MiniLink PD 5 Technical Guide

AAON® www.aaon.com

★★★ Orion Control Systems

MINILINK PD 5
AAON P/N:
ASM01626

LOCAL

T
SH
R

LOCAL LOOP WIRE TERMINALS

NETWORK LOOP WIRE TERMINALS

R
SH
T

NETWORK

LOCAL LOOP COMM CONNECTOR

NETWORK LOOP COMM CONNECTORS

ADDRESS DIP SWITCH

1
2
4
8
16
32
NET LOOP
ON FOR HI SPD

Label P/N:
G040250

24 VAC POWER ONLY
WARNING! POLARITY MUST BE OBSERVED OR THE BOARD WILL BE DAMAGED

GND
+24 VAC

MINILINK PD 5	
PART DESCRIPTION	**AAON P/N**
MiniLink PD 5	ASM01626
AAON Unit Controllers	Varies
Pressure Dependent VAV/Zone BACnet® Controller	ASM02426
Pressure Independent VAV/Zone BACnet® Controller	ASM02427
Power/Comm Board	ASM02224
VAV/Zone Power/Comm Modular Adapter	ASM02188
For Previous Generation VAV/Zone Controllers w/ Power/Comm Connections	Contact Factory

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This manual is also available for download from our website—www.aaon.com/communicationdevices— where you can always find the latest literature updates.

Overview & Features

Overview

The MiniLink PD 5 is an RS-485 communications device that is used to integrate multiple local RS-485 communication loops into an RS-485 network communications system. See **Figure 1**, **page 5** for dimensions.

The MiniLink PD 5 is required on the Orion Control system to separate local loops. Up to 60 MiniLink loops can be on a system.

Local loop terminals of the MiniLink PD 5 are designed to connect to controllers that are daisy-chained together on its RS-485 local communications loop.

Network RS-485 loop terminals on the MiniLink PD 5 are used to daisy-chain multiple MiniLinks back to a CommLink 5 to form a network communications loop. This provides for a fully networked RS-485 communications system.

The MiniLink PD 5 is required for VAV systems to allow information to be shared between the HVAC Unit Controller and the VAV/Zone BACnet® Controllers (VAVZB). It is also required for zoning systems to facilitate voting of the zones to determine the HVAC units heating and cooling mode of operation. It also provides tenant-logging capabilities.

Features

The MiniLink PD 5 utilizes token passing communication architecture. The MiniLink PD 5 is designed to serve as the local communications loop master. This means that it is responsible for sending the token to all the controllers on the local communications loop.

Network communications are RS-485 type operating at 19,200 or 115,200 baud. Local communications are also RS-485 type and operate at 9600 or 57,600 baud. See **Figure 2, page 6.**
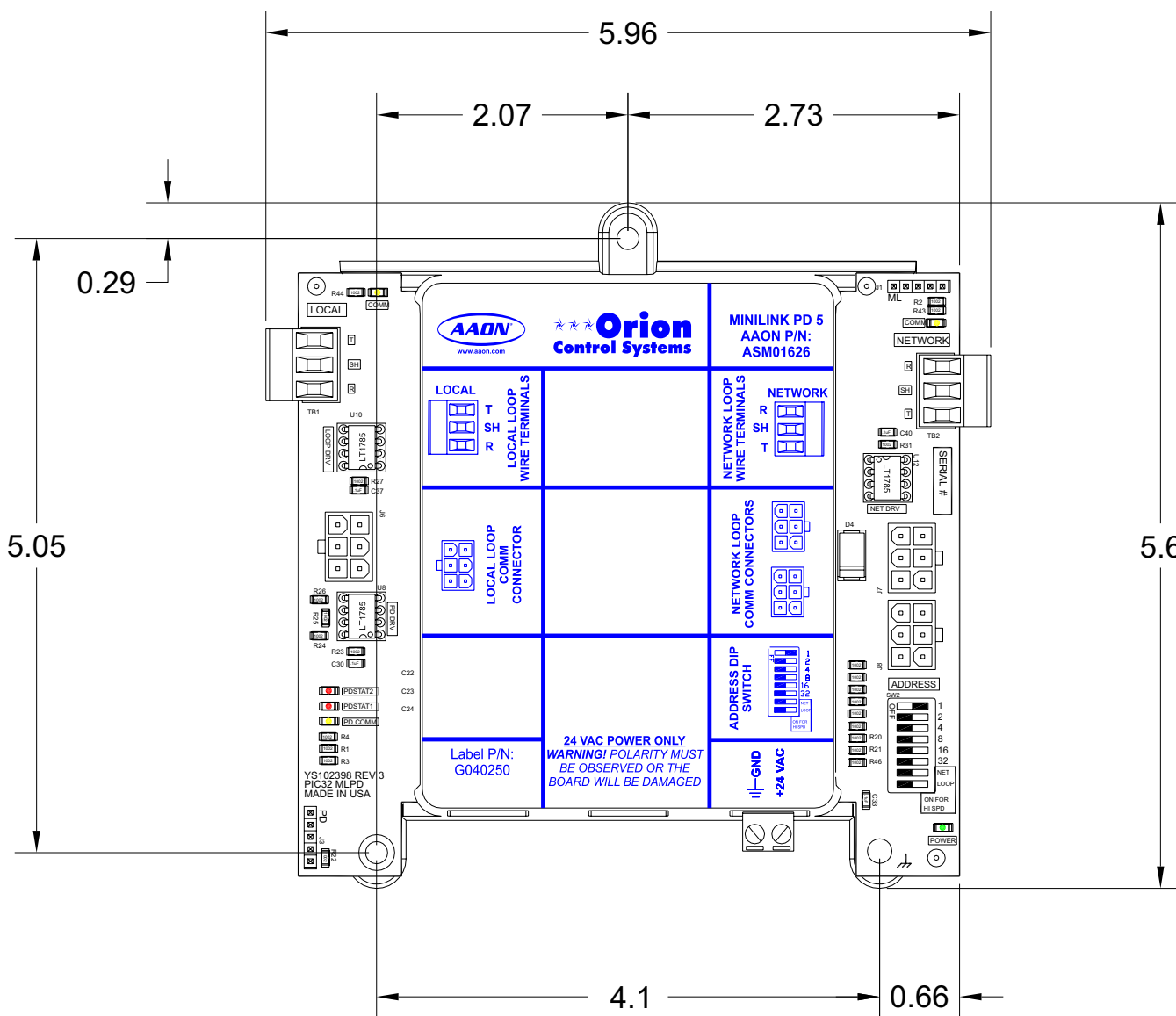
The MiniLink PD 5 is factory default set to low speed. The baud rate is set with dipswitches 7 & 8. See **Figure 3**, **page 7**.

