TRIATEK, INC.
STANDARD DRAWINGS
VOLUMETRIC OFFSET

SYMBOL KEY

A	Actuator ACT-FA-8001	VAV	Triatek Controller	FS	Triatek Flow Sensor	X1	Step-Down Isolation Transformer 120 to 24 VAC Provided
HMS	HMS Controller	SS	Sash Position Sensor	F M S	FMS Pressure Monitor	X2	Isolation Transformer 24 to 24 VAC Provided
H D	HMS Display	SW	Sidewall Sensor	DS	Triatek Door Switch	X3	Step-Down Transformer 120 to 24 VAC 100VA By Others
	Hot Water Control Valve	TS	Temperature Sensor		Manual Control Switch	xC	Cable Factory Provided

xC_L	Triatek Control Network Provided By Others x = # of Conductors
xC_P	Power Wiring Provided By Others x = # of Conductors
xC_CS	Control Wiring Provided By Others x = # of Conductors
xC_IN	Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per Subnet

ACKNOWLEDGEMENTS

REVISIONS

SYM	DATE	APP'D

DATE: 05/20/2005
SCALE: None
DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER: NA

PROJECT: COVER

DWG NO.: T 1

SAMPLE BILL OFF MATERIALS

BILL OF MATERIALS		
TRIATEK PART#	**DESCRIPTION**	**QUANTITY**
VV08ANFAPC	8" Aluminum Venturi Valve with/ fast acting electric actuator Partially Closed	2
VV012ANFAPC	12" Aluminum Venturi Valve with/ fast acting electric actuator Partially Closed	1
VV012HNFAPC	12" Aluminum Venturi Valve with/ fast acting electric actuator Partially Closed	2
VV016ANFAPC	16" Aluminum Venturi Valve with/ fast acting electric actuator Partially Closed	2
VV312ANFAPC	3-12" Ganged Aluminum Venturi Valve with/ fast acting electric actuators Partially Closed	2
VAV-1000L	VAV LON Controller	7
HMS1622-L	FUME HOOD MONITOR / CONTROLLER	2
POS-100	SASH POSITION SENSOR	2
TRIGATE	LON - N2 GATE WAY	1
TLON-G-02	TRIATEK LON GATEWAY W/ DIAL-UP	1

SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller
- HD — HMS Display
- Hot Water Control Valve
- VAV — Triatek Controller
- SS — Sash Position Sensor
- SW — Sidewall Sensor
- TS — Temperature Sensor
- FS — Triatek Flow Sensor
- FMS — FMS Pressure Monitor
- DS — Triatek Door Switch
- Manual Control Switch
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA By Others
- xC — Cable Factory Provided
- xC_L — Triatek Control Network Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per Subnet

ACKNOWLEDGEMENTS

REVISIONS

SYM	DATE	APP'D

DATE: 09/22/2005
SCALE: None
DRAWN BY: GDW

ENGINEER: NA

PROJECT: SAMPLE Bill of Materials

DWG NO.: B1

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

SAMPLE VALVE SCHEDULE

Room Name	Valve Tag	Designated Use	Triatek Part Number	Airflow CFM	Minimum Airflow CFM
003 Bio TL Intro Bio	EAV-A003	HOOD	VV010HNCVPC	500	500
006 Bio Museum / Herb.	EAV-A006A	HOOD	VV08HNCVPC	60	60
	EAV-A006B	HOOD	VV010HNCVPC	500	500
021 Geo Rock Prep	EAV-A021	HOOD	VV08HNCVPC	80	80
102 Lecture Hall	EAV-A102	HOOD	VV010HNCVPC	500	500
120 Geo Lab Service	EAV-A120	HOOD	VV010HNCVPC	500	500
129 Geo Rock Prep	EAV-A129	HOOD	VV08HNCVPC	100	100
201 Bio Glasswash	EAV-A201	HOOD	VV010HNCVPC	700	700
202 Bio Media Prep	EAV-A202	HOOD	VV010HNCVPC	500	500
202A Bio Clean Room	EAV-A202A	HOOD	VV012HNCVPC	800	800
203 Bio Cage Prep	EAV-A203	HOOD	VV08HNCVPC	350	350
204 Molec. Bio	EAV-A204	HOOD	VV012HNCVPC	800	800
205 Develop Bio	EAV-A205	HOOD	VV012HNCVPC	800	800
208 Micro Bio Lab	EAV-A208	HOOD	VV012HNCVPC	800	800
209A Molec Bio SP	EAV-A209A	HOOD	VV010HNCVPC	400	400
	EAV-A209B	HOOD	VV010HNCVPC	400	400
212 Bio TL Service	EAV-A212	HOOD	VV010HNCVPC	650	650
215 Bio TL Service	EAV-A215	HOOD	VV010HNCVPC	500	500
218 Bio TL Service	EAV-A218	HOOD	VV010HNCVPC	500	500
221 Bio TL Service	EAV-A221	HOOD	VV010HNCVPC	500	500
224 Bio TL Service	EAV-A224	HOOD	VV010HNCVPC	500	500
227 Bio Human Anat	EAV-A227	HOOD	VV012HNCVPC	800	800
227A Bio Cad Rm	EAV-A227A	HOOD	VV210HNCVPC	1500	1500
230 Marine Ecol.	EAV-A230	HOOD	VV012HNCVPC	800	800
231 TL Ecology	EAV-A231	HOOD	VV010HNCVPC	650	650
234 Bio TL Service	EAV-A234	HOOD	VV010HNCVPC	500	500
237 Bio TL Service	EAV-A237	HOOD	VV010HNCVPC	650	650
240 Bio TL Service	EAV-A240	HOOD	VV010HNCVPC	500	500
243 Bio TL Service	EAV-A243	HOOD	VV010HNCVPC	650	650
301 Phys TL Service	EAV-A301	HOOD	VV010HNCVPC	650	650
304 Phys Specl Inst	EAV-A304	HOOD	VV010HNCVPC	650	650
305 Analytical lab	EAV-A305	HOOD	VV010HNCVPC	650	650
311 Phys TL Class	EAV-A311	HOOD	VV010HNCVPC	650	650
314 Chem TL Service	EAV-A314	HOOD	VV012HNCVPC	800	800
	EAV-B314	HOOD	VV012HNCVPC	800	800
	EAV-C314	HOOD	VV012HNCVPC	800	800
	EAV-D317	HOOD	VV012HNCVPC	800	800
317 Chem TL Service	EAV-A317	HOOD	VV012HNCVPC	800	800
	EAV-B317	HOOD	VV012HNCVPC	800	800
320 Chem TL	EAV-A320	HOOD	VV012HNCVPC	800	800
	EAV-B320	HOOD	VV012HNCVPC	800	800
	EAV-C320	HOOD	VV012HNCVPC	800	800
	EAV-D321	HOOD	VV08HNCVPC	60	60
322 Instr Prep	EAV-A322	HOOD	VV012HNCVPC	500	500
	EAV-B322	HOOD	VV08HNCVPC	255	255

Room Name	Valve Tag	Designated Use	Triatek Part Number	Airflow CFM	Minimum Airflow CFM
323 Organic Chem	SAV-A323	SUPPLY	VV212ANFAPC	2100	2100
	SAV-B323	SUPPLY	VV212ANFAPC	2100	2100
	SAV-C323	SUPPLY	VV212ANFAPC	2100	2100
	SAV-D323	SUPPLY	VV212ANFAPC	2100	2100
	SAV-E323	SUPPLY	VV212ANFAPC	1400	1400
	EAV-A323	HOOD	VV012HNFAPC	1100	1100
	EAV-B323	HOOD	VV012HNFAPC	1100	1100
	EAV-C323	HOOD	VV012HNFAPC	1100	1100
	EAV-D323	HOOD	VV012HNFAPC	1100	1100
	EAV-E323	HOOD	VV012HNFAPC	1100	1100
	EAV-F323	HOOD	VV012HNFAPC	1100	1100
	EAV-G323	HOOD	VV012HNFAPC	1100	1100
	EAV-H323	HOOD	VV012HNFAPC	1100	1100
	EAV-I323	HOOD	VV012HNFAPC	1100	1100
	EAV-J323	HOOD	VV012HNFAPC	1100	1100
326 Chem TL Gen	EAV-A326	HOOD	VV012HNCVPC	800	800
	EAV-B326	HOOD	VV012HNCVPC	800	800
	EAV-C326	HOOD	VV012HNCVPC	800	800
327 Cem Inst Prep	EAV-A327	HOOD	VV08HNCVPC	175	175
	EAV-B327	HOOD	VV08HNCVPC	175	175
	EAV-C327	HOOD	VV08HNCVPC	250	250
328 Quant Analy	EAV-A328	HOOD	VV012HNCVPC	800	800
	EAV-B328	HOOD	VV012HNCVPC	800	800
	EAV-C328	HOOD	VV012HNCVPC	800	800
329 Gen Storage	EAV-A329	HOOD	VV012HNCVPC	800	800
	EAV-B329	HOOD	VV08HNCVPC	60	60

