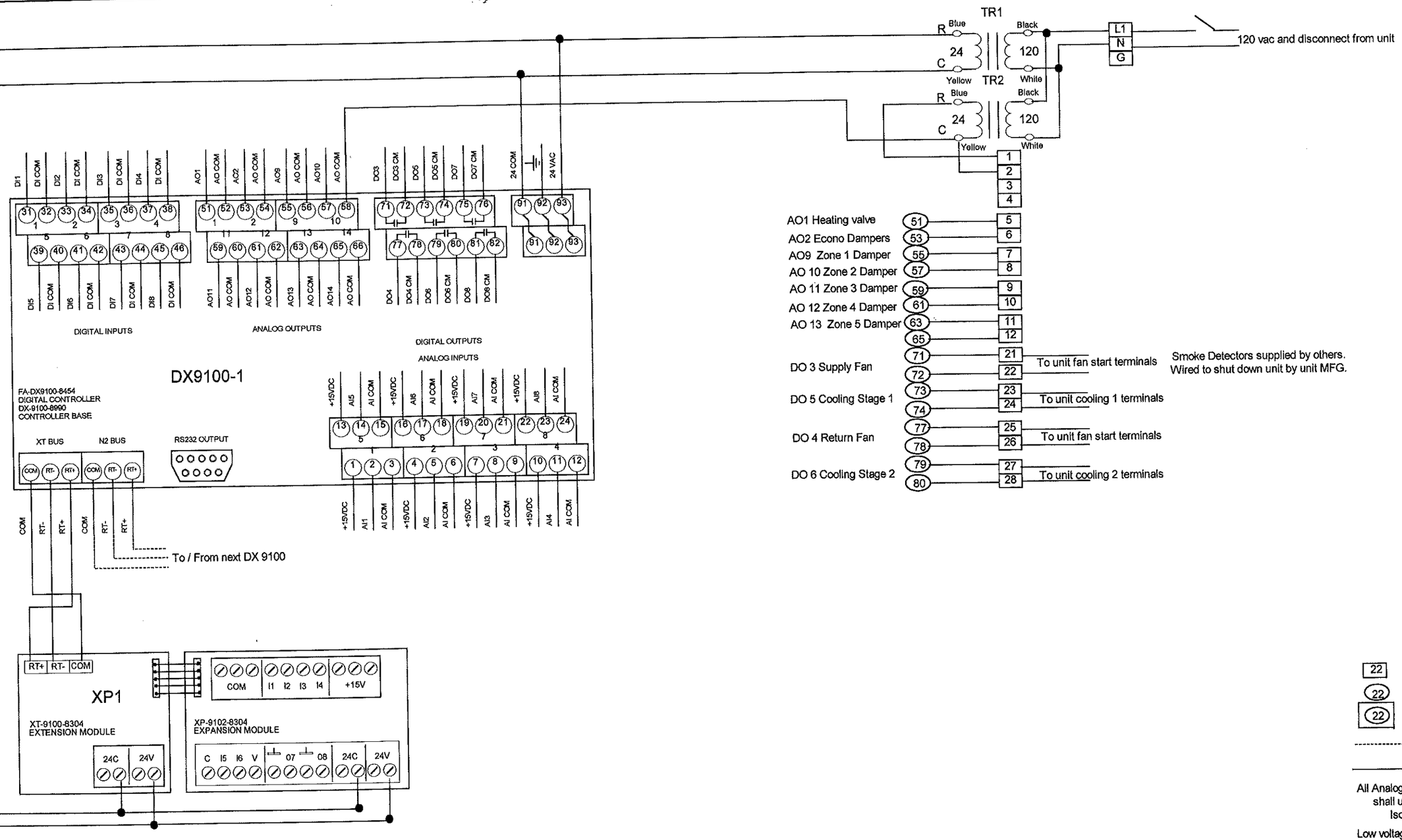
Outputs: DX9100-1			Device
1 AO1	0-100	Heating Valve	Belimo B339/NF24-SR-US
2 AO2	0-100	Economizer Dampers	Belimo NF24-SR-US (2)
3 DO3	Off-On	Supply Fan Start	
4 DO4	Off-On	Return Fan Start	
5 DO5	Off-On	Cooling Stage 1	
6 DO6	Off-On	Cooling Stage 2	
7 DO7			
8 DO8			
9 AO9	0-100	Zone 1 Damper	Belimo LM24-SR-US
10 AO10	0-100	Zone 2 Damper	Belimo LM24-SR-US
11 AO11	0-100	Zone 3 Damper	Belimo LM24-SR-US
12 AO12	0-100	Zone 4 Damper	Belimo NM24-SR-US
13 AO13		Unused	
14 AO14		Unused	
		TR1, TR2	AT175F1023

Johnson Controls Facilitator

Select Energy Contracting, Inc.
148 Norton Street Milldale, CT 06467
Tel: 860-378-3000 Fax: 860-378-3060

DOC. NO: East Granby High School
SCALE:
REV LEVEL: Submittal

DESCRIPTION: RTU-7 CONTROL POINT LIST



22 Control Panel Terminal

(22) DX 9100 Terminal

[(22)] XP 9100 Terminal

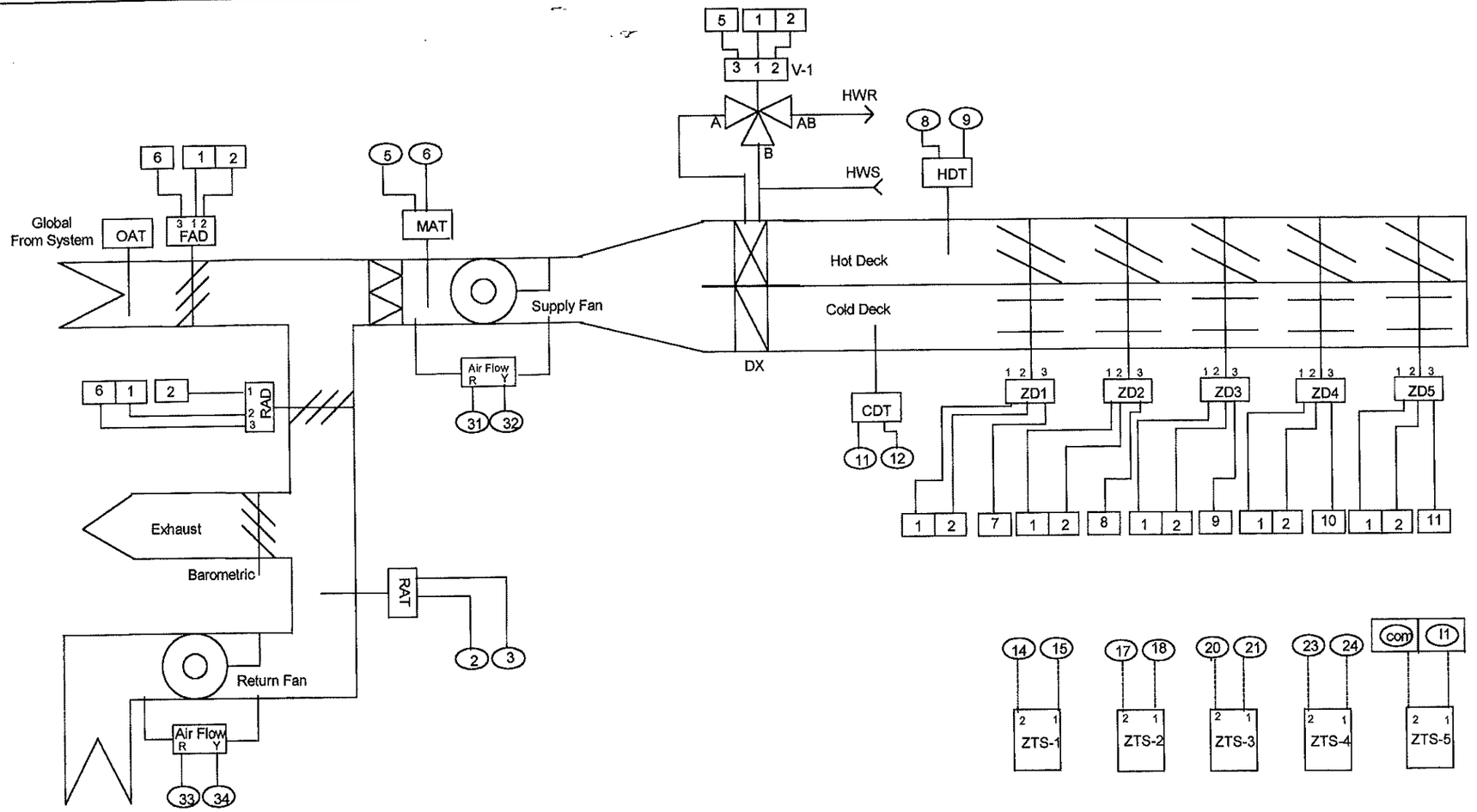
---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : RTU 8 Contol Panel	
		SCALE :			
		REV LEVEL :	Submittal		



22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

Field Wiring

Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESCRIPTION :	RTU 8 Unit Wiring

Analog Inputs:DX9100-1			Device
1 AI1	Deg F.	Return Air Temp	TE-6311P-1
2 AI2	Deg F.	Mixed Air Temp	TE-6316P-1
3 AI3	Deg F.	Hot Deck Temp	TE-6311P-1
4 AI4	Deg F.	Cold Deck Temp	TE-6311P-1
5 AI5	Deg F.	Zone 1 Temp	TE-6411W-2110
6 AI6	Deg F.	Zone 2 Temp	TE-6411W-2110
7 AI7	Deg F.	Zone 3 Temp	TE-6411W-2110
8 AI8	Deg F.	Zone 4 Temp	TE-6411W-2110

