5 YEAR WARRANTY

OMEGA®

User's Guide

Shop online at omega.com®

e-mail: info@omega.com
For latest product manuals:
www.omegamanual.info

CNI-CB120SB SERIES
Industrial Controller Panels

omega.com info@omega.com

Servicing North America:

U.S.A.: Omega Engineering, Inc., One Omega Drive, P.O. Box 4047
Stamford, CT 06907-0047 USA
Toll-Free: 1-800-826-6342 (USA & Canada only)
Customer Service: 1-800-622-2378 (USA & Canada only)
Engineering Service: 1-800-872-9436 (USA & Canada only)
Tel: (203) 359-1660 Fax: (203) 359-7700
e-mail: info@omega.com

For Other Locations Visit omega.com/worldwide

Table of Contents

List of Figures

Section 1 - Introduction

The CNI-CB120SB series Industrial Controller Panel is ideal for light Industrial use and applications requiring temperature measurement and control. The CNI-CB120SB features a Thermocouple and an M-12 Female input connection. The CNI-CB120SB can be configured by the user for use with a thermocouple, RTD, Voltage or Current signal. These controllers are factory configured and calibrated for Thermocouples. It is important that the user read this manual and additional manuals outlined in Section 2.2 completely and follow all safety precautions in both manuals before operating your unit.

WARNING:

- This unit contains 120V which can cause injury or death within the enclosure. Installation and troubleshooting of input, output, and internal circuitry should be performed by qualified personnel only.
- Hazardous voltages are present on the internal circuitry of the Temperature Controller.
- Disconnect power before attempting any inspection or work on the inside of unit.
- Be sure the branch circuit or main disconnect switch is open or electrical input circuit fuses are removed before attempting any inspection or work on the inside of unit.
- This control box is designed for inside, dry use only. To avoid the risk of shock or fire DO NOT expose this box to excessive moisture (ie wash down) or rain. It is not NEMA rated.
- If using both outputs at the same time the maximum rated current for each output is 6.0A, so each output MUST be fused for 7Amps (720Watts). If using only one output the maximum rated current is 12.0 A, so the output MUST be fused for 15 Amps (1440 Watts).

1.1 Precautions

- Follow all safety precautions and operating instructions outlined in this manual.
- Keep unit out of reach of all children.
- Do not operate in flammable or explosive environments.
- Never operate with a power cord that is not properly rated for use with your unit.
- Remove and or disconnect main power cord before attempting any maintenance or fuse replacement.
- Do not connect and or operate this unit to a non-grounded, non-polarized outlet or power source.

- This product is not designed for use in human, medical, nuclear, or other safety critical applications.
- This product is not for use in damp or wet environments. Do not operate controller in an area where it can get wet or sprayed.
- Do not plug the equipment into a receptacle with wet hands. Ensure hands are dry before handling the electrical cord and connecting to power.

NOTE:

There are user serviceable parts inside your unit. Attempting to repair or service your unit must be done ONLY by qualified personnel or you will void your warranty.

1.2 Safety Warnings and IEC Symbols

This device is marked with international safety and hazard symbols in accordance with EN61010-1. It is important to read and follow all precautions and instructions in this manual before operating or commissioning this device as it contains important information relating to safety and EMC. Failure to follow all safety precautions may result in injury and or damage to your controller. Use of this device in a manor not specified by the manufacturer may impair protection devices and safety features provided by the unit.

IEC symbols	Description
	Caution, risk of electrical shock
	Caution, refer to accompanying documentation

Figure 1-1. IEC Symbols

Section 2 – Hardware

2.1 Unpacking and Inspection

Remove the packing slip and verify that you have received everything listed. Inspect the container and equipment for signs of damage as soon as you receive the shipment. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent. The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing the contents, save the packing material and carton in the event reshipment is necessary.

If you have any questions about the shipment, please call our Customer Service Department at:

1-800-622-2378 or 203-359-1660.

We can also be reached on the Internet at omega.com e-mail: info@omega.com

2.2 Parts Included

The following items are supplied with your unit:

- CNI-CB120SB series Industrial Controller Panel (1 each)
- SC-GG-K-30-36 Spool Cap K-Type Thermocouple (1 each)
- Spare 100 mA control fuse (1 each)
- Spare 15 Amp output fuse (use if only one output is used) (1 each)
- Spare 7 Amp output fuse (use if both outputs are used) (1 each)
- Spare 15 Amp line input fuse (1 each)
- Spare 1 Amp SSR fuse (1 each)
- This Users Guide and CNI Controller Manual #M3355 (1 each),
- Quick Start Manual #MQS3355 (1 each)
- Communications Manual #M-3629 (1 each) with Ethernet models only

