

## Using This Quick Start Manual

Use this Quick Start Manual to set up your CN616A Multi Zone Controller. This guide will cover:

- Required Tools and Equipment
- Wiring the device
- Connecting Inputs and Outputs
- Mounting
- Running the Unit
- Changing the Sensor Type
- Available Functions

For complete information on all setup options see the user manual available at [omega.com/manuals](http://omega.com/manuals).

## SAFETY CONSIDERATION

The instrument is a device protected in accordance with UL 61010:2010 Electrical Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory. The device has no power-on switch. Installations must include a switch or circuit breaker that is compliant to IEC 947-1 and 947-3. It must be suitably located to be easily reached and marked as the disconnecting device for the equipment. Use copper conductors only, minimum 20 AWG, UL Rated, for power connection. Insulation must be rated for at least 85C and 600V.

**CAUTION: Risk of electric shock.**

Do NOT connect AC power to your device until you have completed all input and output connections. This device is a panel mount device protected in accordance with Class I of EN61010 (115/230 AC power connections), Class III for the DC power option (9-36Vdc). It must be installed by a trained electrician with corresponding qualifications. Failure to follow all instructions and warnings may result in injury. This device is not designed for use in, and should not be used for, patient-connected applications.

### SAFETY:

- Do not exceed the voltage rating on the label located on the device housing.
- Always disconnect power before changing signal and power connections.
- Do not use this instrument on a work bench without its case.
- Do not operate this instrument in flammable or explosive atmospheres.
- Do not expose this instrument to rain or moisture.

### EMC:

- Whenever EMC is an issue use shielded cables.
- Never run signal and power wires in the same conduit.
- Use signal wire connections with twisted-pair cables.
- If EMC problems occur Install Ferrite Bead(s) on signal wires close to the instrument.

## Required Tool and Equipment

Before Installing the CN616A make sure you have the following Items:

- Suitable Panel with 92x92mm cutout
- Philips and Flathead Screwdriver
- Appropriate wiring and fuses for your installation
- Sensors (TC, RTD, or Process)

## Wiring the Device

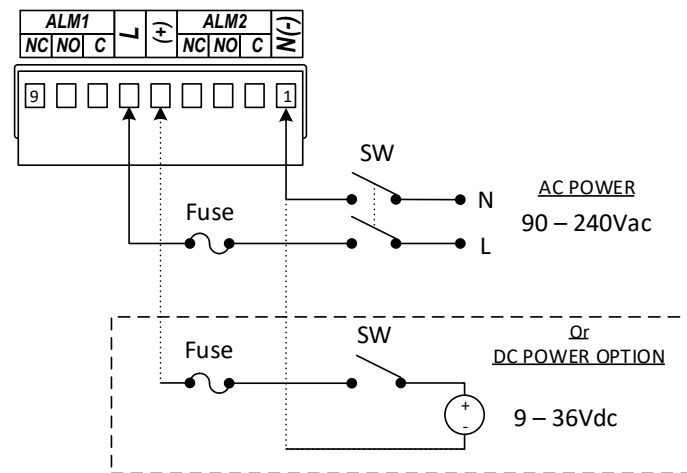


Figure 1 – Main Power Wiring

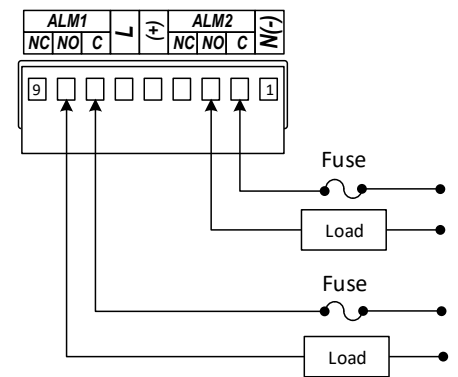


Figure 2 – Alarm Relay Wiring

**CAUTION: Use only provided terminals. Torque all connections to 0.5-0.6Nm.**

Table 1 – Fuse Values

Input Power	Input Fuse	Alarm Fuse
115Vac	25mA	5A
230Vac	25mA	5A
9-36VDC	300mA	3A

## Connecting Inputs and Outputs

Connect Input sensors to the lower terminals Marked Zone 1 through Zone 6 (Z1 – Z6) on the rear panel.

When connecting sensors follow the polarity indicated on the rear panel. For Thermocouples the Negative wire is Red (NA) or White (IEC 584-3). For Process Inputs the Negative terminal is Return.