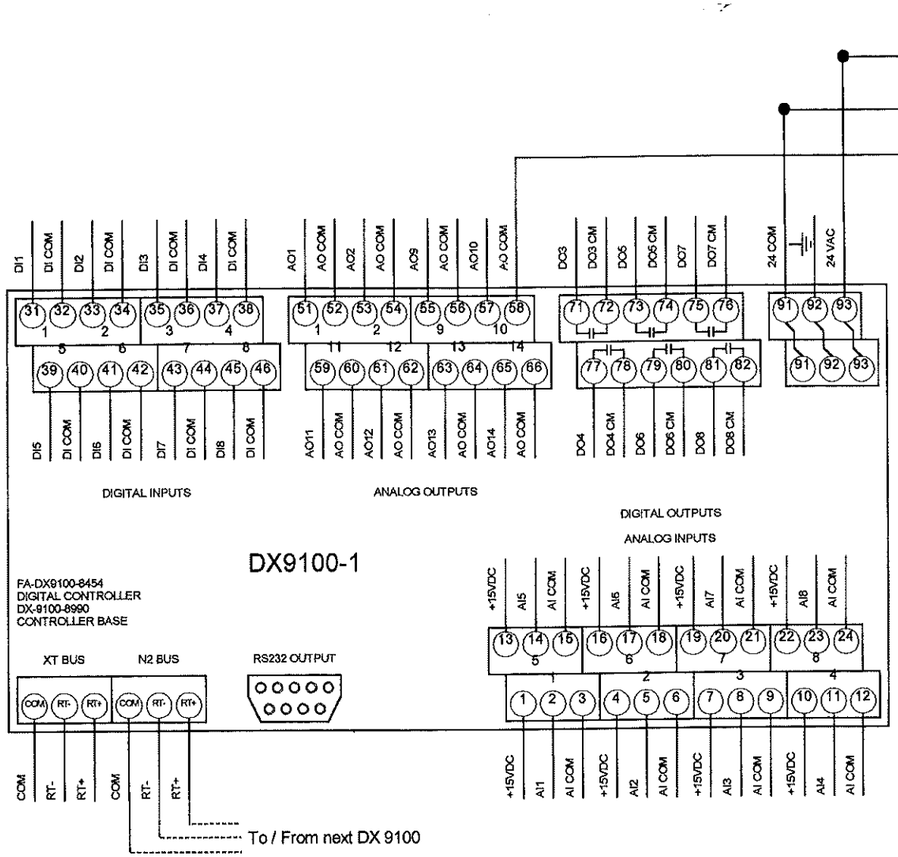
Digital Inputs			
1 DI1	Off-On	Supply Fan Air Flow	JC-P32AF-2C
2 DI2	Off-On	Return Air Flow	JC-P32AF-2C
3 DI3		Unused	
4 DI4		Unused	
5 DI5		Unused	
6 DI6		Unused	
7 DI7		Unused	
8 DI8		Unused	

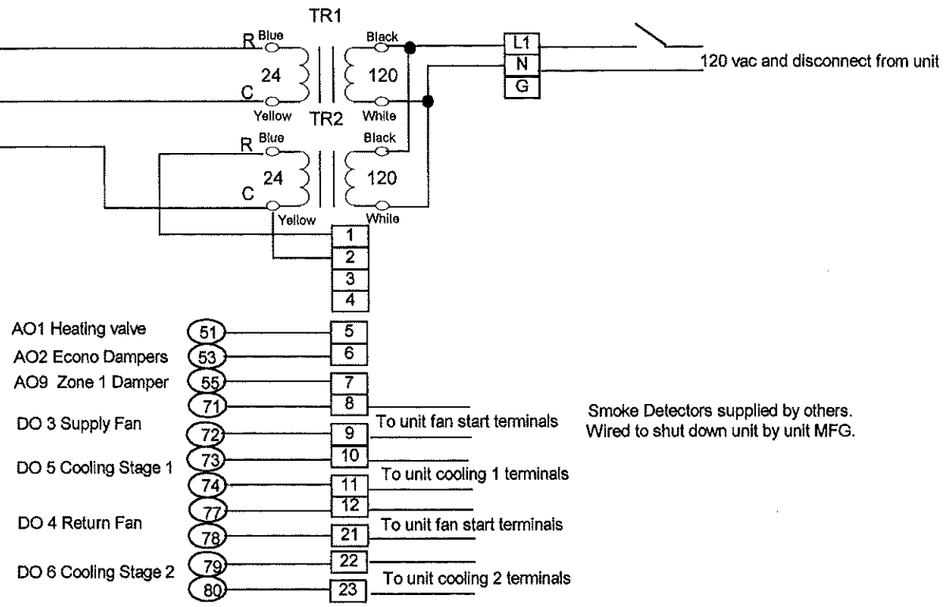
Outputs: DX9100-1			Device
1 AO1	0-100	Heating Valve	Belimo B338/NF24-SR-US
2 AO2	0-100	Economizer Dampers	Belimo NF24-SR-US (2)
3 DO3	Off-On	Supply Fan Start	
4 DO4	Off-On	Return Fan Start	
5 DO5	Off-On	Cooling Stage 1	
6 DO6	Off-On	Cooling Stage 2	
7 DO7			
8 DO8			
9 AO9	0-100	Zone 1 Damper	Belimo NM24-SR-US
10 AO10	0-100	Zone 2 Damper	Belimo LM24-SR-US
11 AO11	0-100	Zone 3 Damper	Belimo LM24-SR-US
12 AO12	0-100	Zone 4 Damper	Belimo LM24-SR-US
13 AO13	0-100	Zone 5 Damper	Belimo LM24-SR-US
14 AO14		Unused	
		TR1, TR2	AT175F1023

Analog Input Expansion: XP-1			Device
1 AI1	Deg F.	Zone 5 Temp	TE-6411W-2110
2 AI2		Unused	
3 AI3		Unused	
4 AI4		Unused	
5 AI5		Unused	
6 AI6		Unused	

Analog Output Expansion:		
7 AO7		Unused
8 AO8		Unused

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESORIPTION :	RTU-8 CONTROL POINT LIST





22 Control Panel Terminal

(22) DX 9100 Terminal

[(22)] XP 9100 Terminal

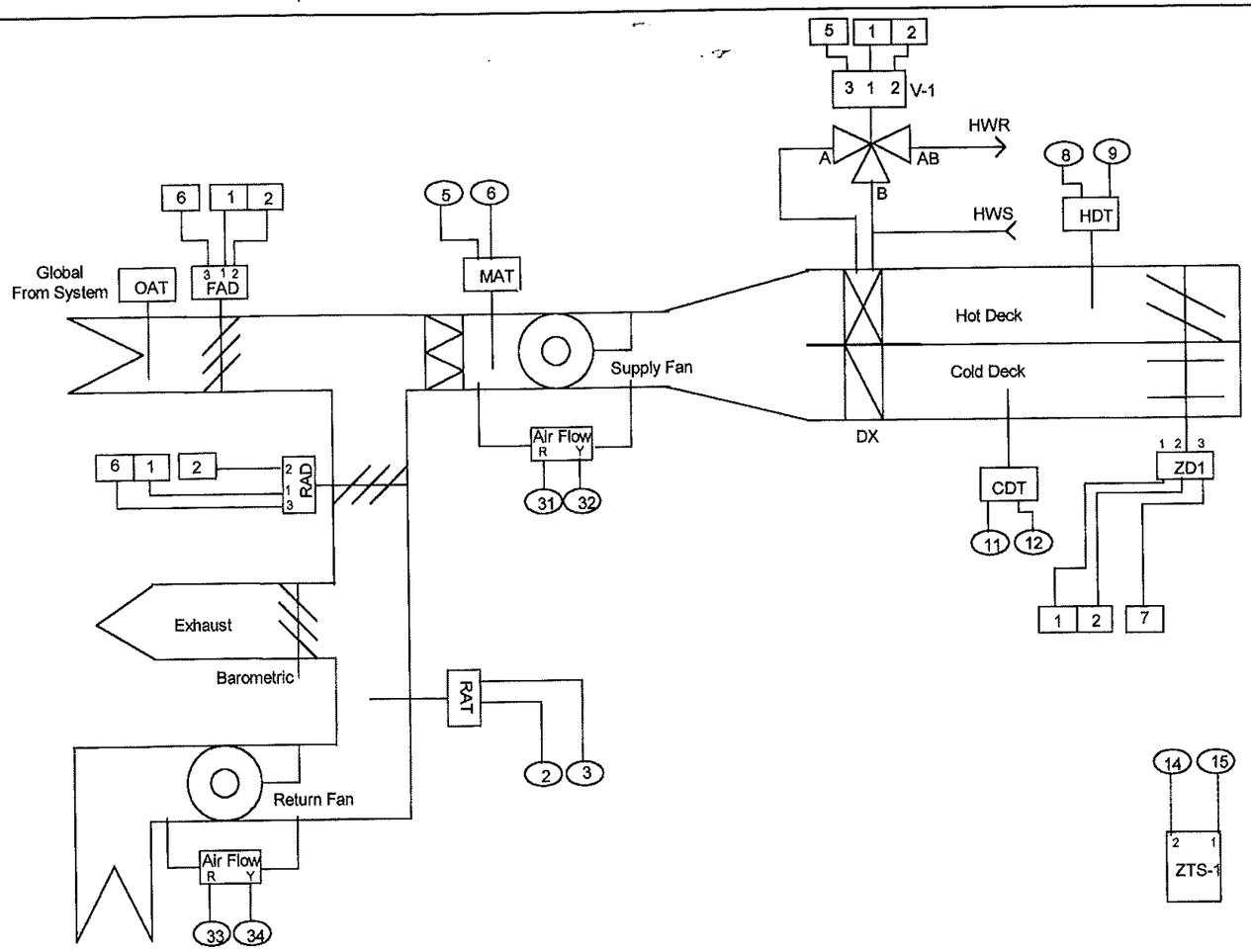
---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : RTU 9 Contol Panel	



