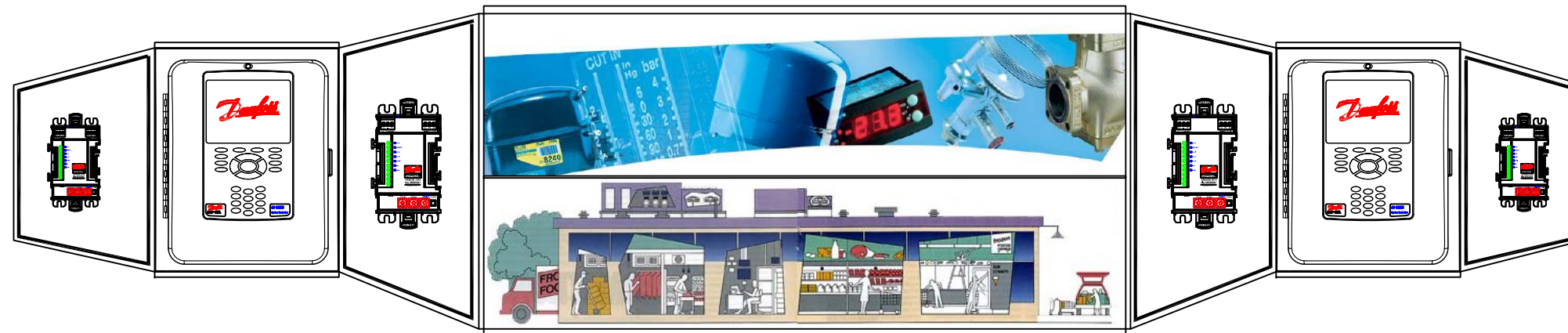




AIR-CONDITIONING & REFRIGERATION DIVISION

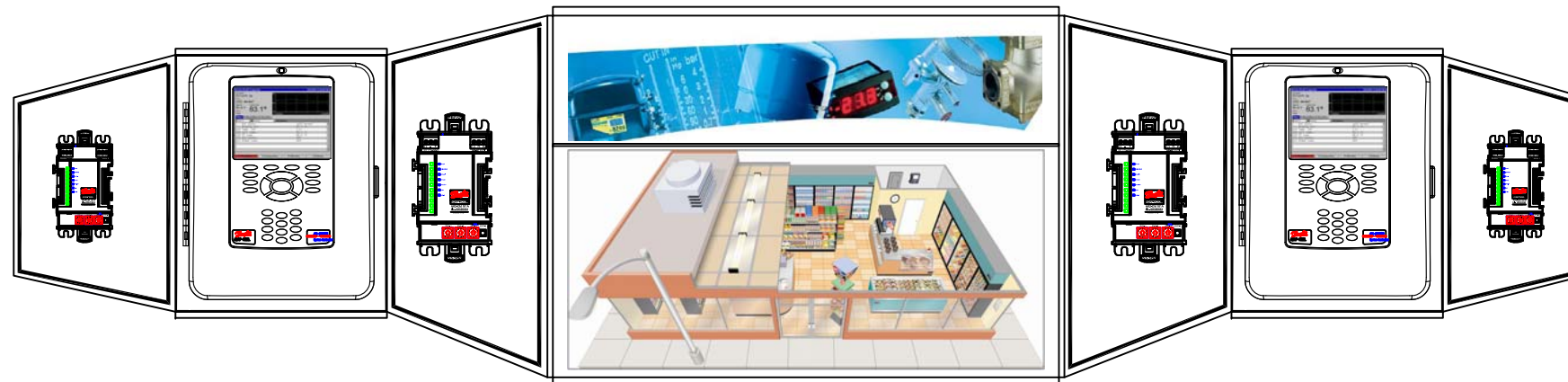
AK-SC255
SUPERMARKET CONTROL SYSTEM
TYPICAL INSTALLATION DETAILS
AND REFERENCE DOCUMENTATION





AIR-CONDITIONING & REFRIGERATION DIVISION

AK-CS
SMALL FACILITY CONTROL SYSTEM
TYPICAL INSTALLATION DETAILS
AND REFERENCE DOCUMENTATION



CONTROL SYSTEM TYPICAL INSTALLATION DETAILS AND REFERENCE DOCUMENTATION INDEX

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- A2 Alternate 255-255 COMM Configurations

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- B2 Typical Centralized Control System

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- C3 Typical AK2 AI Wiring (XM-101A)
- C4 AK2-XM107A Pulse Board / Installation Details
- C5 Dimmer Driver Module (AK2LBDD)
- C6 Variable Output Module / Basic overview (XM-103A)
- C7 AK2 Module Power Supply (080Z0055)
- C8 VO2 Legacy Module (080Z2170)

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- D3 IOPS Power Supply (080Z0052)
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- E3 RTU Zone Temperature Sensor (ZTP2)
- E4 Duct Supply Air Temperature Sensor (ASTP2)
- E5 RTU Temperature / Humidity Sensor (EMHS3-1)
- E6 Outside Temp Humidity And Light Level Sensors (AKCOTHP)
- E7 PHOTO-ID Sensor (Interior Light Level)
- E8 Typical Outdoor Light Sensor / Outdoor Temp Sensor Wiring (PHOTO-OD2)
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- I4 LonWorks Echelon TP78 to TP78 Bridge / Connection Details (084B2251)
- I5 LonWorks Echelon TP78 to FTT10 Bridge / Connection Details (084B2252)
- I6 LonWorks Echelon TP78 to RS-485 Bridge / Connection Details (084B2254)
- I7 TP78 to FTT10 Bridge (084B2252) / Munters Units Details
- I8 TP78 to FTT10 Bridge (084B2252) / Lennox Units Details
- I9 TP78 to FTT10 Bridge (084B2252) / Distech Controller Details
- I10 TP78 to FTT10 Bridge (084B2252) / EKC-316 Details
- I11 Rs232-485K Kit Connection Details
- I12 Cutler Hammer Panels / Lighting Control Wiring Details (CBGATE2)
- I13 50-Square-D Gateway Installation Details

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- J1 AK Small I/O Enclosure / Installation Details (AK2-IO8)
- J2 AK Large I/O Enclosure / Installation Details (AK2-IO16)
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- J4 AK Enclosure 12x24 w/combo bd. Overview Details (080Z2165)
- J5 AK Enclosure 12x24 w/combo bd. & stepper bd. Overview Details (080Z2166)

(K) Field Wiring

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- K2 Dual Temp Switches / Wiring Details
- K3 Typical Low Temp Condensing Unit Retrofit
- K4 Typical Medium Temp Condensing Unit Retrofit
- K5 Typical RTU Thermo-stat Wiring Interface Details
- K6 SmartStat Single-Stage RTU Controller Module / Typical Connections (080Z2180)
- K7 SmartStat Two-Stage RTU Controller Module / Typical Connections (080Z2181)

- Appendix-A Cable Specifications And Symbols Key
- Appendix-B AKS-11 Sensors Reference Table
- Appendix-C AKS32R Pressure Transducers Reference Table

THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.			
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON		TITLE	
PROJECT	NUMBER	Control System Typicals Index	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (X.00)	FRACTIONAL	DATE	DATE
+-.02	ANGULAR	9/28/2009	9/28/2009
+-.005	DIMENSIONS IN INCHES	DRAWING NO. X	
SCALE	n/a	SHEET 1 OF 1	

CONTROL SYSTEM TYPICAL INSTALLATION DETAILS AND REFERENCE DOCUMENTATION INDEX

(SMALL FACILITY)

(B) System Overview - Small Store

- B1 Typical Distributed Control System
- B2 Typical Centralized Control System

(C) System I/O Modules

- C1 Typical 255/AK2 Communications Module Wiring (CM-101A)
- C2 Typical AK2 8AI/8DO Wiring (XM-205B)
- C3 Typical AK2 AI Wiring (XM-101A)
- C4 AK2-XM107A Pulse Board / Installation Details
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- E10 Door Monitor Assembly (DRMON-1)

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- Appendix-A Cable Specifications And Symbols Key
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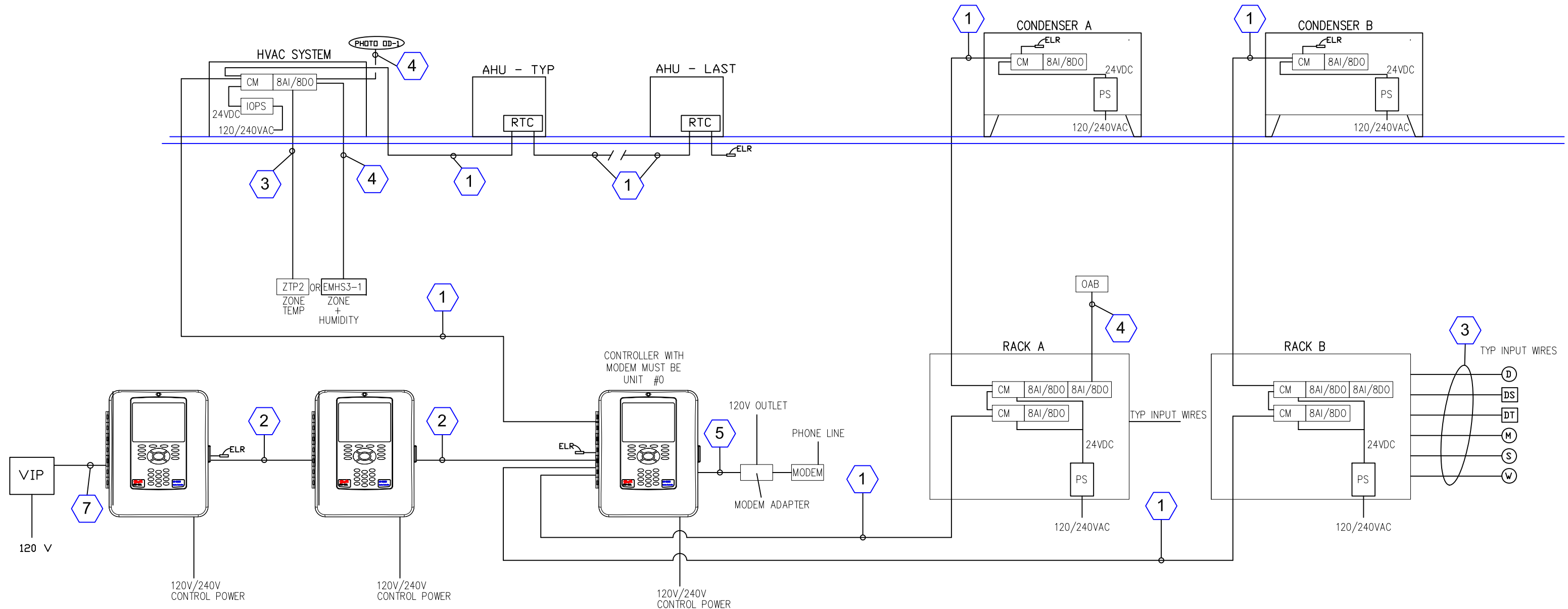
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Danfoss

DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD.
21236-4925

USED ON		TITLE	
PROJECT	NUMBER		
		Small Facility Control System Typicals Index	
TOLERANCES (EXCEPT AS NOTED)		DRAWN	CHKD
DECIMAL (XXX)	FRACTIONAL	DATE	R.M.
±.02		9/28/2009	
DECIMAL (XXX)	ANGULAR	DATE	DATE
±.005		9/28/2009	9/28/2009
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE nts		X	1 OF 1

(Danfoss Control Network Overview)



SYMBOL KEY

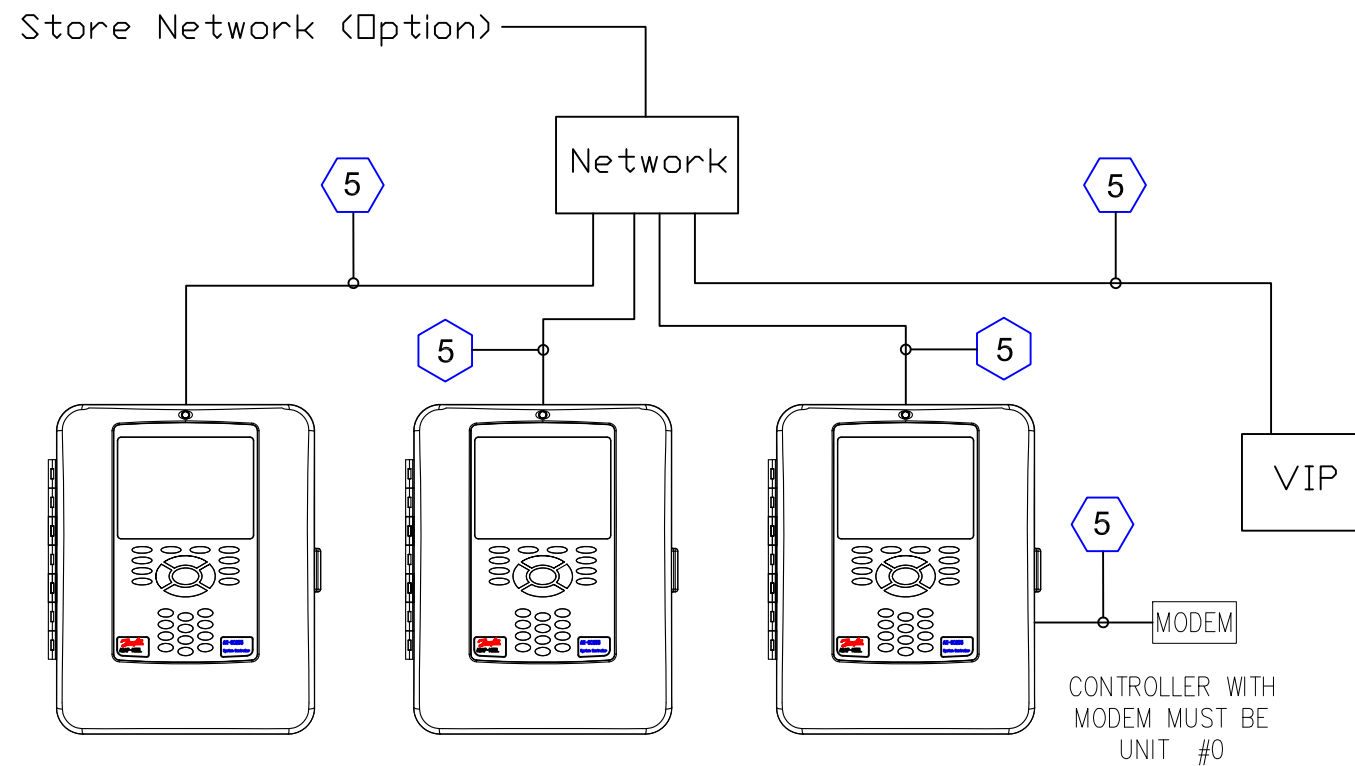
(D)	DISCHARGE AIR SENSOR	(PS)	24VDC POWER SUPPLY	(CM)	Communications Module
(DS)	DOOR SWITCH	(OAB)	OFFICE ALARM BOX	(VIP)	Visual Interface Program (PC)
(DT)	DEFROST TERMINATION	(PHOTO OD-1)	PHOTOCELL/OUTDOOR AIR TEMPERATURE SENSOR	(MODEM)	Telephone Communications Modem
ELR	END OF LINE RESISTOR FOR I/O LOOP OR RS-485 HOST COMM. MOUNT INSIDE CONTROL ENCLOSURE	(RTC)	ROOFTOP CONTROLLER ENCLOSURE (RCE)	(X)	= Refer to Appendix-A (Cable Specifications)
(EMHS3-1)	TEMPERATURE / HUMIDITY SENSOR	(S)	REFRIGERATED AIR TEMPERATURE SENSOR, MOUNTED IN CASE/COOLER/FREEZER		
(M)	MECHANICAL ROOM TEMPERATURE SENSOR (ZTP2)	(W)	HOT WATER TEMPERATURE SENSOR (PT1000)		
		(ZTP2)	ZONE SENSOR, MOUNTED ON SALES FLOOR (ZTP2)		

NOTE: This drawing is intended to show the logical, rather than physical, relationship of components.

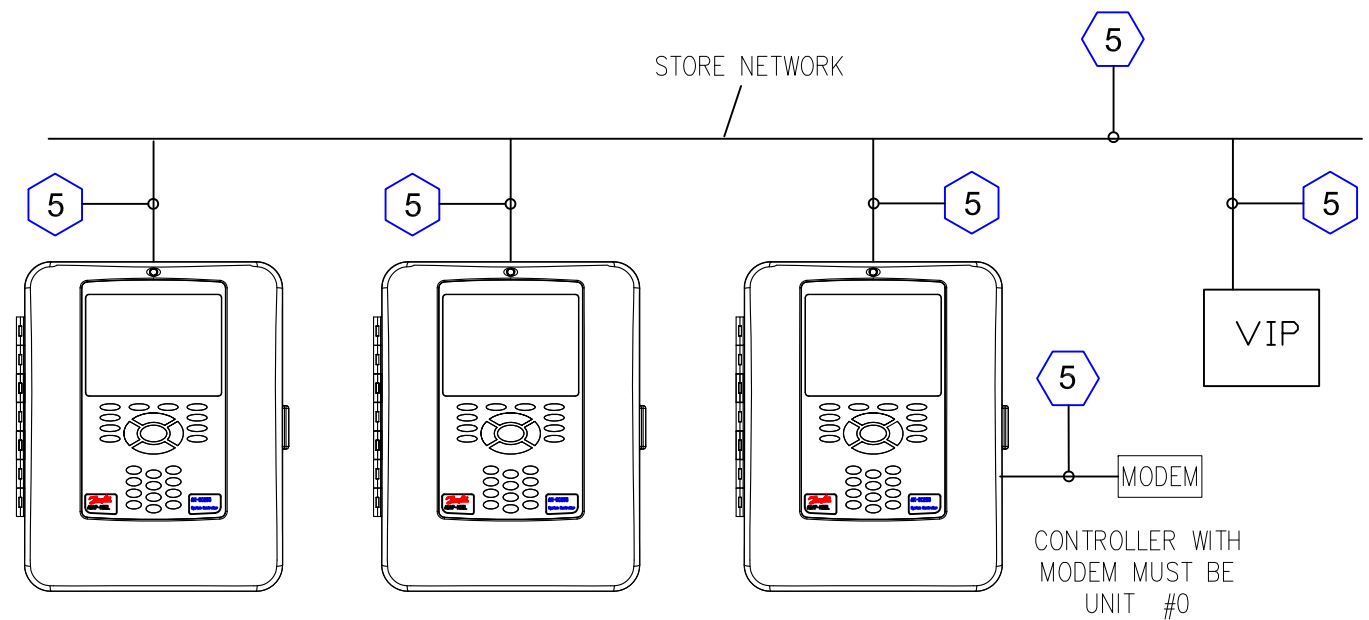
CUSTOMER DETERMINES WHO PROVIDES EQUIPMENT AND CABLES

THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.			
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER		Danfoss Control Network Overview (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE
DECIMAL (LSD)	FRACTIONAL	DATE	DATE
+-.02	ANGULAR	6/23/08	6/23/08
+-.005			
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE	nts	A1	1 OF 1

(Alternate 255-255 COMM Configurations)



ALTERNATE 255-255 COMM CONFIGURATION – SETUP ON OWN NETWORK



ALTERNATE 255-255 COMM CONFIGURATION – USING CUSTOMER NETWORK

SYMBOL KEY

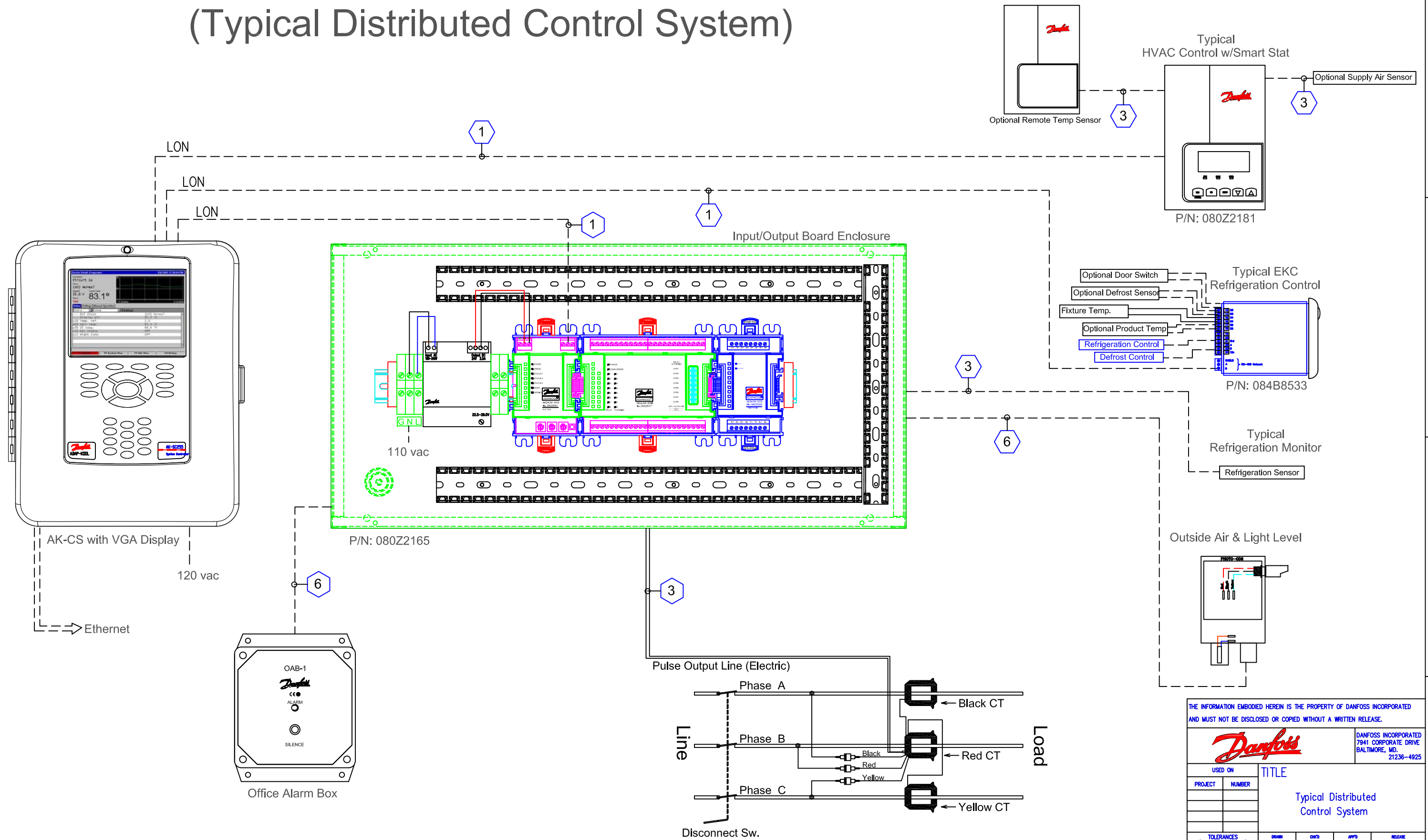
(D)	DISCHARGE AIR SENSOR	PS	24VDC POWER SUPPLY	CM	Communications Module
(DS)	DOOR SWITCH	OAB	OFFICE ALARM BOX	VIP	Visual Interface Program (PC)
(DT)	DEFROST TERMINATION	(PHOTO DD-1)	PHOTOCELL/OUTDOOR AIR TEMPERATURE SENSOR	MODEM	Telephone Communications Modem
ELR	END OF LINE RESISTOR FOR I/O LOOP OR RS-485 HOST COMM. MOUNT INSIDE CONTROL ENCLOSURE	(RTC)	ROOFTOP CONTROLLER ENCLOSURE (RCE)	(X)	= Refer to Appendix-A (Cable Specifications)
(EMHS3-1)	TEMPERATURE / HUMIDITY SENSOR	(S)	REFRIGERATED AIR TEMPERATURE SENSOR, MOUNTED IN CASE/COOLER/FREEZER		
(M)	MECHANICAL ROOM TEMPERATURE SENSOR (ZTP2)	(W)	HOT WATER TEMPERATURE SENSOR (PT1000)		
		(ZTP2)	ZONE SENSOR, MOUNTED ON SALES FLOOR (ZTP2)		

NOTE: This drawing is intended to show the logical, rather than physical, relationship of components.

THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.			
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Danfoss Alternate 255-255 COMM Configuration (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (LSD)	FRACTIONAL	DATE	DATE
+-.02		6/23/08	6/23/08
DECIMAL (LSD)	ANGULAR	DRAWING NO. A2	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES			
SCALE	nts		

CUSTOMER DETERMINES WHO PROVIDES EQUIPMENT AND CABLES

(Typical Distributed Control System)

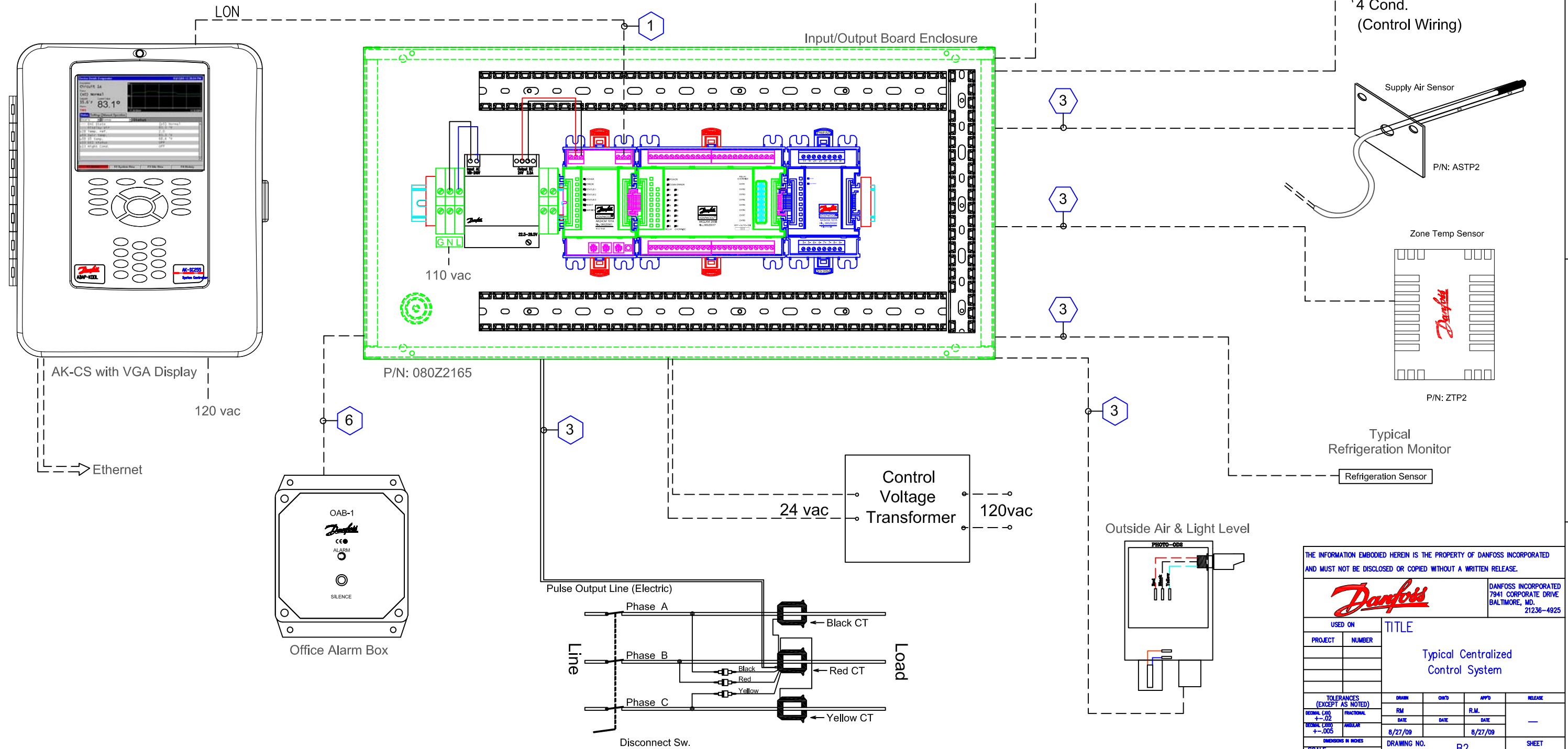


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Danfoss DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD. 21236-4925

USED ON		TITLE	
PROJECT	NUMBER		
		Typical Distributed Control System	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (1:50)	FRACTIONAL	DATE	DATE
+-.02		8/27/09	8/27/09
DECIMAL (1:20)	ANGULAR		
+-.005			
DIMENSIONS IN INCHES			
SCALE	DRAWING NO.		SHEET
nts	B1		1 OF 1

(Typical Centralized Control System)



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7941 CORPORATE DRIVE
BALTIMORE, MD. 21236-4925

USED ON		TITLE	
PROJECT	NUMBER		
		Typical Centralized Control System	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (LSD)	FRACTIONAL	DATE	DATE
+/- .02		8/27/09	8/27/09
DECIMAL (LSD)	ANGULAR		
+/- .005			
DIMENSIONS IN INCHES			
SCALE		DRAWING NO.	SHEET
nts		B2	1 OF 1

(Typical 255/AK2 Communications Module Wiring)

NOTES:

1. INSTALL ENCLOSURE ON A VIBRATION FREE SURFACE, MARK HOLE LOCATIONS. USE APPROPRIATE HARDWARE FOR MOUNTING TO STRUCTURE.
2. FOLLOW ALL NATIONAL AND LOCAL ELECTRICAL CODES WHEN INSTALLING.
3. DO NOT INTERMINGLE OR ROUTE CLASS 1 AND CLASS 2 WIRING TOGETHER. A MINIMUM SPACING OF 1/4 INCH IS REQUIRED.
4. USE COPPER CONDUCTORS ONLY.
5. MAXIMUM ALLOWABLE AMBIENT AIR TEMPERATURE IS 50 DEG C / 122 F.
6. REPLACE FUSES WITH EQUAL VALUE AND TYPE ONLY.
7. FOR CONNECTION TO UL LISTED MODEM, LAN, OR DATA PORT ONLY.
8. EARTH GROUND REQUIRED.
9. UL LISTED, FILE # E166834.

Ensure jumpers (located on Base board), JP3 & JP4 are ON if Modbus is to be used. Ensure Termination at Modbus last device on network. See "On Site Installation Guide" for further details.

ON = Modbus
OFF = RS485

SHIELD CONNECTION: OBSERVE RULES FOR NETWORK TYPE

ECHOLON NETWORK: FOLLOW CABLE SPECIFICATIONS IN THE MANUAL.

ECHOLON COMMUNICATIONS: CONNECT TO NEXT NODE

GROUND 24 VDC } 24 VDC AND GROUND: CONNECT TO NEXT NODE
24 VDC

PLACE A NETWORK TERMINATOR AS SHOWN IF THIS COMMUNICATIONS MODULE IS THE LAST ONE ON THE NETWORK

External Modem Port Requires cable supplied by Danfoss (P/N: 95-108-12)

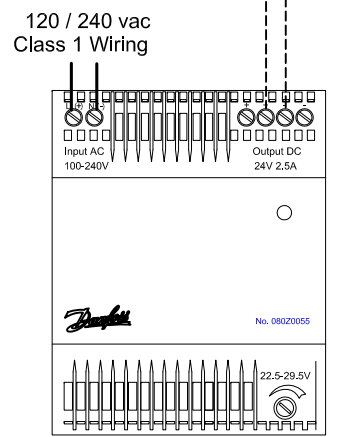
Alarm Relay Rating: 30VDC, 1 Amp "Class 2"

RS485 Host/Modbus Host RS485:

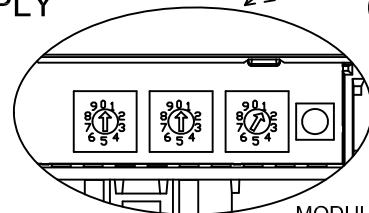
Use 2-conductor twisted pair stranded shield cable. Terminate shield on the AK-SC255 unit addressed as "0", observe polarity on wiring. Install terminators on FIRST and LAST units only. Use Ethernet as host network if 'Virtual Screen' function is required. See "On Site Installation Guide" for further details.

Lonworks I/O controller network Use 2 conductor twisted pair stranded shield cable. Up to 5 network cables can be connected ("A", "B", "Shield") for I/O use. Shield must be connected at both ends, including correct network termination.

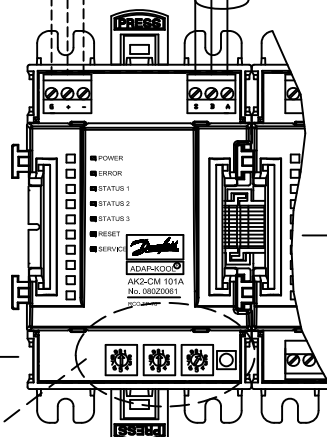
Remove termination resistors from unused Lon terminals.



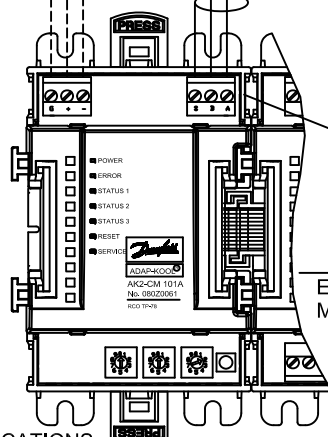
I/O POWER SUPPLY (080Z0055)



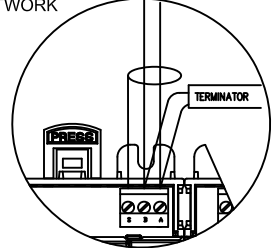
MODULE ADDRESSING SWITCHES



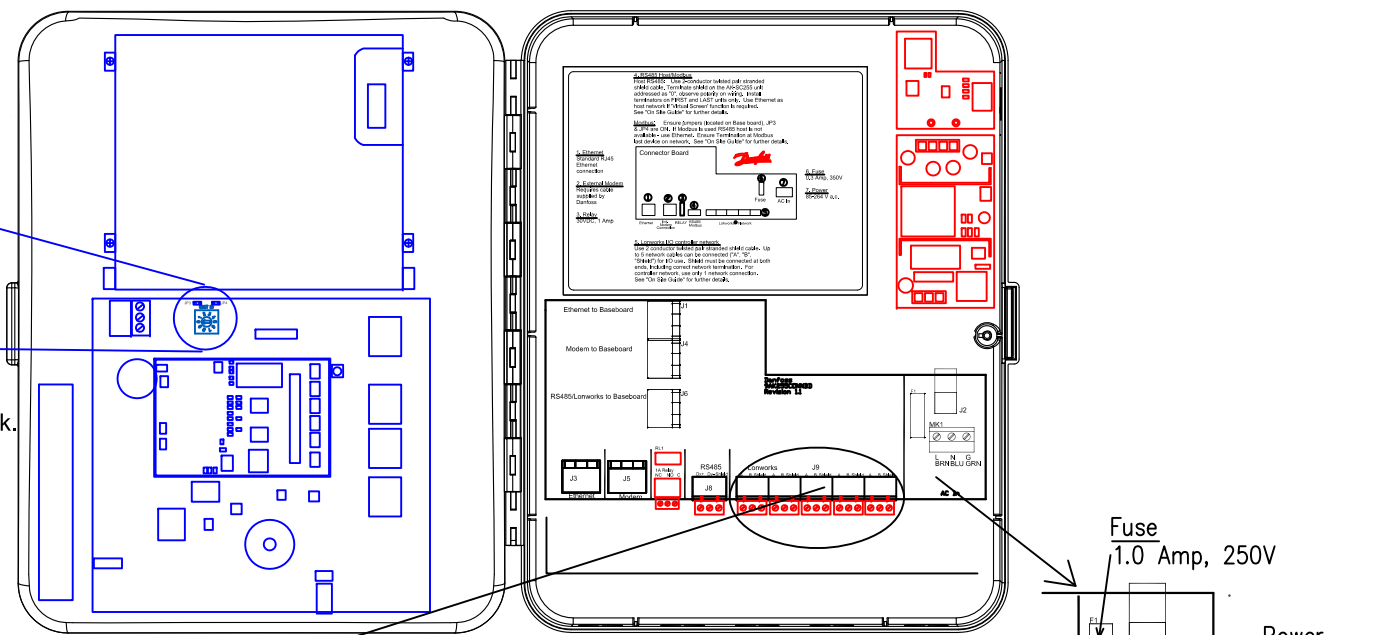
(080Z0061)



COMMUNICATIONS MODULE



TERMINATOR



Fuse 1.0 Amp, 250V

Power 100-250 VAC 50-60Hz

X = Refer to Appendix-A (Cable Specifications)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4825	
USED ON	TITLE		
PROJECT NUMBER	Typical 255 System to Communications Module Wiring		
TOLERANCES (EXCEPT AS NOTED)		DATE	RELEASE
DECIMAL (LSD)	FRACTIONAL	DATE	R.M.
+-.02		7/17/08	7/14/08
DECIMAL (LSD)	ANGULAR	DATE	
+-.0005			
DIMENSIONS IN INCHES		DRAWING NO.	C1
SCALE	nts		SHEET 1 OF 1

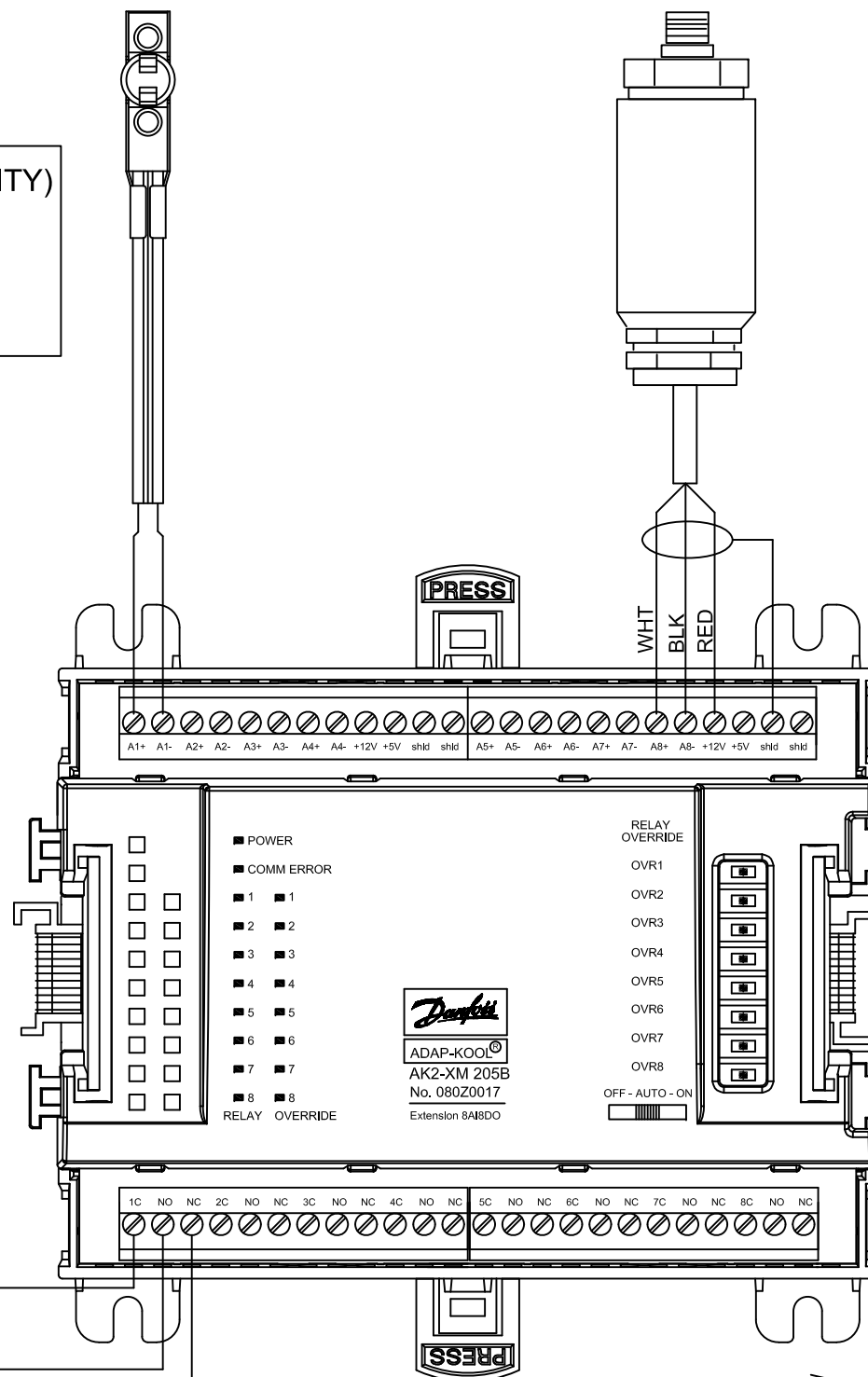
(Typical AK2 8AI/8DO Wiring)

TEMPERATURE SENSOR (NO POLARITY)
(AKS 11)

CONNECT LEADS TO
SIG AND GND

PRESSURE TRANSDUCER
(AKS 32)

BLACK: GND
WHITE: SIG
RED: +12V
SHIELD: SHLD



C Wire to power for controlled load.

NO Wire to normally open load.

NC Wire to normally closed load.

MAX OUTPUT RATINGS

1/4 HP @ 120-240VAC
5A RESISTIVE @ 24VDC OR 250VAC

FUSED @ 5A (SB) 250VAC

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Typical AK2 8AI/8DO Wiring	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (LSD)	FRACTIONAL	DATE	DATE
+-.02		6/23/08	6/23/08
DECIMAL (LSD)	ANGULAR	DRAWING NO. C2	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES			
SCALE	nts		

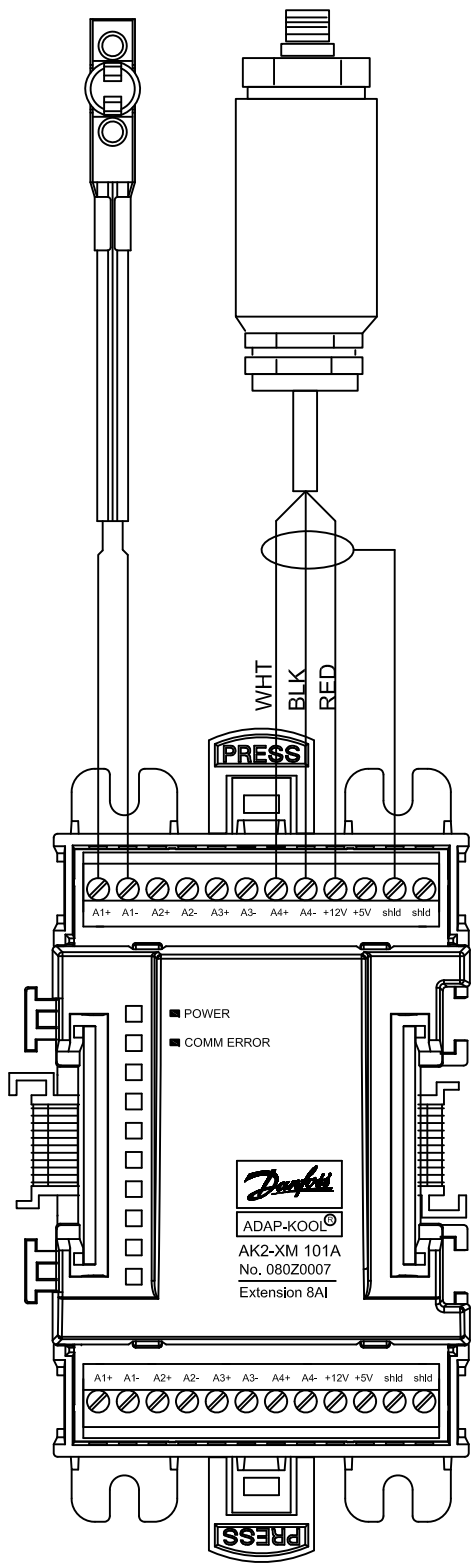
(Typical AK2 AI Wiring)

TEMPERATURE SENSOR (NO POLARITY)
(AKS 11)

CONNECT LEADS TO
SIG AND GND

PRESSURE TRANSDUCER
(AKS 32)

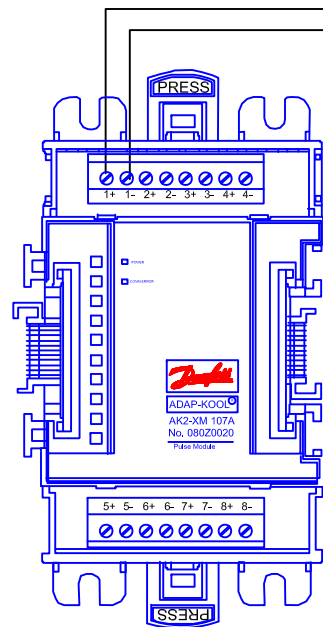
BLACK: GND
WHITE: SIG
RED: +12V
SHIELD: SHLD



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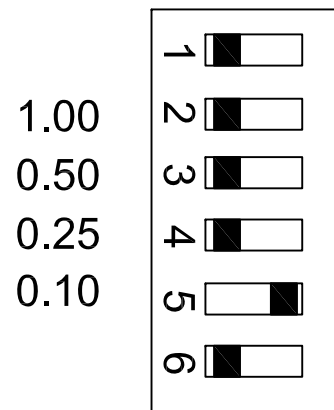
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925			
		USED ON	TITLE		
PROJECT	NUMBER	Typical AK2 AI Wiring			
TOLERANCES (EXCEPT AS NOTED)		DRAWN	CHKD	APPD	RELEASE
DECIMAL (DIM)	FRACTIONAL	RM		R.M.	
+-.02		DATE	DATE	DATE	
DECIMAL (CLOS)	ANGULAR	6/23/08		6/23/08	
+-.005		DRAWING NO.		C3	SHEET 1 OF 1
DIMENSIONS IN INCHES					
SCALE	nts				

Typical KWH Sub-Metering Details (AK2-XM107A / PN: 080Z0020)

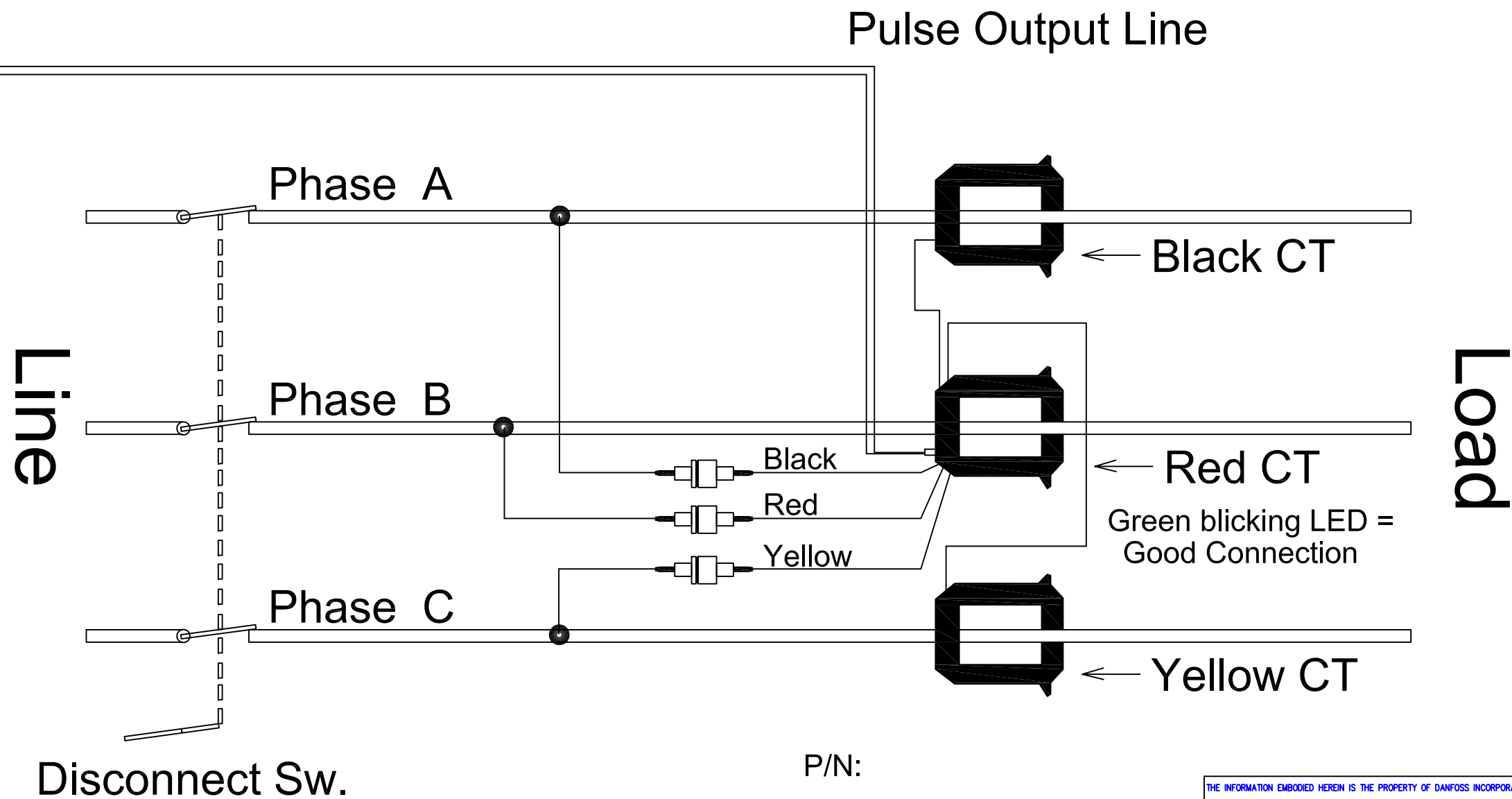


Pulse Rate Selection

0.1 KWH PER PULSE



kWh/pulse

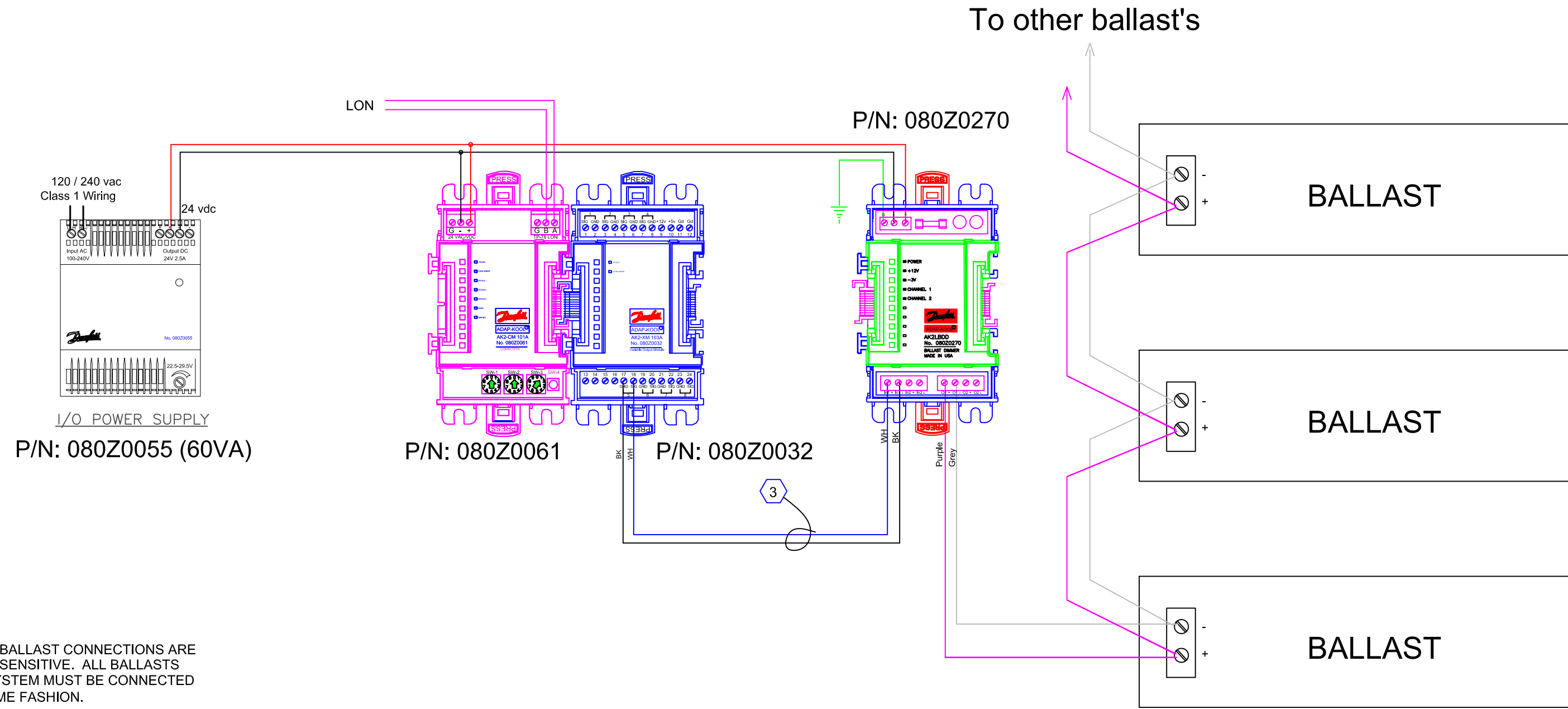


P/N:

- C20106600 100 Amp CT's
- C20106601 300 Amp CT's
- C20106602 400 Amp CT's
- C20106603 800 Amp CT's

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	AK2-XM102 Pulse Board Wiring (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (X10)	FRACTIONAL	DATE	DATE
+0.02		8/5/08	8/5/08
DECIMAL (X10)	ANGULAR	DRAWING NO. C4	
+0.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES		SCALE nts	

Typical Ballast Dimming Installation



NOTES:
 1. 0-10 VDC BALLAST CONNECTIONS ARE POLARITY SENSITIVE. ALL BALLASTS ON THE SYSTEM MUST BE CONNECTED IN THE SAME FASHION.

