USER'S GUIDE

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RELAY-URM SERIES

Universal Relay Module

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Rev:011211

SPECIFICATIONS

(Typical @ 25C and rated supply voltage unless otherwise specified)

RELAY SPECIFICATIONS:

Type: Electro-mechanical relay, SPDT
Current Rating = 15 ampere
Switched voltage = up to 250vac, 18vdc
Coil Voltage = 5vdc
Operate Time (typical) = 10 Milliseconds
Release Time = 5 Milliseconds
Mechanical Life Expectancy = 10million operations
Temperature Rise = 25C (45F) at nominal coil voltage.

OUTPUT CONNECTIONS:

Type = Euro style Pluggable connectors
Terminals = Screw type
Terminal Spacing = 5mm (0.196")
Stripped length = 6mm (0.236")
Current Rating = 15 ampere
Wire Size = AWG22-14
Contacts: Normally open, Normally closed, Common

INPUT CONNECTIONS:

Type = Euro style Pluggable connectors
Terminals = Screw type
Terminal Spacing = 3.51mm (0.137")
Stripped length = 7mm (0.275")
Current Rating = 8 ampere
Wire Size = AWG28-16
Input Signal = 5vdc to 24vdc
Relay activation on: Active High, Active Low, Contact closure

INPUT SIGNAL:

Input Voltage High: 5vdc (Minimum) at 10 milliamp 24vdc (Maximum) at 10 Milliamp
Input Voltage Low: 0.3vdc (Maximum)

POWER SUPPLY:

Universal Input = 100vac to 240vac
Power = 25 watts (5Vdc) -- Standard
Over Voltage Protection = 115 - 135% of output
Leakage Current = Less than 0.5ma
Efficiency = 75% to 78% typical
Output termination = Euro style screw terminal
Standard Auxiliary Output: 5Vdc @ 3 amp
Dual Supply Output Option:
(5Vdc @ 1A, 12Vdc @ 1A),
(5Vdc @ 0.2A, 24vdc @ 0.5A)

DIMENSIONS:

Case: 4.5"(L) x 2.7"(W) x 5.5"(H)
Bezel size: 3.0"(W) x 5.75"(H) x 0.06"(T)

DESCRIPTION

Relay-URM series relay module is a very versatile instrument that is used for switching up to eight 15 ampere loads using low level input signals from PLCs, process controllers, indicators, motor starters etc. Its has extremely flexible inputs which will accept a wide variety of control signals. Also, the inputs are designed for activation of output relays on direct acting or reverse acting signals. Similarly, input signals can range from 5vdc to 24vdc. Conditioning of input allows open collector or logic level inputs (e.g. TTL level signals) from PLCs or controllers to be used for switching output relays. In addition to working with control/logic level signals, another very useful feature of URM is activation of output relays on contact closure.

Each input provides the option of optical isolation from others as well as from URM's control circuit. Thus different instruments (PLCs, Indicators, Motor Starters etc) can switch relays in a single URM without interfering with each other or causing any ground loop problems. For example, relays 1-4 could be switched by a Temperature Monitor with alarm outputs where as relays 5-8 could be used by a PLC for its control functions.

Many process control instruments have low power relays which provide contact closure for low amperage switching but are not suitable for handling heavy loads. In such applications, Relay-URM series comes in handy. Simply connect the low power relay contact output to Relay-URM unit and instantly you have the capability of up to eight 15 ampere load switching relays.