22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : RTU 9 Unit Wiring	
		SCALE :			
		REV LEVEL :	Submittal		

Analog Inputs: DX9100-1			Device
1 AI1	Deg F.	Return Air Temp	TE-6311P-1
2 AI2	Deg F.	Mixed Air Temp	TE-6316P-1
3 AI3	Deg F.	Hot Deck Temp	TE-6311P-1
4 AI4	Deg F.	Cold Deck Temp	TE-6311P-1
5 AI5	Deg F.	Zone 1 Temp	TE-6411W-2110
6 AI6		Unused	
7 AI7		Unused	
8 AI8		Unused	

Digital Inputs			
1 DI1	Off-On	Supply Fan Air Flow	JC -P32AF-2C
2 DI2	Off-On	Return Air Flow	JC -P32AF-2C
3 DI3		Unused	
4 DI4		Unused	
5 DI5		Unused	
6 DI6		Unused	
7 DI7		Unused	
8 DI8		Unused	

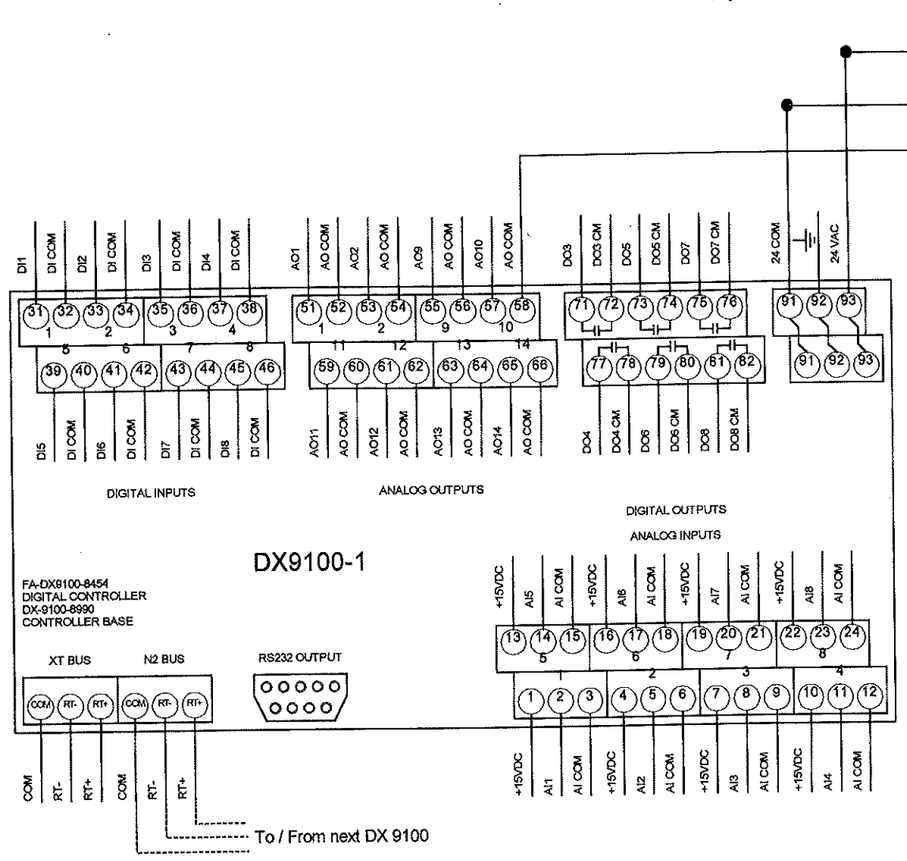
Outputs: DX9100-1			Device
1 AO1	0-100	Heating Valve	Belimo B338/NF24-SR-US
2 AO2	0-100	Economizer Dampers	Belimo NF24-SR-US (2)
3 DO3	Off-On	Supply Fan Start	
4 DO4	Off-On	Return Fan Start	
5 DO5	Off-On	Cooling Stage 1	
6 DO6	Off-On	Cooling Stage 2	
7 DO7		Unused	
8 DO8		Unused	
9 AO9	0-100	Zone 1 Damper	Belimo NM24-SR-US
10 AO10		Unused	
11 AO11		Unused	
12 AO12		Unused	
13 AO13		Unused	
14 AO14		Unused	
		TR1, TR2	AT175F1023

Johnson Controls Facilitator

Select Energy Contracting, Inc.
148 Norton Street Milldale, CT 06467
Tel: 860-378-3000 Fax: 860-378-3060

DOC. NO: East Granby High School
SCALE:
REV LEVEL: Submittal

DESCRIPTION: RTU-9 CONTROL POINT LIST



22 Control Panel Terminal

(22) DX 9100 Terminal

[(22)] XP 9100 Terminal

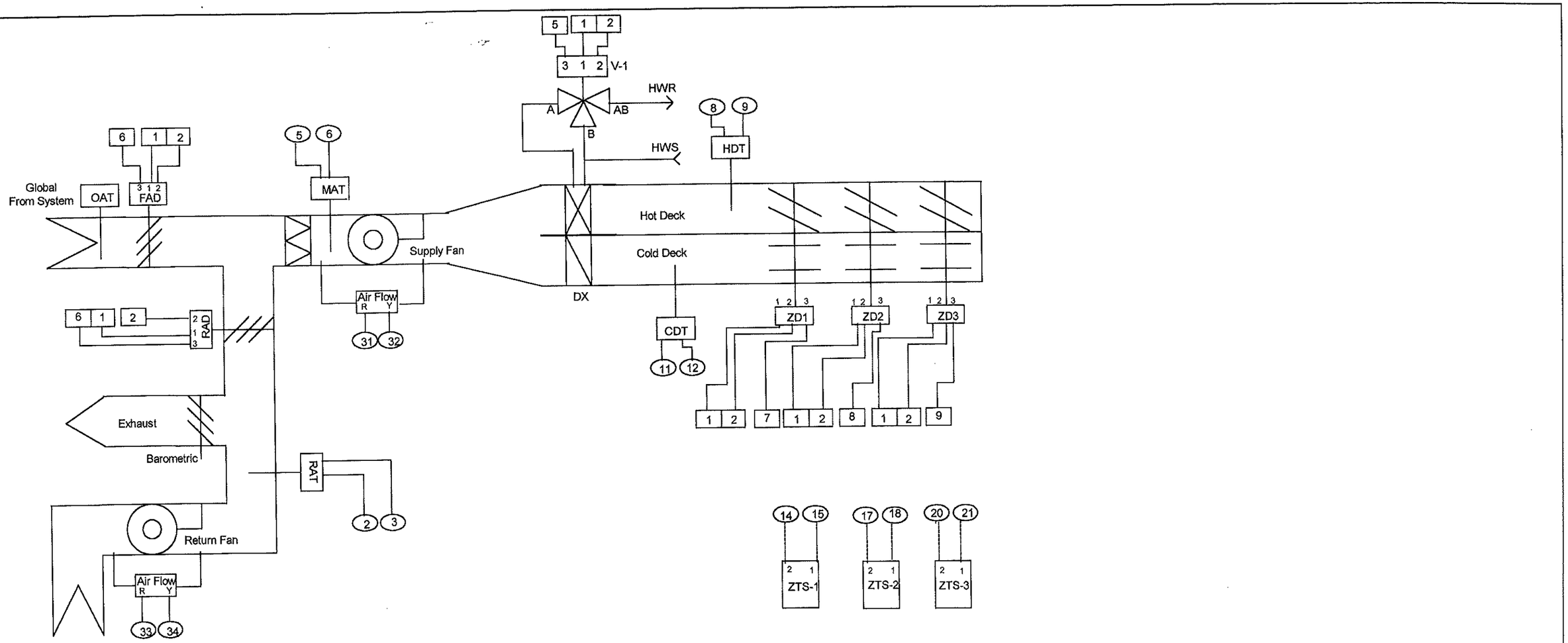
---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : RTU 11 Contol Panel	
		SCALE :			
		REV LEVEL :	Submittal		



22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls
Facilitator

Select Energy Contracting, Inc.
148 Norton Street Milldale, CT 06467
Tel: 860-378-3000 Fax: 860-378-3060

DOC. NO East Granby High School

SCALE :

REV LEVEL : Submittal

DESCRIPTION : RTU 11 Unit Wiring

Analog Inputs: DX9100-1			Device
1 AI1	Deg F.	Return Air Temp	TE-6311P-1
2 AI2	Deg F.	Mixed Air Temp	TE-6316P-1
3 AI3	Deg F.	Hot Deck Temp	TE-6311P-1
4 AI4	Deg F.	Cold Deck Temp	TE-6311P-1
5 AI5	Deg F.	Zone 1 Temp	TE-6411W-2110
6 AI6	Deg F.	Zone 2 Temp	TE-6411W-2110
7 AI7	Deg F.	Zone 3 Temp	TE-6411W-2110
8 AI8		Unused	

Digital Inputs			
1 DI1	Off-On	Supply Fan Air Flow	JC-P32AF-2C
2 DI2	Off-On	Return Air Flow	JC-P32AF-2C
3 DI3		Unused	
4 DI4		Unused	
5 DI5		Unused	
6 DI6		Unused	
7 DI7		Unused	
8 DI8		Unused	

Outputs: DX9100-1			Device
1 AO1	0-100	Heating Valve	Belimo B329/NF24-SR-US
2 AO2	0-100	Economizer Dampers	Belimo NF24-SR-US (2)
3 DO3	Off-On	Supply Fan Start	
4 DO4	Off-On	Return Fan Start	
5 DO5	Off-On	Cooling Stage 1	
6 DO6	Off-On	Cooling Stage 2	
7 DO7		Unused	
8 DO8		Unused	
9 AO9	0-100	Zone 1 Damper	Belimo LM24-SR-US
10 AO10	0-100	Zone 2 Damper	Belimo LM24-SR-US
11 AO11	0-100	Zone 3 Damper	Belimo LM24-SR-US
12 AO12		Unused	
13 AO13		Unused	
14 AO14		Unused	
		TR1, TR2	AT175F1023

Johnson Controls Facilitator

Select Energy Contracting, Inc.

