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The Lonbox® PZM2114 Users Guide

Zone Controller for LonWorks Installations

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This manual is intended for use with the Lonbox® PZM2114 software version 1.20

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The Lonbox® PZM2114 Users Guide

A Zone Controller for LONWORKS control networks.

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Abstract

This manual provides detailed technical information on the electrical and mechanical interface and operating environment characteristics for the *Prolon Lonbox PZM2114 Zone Controller*.

This document also provides guidelines for installation and management of the node in a LonWorks® network.

Introduction

The Lonbox® PZM2114 Zone Controller, is a building automation device for LonWorks installation. The PZM2114 control sunblind, light systems including outlet and HVAC system with CAV, VAV, cool and heat.

The Lonbox® PZM2114 Zone Controller is mounted in a box with knock-outs for mounting of PG.

The Lonbox® PZM2114 Zone Controller only need 230Vac supply and generate power for connected input sensor and power for connected valves and motors.

The controller box contains connection terminals for each core there are suppose to be connected to the controller, so there won't be any need for loop connections.

Functionality

See software description.

Mounting

Connection

The PZM2114 Zone controller module contains 2 printed circuits, Power board for 230Vac and sunblind connections, and a Control board for all other connections. (See figure 5). In the following each terminal will be described.

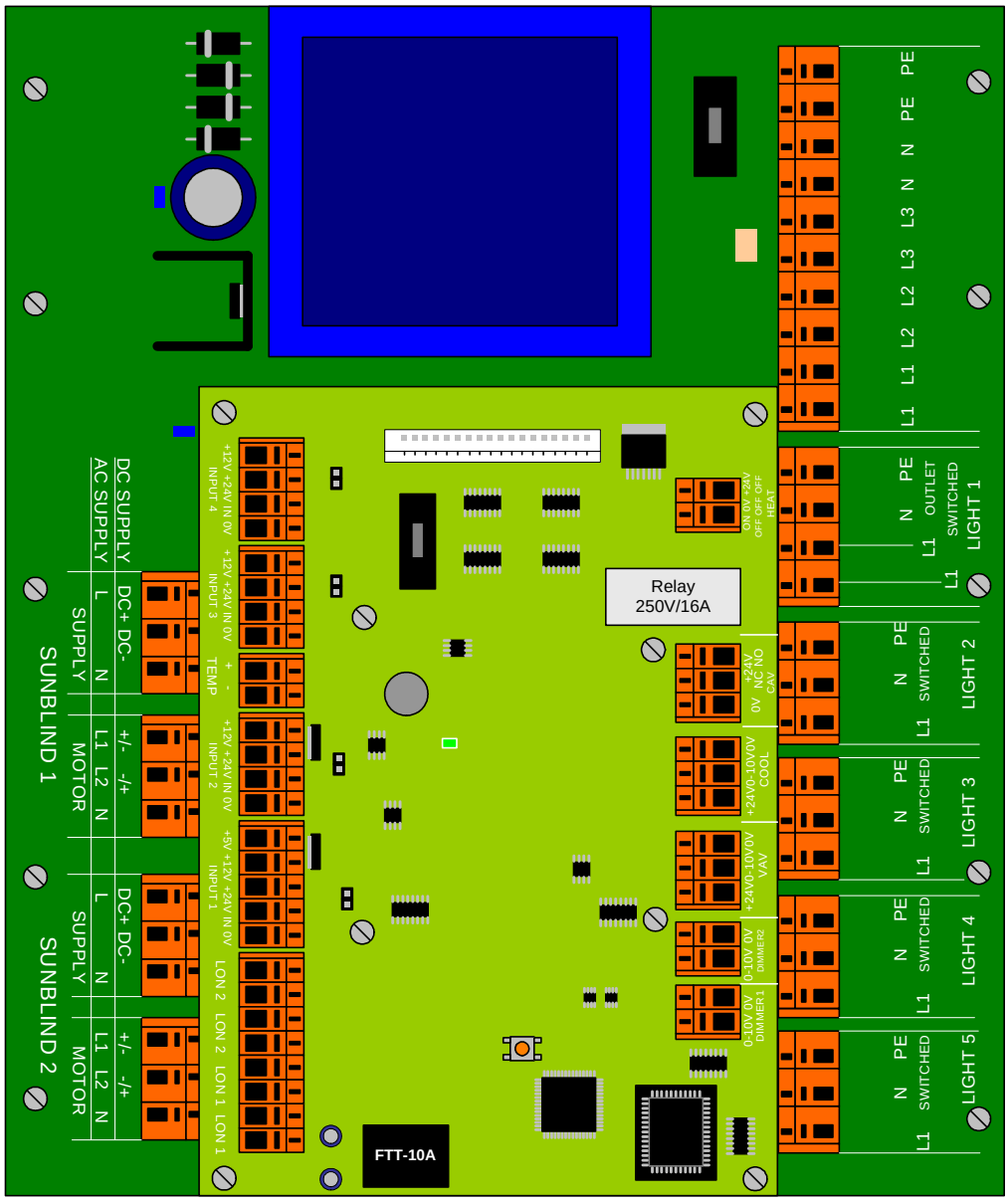

Figure 1 PZM2114 Zone Controller terminals

1: Mains supply terminal.

Connections for 230VAC mains power. Use a standard 3 wires or 5 wire power cable. The unit should always be earthed. There are two connections for each core so the power can be loop through the PZM2114 Zone Controller.

The controller and all light output are powered from the L1 source.

Table 1 Mains supply connections

PE	N	L1, L2, L3
Protection Earth (Yellow/green)	Neutral (Blue)	Phase (Brown or black)

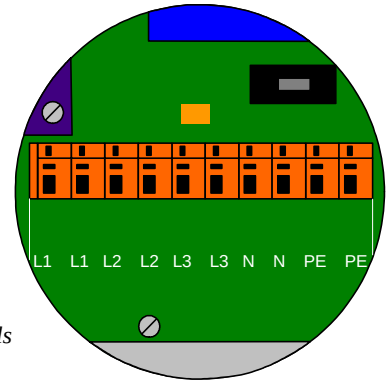

Figure 2 Mains supply terminals

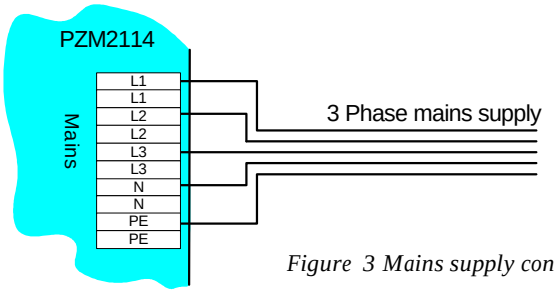

Figure 3 Mains supply connections 3 phases

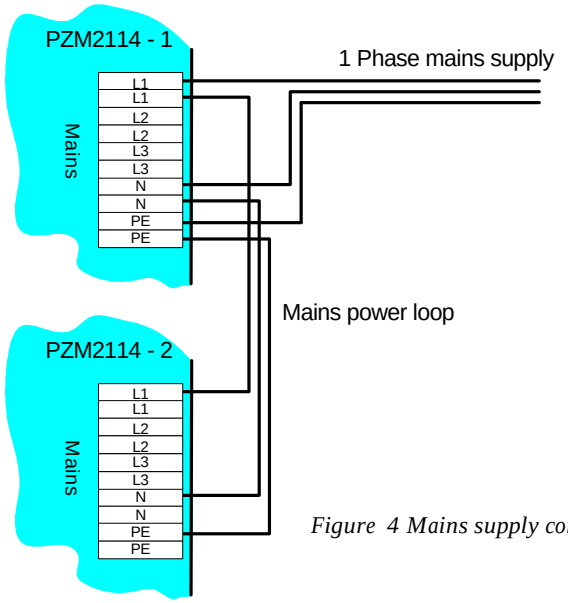

Figure 4 Mains supply connection 1 phase with loop

2: Light 1 to light 5 out terminals.

These terminals are for light connections, and can together with one of the dimmer output also regulate the light (See description below).

Light 5 and Dimmer 1 and Light 4 and Dimmer 2, are as pair, prepared for regulate light.

Terminal Light 1 can be used for outlet, where the L1 outlet is a constant phase and the L1 switched can be use for risky load, like coffee machine.