**Note:** All input terminals share a common internal Return connection. Ensure that all sensors share a common Return or are fully isolated.

**Note:** Absolute Maximum 3.3V (Process Voltage) or 30mA (Process Current).

Connect Output drivers to the upper set of terminals. The CN616A has 6 Common Drain outputs intended to drive external SSRs. The outputs are Active Low and require an external pullup. Each output is rated for 3.3Vdc to 36Vdc. An internal 5Vdc supply is available for convenience and is rated for 25mA per channel. Refer to the diagram below for the most common connection options.

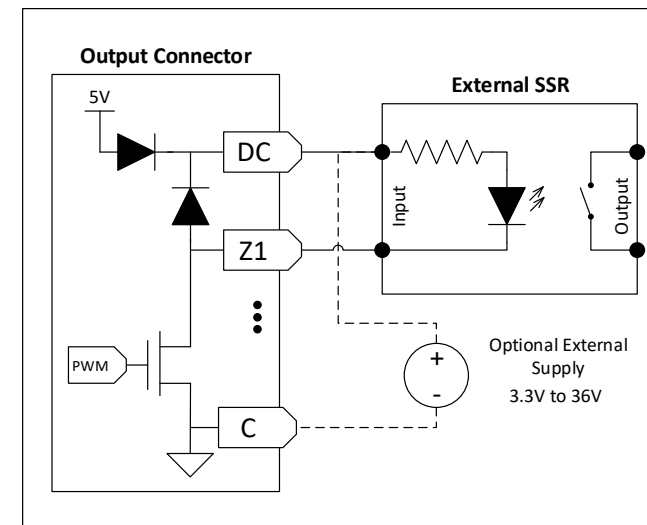


Figure 3 – Output Wiring

When using an optional external power supply:

- If the power supply is less than 5V do not connect to the DC terminals of the output connector as this may cause back feeding of the power supply.
- Note that the Common terminals connect to the input ground. Ensure the inputs and the power supply share a common ground or are fully isolated.

## Mounting

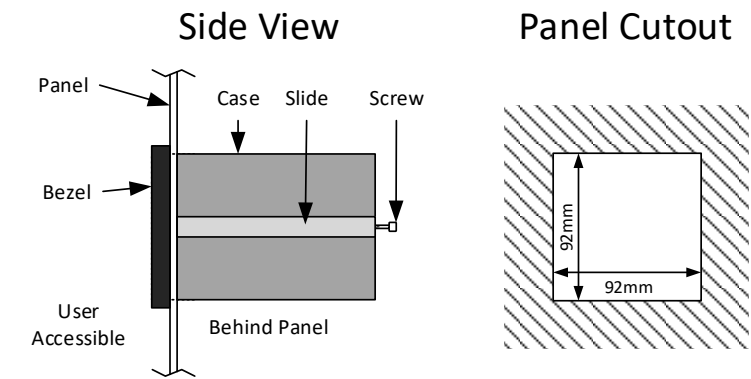


Figure 4 – Panel Mounting

- Using the dimensions from the panel cutout diagram shown above, cut an opening in the front panel
- Remove the two screws that secure the mounting slides and remove the slides.
- Insert the unit into the cutout from the front side of the panel. Reinstall the two slides and two screws.
- Ensure that the unit is properly grounded to the panel which should be earth grounded.
- Use the supplementary ground point indicated on the rear panel if a good ground connection cannot be maintained from the mounting slides alone. A ring terminal is provided for this purpose.