Environmental Requirements

The MiniLink PD 5 needs to be installed in an environment that can maintain a temperature range between -30°F and 150°F and a humidity range between 0% and 95% RH (non-condensing).

Mounting

The MiniLink PD 5 is housed in a plastic enclosure. It is designed to be mounted by using the 3 mounting holes in the enclosure base. It is important to mount the device in a location that is free from extreme high or low temperatures, moisture, dust, and dirt. Be careful not to damage the electronic components when mounting the MiniLink PD 5. The printed circuit board plastic cover has a UL94V0 flame rating.

Figure 1: MiniLink PD 5 Dimensions

Address Dipswitch Setting

Address Dipswitch Setting

MINILINK PD 5

NOTE: The Power To The MiniLink Must Be Removed And Reconnected After Changing The Address Switch Settings In Order For Any Changes To Take Effect.

Address 1
ADD ⟶

	1
	2
	4
	8
	16
	32
	NET
	LOOP

Address 13
ADD ⟶

	1
	2
	4
	8
	16
	32
	NET
	LOOP

Controller
Address Switch

Address Switch Shown Is
Set For Address 1

Address Switch Shown Is
Set For Address 13

The Address For Each MLPD5
Must Be Unique To The Other MLPD5s
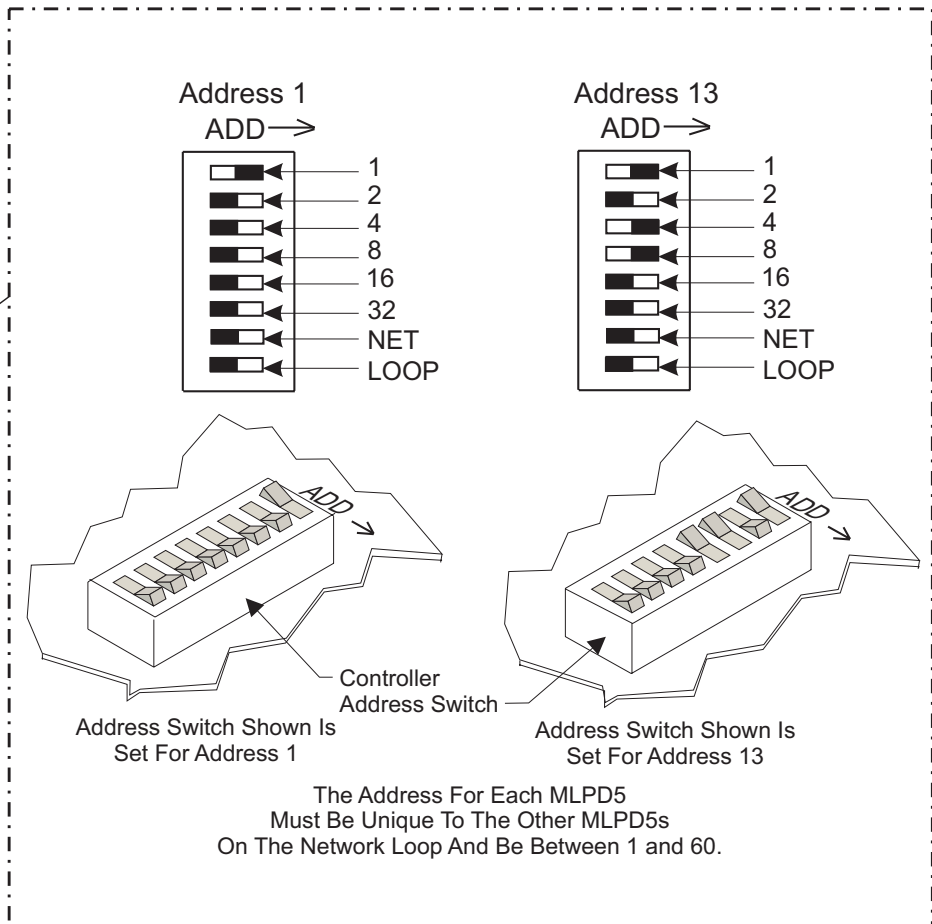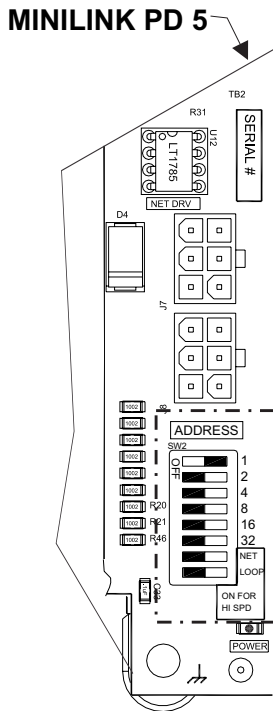On The Network Loop And Be Between 1 and 60.