Table 2 Light output connections

PE	N	L1 Switched	L1 Outlet
Protection Earth (Yellow/green)	Neutral (Blue)	Phase (Brown or black)	Phase (Brown or black)

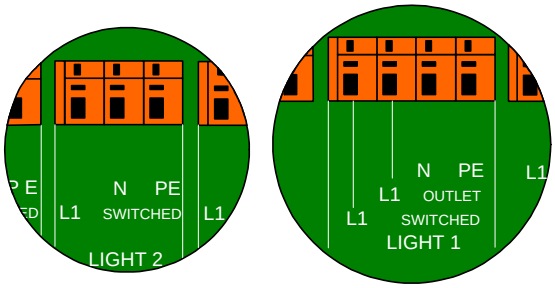

Figure 5 Light output terminals

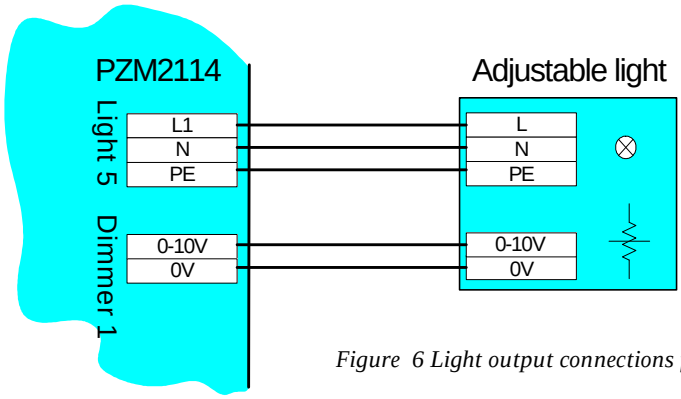

Figure 6 Light output connections for regulated light

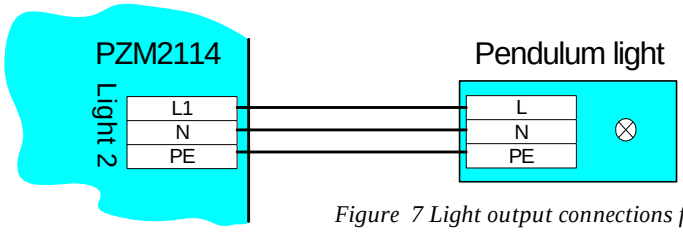

Figure 7 Light output connections for pendulum or similar

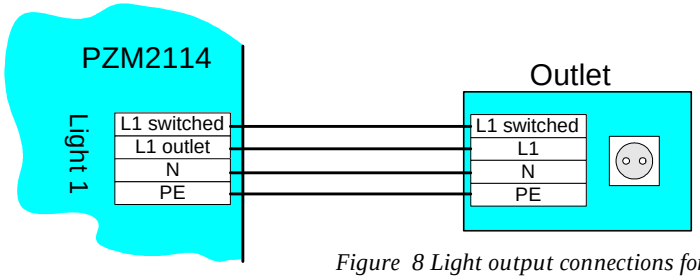

Figure 8 Light output connections for outlet

3: Sunblind.

These terminals are for sunblind use, and can drive a motor. There connector are split one part is for supply and the other for the motor. There can be connected two different kinds of motors, a DC motor where the polarities of the power, control the direction of the motor, or there can be connected an AC or DC motor with a common connector and a connector for each direction.

Table 3 Sunblind supply connections

	Supply		
Polarity controlled motor	DC+	DC-	(Not used)
Direction controlled motor	Phase L	(Not used)	Neutral N

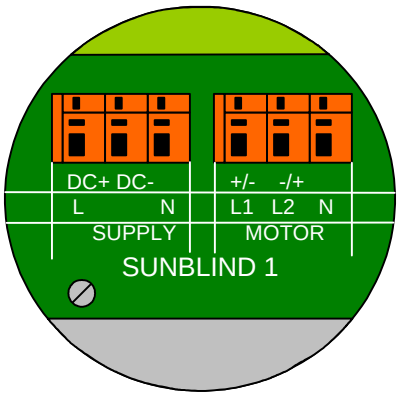

Figure 9 Sunblind terminals

Table 4 Sunblind motor connections

	Motor		
Polarity controlled motor	DC+ or DC-	DC+ or DC-	(Not used)
Direction controlled motor	Phase L1	Phase L2	Neutral N