148 Norton Street Milldale, CT 06467

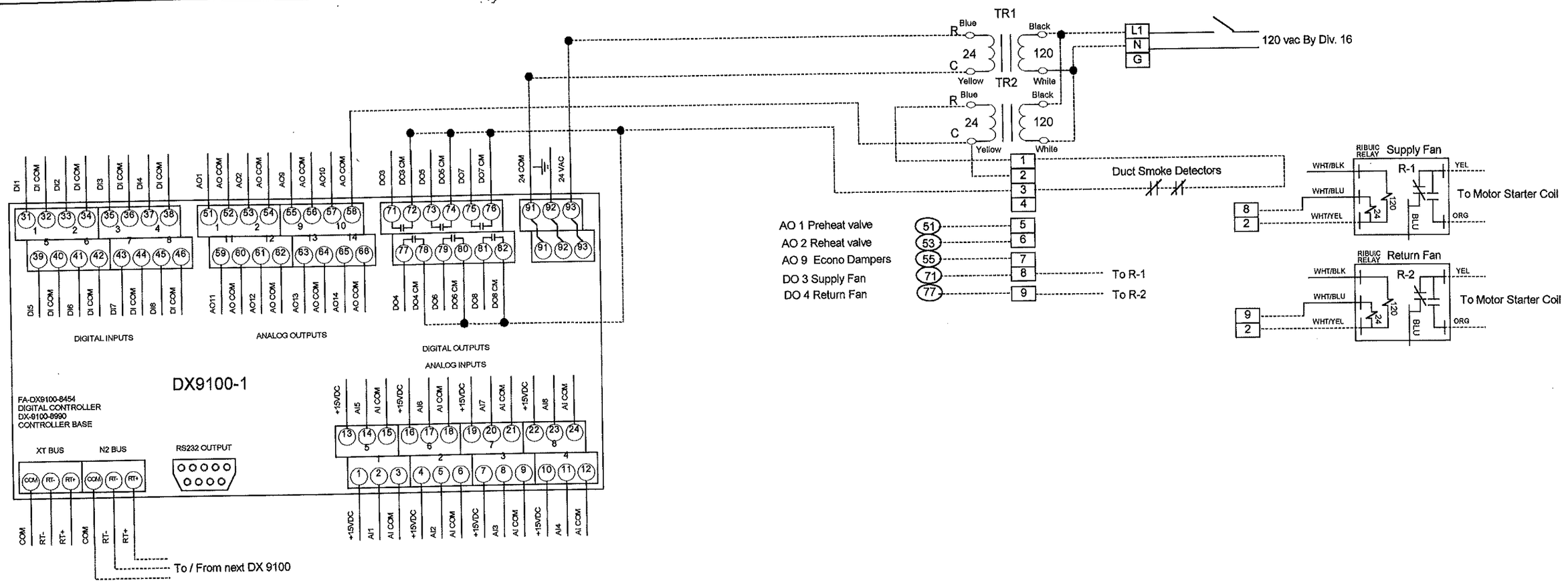
Tel: 860-378-3000 Fax: 860-378-3060

DOC. NO: East Granby High School

SCALE:

REV LEVEL: Submittal

DESCRIPTION: RTU-11 CONTROL POINT LIST



Control Panel Terminal

DX 9100 Terminal

XP 9100 Terminal

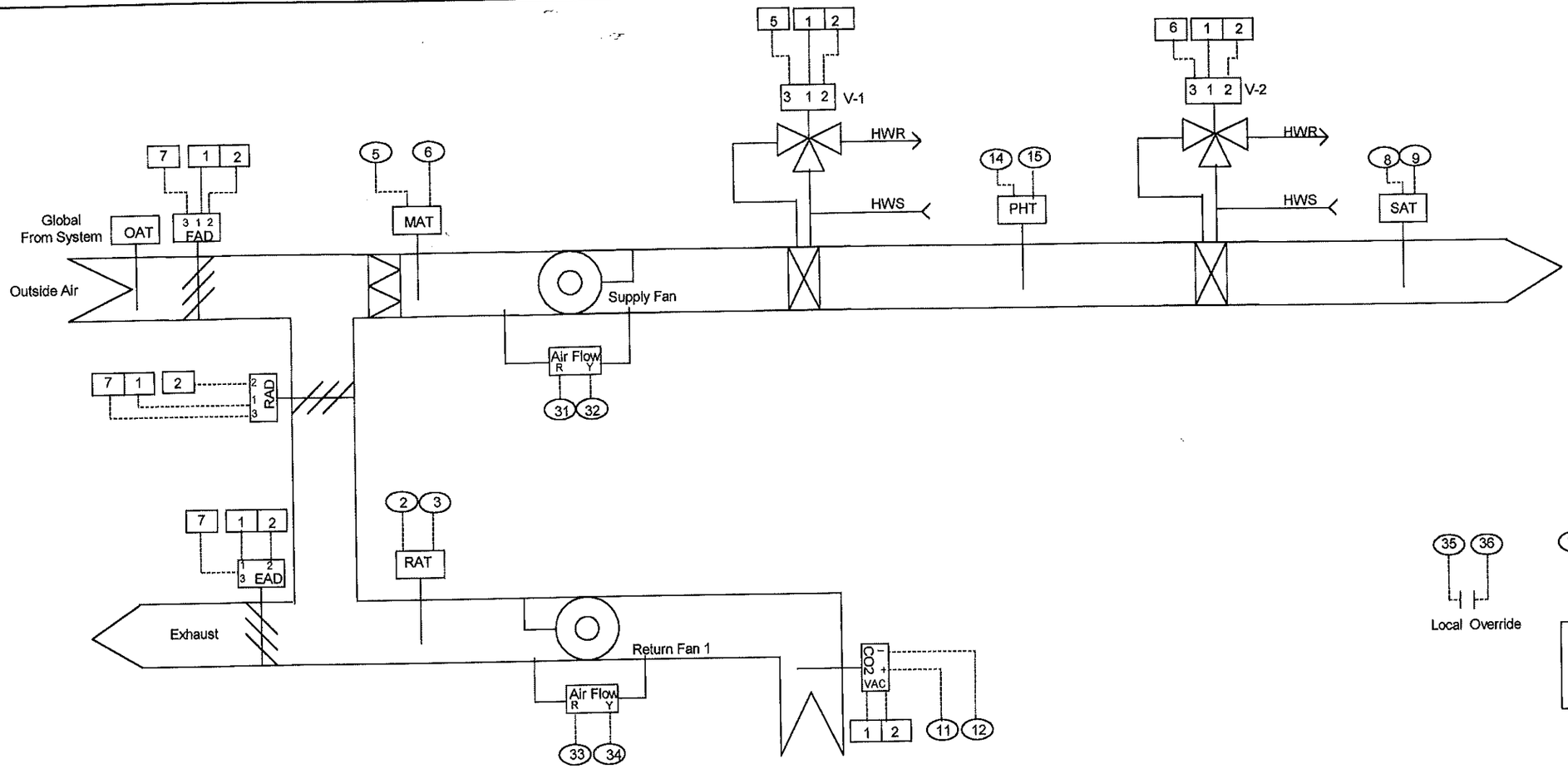
Field Wiring

Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : AHU-1 Contol Panel	



22 Control panel Terminal

(22) DX 9100 Terminal

(22) XP 9100 Terminal

---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : AHU-1 Unit Wiring	

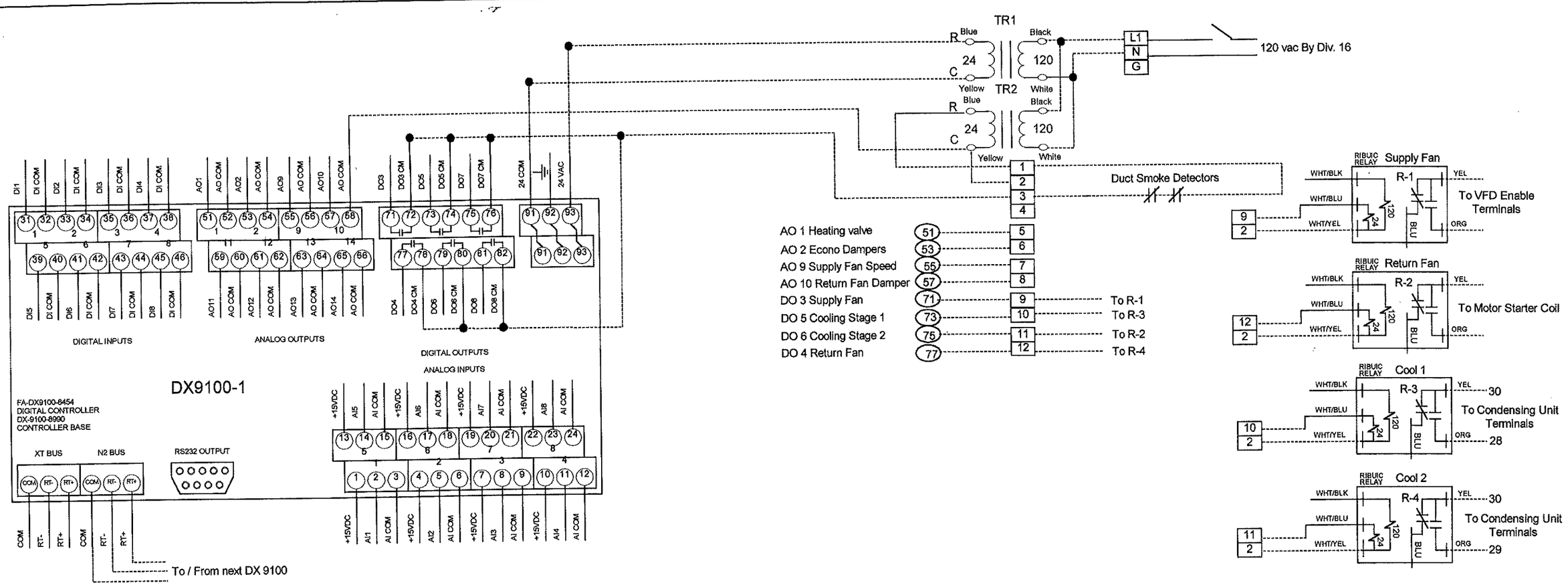
	Analog Inputs:			Device
1	AI1	Deg F.	Return Air Temp	TE-6311P-1
2	AI2	Deg F.	Mixed Air Temp	TE-6316P-1
3	AI3	Deg F.	Supply Air Temp	TE-6316P-1
4	AI4	Deg F.	Return Air CO2	CD-1D
5	AI5	Deg F.	Preheat Coil Temp	TE-6311P-1
6	AI6	Deg F.	Space Temp	TE-6411W-2110
7	AI7	Deg F.	Unused	
8	AI8	Deg F.	Unused	