Section 2.3 Labels

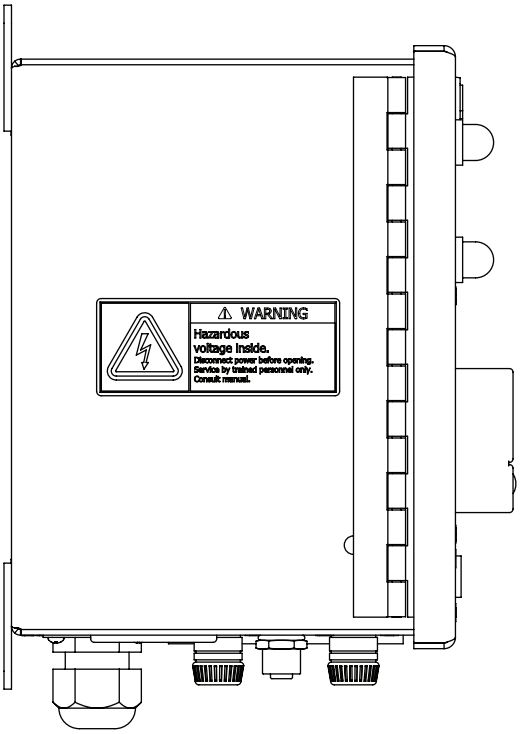


Figure 2-1. CNi-CB120SB Labels, Left View

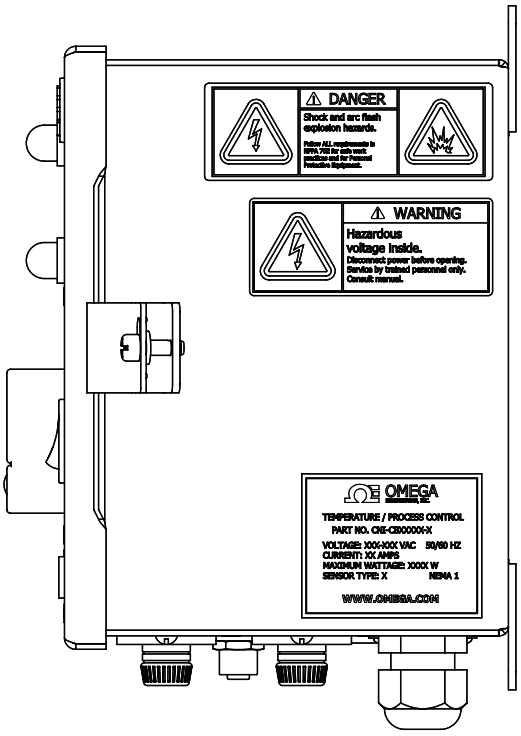


Figure 2-2. CNi-CB120SB Labels, Right View

Section 2.4 Mounting Dimensions

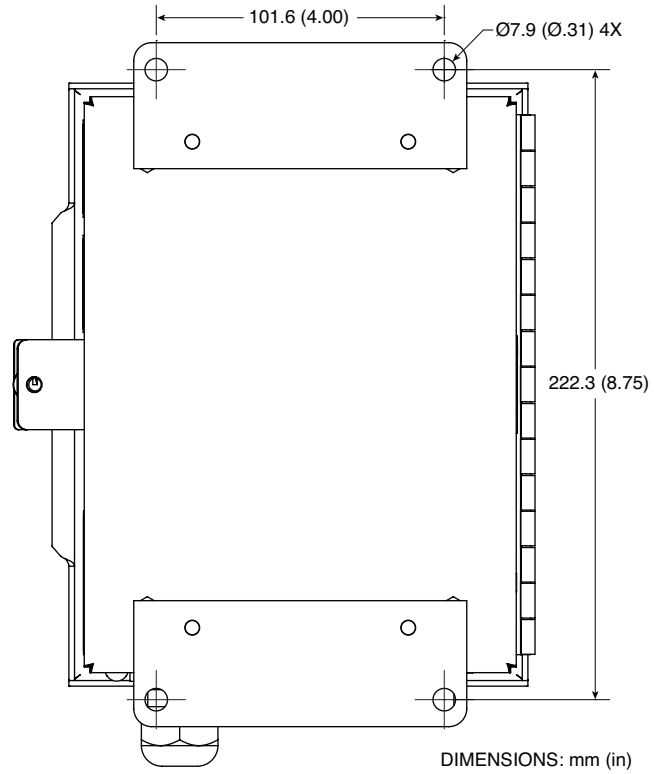


Figure 2-3. CNi-CB120SB Mounting Dimensions, Rear View

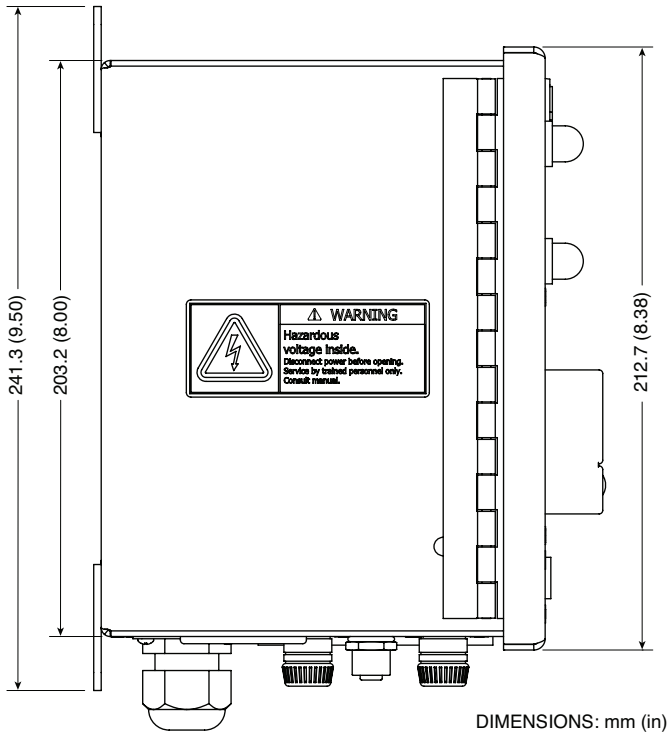


Figure 2-4. CNi-CB120SB Mounting Dimensions, Side View

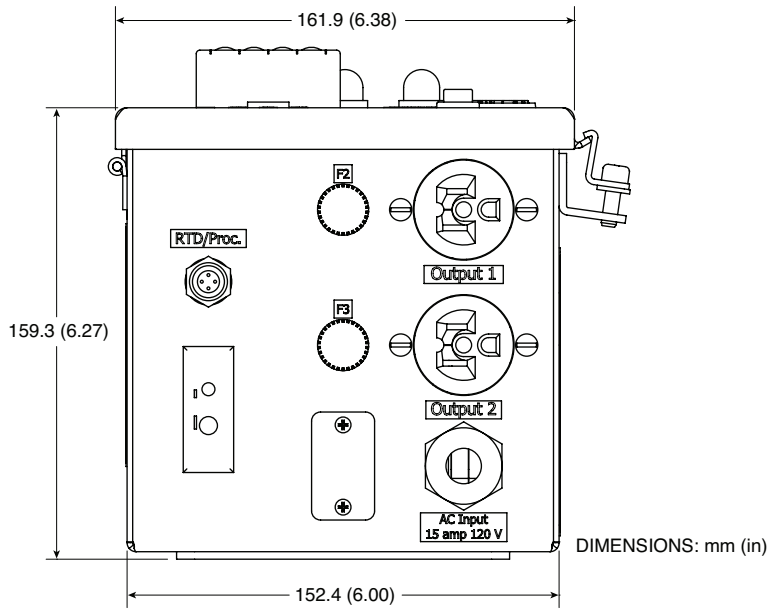
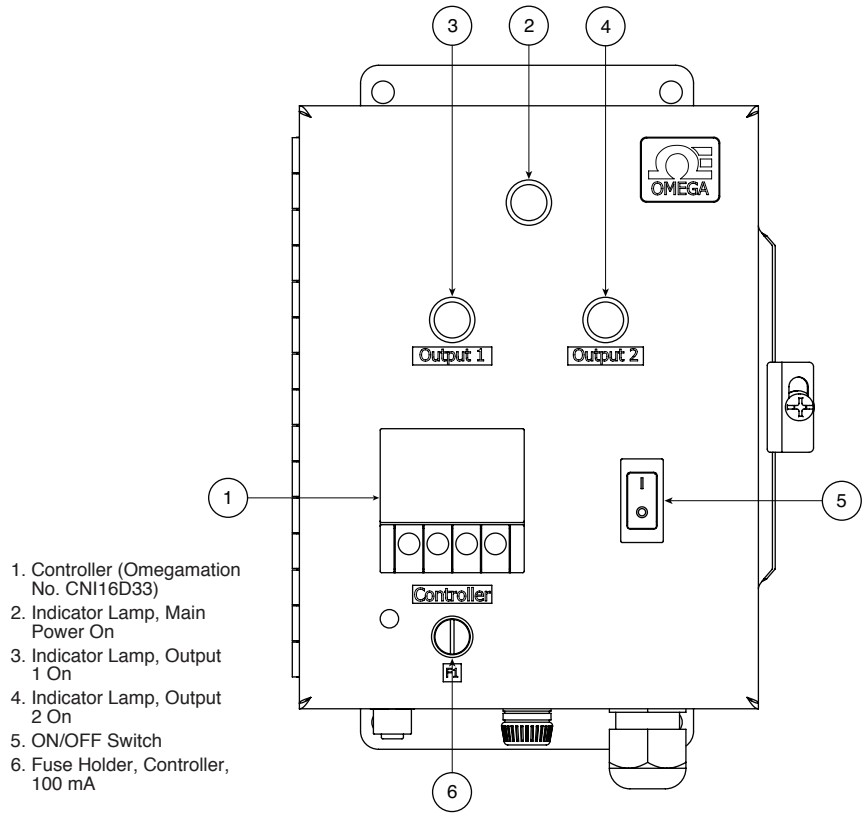