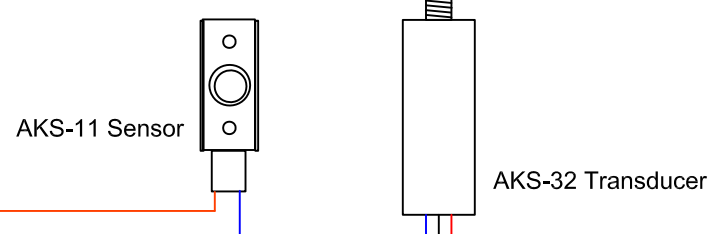
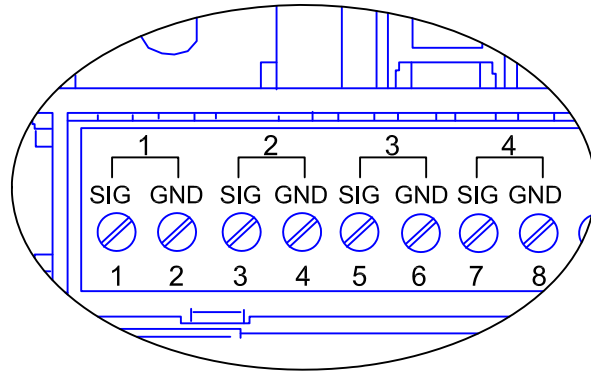
0-10VDC OUTPUT:
 MAX CURRENT OUTPUT RATINGS:
 640mA FOR SINGLE CHANNEL USE
 1040mA FOR DUAL CHANNEL USE

3 = Refer to Appendix-A (Cable Specifications)

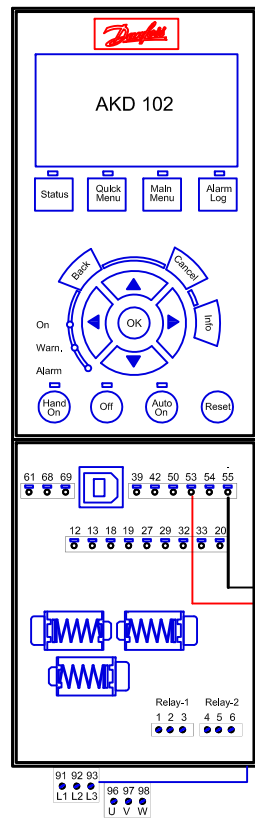
THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.			
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	Ballast Dimming Installation Configuration (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (F2)	FRACTIONAL	DATE	DATE
+/- .02		9/3/08	9/3/08
DECIMAL (F3)	ANGULAR	DRAWING NO. C5	
+/- .005		SHEET 1 OF 1	
SCALE nts		DRAWING NO. C5	

(AK-XM 103A / Variable Output Module / 080Z0032)

(4) Universal Inputs

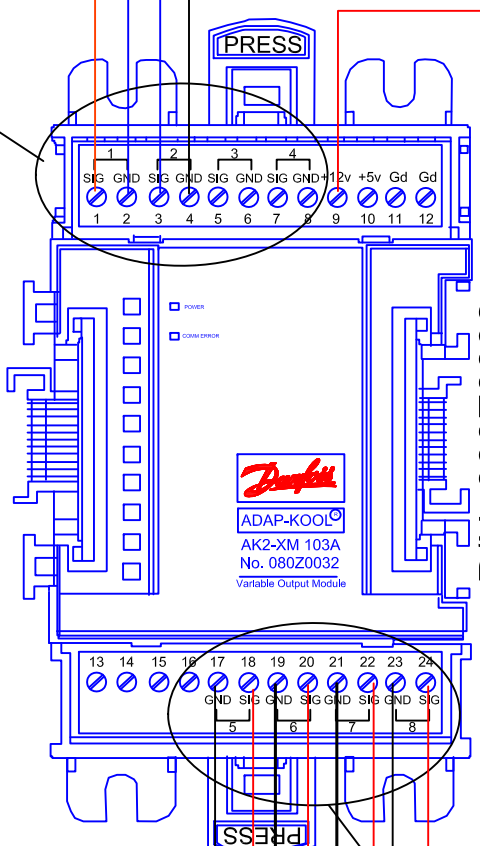


Supply Fan / Cond. Fan / Compressor Control

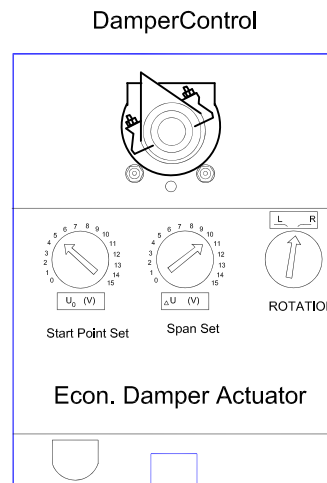
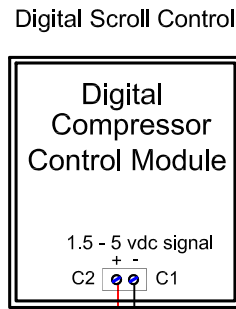


VFD

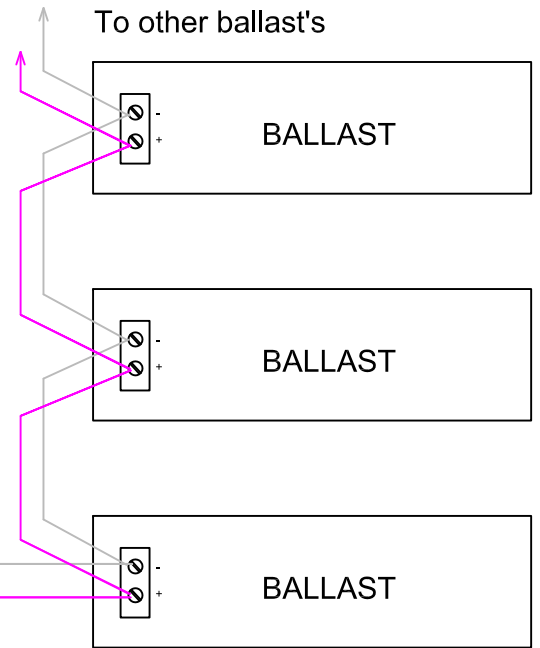
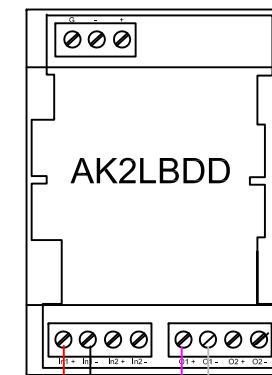
VO Board Options:
 0-10 V
 10-0 V
 0-5 V
 (Setup in 255 Controller)



P/N: 080Z0032



Light Dimming Control

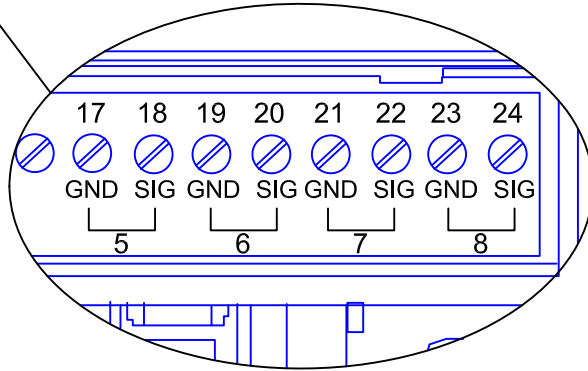


0-10 vdc signal

0-5 vdc signal

0-10 vdc signal

0-10 vdc signal



(4) Variable Outputs

Max. 2.5 mA

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USED ON	TITLE	AK2-XM 103A Variable Output Module (080Z0032)			
PROJECT NUMBER					
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE	DATE	DATE
DECIMAL (1:50)	FRACTIONAL	6/9/09	6/9/09	6/9/09	6/9/09
DECIMAL (1:20)	ANGULAR	DRAWING NO. C6		SHEET 1 OF 1	
DECIMAL (1:10)	ANGULAR	SCALE nts			

AK2 Modules Power Supply (080Z0055)

NOMINAL INPUT VOLTAGE:

100-240 VAC
 45-65 Hz
 1.4 A (120 VAC)
 0.4 A (240 VAC)

OUTPUT VOLTAGE:

24 VDC +/- 1%
 2.5 A
 60 VA

Operating Temperature:

-25° C to + 70° C (-13° F to + 158° F)
 @ +25 C 95% RH (non-condensing)

Vibration (IEC 68-2-6)

< 15 hZ amplitude +/- 2.5 mm

Dimensions

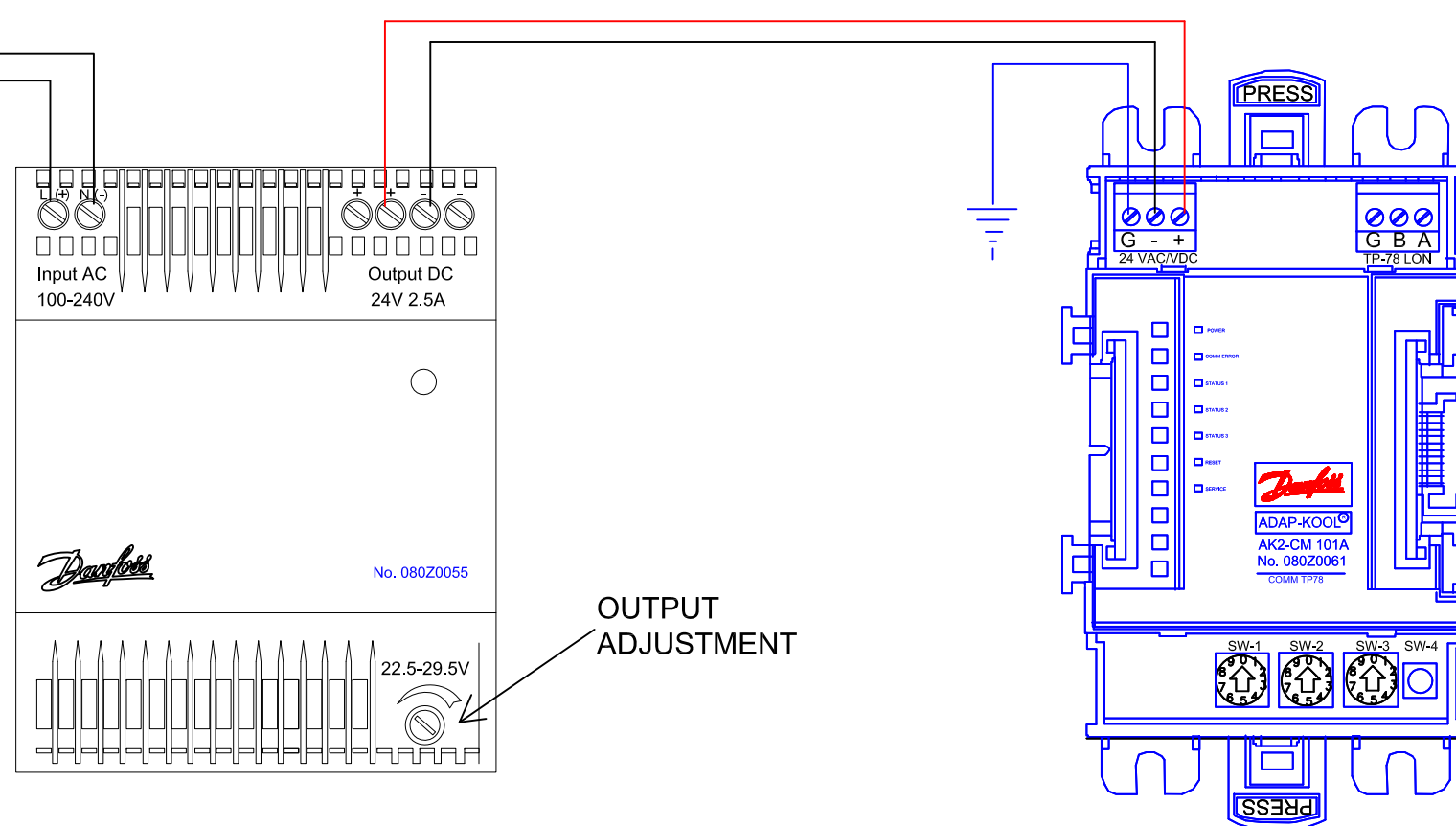
Width 72mm (2.8")
 Depth 61mm (2.4")
 Height 90mm (3.5")

Signalling

Green 'healthy' LED

Fuse

Internally protected



OUTPUT ADJUSTMENT

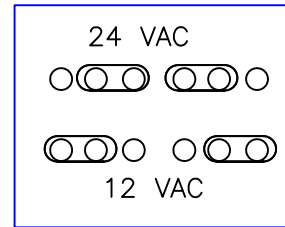
I/O MODULE POWER SUPPLY
 (24 VDC)

POWER SUPPLY (080Z0055)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	AK2 Modules Power Supply (080Z0055)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (X10)	FRACTIONAL	DATE	DATE
+/- .02		6/23/08	6/23/08
DECIMAL (X10)	ANGULAR	DRAWING NO. C7	
+/- .005		SHEET 1 OF 1	
SCALE nts		DRAWING NO. C7	

Variable Output Module (VO2) / Wiring Guide

Jumper settings



Input Power Fuse:
 1-1/2 amp SB 250 VAC

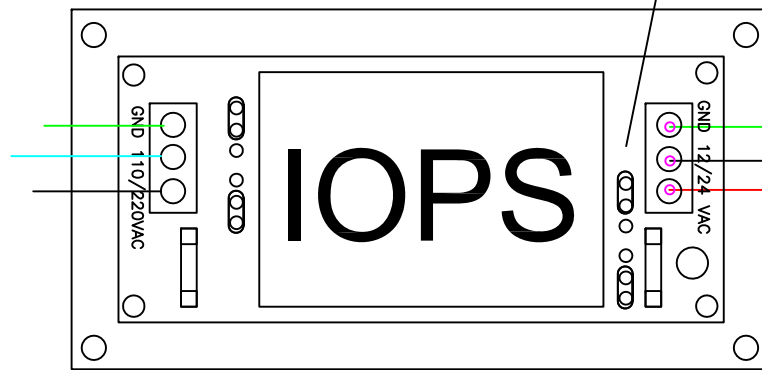
I/O Board Status LED (green):

- Flashing - Board powered and communicating.
- Steady On - Board powered with no communications.
- Off - No power.

Service Status LED (red):

- Flashing or SteadyOn - Replace board.
- Off - Board OK.

120 vac
 Class 1 Wiring

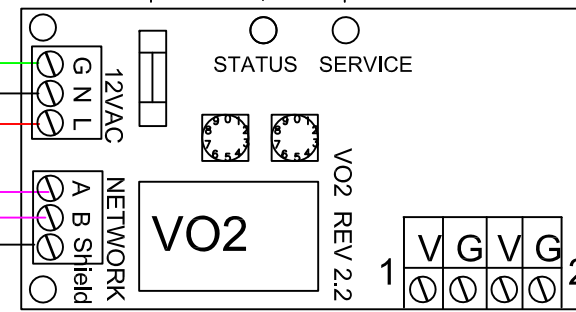


12vac

LON

NOTE:
 There is no polarity requirement on network terminals A and B. The Shield must be connected.

1



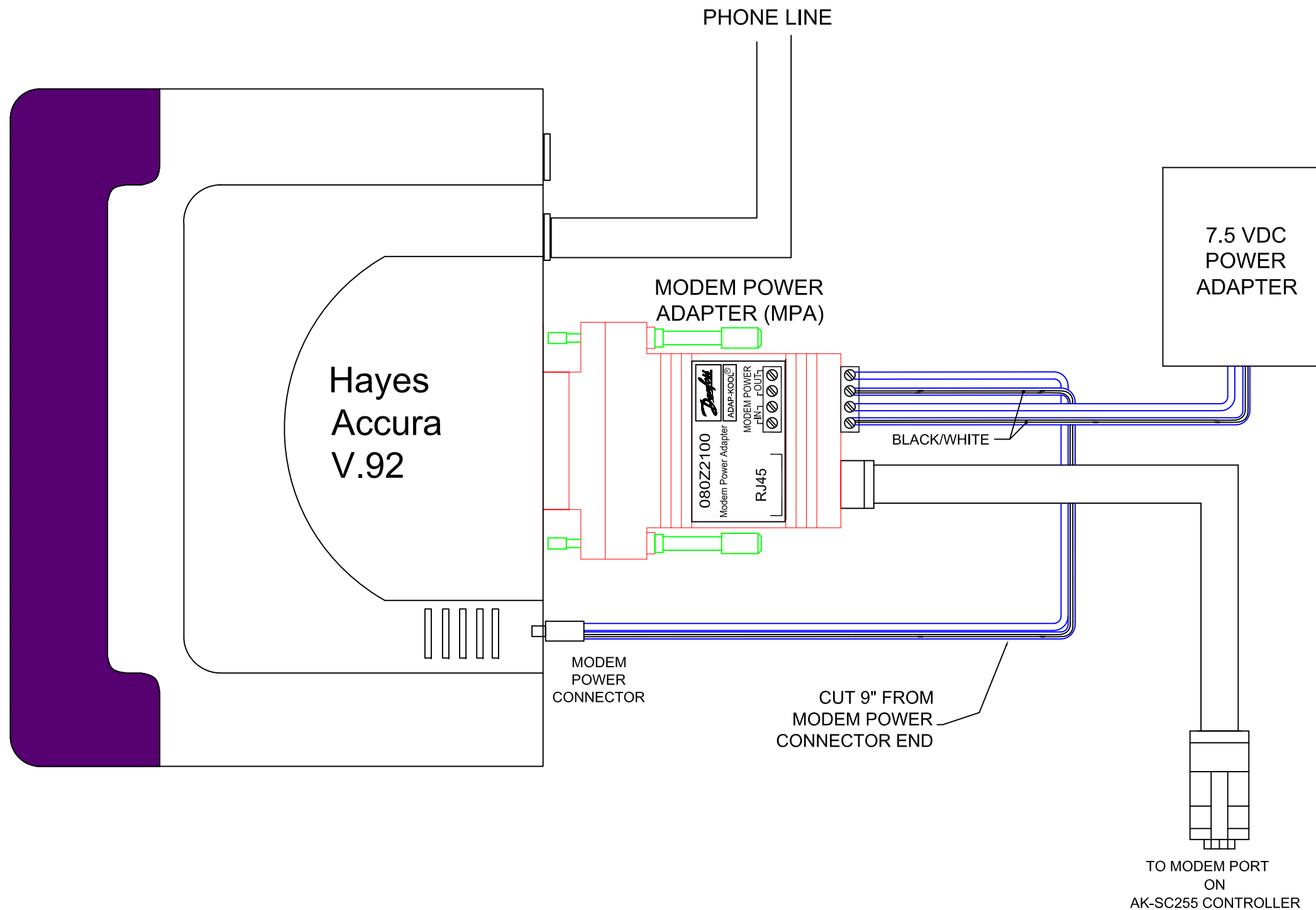
Output Ratings:

- 0-10 VDC
- Maximum 1K ohm load

3 = Refer to Appendix-A (Cable Specifications)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	Variable Output Wiring Guide (VO2)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (X10)	FRACTIONAL	DATE	DATE
+0.02	ANGULAR	9/3/08	9/3/08
+0.005			
SCALE: nts		DRAWING NO. C8	SHEET 1 OF 1

Typical Modem Wiring (080Z2102 Modem w/Adapter & Power Supply)

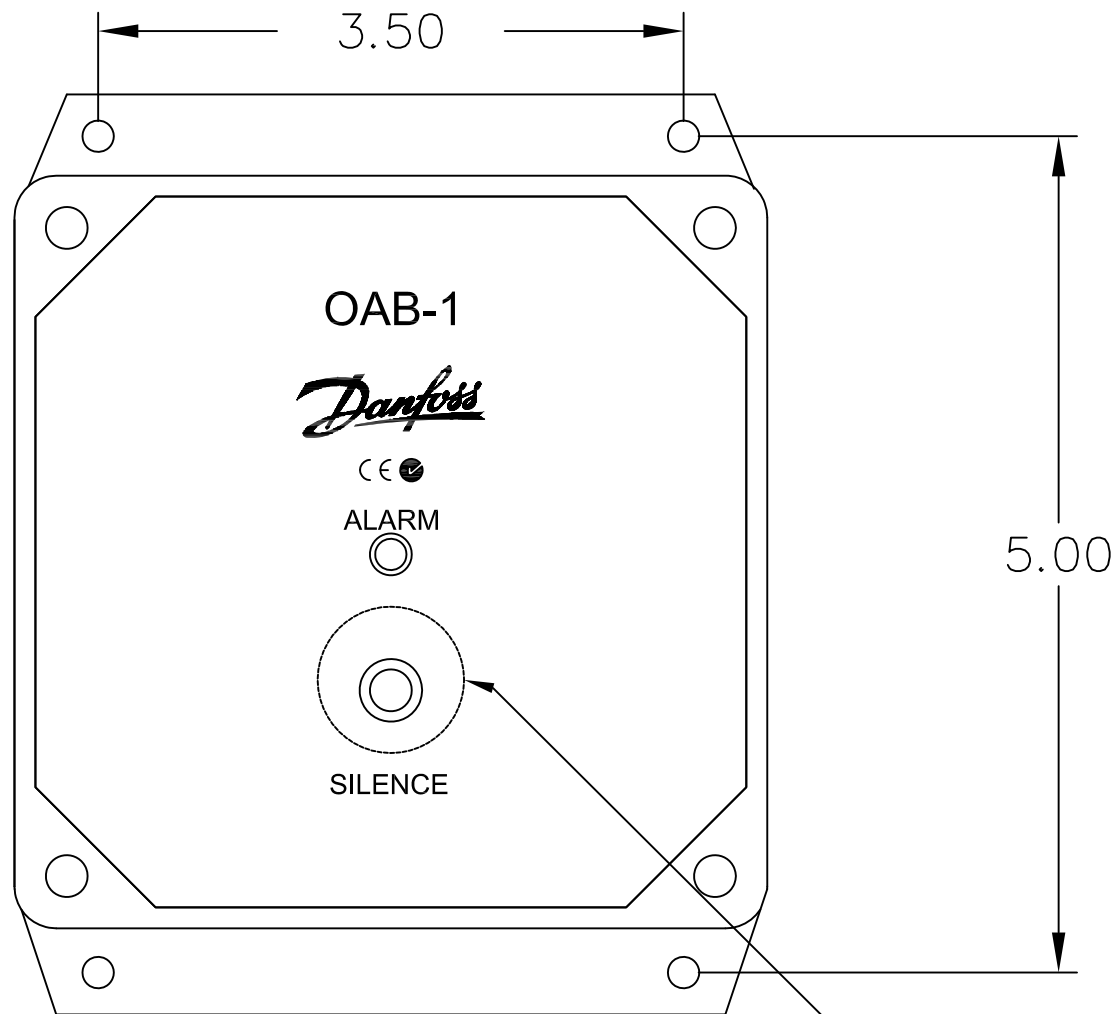


NOTES:

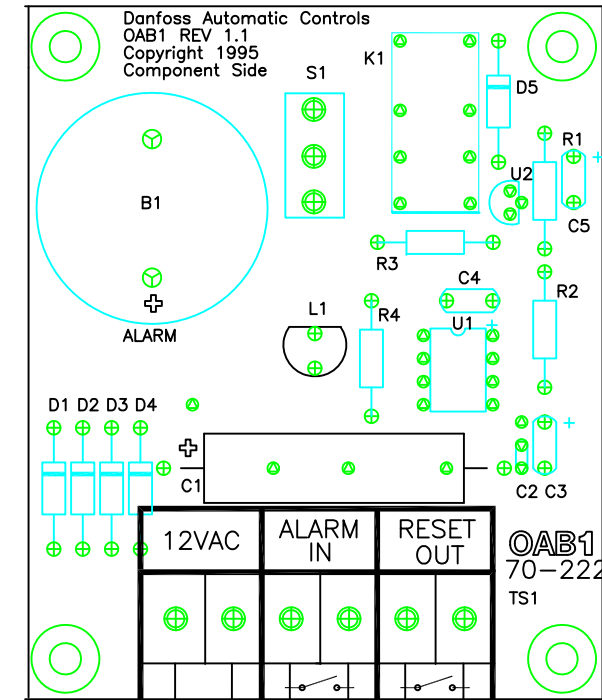
1. CUT MODEM POWER ADAPTER CABLE TO APPROPRIATE LENGTH (APPROX. 9") TO REACH FROM THE MODEM TO THE MODEM POWER ADAPTER (ALSO REFERED TO AS THE MPA).
2. CONNECT FROM MPA MODEM POWER "OUT" TO MODEM ACCORDING TO DIAGRAM. THE OTHER END OF THE AC POWER ADAPTER CONNECTS TO THE MODEM POWER "IN" SIDE OF THE MPA AND PLUGS INTO THE AC RECEPTACLE. OBSERVE PROPER POLARITY WHEN CONNECTING WIRES.
3. CONNECT 9PIN TO 25PIN ADAPTER BETWEEN THE MPA AND THE MODEM IF NEEDED. YOU MAY ALSO USE THE GRAY CABLE ENCLOSED IF SO DESIRED.
4. CONNECT RJ45 CABLE FROM THE MPA TO THE MODEM PORT ON THE AK255.

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Typical Modem Wiring	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (XXX)	FRACTIONAL	DATE	DATE
+-.02		6/23/08	6/23/08
DECIMAL (XXX)	ANGULAR	DRAWING NO. D1	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES		SCALE nts	

Typical Office Alarm Box Wiring (OAB)



Remove plug on back of unit to run wires.
Hole dia. is .875"



12-15 VAC/VDC from Danfoss power source type IOPS

Wire to C. and N.C. terminals of an AK2 Relay module attached to an AK2-SC255

Optional reset monitor
Wire to digital input

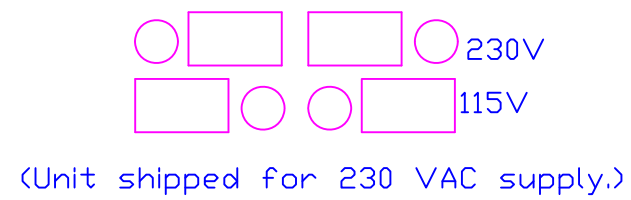
THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.			
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Typical Office Alarm Box Wiring (OAB)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (X10)	FRACTIONAL	DATE	R.M.
+0.02		6/23/08	6/23/08
DECIMAL (X100)	ANGULAR	DATE	
+0.005		6/23/08	
SCALE: nts		DRAWING NO.	SHEET
		D2	1 OF 1

IOPS Power Supply (080Z0052)

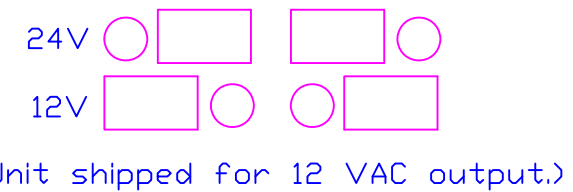
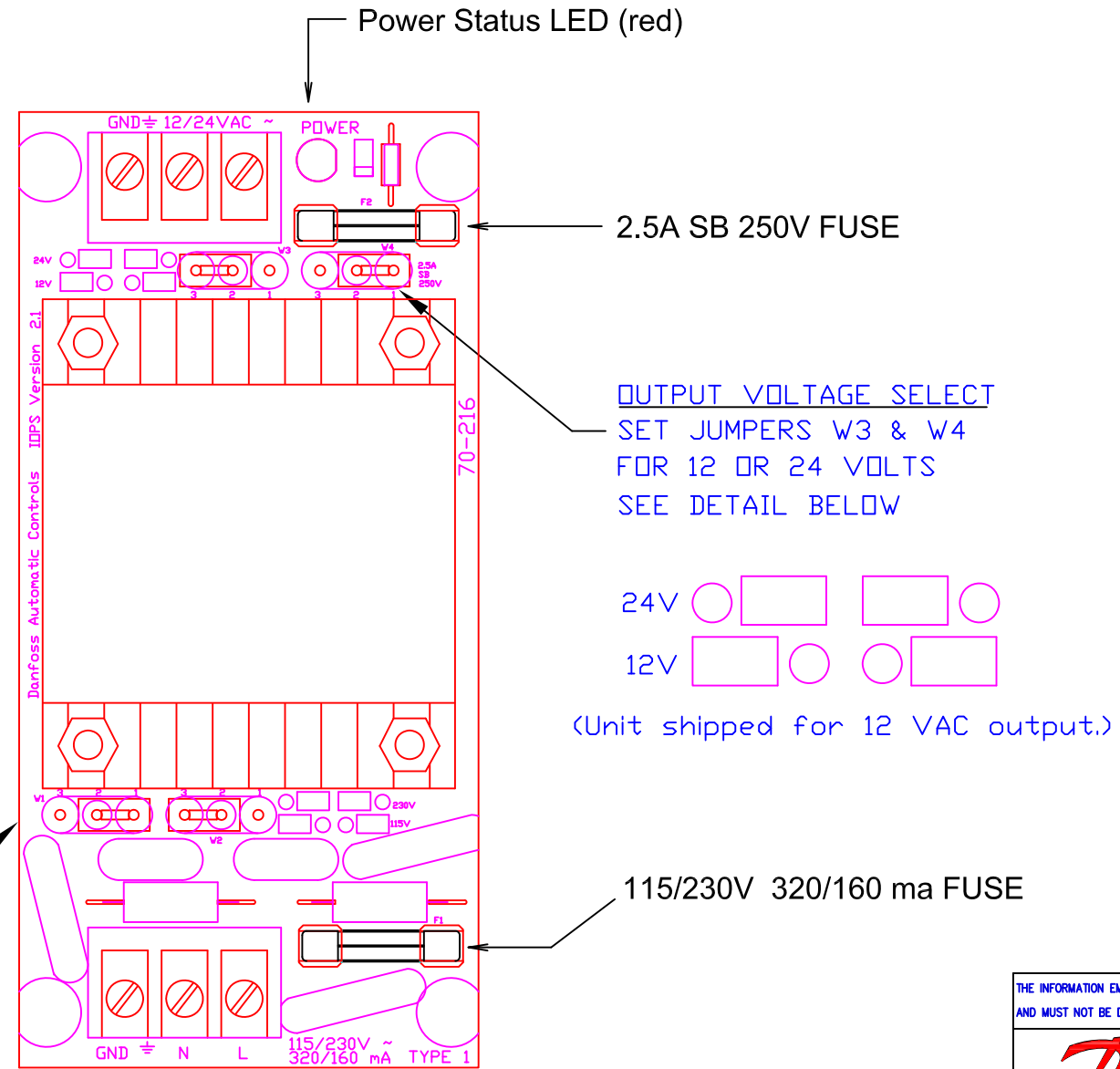
NOTES:

- DO NOT POWER ANY CONTROLLERS OR OTHER DEVICES WITH THE SAME POWER SUPPLY THAT IS POWERING I/O MODULES.
- THE POWER SUPPLY SHALL BE HOUSED WITHIN AN ENCLOSURE OF NONCOMBUSTIBLE MATERIAL IN COMPLIANCE WITH THE REQUIREMENTS OF THE CLASS OF EQUIPMENT IN WHICH USED.

I/O POWER SUPPLY
(IOPS)



SUPPLY VOLTAGE SELECT
SET JUMPERS W1 & W2
FOR 115 OR 230 VOLTS
SEE DETAIL ABOVE



115/230V 320/160 ma FUSE

2.5A SB 250V FUSE

OUTPUT VOLTAGE SELECT
SET JUMPERS W3 & W4
FOR 12 OR 24 VOLTS
SEE DETAIL BELOW

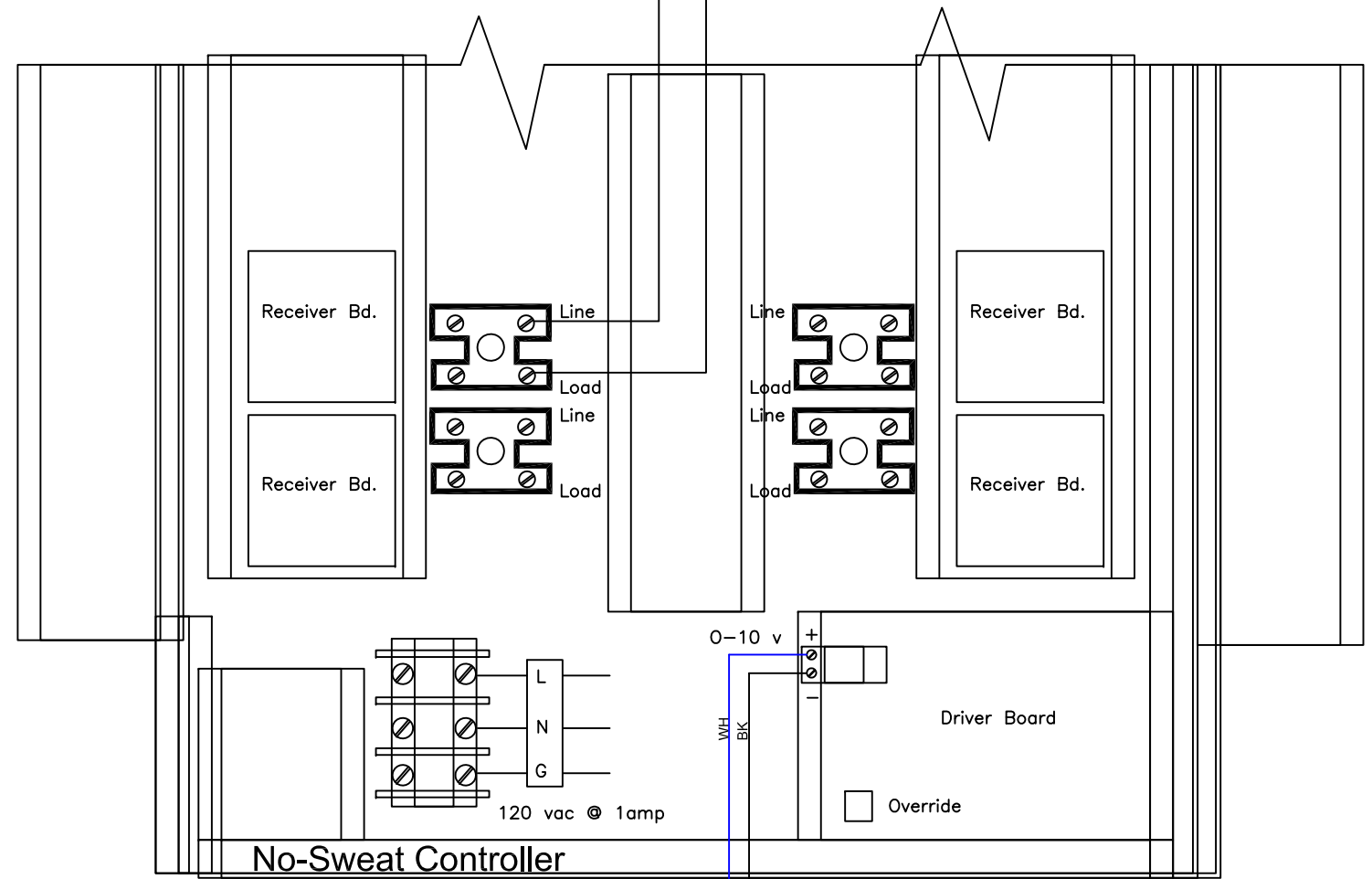
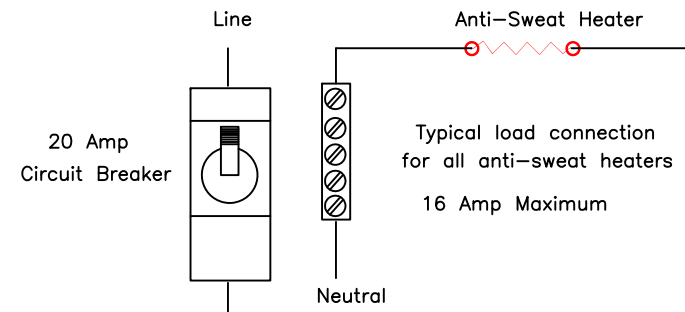
THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.

		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	IOPS Power Supply (080Z0052)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (100)	FRACTIONAL	DATE	DATE
+-.02		6/23/08	6/23/08
DECIMAL (100)	ANGULAR	DRAWING NO. D3	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES			
SCALE	nts		

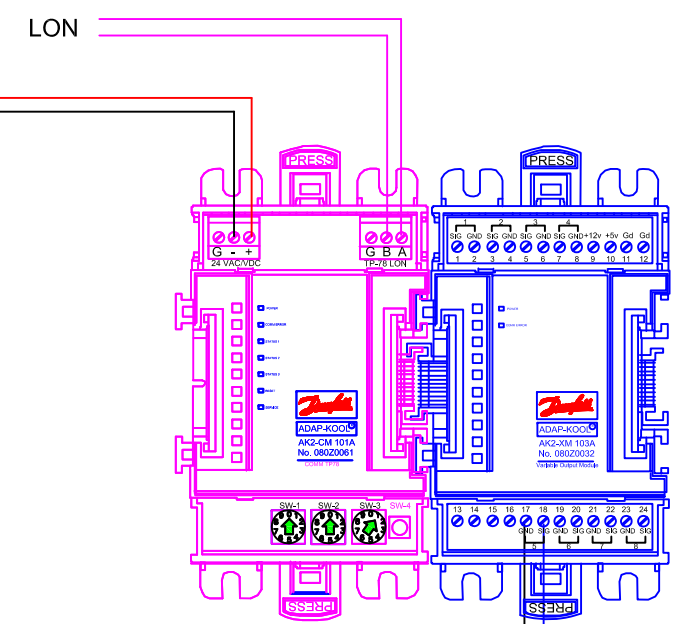
Typical NO SWEAT Controller Wiring Details (Anti-Sweat Heater Control)

INSTALLATION NOTES:

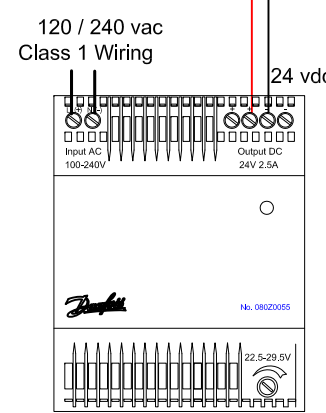
1. ALL WORK MUST BE PERFORMED TO MEET N.E.C. OR LOCAL CODES.
2. Run cables to No-Sweat Controller from VO board as shown.
3. Wire each anti-sweat circuit as shown. Total of 16 per No-Sweat Controller.



No-Sweat Controller
P/N: C20125416
16 Circuit Layout
(Others available)



P/N: 080Z0061
P/N: 080Z0032



I/O POWER SUPPLY
P/N: 080Z0055 (60VA)

X = Refer to Appendix-A for Cable Specification

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	NO-SWEAT Controller Wiring Details (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (X10)	FRACTIONAL	DATE	R.M.
+0.02		9/3/08	9/3/08
DECIMAL (X10)	ANGULAR	DRAWING NO. D4	
+0.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES			
SCALE	nfs		

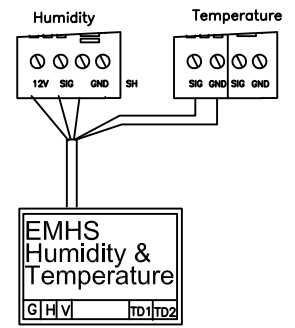
Rooftop Controller Wiring (RTC)

4 3 2 1

Power supply
24V AC +10%/-15%

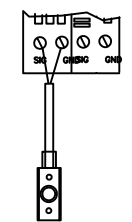
Input Power Fuse:
2 AMP
Connections
L: Line
N: Neutral
G: Ground

Service LED:
Flashing or Steady On - Replace board.
Off - Board OK.

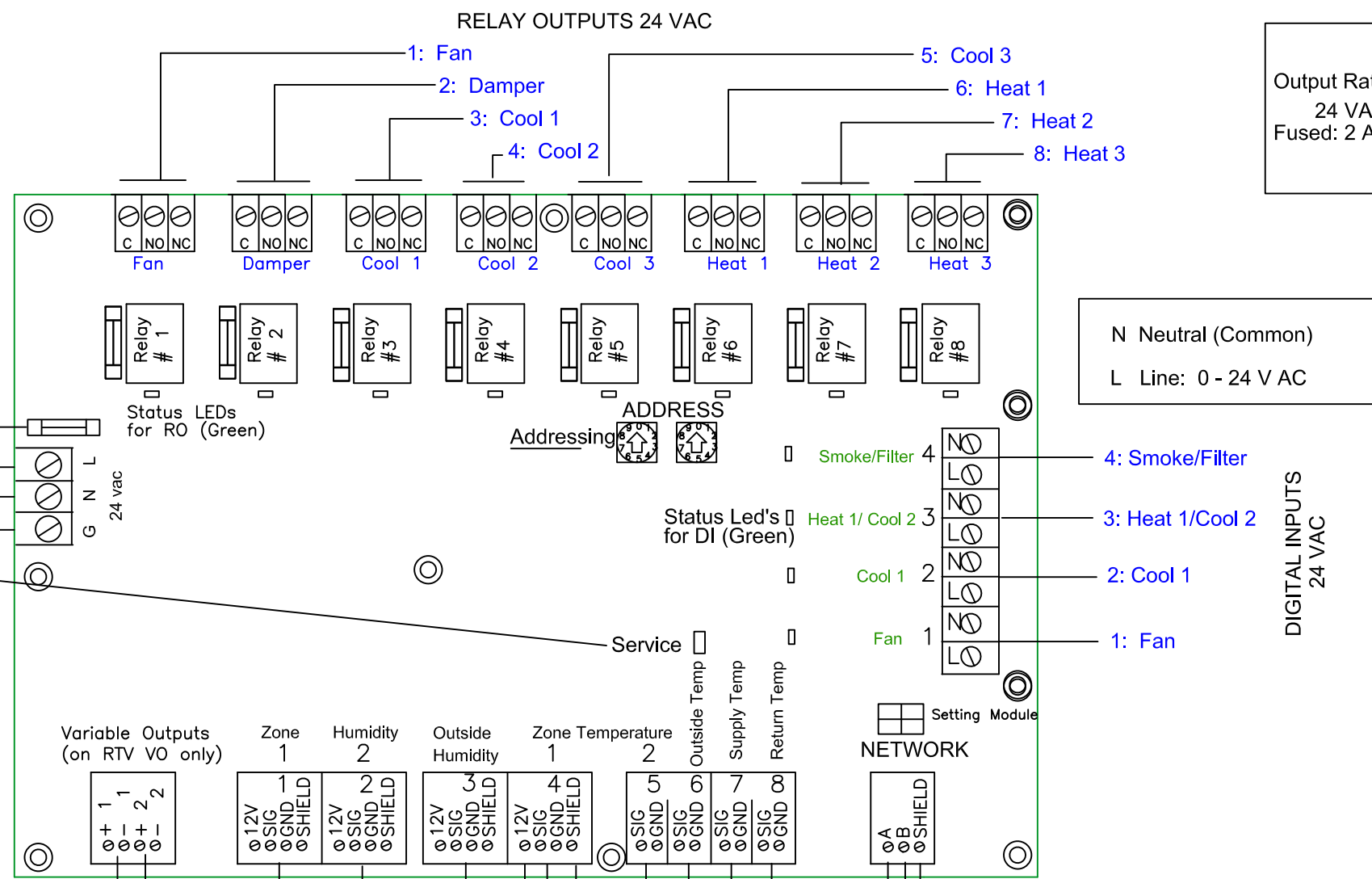


Humidity Sensor
G connect to GND
H connect to SIG
V connect to 12V

VO#1 : for Variable Frequency Drive
VO#2 : for Modulating Damper Motor



Temperature Sensor Wiring:
example: Type AKS 11
Terminal 1: SIG (Signal)
Terminal 2: GND (Ground)
Note: no polarity requirement



Note: There is no polarity requirement on network terminals A and B. The shield must be connected.

X = Refer to Appendix-A (Cable Specifications)

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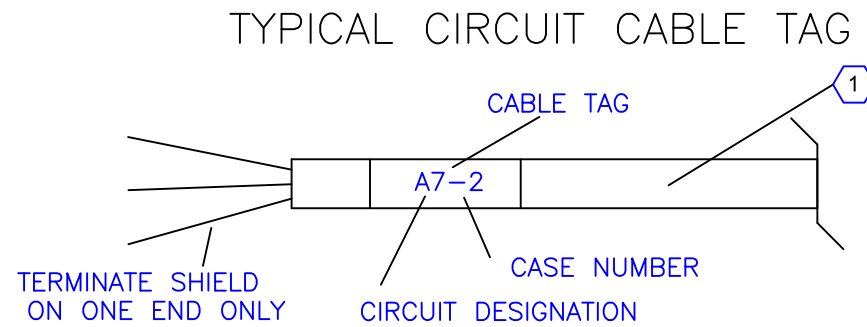
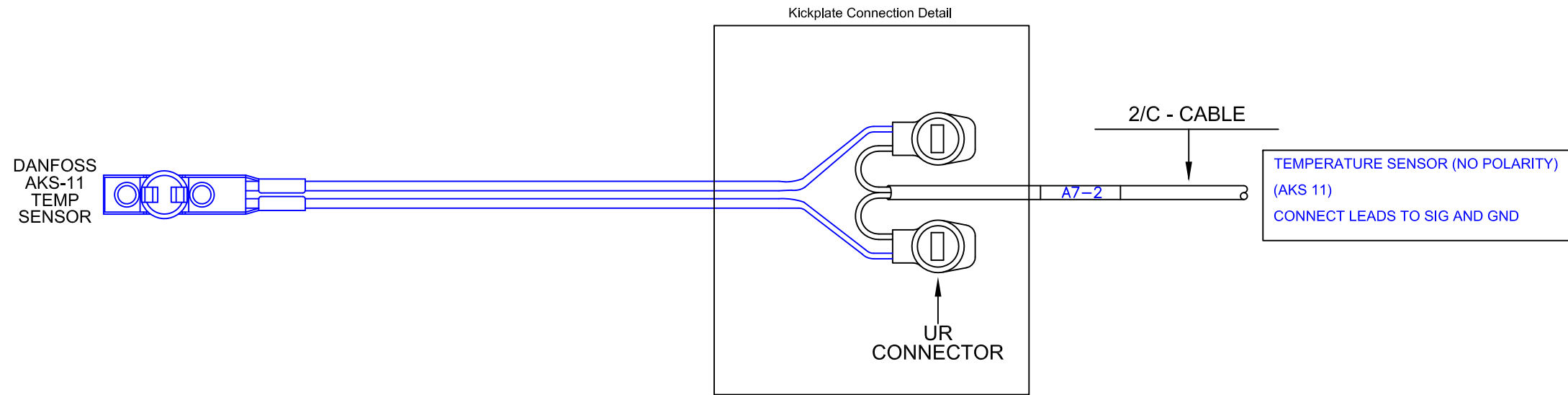
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Rooftop Controller Wiring (RTC)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (DIM)	FRACTIONAL	DATE	R.M.
+0.02		6/23/08	6/23/08
±0.005	ANGULAR	DRAWING NO. D5	
DIMENSIONS IN INCHES		SCALE nts	
DRAWING NO. D5		SHEET 1 OF 1	

D
C
B
A

D
C
B
A

4 3 2 1

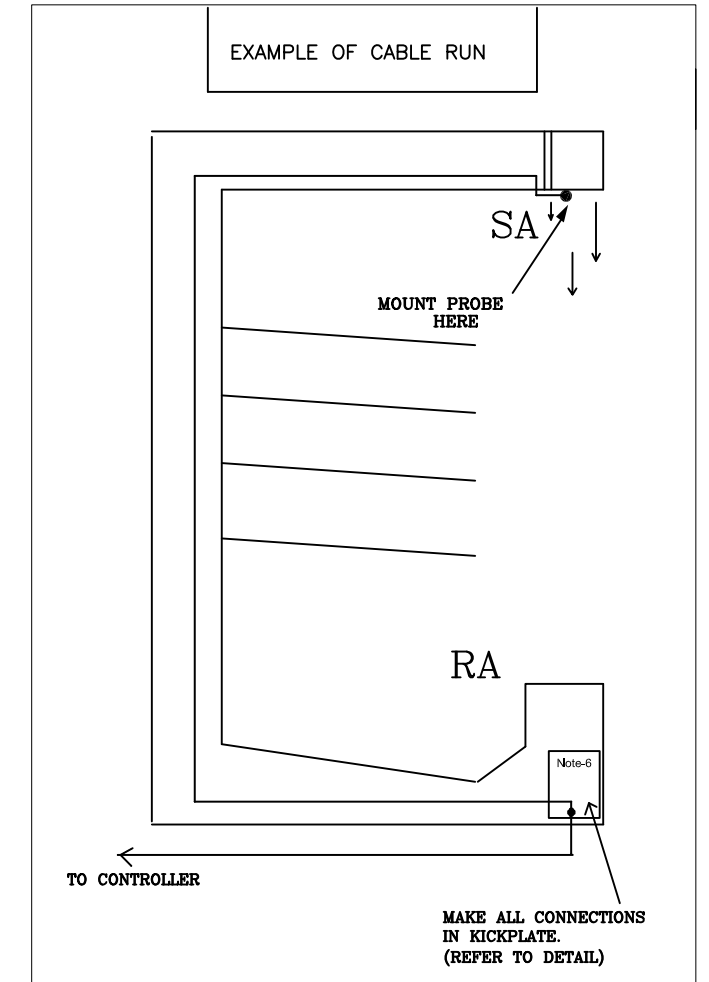
AKS-11 Case Temperature Sensor / Typical Connections



- KEEP SPLICES TO A MINIMUM AND MAINTAIN COLOR CODING.
- MAKE CONNECTIONS OUTSIDE OF REFRIGERATED AREA.
- USE GOOD CONNECTION PRACTICES SUCH AS UR CONNECTORS.