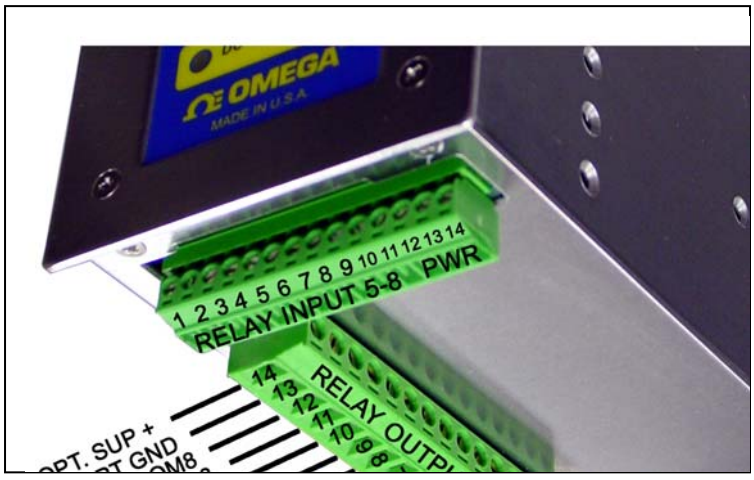
Input and output connections on URM-Relay series are made through euro style pluggable connectors which are conveniently located on the top and bottom of the unit. Screw-in terminals allow for quick connect/disconnect of wires.

The unit is housed in a versatile enclosure which can be configured for mounting on a DIN rail or on a wall. If desired, the same enclosure can be panel mounted with Relay, AC and DC supply status visible on the front. LEDs on the front panel turn on when a relay is energized.

Two different versions are offered in this series. First one is URM-Relay-400 which has four relay outputs. The second one is URM-Relay-800 which has eight relay outputs. Both units come with a built-in universal power supply. It operates from 100vac to 240vac. In addition to providing power to internal electronics and relays it can also provide optional power for external applications by the user.

POWER CONNECTION

Power is connected through the 3-terminals labeled 12, 13 & 14 (as shown in the adjacent picture) on the Input connector located at the bottom of the unit. Terminals 12 and 13 are AC-Line 1 and AC-Line 2 inputs, respectively, where as terminal 14 is Ground. Make note that it is very important that the Line inputs and the power ground are not switched. Doing so will permanently damage the instrument. Refer to the picture for proper connections.



NOTE: WHILE MAKING POWER CONNECTION TO THE UNIT, MAKE SURE THAT AC POWER LINE L1 OR L2 IS NOT ACCIDENTALLY

CONNECTED INTO THE GROUND (GND) TERMINAL. THIS WILL RESULT IN PERMANENT DAMAGE TO THE INSTRUMENT.

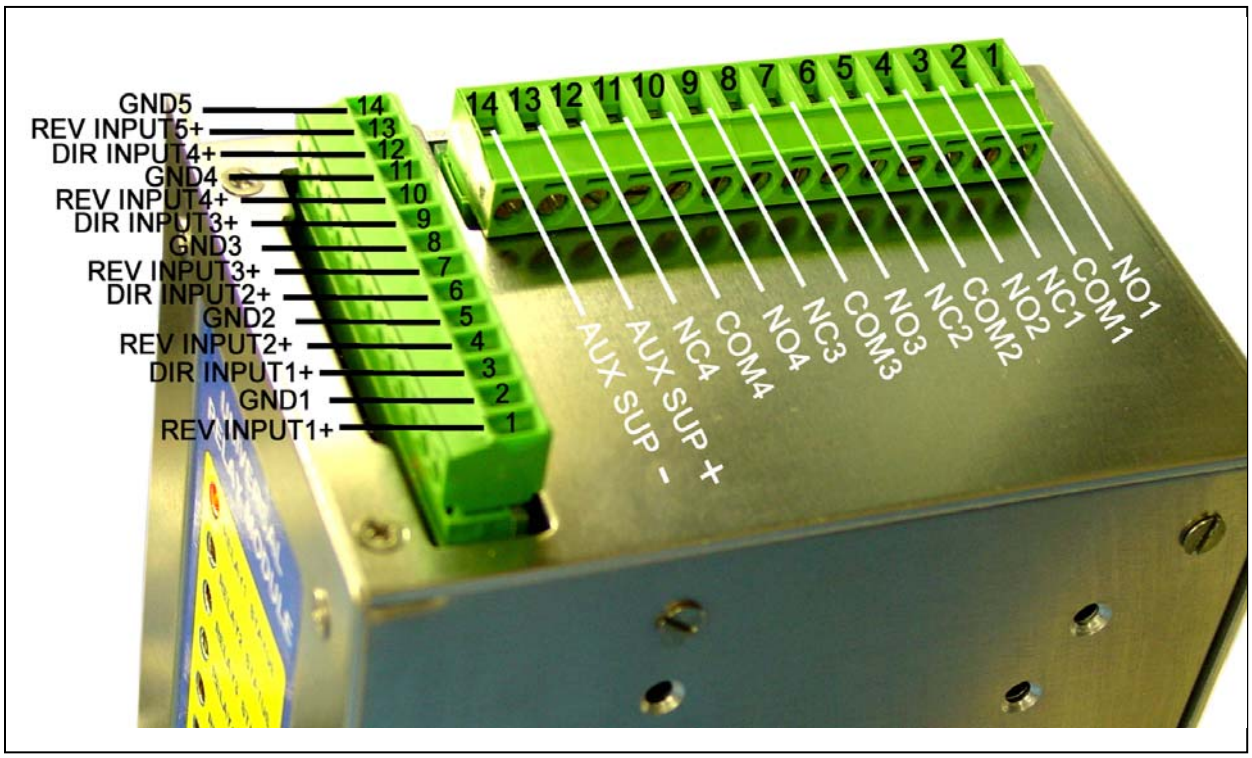
DOUBLE CHECK THE CONNECTIONS BEFORE APPLYING POWER!!