Figure 2-5. CNi-CB120SB Mounting Dimensions, Bottom View

Section 2.5 Components



1. Controller (Omegamation No. CNI16D33)
2. Indicator Lamp, Main Power On
3. Indicator Lamp, Output 1 On
4. Indicator Lamp, Output 2 On
5. ON/OFF Switch
6. Fuse Holder, Controller, 100 mA

Figure 2-6. CNi-CB120SB Components, Front View (Closed)

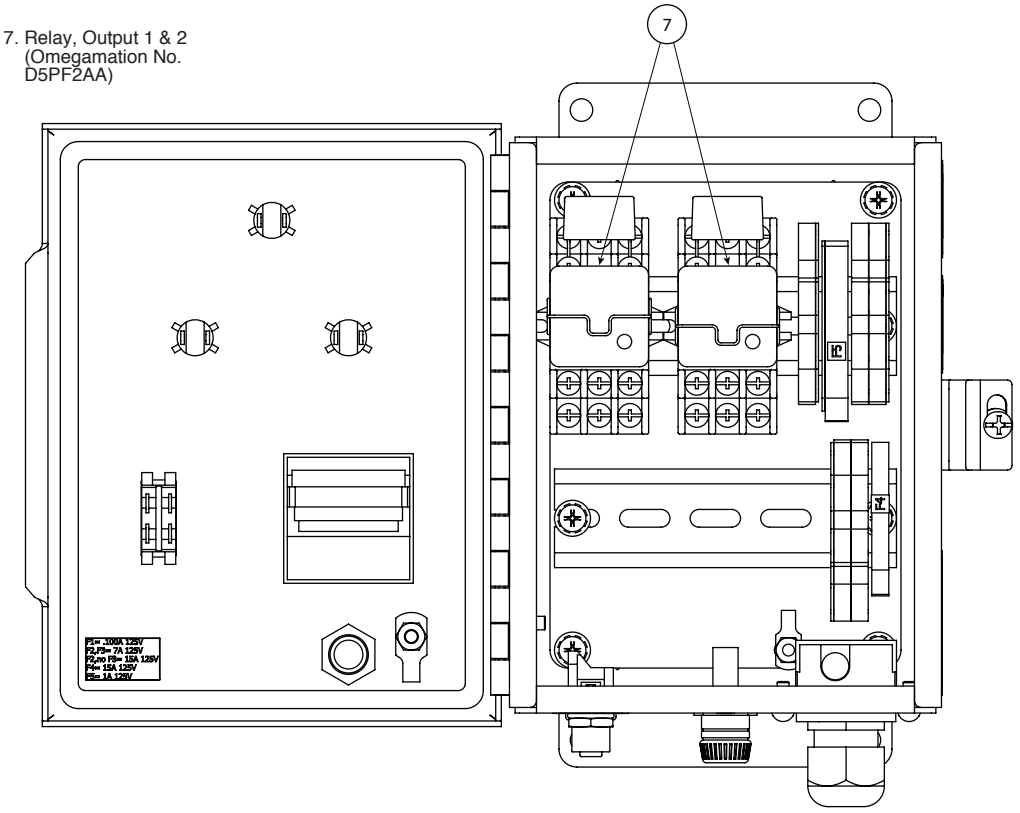
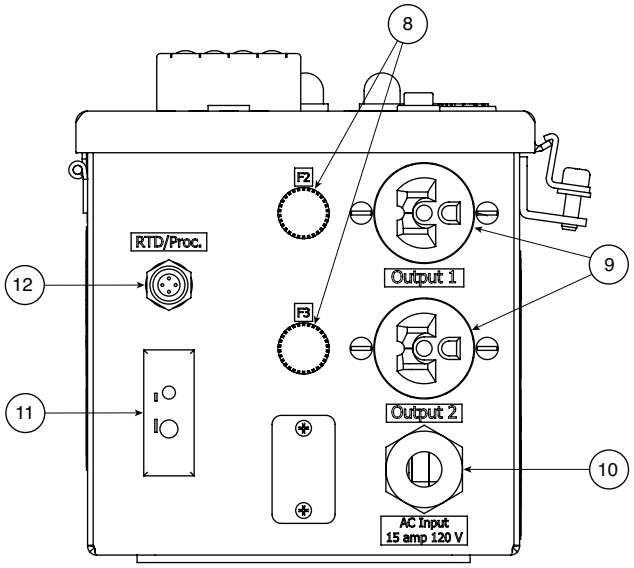


Figure 2-7. CNi-CB120SB Components, Front View (Open)



8. Fuse Holder, Output 1 & 2, 7A -OR- 15A
9. Output Receptacle
10. Input Receptacle
11. TC Input (Omegamation No. UPJ-*-F)
12. RTD / Process Input, M12

Figure 2-8. CNi-CB120SB Components, Bottom View

Section 3 – Installation and Wiring

Section 3.1 Connections

Installation and troubleshooting of input, output, and internal circuitry should be performed by qualified personnel only.

NOTE:

It is very important to read and understand the controller manual before attempting to apply power to this control box. The controller has been preconfigured for thermocouple operation. Should the user desire to use another input such as RTD or Process using the M-12 connector provided, the user will need to remove the thermocouple wires and connect the wires from the M-12 connector on the back of the CNI Controller. The user will also need to reconfigure the input settings to configure the controller for the correct input type (RTD or Process (Voltage or Current) input). See the Controller Manual #M3355 for additional instructions. An example of a 4 wire RTD connection has been given later in this manual.

The CNI-120SB is designed to operate using standard 120V, 60Hz.

1) Attach properly sized input power cable thru bottom input cable gland, and assemble to labeled input fuse block. (DO NOT CONNECT POWER INTO 120V IF CHANGING INPUT TYPES).
2) If using a thermocouple, plug the thermocouple into the jack provided on the bottom of the unit.
3) If using RTD or Process Control, the user will need to rewire the input connections on the back of the back of the controller. MAKE SURE THE POWER IS NOT CONNECTED! (see Section 2.4.1 below for an example of converting it for 4 wire RTD input).
4) The fuses have been preinstalled. Caution must be taken when replacing fuses because high voltage may be present at various locations within control box.
5) After all of the connections have been made AND THE DOOR IS SECURED, the user may turn the unit on. Turning on the power switch will turn the controller on. The outputs will be off at this point. The user can now program the controller for RTD or Process inputs if needed.
6) The set points can now be adjusted for each output.
7) When the set points are adjusted, pressing the down arrow twice will return the controller to run mode and it will begin to control.