AKS-11 Sensor / Part Numbers

084N0027	AKS 11 Temp Sensor - 11.5 FT. Cable General Purpose Sensor
084N002701	AKS 11 Temp Sensor - 11.5 FT. Cable w / Molex Connector (only used with 164 case controls)
084N0028	AKS 11 Temp Sensor - 18 FT. Cable General Purpose Sensor
084N002801	AKS 11 Temp Sensor - 18 FT. Cable w / Molex Connector (only used with 164 case controls)
084N0029	AKS 11 Temp Sensor - 27.5 FT. Cable General Purpose Sensor
084N002901	AKS 11 Temp Sensor - 27.5 FT. Cable w / Molex Connector (only used with 164 case controls)

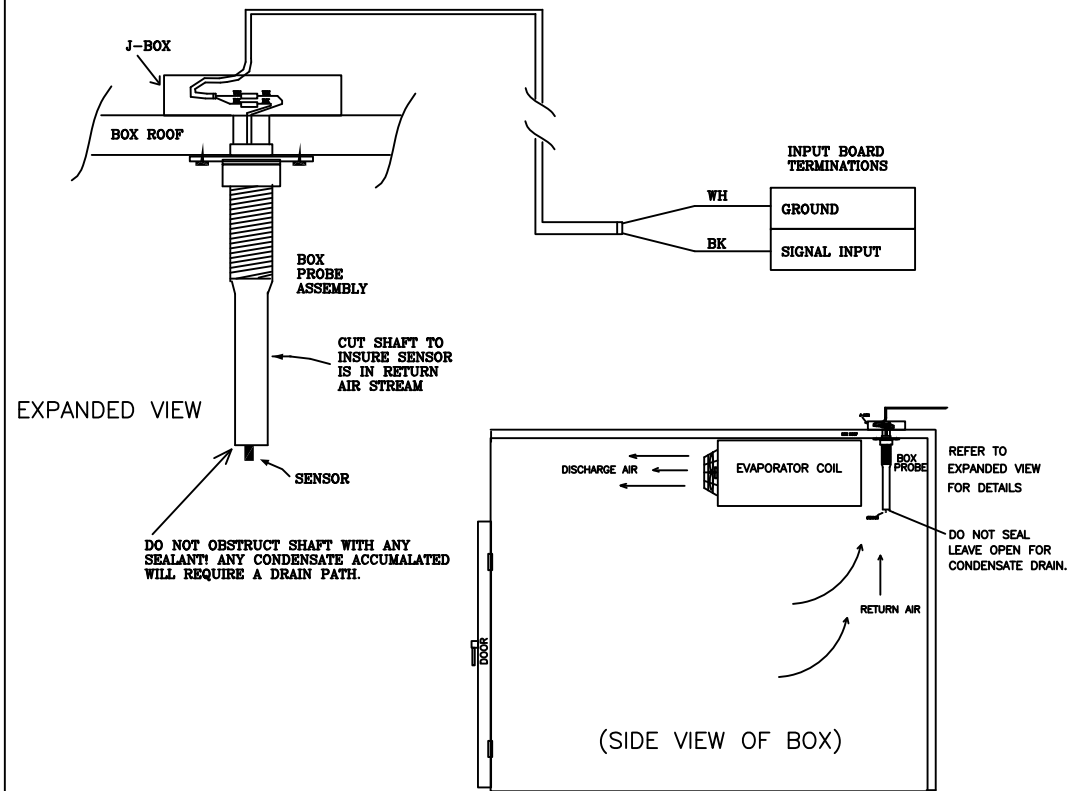


1 = Refer to Appendix-A (Cable Specifications)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	AKS-11 Sensor Typical Installation Details		
TOLERANCES (EXCEPT AS NOTED)		DRAWN	DATE
DECIMAL (1/2)	FRACTIONAL	RM	R.M.
+-.02		DATE	DATE
+-.005	ANGULAR	10/23/09	10/23/09
DIMENSIONS IN INCHES		DRAWING NO.	E1
SCALE	nts		SHEET 1 OF 1

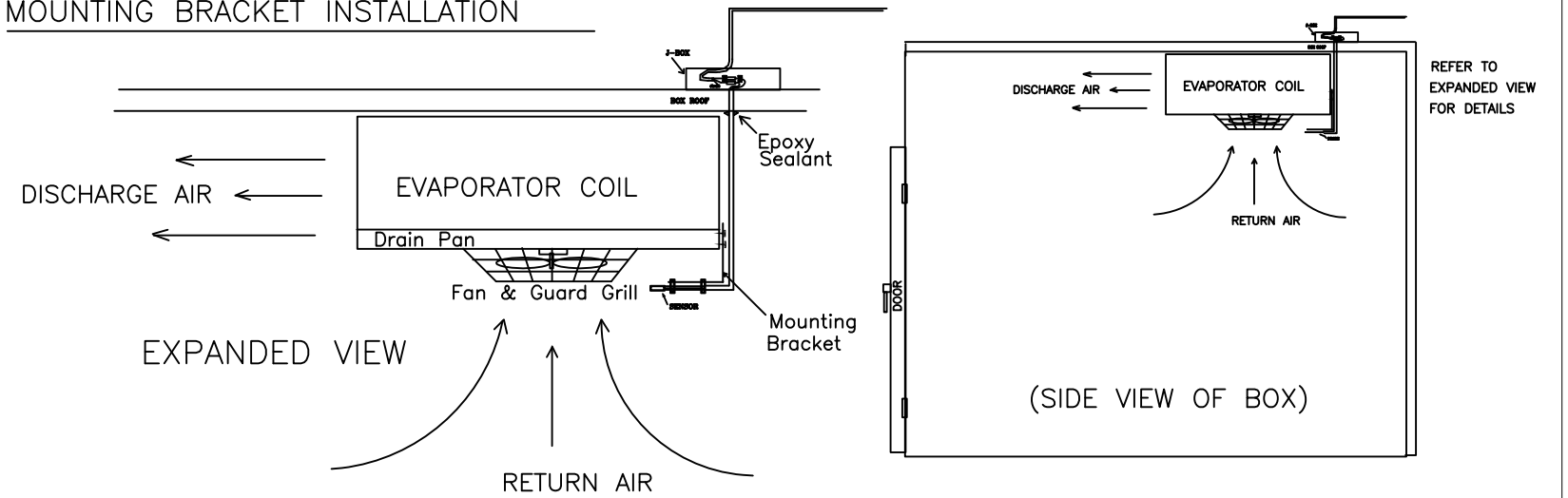
Typical Installation Box Temperature Sensor (080Z2185)

P/N : 080Z2185



Low Temperature Freezers

MOUNTING BRACKET INSTALLATION



Medium Temperature Coolers

REFRIGERATION CONTRACTOR NOTES:

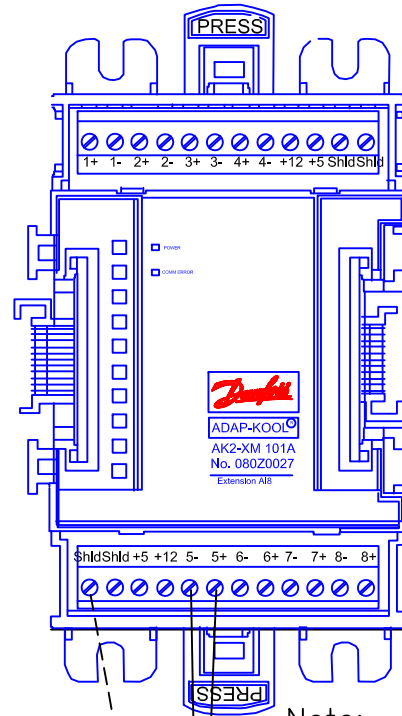
1. SENSOR ASSEMBLIES ARE IDENTIFIED BY SYSTEM NUMBERS.
2. MOUNT SENSOR ASSEMBLY IN BOX AS SHOWN.
3. INSURE THAT SENSOR ASSEMBLY WIRING IS PULLED THROUGH THE TOP OF BOX. THEN SEAL WATERPROOF.
4. USE SELF-TAPPING SCREWS TO MOUNT BOX SENSOR ASSEMBLIES TO ROOF OF BOX.
5. CUT BOX SHAFT AS NECESSARY TO INSURE SENSOR IS IN RETURN AIR STREAM.
6. DO NOT SEAL BOTTOM OF SENSOR TUBE ON FREEZER INSTALLATIONS. IT MUST BE LEFT OPEN FOR CONDENSATE DRAINING.

ELECTRICAL CONTRACTOR NOTES:

1. ALL SENSOR WIRING 18-22 Ga. STRANDED, MULTI/C, SHIELDED WITH DRAIN.

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			DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925
USED ON	TITLE		
PROJECT NUMBER	Box Temperature Sensor (080Z2185) (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (DIM)	FRACTIONAL	DATE	DATE
+-.02		6/23/08	6/23/08
DECIMAL (CLOS)	ANGULAR	DIMENSIONS IN INCHES	
+-.005		SCALE nts	
DRAWN		CHKD	APPD
DATE		DATE	DATE
DRAWING NO.		SHEET	
E2		1 OF 1	

Typical RTU Temperature Sensor Installation (ZTP2)

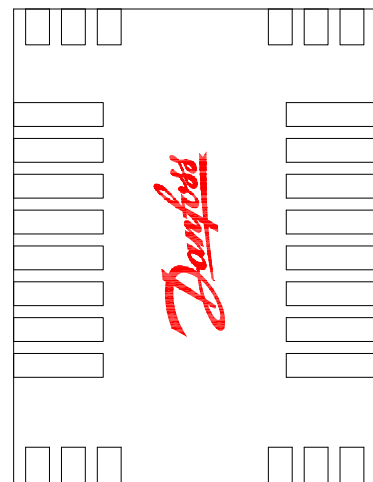


SENSOR INPUT MODULE

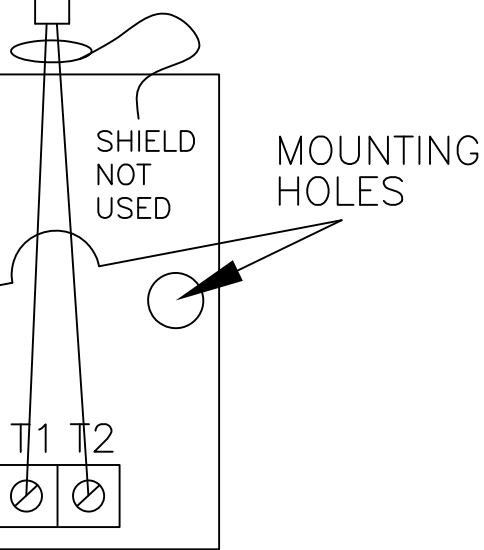
Note:
No Polarity
on Sig & Grd

3

SENSOR COVER

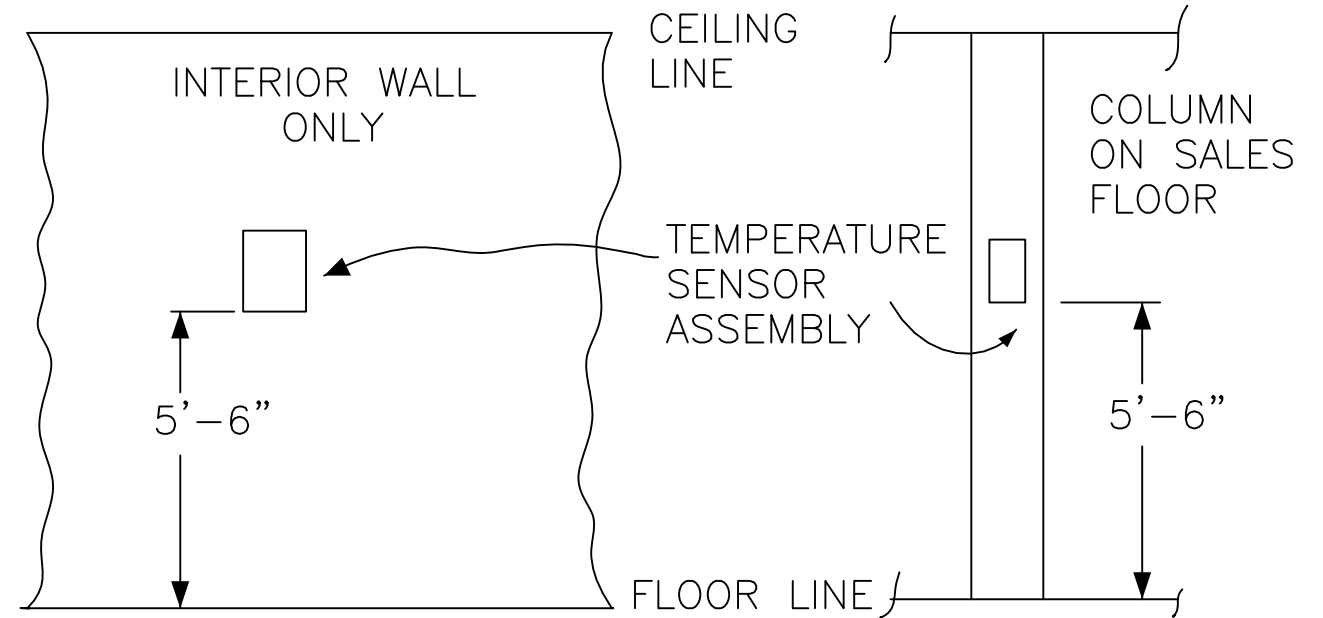


WIRE PASS-THROUGH



P/N: ZTP2

ZONE # X X=RTU NUMBER



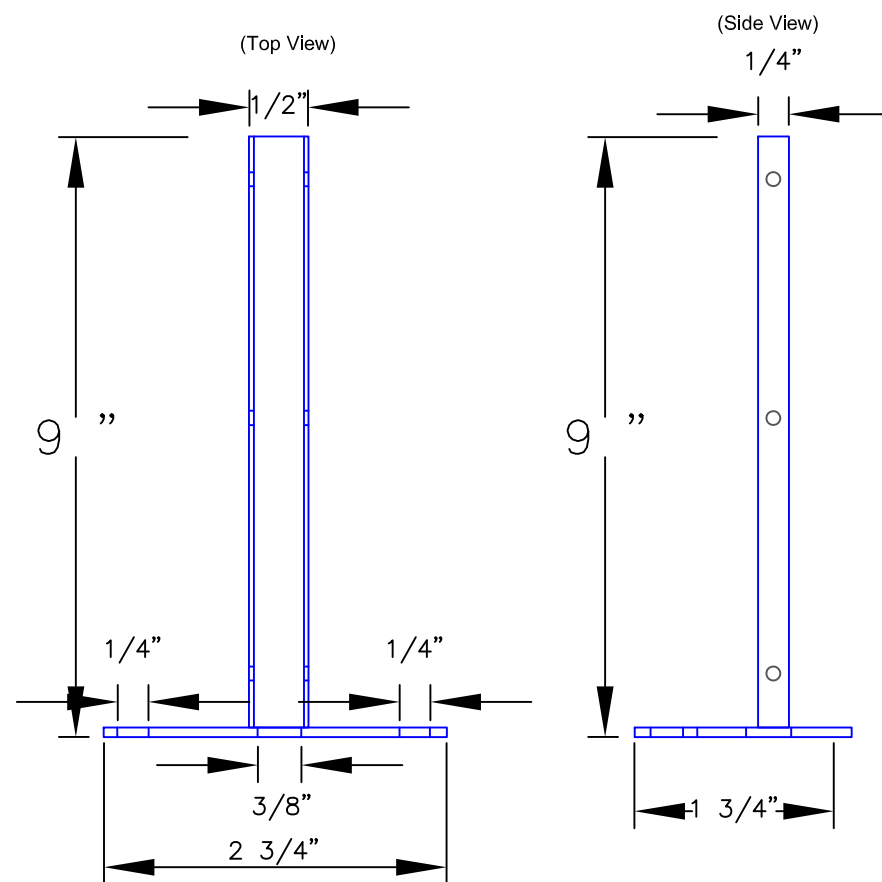
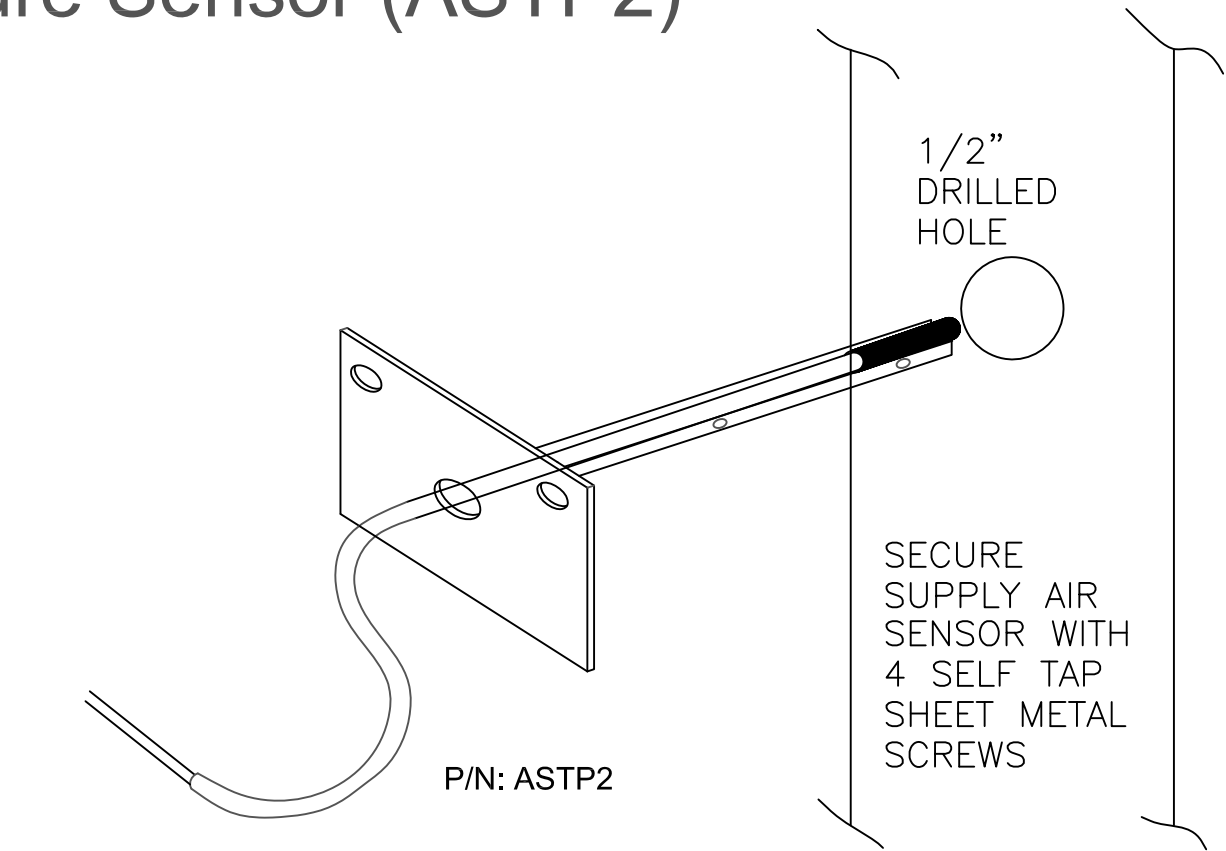
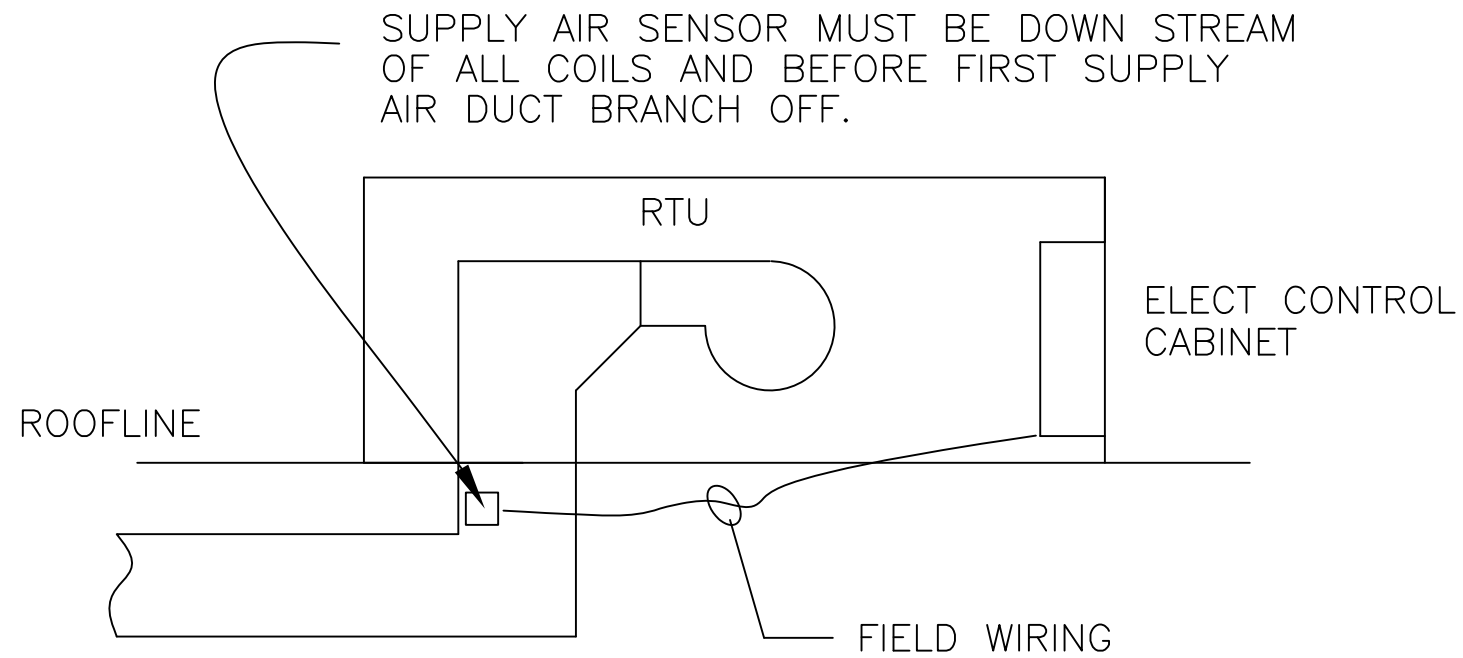
INSTALLATION NOTES:

1. RUN CABLE THROUGH PASS-THROUGH.
2. RECESS CONTROL WIRING IN COLUMN OR WALL AND SEAL CABLE ENTRY.
3. IF COLUMN FALLS IN THE MIDDLE OF A GONDOLA, SENSOR IS TO BE MOUNTED 1'-0" ABOVE TOP OF GONDOLA.

3 = Refer to Appendix-A (Cable Specifications)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	Temperature Sensor (ZTP2) (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (LSD)	FRACTIONAL	DATE	DATE
+-.02		9/3/08	9/3/08
DECIMAL (LSD)	ANGULAR	DRAWING NO. E3	
+-.005		SHEET 1 OF 1	
SCALE nts		RELEASE	

Duct Supply Air Temperature Sensor (ASTP2)



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Danfoss

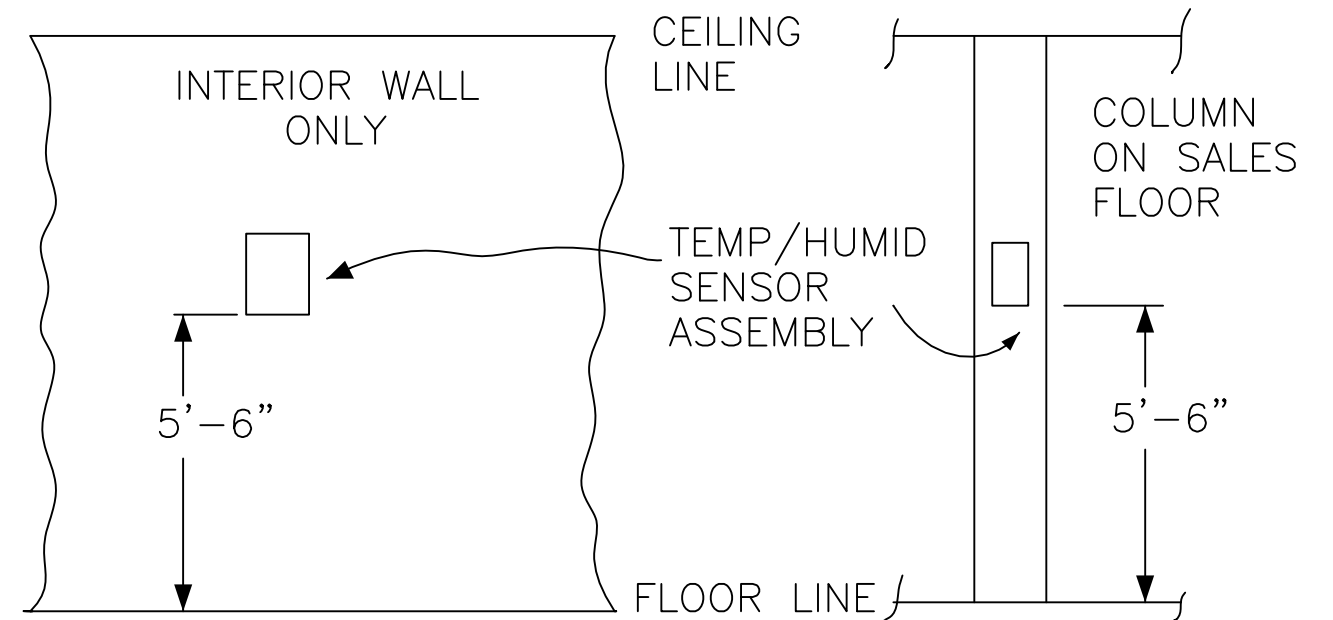
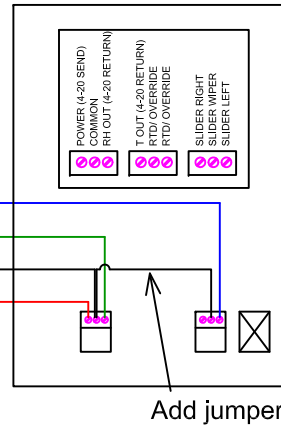
DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD.
21236-4925

USED ON		TITLE			
PROJECT	NUMBER	Supply Air Temperature Sensor (ASTP2)			
TOLERANCES (EXCEPT AS NOTED)		DRAWN	CHKD	APPD	RELEASE
DECIMAL (X2)	FRACTIONAL	RM	DATE	R.M.	DATE
+0.02			9/3/08		9/3/08
+0.005	ANGULAR	DRAWING NO.		SHEET	
DIMENSIONS IN INCHES		E4		1 OF 1	
SCALE	nts				

Typical Temperature/Humidity Sensor Installation (EMHS3-1)

P/N: 080Z2171

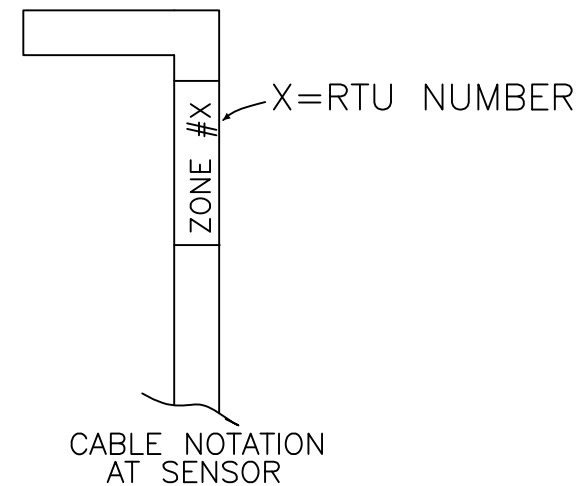
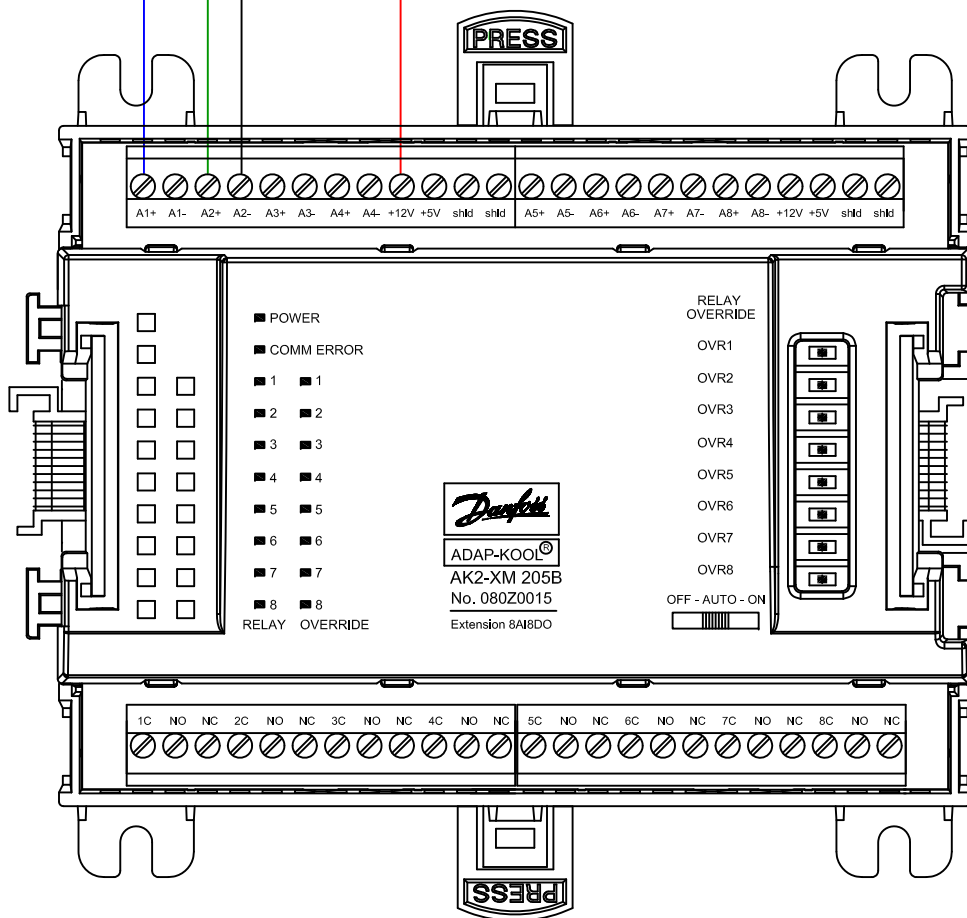
EMHS3-1
BACK PLATE



*- IF USED IN A DIFFERENT CONFIGURATION THAN SHOWN HERE, THE EMHS CAN BE POWERED BY +12 OR 24VDC OR VAC

FOR ADDITIONAL DETAILS AND MOUNTING INSTRUCTIONS, SEE PRODUCT DETAIL SHEET INCLUDED WITH THE SENSOR.

WIRING DETAILS ARE FOR EXAMPLE ONLY



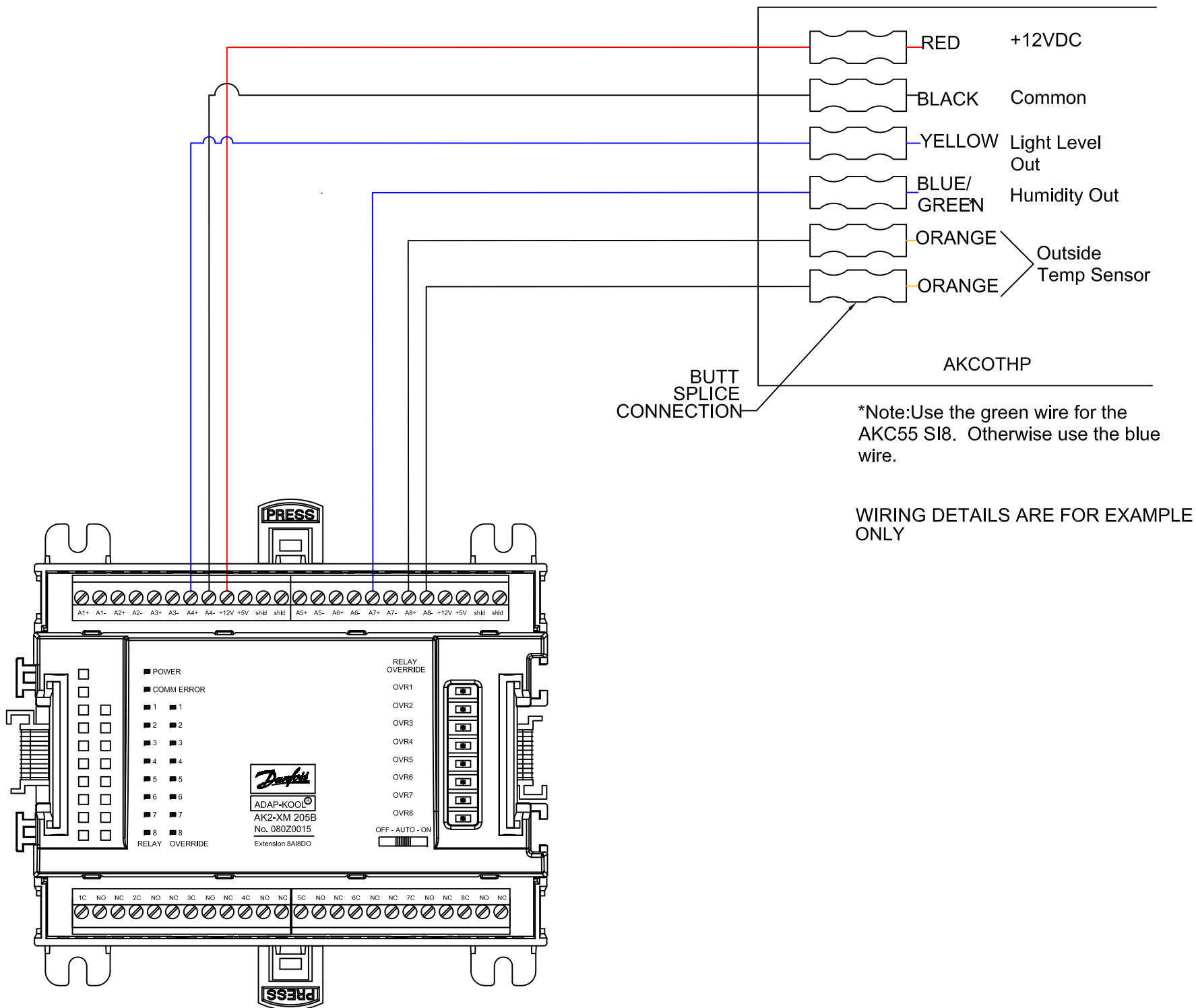
INSTALLATION NOTES:

1. RUN CABLE THROUGH PASS THROUGH. RECESS CONTROL WIRING IN COLUMN OR WALL AND SEAL CABLE ENTRY.
2. IF COLUMN FALLS IN THE MIDDLE OF A GONDOLA, SENSOR IS TO BE MOUNTED 1'-0" ABOVE TOP OF GONDOLA.

6 = Refer to Appendix-A for Cable Specification

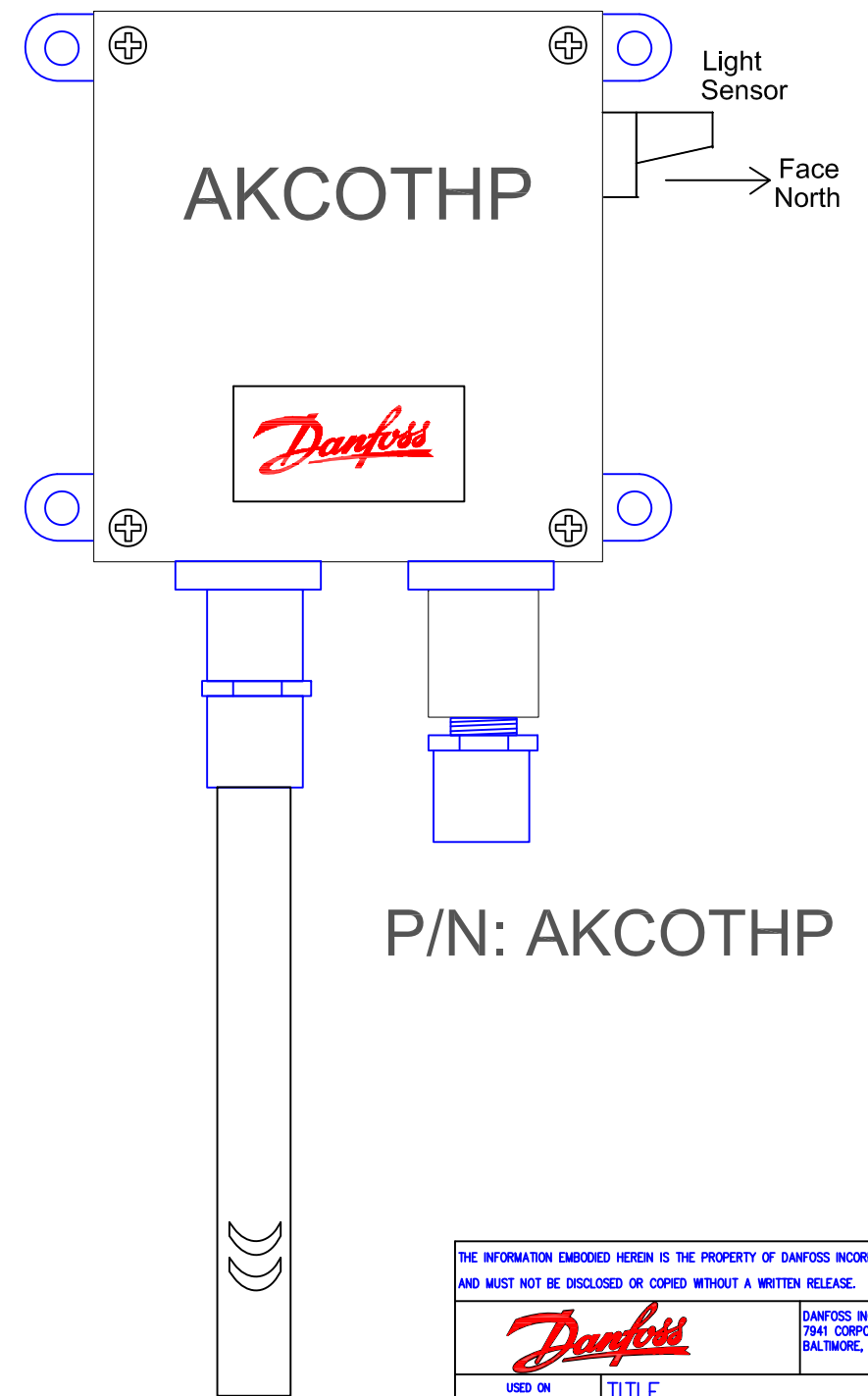
THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.			
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Temperature/Humidity Sensor (EMHS3-1) (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (LSD)	FRACTIONAL	DATE	DATE
+0.02		9/3/08	9/3/08
ANGULAR			
+0.005			
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE	mts	E5	1 OF 1

Typical Outside Temp Humidity and Light Sensor Wiring (AKCOTHP)



*Note: Use the green wire for the AKC55 S18. Otherwise use the blue wire.

WIRING DETAILS ARE FOR EXAMPLE ONLY

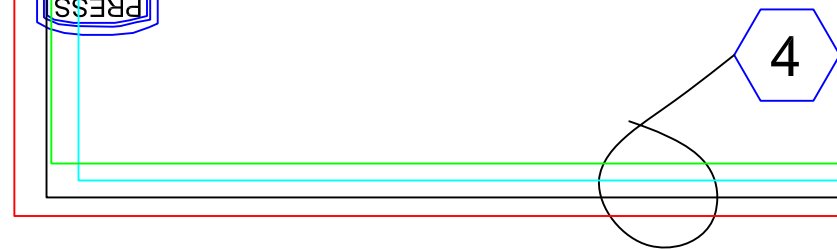
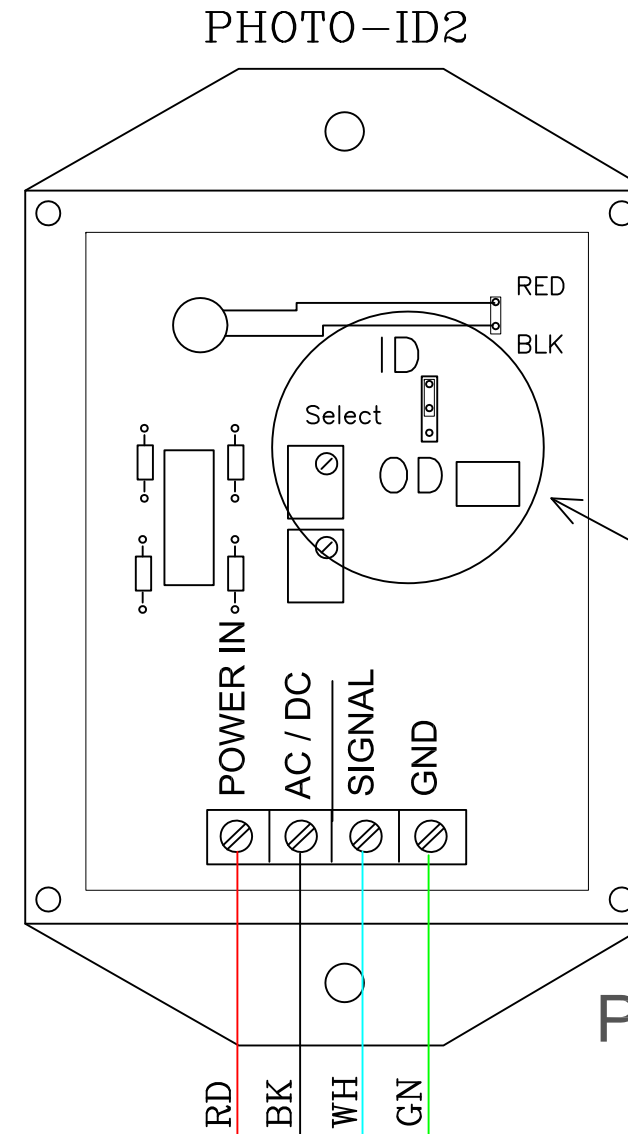
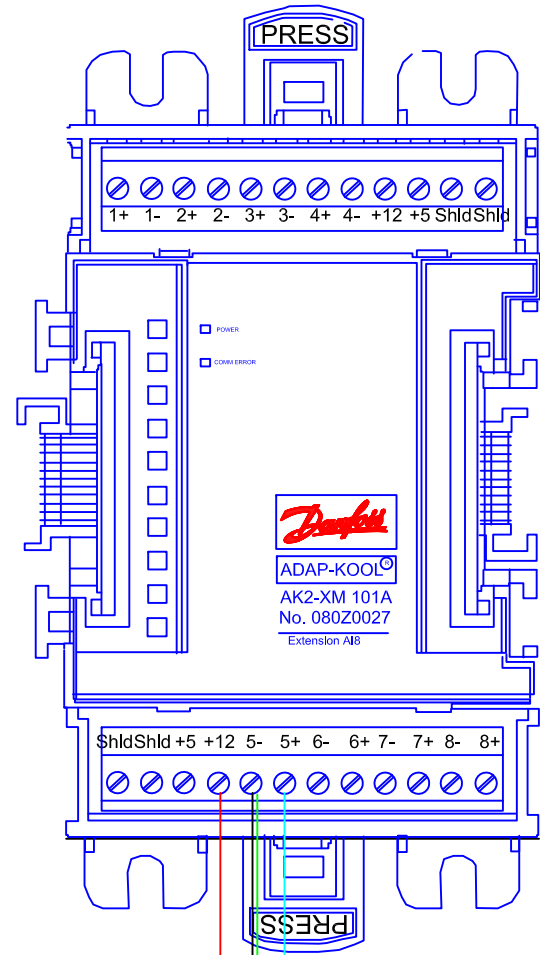


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BALTIMORE, MD.
21236-4925

USED ON		TITLE			
PROJECT	NUMBER	Typical Outside Temp, Humidity, and Light Level Wiring (AKCOTHP)			
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE	DATE	DATE
DECIMAL (X2)	FRACTIONAL	9/3/08	9/3/08	9/3/08	9/3/08
±.02					
±.005	ANGULAR				
DIMENSIONS IN INCHES		DRAWING NO.		SHEET	
SCALE nts		E6		1 OF 1	

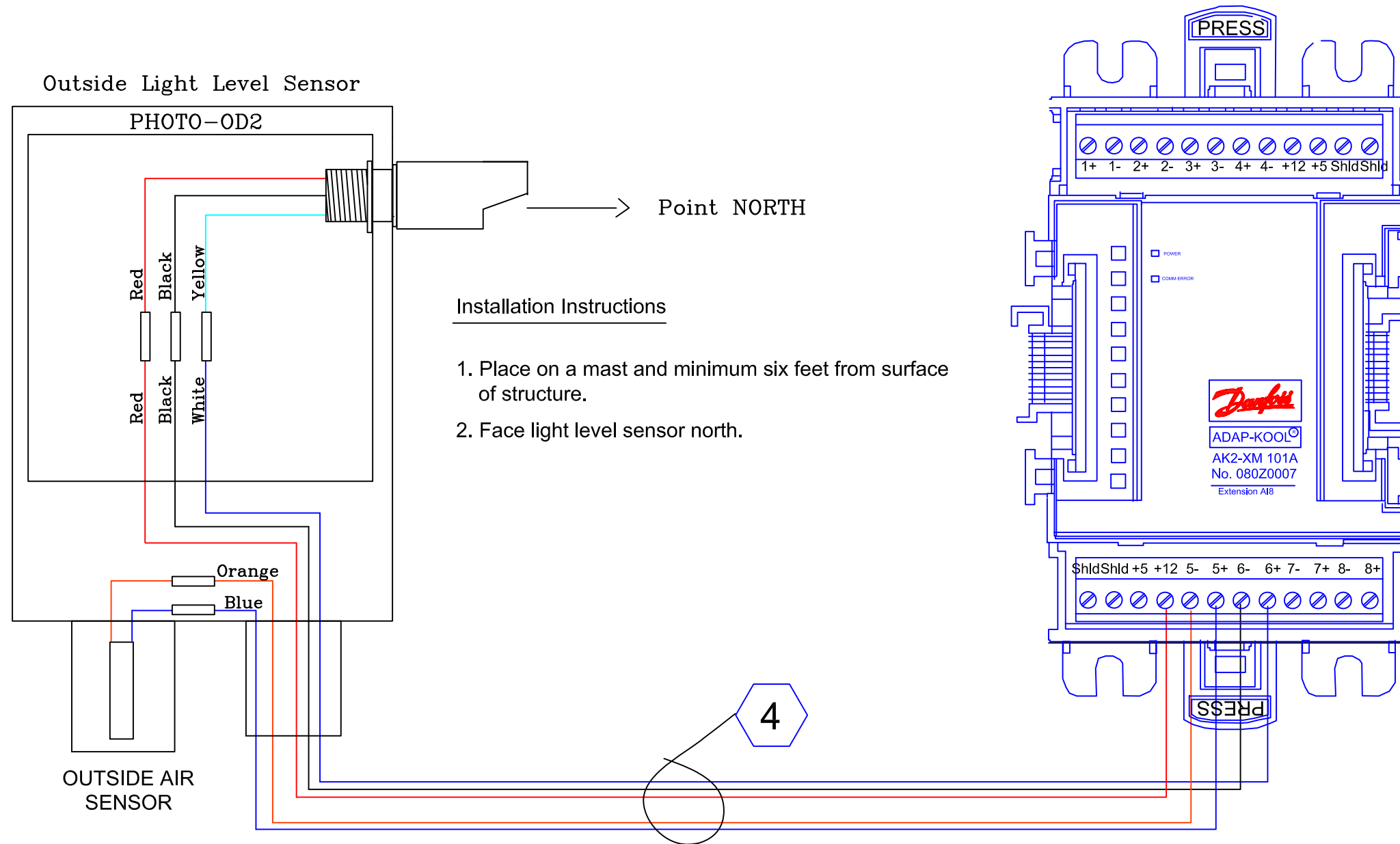
Typical Interior Photocell Wiring (PHOTO-ID2)



4 = Refer to Appendix-A (Cable Specifications)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON		TITLE	
PROJECT	NUMBER	Interior Photocell Wiring (PHOTO-ID2) (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)		DRAWN	CHECKED
DECIMAL (XX)	FRACTIONAL	DATE	DATE
+-.02	ANGULAR	9/3/08	9/3/08
+-.005			
DIMENSIONS IN INCHES		DRAWING NO.	RELEASE
SCALE	nts	E7	SHEET 1 OF 1

Typical Outdoor Air Sensor & Photocell Wiring (080Z2172)



P/N: 080Z2172

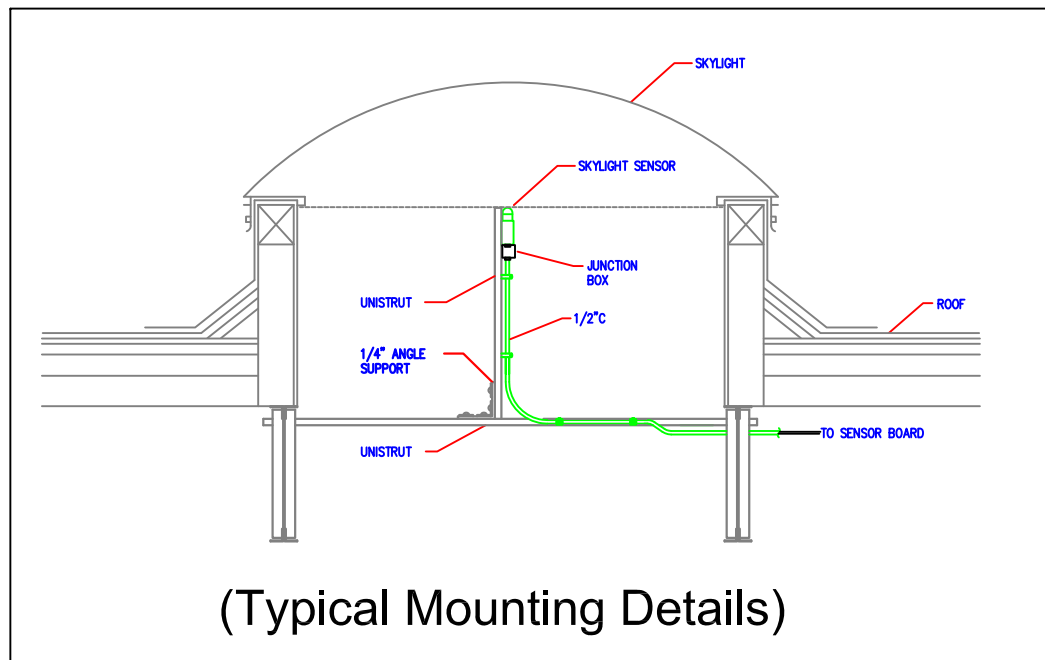
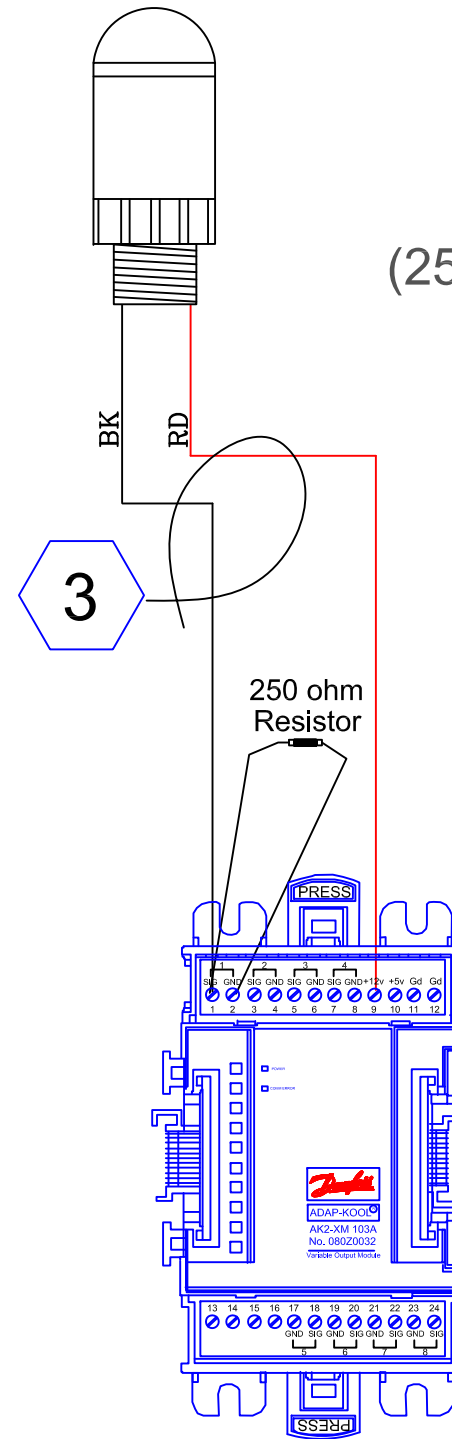
4 = Refer to Appendix-A for Cable Specification

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	Outdoor Air Sensor & Photocell Wiring (080Z2172) (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)	DRWN	CHKD	APPD
DECIMAL (XX) ±.02	DATE	DATE	R.M. DATE
FRACTIONAL	9/3/08		9/3/08
DECIMAL (XXX) ±.005	DATE	DATE	DATE
DIMENSIONS IN INCHES	SCALE	DRAWING NO.	SHEET
nts	1/8"	E8	1 OF 1

Typical Skylight Sensor Installation (080Z2169)

P/N 080Z2169
(0 / 5000FC)

P/N: 080Z2169
(250 ohm resistor in package)



(Typical Mounting Details)

3 = Refer to Appendix-A for Cable Specification

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	Skylight Sensor Wiring (PHOTO-MAS) (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)		DRWN	DATE
DECIMAL (DIM)	FRACTIONAL	DATE	R.M.
+-.02		6/23/08	6/23/08
DECIMAL (HOLE)	ANGULAR	DATE	
+-.005		6/23/08	
SCALE nts		DRAWING NO.	SHEET
		E9	1 OF 1

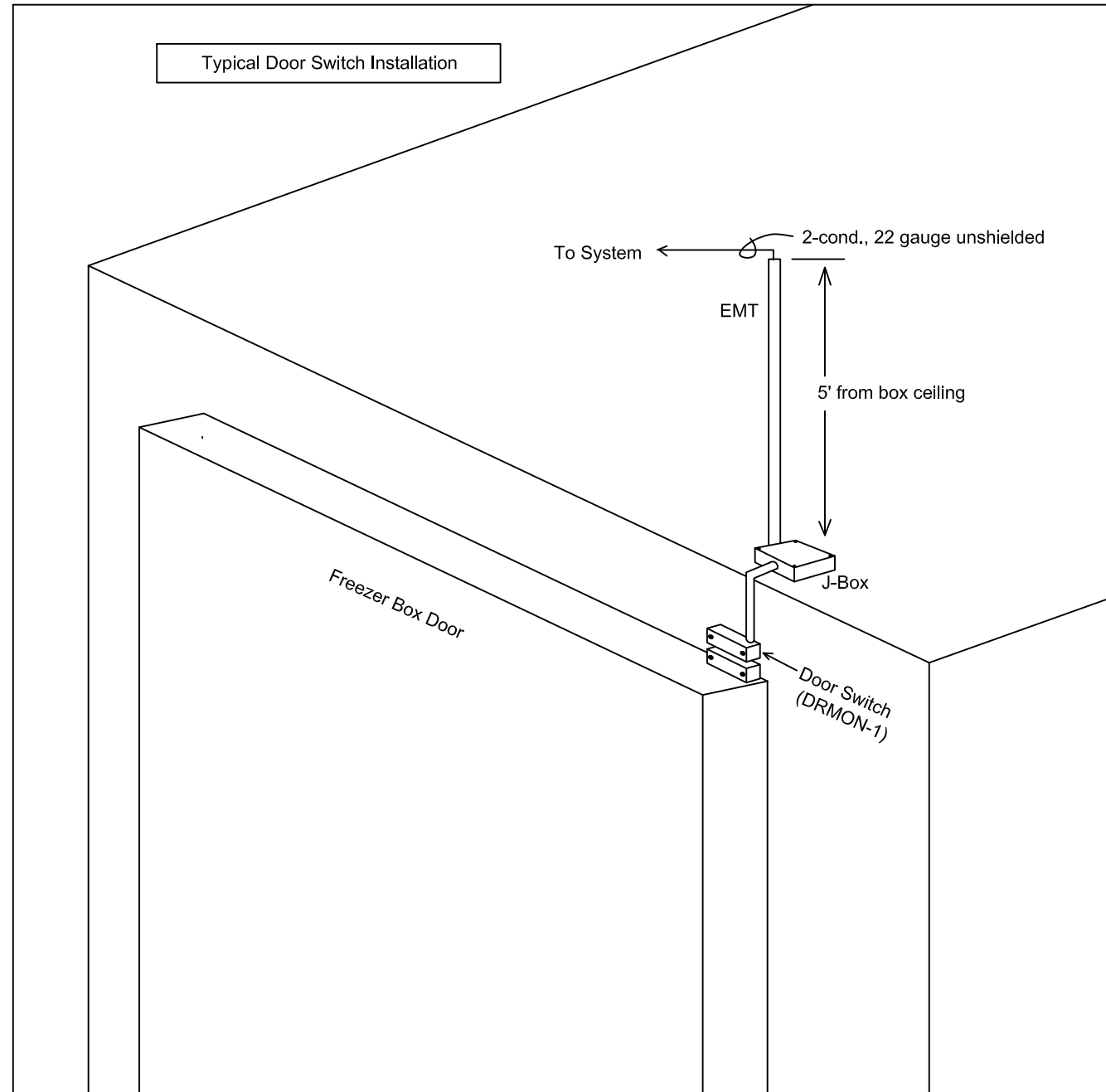
Typical Door Monitor Assembly Installation (DRMON-1)

REFRIGERATION CONTRACTOR NOTES:

1. MOUNT DOOR MONITOR ASSEMBLY ON BOX DOOR AS SHOWN. EXAMPLES TO THE LEFT.
2. INSURE THAT SENSOR ASSEMBLY WIRING IS PULLED THROUGH EMT AS SHOWN IN THE EXAMPLE.
3. USE SELF-TAPPING SCREWS TO MOUNT DOOR MONITOR ASSEMBLY TO DOOR OF BOX.