INPUT CONNECTIONS – RELAYS 1-4

Figure 2 shows Input (and Output) connections for Relays 1 through 4. Following is the detailed description of those connections:

PIN NO.	INPUT CONNECTION DESCRIPTION
1	Relay 1 Positive Input (***Relay 1 Active Low Signal+***)
2	Relay 1 Negative input (***Relay 1 Signal Ground***)
3	Relay 1 Positive Input (***Relay1 Active High Signal+***)
4	Relay 2 Positive input (***Relay 2 Active Low Signal+***)
5	Relay 2 Negative input (***Relay 2 Signal Ground***)
3	Relay 2 Positive Input (***Relay 2 Active High Signal+***)
7	Relay 3 Positive input (***Relay 3 Active Low Signal+***)
8	Relay 3 Negative input (***Relay 3 Signal Ground***)
9	Relay 3 Positive Input (***Relay 3 Active High Signal+***)
10	Relay 4 Positive input (***Relay 4 Active Low Signal+***)
11	Relay 4 Negative input (***Relay 4 Signal Ground***)
12	Relay 4 Positive Input (***Relay 4 Active High Signal+***)
13	Relay 5 Positive input (***Relay 5 Active Low Signal+***)
14	Relay 5 Negative input (***Relay 5 Signal Ground***)

Figure 2: Input/Output Connection for Relay 1-4



OUTPUT CONNECTIONS – RELAYS 1-4

Figure 2 shows input and output connections for Relays 1 through 4. For each relay, Normally open, Normally closed and Common connections are brought out on the terminal. Following is the detail about those connections:

PIN NO.	DESCRIPTION
1	Normally Open Connection for Relay number 1
2	Common Connection for Relay number 1
3	Normally Closed Connection for Relay number 1
4	Normally Open Connection for Relay number 2
5	Common Connection for Relay number 2
6	Normally Closed Connection for Relay number 2
7	Normally Open Connection for Relay number 3
8	Common Connection for Relay number 3
9	Normally Closed Connection for Relay number 3
10	Normally Open Connection for Relay number 4
11	Common Connection for Relay number 4
12	Normally Closed Connection for Relay number 4
13	Auxiliary Power Supply Positive Connection
14	Auxiliary Power Supply Negative Connection

INPUT CONNECTIONS – RELAYS 5-8

Figure 3 shows input and Input connections for Relays 5 through 8. Following is the detail about those connections:

PIN NO.	INPUT CONNECTION DESCRIPTION
13 (Top Input Connector)	Relay 5 Positive Input (***Relay 5 Active Low Signal+***)
14 (Top Input Connector)	Relay 5 Negative Input (***Relay 5 Signal Ground***)
1	Relay 5 Positive Input (***Relay 5 Active High Signal+***)
2	Relay 6 Positive input (***Relay 5 Active Low Signal+***)
3	Relay 6 Negative input (***Relay 6 Signal Ground***)
4	Relay 6 Positive Input (***Relay 6 Active High Signal+***)
5	Relay 7 Positive input (***Relay 7 Active Low Signal+***)
6	Relay 7 Negative input (***Relay 7 Signal Ground***)
7	Relay 7 Positive Input (***Relay 7 Active High Signal+***)
8	Relay 8 Positive input (***Relay 8 Active Low Signal+***)
9	Relay 8 Negative input (***Relay 8 Signal Ground***)
10	Relay 8 Positive Input (***Relay 8 Active High Signal+***)
11	Supply Ground
12	AC Line 1
13	AC Line 2
14	Earth

Figure 3: Input/Output Connection for Relay 5-8

OUTPUT CONNECTIONS – RELAY 5-8

Figure 3 shows input and output connections for Relays 4 through 8. For each relay, Normally Open, Normally Closed and Common Connections are brought out on the terminal. Following is the detail about those connections:

PIN NO.	**DESCRIPTION**
1	Normally Closed Connection for Relay number 5
2	Common Connection for Relay number 5
3	Normally Open Connection for Relay number 5
4	Normally Closed Connection for Relay number 6
5	Common Connection for Relay number 6
6	Normally Open Connection for Relay number 6
7	Normally Closed Connection for Relay number 7
8	Common Connection for Relay number 7
9	Normally Open Connection for Relay number 7
10	Normally Closed Connection for Relay number 8
11	Common Connection for Relay number 8
12	Normally Open Connection for Relay number 8
13	Optional Power Supply Negative Connection
14	Optional Power Supply Positive Connection

INPUT SIGNAL CONNECTIONS AND SETUP

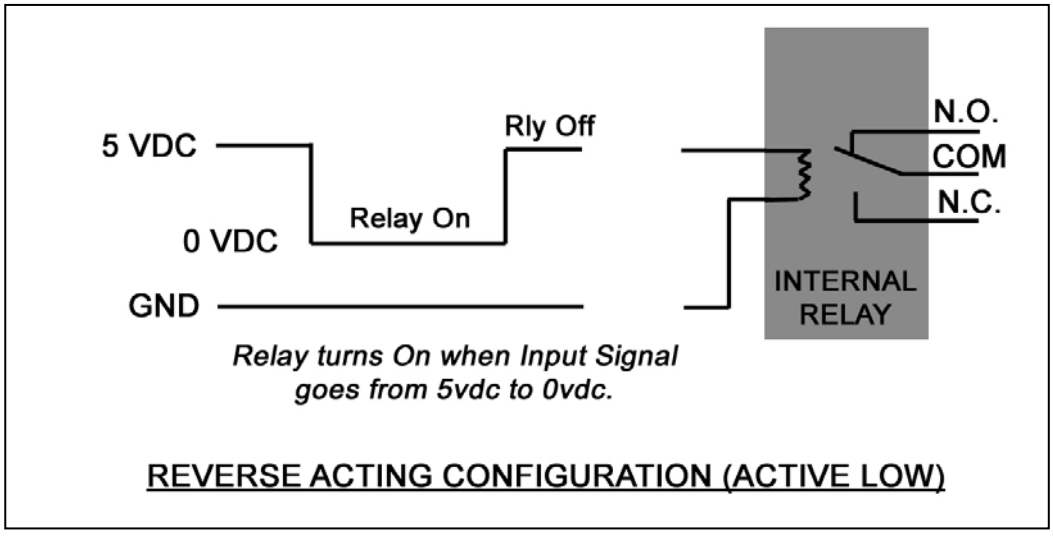
In addition to accepting logic level input signals, Relay-URM series also allows the Input for each Relay to be configured as Active High, Active Low or to activate on a remote contact/switch closure. Most control instruments provide an output which is typically a 5vdc signal. These signals will work properly with Relay-URM units. Relay-URM will also work properly with instruments that have a 12vdc or 24vdc signals limited to a **maximum current of 10 milliamp** (consult your control instrument's manufacturer specifications). ***However, if higher voltage signals are being used (e.g. connecting directly to 12vdc or 24vdc power supply), then care should be taken that the current is limited for such signals. This can be easily accomplished by putting a resistor in series with the Control signal so that the current is limited to under 10 milliamps maximum (e.g. a 1.5K ohm resistor in series with a 12vdc signal will limit the current to 8 milliamp or a 3K ohm resistor in series with a 24vdc signal will reduce the current to 8 milliamp).***