NOTE:

IT IS VERY IMPORTANT TO READ AND UNDERSTAND THE CONTROLLER MANUALS BEFORE OPERATING THE CONTROL BOX.

The CNI Temperature/Process Controller has a lot of functionality. The menu structure in the quick start manual gives the user an easy understanding of how to move thru the settings in the controller. Some of the functions are not enabled for this controller. For example the CNI16D33 is designed for output contacts (relay control) so outputs for Analog and SSR output control are not enabled.

Section 3.1.1 Rewiring For 4 Wire 100 Ohm TRD Input

WARNING:

SHOCK HAZARD! Disconnect the power cable from the power source before rewiring.

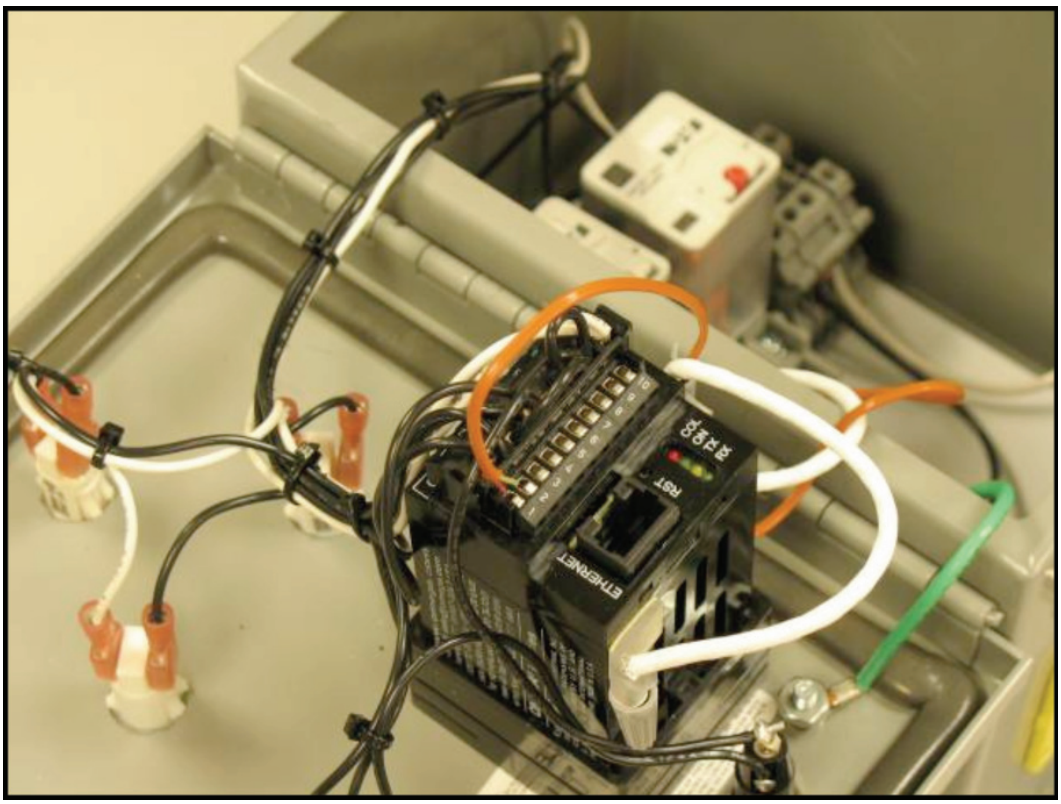


Figure 3-1. From The Factory

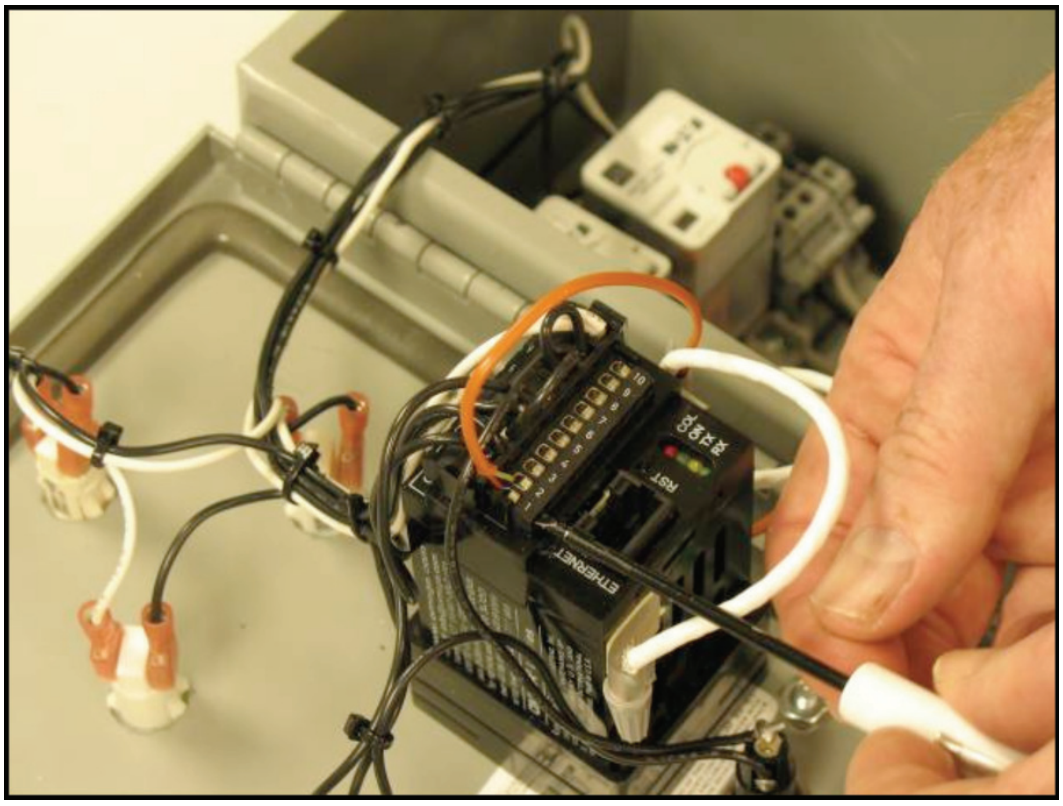


Figure 3-2. Remove The Thermocouple Wire From 1 and 2

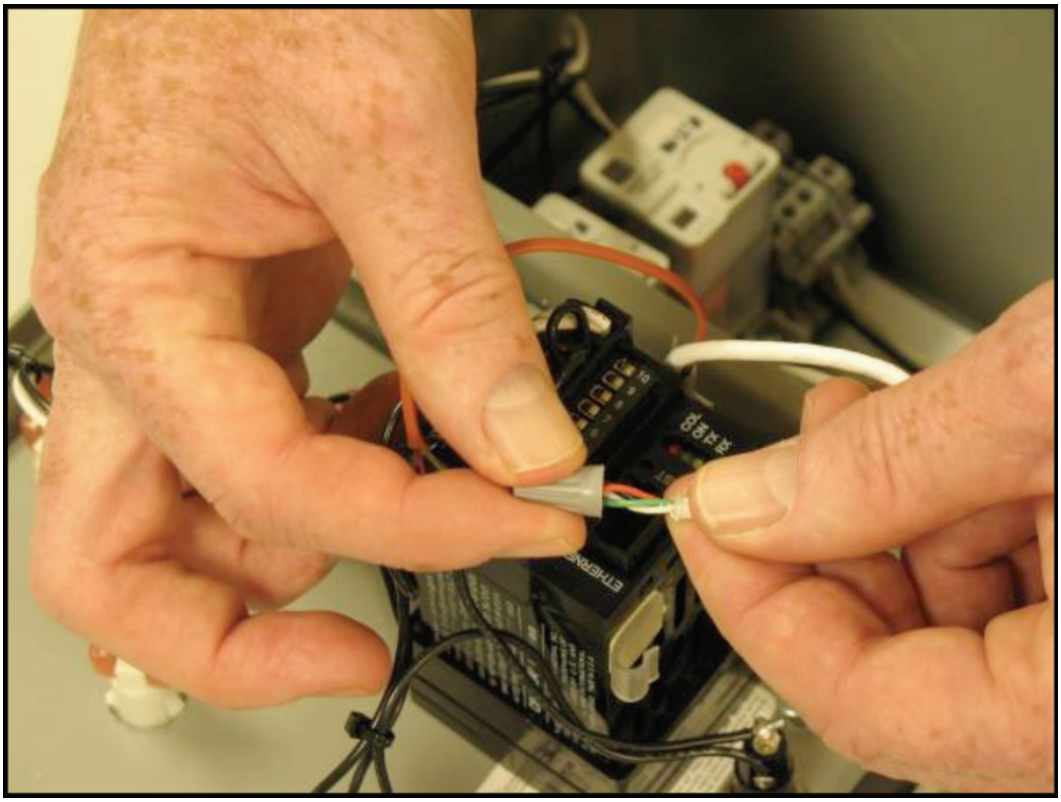