ELECTRICAL CONTRACTOR NOTES:

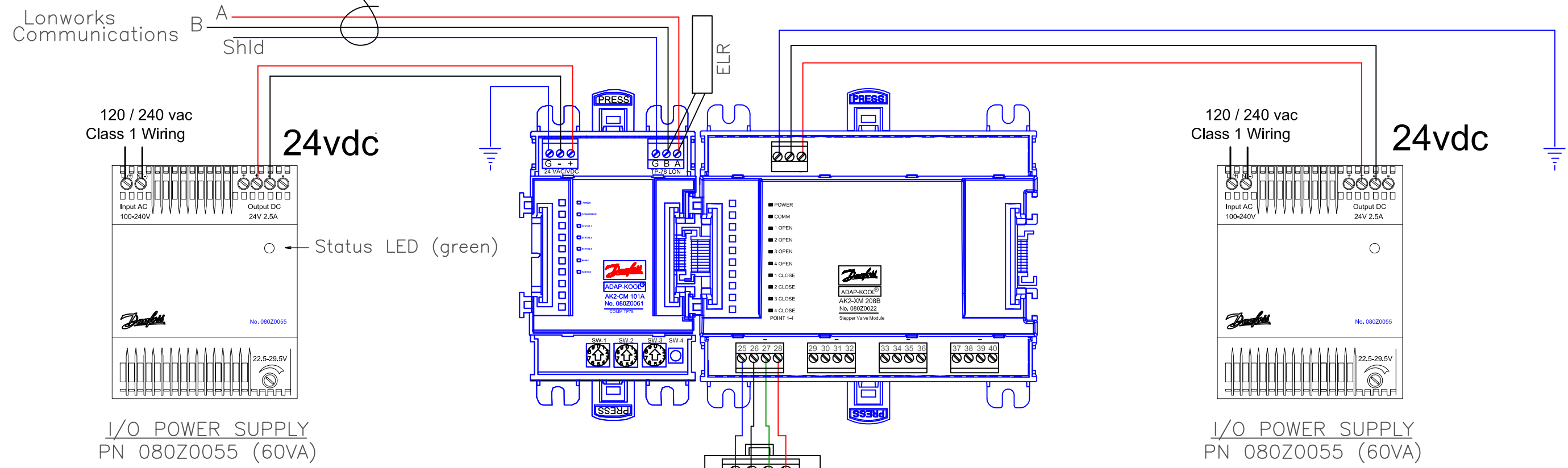
1. ALL DOOR MONITOR WIRING 18-22 Ga. STRANDED, MULTI/C, NON-SHIELED.



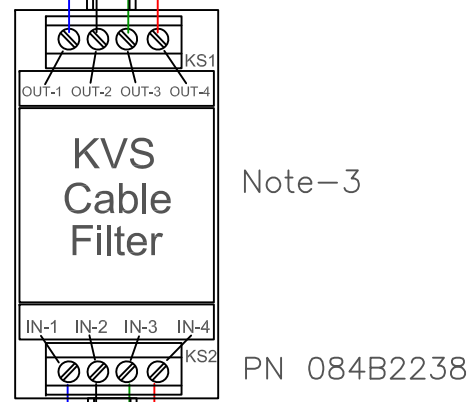
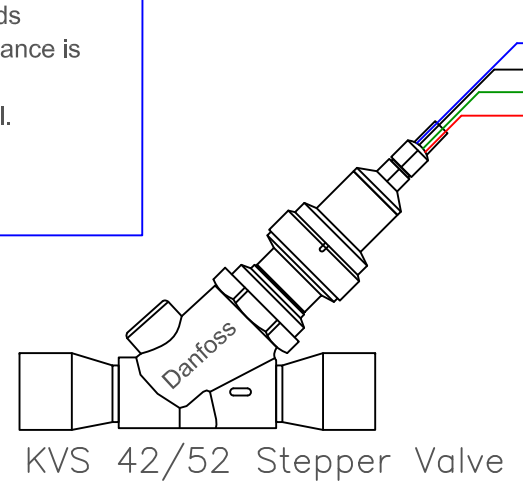
P/N : DRMON-1

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			DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925
USED ON	TITLE		
PROJECT NUMBER	Door Monitor Assembly (DRMON-1) (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (1/10)	FRACTIONAL	DATE	DATE
+0.02	ANGULAR	10/23/09	10/23/09
+0.005	DIMENSIONS IN INCHES		SCALE
SCALE: nts		DRAWING NO. E10	SHEET 1 OF 1

Typical KVS Stepper Valve Wiring (W/Filter)



- Installation Notes:**
1. Wire stepper valve(s) to stepper module(s) exactly as shown in illustration, using the cable reference chart and observing lead colors carefully.
 2. Danfoss KVS Cable filter module must be used when cable distance exceeds 32.8 feet. (10 meters) Maximum distance is 328.08 feet. (100 meters)
 3. Install Cable filter module on DIN rail.



Wiring Reference Chart

Valve	Terminal #			
	1	2	3	4
Danfoss Valve	White	Black	Green	Red
Sporlan CDS	White	Black	Red	Green
Alco ESR	White	Black	Red	Blue

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7941 CORPORATE DRIVE
BALTIMORE, MD.
21236-4925

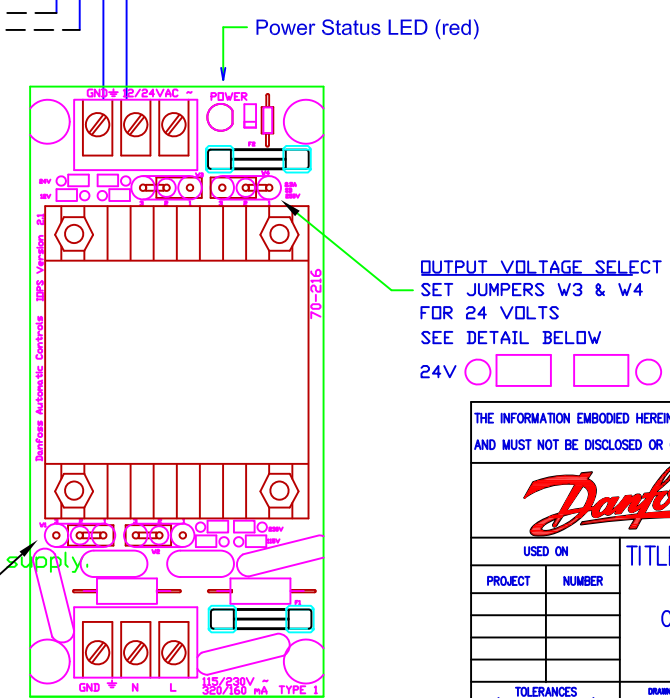
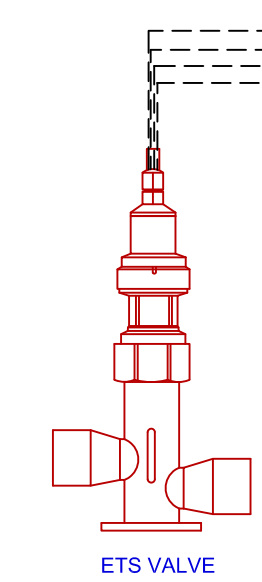
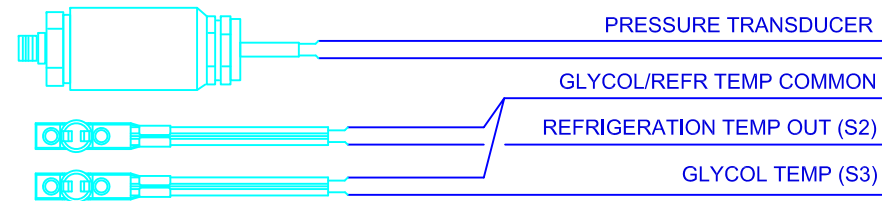
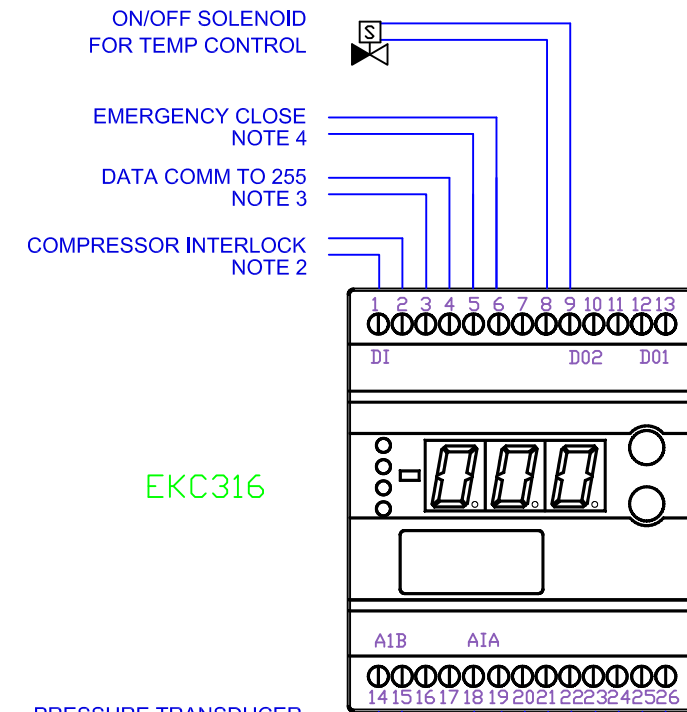
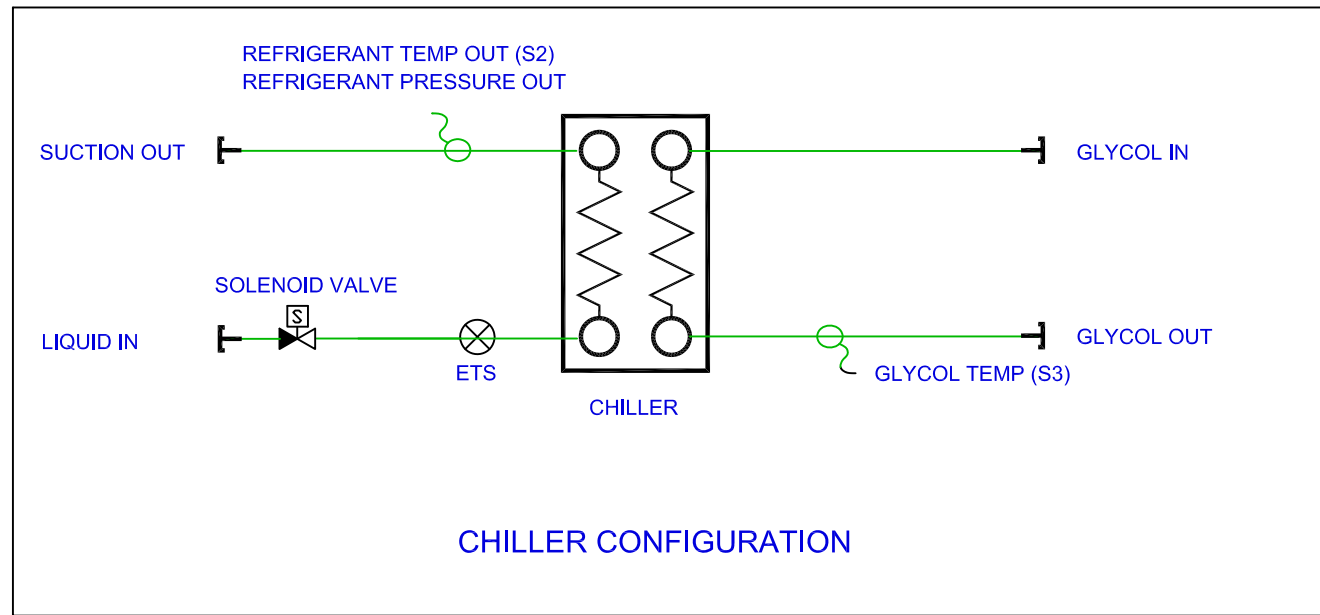
USED ON: TITLE
PROJECT NUMBER: Typical KVS Stepper Valve Wiring (With Filter) (Typical Installation)

TOLERANCES (EXCEPT AS NOTED): DIM IN INCHES: DATE: 10/23/09

SCALE: nts DRAWING NO. F1 SHEET 1 OF 1

1 = Refer to Appendix-A (Cable Specifications)

ETS Valve - Chiller Control Configuration (EKC 316)



- NOTES**
- PART NUMBERS:**
EKC316 = 084B7088
EKA173 = 084B7092 (REQUIRED FOR COMMUNICATION)
AKS 33 = 060G2101 (PRESSURE TRANSDUCER)
AKS 11 = 084N2700 (TEMP SENSOR)
ETS FILTER = 084B2238
POWER SUPPLY = TBD
 - FOR ON OFF CONTROL OF ETS, THERE MUST BE A CONTACT CLOSURE BETWEEN TERMINALS 1 AND 2 FOR VALVE TO OPEN. THIS CAN BE USED TO INTERLOCK THE VALVE WITH A COMPRESSOR CONTACTOR.
 - EKA173 CARD INSTALLS INSIDE EKC316 FOR DATA COMMUNICATIONS TO 255
 - TERMINALS 5 AND 6 CAN BE USED TO CONNECT A BATTERY TO CLOSE THE VALVE IN THE EVENT OF A POWER FAILURE. CONSULT THE MANUAL FOR MORE INFORMATION.
 - ETS CAN HAVE A MAXIMUM DISTANCE OF 10 METERS FROM THE EKC TO THE VALVE WITHOUT THE USE OF A FILTER. FOR DISTANCES UP TO 100M, USE ETS FILTER (REFER TO NOTE 1)

ETS-CHILLER CONTROL CONFIGURATION

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BALTIMORE, MD. 21236-4925

USED ON	TITLE			
PROJECT	NUMBER	ETS Valve Chiller Control Configuration (EKC 316)		
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE	DATE
DECIMAL (LSD)	FRACTIONAL	7/15/2008	7/15/2008	7/15/2008
DECIMAL (LSD)	ANGULAR	DRAWING NO. F2		
DECIMAL (LSD)	ANGULAR	SCALE nts		
DRAWING NO. F2				SHEET 1 OF 1

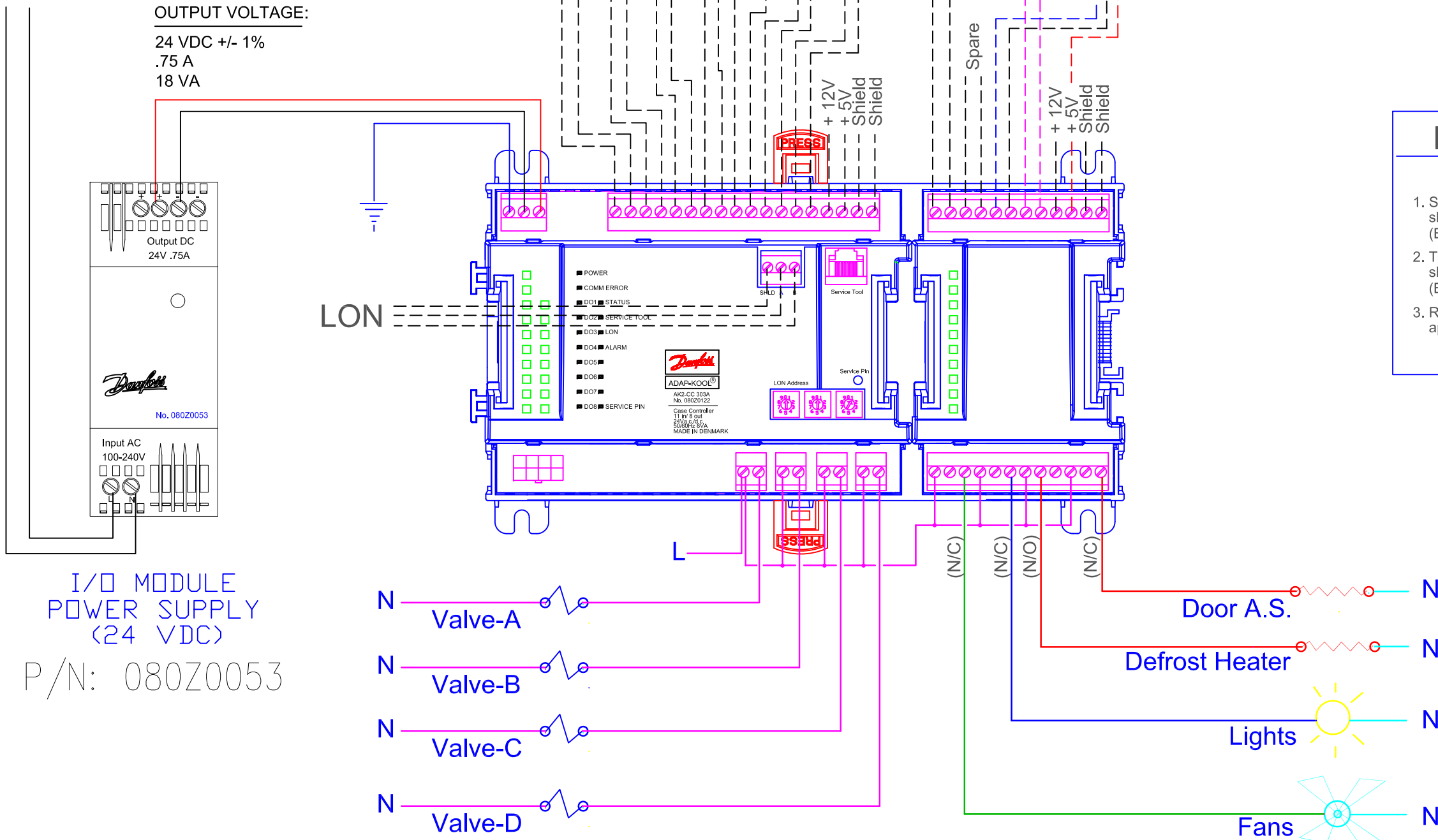
Typical AK2-CC 303A Case Controller Installation (P/N: 080Z0124)

NOMINAL INPUT VOLTAGE:

100-240 VAC
 45-65 Hz
 .37 A (120 VAC)
 .25 A (240 VAC)

OUTPUT VOLTAGE:

24 VDC +/- 1%
 .75 A
 18 VA



I/O MODULE
 POWER SUPPLY
 (24 VDC)
 P/N: 080Z0053

Installation Notes:

1. Sensor cables are 2-conductor, stranded, shielded, 18-22 gauge, with PVC jacket. (Belden 8761 or equiv.)
2. Transducer cables are 3-conductor, stranded, shielded, 18-22 gauge, with PVC jacket. (Belden 8771 or equiv.)
3. Refer to Quick Setup Guide for input/output application.

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE	AK2-CC 303A Case Controller Configuration Details (Typical Installation)	
PROJECT NUMBER		DATE	DATE
		11/25/2008	11/25/2008
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE
DECIMAL (1/10)	FRACTIONAL	11/25/2008	11/25/2008
+-.02			
DECIMAL (1/16)	ANGULAR		
+-.005			
DIMENSIONS IN INCHES		DRAWING NO.	F3
SCALE	nts		SHEET 1 OF 1

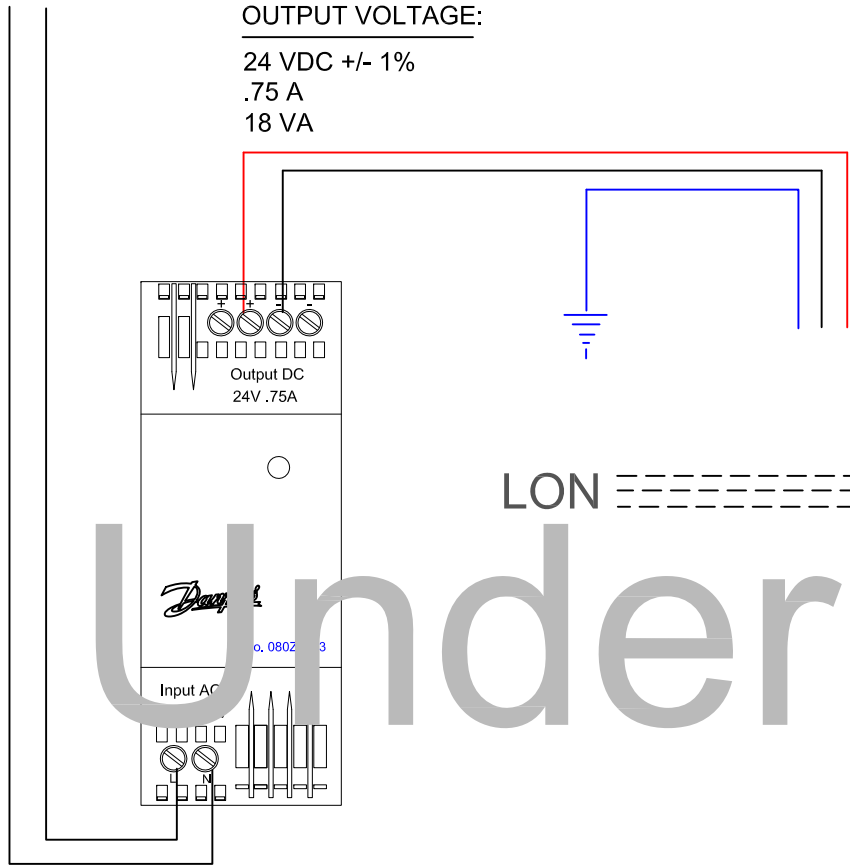
Typical AK-CC 450 Case Controller Installation (P/N:)

NOMINAL INPUT VOLTAGE:

100-240 VAC
 45-65 Hz
 .37 A (120 VAC)
 .25 A (240 VAC)

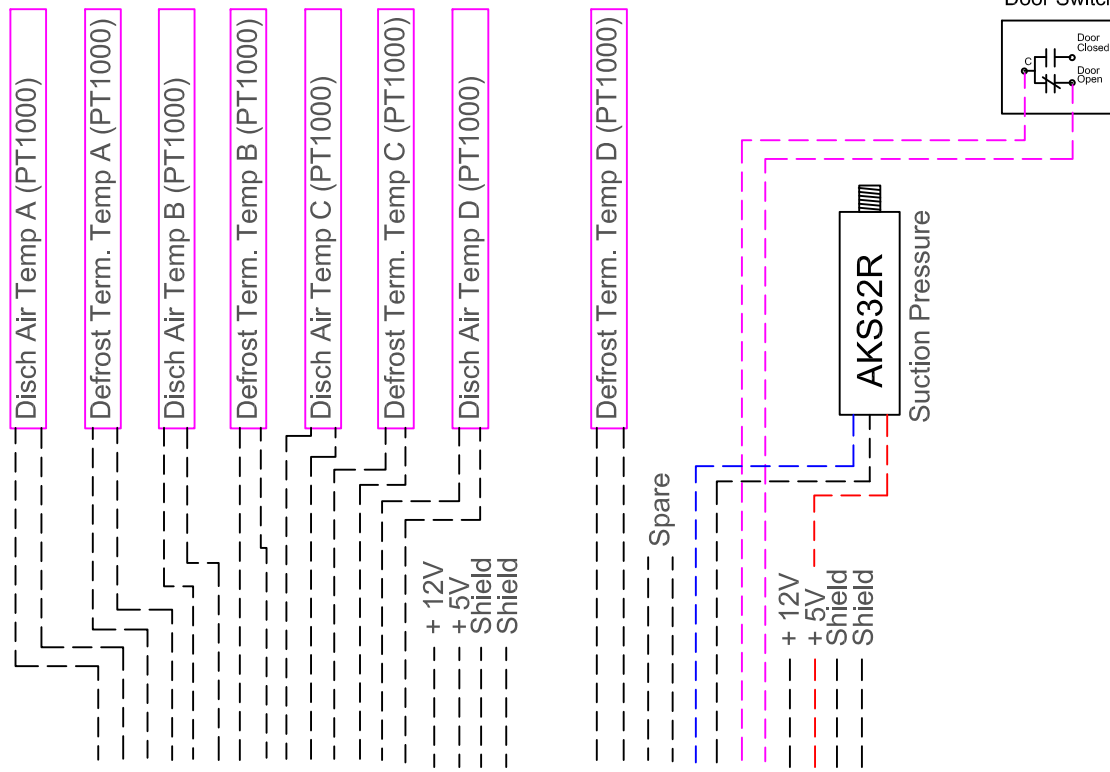
OUTPUT VOLTAGE:

24 VDC +/- 1%
 .75 A
 18 VA



I/O MODULE
 POWER SUPPLY
 (24 VDC)

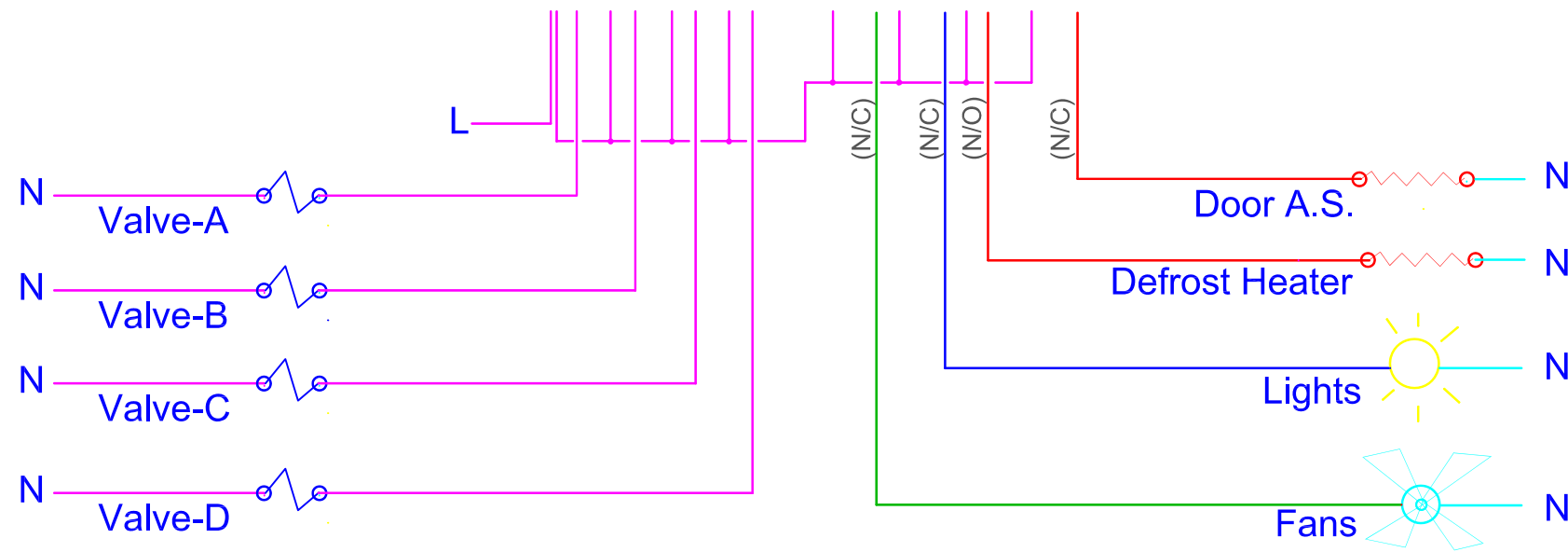
P/N: 080Z0053



LON

- Installation Notes:**
1. Sensor cables are 2-conductor, stranded, shielded, 18-22 gauge, with PVC jacket. (Belden 8761 or equiv.)
 2. Transducer cables are 3-conductor, stranded, shielded, 18-22 gauge, with PVC jacket. (Belden 8771 or equiv.)
 3. Refer to Quick Setup Guide for input/output application.

Under Construction



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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	AK-CC 450 Case Controller Configuration Details (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE
DECIMAL (LSD)	FRACTIONAL	R.M.	R.M.
+-.02		9/30/2009	9/30/2009
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE nts		F4	1 OF 1

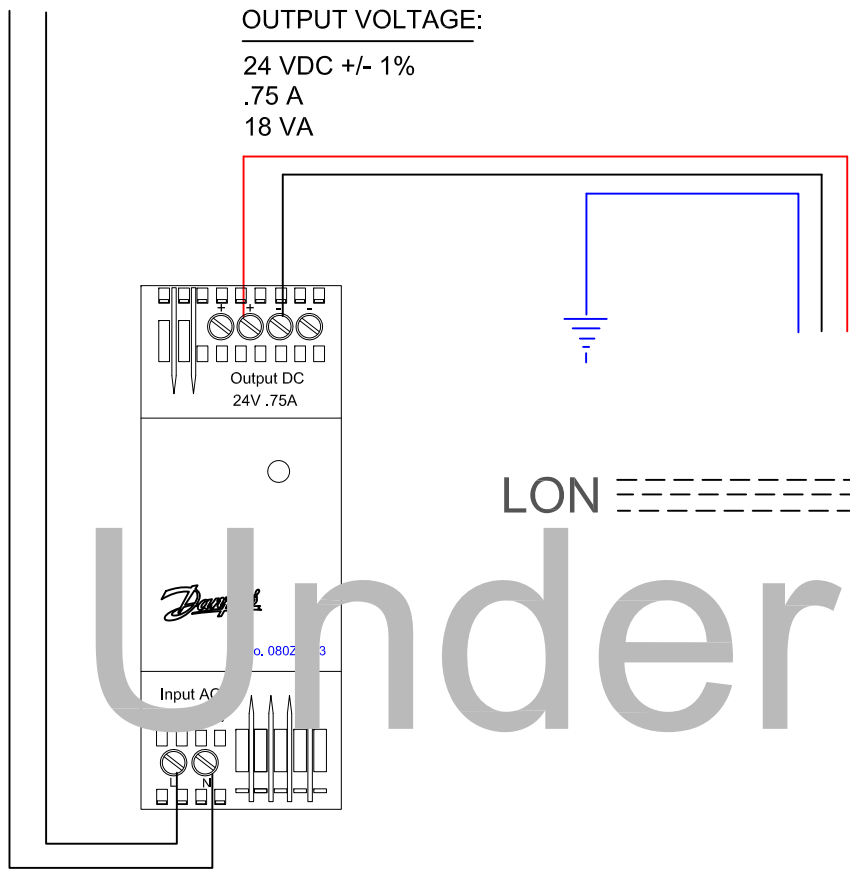
Typical AK-CC 550 Case Controller Installation (P/N:)

NOMINAL INPUT VOLTAGE:

100-240 VAC
 45-65 Hz
 .37 A (120 VAC)
 .25 A (240 VAC)

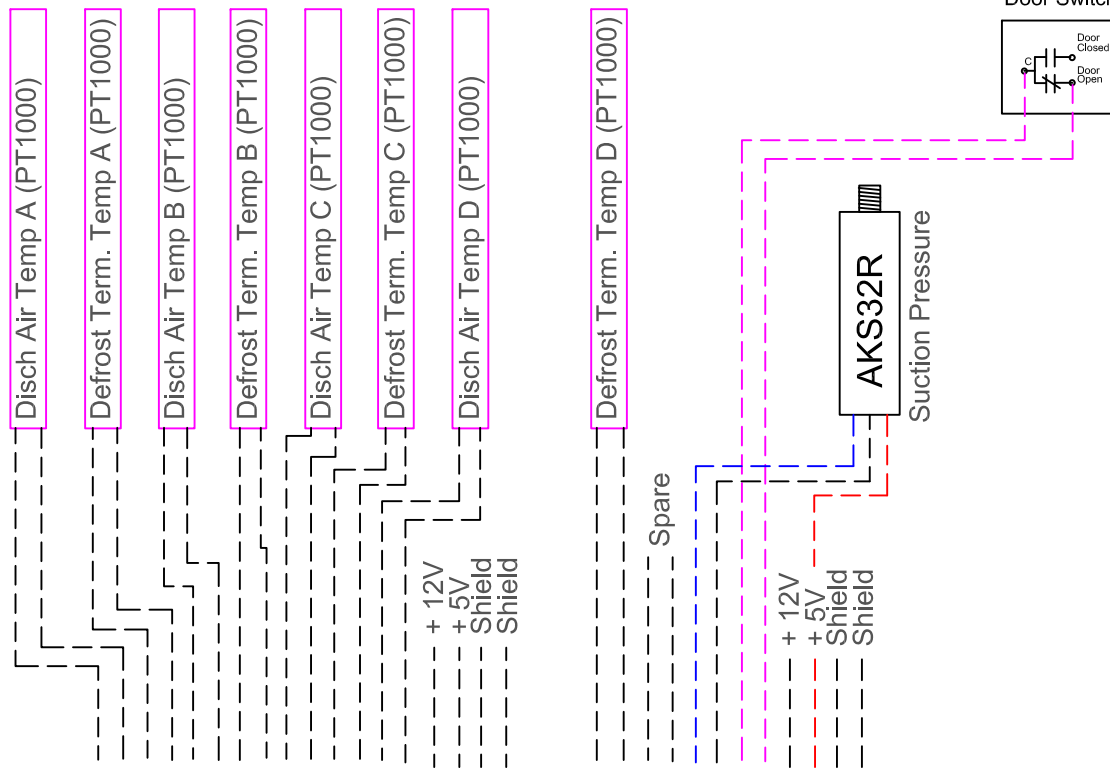
OUTPUT VOLTAGE:

24 VDC +/- 1%
 .75 A
 18 VA



I/O MODULE
 POWER SUPPLY
 (24 VDC)

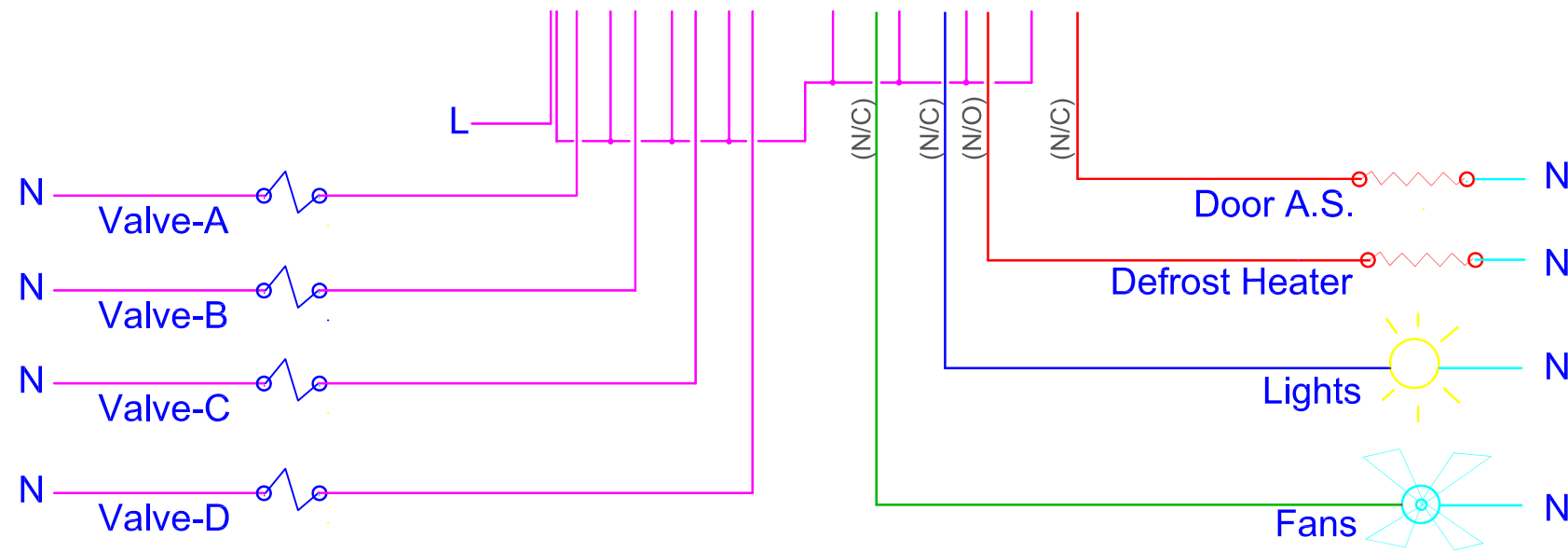
P/N: 080Z0053



LON

- Installation Notes:**
1. Sensor cables are 2-conductor, stranded, shielded, 18-22 gauge, with PVC jacket. (Belden 8761 or equiv.)
 2. Transducer cables are 3-conductor, stranded, shielded, 18-22 gauge, with PVC jacket. (Belden 8771 or equiv.)
 3. Refer to Quick Setup Guide for input/output application.

Under Construction



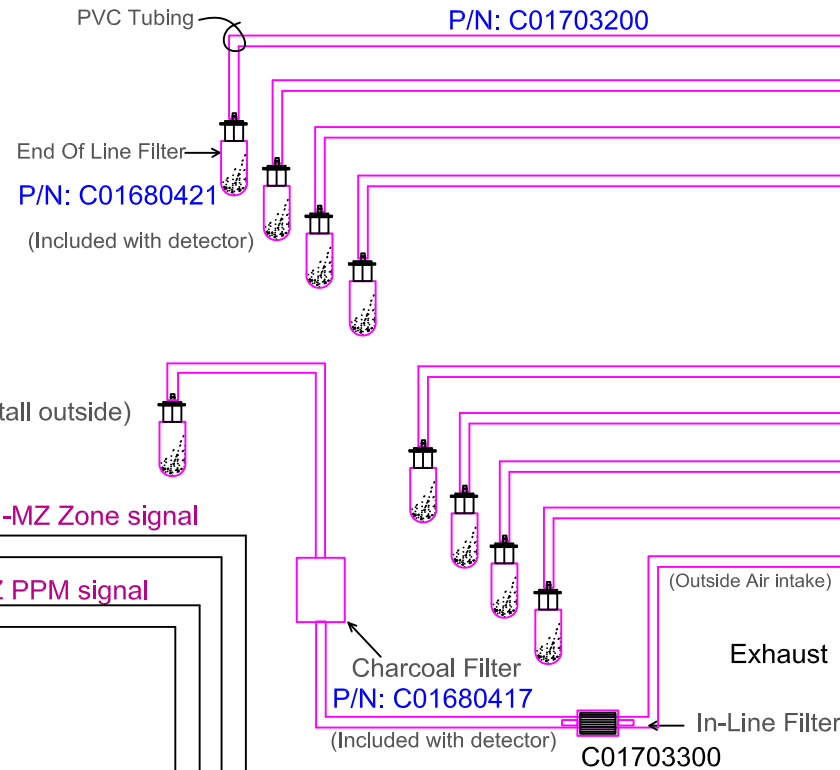
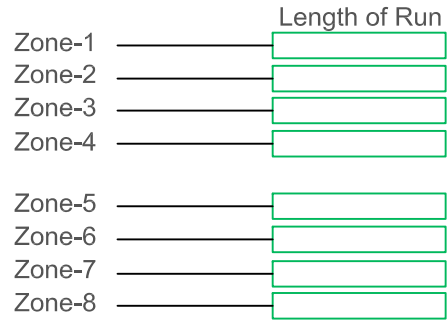
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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925		
		USED ON PROJECT NUMBER	TITLE AK-CC 550 Case Controller Configuration Details (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)		DRAWN RM	CK'D DATE	APP'D DATE
DECIMAL (LSD) +/- .02	FRACTIONAL ANGULAR +/- .005	DATE 9/30/2009	DATE 9/30/2009	DATE 9/30/2009
DIMENSIONS IN INCHES SCALE nts		DRAWING NO. f5		SHEET 1 OF 1

Typical HGM-MZ Leak Detection System Wiring

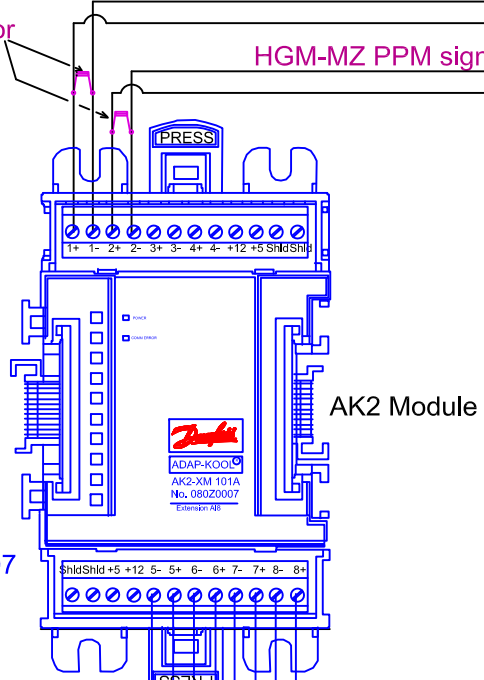
HGM-MZ

Termination Schedule		
Description	CM	Board / Point
HGM-MZ Zone signal		
HGM-MZ PPM signal		
Leak Alarm		
Spill Alarm		
Evacuate Alarm		
System Fault Alarm		



250 ohm resistor
(Part of 4-20 ma output option)
P/N: 080Z2154

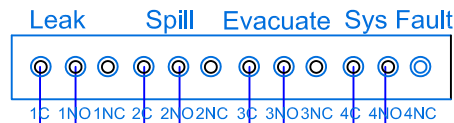
P/N: 080Z0007



Return
Return
Loop 1 Zone
Loop 2 PPM

Optional signals if using
4-20 mA output board (P/N: 080Z2154)

4-20mA OPTIONAL PCB
P/N: 080Z2154



HGM-MZ Relay Outputs

Leak Alarm

Spill Alarm

Evacuate Alarm

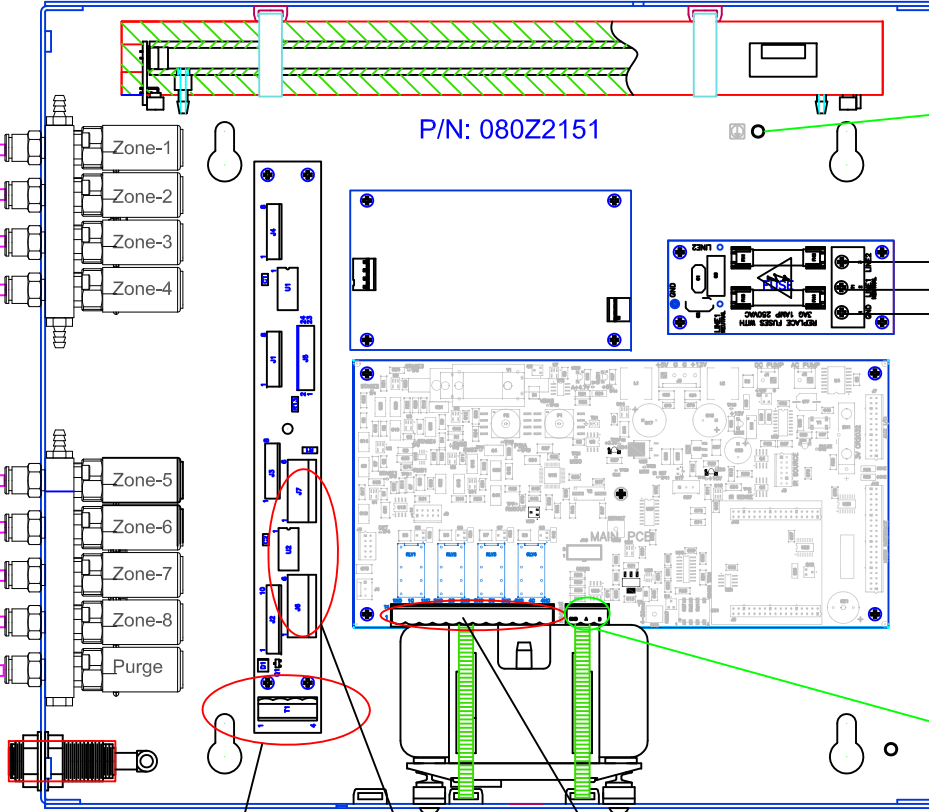
System Fault Alarm

18 gauge, non-shielded cable

18 gauge, shielded cable

Exhaust

Outside Air Intake



HGM-MZ PART NO.'s:

- 4 Zone: 080Z2150
- 8 Zone: 080Z2151
- 12 Zone: 080Z2152
- 16 Zone: 080Z2153

LEGEND

Provide 120 vac to HGM-300 and RDM-800.

Run tubing from HGM-MZ to each location and install filters at each sample point. (P/N C01703200) (Included with detector)

Install charcoal filter at unit, and outside air filter on the outside of building. (included with detector)

For communicating to AK2 modules install 080Z2154 adapter board.

Run 2-conductor shielded cable to AK2 module and wire as shown. (18 awg.)

Install 250 ohm precision resistors at zone and ppm inputs.