Also, all the Active High (direct acting) inputs (e.g. Pins 2 and 3 for Relay1) are optically isolated inputs and can thus be used with instruments that may have Open collector outputs with Vcc (e.g. 5vdc) signals tied together. Many Instruments that have multiple Open Collector outputs have a common Vcc (e.g. 5vdc) and the grounds are switched for output switching. Optically isolated inputs on RELAY-URM are useful for such applications.

ACTIVE LOW INPUT SIGNAL (REVERSE ACTING)

In Active Low configuration, the relay comes on when Input Signal goes from a high level to 0vdc e.g. in the figure below, the relay turns on when the input signal goes from a high level of 5vdc to a 0vdc level. Relay will stay energized for as long as the Input Signal stays low. On Input Signal going back high (5vdc), the relay will de-energize and the LED on the front panel will turn off indicating relay status as off. For example, to setup Relay 1 with an active low input signal, connect the Positive of the signal to Pin 1 of the top signal connector (refer to Figure 2) and the negative (ground) to Pin 2 of the connector. Thus, Relay 1 will come on when the signal goes from 5vdc to 0vdc. It will de-energize when the signal goes back to 5vdc.

Figure 4: Active Low Input Signal (Reverse acting)



The following diagram provides the pin out detail of the method of activating relays 1 through 4 on a low going signal. It requires connecting four ground wires from outputs 1 through 4 (on

external Controller/Indicator/PLC etc) to Pin 14 (Auxiliary Supply Ground) of the Output connector on RELAY-URM unit. This will tie the ground on two systems together.