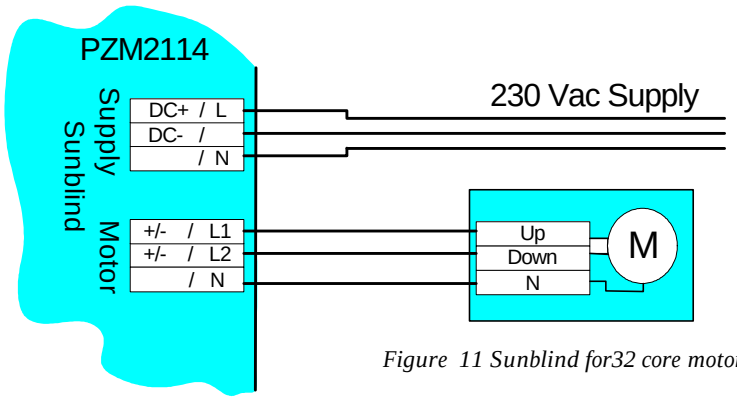

Figure 11 Sunblind for32 core motor connections

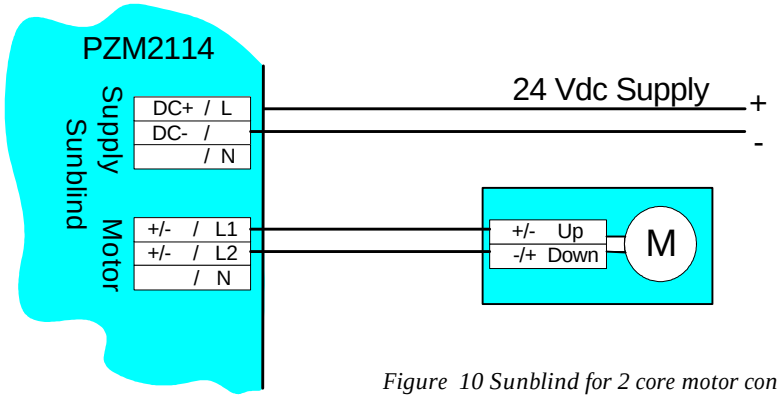

Figure 10 Sunblind for 2 core motor connections

4: Input 1 - 4 terminals.

These terminals are for input sensors and switches. The PZM2114 Zone Controller generate power for the sensors, and can supply +12Vdc or +24Vdc to the sensors, the input 1 also have a +5V supply.

Sensors with analog output or a voltage output are connected to IN, and the jumper behind the connecter must be open.

Sensors with a potential free switch or an open collector output must be connected between IN and 0V, and the jumper behind the connector must be shorted.

If an adjustable resistor are used as sensor, the adjustable pin must be connected to IN and the two other must be connected to +12V and 0V.

Table 5 Input connections

	Jumper	0V	IN	+24V	+12V
Analog input	Dismounted	0V for signal and power.	Analog input	Can be used	Can be used
Switch	Shorted	Switch-A	Switch-B	(Not used)	(Not used)
Open collector	Shorted	0V for power.	Input	Can be used	Can be used
Adjustable resistor	Dismounted	Bottom pin of the resistor	Adjustable pin	(Not used)	Top pin of the resistor