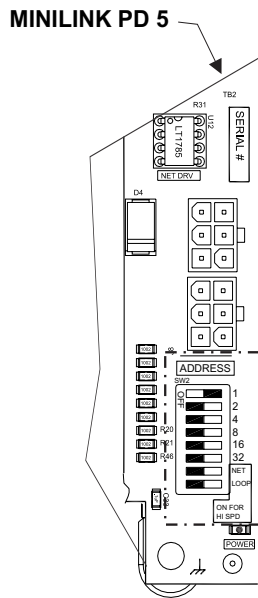**Figure 2: Address Dipswitch Setting**

Network Loop & Local Loop Baud Rate Settings

Network Loop & Local Loop Baud Rate Settings

NOTE: The MiniLink PD 5 Is Factory Set to Low Speed.

NOTE: The Power To The MiniLink Must Be Removed And Reconnected In Order For A Baud Rate Change To Take Effect.

BAUD	NETWORK LOOP SWITCH 7	SPEED
115,200	ON	HIGH*
19,200	OFF	LOW**
BAUD	LOCAL LOOP SWITCH 8	SPEED
57,600	ON	HIGH***
9600	OFF	LOW****

MINILINK PD 5

* The Network Loop (Switch 7) must be set to High Speed if it is connected to a loop that includes a CommLink 5 set to High Speed.

**The Network Loop (Switch 7) must be set to Low Speed if it is being used on a system that includes a CommLink 5 set to Low Speed.

*** The Local Loop (Switch 8) must be set to High Speed if it is connected to a loop that ONLY includes VCB-X or VCC-X Controllers and/or any current or future generation controllers set to high speed

****The Local Loop (Switch 8) must be set to Low Speed if it is being used on a system that includes the VCM-X Controller, older generation Orion Controllers, or any current controllers set to low speed.

NET & LOOP Set To Low Speed
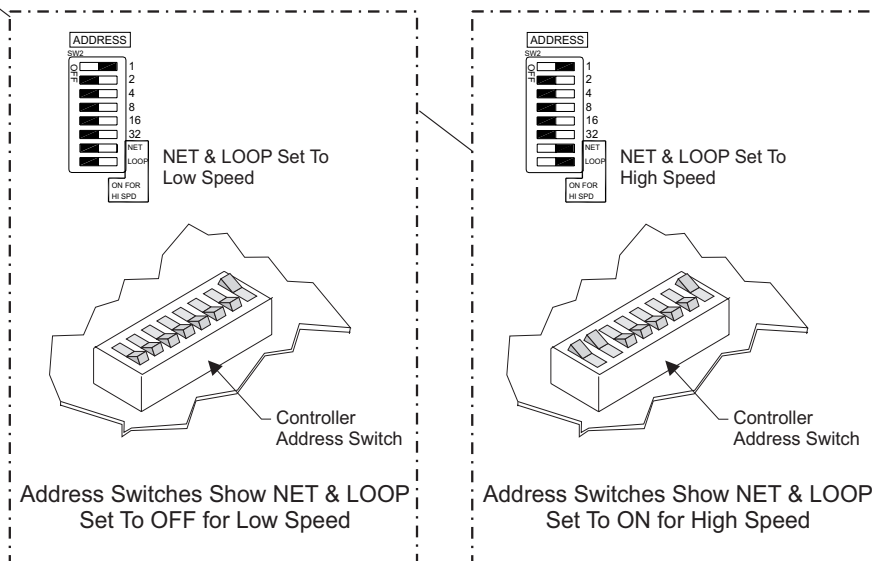
NET & LOOP Set To High Speed

Controller Address Switch

Controller Address Switch

Address Switches Show NET & LOOP Set To OFF for Low Speed

Address Switches Show NET & LOOP Set To ON for High Speed

Figure 3: Baud Rate Setting

MiniLink PD 5 Terminal Wiring

CAUTION:
Disconnect All Communication Loop Wiring From The MiniLink Before Removing Power From The Controller. Reconnect Power And Then Reconnect Communication Loop Wiring.

NOTE: All Communication Wiring Must Be Plenum-rated, Minimum 18-gauge, 2-conductor, Twisted Pair With Shield Wire. AAON Can Supply Communication Wire That Meets This Specification And Is Color Coded For The Network Or Local Loop. The Local Loop Wire Is Color Coded With Green Candy Striping And Comes On A 1000 Ft. Spool. The Network Is Color Coded With Red Candy Striping And Comes On A 500 Ft. Spool. If Desired, 18-Gauge Minimum Belden #82760 Or Equivalent Communications Wire May Also Be Used For Network Or Local Loop Wiring.

Connect Local Loop Terminals To T, SH & R Local Loop Terminals On First Controller On Local Loop. Be Sure To Wire T To T, SH To SH & R To R.