SYMBOL KEY

NOTES

ACKNOWLEDGEMENTS

REVISIONS			DATE: 03/07/05
SYM	DATE	APP'D	SCALE: None
			DRAWN BY: GDW

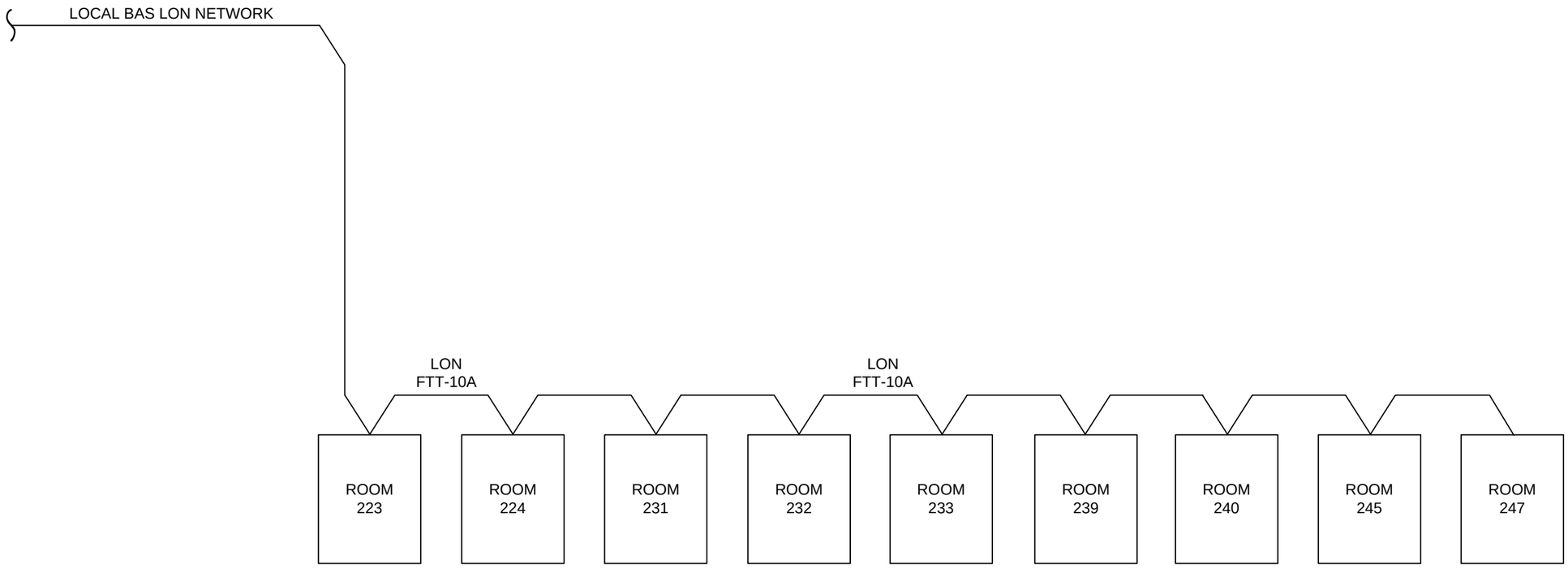
TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER: NA

PROJECT: SAMPLE Valve Schedule

DWG NO.: V1

SAMPLE
COMMUNICATION RISER



Cable Specifications

Doubly-Terminated Bus Topology Specifications		
Cable Type	**Maximum bus length**	**Units**
Belden 85102	2700	Meters
Belden 8471	2700	Meters
Level IV, 22AWG	1400	Meters
JY(St) Y 2x2x0.8	900	Meters
TIA Category 5	900	Meters

Free Topology Specifications			
Cable Type	**Maximum node-to-node distance**	**Maximum total Wire length**	**Units**
Belden 85102	500	500	Meters
Belden 8471	400	500	Meters
Level IV, 22AWG	400	500	Meters
JY(St) Y 2x2x0.8	320	500	Meters
TIA Category 5	250	450	Meters

Refer to www.lonmark.org for more details.

CABLE LEGEND
#1. 1 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#2. 2 Conductor, #18 AWG, THHN, Stranded Copper (24vac power)
#3. 1 Pair, #22 AWG, Belden 85102 Recommended
#4. 2 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#5. 3 Conductors (120vac power)

SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller
- HD — HMS Display
- Hot Water Control Valve
- VAV — Triatek Controller
- SS — Sash Position Sensor
- SW — Sidewall Sensor
- TS — Temperature Sensor
- FS — Triatek Flow Sensor
- FMS — FMS Pressure Monitor
- DS — Triatek Door Switch
- Manual Control Switch
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA By Others
- xC — Cable Factory Provided
- xC_L — Triatek Control Network Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per Subnet

ACKNOWLEDGEMENTS

REVISIONS

SYM	DATE	APP'D

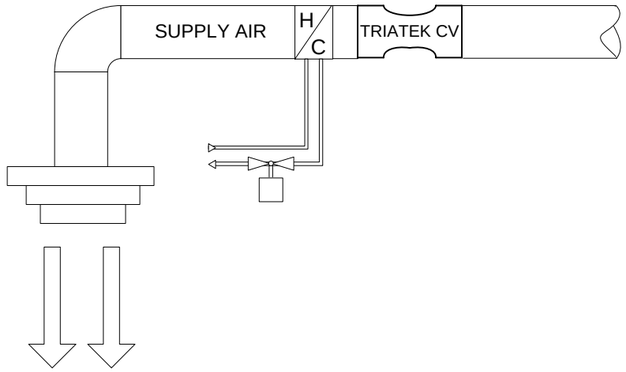
DATE: 05/20/2005
SCALE: None
DRAWN BY: GDW

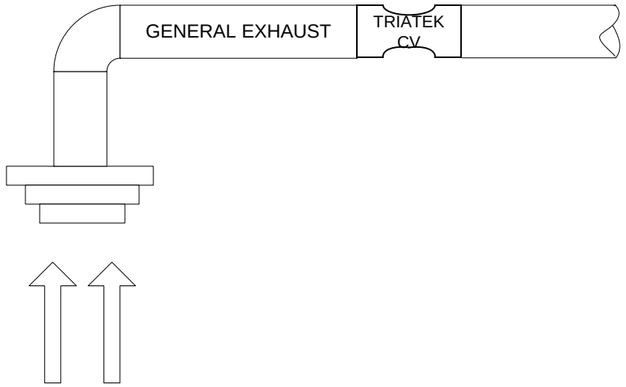
ENGINEER: NA

PROJECT: SAMPLE Communication Riser

DWG NO.: R1

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944





CABLE LEGEND
#1. 1 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#2. 2 Conductor, #18 AWG, THHN, Stranded Copper (24vac power)
#3. 1 Pair, #22 AWG, Belden 85102 Recommended
#4. 2 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#5. 3 Conductors (120vac power)
#6. 3 Conductor, #18 AWG, THHN, Stranded Copper (24VDC power/input)

SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller
- H D — HMS Display
- Hot Water Control Valve
- VAV — Triatek Controller
- SS — Sash Position Sensor
- SW — Sidewall Sensor
- TS — Temperature Sensor
- FS — Triatek Flow Sensor
- F M S — FMS Pressure Monitor
- DS — Triatek Door Switch
- Manual Control Switch
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA By Others
- xC — Cable Factory Provided
- xC_L — Triatek Control Network Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per Subnet

ACKNOWLEDGEMENTS

REVISIONS			DATE: 10/06/2005
SYM	DATE	APP'D	SCALE: None
			DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER: NA

PROJECT: Constant Volume Supply and General Exhaust

DWG NO.: T1

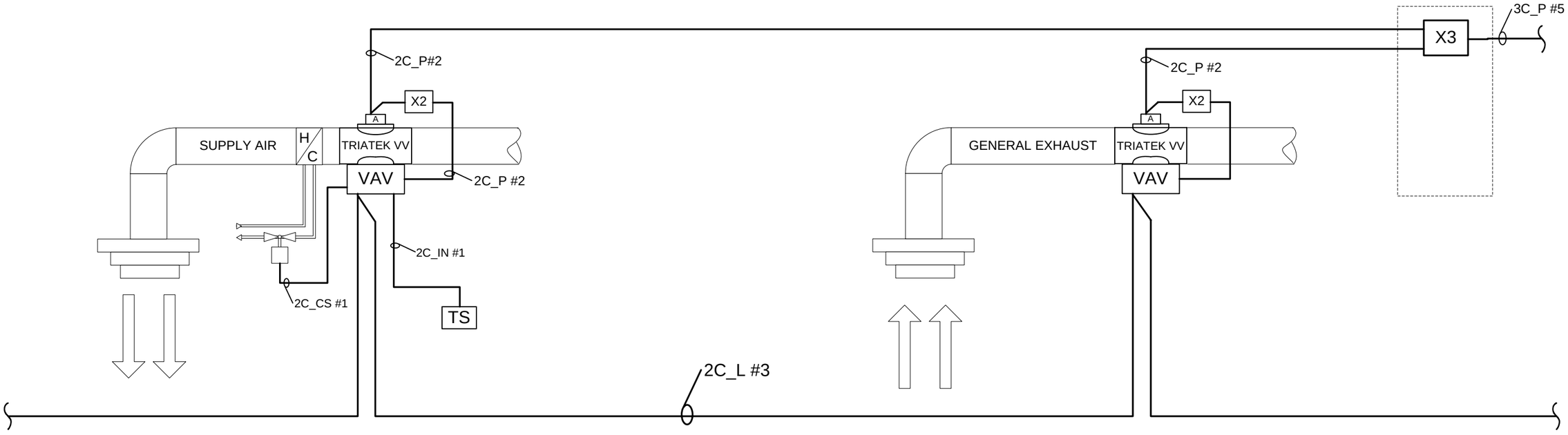
Sequence of Operation

VAV Supply and General Exhaust

The Lab Flow Controller will modulate the general exhaust air valve and/or the supply air valve, and the reheat coil valve to maintain the room's desired CFM offset setpoint, satisfy room cooling/heating load, and maintain minimum supply air without exhausting excess air. The controller can be connected to the Building Automation System via LON 'FTT' communication network interface to provide remote monitoring / setpoint adjustment, and to provide occupied/unoccupied status indication.

FAIL-SAFE MODE

All exhaust valves will fail to the full open position upon loss of power to either the controller or actuator, or loss of analog control signal from the controller to the actuator. All supply valves will fail to its minimum position upon loss of power to the controller or actuator, or loss of analog control signal from the controller to the actuator.