Figure 3-3. Unclip the M12 Connector Wire

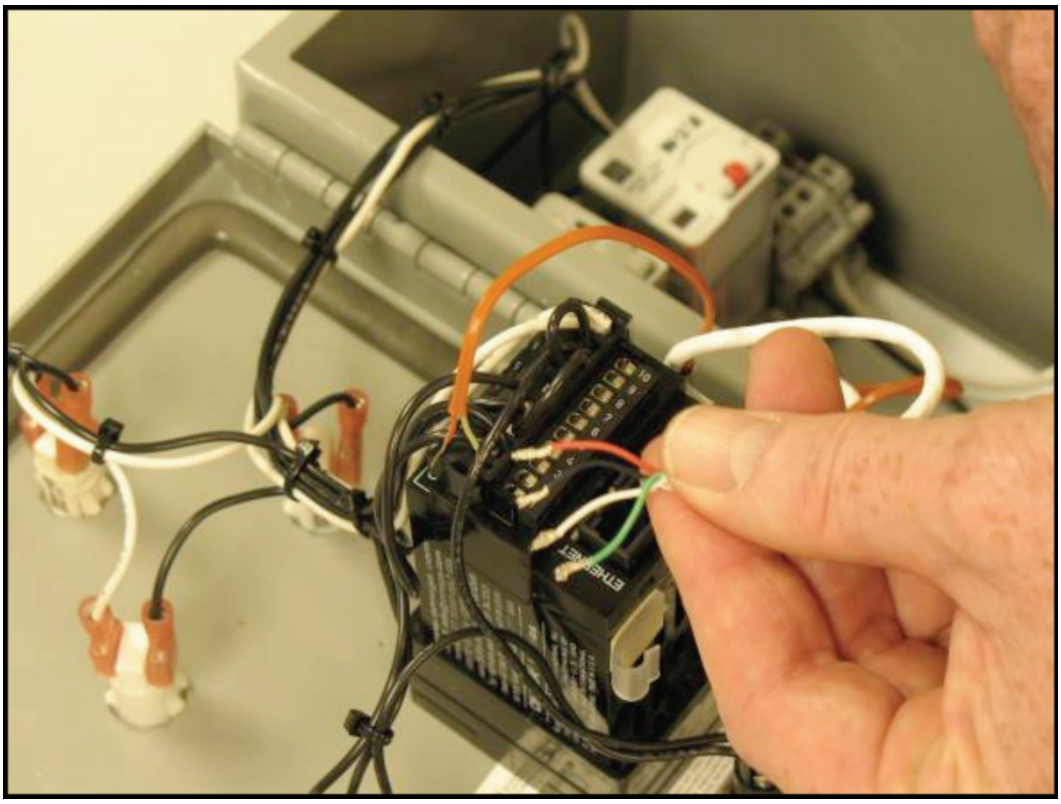


Figure 3-4. Remove Wire Nut

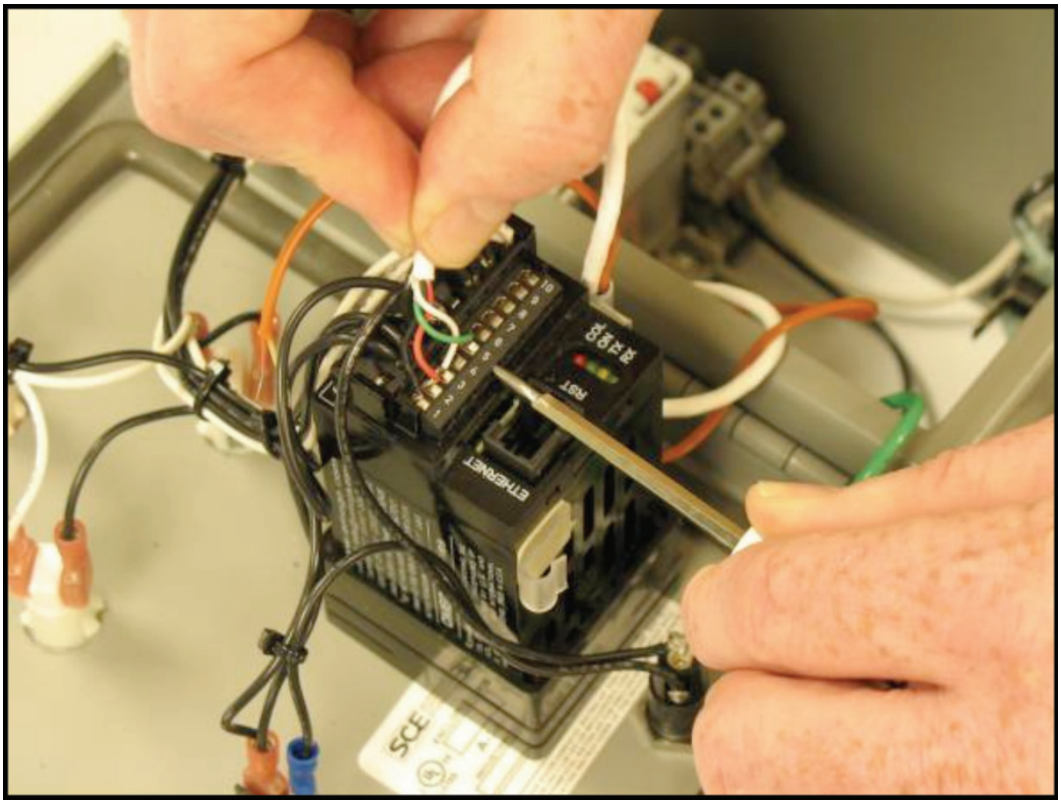


Figure 3-5. Install Wires Per Wiring Diagram

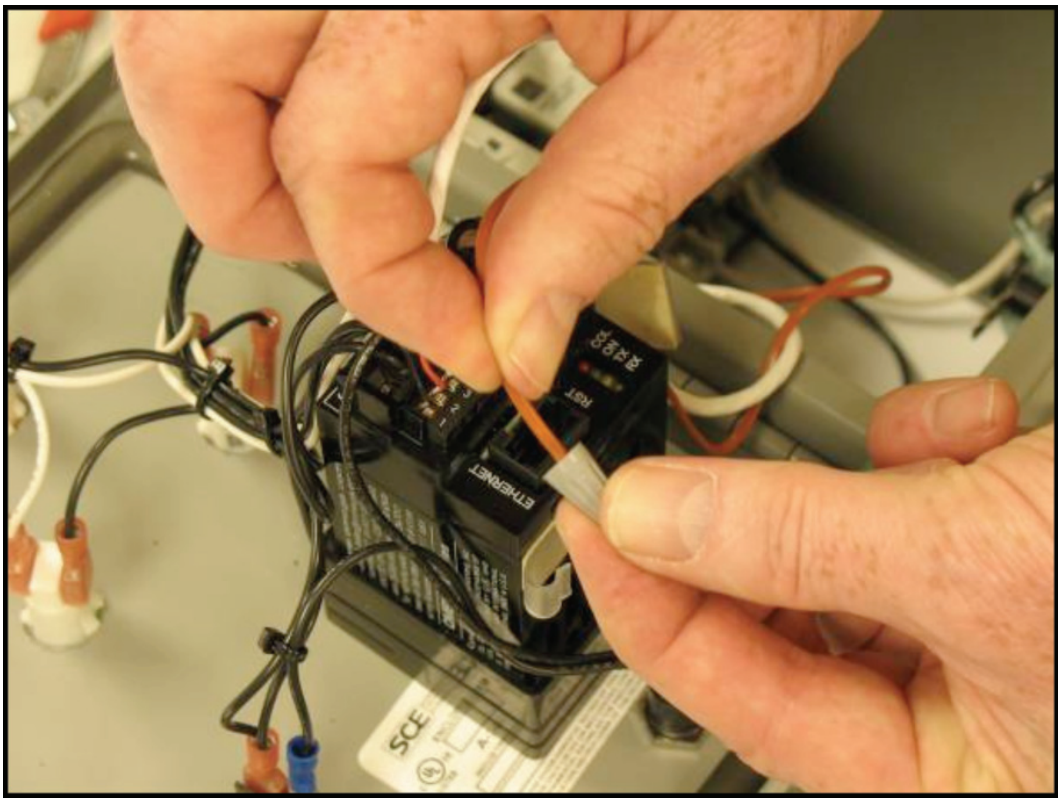


Figure 3-6. Place Wire Nut On T/C Wire

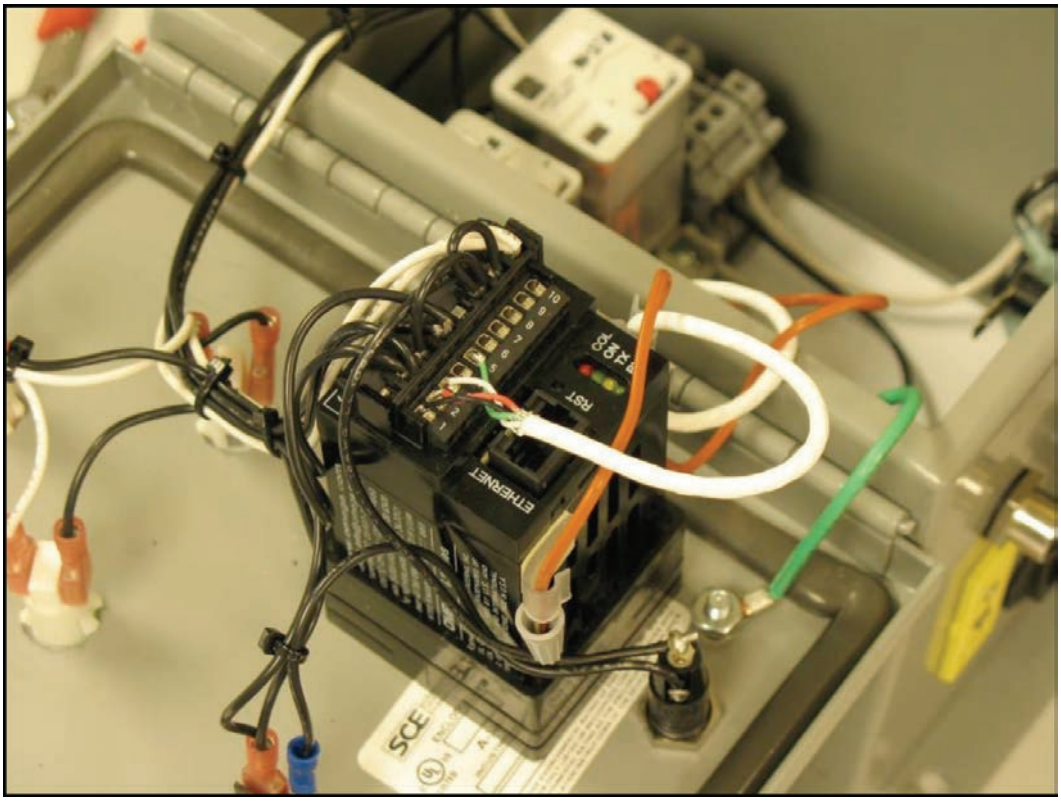


Figure 3-7. Place Wire Into Clip To Secure It. Close Box And Secure Box Cover Screws.