	Digital Inputs			
1	DI1	Off-On	Supply Fan Air Flow	JC-P32AF-2C
2	DI2	Off-On	Return Fan Air Flow	JC-P32AF-2C
3	DI3	Off-On	Local Override	
4	DI4		Unused	
5	DI5		Unused	
6	DI6		Unused	
7	DI7		Unused	
8	DI8		Unused	

	Outputs			Device	
1	AO1	0-100	Preheat Valve	Belimo B338/NF24-SR-US	
2	AO2	0-100	Reheat Valve	Belimo B339/NF24-SR-US	
3	DO3	Off-On	Supply Fan Start	RIBU1C	
4	DO4	Off-On	Return Fan Start	RIBU1C	
5	DO5	Off-On	Unused		
6	DO6	Off-On	Unused		
7	DO7	Off-On	Unused		
8	DO8	Off-On	Unused		
9	AO9	0-100	Economizer Dampers	Belimo AF24-SR-US	3
10	AO10	0-100	Unused		
11	AO11	0-100	Unused		
12	AO12	0-100	Unused		
13	AO13	0-100	Unused		
14	AO14	0-100	Unused		

TR1, TR2 AT1751023

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : AHU-1 CONTROL POINT LIST	
		SCALE :			
		REV LEVEL :	Submittal		



22 Control Panel Terminal

(22) DX 9100 Terminal

(22) XP 9100 Terminal

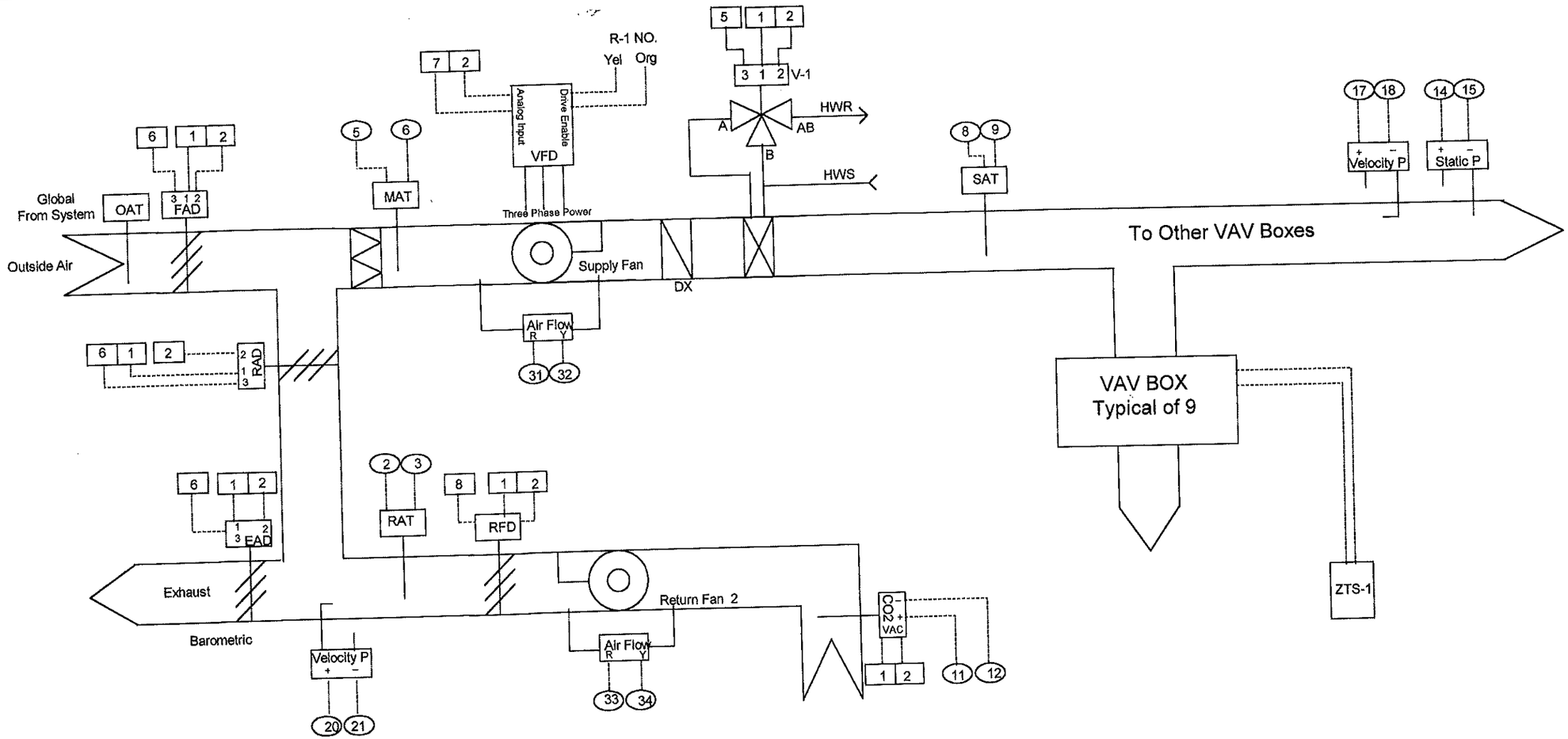
---------- Field Wiring

———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESCRIPTION :	AHU-2 Contol Panel



22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

---------- Field Wiring

_____ Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESCRIPTION :	AHU-2 Unit Wiring

Analog Inputs:			Device
1 AI1	Deg F.	Return Air Temp	TE-6311P-1
2 AI2	Deg F.	Mixed Air Temp	TE-6316P-1
3 AI3	Deg F.	Supply Air Temp	TE-6316P-1
4 AI4	Deg F.	Return Air CO2	CD-1D
5 AI5	Deg F.	Supply Static Press	Modus T30-050
6 AI6	Deg F.	Supply Velocity Press.	Modus T30-050
7 AI7	Deg F.	Return Velocity Press.	Modus T30-050
8 AI8	Deg F.	Unused	

Digital Inputs			
1 DI1	Off-On	Supply Fan Air Flow	JC-P32AF-2C
2 DI2	Off-On	Return Fan Air Flow	JC-P32AF-2C
3 DI3		Unused	
4 DI4		Unused	
5 DI5		Unused	
6 DI6		Unused	
7 DI7		Unused	
8 DI8		Unused	

Outputs			Device	
1 AO1	0-100	Heating Valve	Belimo B338/NF24-SR-US	
2 AO2	0-100	Economizer Dampers	Belimo AF24-SR-US	3
3 DO3	Off-On	Supply Fan Start	RIBU1C	
4 DO4	Off-On	Return Fan Start	RIBU1C	
5 DO5	Off-On	Cooling Stage 1	RIBU1C	
6 DO6	Off-On	Cooling Stage 2	RIBU1C	
7 DO7	Off-On	Unused		
8 DO8	Off-On	Unused		
9 AO9	0-100	Supply Fan Speed		
10 AO10	0-100	Return Fan Speed		
11 AO11		Unused		
12 AO12		Unused		
13 AO13		Unused		
14 AO14		Unused		
		TR1, TR2	AT1751023	

Johnson Controls Facilitator

Select Energy Contracting, Inc.