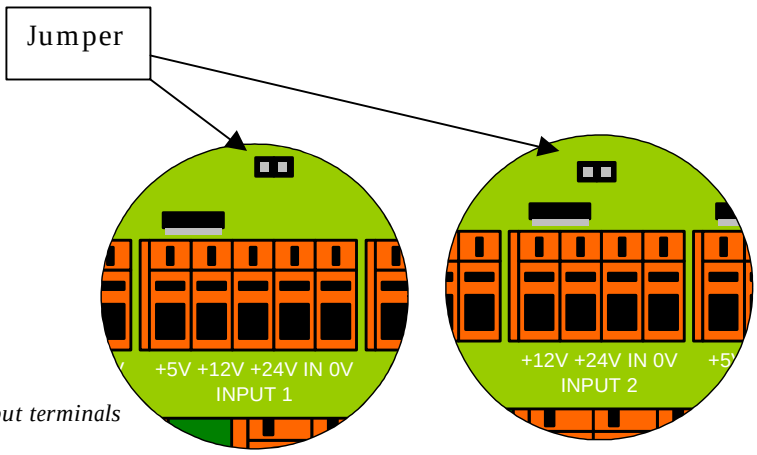

Figure 12 Input terminals

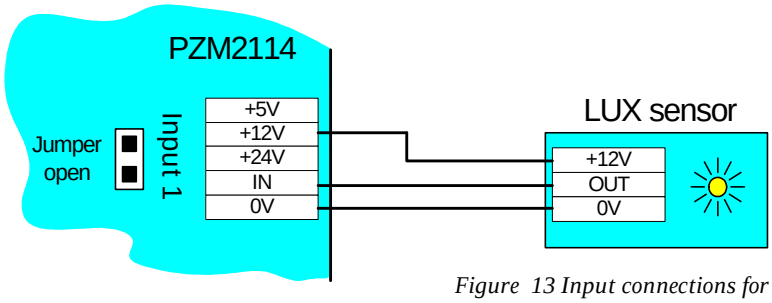

Figure 13 Input connections for LUX sensor

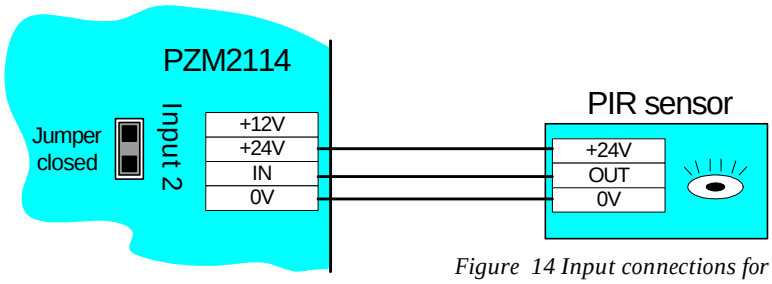

Figure 14 Input connections for PIR sensor

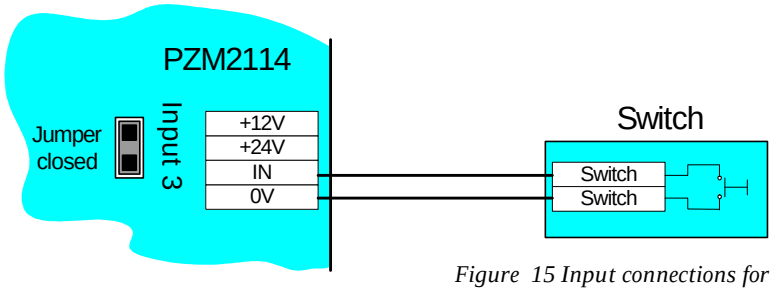

Figure 15 Input connections for switch

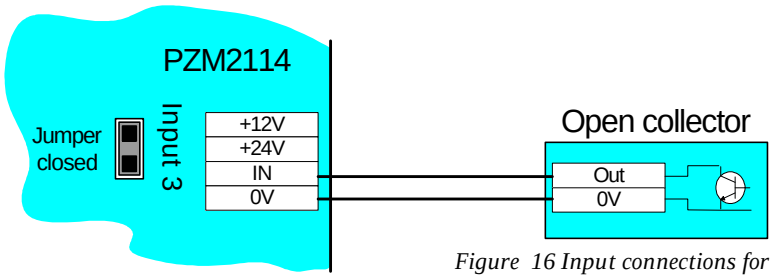

Figure 16 Input connections for open collector

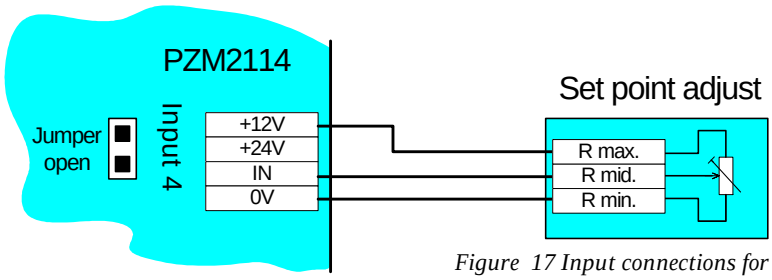

Figure 17 Input connections for set point resistor

5: Temperature terminals.

These terminals are for a simple temperature NTC 1K8 @ 25ºC sensor and can be ordered so it fit to NTC 5K @ 25ºC or PT-1000.

Mount the sensor between the two terminals.

Table 6 Temperature sensor connections

Temp +	Temp -
Temperature sensor +	Temperature sensor -

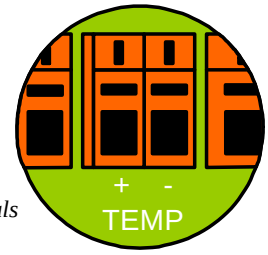

Figure 18 Temperature sensor terminals

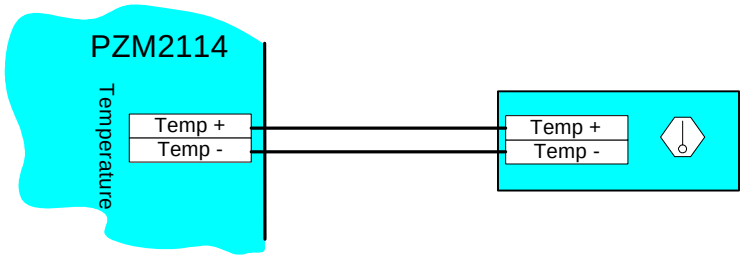

Figure 19 Temperature sensor connections

6: LonWorks communication terminal.