Section 3.1.2 Programming the Controller for 4 Wire 100 Ohm RTD

Now that the controller wiring has been properly connected for 4 wire,100 OHM usage the controller input needs to be set up to allow the controller to operate correctly. This is easily accomplished in the example below. Referencing the Menu diagram at the bottom right of page 2 of the Quick Start Manual the user will see the input portion below.

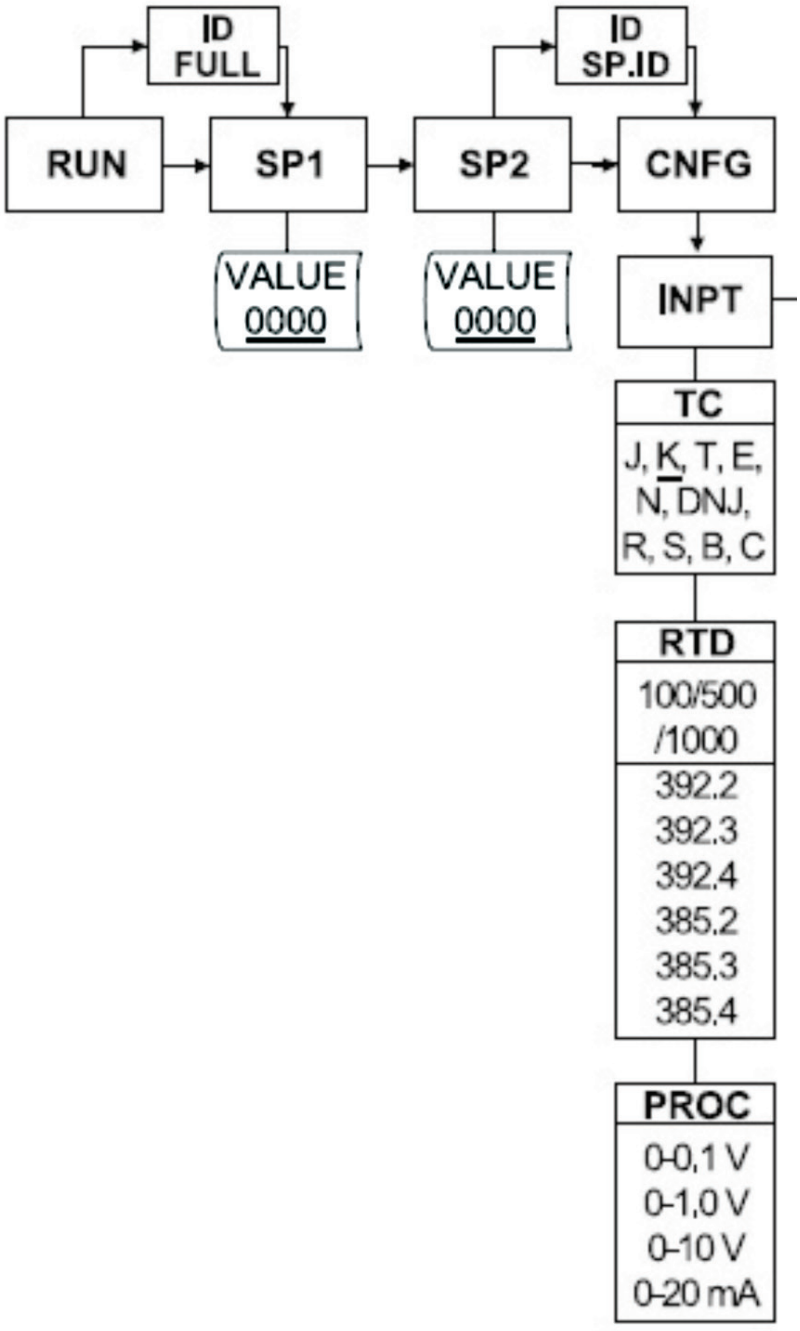


Figure 3-8. Flow Chart

The following steps will set the controller for 4 wire RTD.

1) From the RUN screen press the menu button (far left button). SP1 is displayed
2) Press the menu button again. SP2 is displayed.
3) Press the Menu button again and CNFG is displayed.
4) Press the enter button (far right) and INPT is displayed. This is where the inputs for the controller are changed and stored.
5) Press the menu Button and TC is displayed. Press the menu button and next RTD is displayed. Press the enter button to choose this option.
6) Use the down arrow to select the correct type RTD curve. Most RTD's are 385 or European curve. The period 2, 3, or 4 stands for how many wire RTD it is. So in this case we use 385.4 since we are connecting a 4 wire RTD. (Consult the RTD manufacture if you are unsure which type RTD you have.)
7) Press enter to save the change.
8) Next RDG is displayed. Press the down arrow 2 times and this will exit the menu system and return you to RUN mode.
9) You should now be reading the correct temperature on the face is the unit.