NOTE: This Network Wiring Is Not Required On Single Loop Systems Without A CommLink. When A CommLink Is Used On Single Loop Systems, Connect Network Loop Wire Terminals To The CommLink.
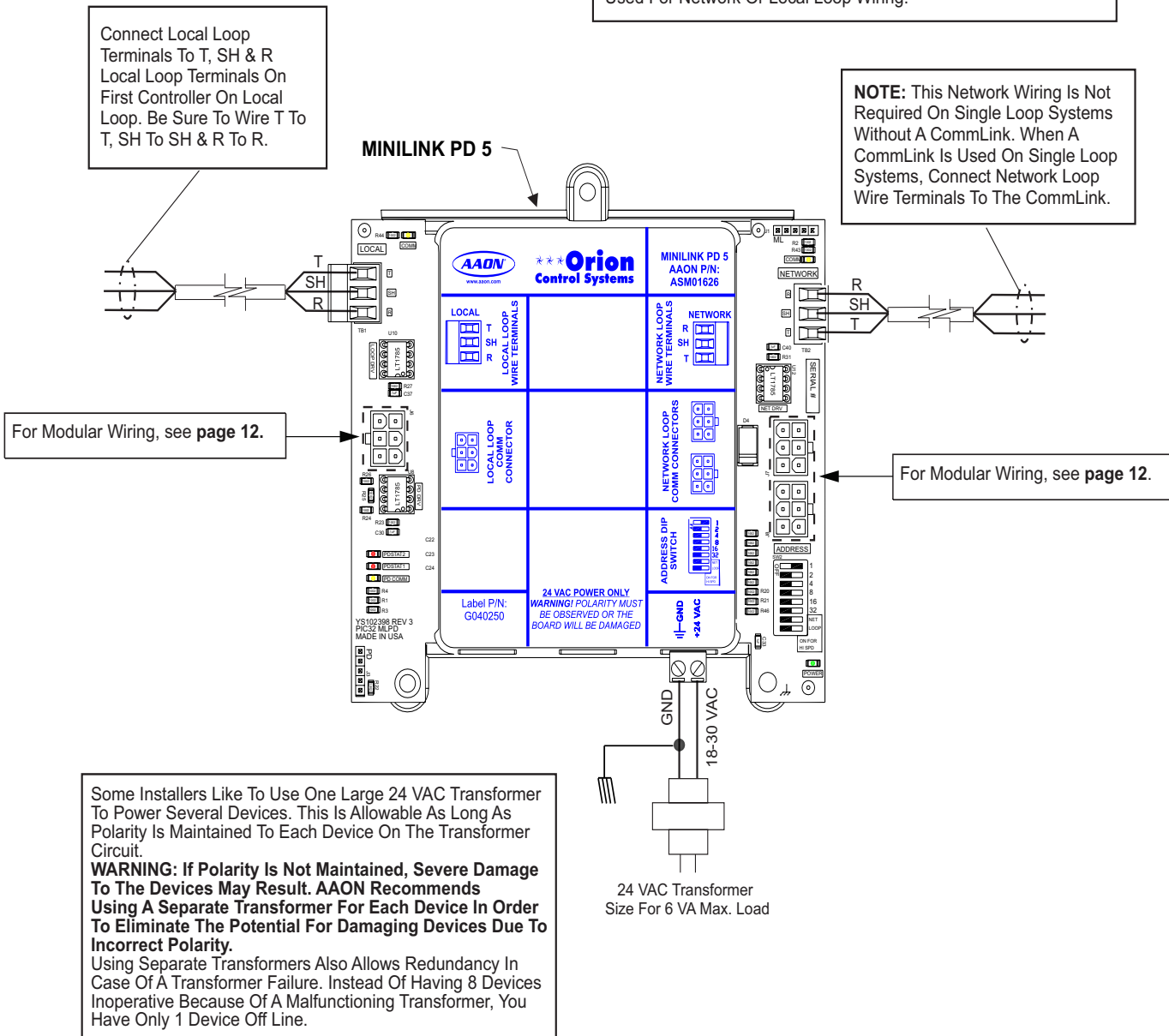
MINILINK PD 5

For Modular Wiring, see **page 12.**

For Modular Wiring, see **page 12**.

Some Installers Like To Use One Large 24 VAC Transformer To Power Several Devices. This Is Allowable As Long As Polarity Is Maintained To Each Device On The Transformer Circuit.
WARNING: If Polarity Is Not Maintained, Severe Damage To The Devices May Result. AAON Recommends Using A Separate Transformer For Each Device In Order To Eliminate The Potential For Damaging Devices Due To Incorrect Polarity.
Using Separate Transformers Also Allows Redundancy In Case Of A Transformer Failure. Instead Of Having 8 Devices Inoperative Because Of A Malfunctioning Transformer, You Have Only 1 Device Off Line.