CABLE LEGEND
#1. 1 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#2. 2 Conductor, #18 AWG, THHN, Stranded Copper (24vac power)
#3. 1 Pair, #22 AWG, Belden 85102 Recommended
#4. 2 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#5. 3 Conductors (120vac power)
#6. 3 Conductor, #18 AWG, THHN, Stranded Copper (24VDC power/input)

SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller
- H D — HMS Display
- Hot Water Control Valve
- VAV — Triatek Controller
- SS — Sash Position Sensor
- SW — Sidewall Sensor
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- F M S — FMS Pressure Monitor
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- X3 — Step-Down Transformer 120 to 24 VAC 100VA By Others
- xC — Cable Factory Provided
- xC_L — Triatek Control Network Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per Subnet

ACKNOWLEDGEMENTS

REVISIONS			DATE: 10/06/2005
SYM	DATE	APP'D	SCALE: None
			DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

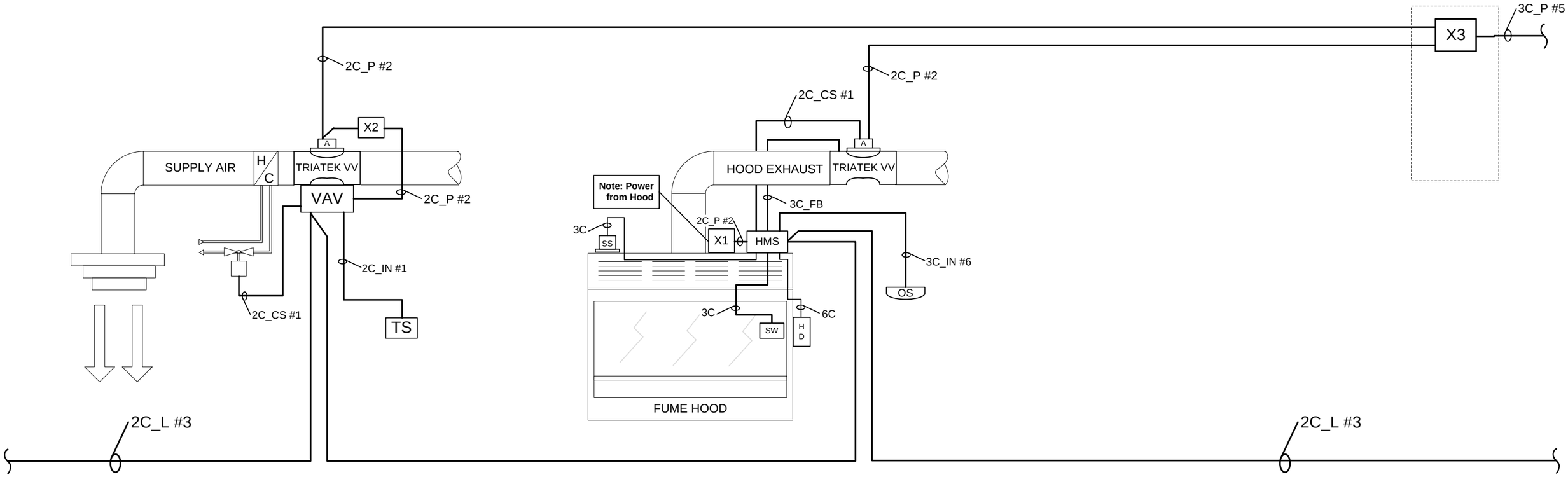
ENGINEER	PROJECT:	DWG NO.: T2
NA	TRACKING PAIR WITH REHEAT CONTROL	Page: 6 of 17

Sequence of Operation

HMS - Fume Hood Monitoring System
The Fume Hood Controller will modulate the Fume Hood's exhaust air valve to maintain
the desired face velocity set point. The System's speed of response to sash movement will provide adequate containment of hazardous fumes. Alarms will be enabled whenever the face velocity set point can not be achieved by the exhaust system, or whenever face velocity rises above the high alarm limit. Audible and visual alarms will be provided locally. The controller can be connected to the Building Automation System via LON 'FTT' communication network interface to provide remote monitoring / setpoint adjust.
Emergency purge operation is via the 'MAX FLOW' touch-pad button. The Fume Hood's Exhaust valve maximum position will be equal to the Fume Hood's high CFM limit.

VAV Supply and Fume Hood Exhaust
The Lab Flow Controller will modulate the supply air valve, and the reheat coil valve to maintain the room's desired CFM offset setpoint, satisfy room cooling/heating load, and maintain minimum supply air without exhausting excess air.
The System's speed of response to Fume Hood exhaust requirements will provide adequate containment of Room air. The controller can be connected to the Building Automation System via LON 'FTT' communication network interface to provide remote monitoring / setpoint adjustment, and to provide occupied/unoccupied status indication.

FAIL-SAFE MODE
All exhaust valves will fail to the full open position upon loss of power to either the controller or actuator, or loss of analog control signal from the controller to the actuator. All supply valves will fail to its minimum position upon loss of power to the controller or actuator, or loss of analog control signal from the controller to the actuator.



CABLE LEGEND
#1. 1 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#2. 2 Conductor, #18 AWG, THHN, Stranded Copper (24vac power)
#3. 1 Pair, #22 AWG, Belden 85102 Recommended
#4. 2 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#5. 3 Conductors (120vac power)

SYMBOL KEY

A	Actuator ACT-FA-8001	VAV	Triatek Controller	FS	Triatek Flow Sensor	X1	Step-Down Isolation Transformer 120 to 24 VAC Provided
HMS	HMS Controller	SS	Sash Position Sensor	F M S	FMS Pressure Monitor	X2	Isolation Transformer 24 to 24 VAC Provided
H D	HMS Display	SW	Sidewall Sensor	DS	Triatek Door Switch	X3	Step-Down Transformer 120 to 24 VAC 100VA By Others
	Hot Water Control Valve	TS	Temperature Sensor		Manual Control Switch	xC	Cable Factory Provided

xC_L	Triatek Control Network Provided By Others x = # of Conductors
xC_P	Power Wiring Provided By Others x = # of Conductors
xC_CS	Control Wiring Provided By Others x = # of Conductors
xC_IN	Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per Subnet

ACKNOWLEDGEMENTS

REVISIONS			DATE: 09/22/2005
SYM	DATE	APP'D	SCALE: None
			DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER	PROJECT:	DWG NO.:
NA	Single Supply & Hood Typical	T3

Sequence of Operation

HMS - Fume Hood Monitoring System

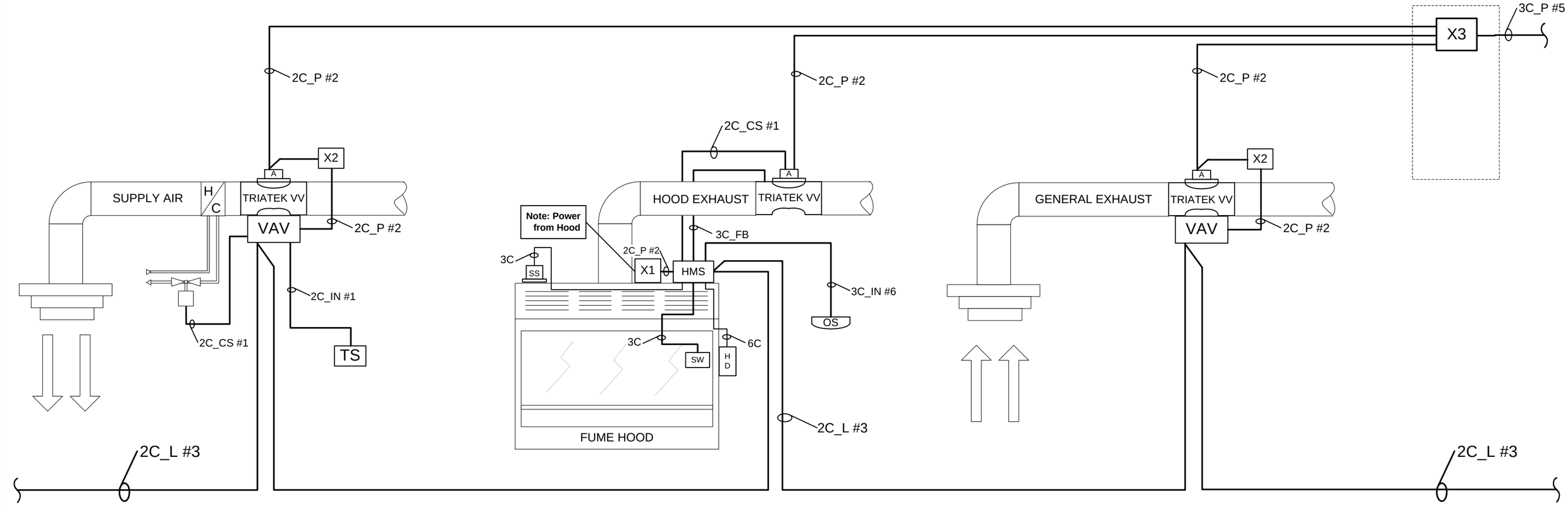
The Fume Hood Controller will modulate the Fume Hood's exhaust air valve to maintain the desired face velocity set point. The System's speed of response to sash movement will provide adequate containment of hazardous fumes. Alarms will be enabled whenever the face velocity set point can not be achieved by the exhaust system, or whenever face velocity rises above the high alarm limit. Audible and visual alarms will be provided locally. The controller can be connected to the Building Automation System via LON 'FTT' communication network interface to provide remote monitoring / setpoint adjust. Emergency purge operation is via the 'MAX FLOW' touch-pad button. The Fume Hood's Exhaust valve maximum position will be equal to the Fume Hood's high CFM limit.

VAV Supply, General Exhaust, and Fume Hood Exhaust

The Lab Flow Controller will modulate the general exhaust air valve and/or the supply air valve, and the reheat coil valve to maintain the room's desired CFM offset setpoint, satisfy room cooling/heating load, and maintain minimum supply air without exhausting excess air. The System's speed of response to Fume Hood exhaust requirements will provide adequate containment of Room air. The controller can be connected to the Building Automation System via LON 'FTT' communication network interface to provide remote monitoring / setpoint adjustment.