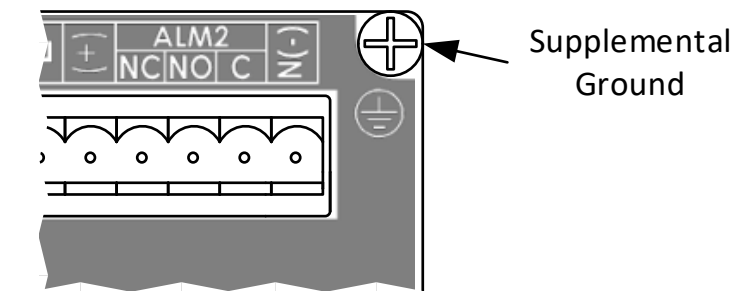


Figure 5 – Supplemental Ground Point

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## Running the Unit

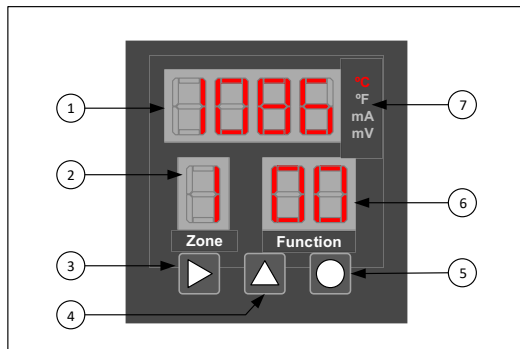


Figure 6 – Front Panel Diagram

Item	Description	Item	Description
1	Main Display	5	Select Button
2	Zone Display	6	Function Display
3	Advance Button	7	Unit/Mode Indicator
4	Increment Button		

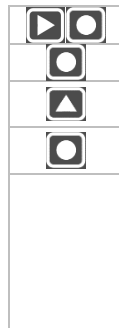
When power is applied to the unit it automatically enters Run mode, sequentially scanning each active zone and activating alarms and outputs if required. The Main display shows the measured value of the indicated zone.

The default sensor type is a K-type thermocouple. Please see the section below to select the correct sensor.

By default, the outputs are set to On/Off control in the Reverse direction (Heating) and the Setpoint for each zone is zero. To change the setpoint use Function 36 in submenu 72.

## Changing the sensor type:

- Enter Function Select Mode using:
- Enter Function 71 using the select button.
- 31 Appears on the Display. Increment the selected function to 33.
- Enter Function 33 using the Select Button
- Function 33 is shown in the Function Display and the current settings are shown in the Main Display.
- Refer to the Device Configuration table below to determine the desired settings.



- Digit 1 flashes to indicate it can be changed.
- Use the Increment button to change the digit.
- Use the Advance button to move to the next Digit.
- Once all changes are made use the Select Button to save the settings.
- The unit returns to Function Select Mode and 31 is shown in the Main Display
- Use the escape button combination twice to return to run mode.



Digit 1	Digit 2		Digit 3		Digit 4 (Function depends on Digit 3)		
Alarm Type	Unit	Alarm Latch	Input Type	TC Type	RTD Type	Decimal Points*	
0 High	0 C	Latching	0 TC	0 B	Pt100	0	
1 Low	1 F	Latching	1 RTD2	1 C	Ni120	1	
2 High / Low	2 C	Non-Latching		2 E	Cu10	2	
3 Off	3 F	Non-Latching	3 mA	3 J		3	
4 User			4 mV	4 K			
				5 R			
				6 S			
				7 T			
				8 N			

\*Only Available in mA/mV mode.

Please Note: Digit 4 is dependent upon the "Input Type" selected under Digit 3. Ex: If "TC" is selected under "Input Type" under Digit 3, Digit 4 becomes one of the following "B, C, E, J, etc." under "TC Type."

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## Available Functions

The current Function is always displayed in the Function Menu. While in Run Mode Press to enter Function select Mode.

Function select mode allows for full configuration of the device. In Function select mode the desired Function to edit is shown in the Main Display. Press to increment the Function. Press to enter the Selected Menu

Func	Description	Func	Description
70	Function Select		
71	Model Setup Group	73	Control Setup
31	Zone Enable	41	Cycle Time
32	Password Enable	42	Hysteresis
33	Input and Alarm	43	PID Enable
34	Modbus Address	44	Proportional Gain
35	Zone Display Time	45	Integral Gain
81	Power-Up State	46	Derivative Gain
82	Alarm Relay 1	47	Control Direction
83	Alarm Relay 2	48	Control Mode
84	Serial Configuration	74	Segment Control
85	mA/mV Low Scaling	75	Segment Edit
86	mA/mV High Scaling	##	Segment ## (01 to 20)
72	Setpoints and Alarms	76	Autotune Setpoint
36	Absolute Setpoint	77	Run Autotune
37	High Alarm Setpoint	78	Calibration
38	Low Alarm Setpoint	79	Start Profile

Table 2 – Device Configuration

For more detailed information on each Function please refer to the user Manual.

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OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **25 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **two (2) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY REPAIRS**, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

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2. Model and serial number of the product, and
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## QUICK START

For complete product manual:  
[www.omega.com/manuals/manualpdf/M5704.pdf](http://www.omega.com/manuals/manualpdf/M5704.pdf)



# CN616A

## Multi Zone Controller

### MQS5807/0818



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