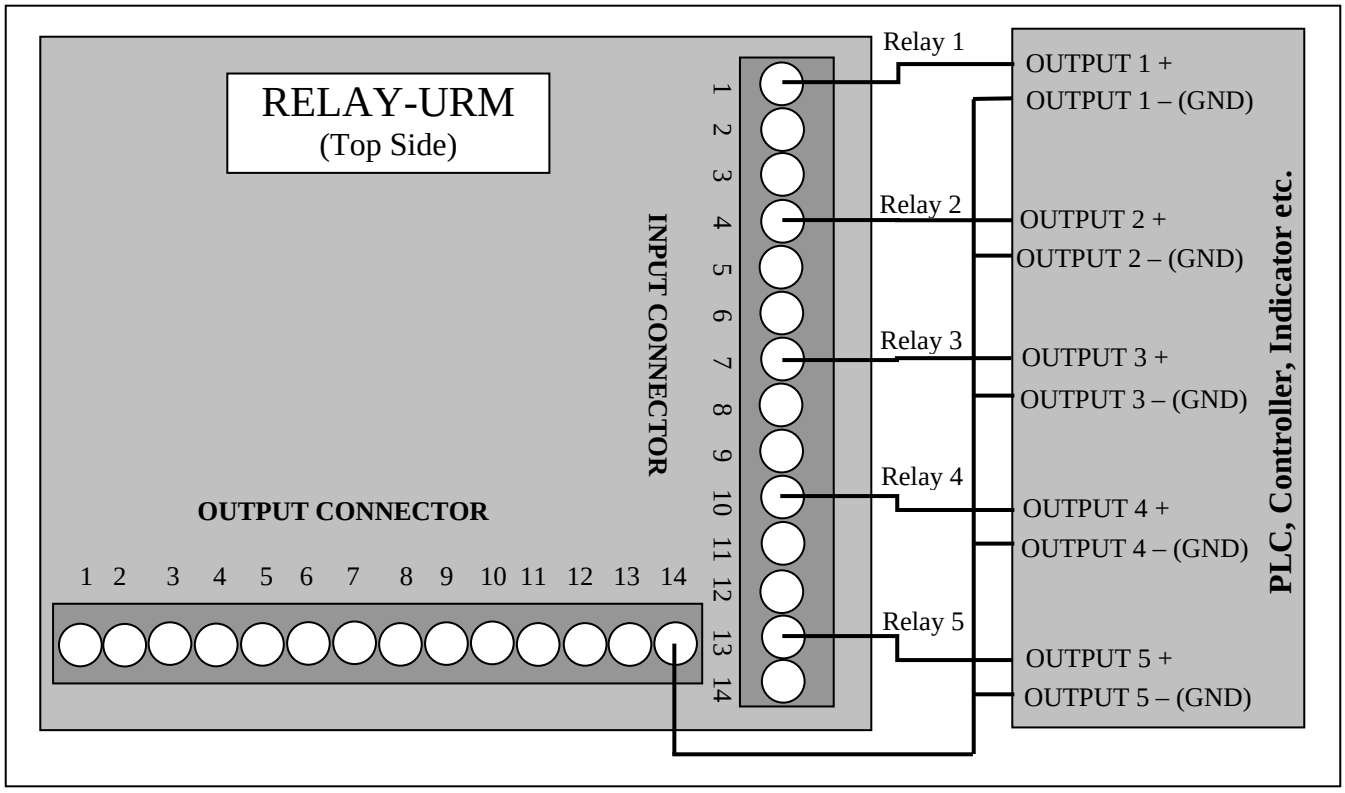


Figure 5: Wiring for Active Low Signal for Relays 1-4 and Relay 5

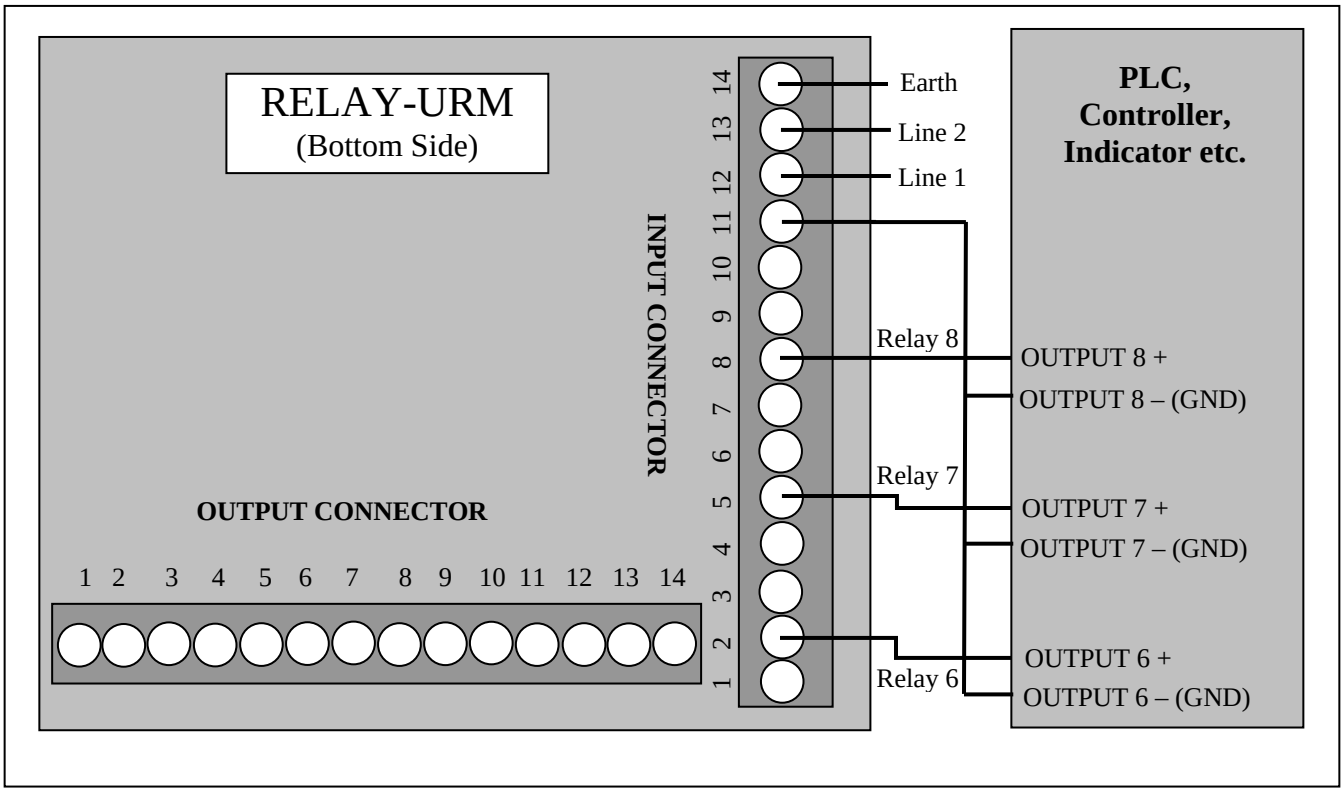


Figure 6: Wiring for Active Low Signal for Relays 6-8

ACTIVE HIGH INPUT SIGNAL (DIRECT ACTING)

In Active High (Direct Acting) configuration, the relay comes on when Input Signal goes from a low level to 5vdc (goes high) e.g. in the figure below, the relay turns on when the input signal goes from a low level of 0vdc to a 5vdc level. Relay will stay energized for as long as the Input