FAIL-SAFE MODE

All exhaust valves will fail to the full open position upon loss of power to either the controller or actuator, or loss of analog control signal from the controller to the actuator. All supply valves will fail to its minimum position upon loss of power to the controller or actuator, or loss of analog control signal from the controller to the actuator.



CABLE LEGEND
#1. 1 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#2. 2 Conductor, #18 AWG, THHN, Stranded Copper (24vac power)
#3. 1 Pair, #22 AWG, Belden 85102 Recommended
#4. 2 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#5. 3 Conductors (120vac power)

SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller
- H D — HMS Display
- Hot Water Control Valve
- VAV — Triatek Controller
- SS — Sash Position Sensor
- SW — Sidewall Sensor
- TS — Temperature Sensor
- FS — Triatek Flow Sensor
- F M S — FMS Pressure Monitor
- RAS — Triatek Remote Access Server
- TR — Triatek Router
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA By Others
- xC — Cable Factory Provided
- xC_L — Triatek Control Network Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per Subnet

ACKNOWLEDGEMENTS

REVISIONS		
SYM	DATE	APP'D

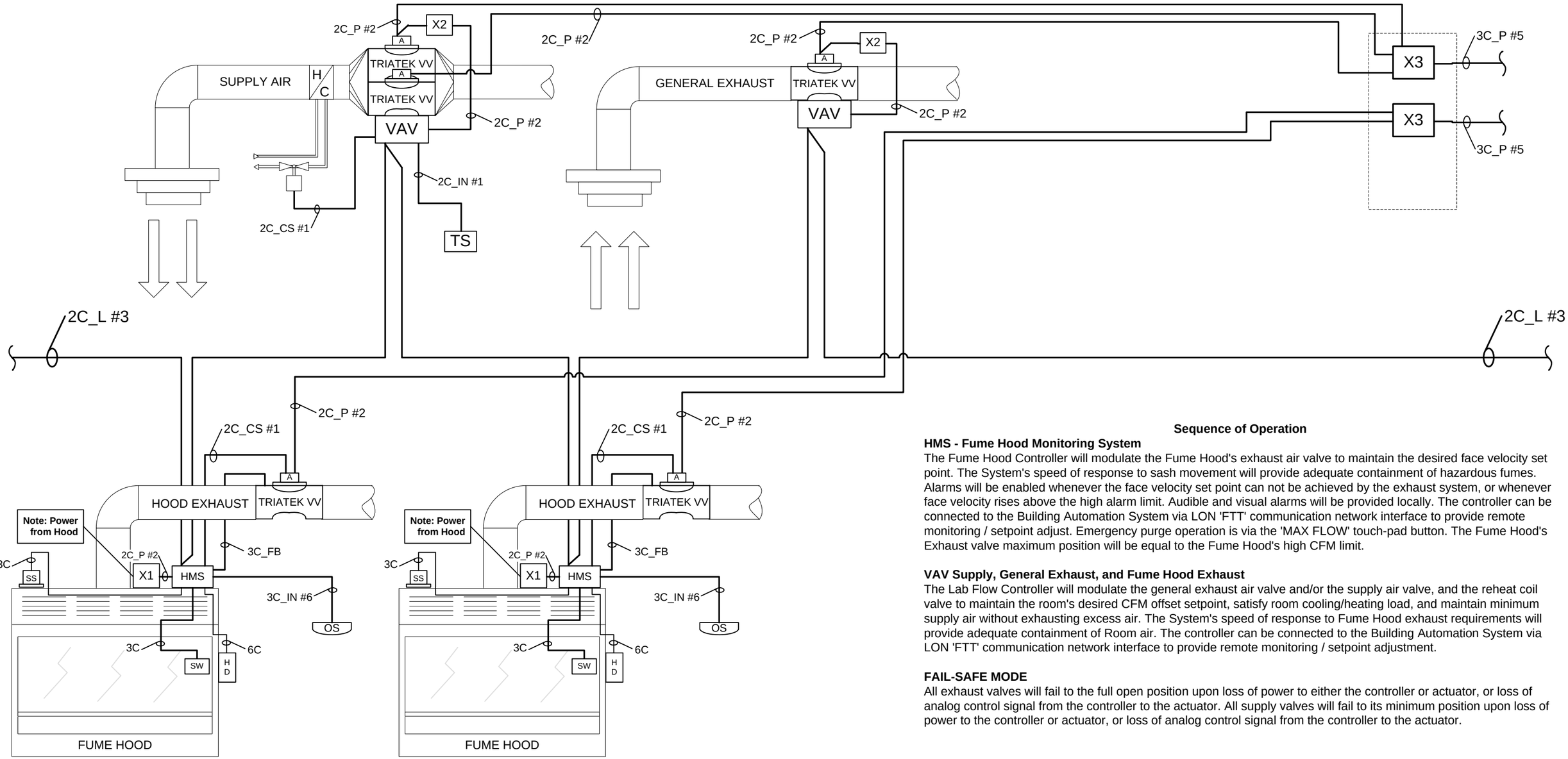
DATE: 06/03/04
SCALE: None
DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER: EarlWalls Associates

PROJECT: Single Supply, General Exhaust & Hood Typical

DWG NO.: T4



CABLE LEGEND
#1. 1 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#2. 2 Conductor, #18 AWG, THHN, Stranded Copper (24vac power)
#3. 1 Pair, #22 AWG, Belden 85102 Recommended
#4. 2 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#5. 3 Conductors (120vac power)
#6. 3 Conductor, #18 AWG, THHN, Stranded Copper (24VDC power/input)

Sequence of Operation

HMS - Fume Hood Monitoring System
The Fume Hood Controller will modulate the Fume Hood's exhaust air valve to maintain the desired face velocity set point. The System's speed of response to sash movement will provide adequate containment of hazardous fumes. Alarms will be enabled whenever the face velocity set point can not be achieved by the exhaust system, or whenever face velocity rises above the high alarm limit. Audible and visual alarms will be provided locally. The controller can be connected to the Building Automation System via LON 'FTT' communication network interface to provide remote monitoring / setpoint adjust. Emergency purge operation is via the 'MAX FLOW' touch-pad button. The Fume Hood's Exhaust valve maximum position will be equal to the Fume Hood's high CFM limit.

VAV Supply, General Exhaust, and Fume Hood Exhaust
The Lab Flow Controller will modulate the general exhaust air valve and/or the supply air valve, and the reheat coil valve to maintain the room's desired CFM offset setpoint, satisfy room cooling/heating load, and maintain minimum supply air without exhausting excess air. The System's speed of response to Fume Hood exhaust requirements will provide adequate containment of Room air. The controller can be connected to the Building Automation System via LON 'FTT' communication network interface to provide remote monitoring / setpoint adjustment.

FAIL-SAFE MODE
All exhaust valves will fail to the full open position upon loss of power to either the controller or actuator, or loss of analog control signal from the controller to the actuator. All supply valves will fail to its minimum position upon loss of power to the controller or actuator, or loss of analog control signal from the controller to the actuator.

SYMBOL KEY

- A — Actuator ACT-FA-8001
- VAV — Triatek Controller
- FS — Triatek Flow Sensor
- HMS — HMS Controller
- SS — Sash Position Sensor
- OS — Occupancy Sensor
- H D — HMS Display
- SW — Sidewall Sensor
- Hot Water Control Valve
- TS — Temperature Sensor
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA By Others
- xC — Cable Factory Provided
- xC_L — Triatek Control Network Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per LON Subnet

ACKNOWLEDGEMENTS

REVISIONS		
SYM	DATE	APP'D

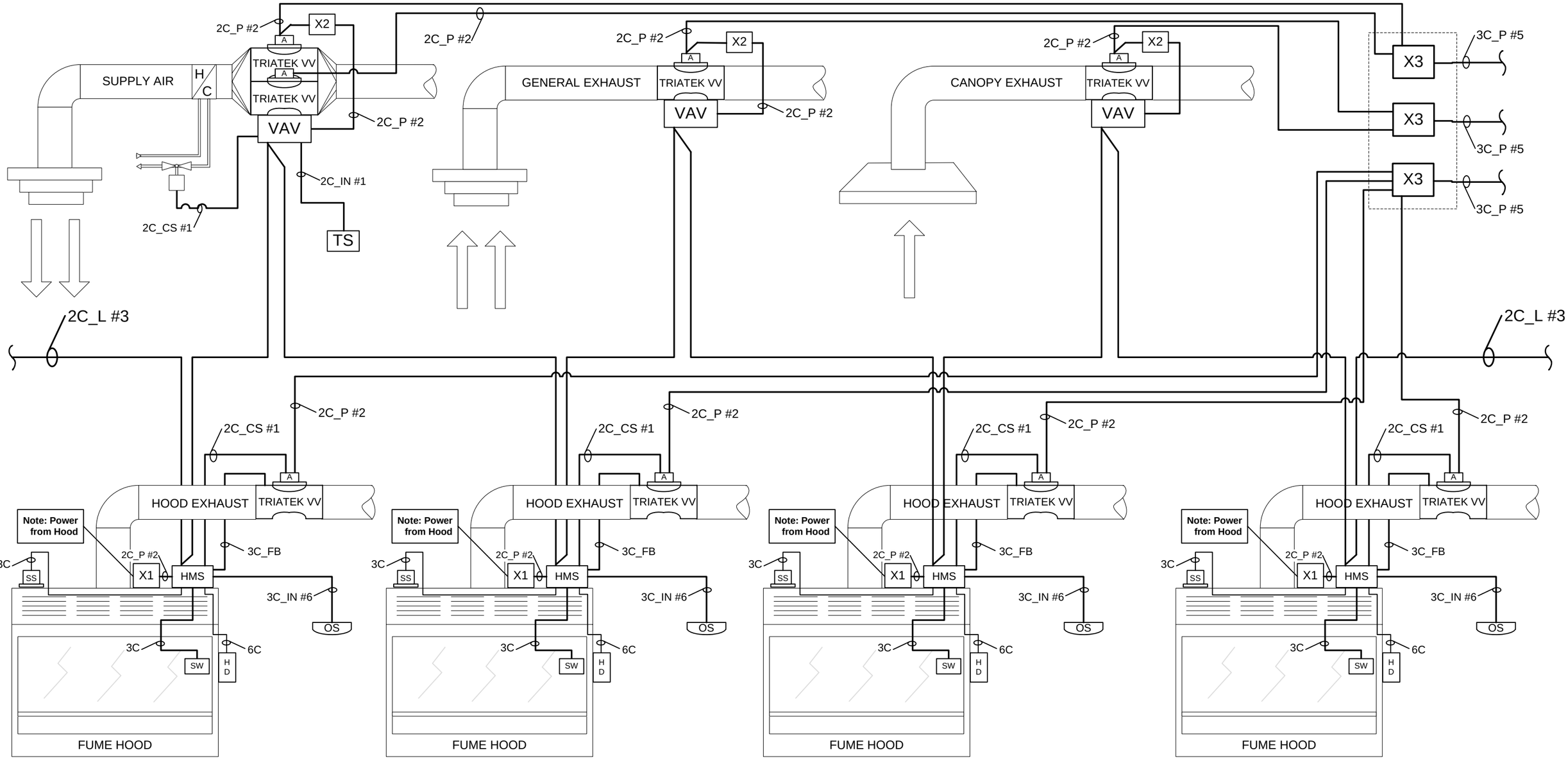
DATE: 10/06/2005
SCALE: None
DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER: NA