Connection to the LonWorks network using the FTT-10A transceiver.

There are two connections for each core so the LONWORKS net can be loop through the PZM2114 Zone Controller. The PZM2114 Zone controller are connected to the LON1

Table 7 LonWorks connections

LON2		LON2		LON1		LON1	
a	b	a	b	a	b	a	b

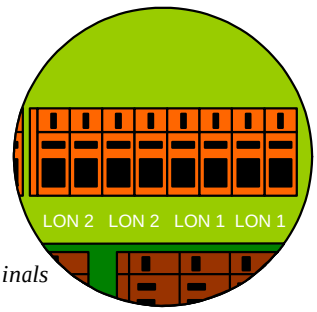

Figure 20 LonWorks terminals

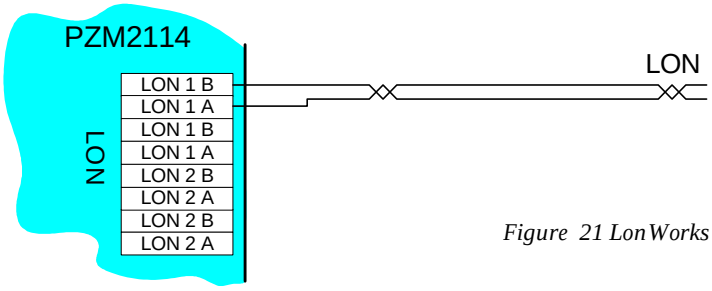

Figure 21 LonWorks connections

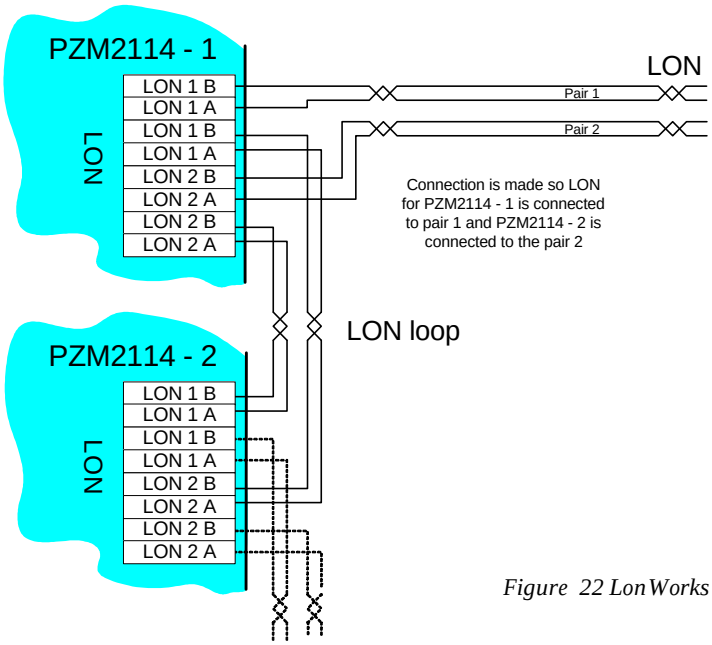

Figure 22 LonWorks connections for two pairs

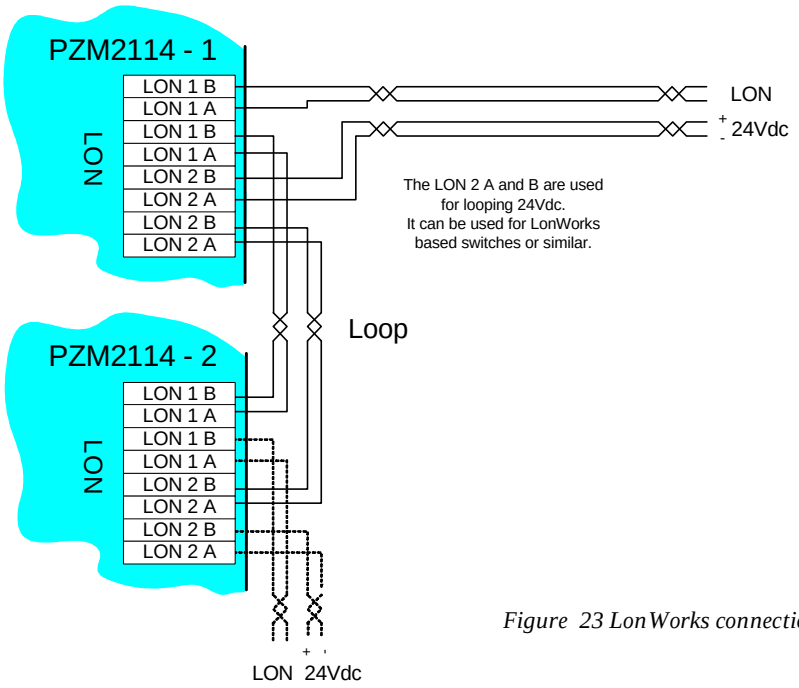

Figure 23 LonWorks connections with looped 24V

7: Dimmer terminals.