148 Norton Street Milldale, CT 06467

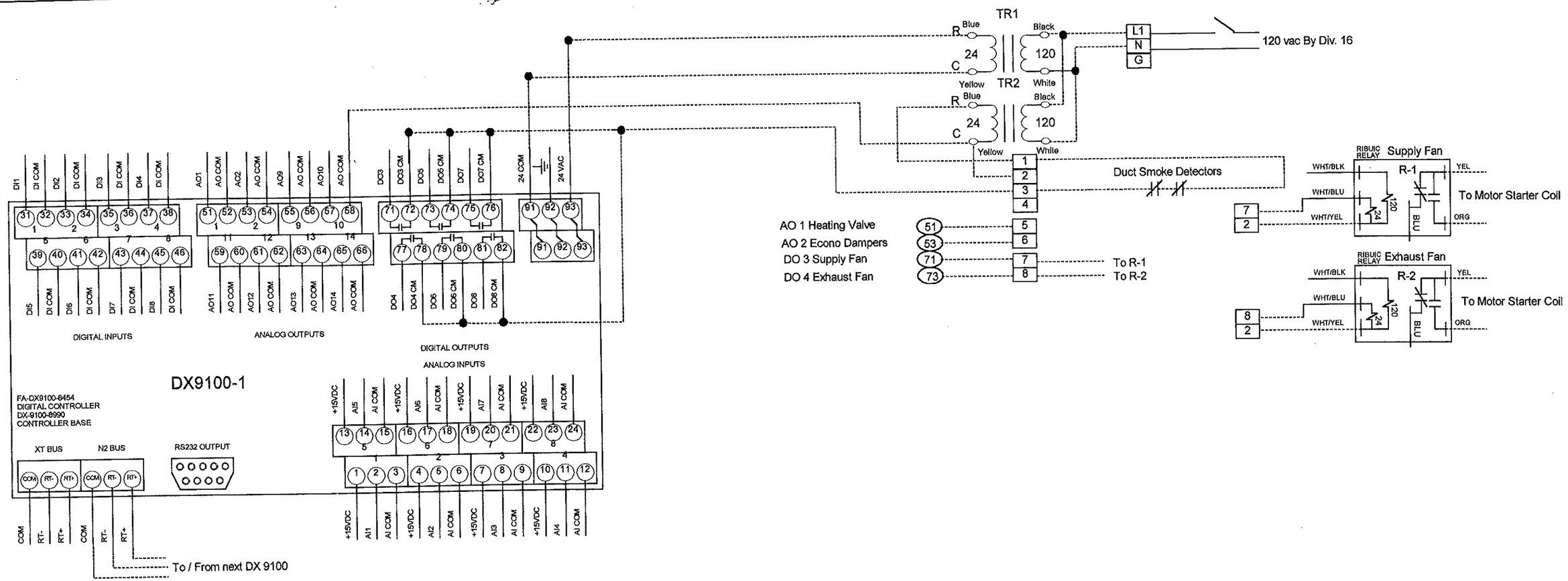
Tel: 860-378-3000 Fax: 860-378-3060

DOC. NO East Granby High School

SCALE:

REV LEVEL : Submittal

DESCRIPTION : AHU-2 CONTROL POINT LIST



22 Control Panel Terminal

(22) DX 9100 Terminal

[(22)] XP 9100 Terminal

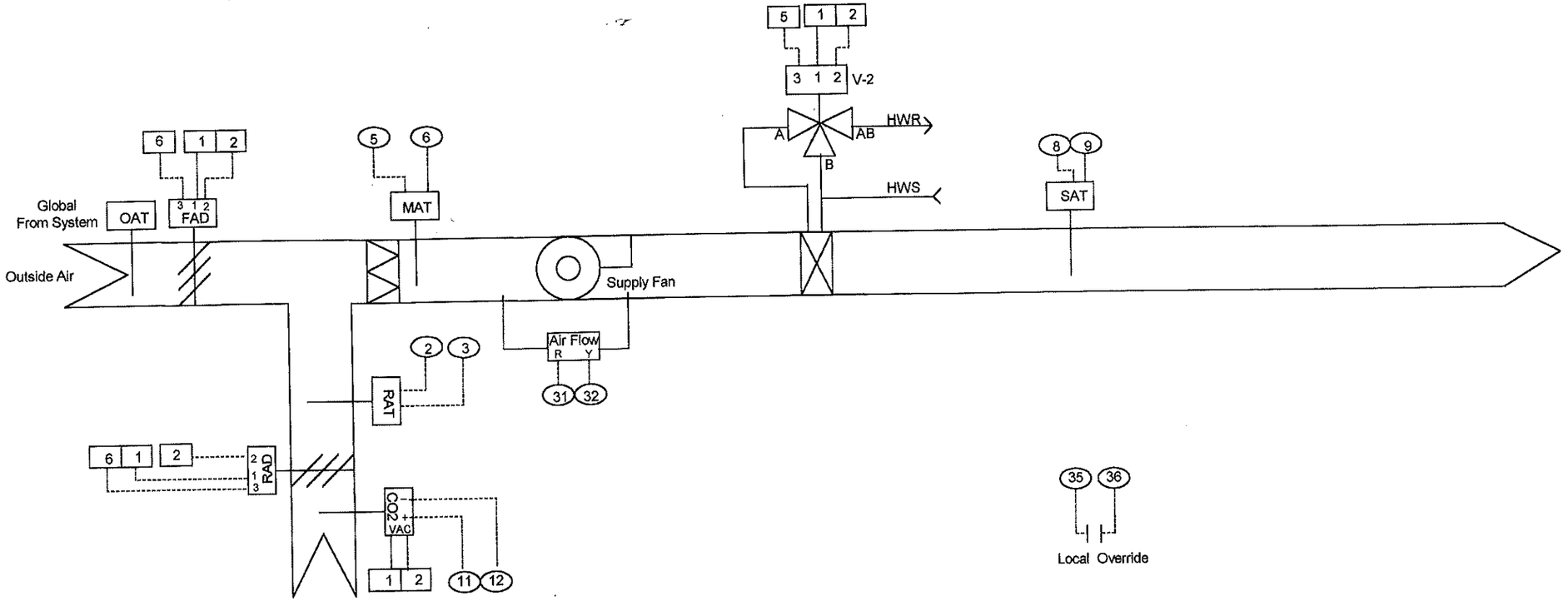
---------- Field Wiring

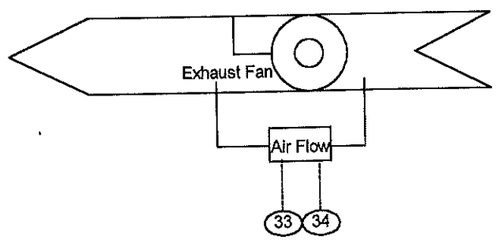
———— Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : AHU-5 Contol Panel		





22 Control panel Terminal

(22) DX 9100 Terminal

[22] XP 9100 Terminal

---------- Field Wiring

_____ Unit Wiring by MFG.

All Analog devices and communication shall use twisted shielded cable
Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator

Select Energy Contracting, Inc.
148 Norton Street Milldale, CT 06467
Tel: 860-378-3000 Fax: 860-378-3060

DOC. NO East Granby High School

SCALE :

REV LEVEL : Submittal

DESCRIPTION : AHU-5 Unit Wiring

Analog Inputs:

				Device
1	AI1	Deg F.	Return Air Temp	TE-6311P-1
2	AI2	Deg F.	Mixed Air Temp	TE-6316P-1
3	AI3	Deg F.	Supply Air Temp	TE-6316P-1
4	AI4	Deg F.	Return Air CO2	CD-1D
5	AI5	Deg F.	Unused	
6	AI6	Deg F.	Unused	
7	AI7	Deg F.	Unused	
8	AI8	Deg F.	Unused	

Digital Inputs

1	DI1	Off-On	Supply Fan Air Flow	JC-P32AF-2C
2	DI2	Off-On	Exhaust Fan Air Flow	CT
3	DI3	Off-On	Local Override	
4	DI4		Unused	
5	DI5		Unused	
6	DI6		Unused	
7	DI7		Unused	
8	DI8		Unused	