24 VAC Transformer
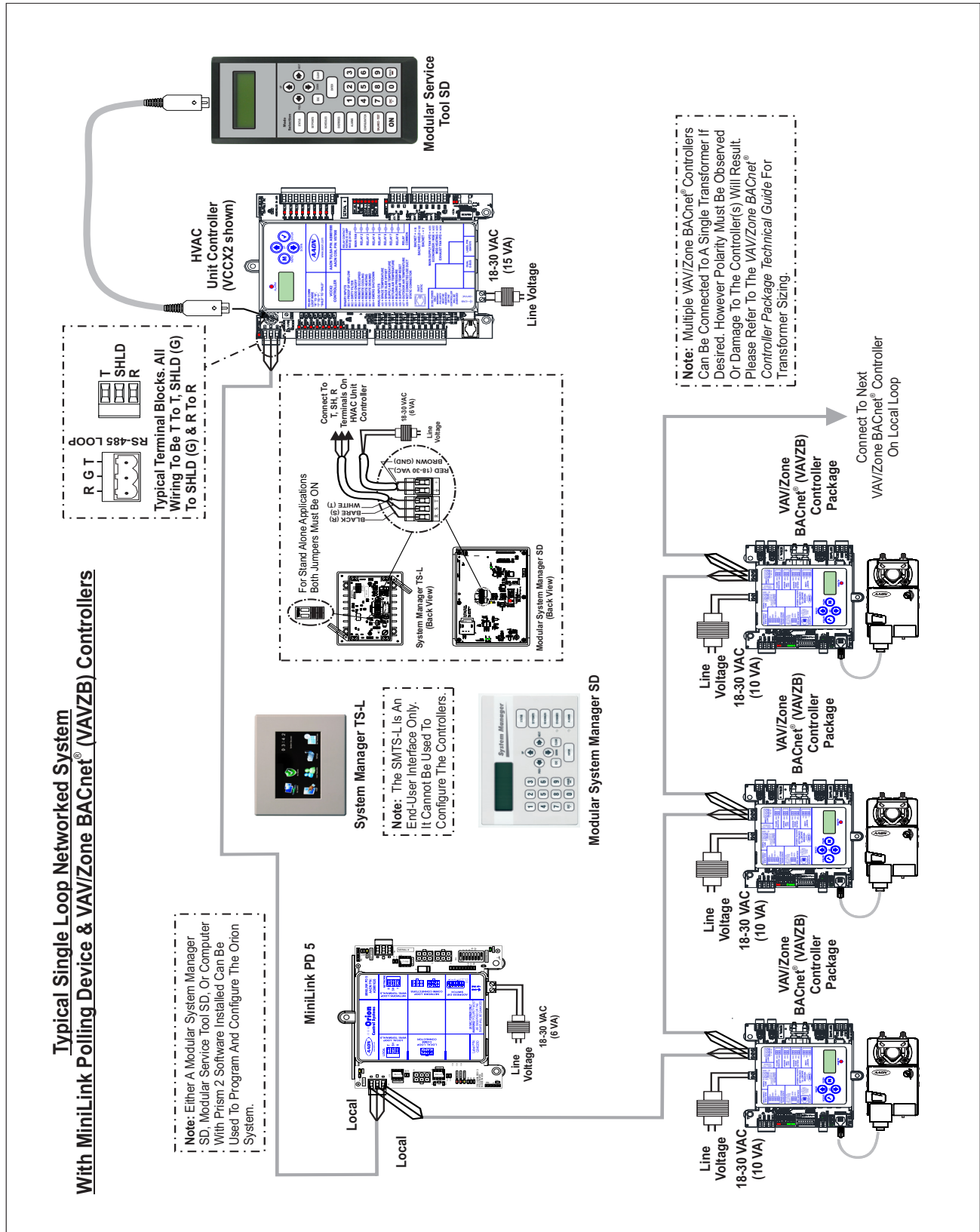Size For 6 VA Max. Load

Figure 4: MiniLink PD 5 Terminal Wiring

Figure 5: MiniLink PD 5 RS-485 Networked Single Loop Wiring

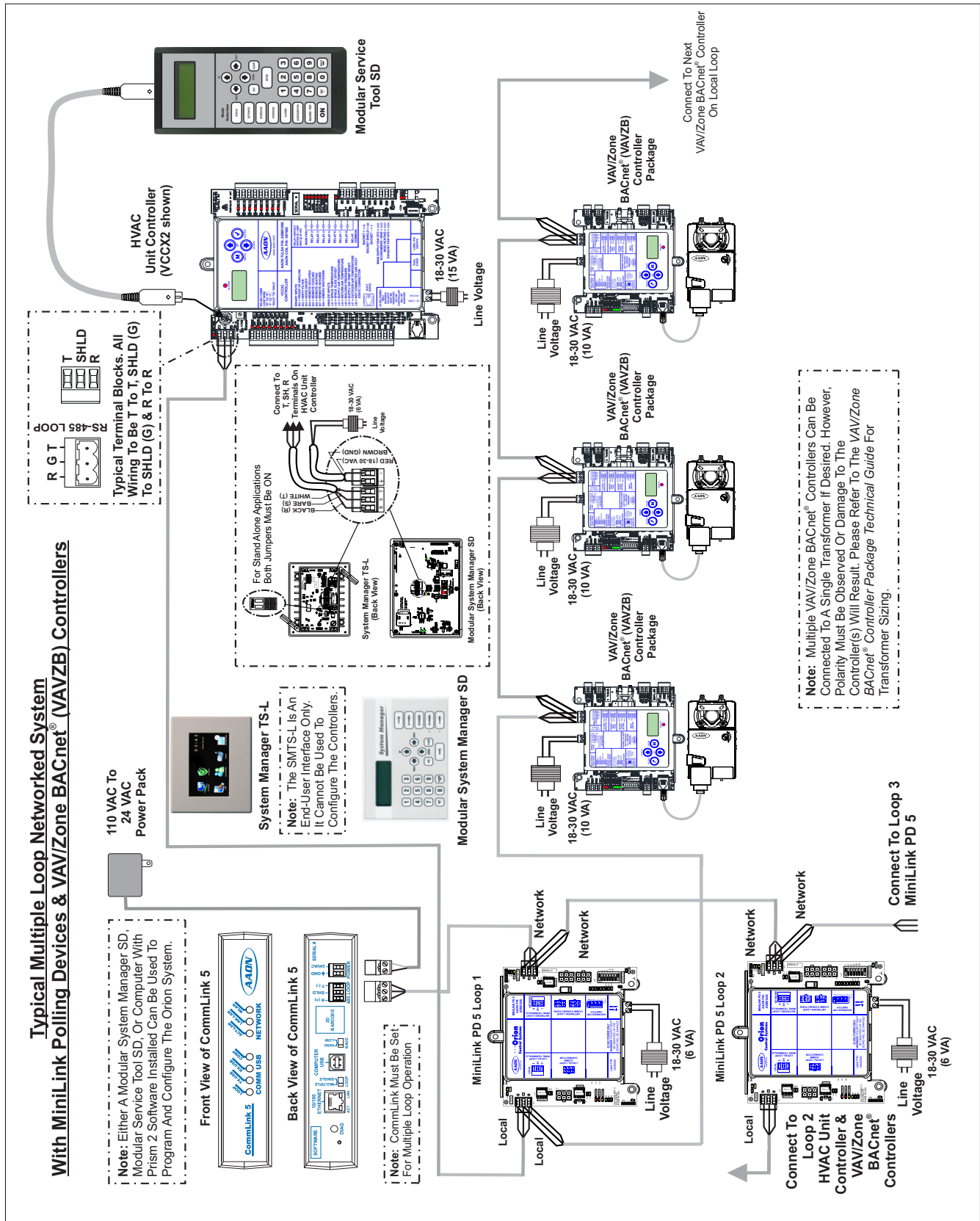## Networked Multiple RS-485 Loop Wiring

Figure 6: MiniLink PD 5 RS-485 Networked Multiple Loop Wiring

NOTE: The MiniLink PD 5 will connect to a Power/Comm Board Only If Power/Comm Cables are Used to Daisy-Chain Between VAV/Zone Controllers.

WARNING!
DO NOT GROUND THE 24V TRANSFORMER THAT IS TO BE USED WITH THE POWER/COMM BOARDS. GROUNDING OF THE TRANSFORMER WILL DAMAGE THE POWER/COMM BOARD AND ALL BOARDS CONNECTED TO IT. A SEPARATE TRANSFORMER MUST BE USED FOR EACH POWER/COMM BOARD. NO EXCEPTIONS. DO NOT CONNECT ANY OTHER DEVICES TO THE TRANSFORMER USED FOR THE POWER/COMM BOARD!

A Power/Comm Cable Can Be Used To Connect With The MiniLink PD 5's Local Loop Connection Instead Of Using 2-Conductor Twisted Pair With Shield Cable. You Can Also Use A Power/Comm Cable To Connect With Another Power/Comm Board, A System Manager Or A VAV/Zone Controller.

If Desired, Instead Of Using A Power/Comm Cable, You Can Use 2-Conductor Twisted Pair With Shield Cable To Connect To The Power/Comm Board From The Unit Controller, MiniLink PD 5's Local Loop Connection, Or Another Power/Comm Board.

NOTE: Diagram Shown Is For Wiring Of Power/Comm Board When Used For Connecting Local Loop Devices Such As VAV/Zone Controllers, System Manager(s), and Other Power/Comm Boards.

Line Voltage

18-30 VAC

24 VAC Transformer (By Others)

4 Amp Slow Blow Fuse

Local Loop RS-485 9600 or 57,600 Baud

All Comm Loop Wiring Is Straight Through

Local Loop RS-485

Power/Comm Cable To Other Power/Comm Board(s), System Manager, Or VAV/Zone Controllers On Local Loop Only.