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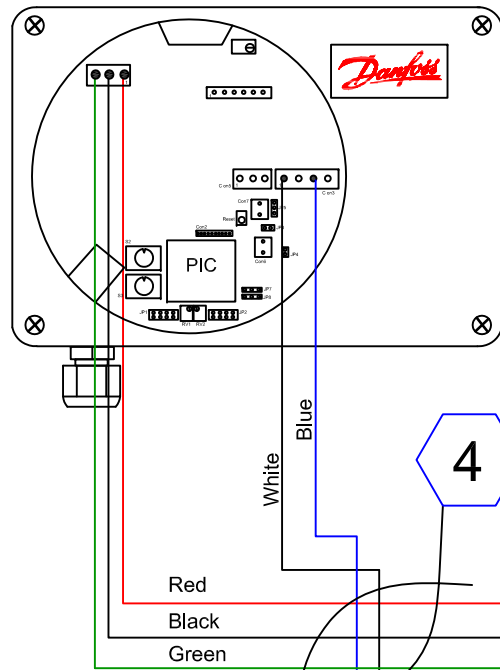
DANFOSS INCORPORATED
11655 Crossroads Circle
BALTIMORE, MD. 21220

USED ON		TITLE	
PROJECT	NUMBER	Typical HGM-MZ Leak Detection System Wiring (Typical Installation) 080Z9170	
TOLERANCES (EXCEPT AS NOTED)		DRWN	CHKD
DECIMAL (1/32)	FRACTIONAL	DATE	R.M.
+/- .02		DATE	DATE
ENGINEERING	ASSEMBLY	10/26/09	10/26/09
DIMENSIONS IN INCHES		SCALE nts	
DRAWING NO. G1		SHEET 1 OF 1	

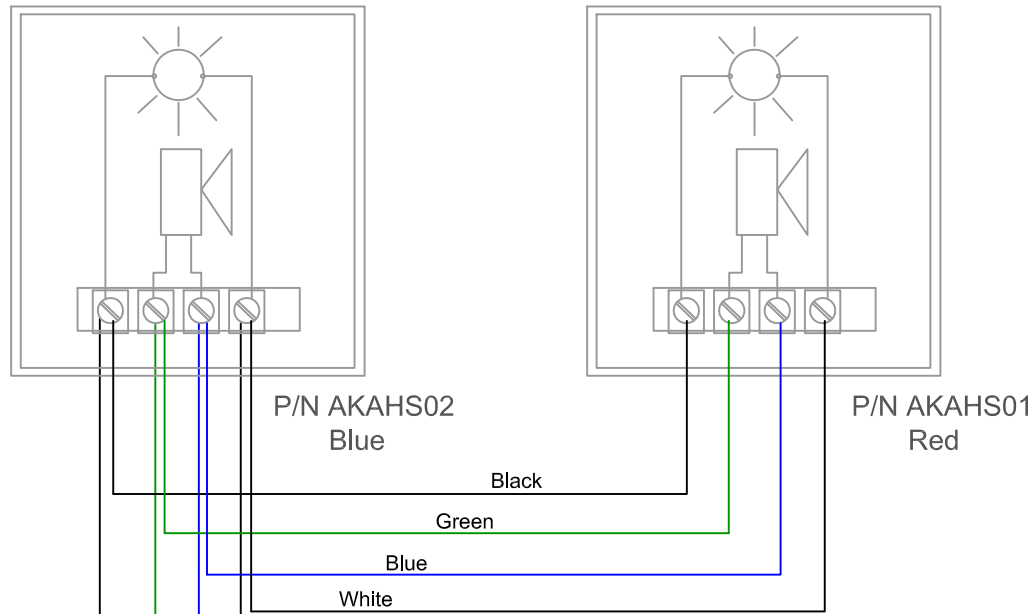
Typical GDHF Leak Detection Sensor Installation

Horn/Siren

Horn/Siren



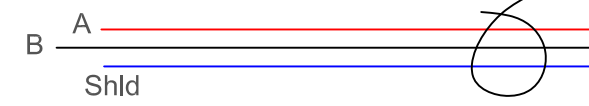
GDHF Sensor



P/N AKAHS02
Blue

P/N AKAHS01
Red

Lonworks
Communications

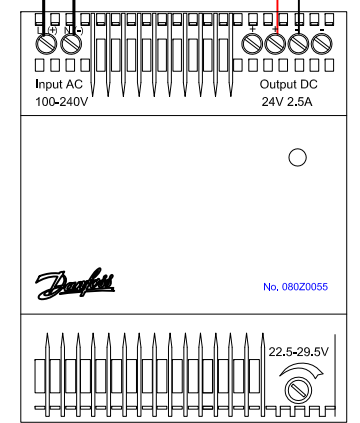


X = Refer to Appendix-A for Cable Specification

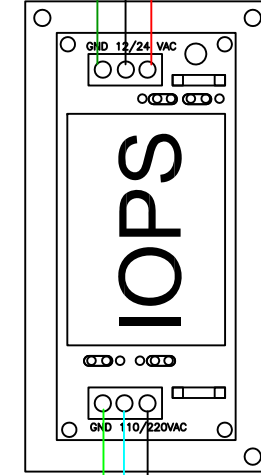
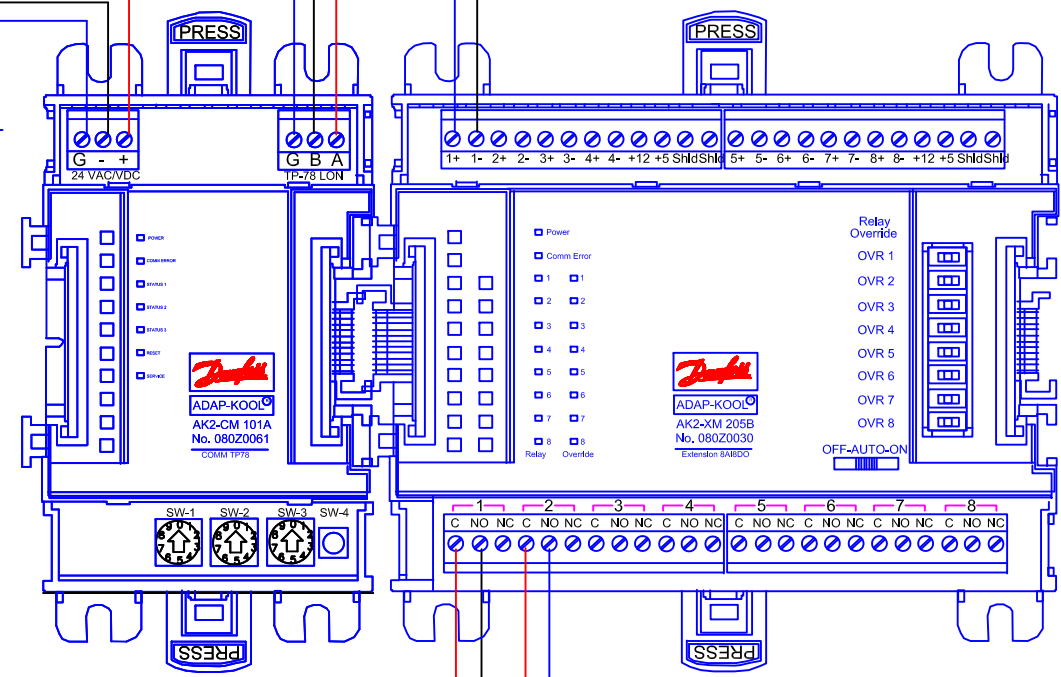
120 / 240 vac
Class 1 Wiring

24 vdc

24vac



I/O POWER SUPPLY
PN 080Z0055 (60VA)



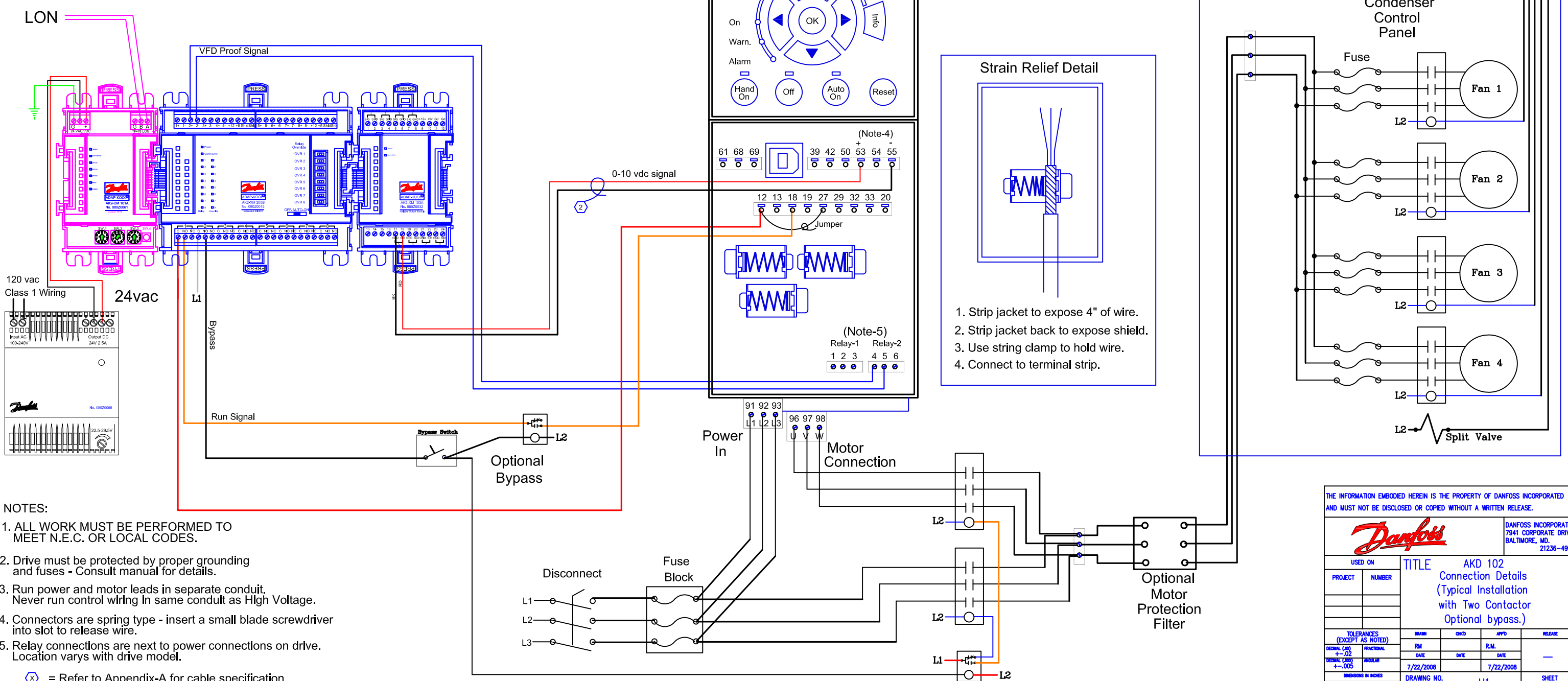
120 vac
Class 1 Wiring

18 gauge
Unshielded

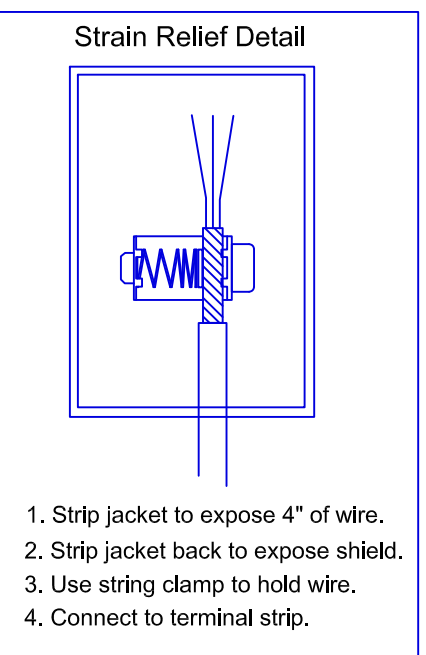
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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	GDHF Leak Detection Sensor (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE
DECIMAL (LSD)	FRACTIONAL	DATE	DATE
+-.02		6/23/08	6/23/08
DECIMAL (LSD)	ANGULAR	DRAWING NO. G2	
+-.005		SHEET 1 OF 1	
SCALE nts		DRAWING NO. G2	

AKD 102 Typical Connection Drawing

(Condenser Fans)



- NOTES:
1. ALL WORK MUST BE PERFORMED TO MEET N.E.C. OR LOCAL CODES.
 2. Drive must be protected by proper grounding and fuses - Consult manual for details.
 3. Run power and motor leads in separate conduit. Never run control wiring in same conduit as High Voltage.
 4. Connectors are spring type - insert a small blade screwdriver into slot to release wire.
 5. Relay connections are next to power connections on drive. Location varies with drive model.
- ⊗ = Refer to Appendix-A for cable specification



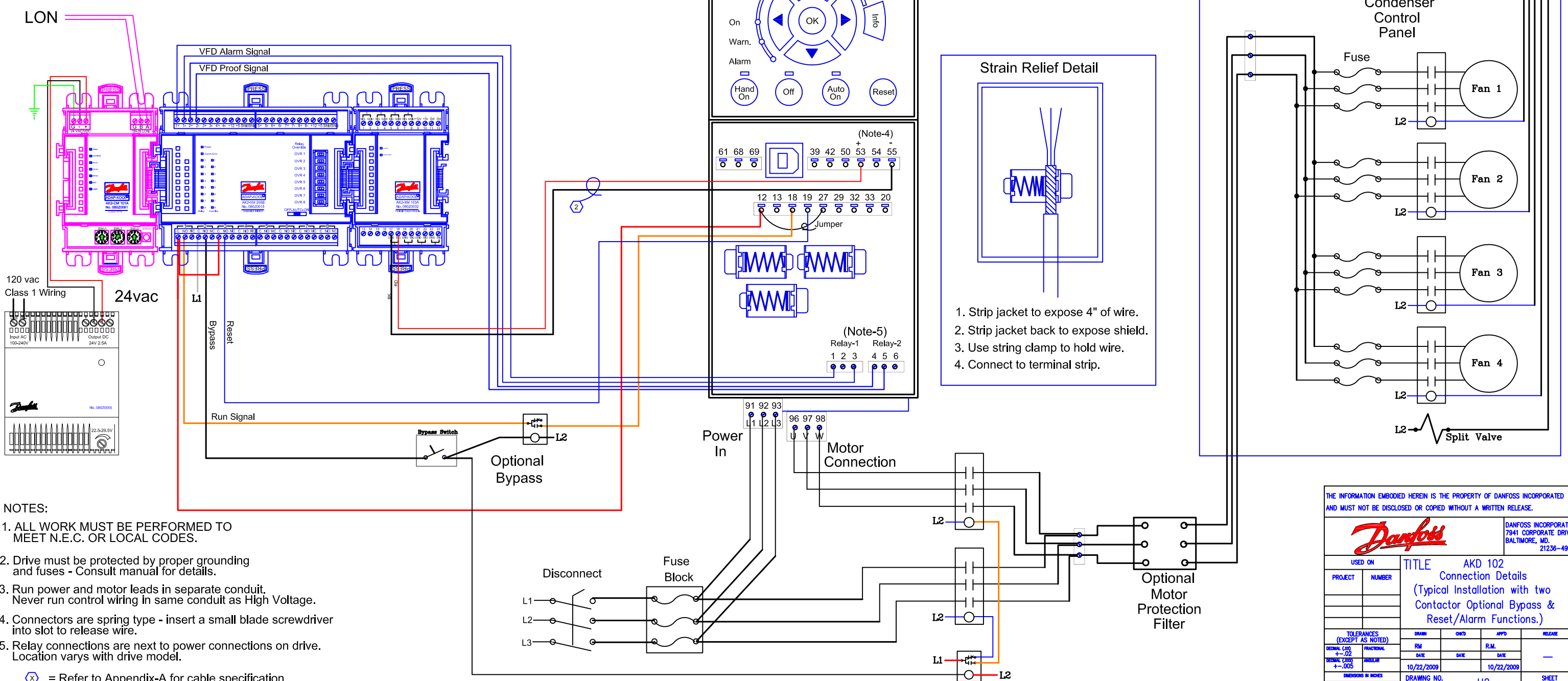
THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.

Danfoss DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD. 21236-4925

USED ON	TITLE	DATE	DATE	DATE	DATE
PROJECT NUMBER	AKD 102 Connection Details (Typical Installation with Two Contactor Optional bypass.)	7/22/2008	7/22/2008		
TOLERANCES (EXCEPT AS NOTED)		DRAWN	CHKD	APP'D	RELEASE
DECIMAL (XX)	FRACTIONAL	RM	DATE	R.M.	DATE
+0.02					
DECIMAL (XX)	ANGULAR				
+0.005					
SCALE nts		DRAWING NO. H1		SHEET 1 OF 1	

AKD 102 Typical Connection Drawing

(Condenser Fans)

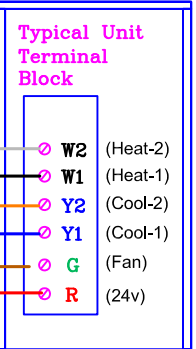
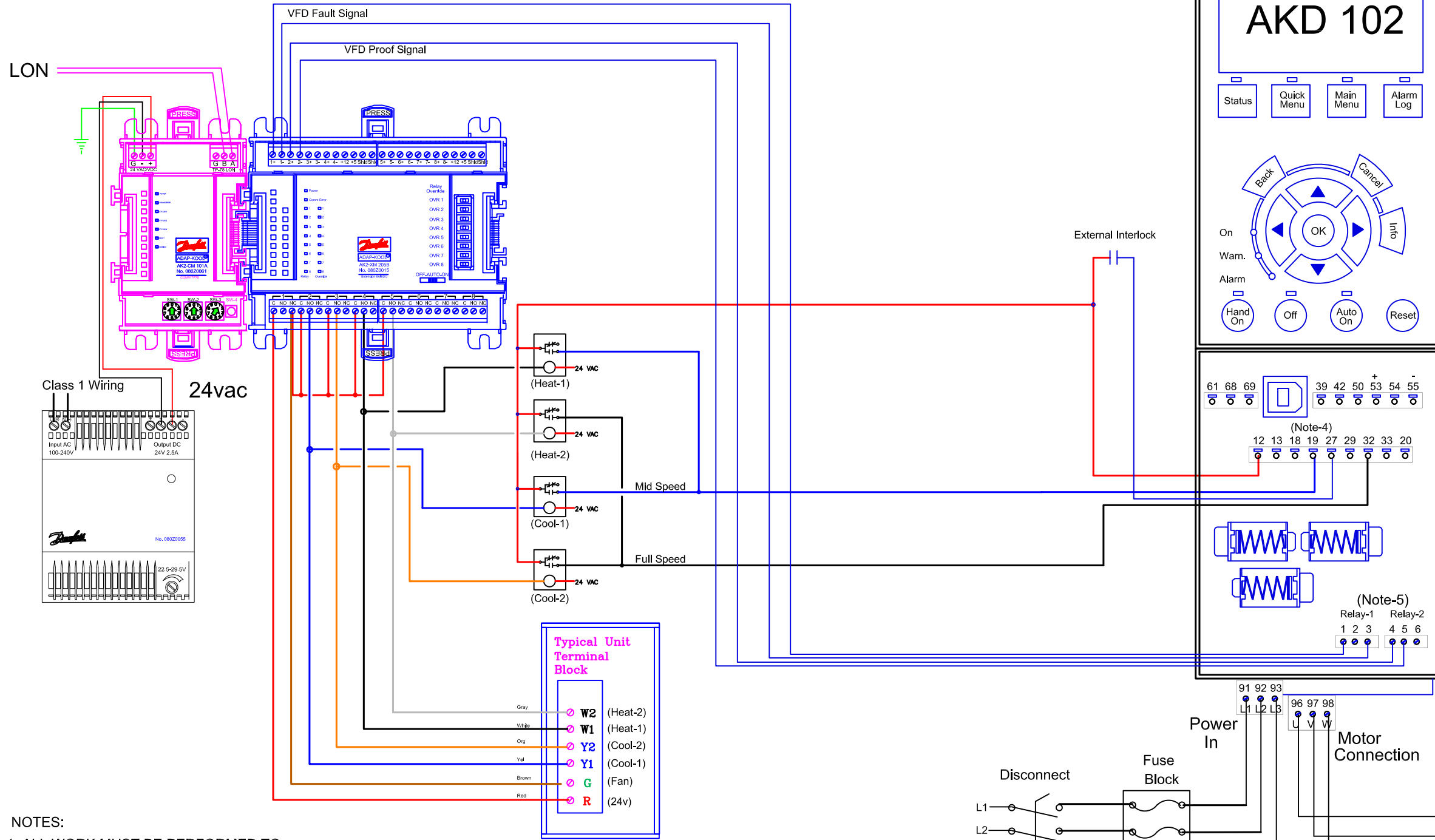


- NOTES:**
- ALL WORK MUST BE PERFORMED TO MEET N.E.C. OR LOCAL CODES.
 - Drive must be protected by proper grounding and fuses - Consult manual for details.
 - Run power and motor leads in separate conduit. Never run control wiring in same conduit as High Voltage.
 - Connectors are spring type - insert a small blade screwdriver into slot to release wire.
 - Relay connections are next to power connections on drive. Location varies with drive model.
- ⊗ = Refer to Appendix-A for cable specification

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE	AKD 102 Connection Details (Typical Installation with two Contactor Optional Bypass & Reset/Alarm Functions.)	
PROJECT NUMBER	DATE	DATE	DATE
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE
DECIMAL (X2)	FRACTIONAL	DATE	DATE
+0.02		10/22/2009	10/22/2009
DECIMAL (X10)	ANGULAR	DRAWING NO. H2	
+0.005		SHEET 1 OF 1	
SCALE nts		DRAWING NO. H2	

AKD 102 Typical Connection Drawing

(Single Fan / Preset Control)



- NOTES:**
- ALL WORK MUST BE PERFORMED TO MEET N.E.C. OR LOCAL CODES.
 - Drive must be protected by proper grounding and fuses - Consult manual for details.
 - Run power and motor leads in separate conduit. Never run control wiring in same conduit as High Voltage.
 - Connectors are spring type - insert a small blade screwdriver into slot to release wire.
 - Relay connections are next to power connections on drive. Location varies with drive model.

Field Notes:

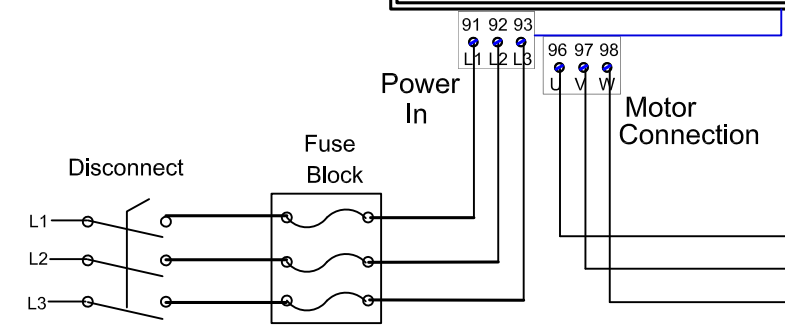
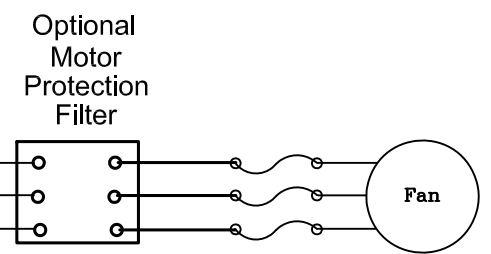
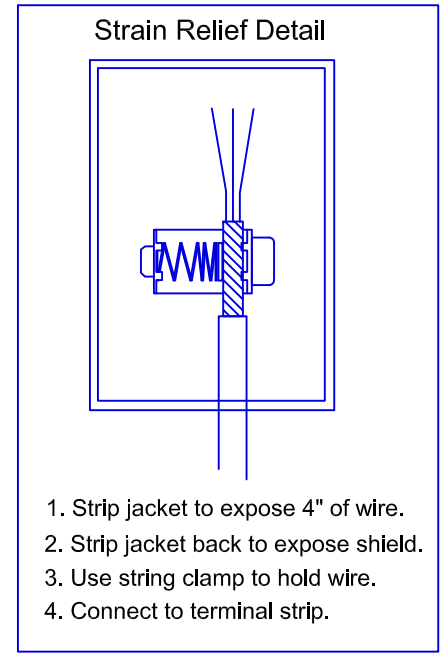
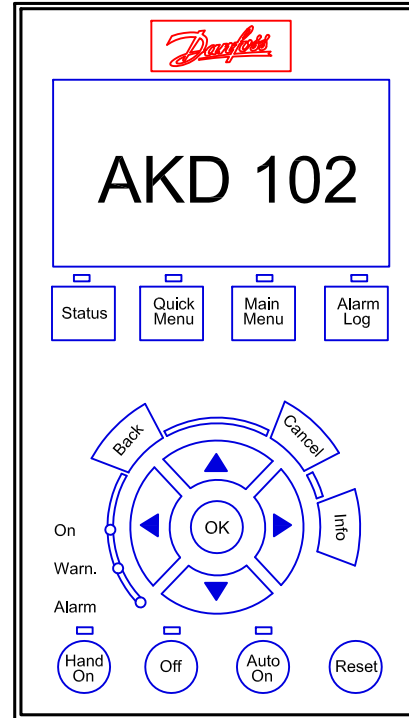
Location of Signal Relays: _____

Minimum Speed: _____
(Reference-0)

Preset Mid Speed: _____
(Reference-1)

VFD Programming Parameters (Must run Wizard first)

Parameter	Parameter Name	Default Value	Action Required
0-03	Regional Settings	[0] International	[1] North America
1-21	Motor Power (HP)	Drive specific	Set to actual total motor HP
1-22	Motor Voltage	Unit specific	Change if necessary to match motor
1-25	Motor Nominal Spd	1704 RPM	Change to match motor
3-02	Minimum Reference	Varies	Change to 30 Hz
3-03	Maximum Reference	60 Hz	Leave at 60 Hz
3-10	Preset Reference 0	0.00%	Set to desired low speed
3-10	Preset Reference 1	0.00%	Set to desired mid speed
3-10	Preset Reference 2	0.00%	100.00%
3-10	Preset Reference 3	0.00%	100.00%
3-15	Reference Source 1	[1] Analog input 53	Change to [0] No operation
3-16	Reference Source 2	[20] Digital Pot Mtr	Change to [0] No operation
3-41	Ramp 1 Up Time	10 seconds	Change to 30 sec or as necessary
3-42	Ramp 1 Down Time	10 seconds	Change to 30 sec or as necessary
4-12	Mtr Spd Low Limit	10 Hz	Min speed desired in Hand Mode
4-14	Mtr Spd High Limit	60 Hz	Leave at 60 Hz
4-53	Warning Speed High	1500 RPM	Set higher than P1-25
5-11	Term 19 Dig. Input	[10] Reversing	[16] Preset Reference Bit 0
5-14	Term 32 Dig. Input	[39] Day/Night Ctrl.	[17] Preset Reference Bit 1
14-20	Reset Mode	[0] Manual Reset	[13] Infinite Automatic Reset



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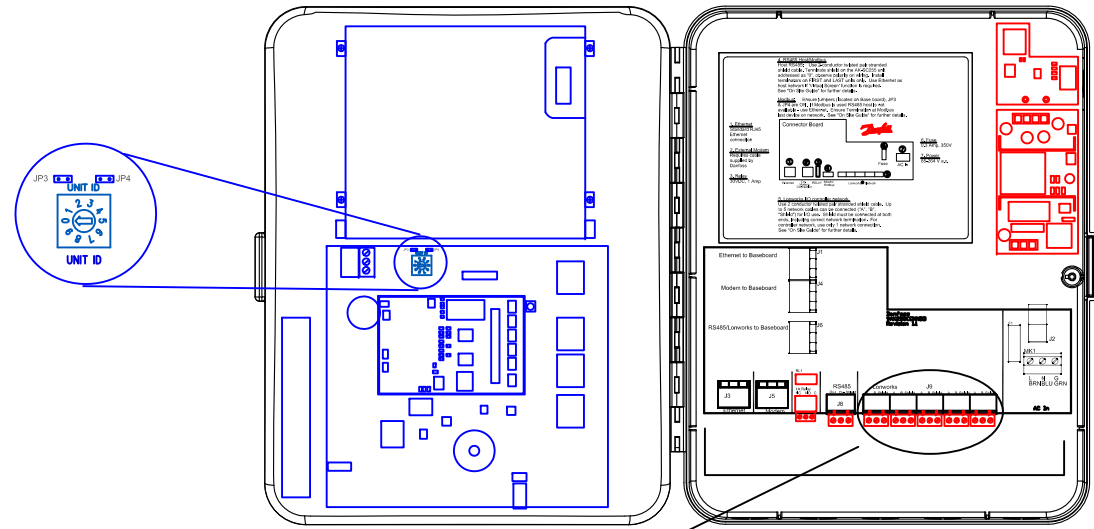
DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD.
21236-4925

USED ON	TITLE	DATE	DATE	DATE	DATE
PROJECT	NUMBER	1/12/2009	1/12/2009		
AKD 102 Connection Details (Typical Installation Single Fan with Preset Control)					
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE	DATE	DATE
DECIMAL (1/2)	FRACTIONAL	DATE	DATE	DATE	DATE
+-.02		1/12/2009	1/12/2009		
DECIMAL (1/2)	ANGULAR				
+-.005					
DIMENSIONS IN INCHES		DRAWING NO.		SHEET	
SCALE nts		H3		1 OF 1	

(X) = Refer to Appendix-A for cable specification

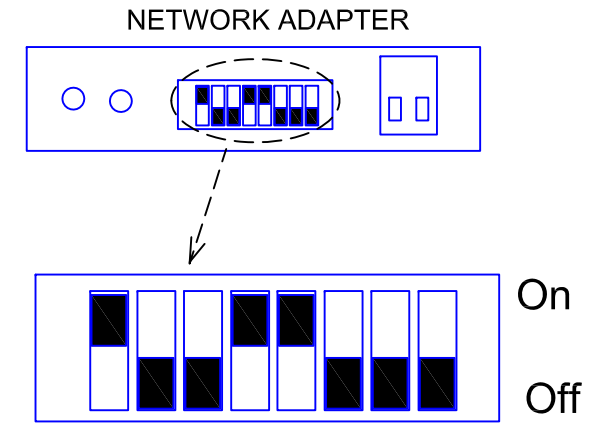
(Typical ECI I/O Upgrade Kit Installation (080Z2110))

AK-SC 255 Software R02.031

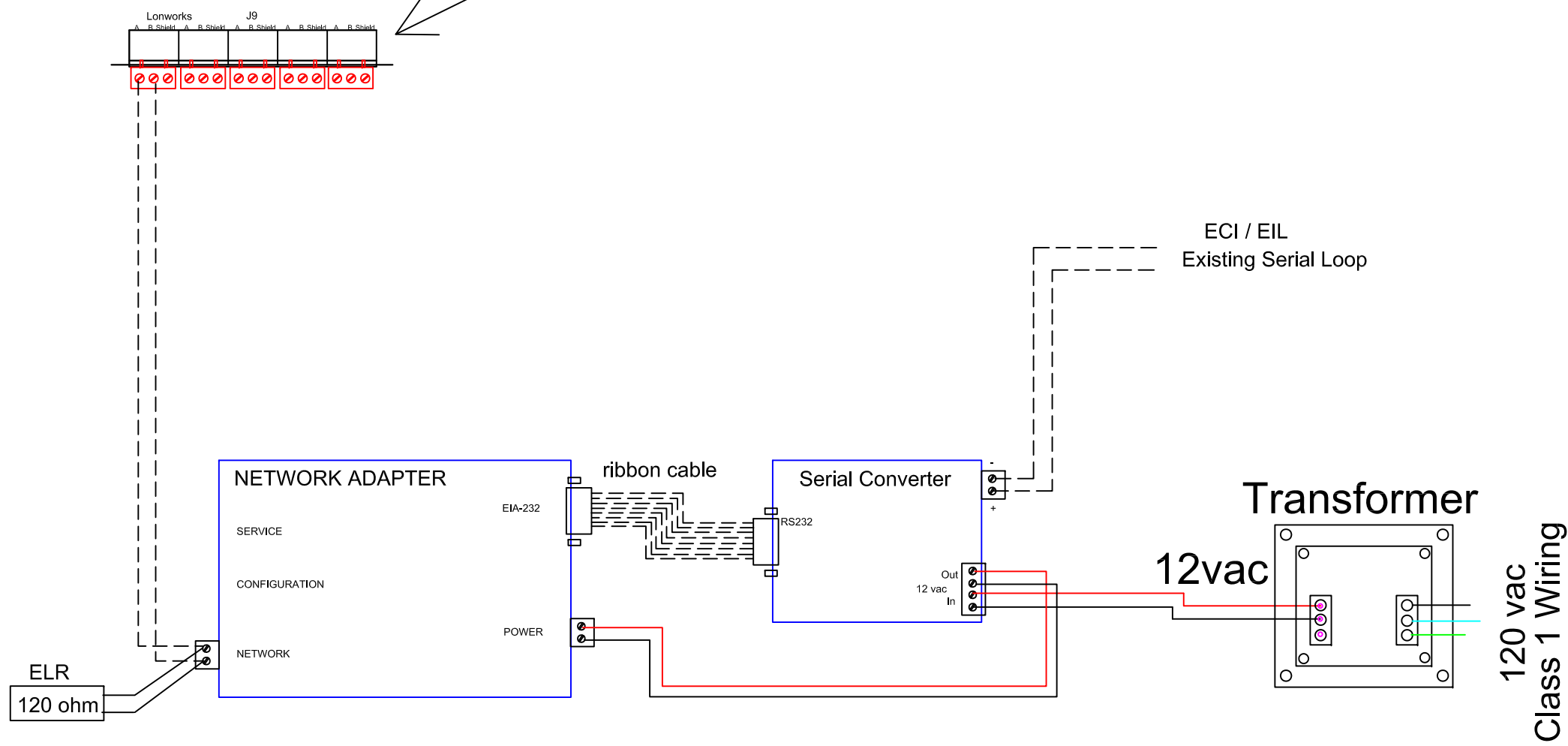


ECI Upgrade Kit Consists of:

- Serial Adapter (mounted on plastic snap track)
- 12 VAC Transformer Power Supply
- Echelon Gateway (custom configured for ECI upgrade)
- Interconnecting ribbon cable



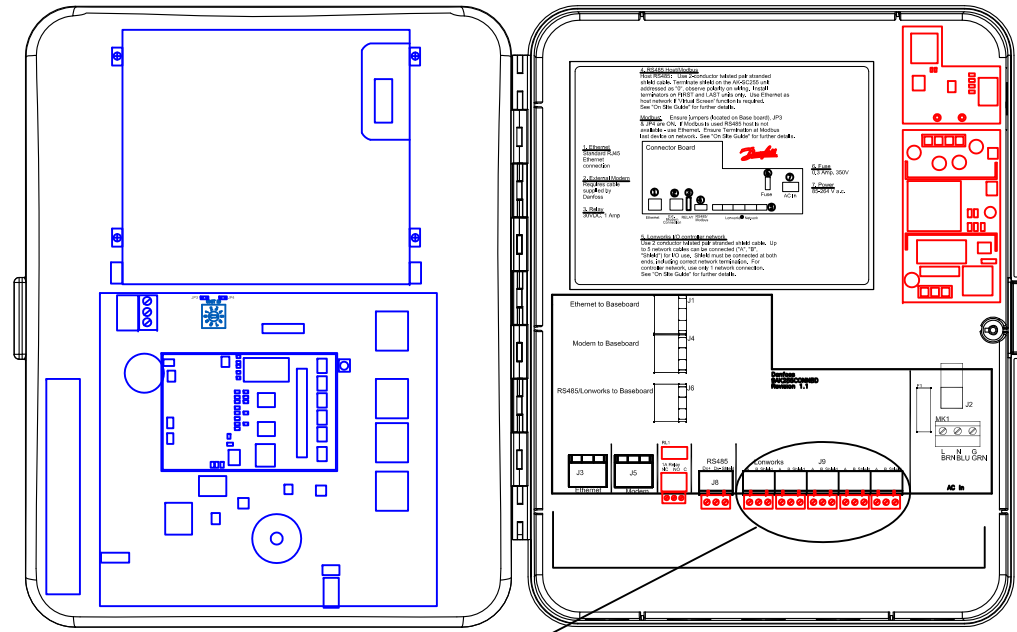
Insure that dip switch 4 is in the upward position. (on)



P/N: 080Z2110

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	ECI Gateway Typical Connections (080Z2110)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (XXX)	FRACTIONAL	DATE	DATE
+-.02		9/3/2008	9/3/2008
DECIMAL (XXX)	ANGULAR	DRAWING NO. 11	
+-.005		SHEET 1 OF 1	
SCALE nts			

TP78 to LON RS485 Bridge / EKC-202 Modules (TP78-04) (PN: 084B2254)



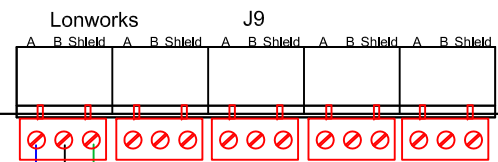
THIS LINE OF NODES MUST HAVE 60 OR LESS NODES OR A TOTAL LENGTH OF 5000 FEET.

NODES MUST BE WIRED EITHER POINT TO POINT OR DAISY CHAINED. NO STAR RUNS.

EKC'S MUST CONTAIN ONLY LON RS485 DEVICES.

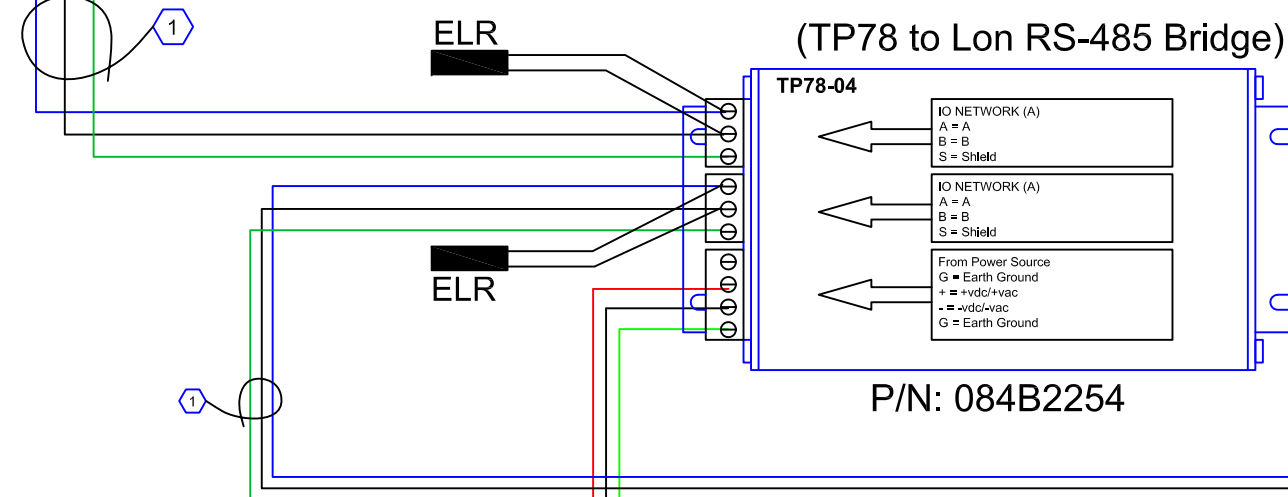
CONNECT 120 OHM TERMINATION RESISTOR TO LAST NODE IN RUN.

EACH EKC-202 MODULE MUST HAVE A COMMUNICATION MODULE INSTALLED. (p/n: 084B8565)



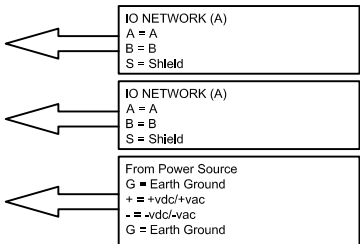
THE REMAINING 4 TP78 CONNECTORS MUST HAVE LESS THAN 60 NODES CONNECTED TOTAL.

Total length 5000' of all ports

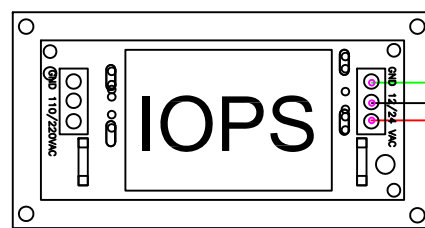


(TP78 to Lon RS-485 Bridge)

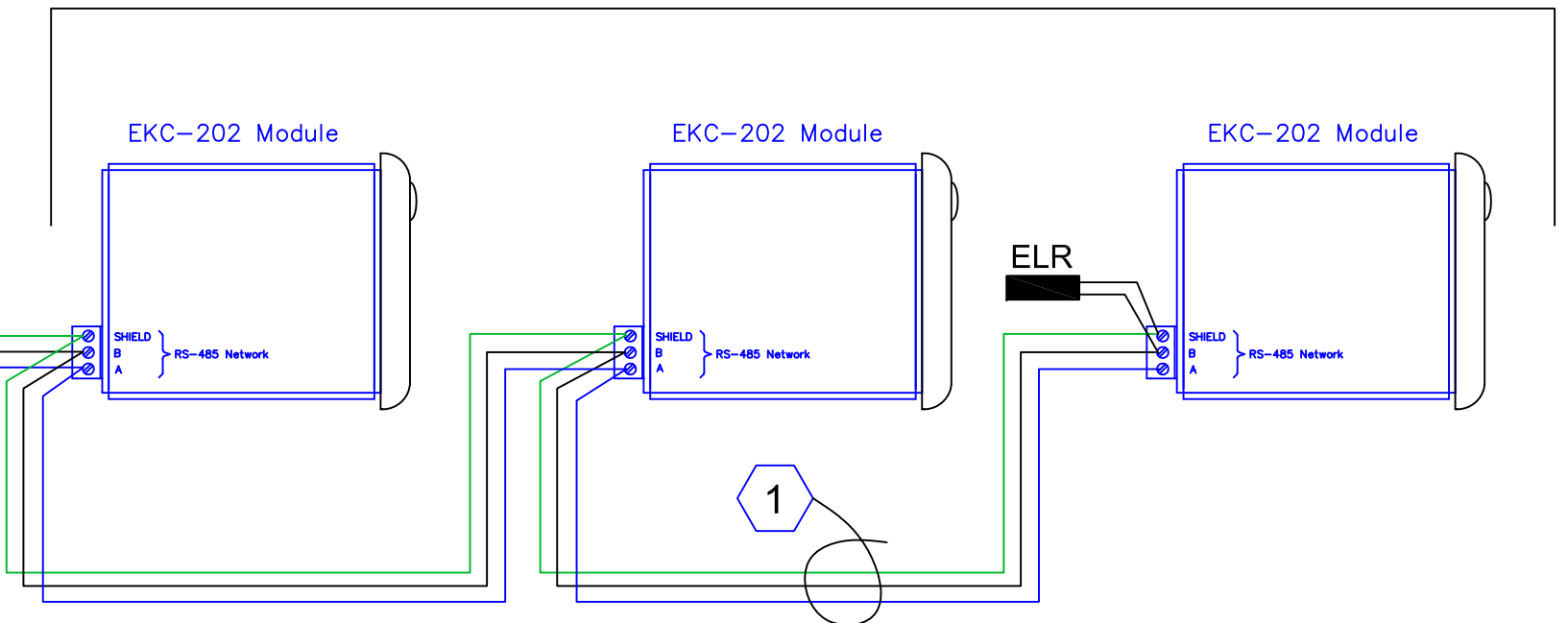
TP78-04



P/N: 084B2254



P/N: 084Z0052




- EKC-202A Module / 115V, Ref, Def, or Alm (P/N: 084B8531)
- EKC-202A Module / 220V, Ref, Def, or Alm (P/N: 084B8521)
- EKC-202B Module / 115V, Ref, Def, Fan (P/N: 084B8532)
- EKC-202B Module / 220V, Ref, Def, Fan (P/N: 084B8522)
- EKC-202C Module / 115V, Ref, Def, Fan, Light, or Alm (P/N: 084B8533)
- EKC-202C Module / 220V, Ref, Def, Fan, Light or Alm (P/N: 084B8523)

⊗ = Refer to Appendix-A for Cable Specification

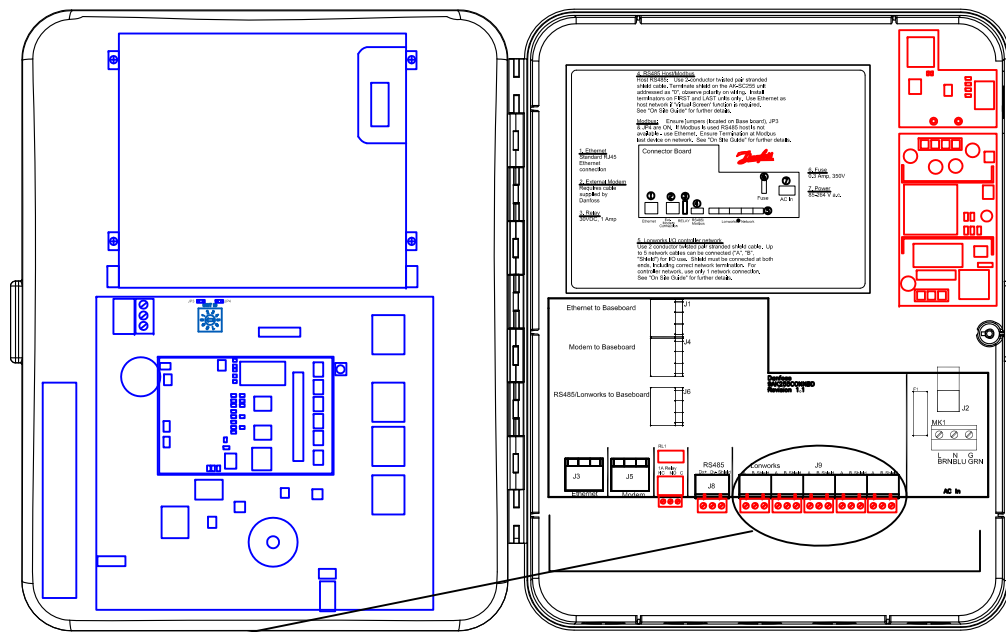
THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.			
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	TP7804 TP78 to LON RS485 Bridge For EKC-202 Modules (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)		DRAWN	APP'D
DECIMAL (LSD)	FRACTIONAL	DATE	R.M.
+-.02		DATE	DATE
ANGULAR		1/9/2009	1/9/2009
+-.005		DRAWING NO. 12	
DIMENSIONS IN INCHES		SCALE nts	
		SHEET 1 OF 1	

TP78 to FTT10 Bridge / EKC-550 Modules (TP7802) (PN: 084B2253)

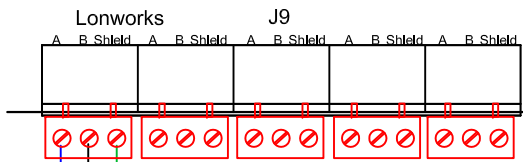
(Under Construction)

THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.							
						DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON		TITLE					
PROJECT	NUMBER	TP7802 TP78 to LON RS485 Bridge For EKC-550 Modules (Typical Installation)					
TOLERANCES (EXCEPT AS NOTED)		DRWN	CHKD	APP'D	RELEASE		
DECIMAL (.02)	FRACTIONAL	RM		R.M.			
+-.02		DATE	DATE	DATE			
DECIMAL (.005)	ANGULAR	8/18/2008		8/18/2008			
+-.005		DRAWING NO.		13	SHEET 1 OF 1		
SCALE		nts					

Typical TP78 to TP78 Installation (TP78-01) (PN: 084B2251)



AK-SC 255

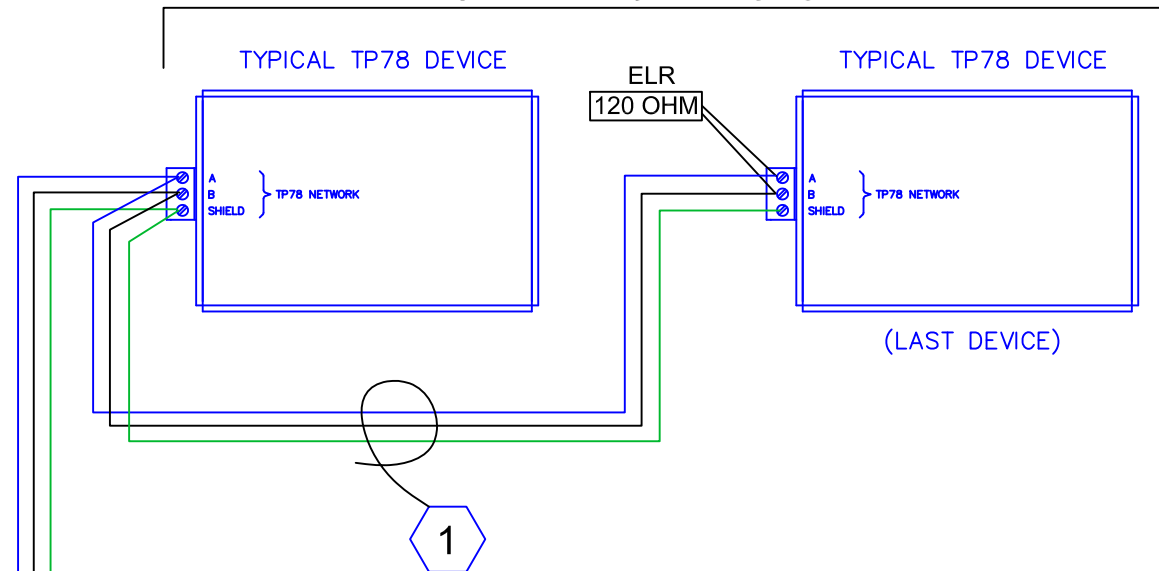
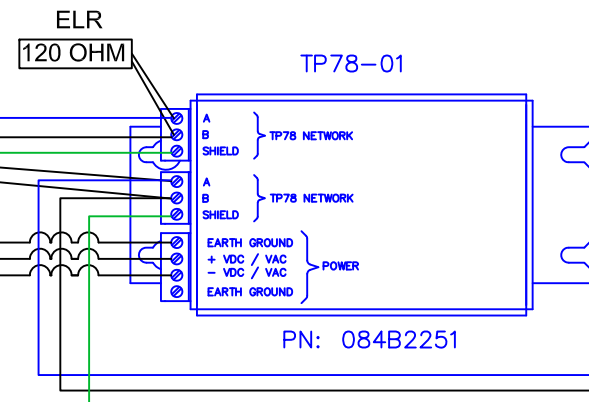
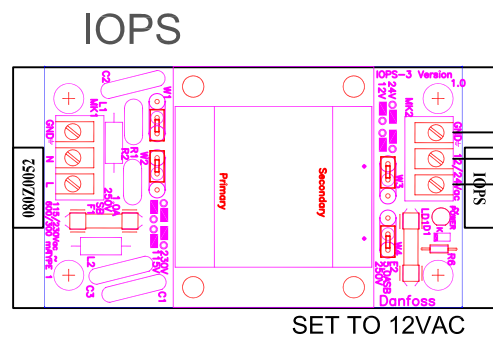


Total length 5000' of all ports
THE REMAINING 4 TP78
CONNECTORS MUST HAVE LESS
THAN 60 NODES CONNECTED
TOTAL.

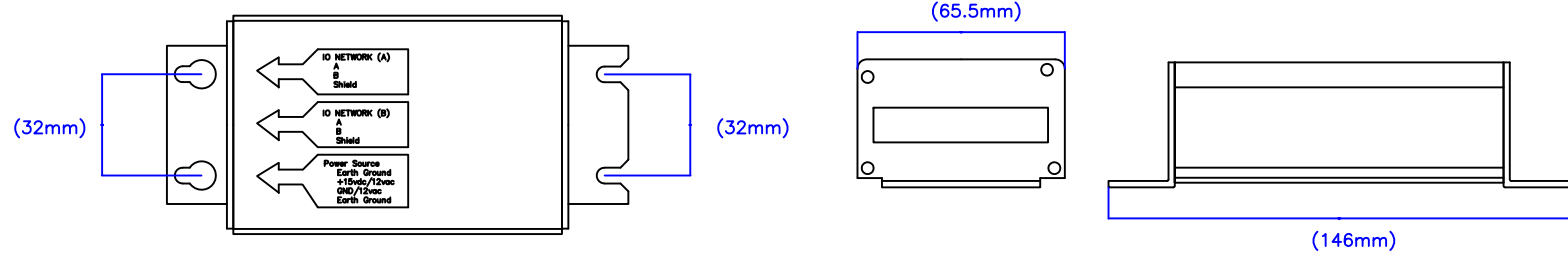
THIS LINE OF NODES MUST HAVE
LESS THAN 60 NODES OR A TOTAL
LENGTH OF 5000 FEET.

NODES MUST BE WIRED EITHER
POINT TO POINT OR DAISY
CHAINED. NO STAR RUNS.

ALSO, THIS LINE MUST CONTAIN
ONLY TP78 DEVICES.