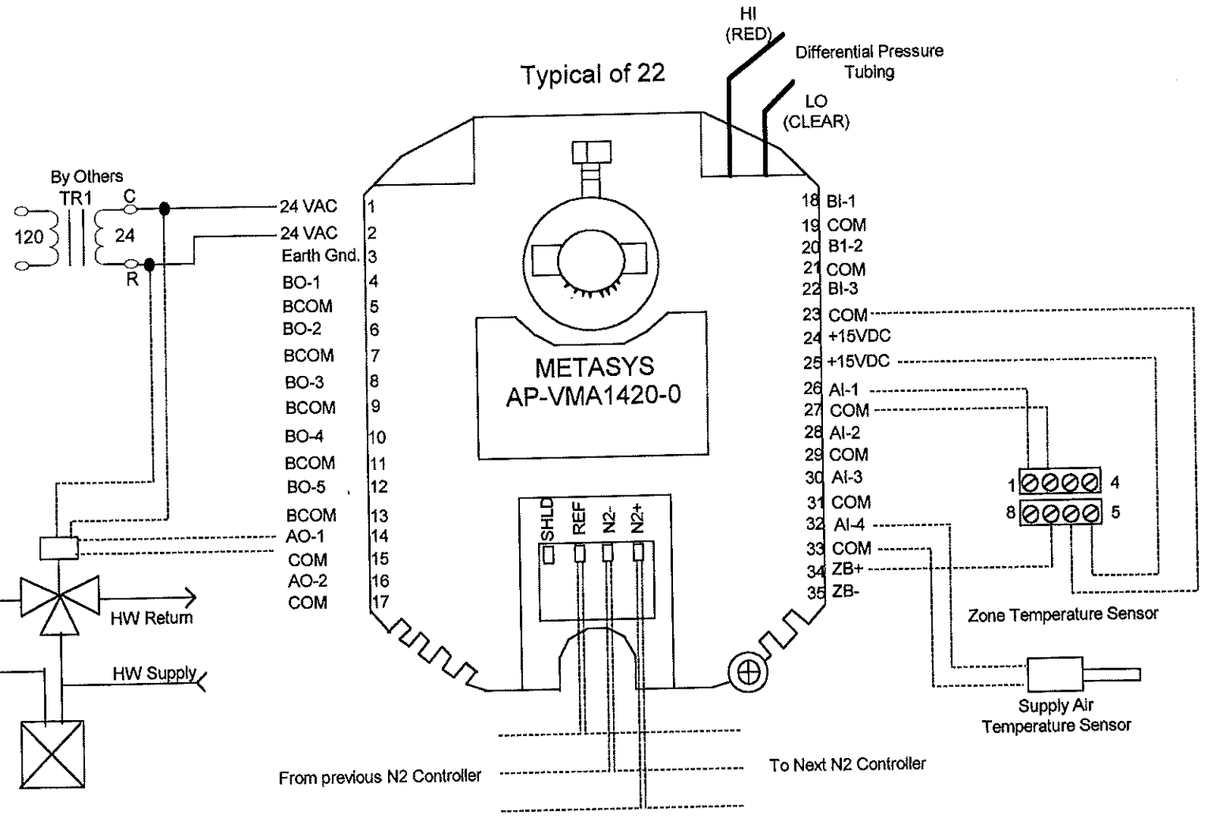
Outputs

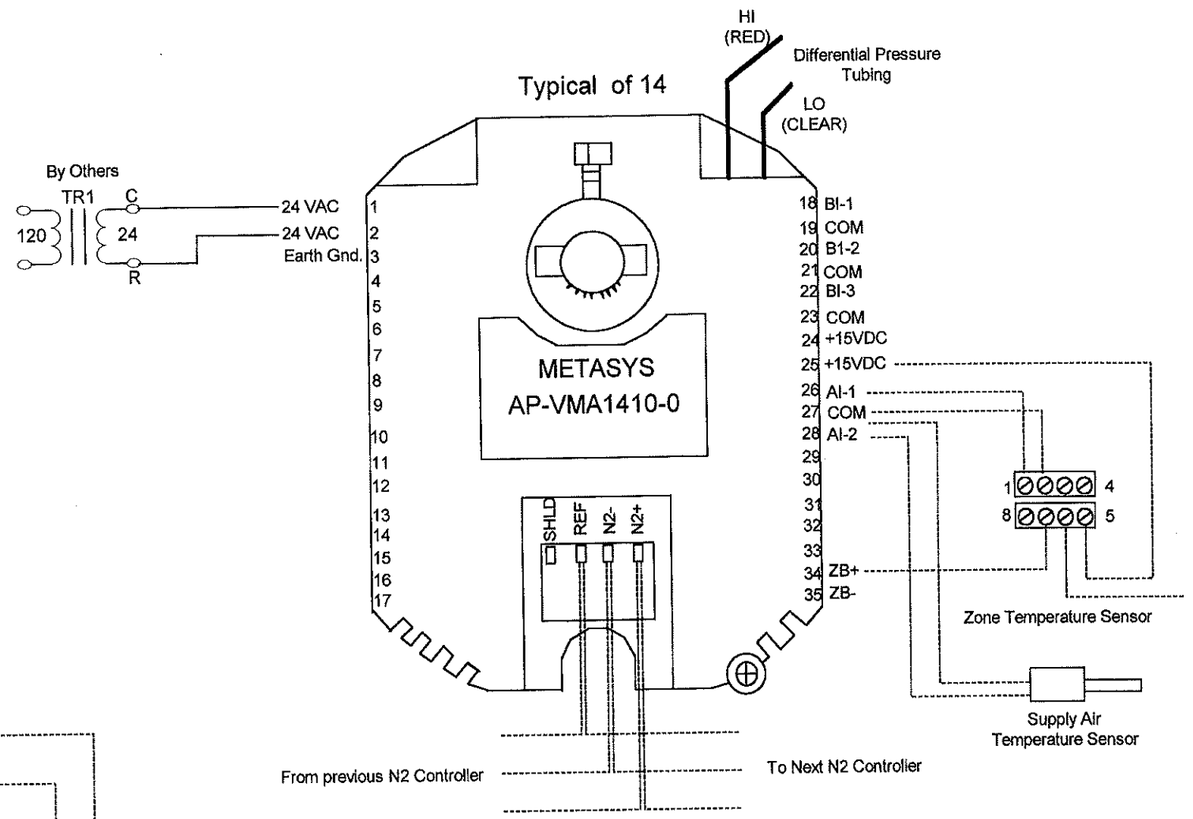
				Device	
1	AO1	0-100	Heating Valve	Belimo B338/NF24-SR-US	
2	AO2	0-100	Economizer Dampers	Belimo NF24-SR-US	2
3	DO3	Off-On	Supply Fan Start	RIBU1C	
4	DO4	Off-On	Exhaust Fan Start	RIBU1C	
5	DO5	Off-On	Unused		
6	DO6	Off-On	Unused		
7	DO7	Off-On	Unused		
8	DO8	Off-On	Unused		
9	AO9	0-100	Unused		
10	AO10	0-100	Unused		
11	AO11	0-100	Unused		
12	AO12	0-100	Unused		
13	AO13	0-100	Unused		
14	AO14	0-100	Unused		
			TR1, TR2	AT1751023	

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO SCALE : REV LEVEL :	East Granby High School Submittal	DESCRIPTION : AHU-5 CONTROL POINT LIST	

AP-VMA1420-0

VAV -A1	VAV-A26
VAV -A2	VAV-A27
VAV -A3	VAV-C1
VAV-A4	VAV-C2
VAV-A5	VAV-C3
VAV-A6	VAV-C4
VAV-A7	VAV-C5
VAV-A8	VAV-C6
VAV-A9	VAV-C7
VAV-A14	VAV-C8
VAV-A15	VAV-C9





AP-VMA1410

VAV-A10	VAV-A19
VAV-A11	VAV-A20
VAV-A12	VAV-A21
VAV-A13	VAV-A22
VAV-A16	VAV-A23
VAV-A17	VAV-A24
VAV-A18	VAV-A25

Field Wiring

Wiring By Unit Mfg.

All Analog devices and communication shall use twisted shielded cable Isolate and tape one end

Low voltage and sensor wiring must not be run in conduit with line voltage.

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : VAV Boxes
		SCALE :	Submittal	
		REV LEVEL :		

VAV -A2
VAV -A3
VAV-A4
VAV-A5
VAV-A6
VAV-A9
VAV-A14
VAV-A15
VAV-A26
VAV-A27
VAV-C1
VAV-C2
VAV-C4
VAV-C5
VAV-C6
VAV-C7
VAV-C8

VAV-A11
VAV-A12
VAV-A16
VAV-A17
VAV-A18
VAV-A19
VAV-A20
VAV-A21
VAV-A22
VAV-A23
VAV-A25

Analog Inputs: VMA1420 Device

1	AI1	Deg F.	Zone Temp	TE-6411W-2110
2	AI2		Unused	
3	AI3		Unused	
4	AI4	Deg F.	Discharge Air Temp	TE-6311P-1
5	AI5	Inches WC	Velocity Pressure	Internal

Digital Inputs:

1	DI1	Unused	
2	DI2	Unused	
3	DI3	Unused	

Outputs

1	AO1 0-100	Reheat Coil Valve	Belimo B311/LR24-SR-US
2	AO2	Unused	
3	BO1	Unused	
4	BO2	Unused	
5	BO3	Unused	
6	BO4	Unused	
7	BO5	Unused	
8	SM1 0-100	Stepper Motor	Internal

Analog Inputs: VMA1410 Device

1	AI1	Deg F.	Zone Temp	TE-6411W-2110
2	AI2		Unused	
3	AI3	Inches WC	Velocity Pressure	Internal

Digital Inputs:

1	DI1	Unused	
2	DI2	Unused	
3	DI3	Unused	

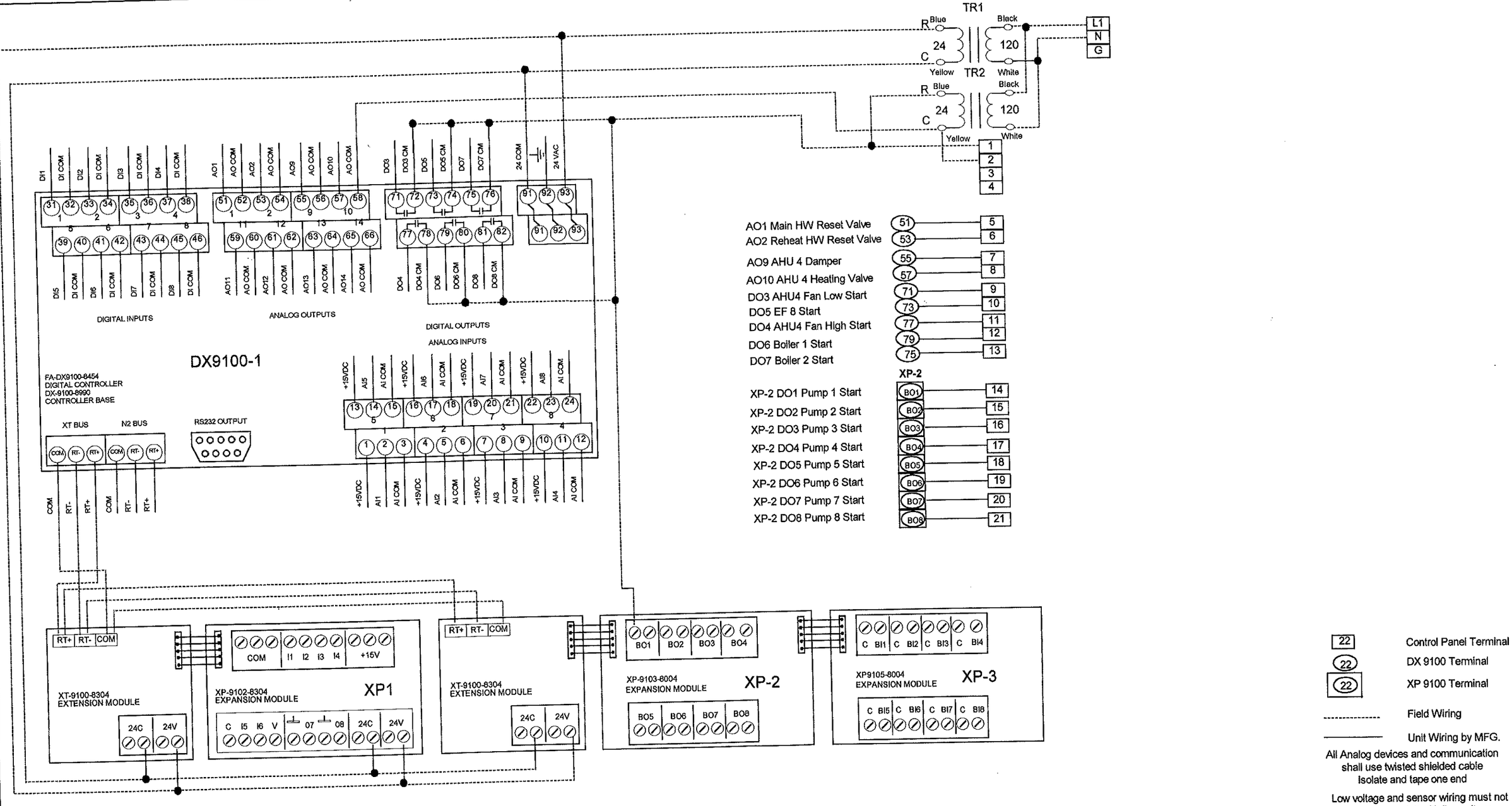
Outputs

1	SM1 0-100	Stepper Motor	Internal

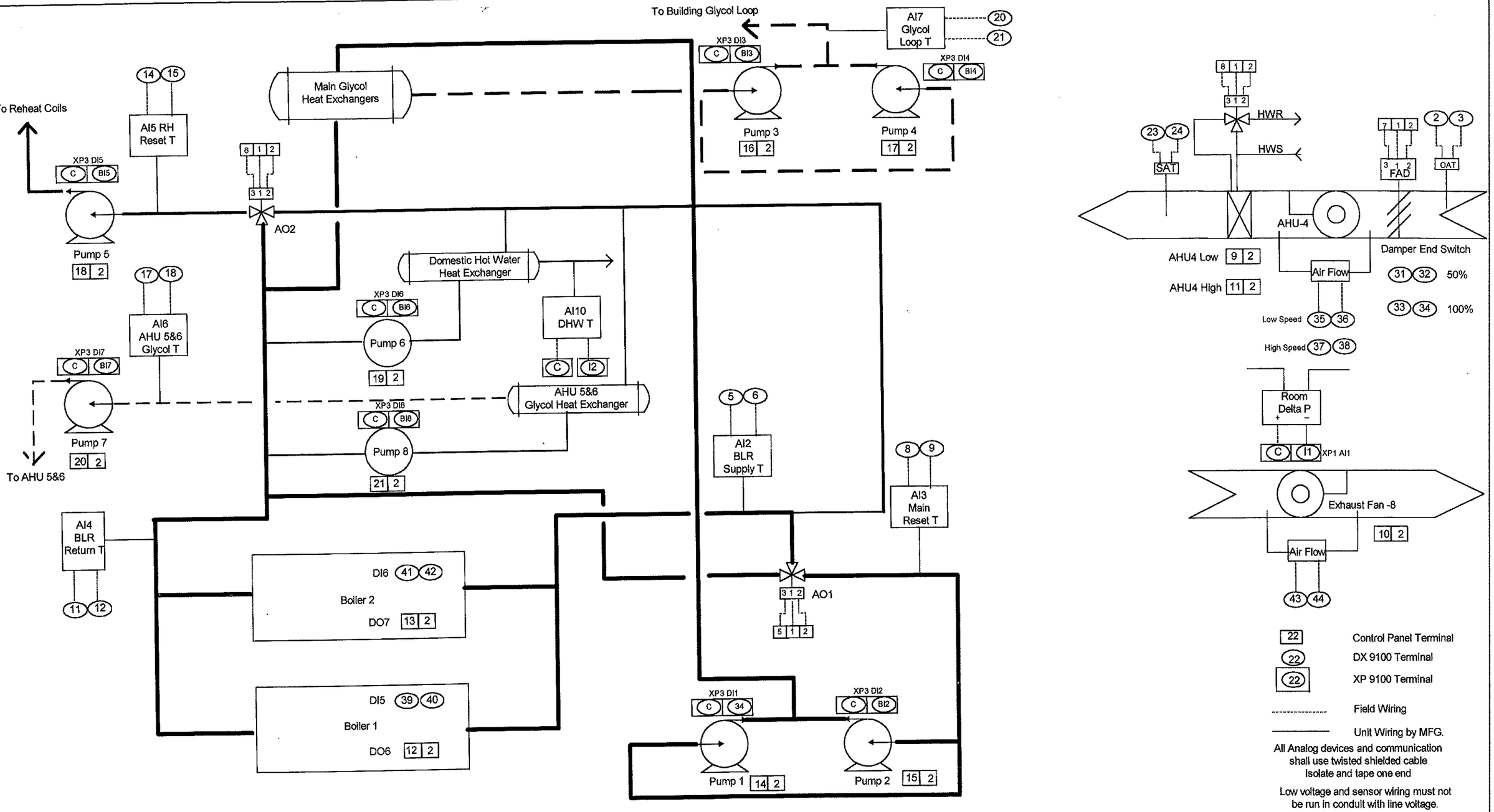
Additional Points

VAV Controller	BO-1	BI-1	AI-2
A1	Exhaust Fans 1,2,7		
A7		FCU Air Flow	FCU Space Temp
A9	Exhaust Fan 5		
A10		EF-2 Air Flow	
A13		EF-1 Air Flow	
A24		EF-5 Air Flow	
C3		EF-6 Air Flow	

Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : CONTROL POINT LIST	
		SCALE :	Submittal		
		REV LEVEL :			



Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO East Granby High School SCALE : REV LEVEL : Submittal	DESCRIPTION : Boiler Room Contol Panel	



Johnson Controls Facilitator	***Select Energy Contracting, Inc.*** 148 Norton Street Milldale, CT 06467 Tel: 860-378-3000 Fax: 860-378-3060	DOC. NO	East Granby High School	DESCRIPTION : Boiler Room Wiring	
		SCALE :			
		REV LEVEL :	Submittal		

Analog Inputs:DX9100

			Device
1 AI1	Deg F.	Outside Air Temp	TE-6313P-1
2 AI2	Deg F.	Boiler Header Temp	TE-631AP-1/WZ1000-5
3 AI3	Deg F.	Main HWS Temp	TE-631AP-1/WZ1000-5
4 AI4	Deg F.	Boiler Return Temp	TE-631AP-1/WZ1000-5
5 AI5	Deg F.	Reheat HWS Temp	TE-631AP-1/WZ1000-5
6 AI6	Deg F.	AHU 5&6 HWS Temp	TE-631AP-1/WZ1000-5
7 AI7	Deg F.	Main Glycol Supply Temp	TE-631AP-1/WZ1000-5
8 AI8	Deg F.	AHU 4 Supply Temp	TE-6316P-1

Digital Inputs

1 DI1	Off-On	AHU 4 Damper 50%	Belimo LF24-SR-US
2 DI2	Off-On	AHU 4 Damper 100%	End Switch
3 DI3	Off-On	AHU 4 Low Speed Flow	CT
4 DI4	Off-On	Ahu 4 High Speed Flow	CT
5 DI5	Off-On	EF 8 Air Flow	CT
6 DI6	Off-On	Boiler 1 Flame Fail	RIBU1C
7 DI7	Off-On	Boiler 2 Flame Fail	RIBU1C
8 DI8		Unused	

Analog Input Expansion: XP-1

			Device
1 AI1	In. Wc.	Boiler Room Delta P.	Modus T30-010B
2 AI2	Deg F.	Domestic HW Temp	TE-631AP-1/WZ1000-5
3 AI3		Unused	
4 AI4		Unused	
5 AI5		Unused	
6 AI6		Unused	

Analog Output Expansion:

7 AO7
8 AO8

Digital Input Expansion: XP-3

			Device
1 DI1	Off-On	Pump 1 Flow	P74FA5C
2 DI2	Off-On	Pump 2 Flow	P74FA5C
3 DI3	Off-On	Pump 3 Flow	P74FA5C
4 DI4	Off-On	Pump 4 Flow	P74FA5C
5 DI5	Off-On	Pump 5 Flow	P74FA5C
6 DI6	Off-On	Pump 6 Flow	P74FA5C
7 DI7	Off-On	Pump 7 Flow	P74FA5C
8 DI8	Off-On	Pump 8 Flow	P74FA5C

Outputs:DX9100

			Device
1 AO1	0-100	Main Hot Water Reset Valve	Belimo F7150
2 AO2	0-100	Reheat Hot Water Reset Valve	Belimo F7100/2XAF24-SR-US
3 DO3	Off-On	AHU 4 Fan Low Speed	RIBU1C
4 DO4	Off-On	AHU 4 Fan High Speed	RIBU1C
5 DO5	Off-On	EF 8 Start	RIBU1C
6 DO6	Off-On	Boiler 1 Start	RIBU1C
7 DO7	Off-On	Boiler 2 Start	RIBU1C
8 DO8	Off-On	Unused	
9 AO9	0-100	AHU 4 Damper	Belimo LF24-SR-US
10 AO10	0-100	Ahu 4 Heating Valve	Belimo B329/NF24-SR-US
11 AO11	0-100	Unused	
12 AO12	0-100	Unused	
13 AO13	0-100	Unused	
14 AO14	0-100	Unused	

TR1, TR2 AT1751023

Digital Output Expansion: XP-2

		Device
1 DO1	Boiler Hot Water Pump 1 Start	RIBU1C
2 DO2	Boiler Hot Water Pump 2 Start	RIBU1C
3 DO3	Glycol Loop Pump 3 Start	RIBU1C
4 DO4	Glycol Loop Pump 4 Start	RIBU1C
5 DO5	Reheat Loop Pump 5 Start	RIBU1C
6 DO6	Domestic HW HX Pump 6 Start	RIBU1C
7 DO7	AHU 5&6 Glycol Loop Pump Start	RIBU1C
8 DO8	AHU 5&6 HX Pump 8 Start	RIBU1C

Johnson Controls Facilitator

Select Energy Contracting, Inc.
148 Norton Street Milldale, CT 06467
Tel: 860-378-3000 Fax: 860-378-3060

DOC. NO East Granby High School
SCALE:
REV LEVEL : Submittal

DESCRIPTION BOILER ROOM CONTROL POINT LIST