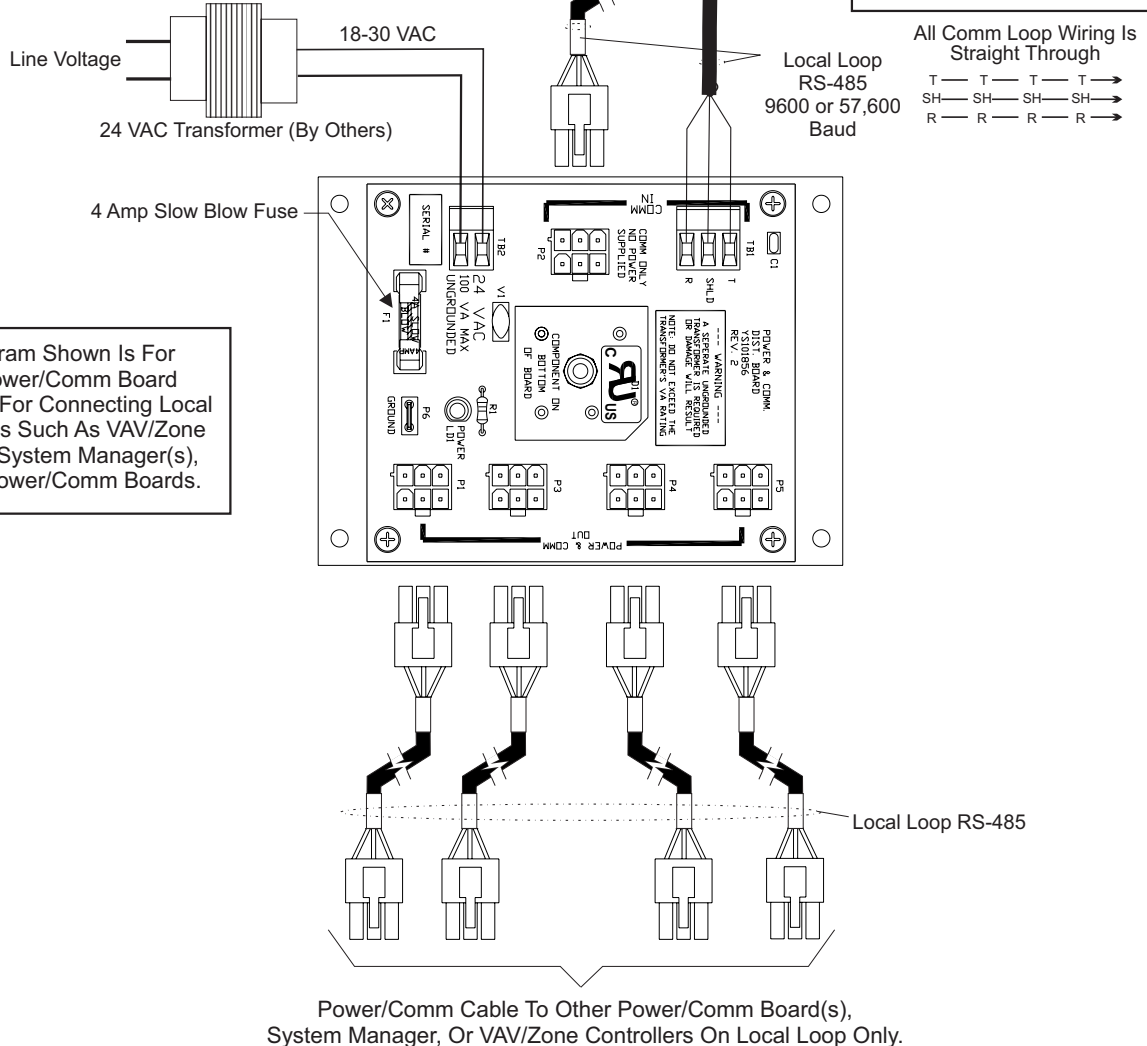**Figure 7: Power/Comm Board Wiring**

MiniLink PD 5 Modular Wiring

CAUTION:
Disconnect All Communication Loop Wiring From The MiniLink Before Removing Power From The Controller. Reconnect Power And Then Reconnect Communication Loop Wiring.
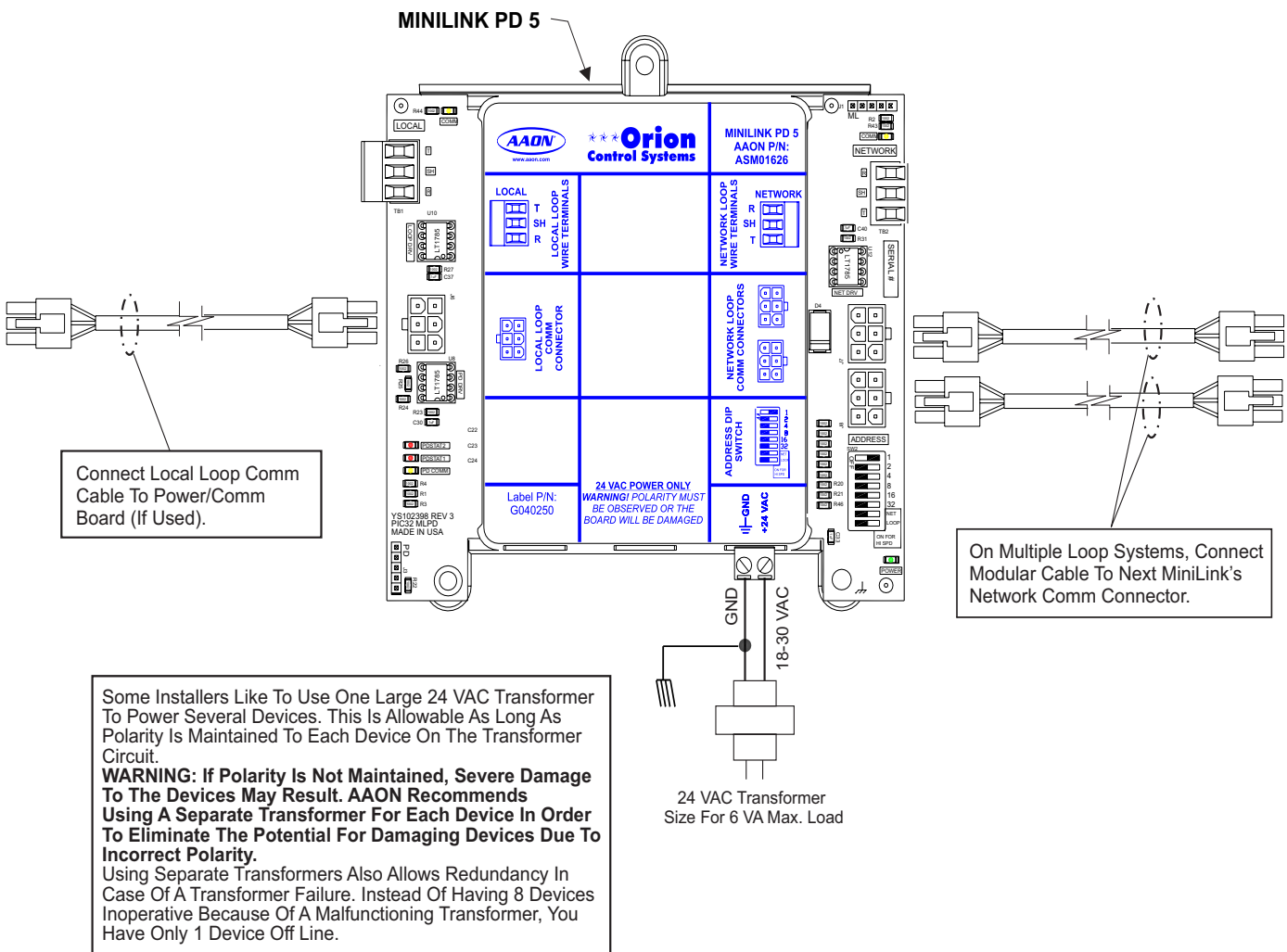
MINILINK PD 5

Connect Local Loop Comm Cable To Power/Comm Board (If Used).