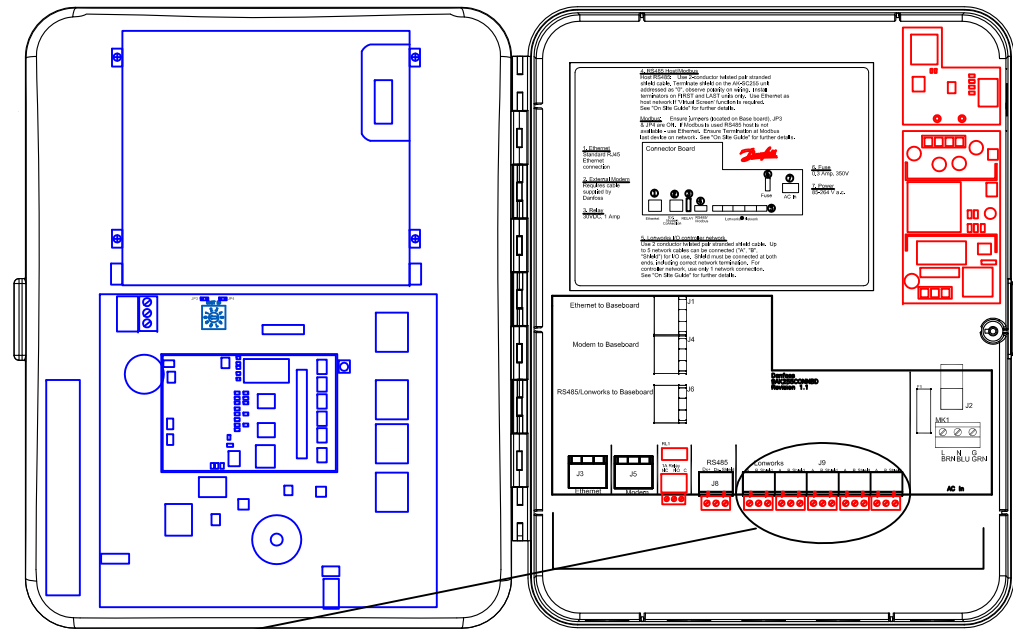


X = Refer to Appendix-A for Cable Specification



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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	TP78 to TP78 Bridge (TP78-01) (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (X.XX)	FRACTIONAL	DATE	R.M.
+0.02	ANGULAR	9/3/08	9/3/08
+0.005			
SCALE: nts		DRAWING NO.	SHEET
		14	1 OF 1

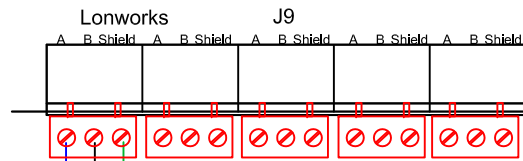
TP78 to FTT10 Bridge / Typical Installation (TP7802) (PN: 084B2252)



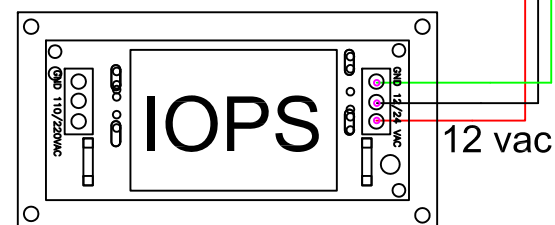
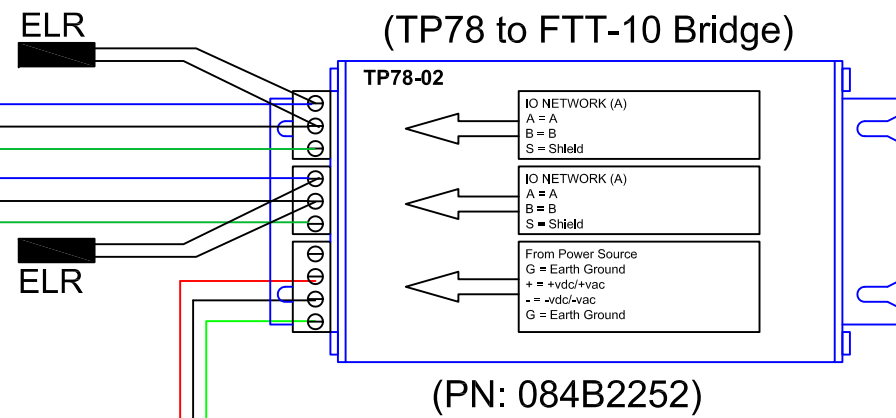
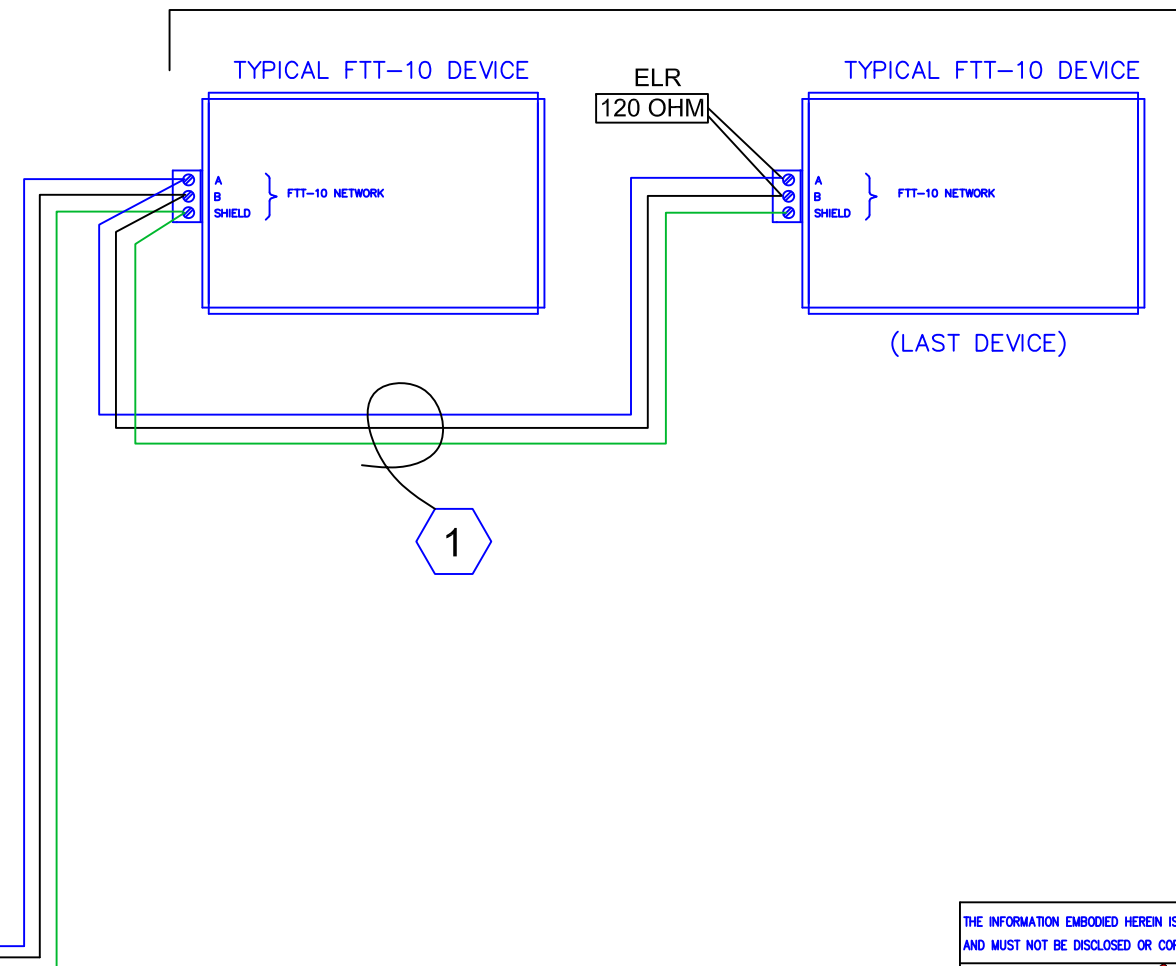
THIS LINE OF NODES MUST HAVE LESS THAN 60 NODES OR A TOTAL LENGTH OF 5000 FEET.

NODES MUST BE WIRED POINT TO POINT. NO STAR RUNS.

ALSO, THIS LINE MUST CONTAIN ONLY FTT-10 DEVICES.



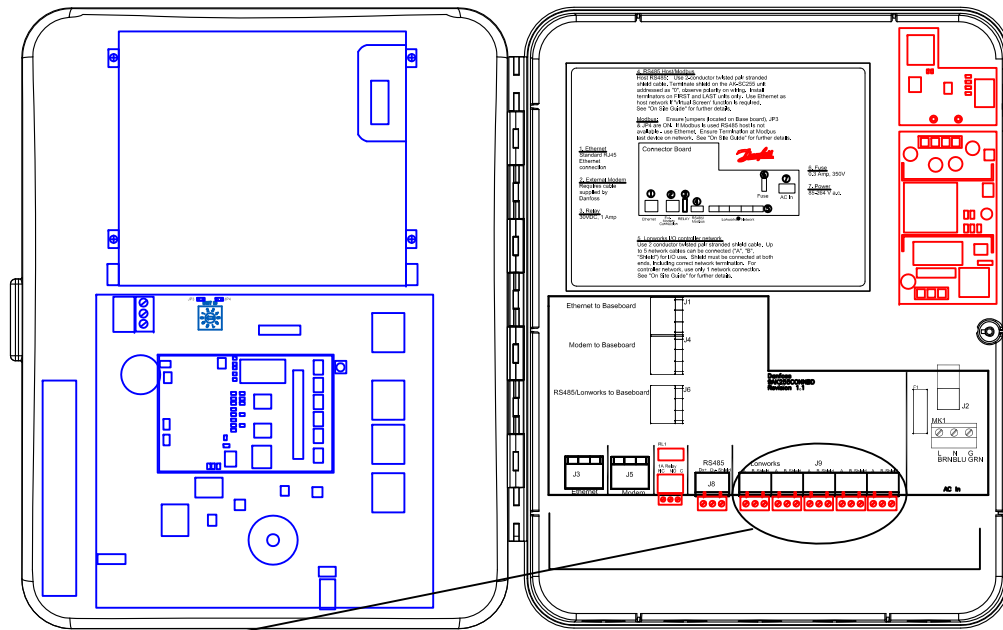
Total length 5000' of all ports
(Remaining 4 TP-78 ports must have less than 60 nodes.)



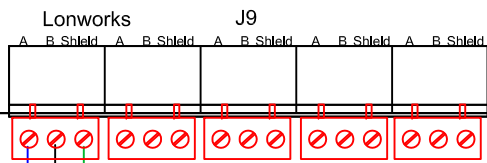
⊗ = Refer to Appendix-A for Cable Specification

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	TP7802 TP78 to FTT10 Bridge (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)		DRAWN	APP'D
DECIMAL (X10)	FRACTIONAL	R.M.	R.M.
+/- .02		DATE	DATE
DECIMAL (X10)	ANGULAR	9/3/2008	9/3/2008
+/- .005		DRAWING NO. 15	
DIMENSIONS IN INCHES		SCALE nts	
		SHEET 1 OF 1	

Typical TP78 to RS-485 Installation (TP78-04) (PN: 080B2254)



AK-SC 255



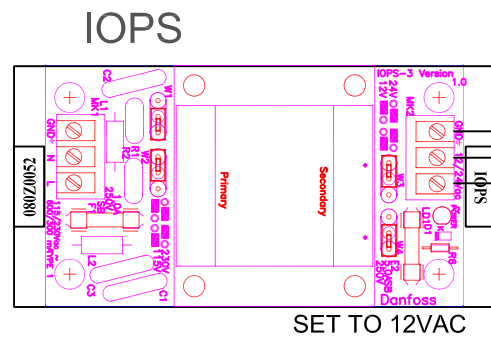
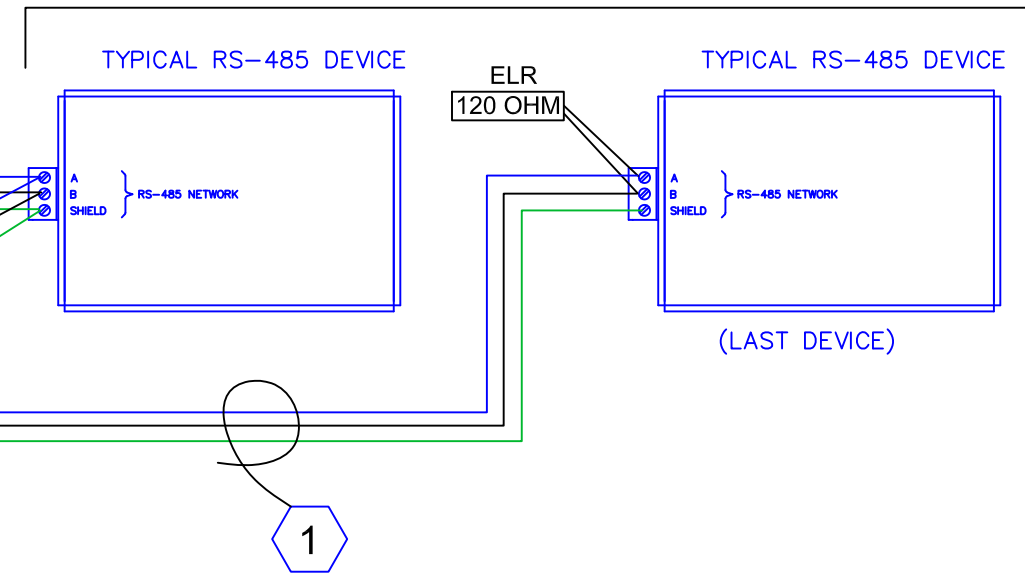
Total length 5000' of all ports
THE REMAINING 4 TP78 CONNECTORS MUST HAVE LESS THAN 60 NODES CONNECTED TOTAL.

THIS LINE OF NODES MUST HAVE 60 OR LESS NODES OR A TOTAL LENGTH OF 5000 FEET.

NODES MUST BE WIRED EITHER POINT TO POINT OR DAISY CHAINED. NO STAR RUNS.

ALSO, THIS LINE MUST CONTAIN ONLY 485 DEVICES.

CONNECT 120 OHM TERMINATION RESISTOR TO LAST NODE IN RUN.



120 OHM ELR

ELR 120 OHM

TP78-04

(PN: 080B2254)

X = Refer to Appendix-A for Cable Specification

(32mm)

(32mm)

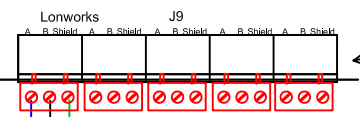
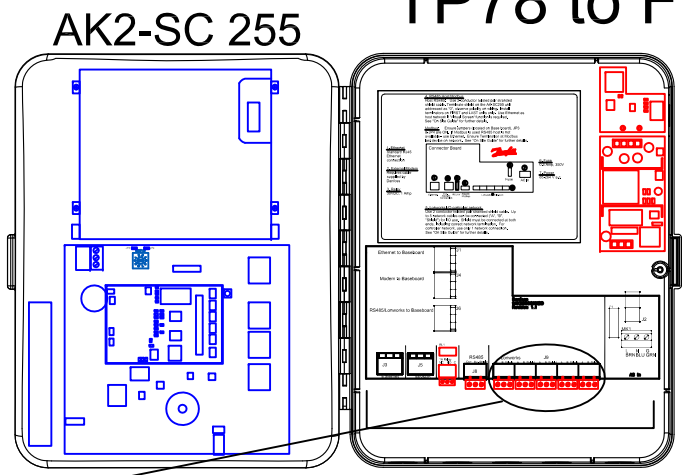
(65.5mm)

(146mm)

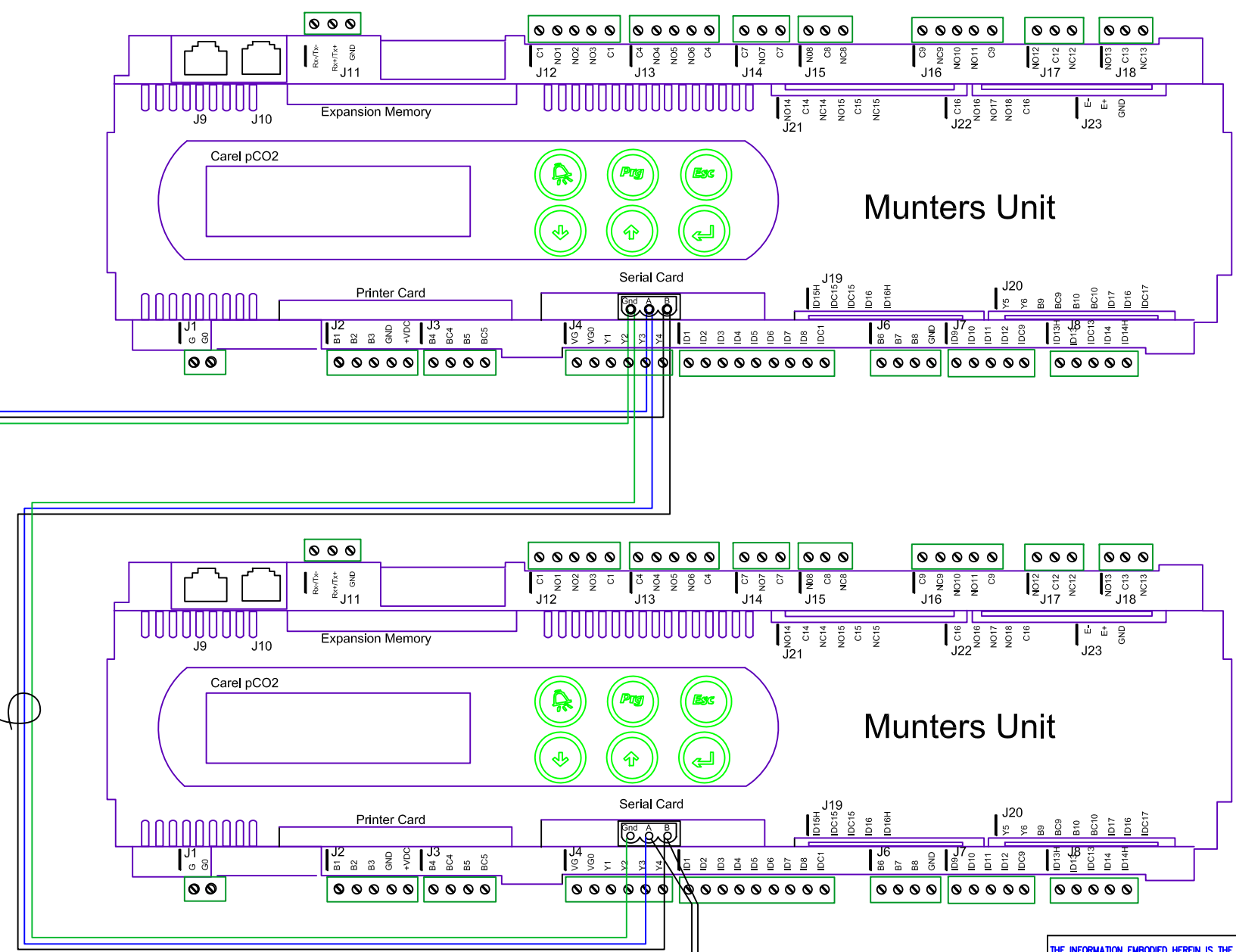
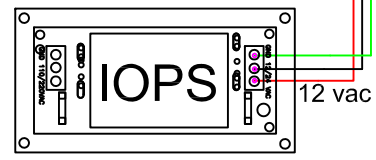
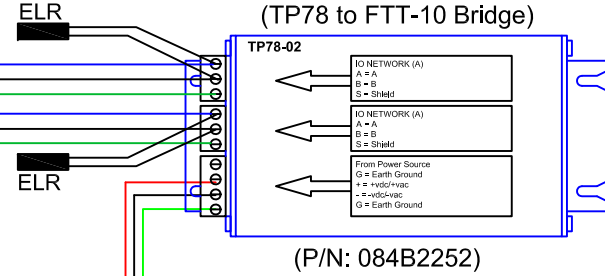
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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	TP78 to RS-485 Bridge (TP78-04) (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (X.00)	FRACTIONAL	DATE	DATE
+-.02		9/3/08	9/3/08
ANGULAR			
+-.005			
SCALE		DRAWING NO.	SHEET
mts		16	1 OF 1

TP78 to FTT10 Bridge / Typical Munters Units Installation (TP78-02)

(Munters Units with Carel Controllers)



Total length 5000' of all ports



⊗ = Refer to Appendix-A for Cable Specification

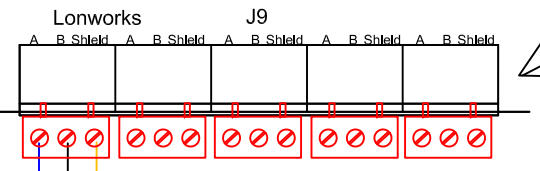
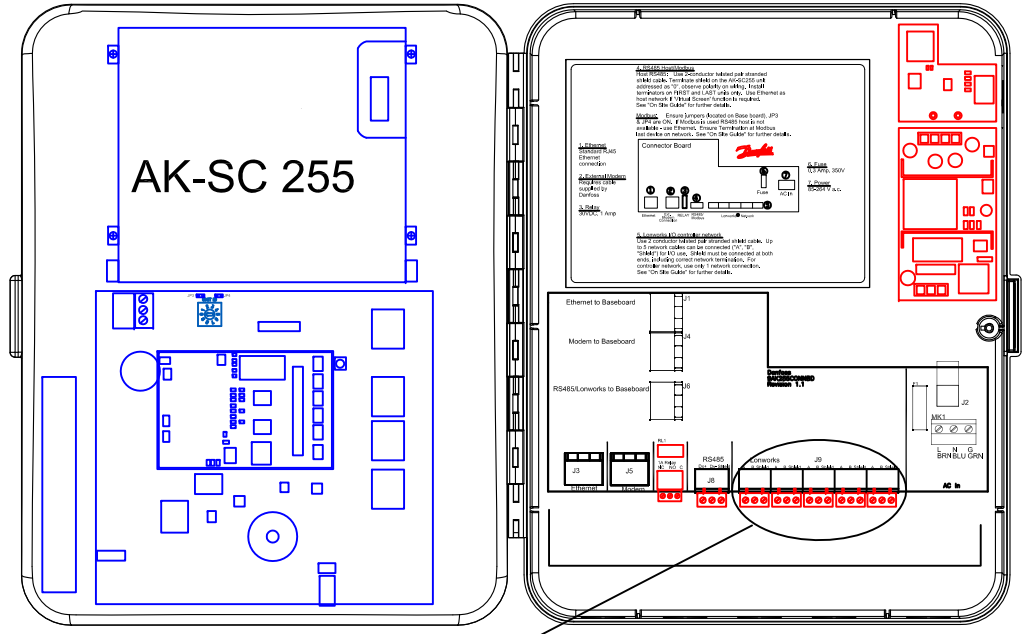
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Danfoss

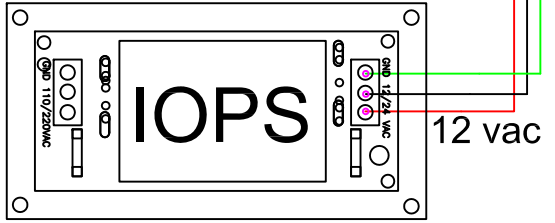
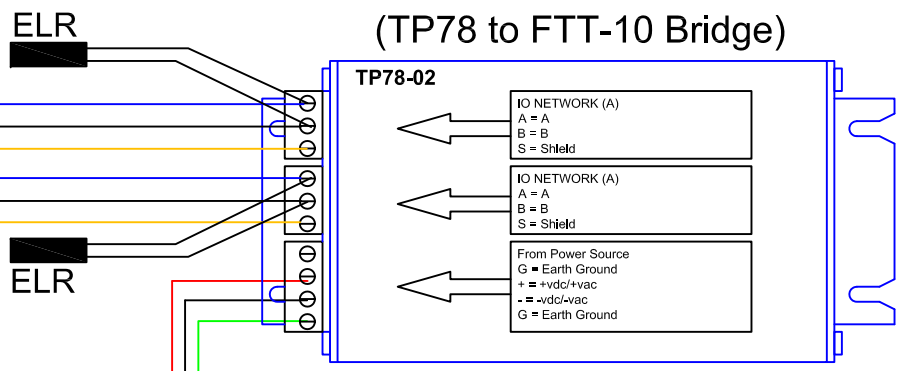
DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD.
21236-4925

USED ON		TITLE	
PROJECT	NUMBER	TP7802 TP78 to FTT10 Bridge (Typical Munters Units Installation)	
TOLERANCES (EXCEPT AS NOTED)		DATE	DATE
DECIMAL (1/100)	FRACTIONAL	7/15/2008	7/15/2008
DECIMAL (1/100)	ANGULAR	DRAWING NO. 17	
DIMENSIONS IN INCHES		SCALE nts	
		SHEET 1 OF 1	

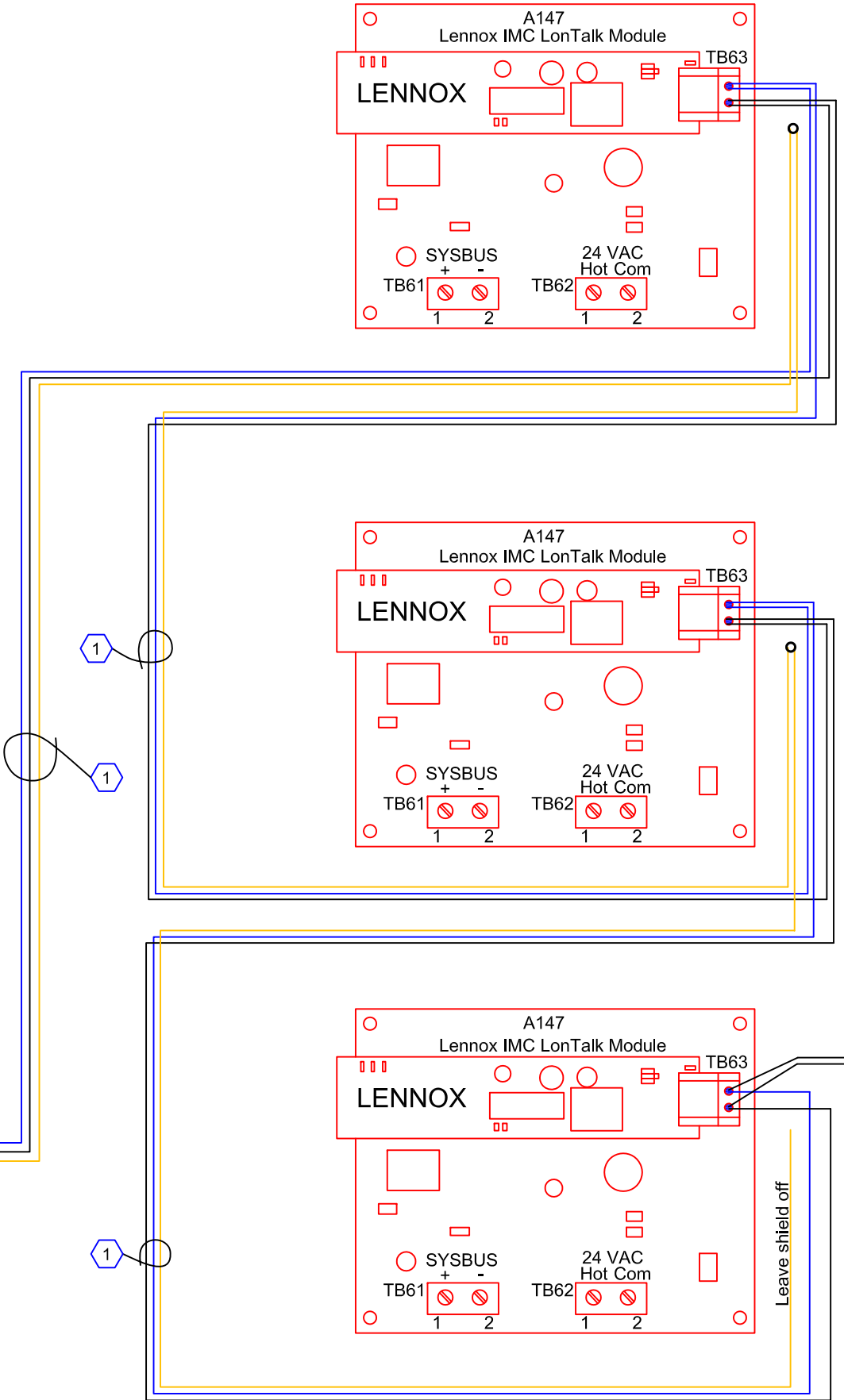
TP78 to FTT10 Bridge / Lennox Units (TP78-02) (PN: 084B2252)



Total length 5000' of all ports



⊗ = Refer to Appendix-A for Cable Specification

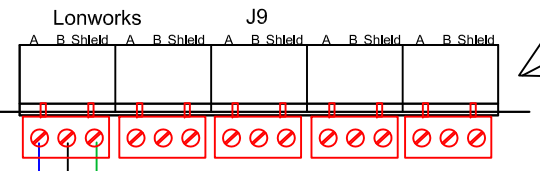
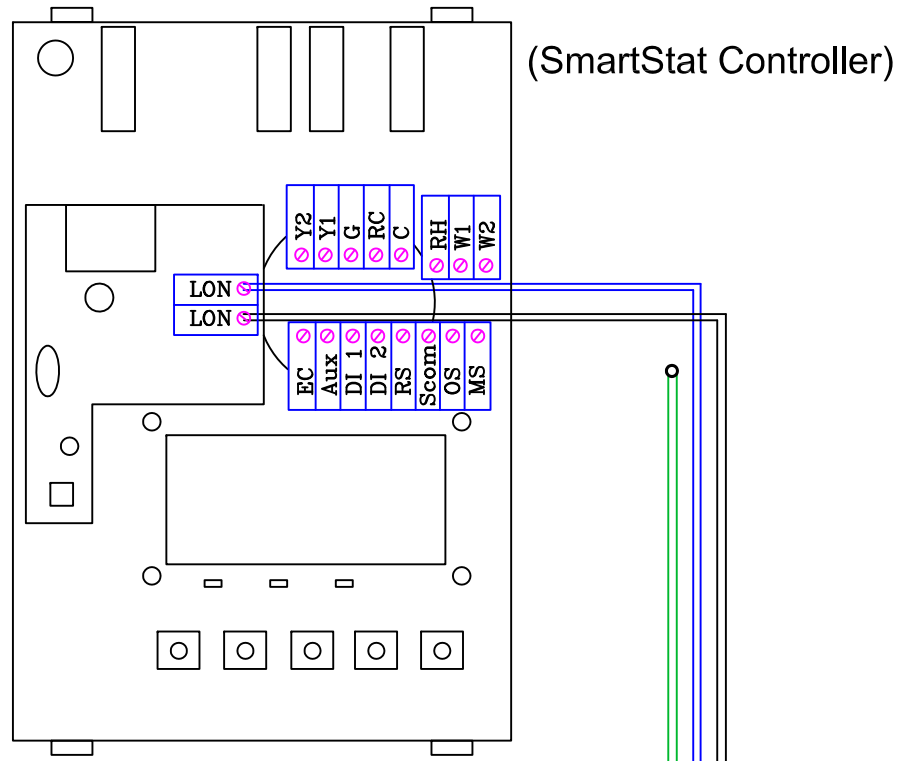
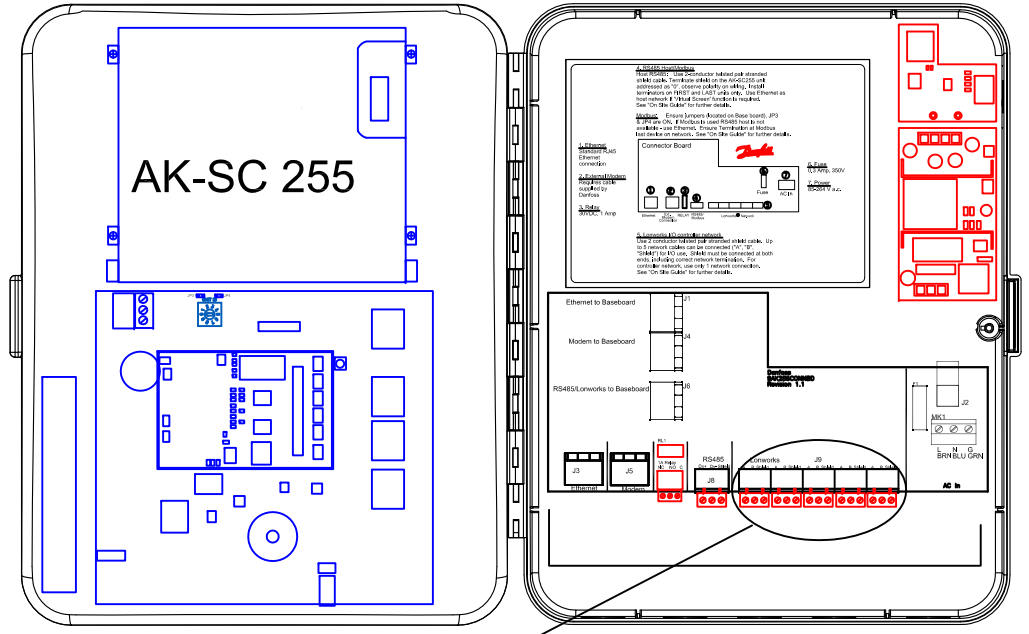


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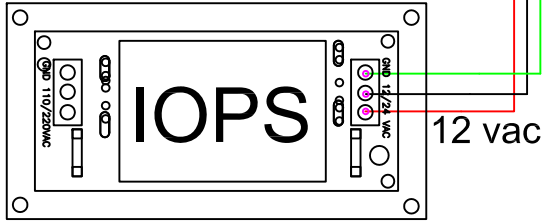
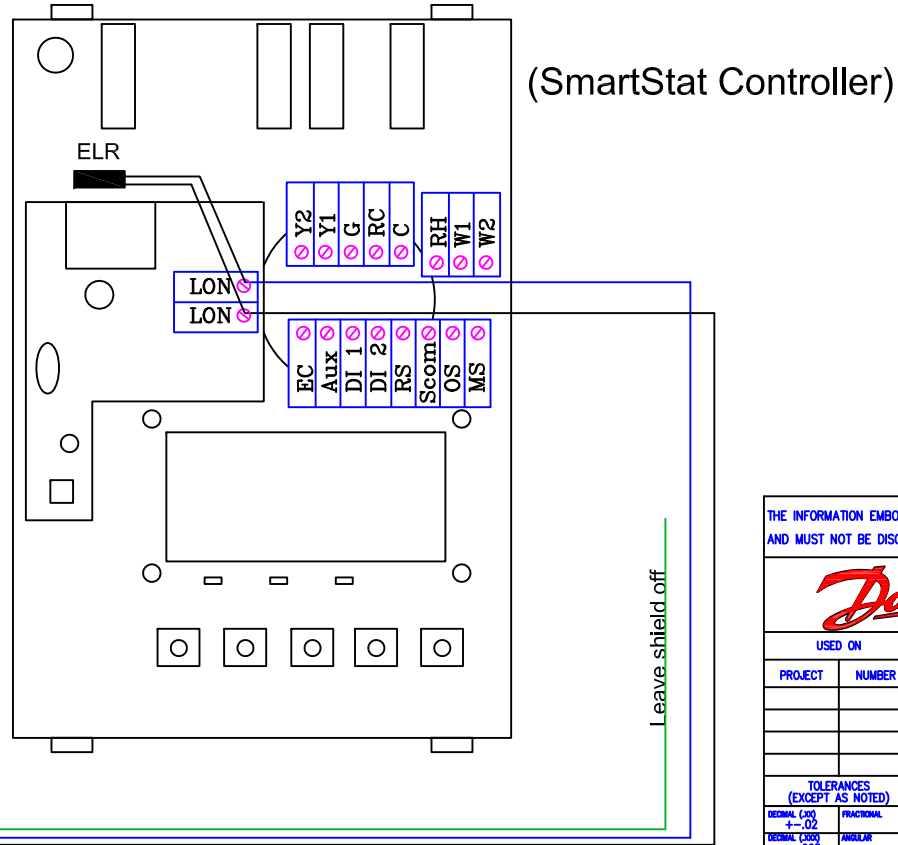
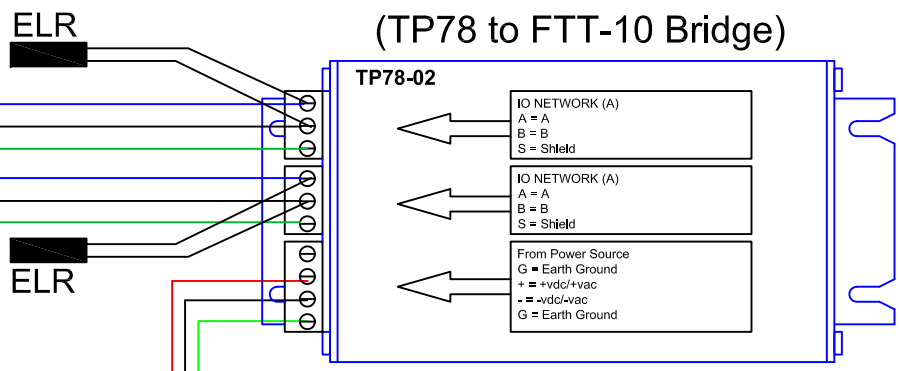
Danfoss DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD, 21236-4925

USED ON		TITLE	
PROJECT	NUMBER	TP78-02 Typical Interface to Lennox IMC Controllers	
TOLERANCES (EXCEPT AS NOTED)		DRAWN	DATE
DECIMAL (LSD)	FRACTIONAL	RM	R.M.
+-.02		DATE	DATE
ANGULAR		7/15/2008	7/15/2008
+-.005		DIMENSIONS IN INCHES	
SCALE nts		DRAWING NO.	18
		SHEET 1 OF 1	

TP78 to FTT10 Bridge / SmartStat Controller (TP78-02) (PN: 084B2252)



Total length 5000' of all ports



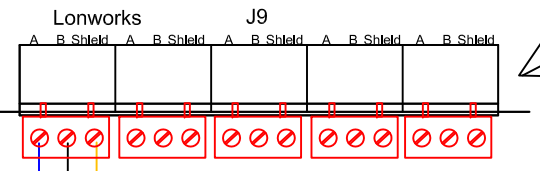
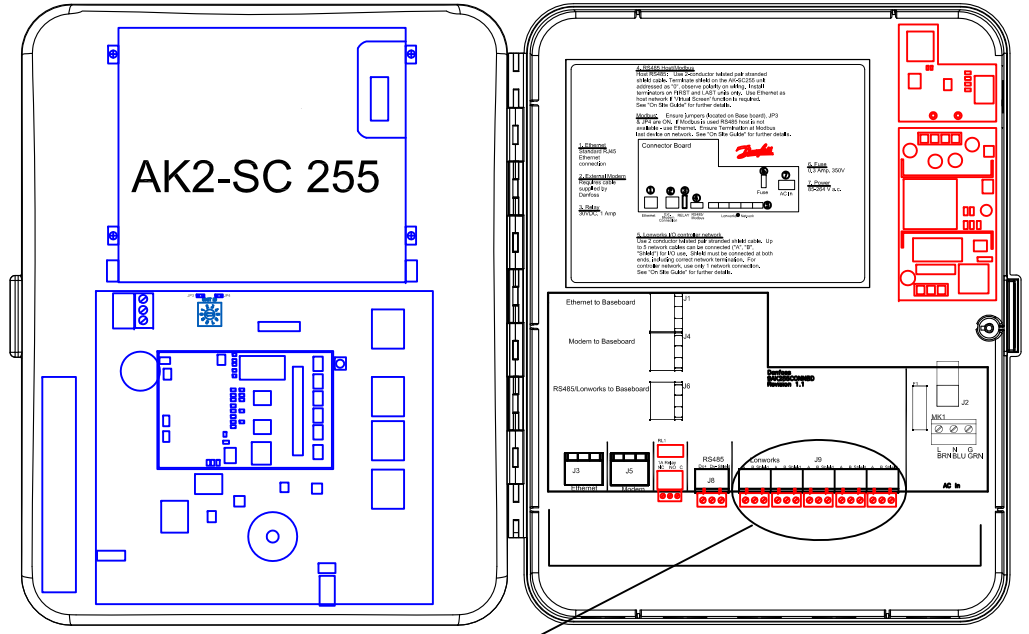
⊗ = Refer to Appendix-A for Cable Specification

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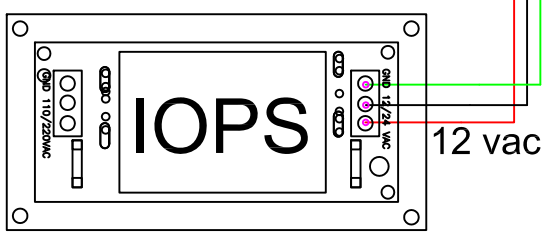
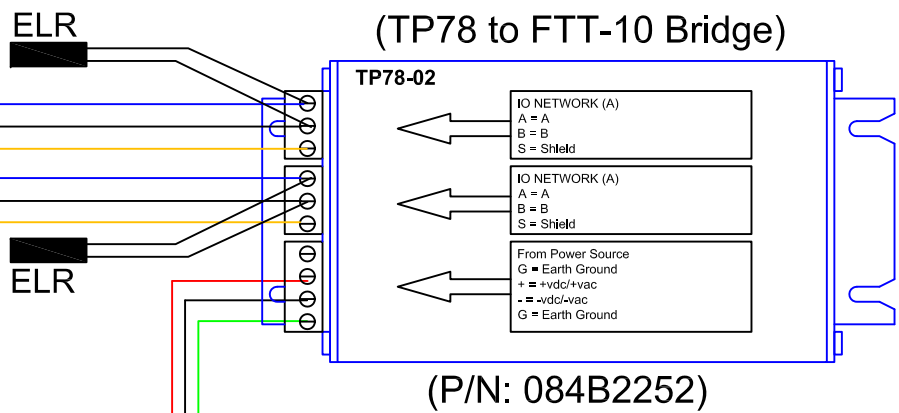
Danfoss DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD. 21236-4925

USED ON	TITLE		DATE		DATE	
PROJECT	NUMBER	TP78-02 TP78 to FTT10 Bridge For SmartStat RTU Controllers (Typical Installation)		8/18/2008	8/18/2008	
TOLERANCES (EXCEPT AS NOTED)			DRAWN	CHKD	APPD	RELEASE
DECIMAL (X.0)	FRACTIONAL	FIN		R.M.		
+-.02						
DECIMAL (X.00)	ANGULAR	DATE	DATE	DATE		
+-.005		8/18/2008		8/18/2008		
DIMENSIONS IN INCHES			DRAWING NO.		SHEET	
SCALE nts			19		1 OF 1	

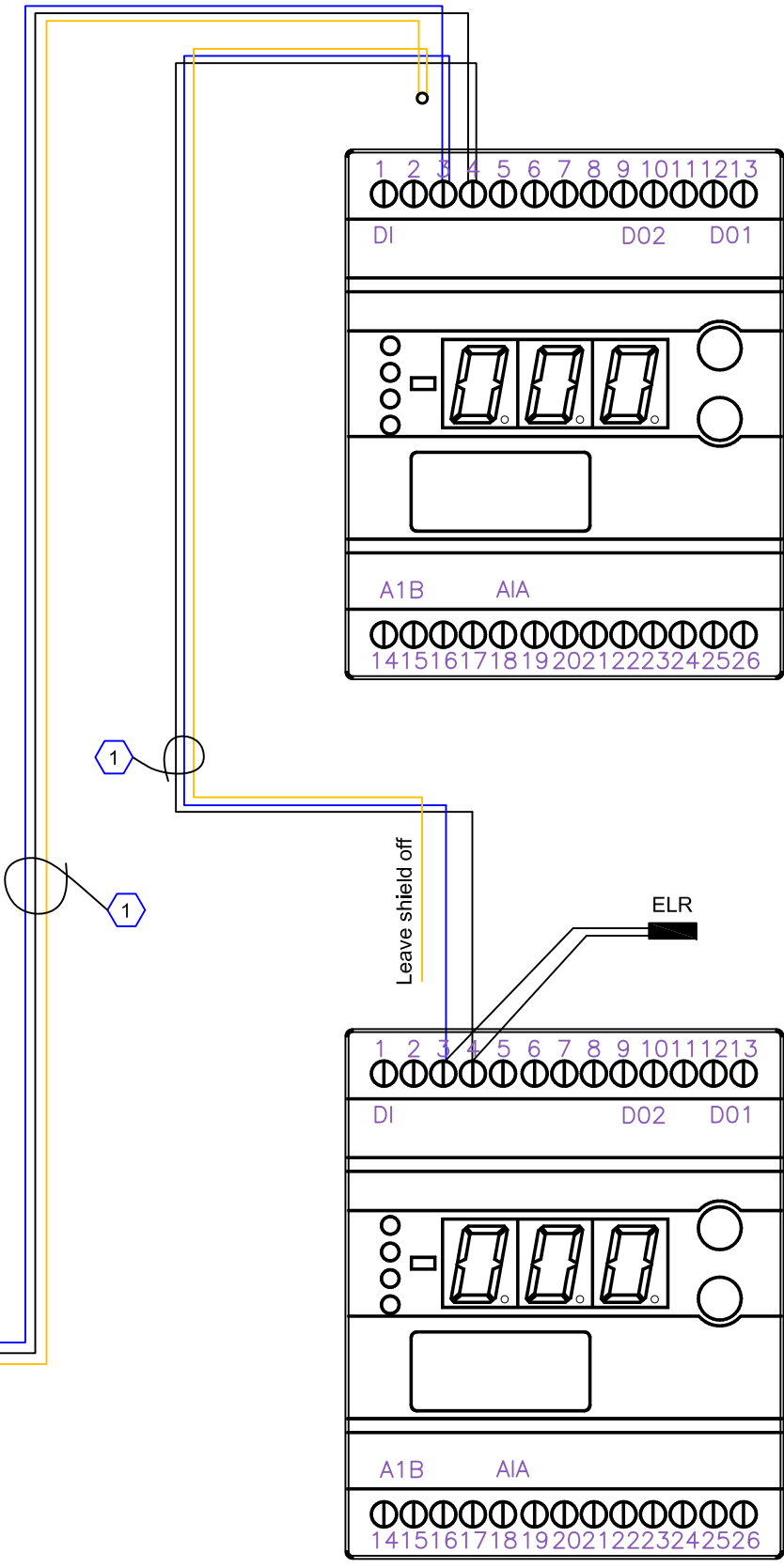
TP78 to FTT10 Bridge / EKC-316 Modules (TP78-02) (PN: 084B2252)



Total length 5000' of all ports



⊗ = Refer to Appendix-A for Cable Specification



EKA173 CARD (084B7092) INSTALLS INSIDE EKC316 FOR DATA COMMUNICATIONS TO 255

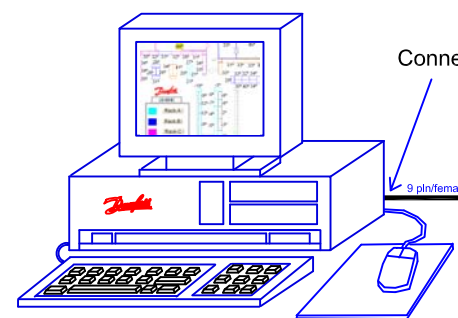
THE INFORMATION EMBODIED HEREIN IS THE PROPERTY OF DANFOSS INCORPORATED AND MUST NOT BE DISCLOSED OR COPIED WITHOUT A WRITTEN RELEASE.			
		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE	TP7802 TP78 to FTT10 Bridge For EKC-316 Modules (Typical Installation)	
PROJECT NUMBER			
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (XX)	FRACTIONAL	DATE	DATE
+-.02		8/18/2008	8/18/2008
DECIMAL (XXX)	ANGULAR		
+-.005			
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE nts		110	1 OF 1

(Typical RS-232/485 Kit Connection Details)

(Typical RS232 cable extension for runs exceeding 50 feet)

Part No. for Kit: RS232-485K

Personal Computer
or VIP Panel



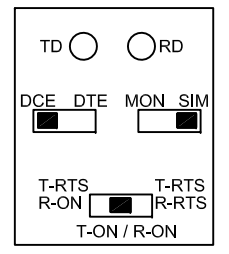
Connect to PC Serial Port

Standard 8 conductor
RS232 cable

9 pin/female

25 pin/female

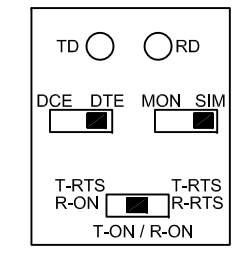
Adapter Settings:
SET to DCE
SET to SIM
SET to T-On / R-ON



(Adapter Settings)

RS 232 to RS 485
Adapter

Adapter Settings:
SET to DTE
SET to SIM
SET to T-On / R-ON



(Adapter Settings)

RS 232 to RS 485
Adapter

Use 18 - 22 gauge
4-conductor with shield
(Beldon 8729 or equivalent)

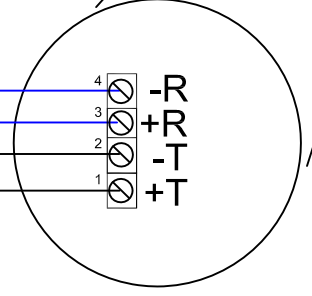
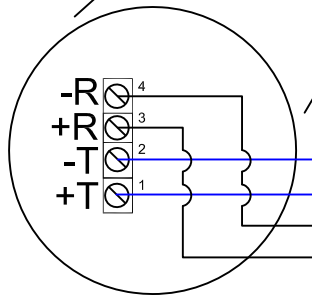
AK-SC 255



(Direct Connect Port)

RS 232
25 pin to 9 pin
Adapter

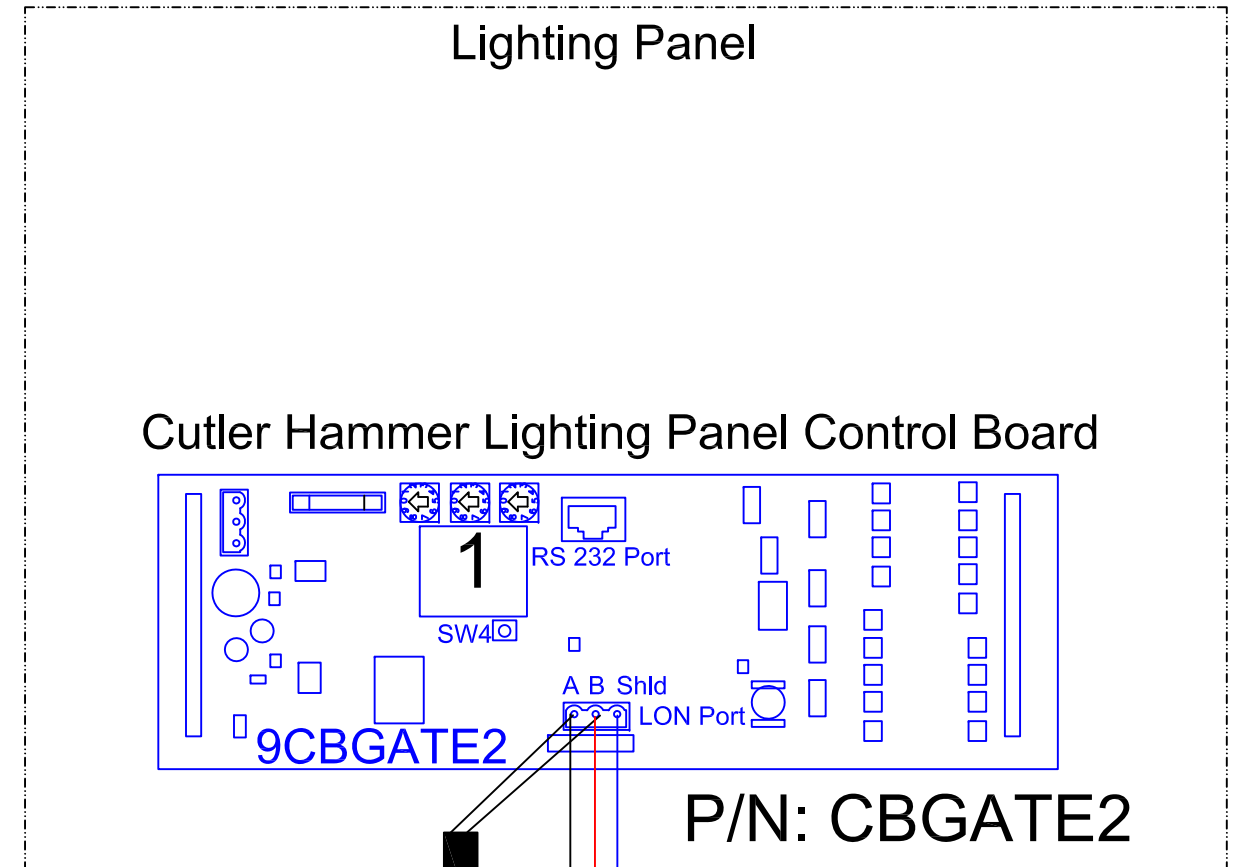
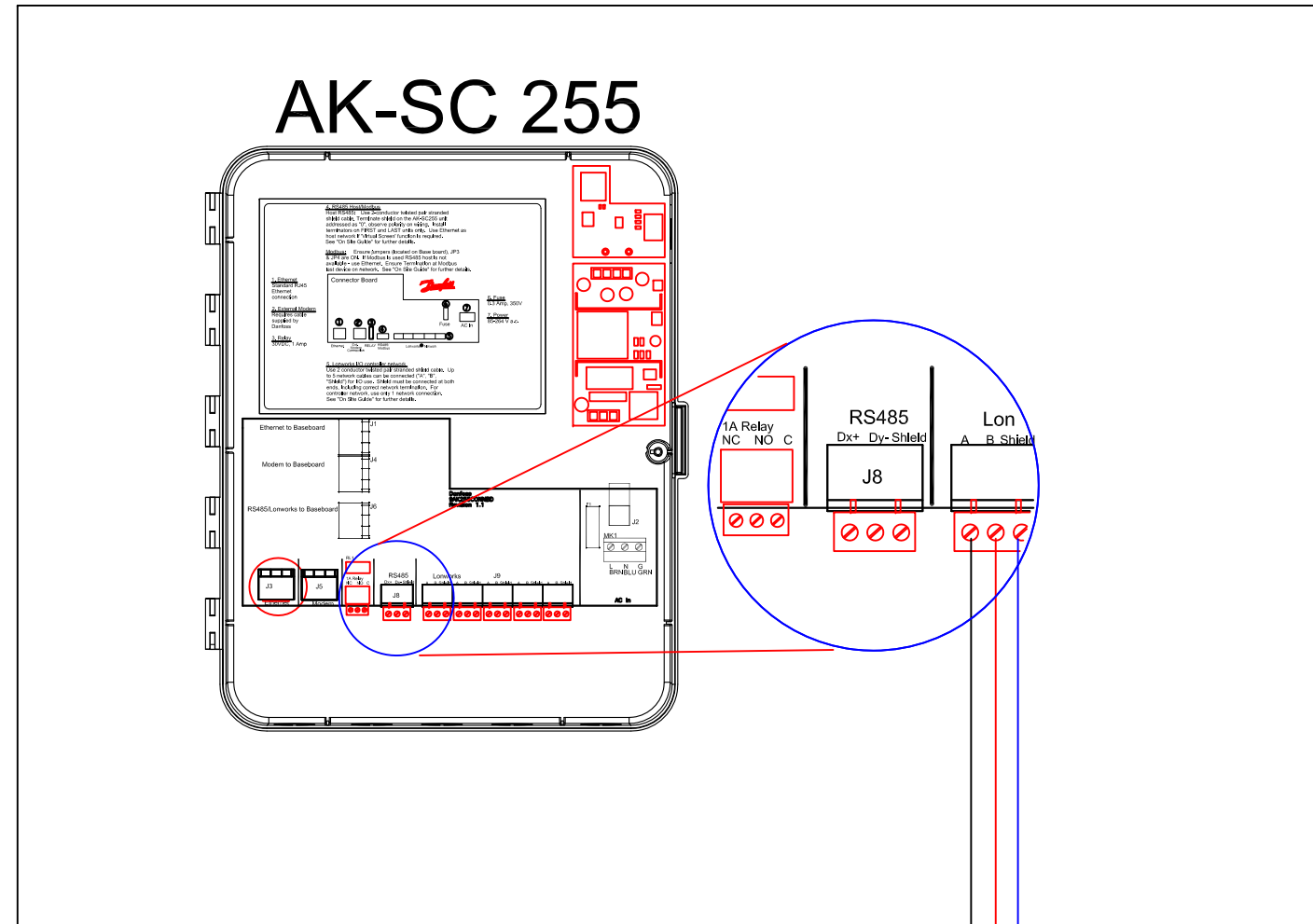
Danfoss RS232 Cable
Part No: 080Z0262