These terminals are for light attenuation, and are a 0 to 10 voltage output.

These control output are only a low voltage output and must be isolated from the 230V power in the light module.

For connection see “Figure 6 Light output connections for regulated light”

Table 8 Dimmer connections

0V	0-10V
0V for output	Output

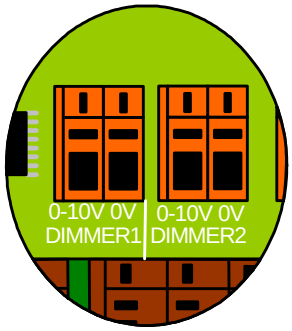

Figure 24 Dimmer terminals

8: VAV and Cool terminals.

These terminals are for the HVAC system and are a 0 to 10 voltage output and +24VDC supply for the valve.

Table 9 VAV and Cool connections

0V	0-10V	+24V
0V for supply and output	Output	Supply

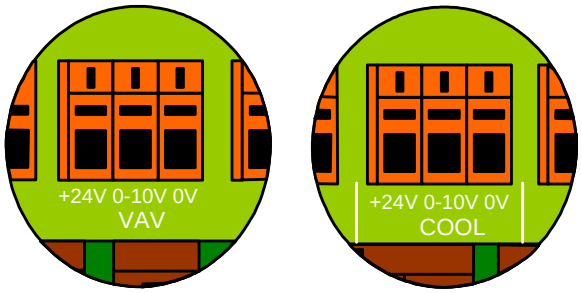

Figure 25 VAV and Cool terminals

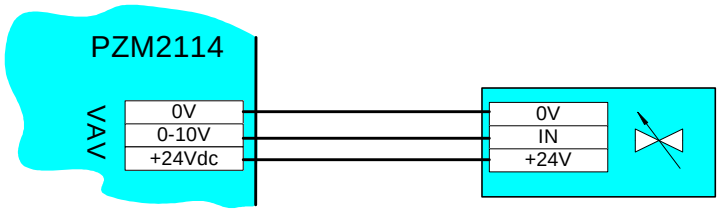

Figure 26 VAV connections

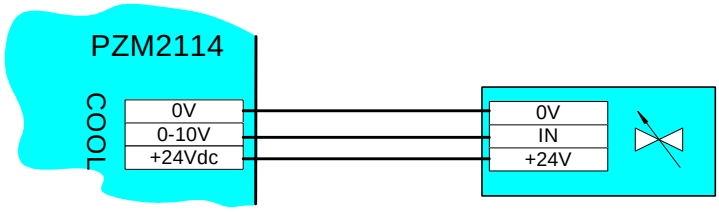

Figure 27 COOL connections

9: CAV terminals.

These terminals are for the HVAC system and are for a three point CAV actuator.

There are always power on one off the connectors, normally is the CAV in standby and there are +24V out on terminal NC, when the CAV are activated there are +24V on the NO connector.

Table 10 CAV connections

0V	NC Normally Connected	NO Normally Open
0V	+24V	+24V

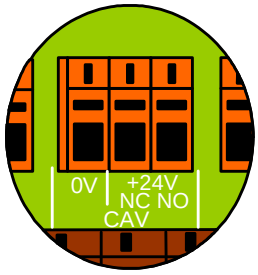

Figure 28 CAV terminals

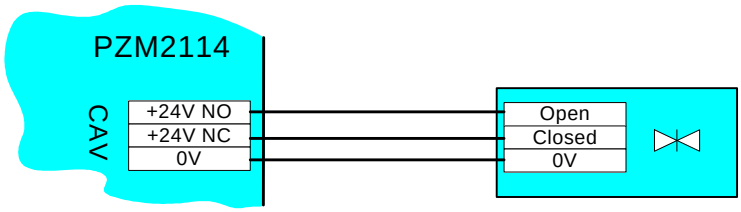

Figure 29 CAV connections

10: Heat terminals.

These terminals are for the HVAC system and are for heating valve.