On Multiple Loop Systems, Connect Modular Cable To Next MiniLink's Network Comm Connector.

Some Installers Like To Use One Large 24 VAC Transformer To Power Several Devices. This Is Allowable As Long As Polarity Is Maintained To Each Device On The Transformer Circuit.
WARNING: If Polarity Is Not Maintained, Severe Damage To The Devices May Result. AAON Recommends Using A Separate Transformer For Each Device In Order To Eliminate The Potential For Damaging Devices Due To Incorrect Polarity.
Using Separate Transformers Also Allows Redundancy In Case Of A Transformer Failure. Instead Of Having 8 Devices Inoperative Because Of A Malfunctioning Transformer, You Have Only 1 Device Off Line.

24 VAC Transformer Size For 6 VA Max. Load

Figure 8: MiniLink PD 5 Modular Wiring

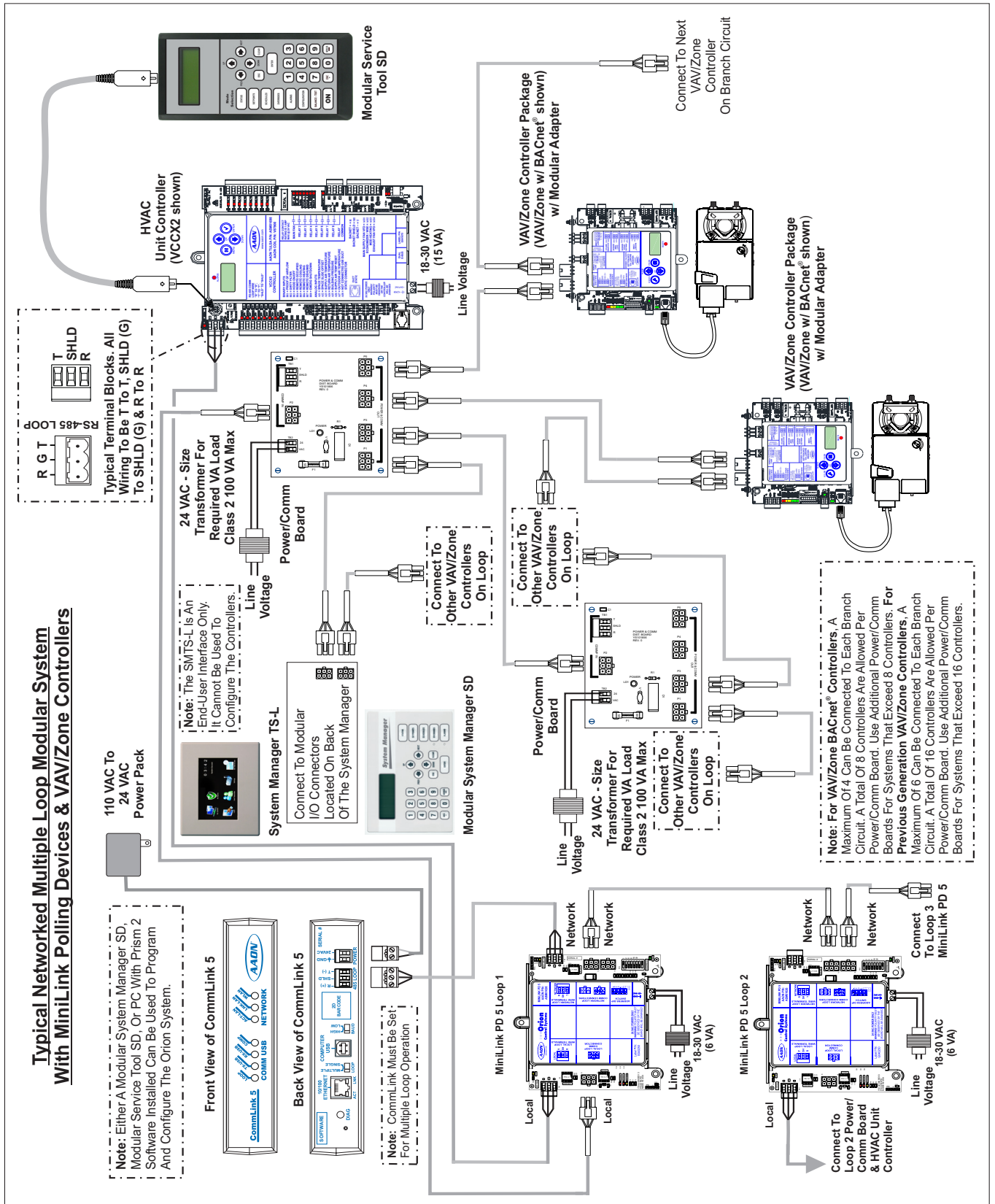## Networked Multiple RS-485 Loop Modular System Wiring

Figure 9: MiniLink PD 5 RS-485 Networked Multiple Loop Modular System Wiring

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AAON Factory Technical Support: 918-382-6450

techsupport@aaon.com

AAON Controls Support: 866-918-1100
Monday through Friday, 7:00 AM to 5:00 PM
Central Standard Time.

NOTE: Before calling Technical Support, please have the model and serial number of the unit available.

PARTS: For replacement parts please contact your local AAON Representative.