Maximum length 1000'
Use 18 - 22 gauge
4-conductor with shield
(leave shield unconnected)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Typical RS-232/485 kit Details	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (1/100)	FRACTIONAL	DATE	RELEASE
+-.02		11/20/08	11/20/08
DECIMAL (1/100)	ANGULAR	DRAWING NO. 111	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES			
SCALE	nts		

Typical Cutler Hammer Lighting Panel Control Board Interface (CBGATE2)



Total length 5000' of all ports

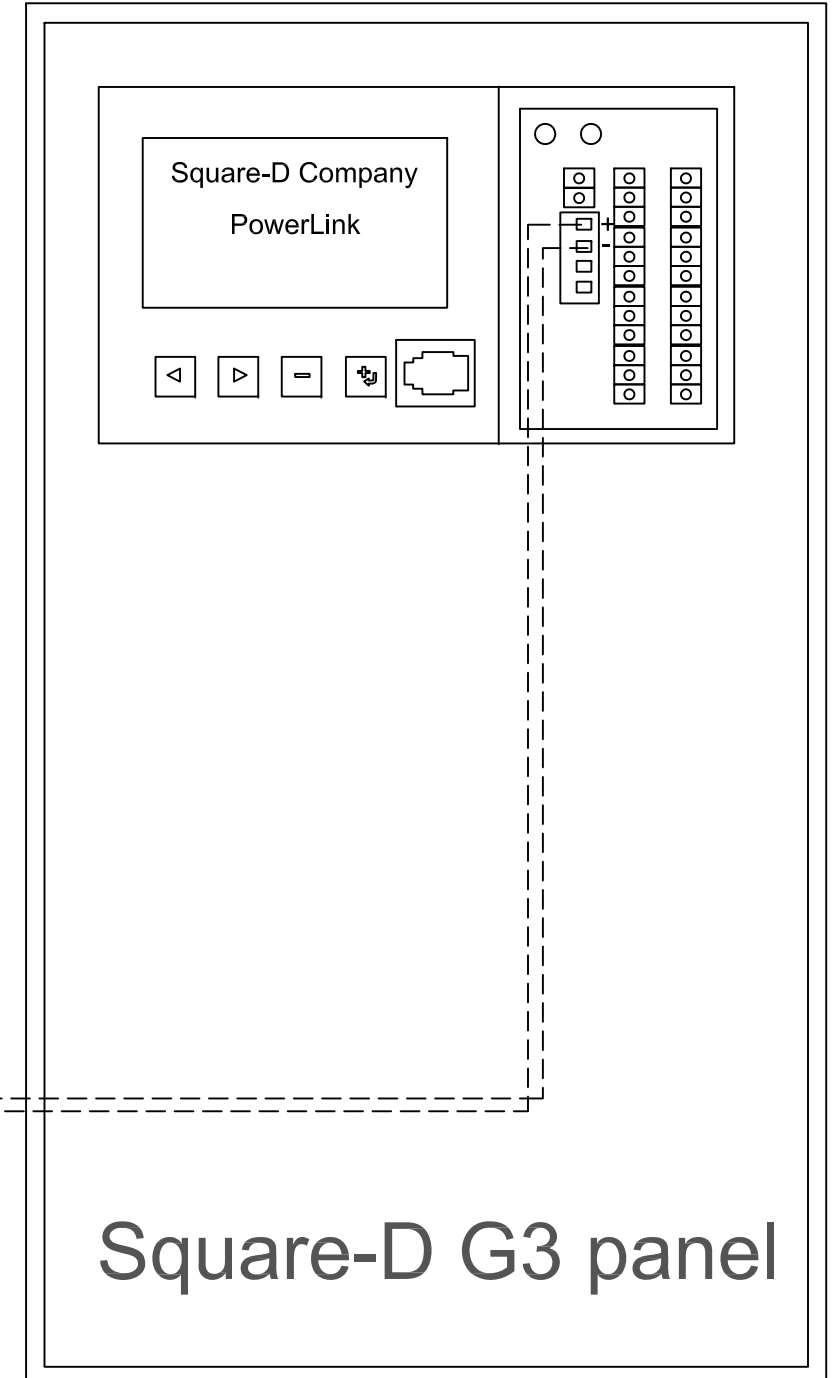
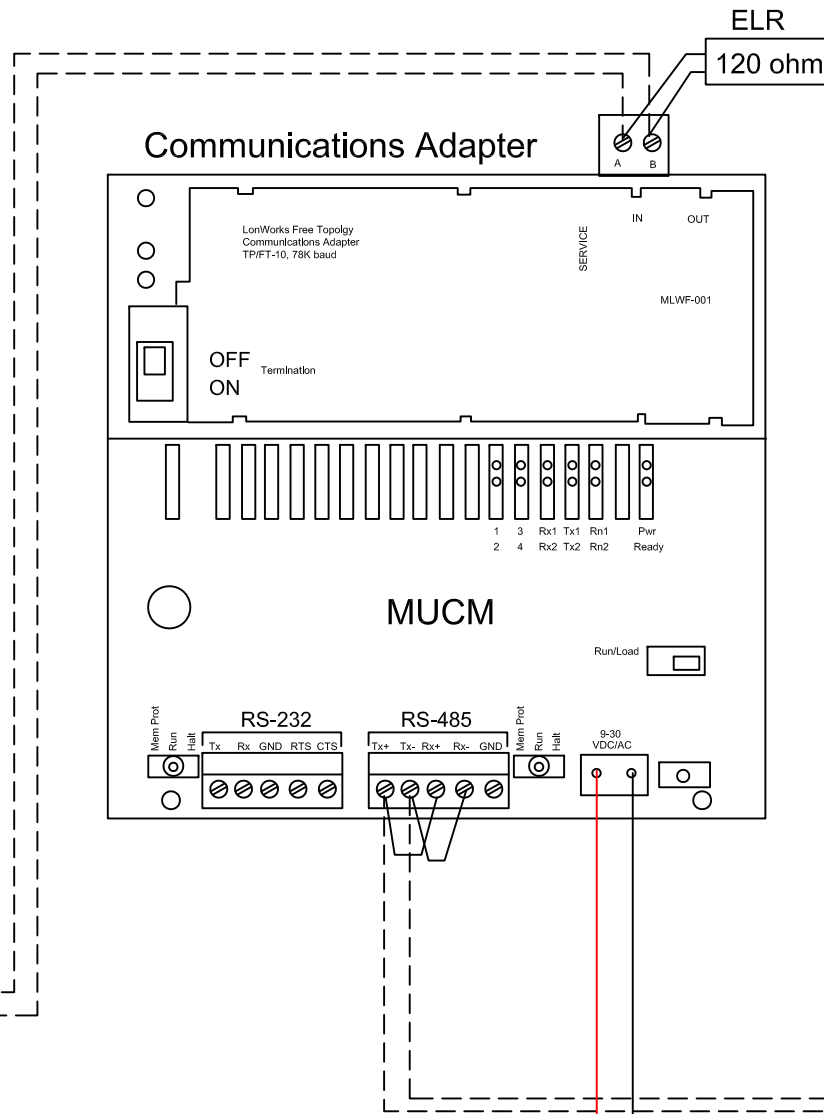
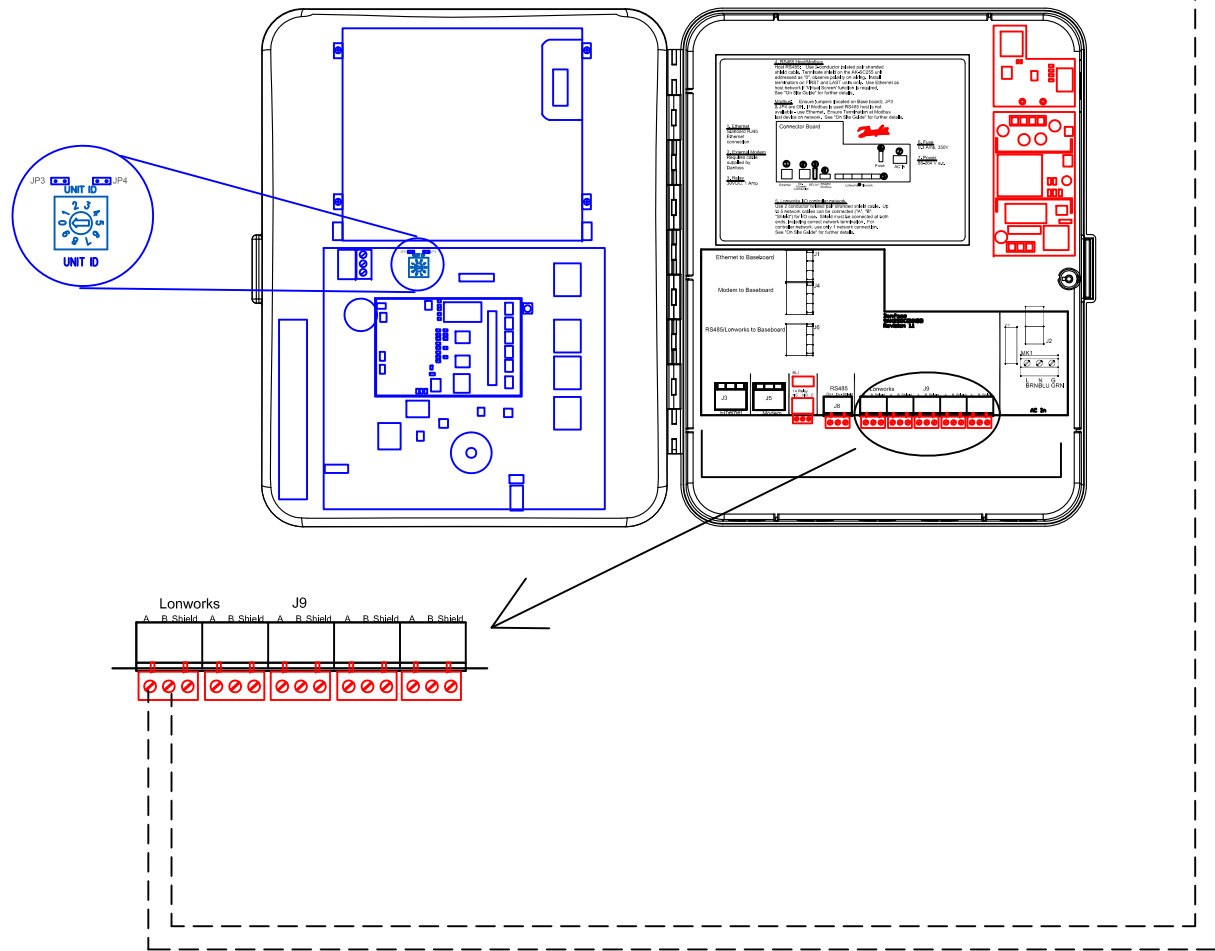


= Refer to Appendix-A for Cable Specification

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	Cutler Hammer Control Board Interface (CBGATE2) (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (XX)	FRACTIONAL	DATE	R.M.
+0.02		9/3/08	9/3/08
DECIMAL (XX)	ANGULAR	DATE	
+0.005		9/3/08	
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE nts		112	1 OF 1

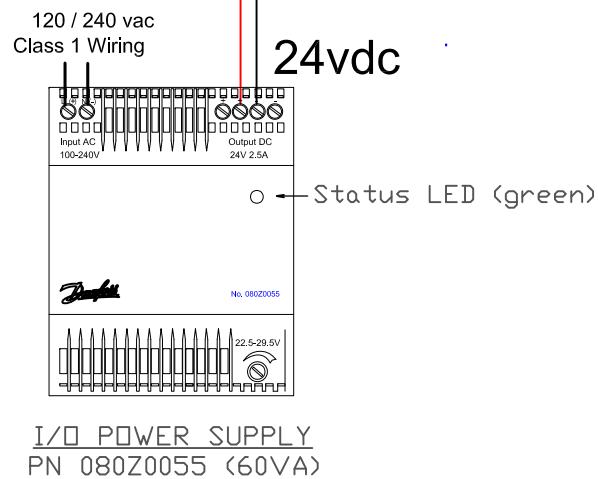
(Typical AK-SC255 to Square-D G3 panel communications details)

AK-SC 255 Software R02.031



Necessary Communications Interface Module:

- Niobrara R&D Corp. TSX Momentum Universal Communications Module (MUCM) with MLWF-001 LonWorks adapter.

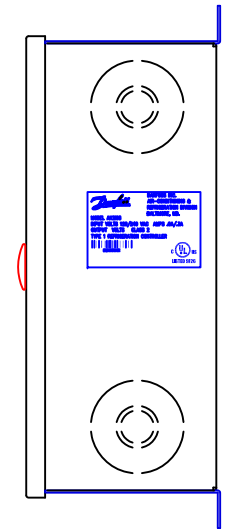
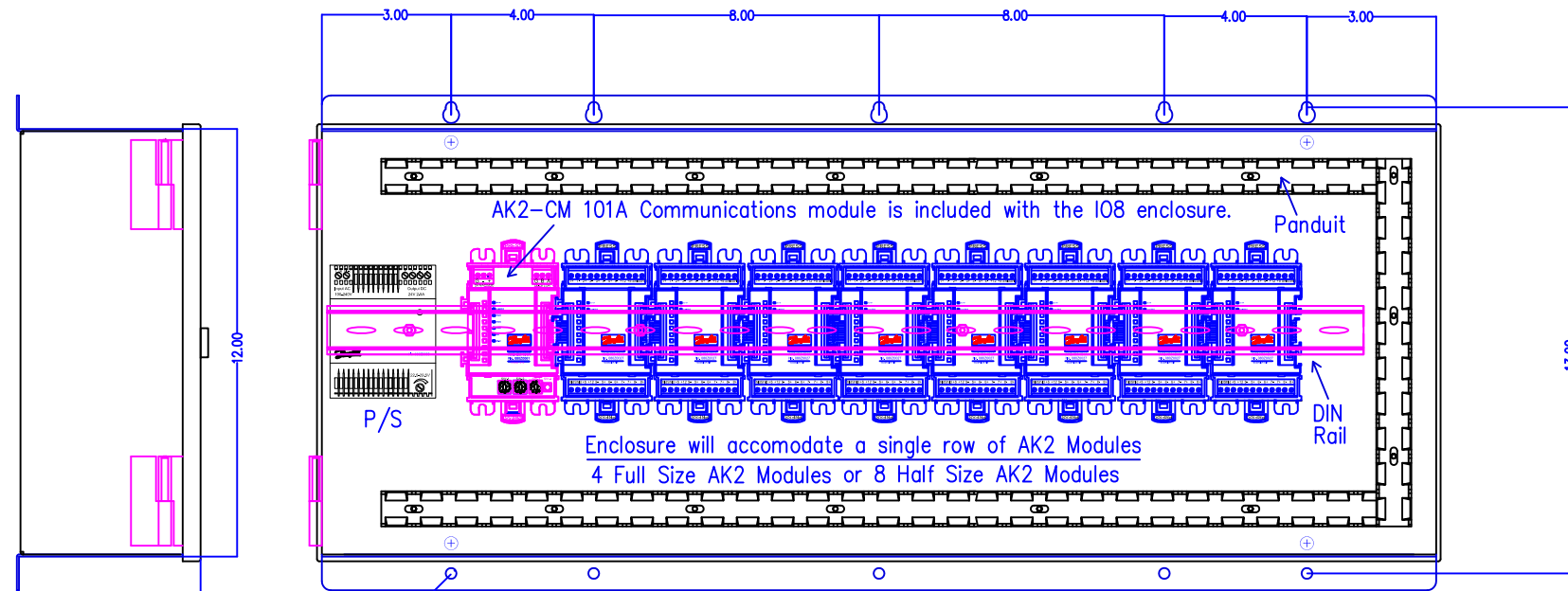
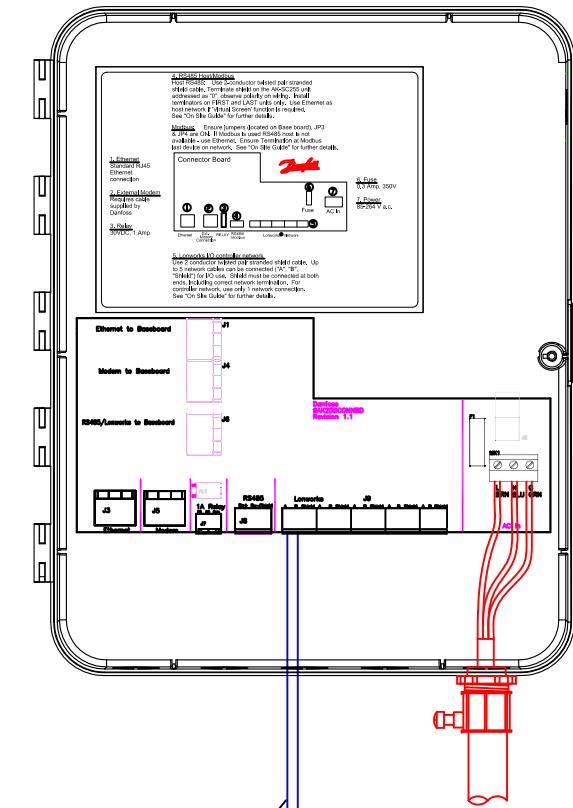


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BALTIMORE, MD. 21236-4925

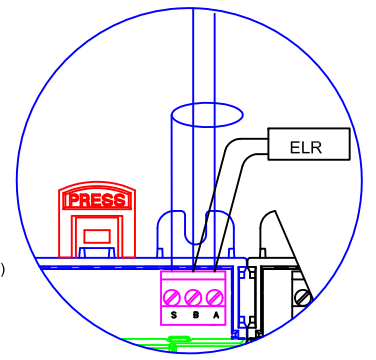
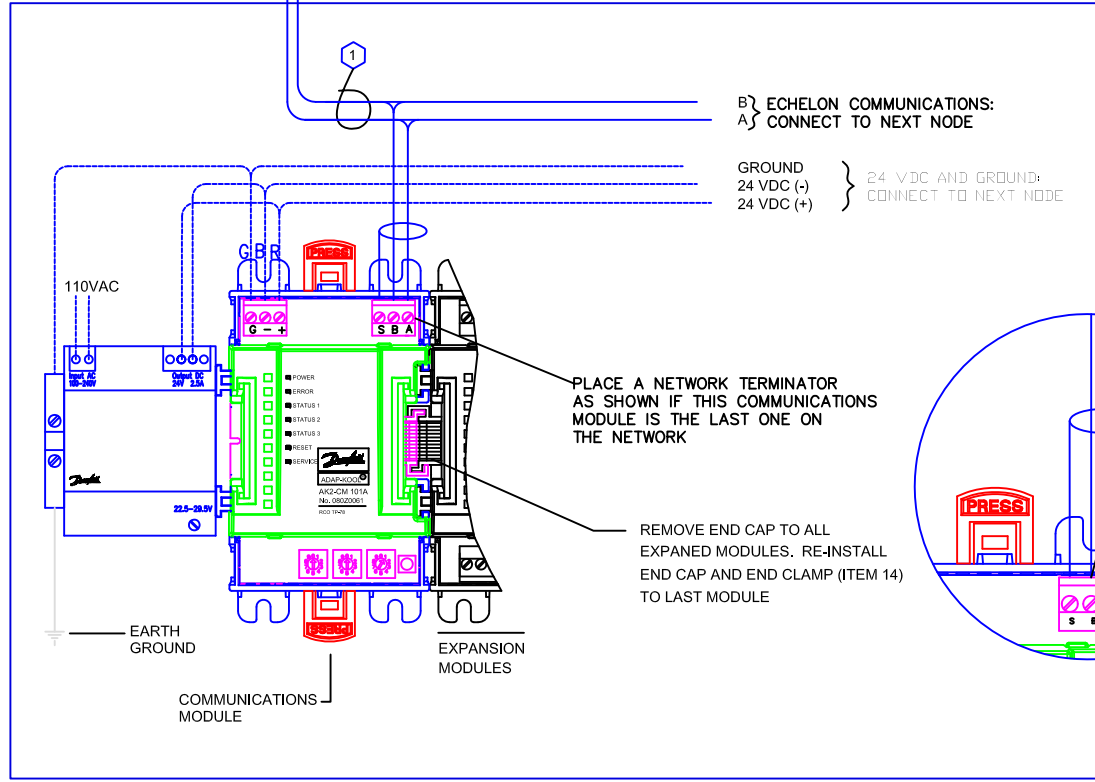
USED ON		TITLE	
PROJECT	NUMBER	Square-D G3 Panel Typical Connections	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (DIM)	FRACTIONAL	DATE	DATE
+/- .02		9/3/2008	9/3/2008
DECIMAL (HOLE)	ANGULAR	DRAWING NO. 113	
+/- .005		SHEET 1 OF 1	
SCALE nts			

AK2IO8 Enclosure / Basic Overview



(Note: Input/Output modules are not included with the IO8 enclosure, they must be ordered separately.)

SHIELD CONNECTION: OBESERVE RULES FOR NETWORK TYPE

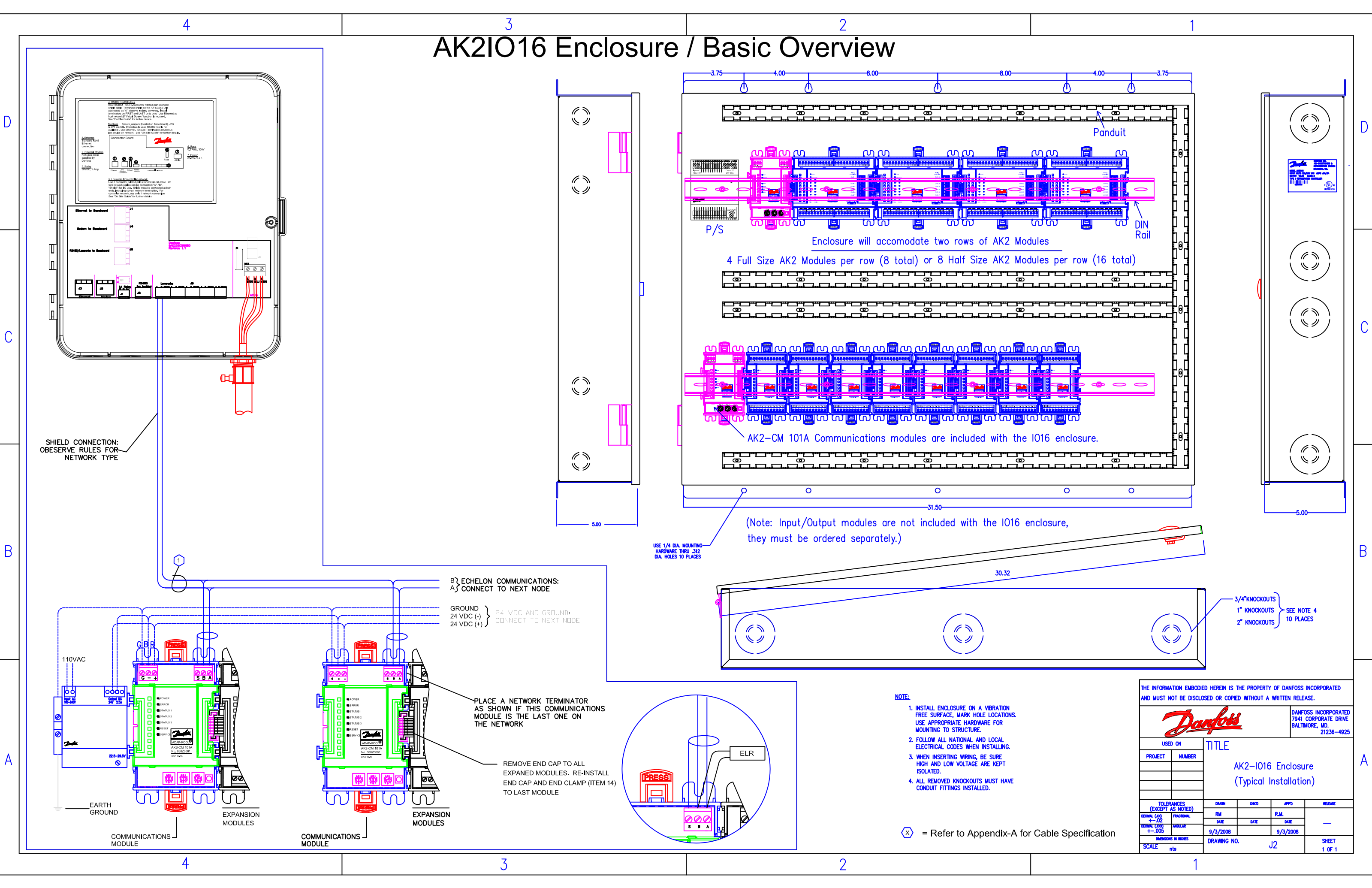


- NOTE:**
1. INSTALL ENCLOSURE ON A VIBRATION FREE SURFACE, MARK HOLE LOCATIONS. USE APPROPRIATE HARDWARE FOR MOUNTING TO STRUCTURE.
 2. FOLLOW ALL NATIONAL AND LOCAL ELECTRICAL CODES WHEN INSTALLING.
 3. WHEN INSERTING WIRING, BE SURE HIGH AND LOW VOLTAGE ARE KEEP ISOLATED.
 4. ALL REMOVED KNOCKOUTS MUST HAVE CONDUIT FITTINGS INSTALLED.

(X) = Refer to Appendix-A for Cable Specification

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	AK2-IO8 Enclosure (Typical Installation)		
TOLERANCES (EXCEPT AS NOTED)		DRAWN	DATE
DECIMAL (1/10)	FRACTIONAL	R.M.	R.M.
+/- .02		DATE	DATE
+/- .005	ANGULAR	9/3/2008	9/3/2008
DIMENSIONS IN INCHES		DRAWING NO.	J1
SCALE	nts	SHEET 1 OF 1	

AK2IO16 Enclosure / Basic Overview



B) ECHELON COMMUNICATIONS:
A) CONNECT TO NEXT NODE

GROUND } 24 VDC AND GROUND:
24 VDC (-) } CONNECT TO NEXT NODE
24 VDC (+)

PLACE A NETWORK TERMINATOR
AS SHOWN IF THIS COMMUNICATIONS
MODULE IS THE LAST ONE ON
THE NETWORK

REMOVE END CAP TO ALL
EXPANDED MODULES. RE-INSTALL
END CAP AND END CLAMP (ITEM 14)
TO LAST MODULE

- NOTE:
1. INSTALL ENCLOSURE ON A VIBRATION FREE SURFACE, MARK HOLE LOCATIONS. USE APPROPRIATE HARDWARE FOR MOUNTING TO STRUCTURE.
 2. FOLLOW ALL NATIONAL AND LOCAL ELECTRICAL CODES WHEN INSTALLING.
 3. WHEN INSERTING WIRING, BE SURE HIGH AND LOW VOLTAGE ARE KEPT ISOLATED.
 4. ALL REMOVED KNOCKOUTS MUST HAVE CONDUIT FITTINGS INSTALLED.

X = Refer to Appendix-A for Cable Specification

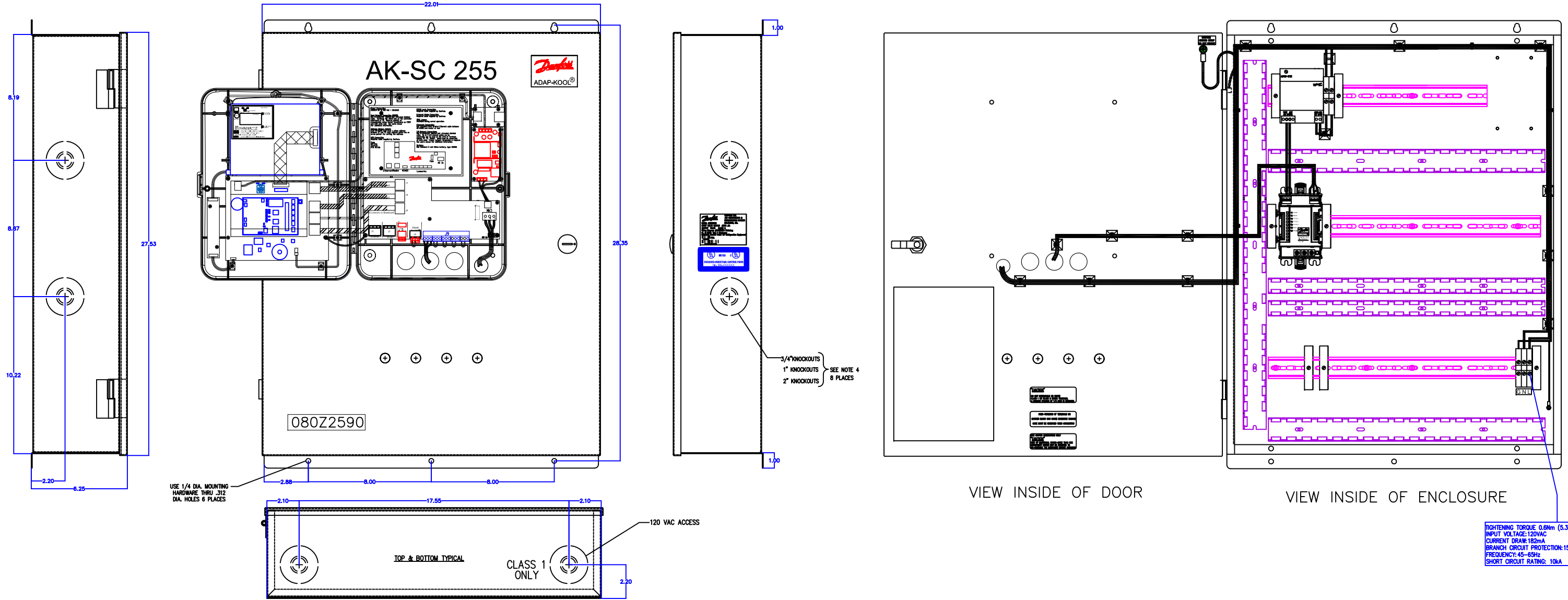
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Danfoss

DANFOSS INCORPORATED
7941 CORPORATE DRIVE
BALTIMORE, MD.
21236-4925

USED ON	TITLE
PROJECT NUMBER	AK2-IO16 Enclosure (Typical Installation)
TOLERANCES (EXCEPT AS NOTED)	
DECIMAL (X10)	FRACTIONAL
±.02	ANGULAR
±.005	
DATE	DATE
9/3/2008	9/3/2008
SCALE	DRAWING NO.
nts	J2
	SHEET
	1 OF 1

AK-SC255 I/O Panel / Basic Overview



- NOTES:**
1. INSTALL ENCLOSURE ON A VIBRATION FREE SURFACE, MARK HOLE LOCATIONS. USE APPROPRIATE HARDWARE FOR MOUNTING TO STRUCTURE.
 2. FOLLOW ALL NATIONAL AND LOCAL ELECTRICAL CODES WHEN INSTALLING.
 3. WHEN INSERTING WIRING, BE SURE HIGH AND LOW VOLTAGE WIRES ARE ISOLATED.
 4. ALL REMOVED KNOCKOUTS MUST HAVE CONDUIT FITTINGS INSTALLED.
 5. MULTIPLE DISCONNECTS MAY BE NEEDED. ALL DISCONNECTS AS WELL AS BRANCH CIRCUIT PROTECTION TO BE PROVIDED BY INSTALLER.

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	AK-SC255 I/O Panel (Basic Overview)	
TOLERANCES (EXCEPT AS NOTED)		DRAWN	DATE
DECIMAL (X10)	FRACTIONAL	R.M.	R.M.
+0.02		DATE	DATE
+0.005	ANGULAR	9/3/2008	9/3/2008
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE	nts	J3	1 OF 1

(Typical 12x24 I/O Enclosure / PN 080Z2165)

TIGHTENING TORQUE 0.6Nm (5.31 IN/LBS)
 INPUT VOLTAGE: 120VAC
 CURRENT DRAW: 182mA
 BRANCH CIRCUIT PROTECTION: 15A
 FREQUENCY: 45-65Hz
 SHORT CIRCUIT RATING: 10kA

TEMPERATURE SENSOR (NO POLARITY) (AKS 11)
 CONNECT LEADS TO SIG AND GND

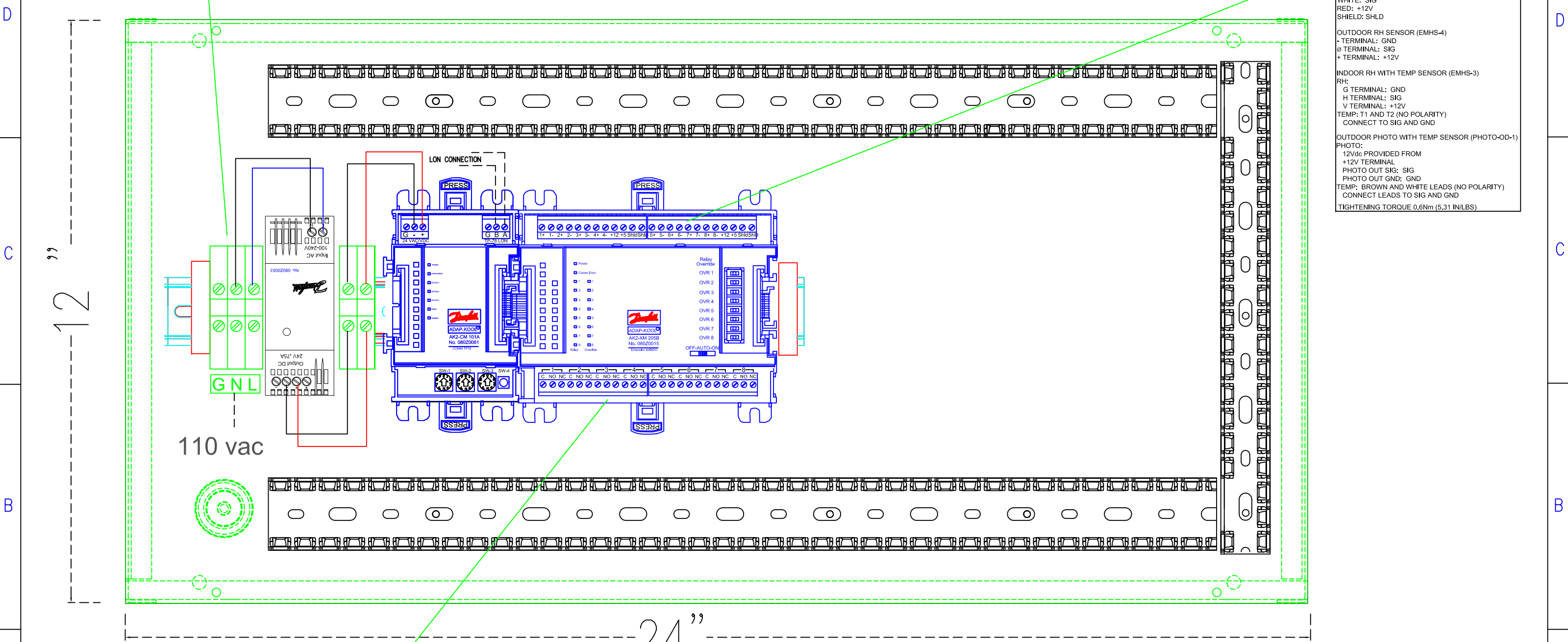
PRESSURE TRANSDUCER (AKS 32)
 BLACK: GND
 WHITE: SIG
 RED: +12V
 SHIELD: SHLD

OUTDOOR RH SENSOR (EMHS-4)
 - TERMINAL: GND
 Ø TERMINAL: SIG
 + TERMINAL: +12V

INDOOR RH WITH TEMP SENSOR (EMHS-3)
 RH:
 G TERMINAL: GND
 H TERMINAL: SIG
 V TERMINAL: +12V
 TEMP: T1 AND T2 (NO POLARITY)
 CONNECT TO SIG AND GND

OUTDOOR PHOTO WITH TEMP SENSOR (PHOTO-OD-1)
 PHOTO:
 12Vdc PROVIDED FROM
 +12V TERMINAL
 PHOTO OUT SIG: SIG
 PHOTO OUT GND: GND
 TEMP: BROWN AND WHITE LEADS (NO POLARITY)
 CONNECT LEADS TO SIG AND GND

TIGHTENING TORQUE 0.6Nm (5.31 IN/LBS)



MAX OUTPUT RATINGS:
 FOR CONNECTION TO CONTACTOR ONLY
 @ 120-240VAC
 5A RESISTIVE @ 24VDC OR 250VAC
 FUSED @ 5A (SB) 250VAC
 NEEDS SEPERATE BRANCH CIRCUIT
 PROTECTION: 15A
 NC Wire to normally
 closed load.
 NO Wire to normally
 open load.
 C Wire to power for
 controlled load.
 TIGHTENING TORQUE 1.36Nm (12.04 IN/LBS)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
		USED ON	TITLE
PROJECT	NUMBER	Typical I/O Enclosure P/N 080Z2165	
TOLERANCES (EXCEPT AS NOTED)		DATE	RELEASE
DECIMAL (LSD)	FRACTIONAL	DATE	DATE
DECIMAL (LSD)	ANGULAR	8/27/09	8/27/09
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE nts		J4	1 OF 1

(Typical 12x24 I/O Enclosure / PN 080Z2166)

TIGHTENING TORQUE 0.6Nm (5.31 IN/LBS)
 INPUT VOLTAGE: 120VAC
 CURRENT DRAW: 182mA
 BRANCH CIRCUIT PROTECTION: 15A
 FREQUENCY: 45-65Hz
 SHORT CIRCUIT RATING: 10kA

TEMPERATURE SENSOR (NO POLARITY) (AKS 11)
 CONNECT LEADS TO SIG AND GND

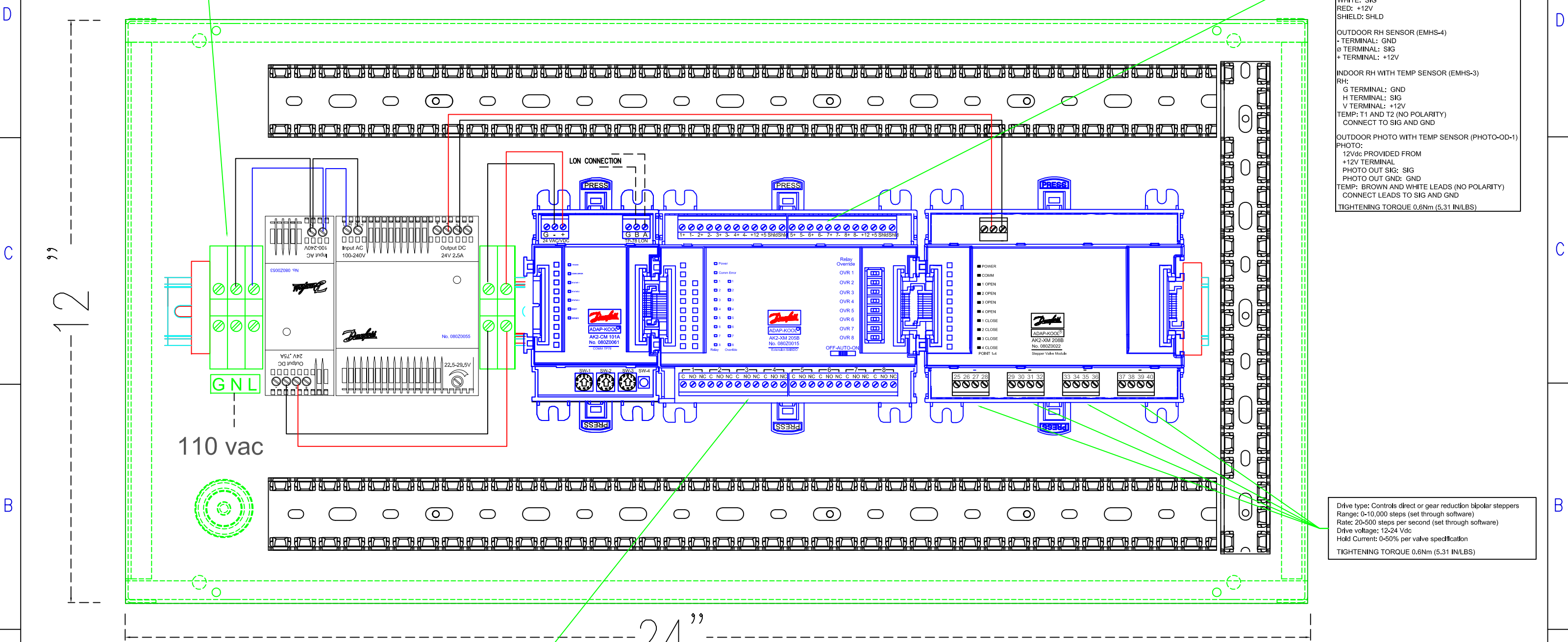
PRESSURE TRANSDUCER (AKS 32)
 BLACK: GND
 WHITE: SIG
 RED: +12V
 SHIELD: SHLD

OUTDOOR RH SENSOR (EMHS-4)
 - TERMINAL: GND
 Ø TERMINAL: SIG
 + TERMINAL: +12V

INDOOR RH WITH TEMP SENSOR (EMHS-3)
 RH:
 G TERMINAL: GND
 H TERMINAL: SIG
 V TERMINAL: +12V
 TEMP: T1 AND T2 (NO POLARITY)
 CONNECT TO SIG AND GND

OUTDOOR PHOTO WITH TEMP SENSOR (PHOTO-OD-1)
 PHOTO:
 +12Vdc PROVIDED FROM
 +12V TERMINAL
 PHOTO OUT SIG: SIG
 PHOTO OUT GND: GND
 TEMP: BROWN AND WHITE LEADS (NO POLARITY)
 CONNECT LEADS TO SIG AND GND

TIGHTENING TORQUE 0.6Nm (5.31 IN/LBS)



110 vac



Drive type: Controls direct or gear reduction bipolar steppers
 Range: 0-10,000 steps (set through software)
 Rate: 20-500 steps per second (set through software)
 Drive voltage: 12-24 Vdc
 Hold Current: 0-50% per valve specification
 TIGHTENING TORQUE 0.6Nm (5.31 IN/LBS)

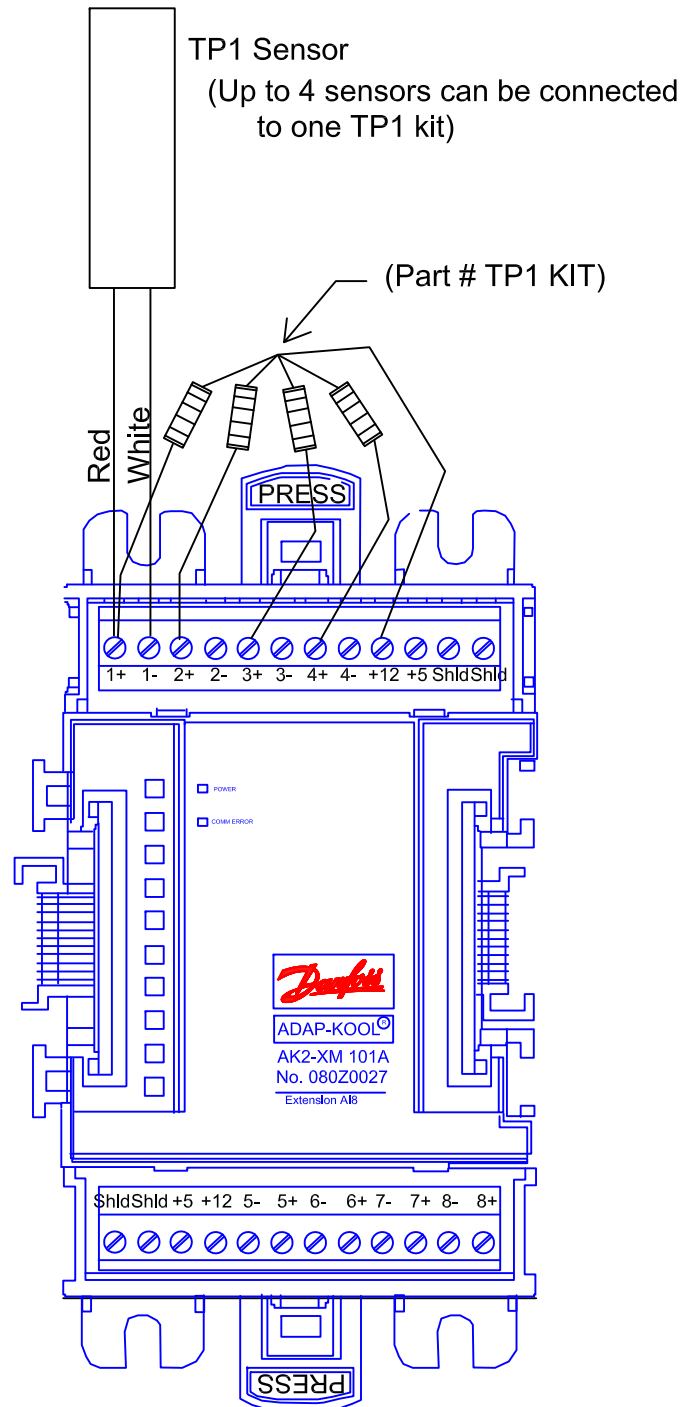
MAX OUTPUT RATINGS:
 FOR CONNECTION TO CONTACTOR ONLY
 @ 120-240VAC
 5A RESISTIVE @ 24VDC OR 250VAC
 FUSED @ 5A (SB) 250VAC
 NEEDS SEPERATE BRANCH CIRCUIT
 PROTECTION: 15A
 NC Wire to normally
 closed load.
 NO Wire to normally
 open load.
 C Wire to power for
 controlled load.
 TIGHTENING TORQUE 1.36Nm (12.04 IN/LBS)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4825	
USED ON	TITLE		
PROJECT	NUMBER	Typical I/O Enclosure P/N 080Z2166	
TOLERANCES (EXCEPT AS NOTED)		DATE	RELEASE
DECIMAL (1:50)	FRACTIONAL	RM	R.M.
+-.02		DATE	DATE
DECIMAL (1:100)	ANGULAR	8/27/09	8/27/09
+-.005		DRAWING NO.	J5
DIMENSIONS IN INCHES		SCALE	SHEET 1 OF 1
		nts	

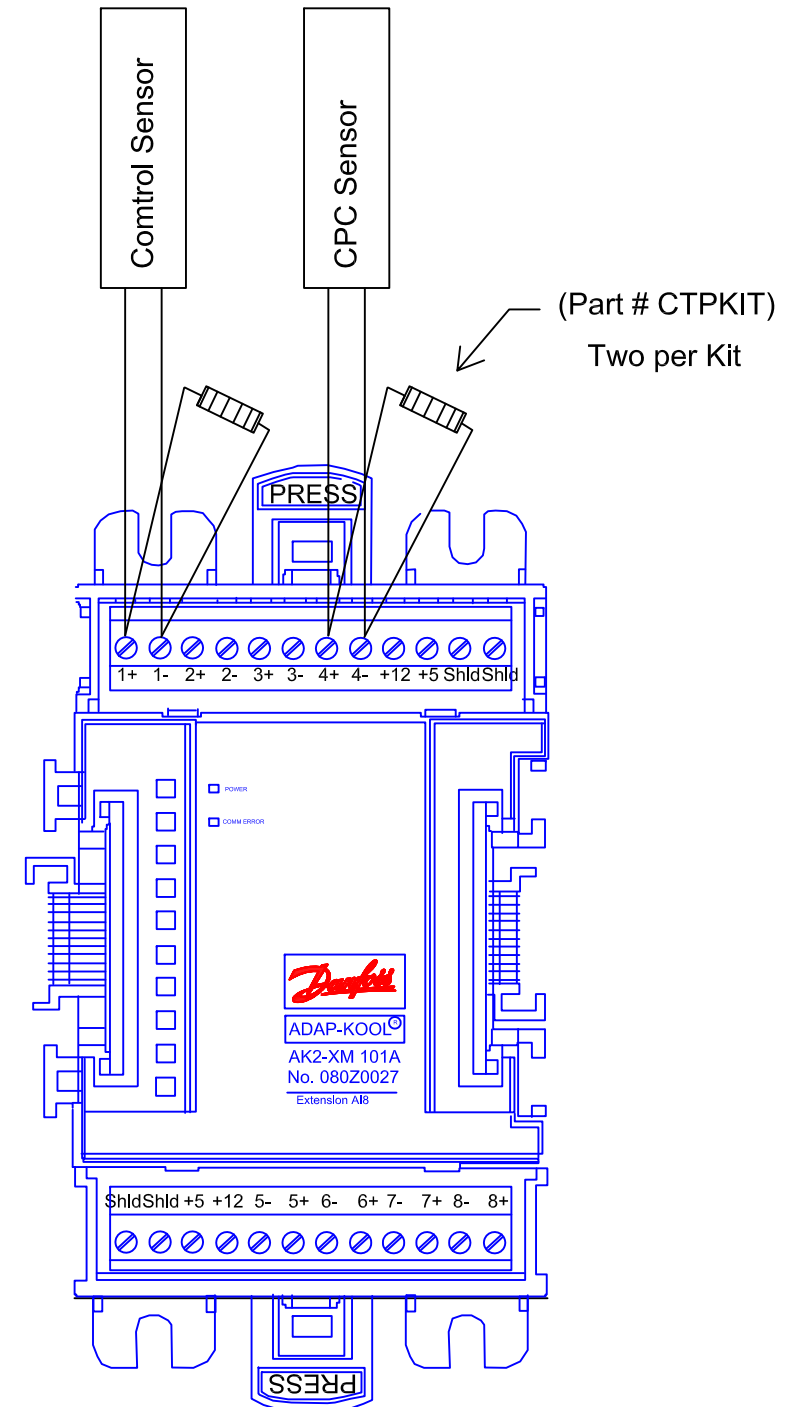
Typical Wiring of other temperature sensors

ECI Sensors



- 10K Resistor (Non Precision)
- Resistor is between +12 and 'signal' terminal for TP1 sensor
- TP1 sensors are polarity sensitive with the red lead on 'signal' terminal

CPC & Control Sensors



- 2.5K Precision Resistor
- Kit includes (2)
- Wire across SIG & GRD
- Sensors are not polarity sensitive

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Other Temp Sensors Wiring Guide (Typical Installation)	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (DIM)	FRACTIONAL	DATE	R.M.
+-.02		8/5/08	8/5/08
DECIMAL (CLOS)	ANGULAR	DRAWING NO. K1	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES		SCALE nts	

(Typical Dual Temp Switch Wiring)

← Example-1 Example-2 →

Selection Switch (SPDT)

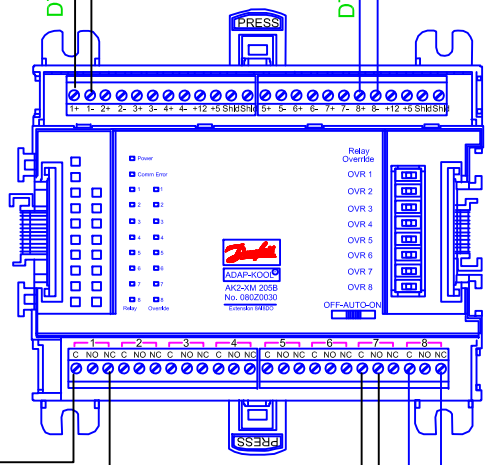
Switch is installed at cases or department room.

Dual Temp Switch (SPST)

Install switch at case or department

(Standard Temp control of LLSV or SSV)
 Dual temp switch closure will give 255 controller command for dual temp mode.
 The 255 controller automatically switches from medium temp settings to low temp settings.
 Control of the LLSV or SSV in either mode maintains the desired setpoint.

When switch is in Low Temp mode (closed) the SSV opens and bypasses the EPR.
 The 255 controller automatically switches from medium temp settings to low temp settings.
 Control of the LLSV in either mode maintains the desired setpoint.