Section 3.2 Wiring Schematics

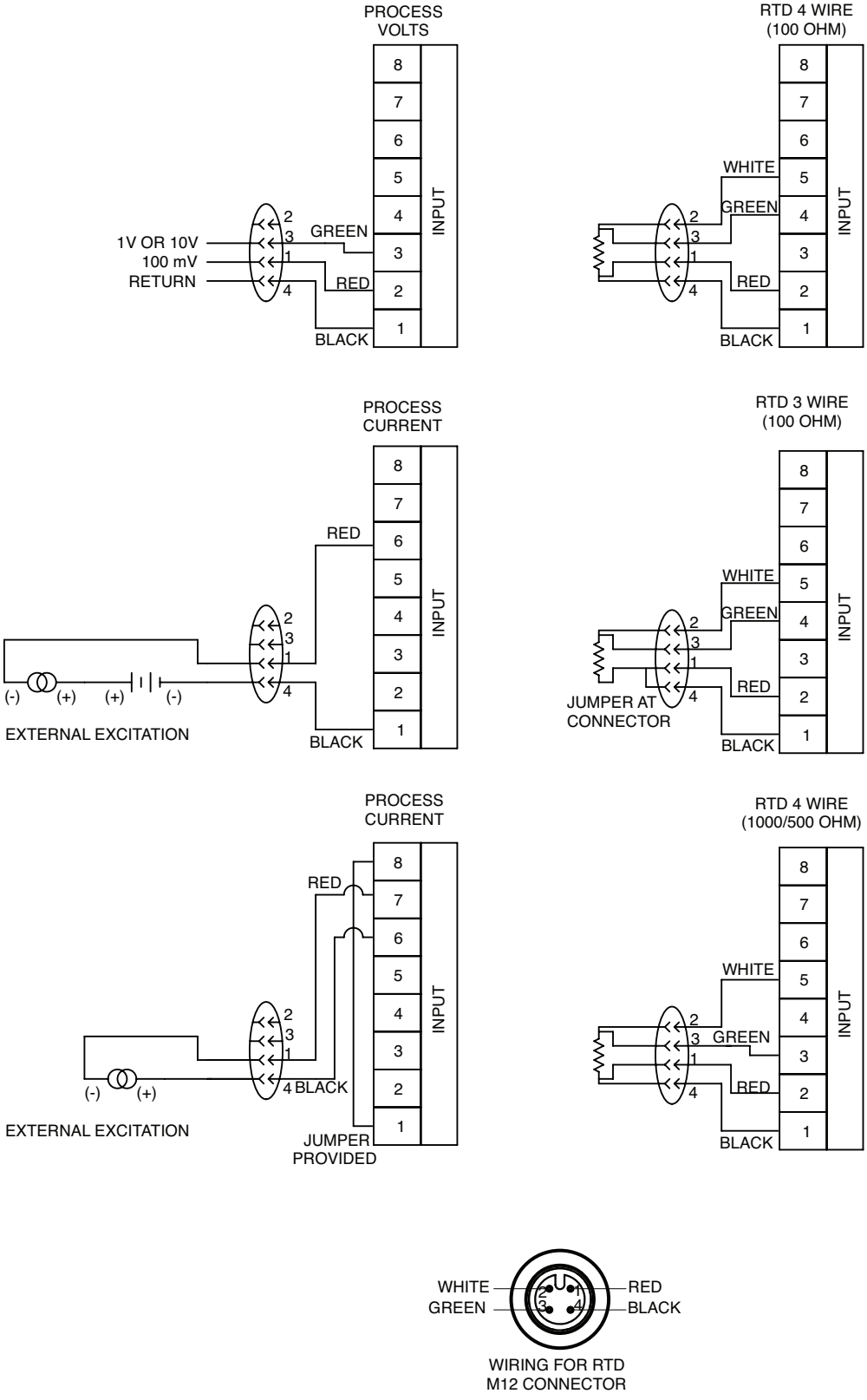


Figure 3-9. CNi-CB120SB Wiring Schematics

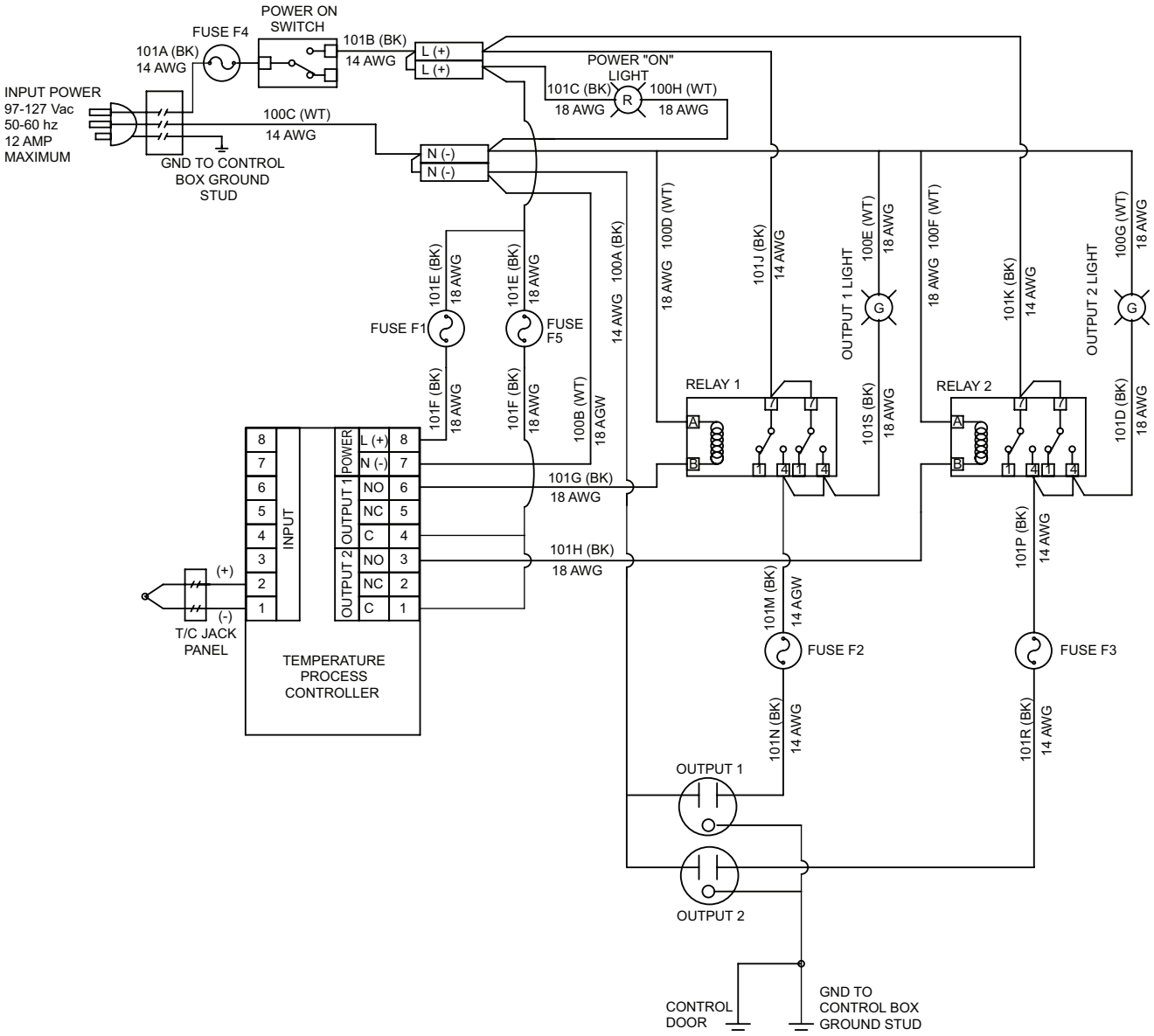


Figure 3-10. CNi-CB120SB Internal Wiring

Section 4 - Spare Parts

The following parts are used in the CNI-CB120SB:

Item	Omega PN	Omega Catalog Page URL
15 A Mechanical Relay	D5PF2AA	http://www.omega.com/pptst/D5PF.html
Controller Fuse, 100 mA, Fast Acting, 5 x 20 mm	CB-0051	
Output Fuse, 25 A, Fast Acting	CB-0032	
Relay Fuse, 1 A, Fast Acting, 5 x 20 mm	BB-0303	

Specifications:

Control: One 120 Vac input that controls two internal mechanical relays for two 6 Amp – or – one 12 Amp outputs.

Rating: 120 Vac , 60 Hz, 12 Amps (1440 Watts resistive load, or 1/3HP)

Dimensions: 203 H x 152 W x 152 mm D (8 H x 6 W x 6" D)

Weight: 10 Lbs.

Operating Temperature: 0 to 55°C (32 to 151°F)

Controller Fuse: 100 mA 250 Vac

Output Fuses: 7 Amp, 250 Vac if both outputs are used, 15A, 250 Vac if only one Output is used.

For Indoor use only

MADE IN USA

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **61 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **five (5) 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.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

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:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

Shop online at omega.com℠

TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gages
- Load Cells & Pressure Gages
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Data Logging Systems
- Recorders, Printers & Plotters

HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

M5232/1013