PROJECT: Single Supply, General Exhaust & 2 Hood Typical

DWG NO.: T5



CABLE LEGEND
#1. 1 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#2. 2 Conductor, #18 AWG, THHN, Stranded Copper (24vac power)
#3. 1 Pair, #22 AWG, Belden 85102 Recommended
#4. 2 Pair, #20 AWG, Twisted/Shield, Tinned/Stranded Copper (Low Voltage)
#5. 3 Conductors (120vac power)
#6. 3 Conductor, #18 AWG, THHN, Stranded Copper (24VDC power/input)

SYMBOL KEY

- A — Actuator ACT-FA-8001
- VAV — Triatek Controller
- FS — Triatek Flow Sensor
- HMS — HMS Controller
- SS — Sash Position Sensor
- OS — Occupancy Sensor
- H D — HMS Display
- SW — Sidewall Sensor
- Hot Water Control Valve
- TS — Temperature Sensor
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA By Others
- xC — Cable Factory Provided
- xC_L — Triatek Control Network Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

1. See Power Distribution Detail
2. Connect maximum of 60 controllers per LON Subnet

ACKNOWLEDGEMENTS

REVISIONS

SYM	DATE	APP'D

DATE: 10/06/2005
SCALE: None
DRAWN BY: GDW

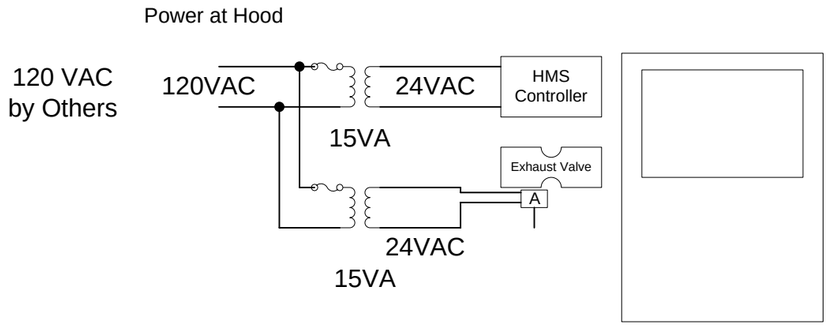
ENGINEER: NA

PROJECT: Single Supply, General Exhaust, Canopy & 4 Hood Typical

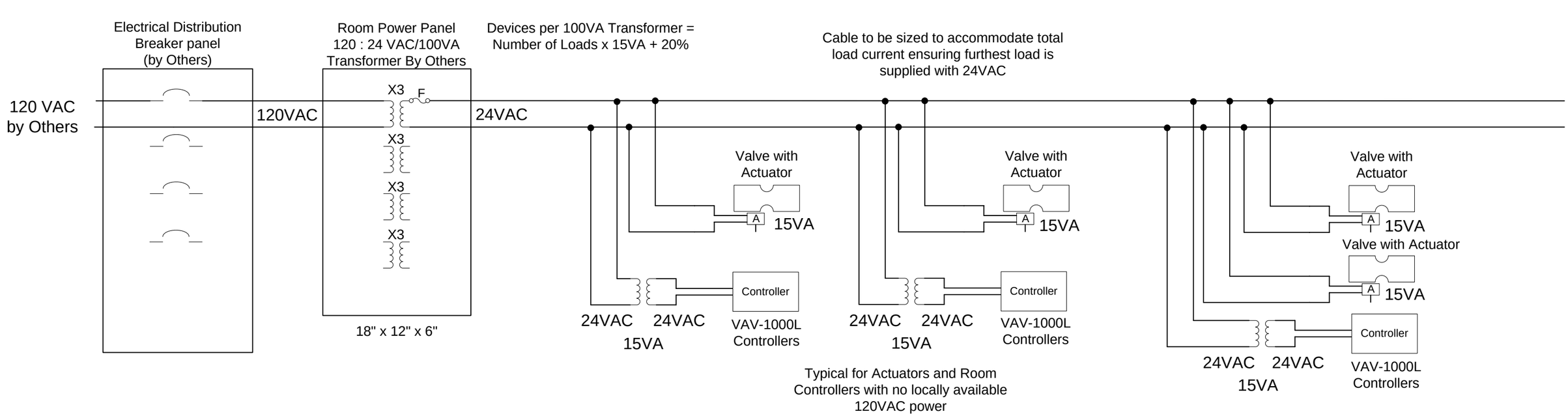
DWG NO.: T6

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

Power Distribution for Triatek HMS1600L, VAV-1000L and Actuators



Typical for HMS Controller with 120VAC available locally



SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller LON
- H D — HMS Display
- Hot Water Control Valve
- VAV — Triatek LON Controller
- SS — Sash Position Sensor
- SW — Sidewall Sensor
- TS — Temperature Sensor
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA By Others
- xC — Cable Factory Provided
- xC_L — LON Network FTT-10 Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

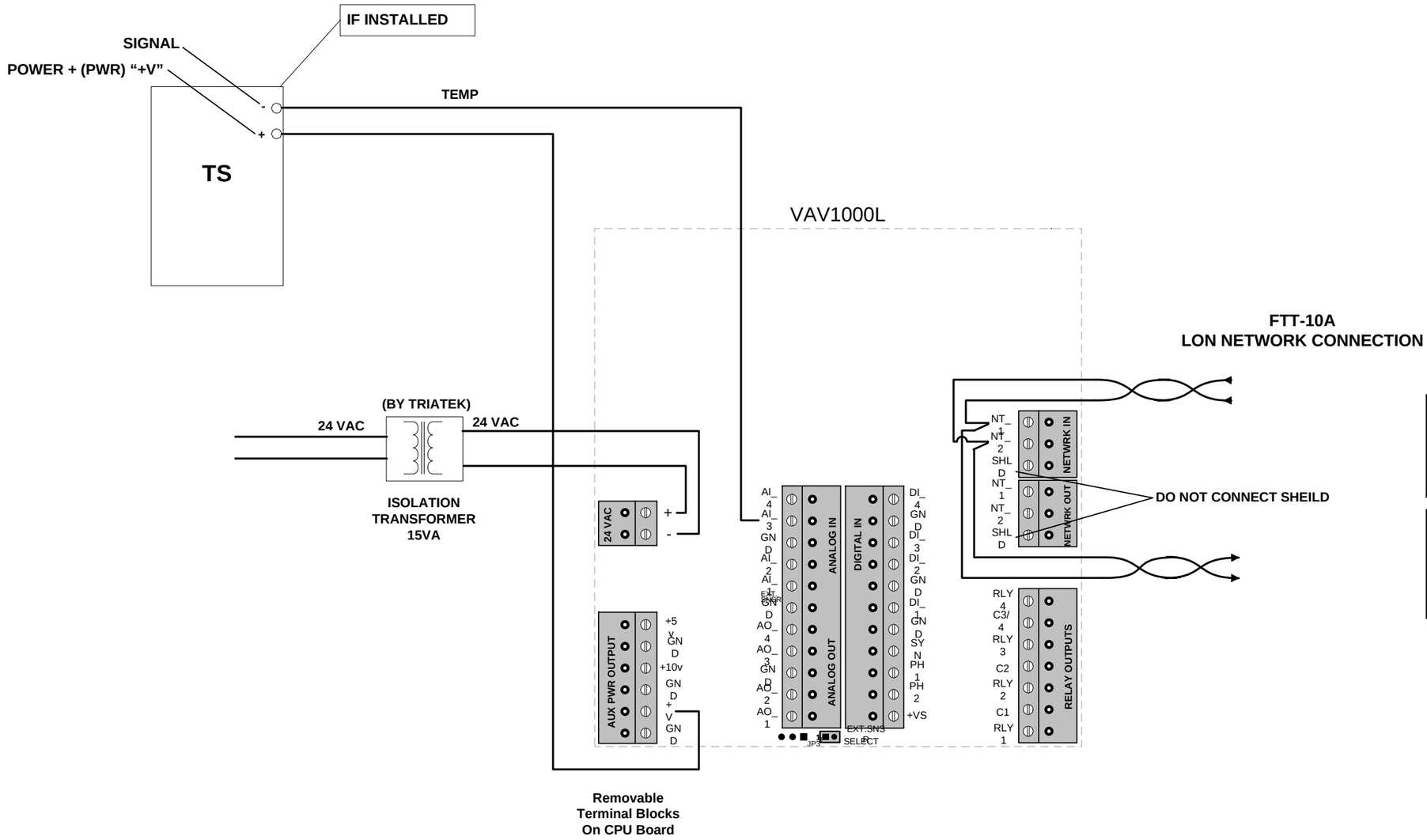
NOTES

ACKNOWLEDGEMENTS

REVISIONS			DATE: 06/03/04
SYM	DATE	APP'D	SCALE: None
			DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER	PROJECT:	DWG NO.: D1
NA	POWER DISTRIBUTION DETAIL	Page: 11 of 17



FTT-10A
LON NETWORK CONNECTION

Cable Specifications

Doubly-Terminated Bus Topology Specifications		
Cable Type	**Maximum bus length**	**Units**
Belden 85102	2700	Meters
Belden 8471	2700	Meters
Level IV, 22AWG	1400	Meters
JY(St) Y 2x2x0.8	900	Meters
TIA Category 5	900	Meters

Free Topology Specifications			
Cable Type	**Maximum node-to-node distance**	**Maximum total Wire length**	**Units**
Belden 85102	500	500	Meters
Belden 8471	400	500	Meters
Level IV, 22AWG	400	500	Meters
JY(St) Y 2x2x0.8	320	500	Meters
TIA Category 5	250	450	Meters

Refer to www.lonmark.org for more details.

SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller LON
- H D — HMS Display
- Hot Water Control Valve By Others
- VAV — Triatek LON Controller
- SS — Triatek Sash Sensor
- SW — Triatek Sidewall Sensor
- TS — Triatek Temp. Sensor with Override
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA Provided
- xC — Cable Factory Provided
- xC_L — LON Network FTT-10 Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

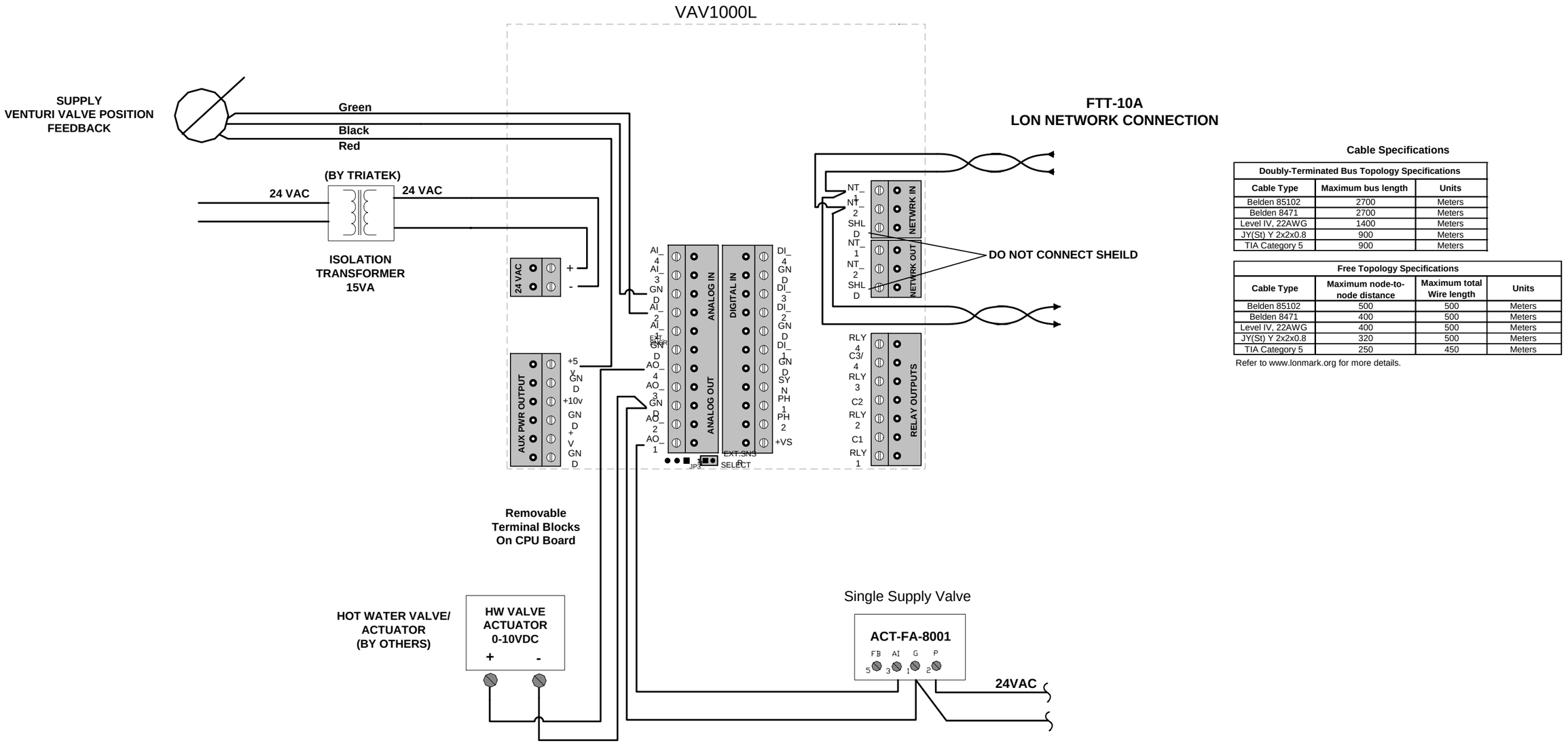
NOTES

ACKNOWLEDGEMENTS

REVISIONS			DATE: 12/14/04
SYM	DATE	APP'D	SCALE: None
			DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER	PROJECT:	DWG NO.: D2
NA	VAV1000L Power, Temp. Sensor & Network Detail	Page: 12 of 17



Cable Specifications

Doubly-Terminated Bus Topology Specifications		
Cable Type	**Maximum bus length**	**Units**
Belden 85102	2700	Meters
Belden 8471	2700	Meters
Level IV, 22AWG	1400	Meters
JY(St) Y 2x2x0.8	900	Meters
TIA Category 5	900	Meters

Free Topology Specifications			
Cable Type	**Maximum node-to-node distance**	**Maximum total Wire length**	**Units**
Belden 85102	500	500	Meters
Belden 8471	400	500	Meters
Level IV, 22AWG	400	500	Meters
JY(St) Y 2x2x0.8	320	500	Meters
TIA Category 5	250	450	Meters

Refer to www.lonmark.org for more details.

SYMBOL KEY

A	Actuator ACT-FA-8001	VAV	Triatek LON Controller	X1	Step-Down Isolation Transformer 120 to 24 VAC Provided
HMS	HMS Controller LON	SS	Triatek Sash Sensor	X2	Isolation Transformer 24 to 24 VAC Provided
HD	HMS Display	SW	Triatek Sidewall Sensor	X3	Step-Down Transformer 120 to 24 VAC 100VA Provided
	Hot Water Control Valve By Others	TS	Triatek Temp. Sensor with Override	xC	Cable Factory Provided

xC_L	LON Network FTT-10 Provided By Others x = # of Conductors
xC_P	Power Wiring Provided By Others x = # of Conductors
xC_CS	Control Wiring Provided By Others x = # of Conductors
xC_IN	Input Wiring Provided by Other x = # of Conductors

NOTES

ACKNOWLEDGEMENTS

REVISIONS

SYM	DATE	APP'D

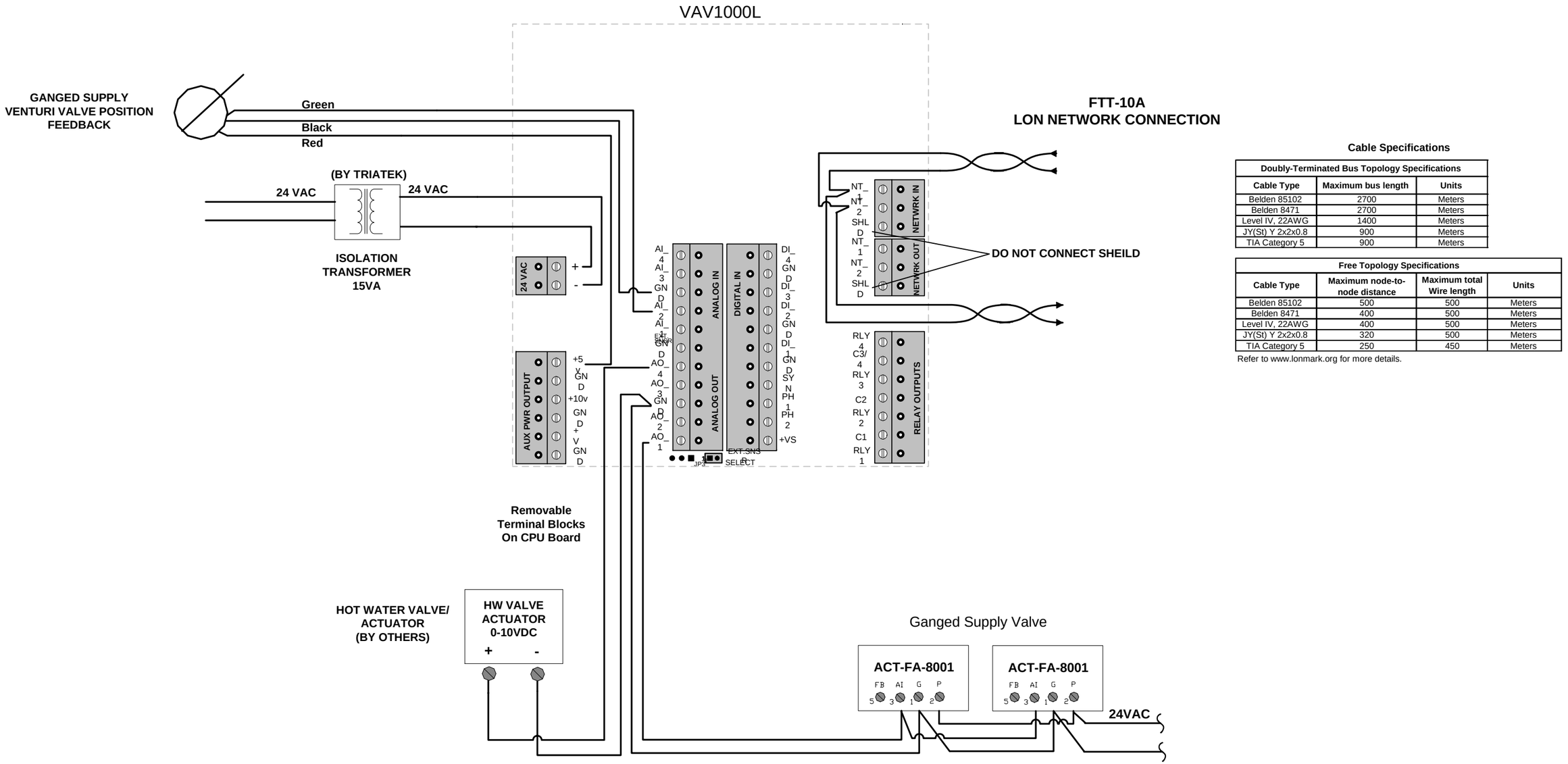
DATE: 12/14/04
SCALE: None
DRAWN BY: GDW