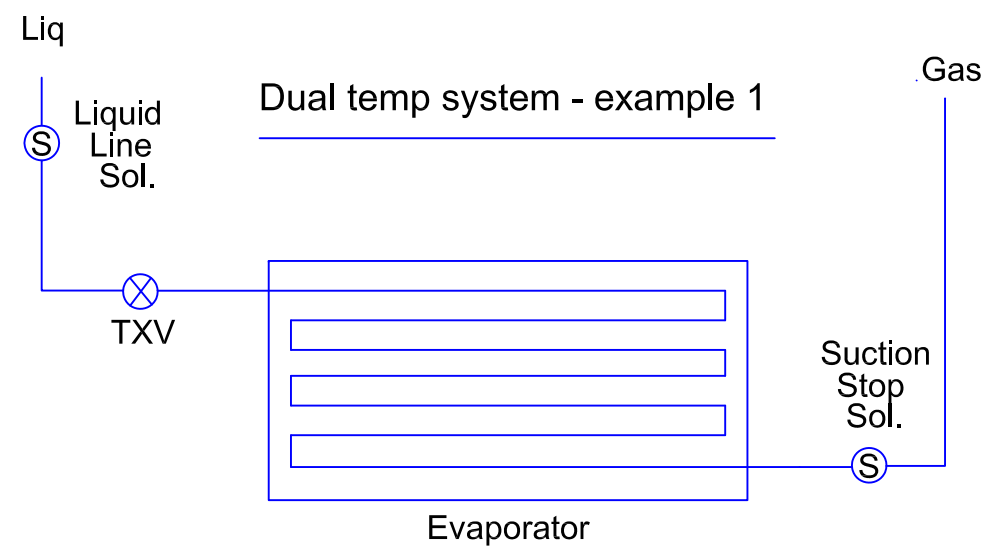
LLSV or SSV control

LLSV control

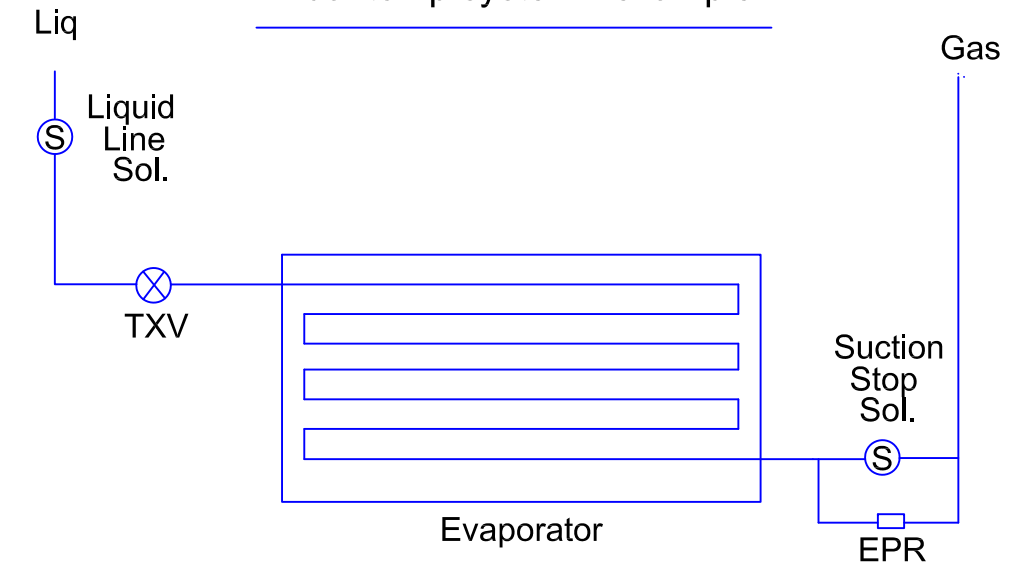
SSV control

This example is based on a normally closed solenoid.
 (Reverse to NC contacts if normally open solenoid.)

Dual temp system - example 1



Dual temp system - example 2



NOTE: This drawing is intended to show the logical, rather than physical, relationship of components.

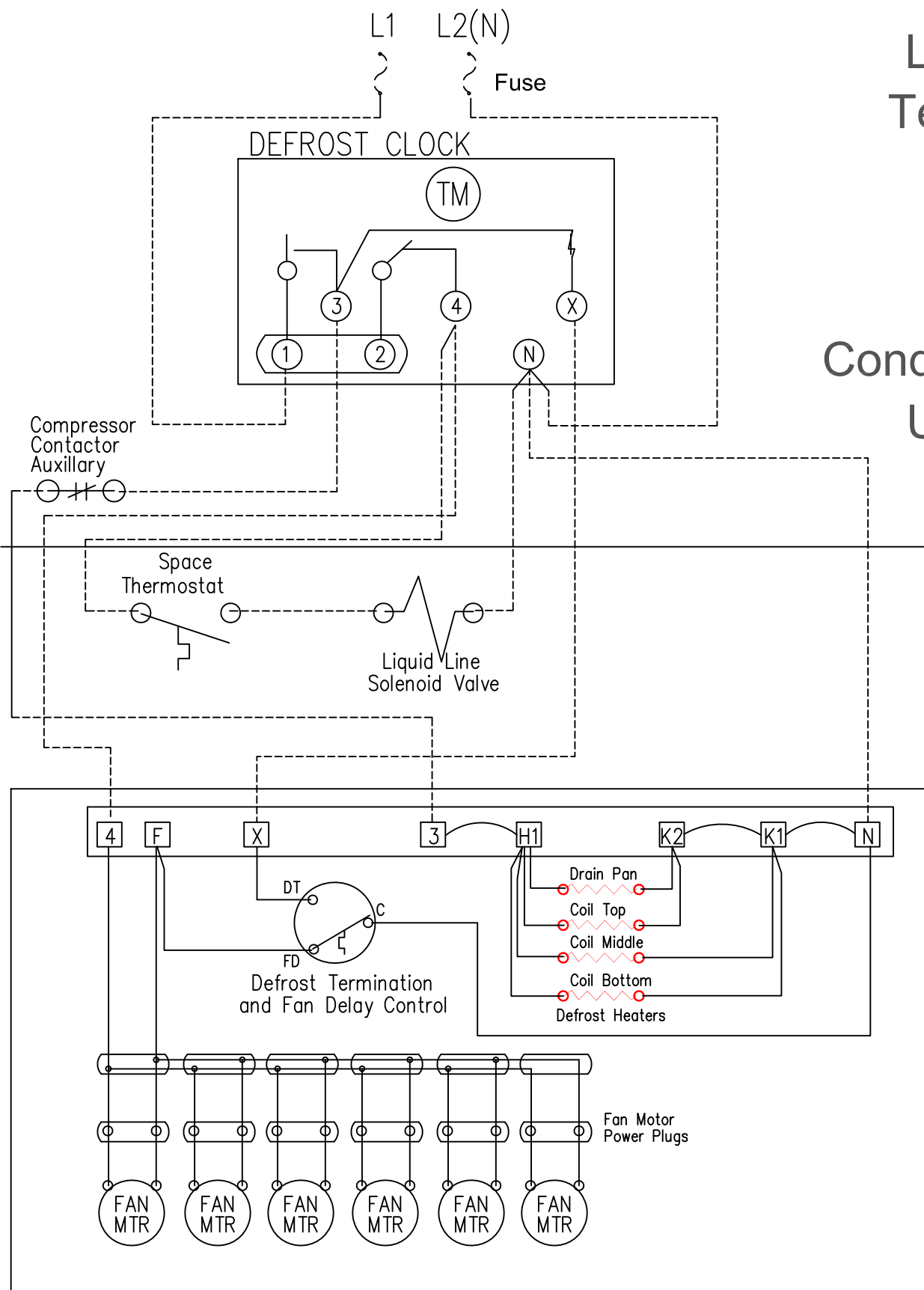
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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4825	
USED ON	TITLE		
PROJECT	NUMBER	Typical Dual Temp Switch Wiring	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (1:10)	FRACTIONAL	DATE	DATE
+-.02		9/3/08	9/3/08
ANGULAR			
+-.005			
DIMENSIONS IN INCHES		DRAWING NO.	SHEET
SCALE	nts	K2	1 OF 1

Existing

Low Temp

Condensing Unit

Evap

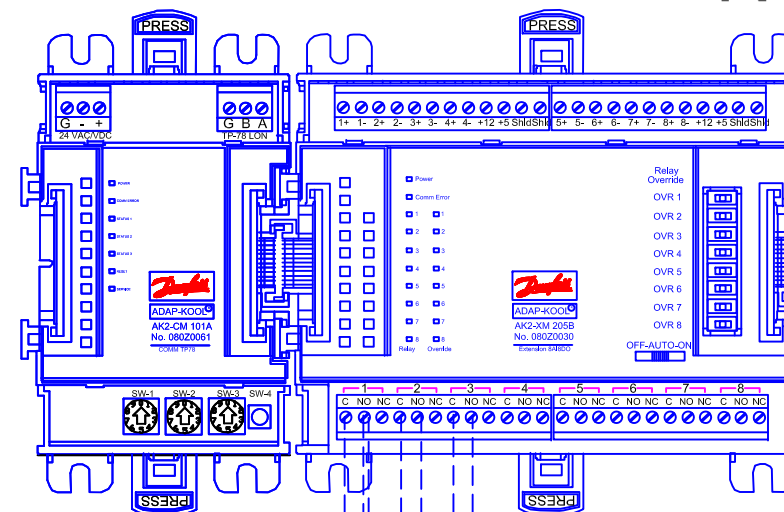


New

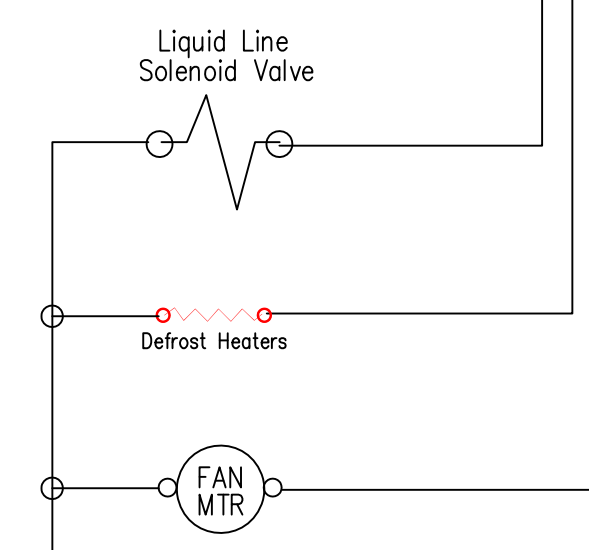
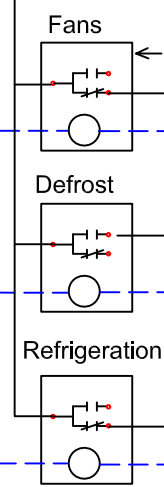
(Remove Time Clock)

Condensing Unit

Evap



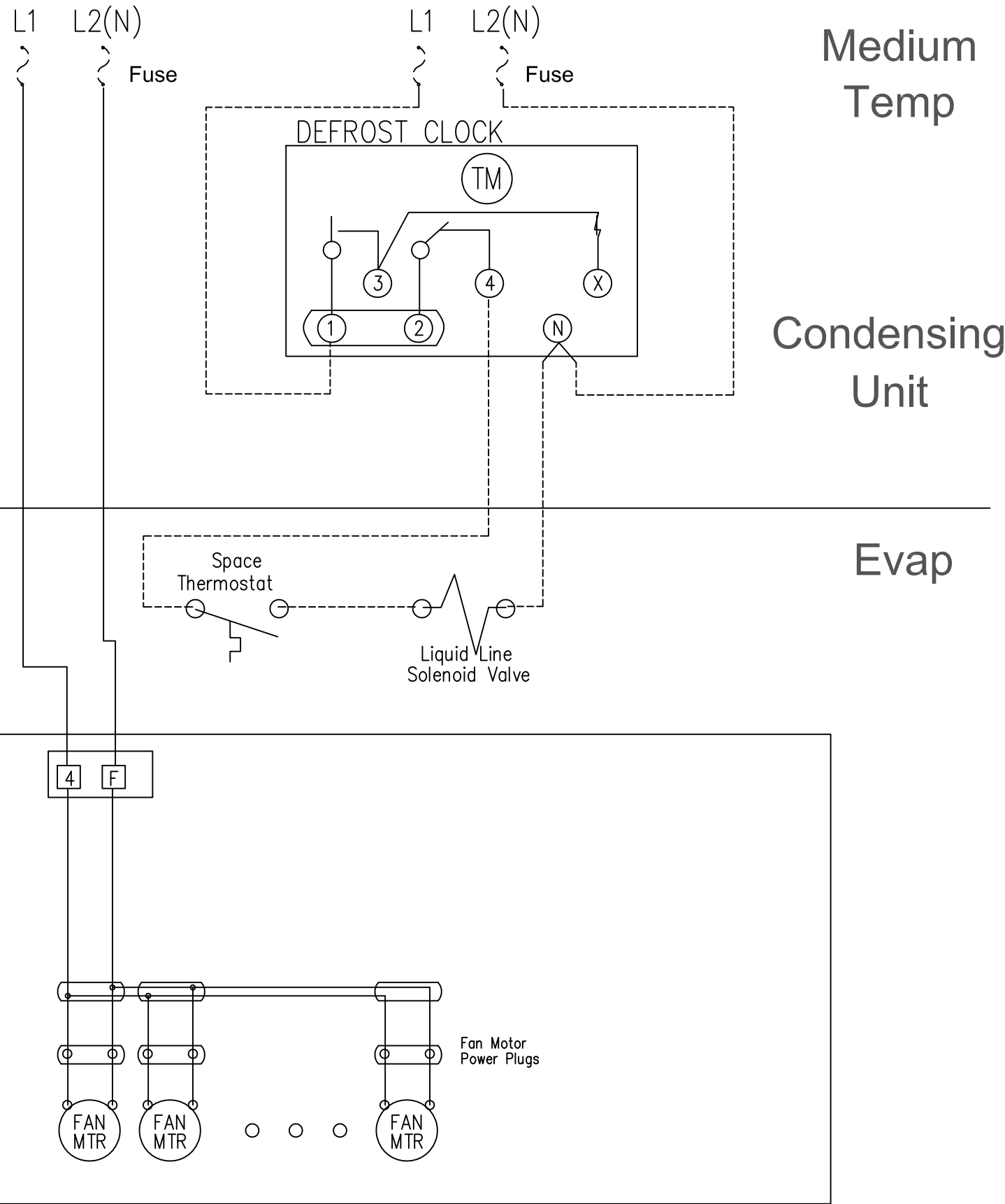
24 VAC



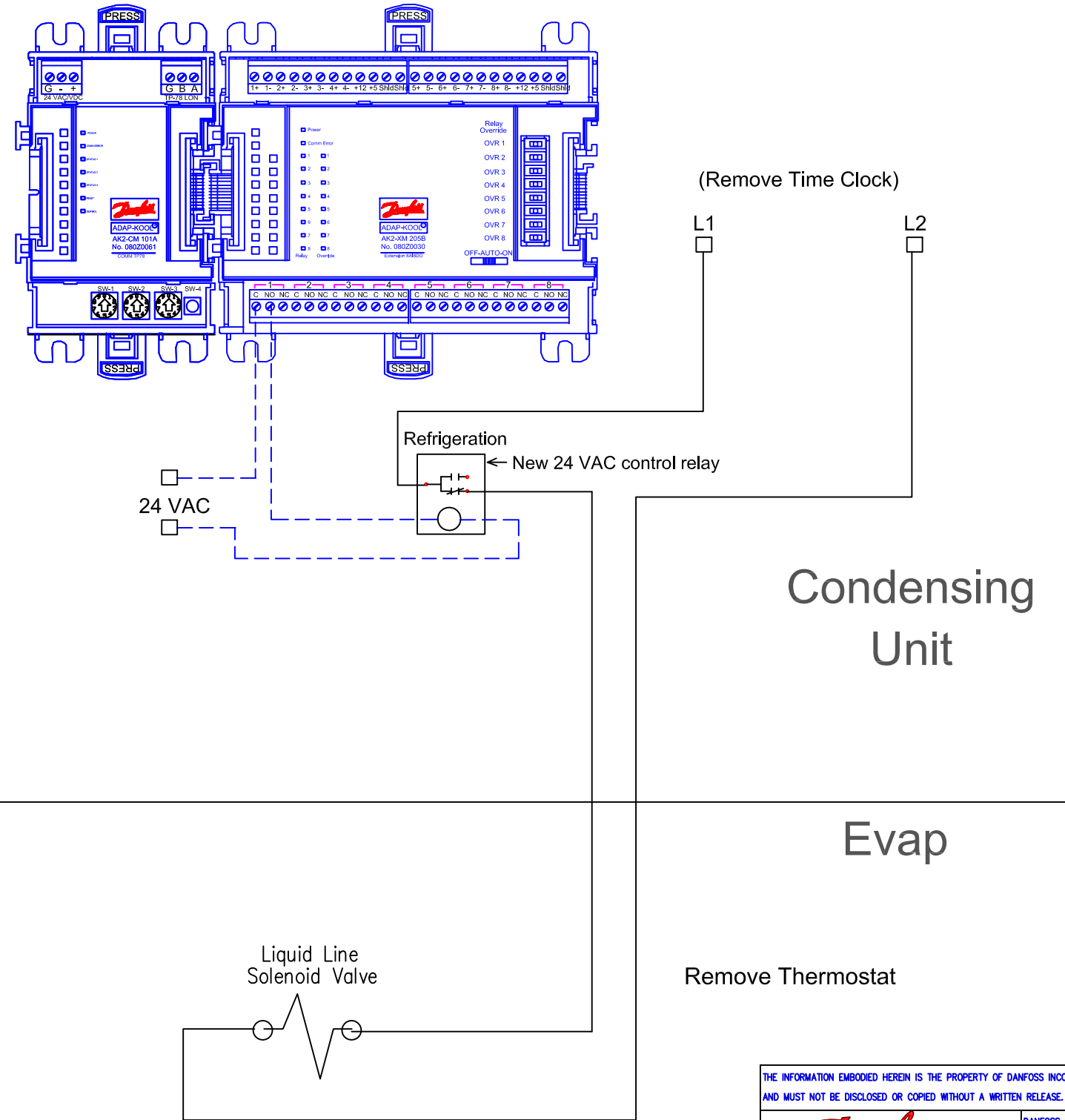
Remove Thermostat
Remove Fan Term & Delay Stat

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT	NUMBER	Typical Low Temp Retrofit	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (1:50)	FRACTIONAL	DATE	DATE
+-.02		8/27/09	8/27/09
DECIMAL (1:20)	ANGULAR	DRAWING NO. K3	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES			
SCALE	nts		

Existing



New

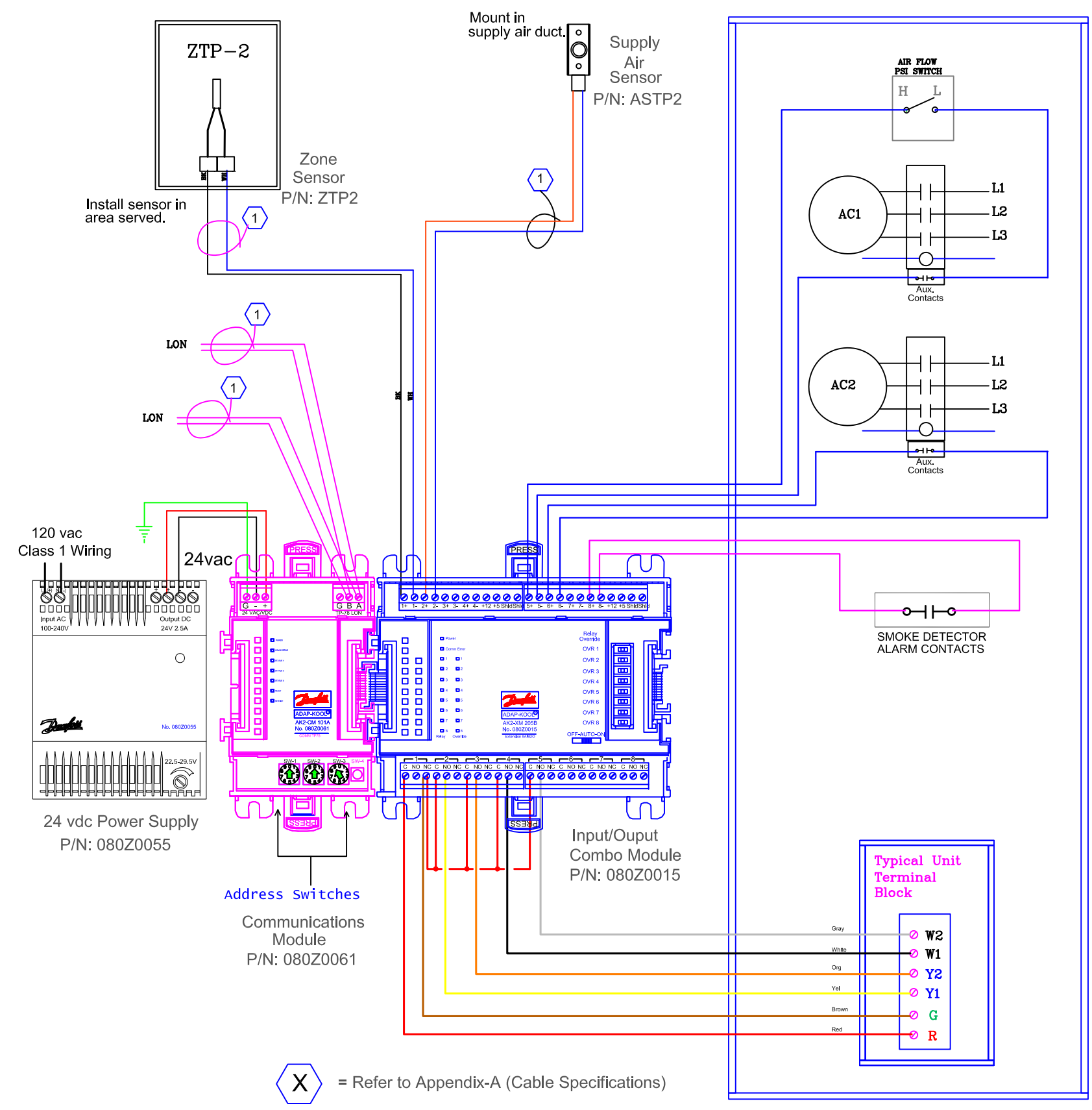


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BALTIMORE, MD. 21236-4925

USED ON		TITLE	
PROJECT	NUMBER		
		Typical Medium Temp Retrofit	
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (1/10)	FRACTIONAL	DATE	DATE
+-.02		8/27/09	8/27/09
DECIMAL (1/10)	ANGULAR	DRAWING NO. K4	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES			
SCALE	nts		

Typical RTU Thermostat Interface Wiring Details

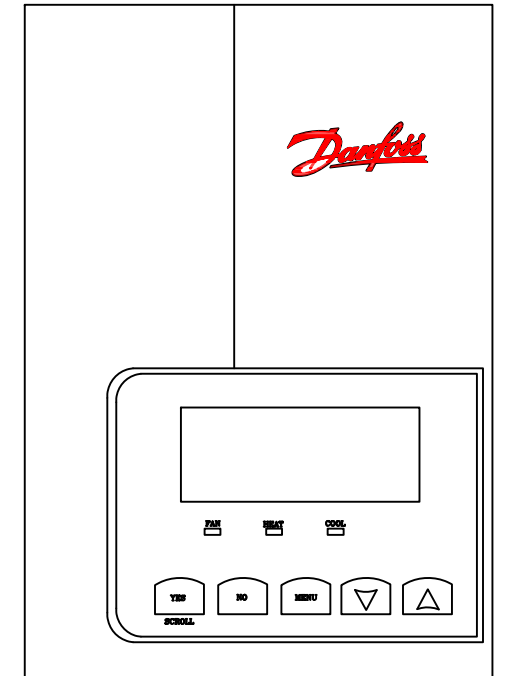
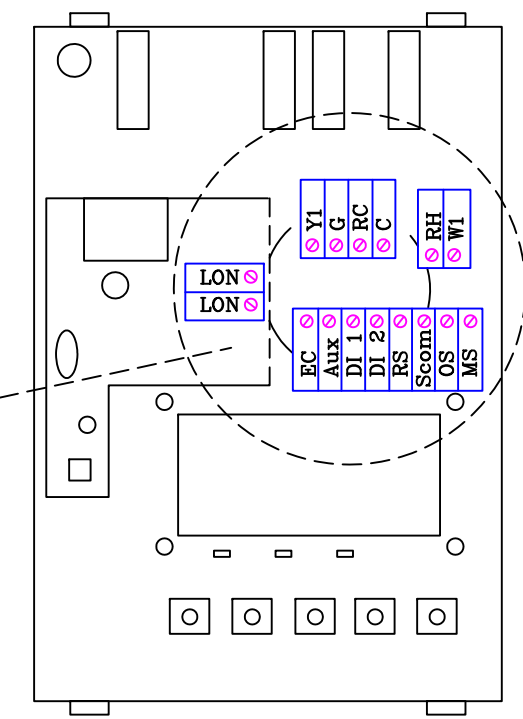
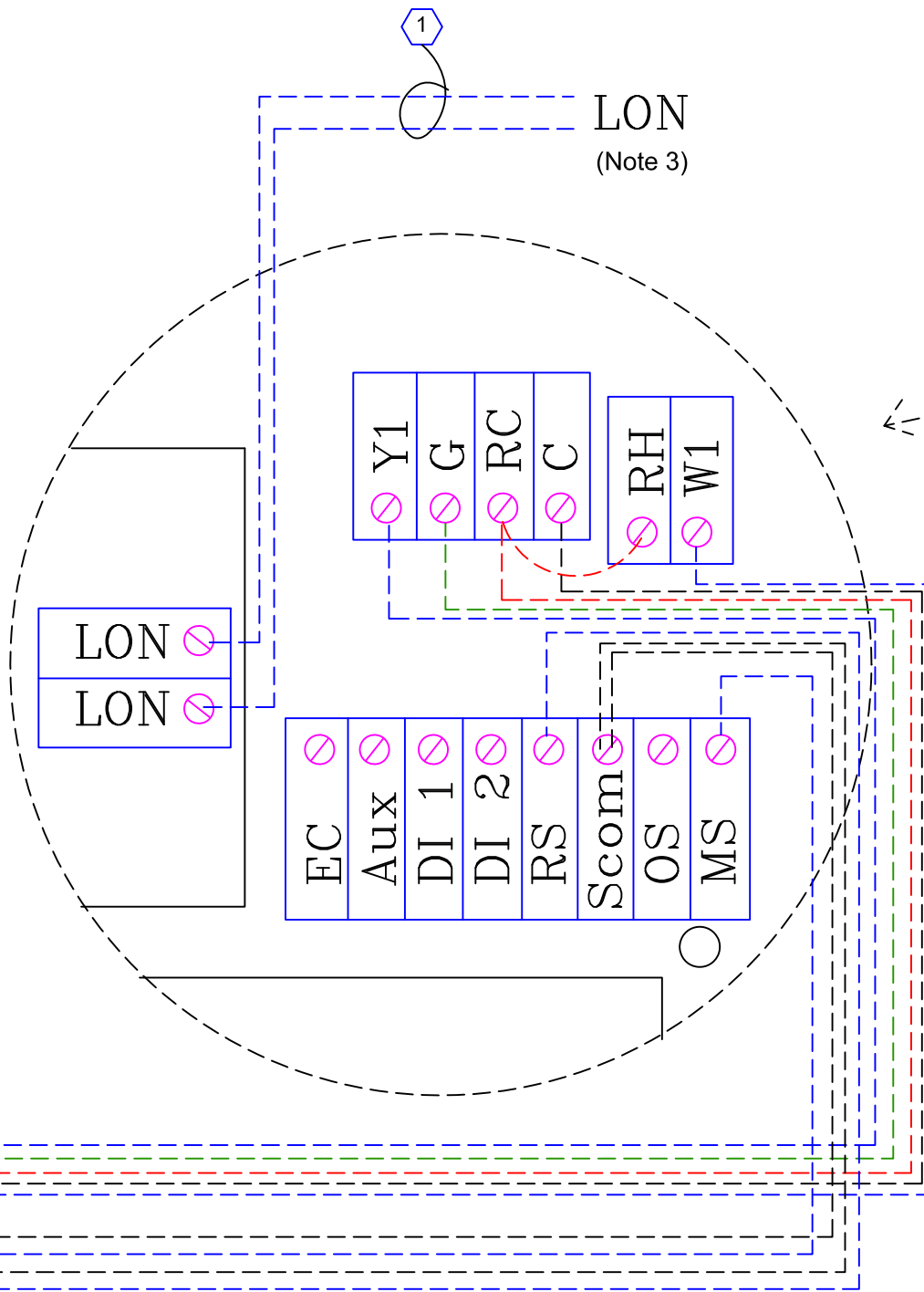
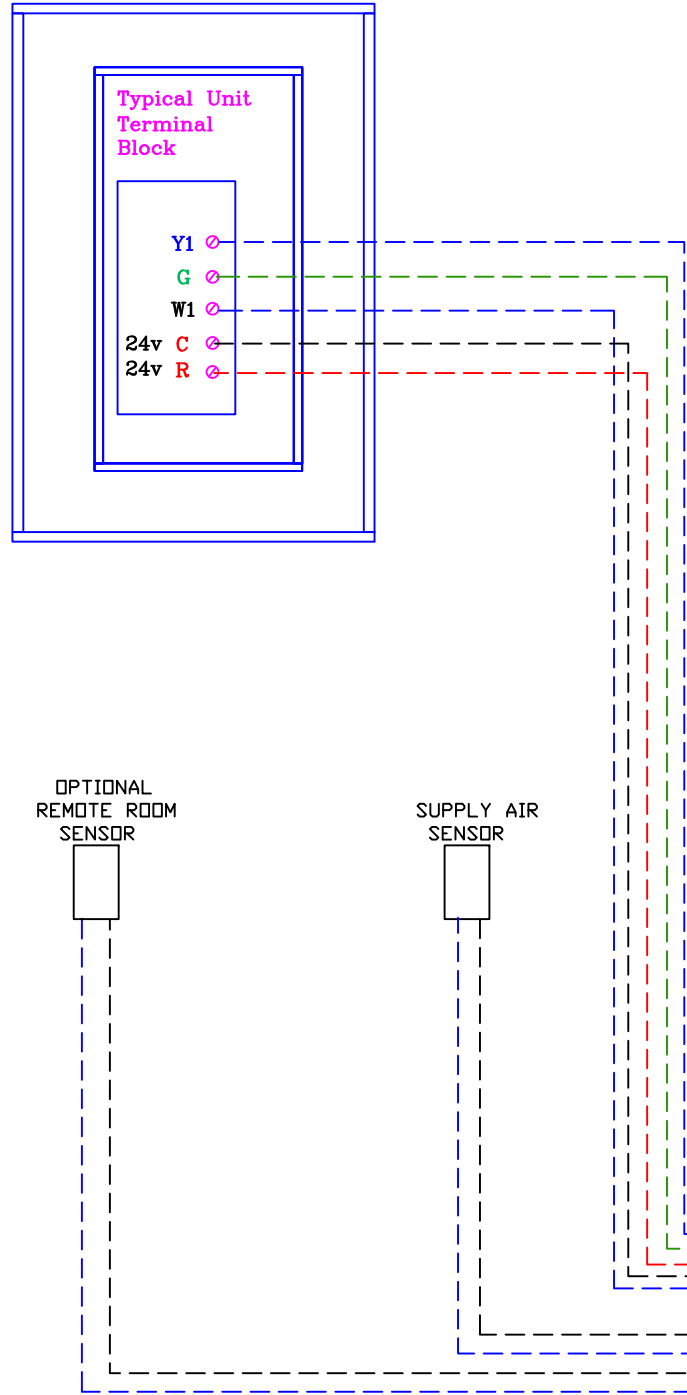


X = Refer to Appendix-A (Cable Specifications)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	Typical RTU Thermostat Wiring Interface Details		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (DIM)	FRACTIONAL	DATE	DATE
+0.02	ANGULAR	9/10/08	9/10/08
+0.005			
SCALE: nts		DRAWING NO. K5	SHEET 1 OF 1

Typical SmartStat RTU Controller Installation (080Z2180)

ROOF TOP UNIT



P/N: 080Z2180
(1 CL, 1 HT)

Installation:

- Remove security screw on the bottom of thermostat cover.
- Open up by pulling on the bottom side of thermostat.

A) Location:

1. Should not be installed on an outside wall.
2. Must be installed away from heat source.
3. Should not be installed near an air discharge grill.
4. Should not be affected by direct sun radiation.
5. Nothing must restrain vertical air circulation to the thermostat.

Wiring

Note 1: If the same power source is used for the heating stages, install jumper across RC & RH, Maximum current is 2.0 amps.

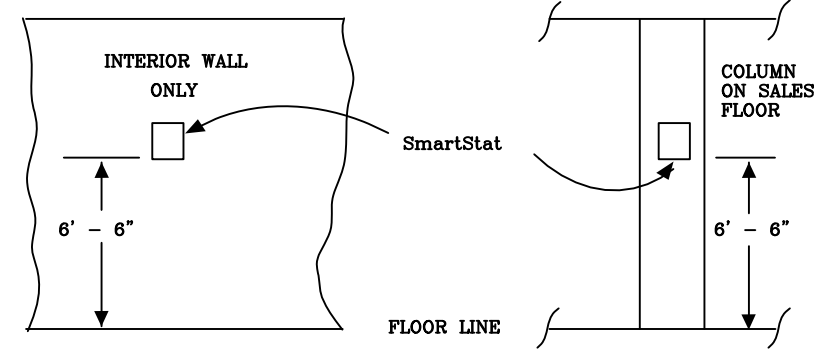
Note 2: The transformer of the unit provides power to the thermostat and the additional loads that will be wired to the thermostat.

Note 3: TP-78 to FTT-10 bridge is required. (P/N: 084B2252)

NOTES:

1. ALL WORK MUST BE PERFORMED TO MEET N.E.C. OR LOCAL CODES.
2. Contractor to run communication cables to Controller and terminate as shown.

② = refer to Appendix-A for Cable Specification

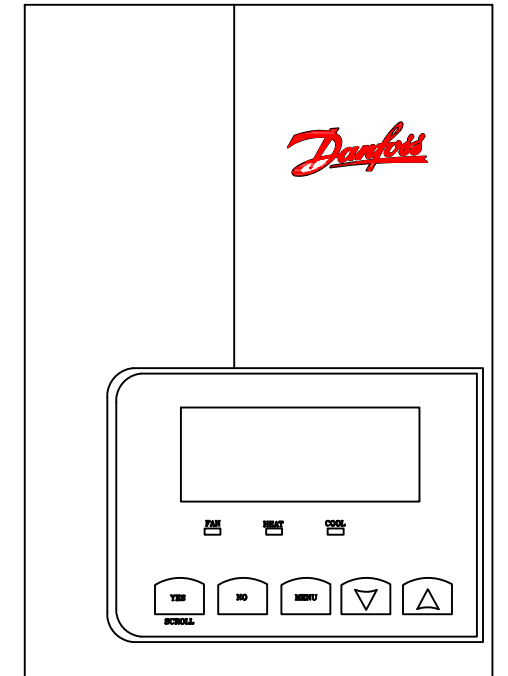
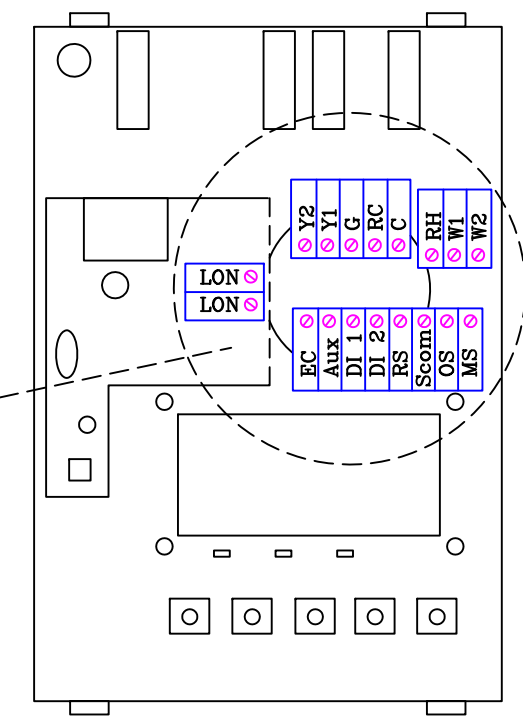
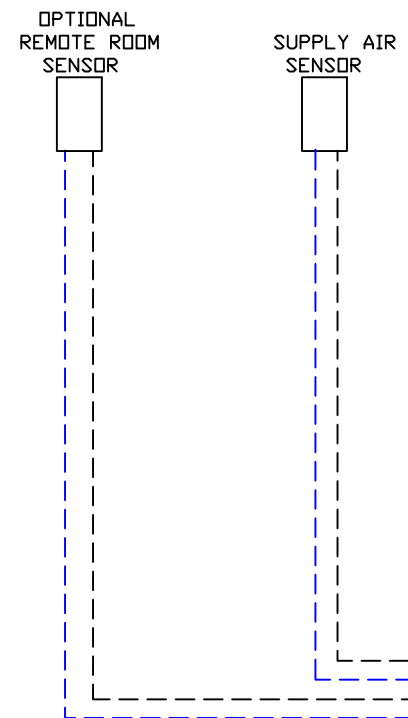
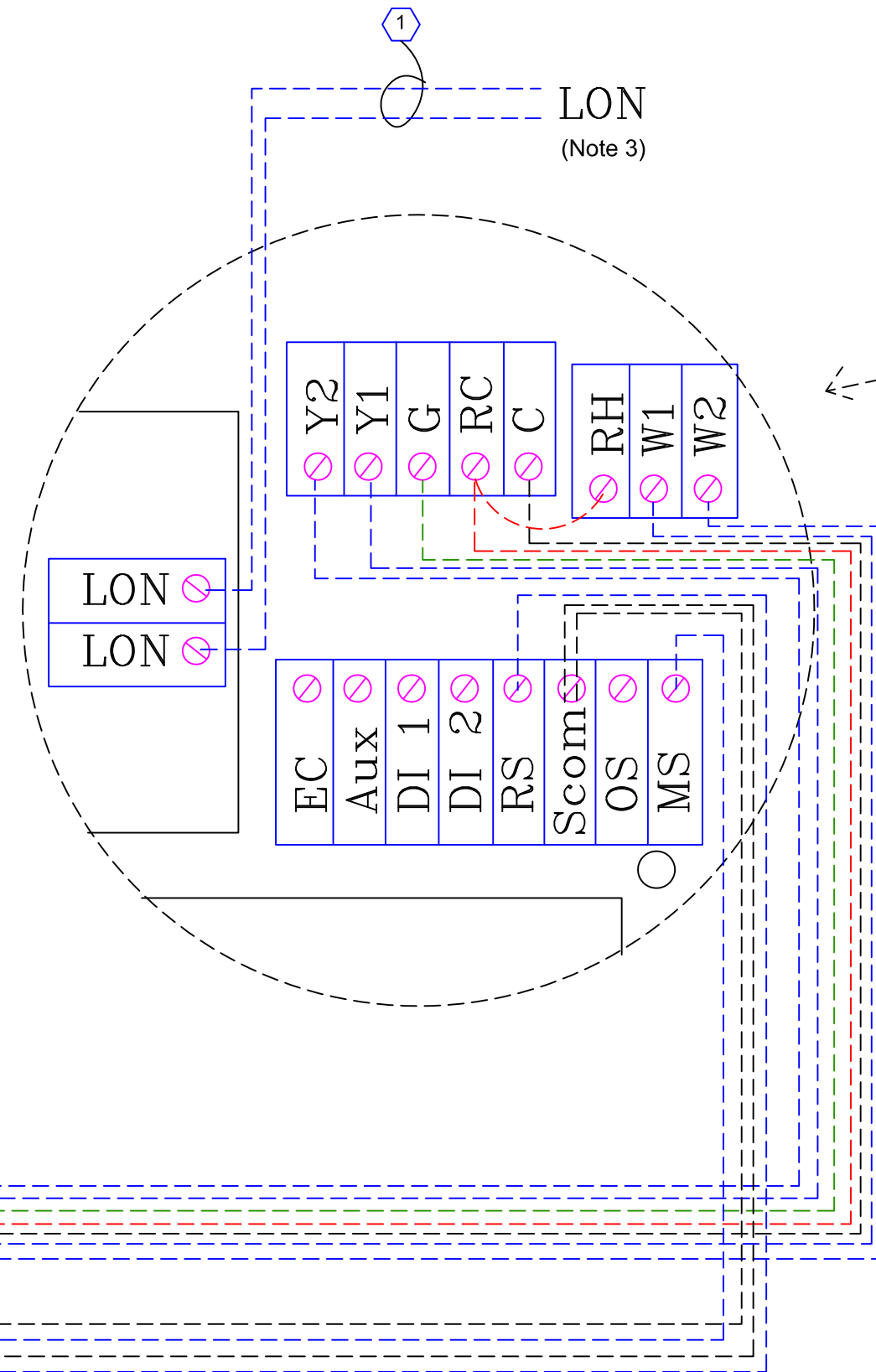
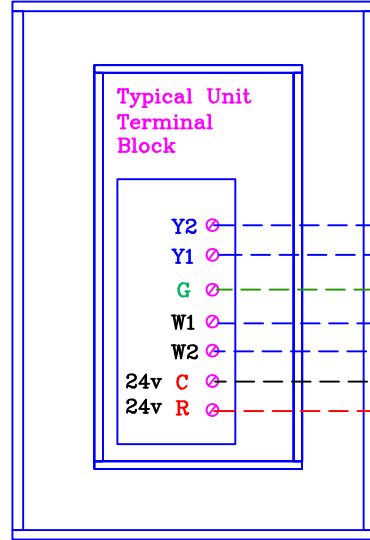


Typical SmartStat Installation

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	SmartStat Roof Top Controller Typical Connections (080Z2180)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (1/100)	FRACTIONAL	DATE	DATE
+-.02		9/3/2008	9/3/2008
DECIMAL (1/100)	ANGULAR	DRAWING NO. K6	
+-.005		SHEET 1 OF 1	
DIMENSIONS IN INCHES		SCALE nts	

Typical SmartStat RTU Controller Installation (080Z2181)

ROOF TOP UNIT



P/N: 080Z2181
(2 CL, 2 HT)

Installation:

- Remove security screw on the bottom of thermostat cover.
 - Open up by pulling on the bottom side of thermostat.
- A) Location:
1. Should not be installed on an outside wall.
 2. Must be installed away from heat source.
 3. Should not be installed near an air discharge grill.
 4. Should not be affected by direct sun radiation.
 5. Nothing must restrain vertical air circulation to the thermostat.

Wiring

- Note 1: If the same power source is used for the heating stages, install jumper across RC & RH, Maximum current is 2.0 amps.
- Note 2: The transformer of the unit provides power to the thermostat and the additional loads that will be wired to the thermostat.
- Note 3: TP-78 to FTT-10 bridge is required. (P/N: 084B2252)

NOTES:

1. ALL WORK MUST BE PERFORMED TO MEET N.E.C. OR LOCAL CODES.
2. Contractor to run communication cables to Controller and terminate as shown.

② = refer to Appendix-A for Cable Specification

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON	TITLE		
PROJECT NUMBER	SmartStat Roof Top Controller Typical Connections (080Z2181)		
TOLERANCES (EXCEPT AS NOTED)			
DECIMAL (1/10)	FRACTIONAL	DATE	DATE
+/- .02		10/23/2009	10/23/2009
DECIMAL (1/10)	ANGULAR		
+/- .005			
DIMENSIONS IN INCHES			
SCALE	DRAWING NO.	DATE	SHEET
nts	K7	10/23/2009	1 OF 1

Cable Specifications & Symbol Key

CABLE SPECIFICATIONS


- ① LON I/O COMMUNICATIONS BUS: 2c-#22, twisted pair, stranded.
(For total wire lengths under 200 feet use: Belden 8761 or equivalent.)
(For total wire lengths over 200 feet use: Windy City 10550-S, General Wire 030-21851, or BICCGeneral C8641)
Note: For other approved Lon wire types refer to document 005-0023-O1M.pdf (Junction Box & Wire Guide), available at www.echelon.com
- ② RS-485 HOST NETWORK: 2c-#18, twisted pair, stranded, shielded (Belden 8760)
- ③ Sensor Cable: 2c-#18, twisted pair, stranded, shielded. (Belden 8760)
Sensor Cable: 2c-#22, twisted pair, stranded, shielded. (Belden 8761)
Plenum rated Sensor Cable: 2c-#18, twisted pair, stranded, shielded. (Belden 88760)
Plenum rated Sensor Cable: 2c-#22, twisted pair, stranded, shielded. (Belden 88761)
- ④ MISC SENSORS: 6c-20GA stranded, shielded. (Carol C0783)
- ⑤ CAT-5 Cable
- ⑥ OAB-1 & Misc. Sensors: 4c-18GA twisted pair, stranded, sheilded. (Belden 9418, Belden 82418)
- ⑦ CAT-5 "CROSS OVER" Cable

The above referenced cables are Danfoss recommended, equivalents can be used.

CUSTOMER DETERMINES WHO PROVIDES EQUIPMENT AND CABLES

SYMBOL KEY

Ⓚ	DISCHARGE AIR SENSOR	PS	24VDC POWER SUPPLY
DS	DOOR SWITCH	OAB	OFFICE ALARM BOX
DT	DEFROST TERMINATION	PHOTO OD-1	PHOTOCELL/OUTDOOR AIR TEMPERATURE SENSOR
ELR	END OF LINE RESISTOR FOR I/O LOOP OR RS-485 HOST COMM. MOUNT INSIDE CONTROL ENCLOSURE	RTC	ROOFTOP CONTROLLER ENCLOSURE (RCE)
EMHS3-1	TEMPERATURE / HUMIDITY SENSOR	S	REFRIGERATED AIR TEMPERATURE SENSOR, MOUNTED IN CASE/COOLER/FREEZER
M	MECHANICAL ROOM TEMPERATURE SENSOR (ZTP2)	W	HOT WATER TEMPERATURE SENSOR (PT1000)
		ZTP2	ZONE SENSOR, MOUNTED ON SALES FLOOR (ZTP2)

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		DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON		TITLE	
PROJECT	NUMBER	Cable Specifications And Symbol Key	
TOLERANCES (EXCEPT AS NOTED)		DRAWN	DATE
DECIMAL (X2)	FRACTIONAL	RM	R.M.
+-.02		DATE	DATE
DECIMAL (X2)	ANGULAR	10/23/09	10/23/09
+-.005		DRAWING NO. Appendix-A	
SCALE nts		SHEET 1 OF 1	


AKS11 Temperature Sensors Reference Table

ohm	Deg. F
803	-58
807	-56
811	-54
815	-53
819	-51
823	-49
827	-47
831	-45
835	-44
839	-42
843	-40
847	-38
851	-36
855	-35
859	-33
862	-31
866	-29
870	-27
874	-26
878	-24
882	-22
886	-20
890	-18
894	-17
898	-15
902	-13
906	-11
910	-9
914	-8

ohm	Deg. F
918	-6
922	-4
926	-2
929	0
933	1
937	3
941	5
945	7
949	9
953	10
957	12
961	14
965	16
969	18
973	19
977	21
980	23
984	25
988	27
992	28
996	30
1000	32
1004	34
1008	36
1012	37
1016	39
1020	41
1023	43
1027	45

ohm	Deg. F
1031	46
1035	48
1039	50
1043	52
1047	54
1051	55
1055	57
1058	59
1062	61
1066	63
1070	64
1074	66
1078	68
1082	70
1086	72
1090	73
1093	75
1097	77
1101	79
1105	81
1109	82
1113	84
1117	86
1121	88
1124	90
1128	91
1132	93
1136	95

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7941 CORPORATE DRIVE
BALTIMORE, MD.
21236-4925

<small>USED ON</small>	<small>TITLE</small>				
<small>PROJECT</small>	<small>NUMBER</small>	AKS11 Temperature Sensors Reference Table			
<small>TOLERANCES (EXCEPT AS NOTED)</small>		<small>DRAWN</small>	<small>CHKD</small>	<small>APPD</small>	<small>RELEASE</small>
<small>DECIMAL (X2)</small>	<small>FRACTIONAL</small>	<small>RM</small>	<small>R.M.</small>	—	
<small>+-.02</small>	<small>ANGULAR</small>	<small>DATE</small>	<small>DATE</small>		
<small>+-.005</small>	<small>DIMENSIONS IN INCHES</small>	6/23/08	6/23/08		
<small>SCALE</small>	<small>nts</small>	<small>DRAWING NO.</small>		<small>SHEET</small>	
		Appendix-B		1 OF 1	


AKS32 Pressure Transducers Reference Table

PSI Range		Output
200	500	Eo(V)
0.0	0.0	1.00
2.0	5.0	1.04
4.0	10.0	1.08
6.0	15.0	1.12
8.0	20.0	1.16
10.0	25.0	1.20
12.0	30.0	1.24
14.0	35.0	1.28
16.0	40.0	1.32
18.0	45.0	1.36
20.0	50.0	1.40
22.0	55.0	1.44
24.0	60.0	1.48
26.0	65.0	1.52
28.0	70.0	1.56
30.0	75.0	1.60
32.0	80.0	1.64
34.0	85.0	1.68
36.0	90.0	1.72
38.0	95.0	1.76
40.0	100.0	1.80
42.0	105.0	1.84
44.0	110.0	1.88
46.0	115.0	1.92
48.0	120.0	1.96
50.0	125.0	2.00
52.0	130.0	2.04
54.0	135.0	2.08
56.0	140.0	2.12
58.0	145.0	2.16
60.0	150.0	2.20

PSI Range		Output
200	500	Eo(V)
62.0	155.0	2.24
64.0	160.0	2.28
66.0	165.0	2.32
68.0	170.0	2.36
70.0	175.0	2.40
72.0	180.0	2.44
74.0	185.0	2.48
76.0	190.0	2.52
78.0	195.0	2.56
80.0	200.0	2.60
82.0	205.0	2.64
84.0	210.0	2.68
86.0	215.0	2.72
88.0	220.0	2.76
90.0	225.0	2.80
92.0	230.0	2.84
94.0	235.0	2.88
96.0	240.0	2.92
98.0	245.0	2.96
100.0	250.0	3.00
102.0	255.0	3.04
104.0	260.0	3.08
106.0	265.0	3.12
108.0	270.0	3.16
110.0	275.0	3.20
112.0	280.0	3.24
114.0	285.0	3.28
116.0	290.0	3.32
118.0	295.0	3.36
120.0	300.0	3.40
122.0	305.0	3.44

PSI Range		Output
200	500	Eo(V)
124.0	310.0	3.48
126.0	315.0	3.52
128.0	320.0	3.56
130.0	325.0	3.60
132.0	330.0	3.64
134.0	335.0	3.68
136.0	340.0	3.72
138.0	345.0	3.76
140.0	350.0	3.80
142.0	355.0	3.84
144.0	360.0	3.88
146.0	365.0	3.92
148.0	370.0	3.96
150.0	375.0	4.00
152.0	380.0	4.04
154.0	385.0	4.08
156.0	390.0	4.12
158.0	395.0	4.16
160.0	400.0	4.20
162.0	405.0	4.24
164.0	410.0	4.32
166.0	415.0	4.36
168.0	420.0	4.40
170.0	425.0	4.44
172.0	430.0	4.48
174.0	435.0	4.52
176.0	440.0	4.56
178.0	445.0	4.60
180.0	450.0	4.64
182.0	455.0	4.68
184.0	460.0	4.72

PSI Range		Output
200	500	Eo(V)
186.0	465.0	4.72
188.0	470.0	4.76
190.0	475.0	4.80
192.0	480.0	4.84
194.0	485.0	4.88
196.0	490.0	4.92
198.0	495.0	4.96
200.0	500.0	5.00

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						DANFOSS INCORPORATED 7941 CORPORATE DRIVE BALTIMORE, MD. 21236-4925	
USED ON		TITLE					
PROJECT	NUMBER	AKS32 Pressure Transducers Reference Table					
TOLERANCES (EXCEPT AS NOTED)		DRAWN	QW'D	APP'D	RELEASE		
DECIMAL (X2)	FRACTIONAL	RM	DATE	R.M.	DATE		
+-.02							
DECIMAL (X10)	ANGULAR		6/23/08		6/23/08		
+-.005							
DIMENSIONS IN INCHES		DRAWING NO. Appendix-C				SHEET 1 OF 1	
SCALE	nts						