There are 24V out when the heat is on, when the heat is off the two outputs is three stated (Not connected). It is also possible to use a thermohydraulic motor. Where the pulls-pause time control the flow.

Table 11 Heat connections

	0V	+24V
On	0V	+24V
Off	No connection	No connection

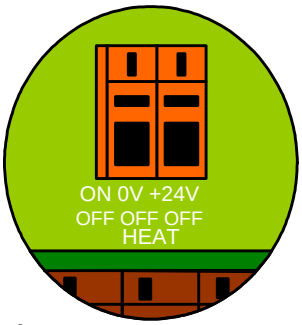

Figure 30 Heat terminals

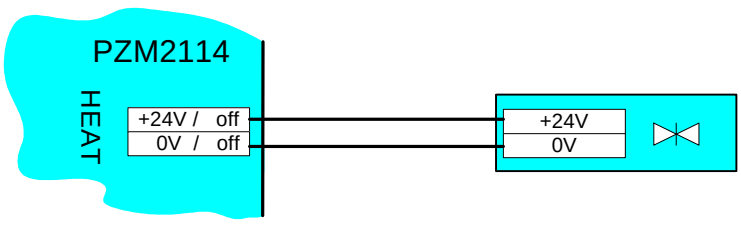

Figure 31 Heat connections

Mechanical

The PZM2114 Zone controller is mount in a Fibox SP2828 box and can be mounted on the wall or ceiling by using the four screw holes in the corner of the box. The front cover has to be removed to access these mounting holes. The box has knockouts for PG.

Network Interface

See software description.

Electrical Specifications

Supply	
Operating voltage	230VAC +10% -15%
Frequency	50 Hz
Operating current for PZM2114	Typical 200 mA
Main fuse for PZM2114	T 200 mA
Total current through phase L1	16A

Control Circuit	
Microprocessor	Neuron® 3150® Chip
Crystal Oscillator Frequency	10 MHz
Memory	128 Kbytes flash in PLCC32 socket

Relay for light Output	
Number	5
Contact	Normally open (Make)
Max switching voltage	250 VAC
Max switching current	16 A
Max switching power	4000 VA AC
Switching voltage	230 VAC
Mechanical life	1 mil.

Relay for Sunblind	
Number	2 (3 relay/sunblind)
Contact	Change over
Max switching voltage	250 VAC
Max switching current	16 A
Max switching power	4000 VA AC
Switching voltage	230 VAC
Mechanical life	1 mil.

Input Data	
Number	4
Input voltage maximum	12V
Over voltage protection	15V
Input impedance	39,8 K ohm

Digital conversion	D = Vin*8,2/39,8*1024/2,5
Voltage / bit	11,85 mV/bit

Temperature Input	
Sensor type	NTC thermistor 1K8 @ 25 °C
Measuring range	-10 to +50 °C
Temperature / bit	0,06 °C /bit
Accuracy	±0,5°C

LONWORKS Communication Port	
Type	Local Operating Network
Communication protocol	LonTalk
Physical channel	Ftt-10A, 78Kbps

Dimmer output	
Number	2
Output voltage	0 – 10 VDC
Over voltage protection	15V
Voltage / bit	9,84 mV/bit
Output current	±30 mA

VAV output	
Number	1
Output voltage	0 – 10 VDC
Over voltage protection	15V
Voltage / bit	9,84 mV/bit
Output current	±30 mA
Supply voltage	24V DC±20%

Cool output	
Number	1
Output voltage	0 – 10 VDC
Over voltage protection	15V
Voltage / bit	9,84 mV/bit
Output current	±30 mA
Supply voltage	24V DC±20%

CAV output	
Number	1
Output voltage	24 VDC±20%
Contact	Change over
Output current	700 mA

Heat output	
Number	1
Output voltage	24 VDC±20%
Output current	700 mA

Indicators			
Power indicator led's	24 V power on, green 12 V power on, green 5 V power on, green		
Service indicator	Yellow LED	Applicationless: Unconfigured: Configured:	On Flashing Off

Mechanical Data	
Terminals	Cage clamp
Housing	Fibox SP2828, 280 * 280 * 130 mm
Mounting	4 screws 254 * 254 mm
Protection Class	IP 65
Screw Terminals	Cage clamp
- Clamping	2.5 mm^2
- Ratings	250 Vac / 16A

EMC	
Immunity	According to EN 50082-2
Emission	According to EN 50081-1

Temperature	
Operating	10 °C to + 45 °C
Storage	-20 °C to + 50 °C
Humidity	45 – 75% non condensing

References

- See software description.