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944

ENGINEER: NA

PROJECT: Single Supply Valve Typical
VAV1000L Power, Flow Sensor, ACT & Network Detail

DWG NO.: D3



Cable Specifications

Doubly-Terminated Bus Topology Specifications		
Cable Type	**Maximum bus length**	**Units**
Belden 85102	2700	Meters
Belden 8471	2700	Meters
Level IV, 22AWG	1400	Meters
JY(St) Y 2x2x0.8	900	Meters
TIA Category 5	900	Meters

Free Topology Specifications			
Cable Type	**Maximum node-to-node distance**	**Maximum total Wire length**	**Units**
Belden 85102	500	500	Meters
Belden 8471	400	500	Meters
Level IV, 22AWG	400	500	Meters
JY(St) Y 2x2x0.8	320	500	Meters
TIA Category 5	250	450	Meters

Refer to www.lonmark.org for more details.

SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller LON
- HD — HMS Display
- Hot Water Control Valve By Others
- VAV — Triatek LON Controller
- SS — Triatek Sash Sensor
- SW — Triatek Sidewall Sensor
- TS — Triatek Temp. Sensor with Override
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA Provided
- xC — Cable Factory Provided
- xC_L — LON Network FTT-10 Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

ACKNOWLEDGEMENTS

REVISIONS

SYM	DATE	APP'D

DATE: 12/14/04
SCALE: None
DRAWN BY: GDW

ENGINEER: NA

PROJECT: Ganged Supply Valve Typical
VAV1000L Power, Flow Sensor, ACT & Network Detail

DWG NO.: D4

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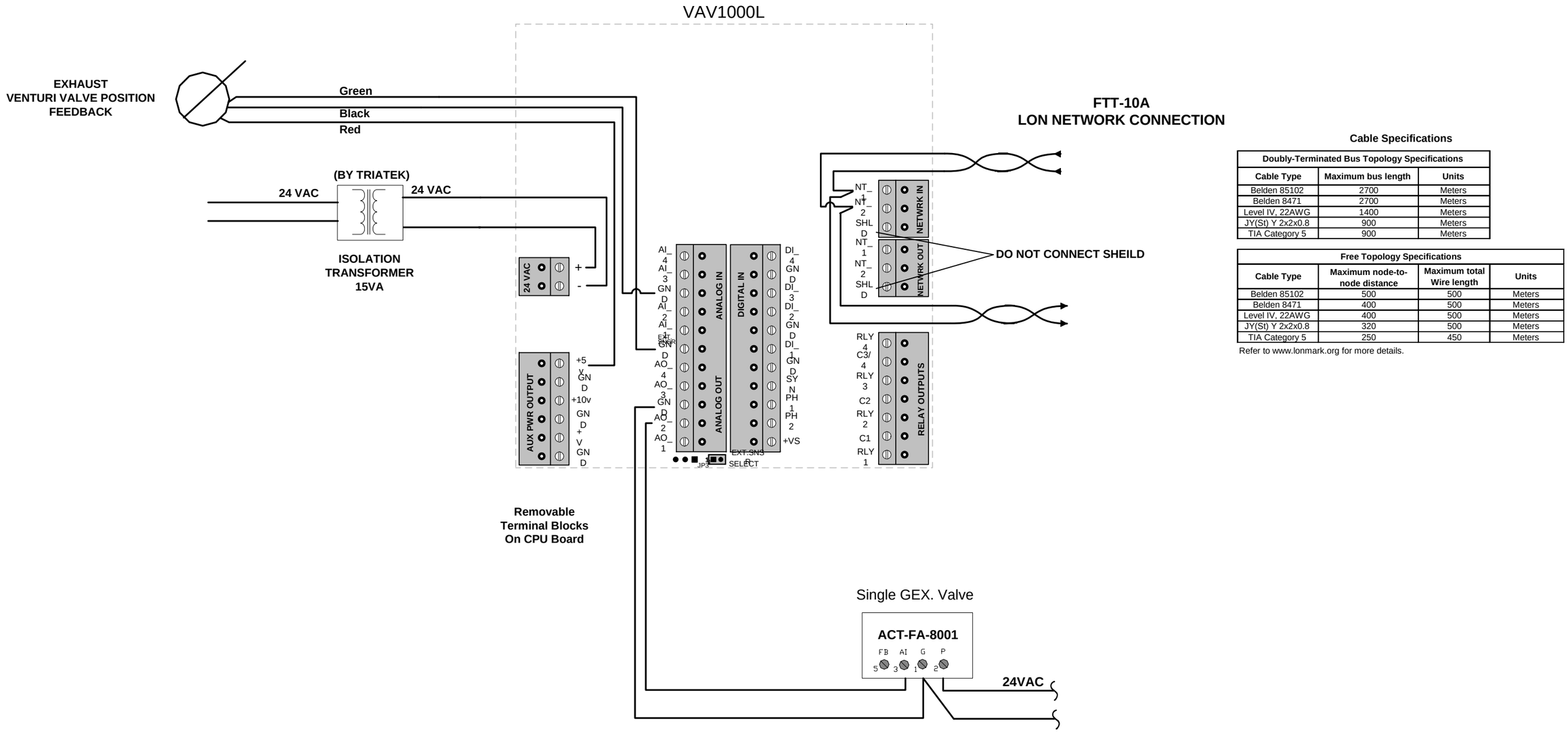
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944



Cable Specifications

Doubly-Terminated Bus Topology Specifications		
Cable Type	**Maximum bus length**	**Units**
Belden 85102	2700	Meters
Belden 8471	2700	Meters
Level IV, 22AWG	1400	Meters
JY(St) Y 2x2x0.8	900	Meters
TIA Category 5	900	Meters

Free Topology Specifications			
Cable Type	**Maximum node-to-node distance**	**Maximum total Wire length**	**Units**
Belden 85102	500	500	Meters
Belden 8471	400	500	Meters
Level IV, 22AWG	400	500	Meters
JY(St) Y 2x2x0.8	320	500	Meters
TIA Category 5	250	450	Meters

Refer to www.lonmark.org for more details.

SYMBOL KEY

- A — Actuator ACT-FA-8001
- HMS — HMS Controller LON
- HD — HMS Display
- Hot Water Control Valve By Others
- VAV — Triatek LON Controller
- SS — Triatek Sash Sensor
- SW — Triatek Sidewall Sensor
- TS — Triatek Temp. Sensor with Override
- X1 — Step-Down Isolation Transformer 120 to 24 VAC Provided
- X2 — Isolation Transformer 24 to 24 VAC Provided
- X3 — Step-Down Transformer 120 to 24 VAC 100VA Provided
- xC — Cable Factory Provided
- xC_L — LON Network FTT-10 Provided By Others x = # of Conductors
- xC_P — Power Wiring Provided By Others x = # of Conductors
- xC_CS — Control Wiring Provided By Others x = # of Conductors
- xC_IN — Input Wiring Provided by Other x = # of Conductors

NOTES

ACKNOWLEDGEMENTS

REVISIONS

SYM	DATE	APP'D

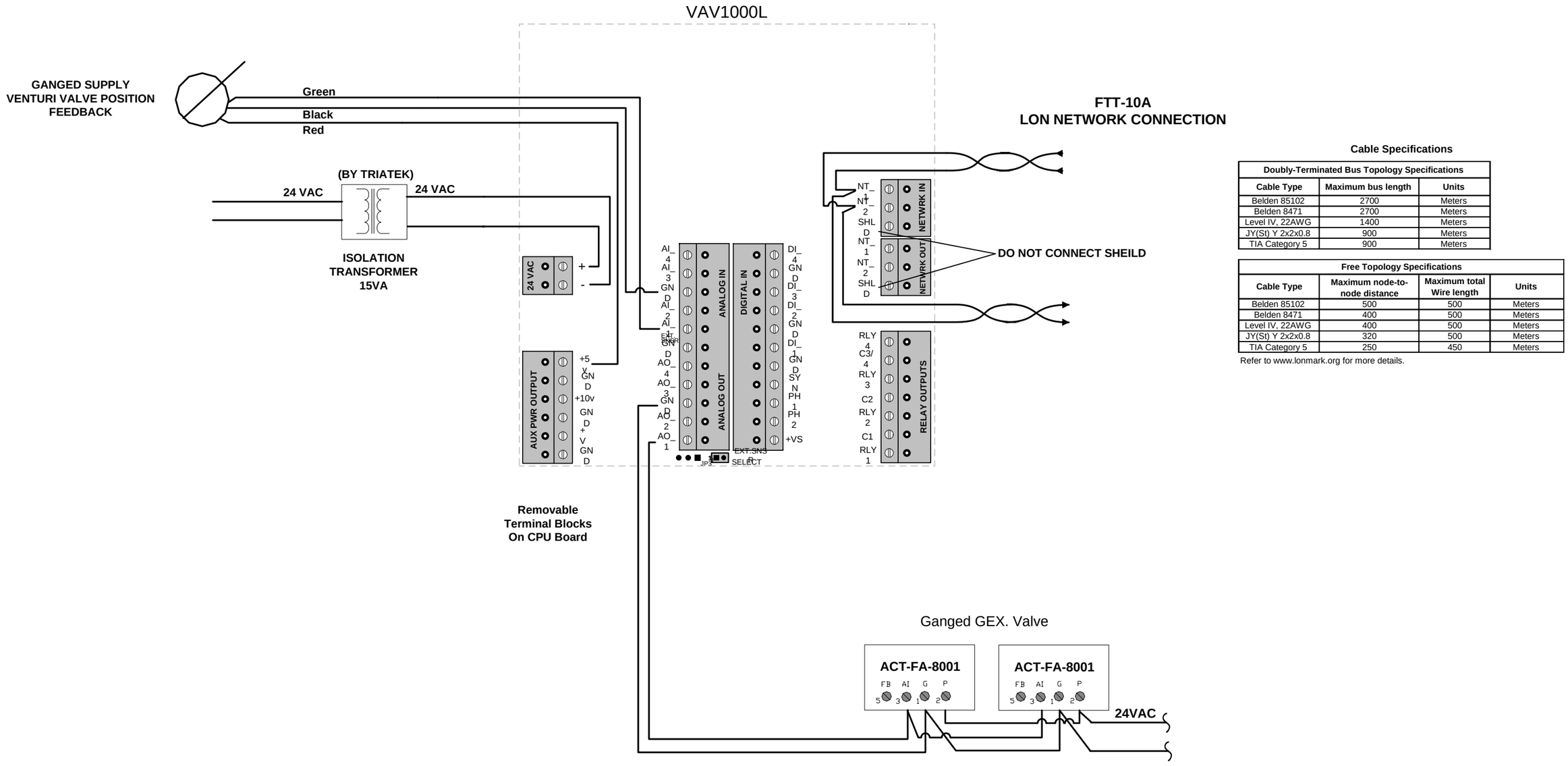
DATE: 12/14/04
SCALE: None
DRAWN BY: GDW

ENGINEER: NA

PROJECT: GEX. Valve
VAV1000L Power, Flow Sensor, ACT & Network Detail

DWG NO.: D5

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944



Cable Specifications

Doubly-Terminated Bus Topology Specifications		
Cable Type	**Maximum bus length**	**Units**
Belden 85102	2700	Meters
Belden 8471	2700	Meters
Level IV, 22AWG	1400	Meters
JY(St) Y 2x2x0.8	900	Meters
TIA Category 5	900	Meters

Free Topology Specifications			
Cable Type	**Maximum node-to-node distance**	**Maximum total Wire length**	**Units**
Belden 85102	500	500	Meters
Belden 8471	400	500	Meters
Level IV, 22AWG	400	500	Meters
JY(St) Y 2x2x0.8	320	500	Meters
TIA Category 5	250	450	Meters

Refer to www.lonmark.org for more details.

SYMBOL KEY

A	Actuator ACT-FA-8001	VAV	Triatek LON Controller	X1	Step-Down Isolation Transformer 120 to 24 VAC Provided
HMS	HMS Controller LON	SS	Triatek Sash Sensor	X2	Isolation Transformer 24 to 24 VAC Provided
HD	HMS Display	SW	Triatek Sidewall Sensor	X3	Step-Down Transformer 120 to 24 VAC 100VA Provided
	Hot Water Control Valve By Others	TS	Triatek Temp. Sensor with Override	xC	Cable Factory Provided

xC_L	LON Network FTT-10 Provided By Others x = # of Conductors
xC_P	Power Wiring Provided By Others x = # of Conductors
xC_CS	Control Wiring Provided By Others x = # of Conductors
xC_IN	Input Wiring Provided by Other x = # of Conductors

NOTES

ACKNOWLEDGEMENTS

REVISIONS

SYM	DATE	APP'D

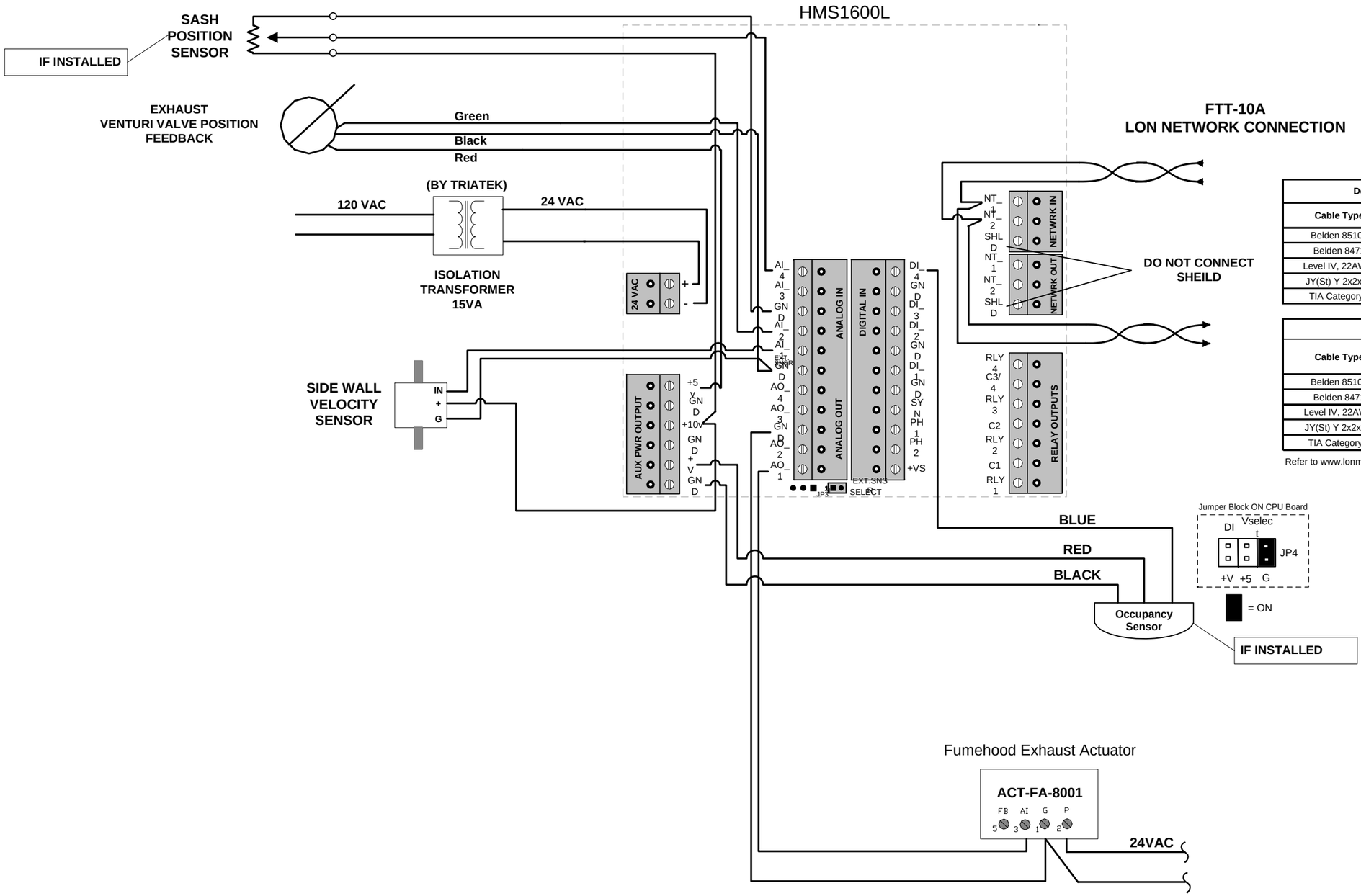
DATE: 12/14/04
SCALE: None
DRAWN BY: GDW

ENGINEER: NA

PROJECT: Ganged GEX. Valve Typical
VAV1000L Power, Flow Sensor, ACT & Network Detail

DWG NO.: D6

TRIATEK®
2976 PACIFIC DR. NORCROSS, GA 30071 TEL. 770-242-1922 FAX 770-242-1944



Cable Specifications

Doubly-Terminated Bus Topology Specifications		
Cable Type	**Maximum bus length**	**Units**
Belden 85102	2700	Meters
Belden 8471	2700	Meters
Level IV, 22AWG	1400	Meters
JY(St) Y 2x2x0.8	900	Meters
TIA Category 5	900	Meters

Free Topology Specifications			
Cable Type	**Maximum node-to-node distance**	**Maximum total Wire length**	**Units**
Belden 85102	500	500	Meters
Belden 8471	400	500	Meters
Level IV, 22AWG	400	500	Meters
JY(St) Y 2x2x0.8	320	500	Meters
TIA Category 5	250	450	Meters

Refer to www.lonmark.org for more details.

SYMBOL KEY

A	Actuator ACT-FA-8001	VAV	Triatek LON Controller	X1	Step-Down Isolation Transformer 120 to 24 VAC Provided
HMS	HMS Controller LON	SS	Triatek Sash Sensor	X2	Isolation Transformer 24 to 24 VAC Provided
H D	HMS Display	SW	Triatek Sidewall Sensor	X3	Step-Down Transformer 120 to 24 VAC 100VA Provided
	Hot Water Control Valve By Others	TS	Triatek Temp. Sensor with Override	xC	Cable Factory Provided

xC_L	LON Network FTT-10 Provided By Others x = # of Conductors
xC_P	Power Wiring Provided By Others x = # of Conductors
xC_CS	Control Wiring Provided By Others x = # of Conductors
xC_IN	Input Wiring Provided by Other x = # of Conductors

NOTES

ACKNOWLEDGEMENTS

REVISIONS			DATE: 12/14/04
SYM	DATE	APP'D	SCALE: None
			DRAWN BY: GDW

ENGINEER: NA

PROJECT: HMS1600L Detail

DWG NO.: D7

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