Signal stays high. On Input Signal going back low (0vdc), the relay will de-energize and the LED on the front panel will turn off indicating relay status as off. For example, to setup Relay 1 with an active high input signal, connect the Positive of the signal to Pin 3 of the top signal connector (refer to Figure 2) and the negative (ground) to Pin 2 of the connector. Thus, Relay 1 will come on when the signal goes from 0vdc to 5vdc. It will de-energize when the signal goes back down to 0vdc.

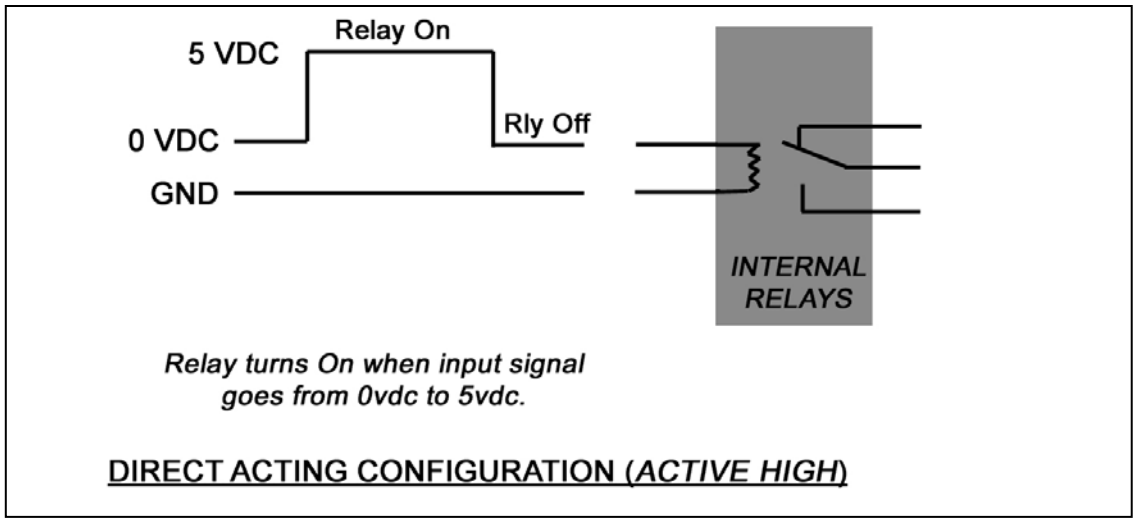
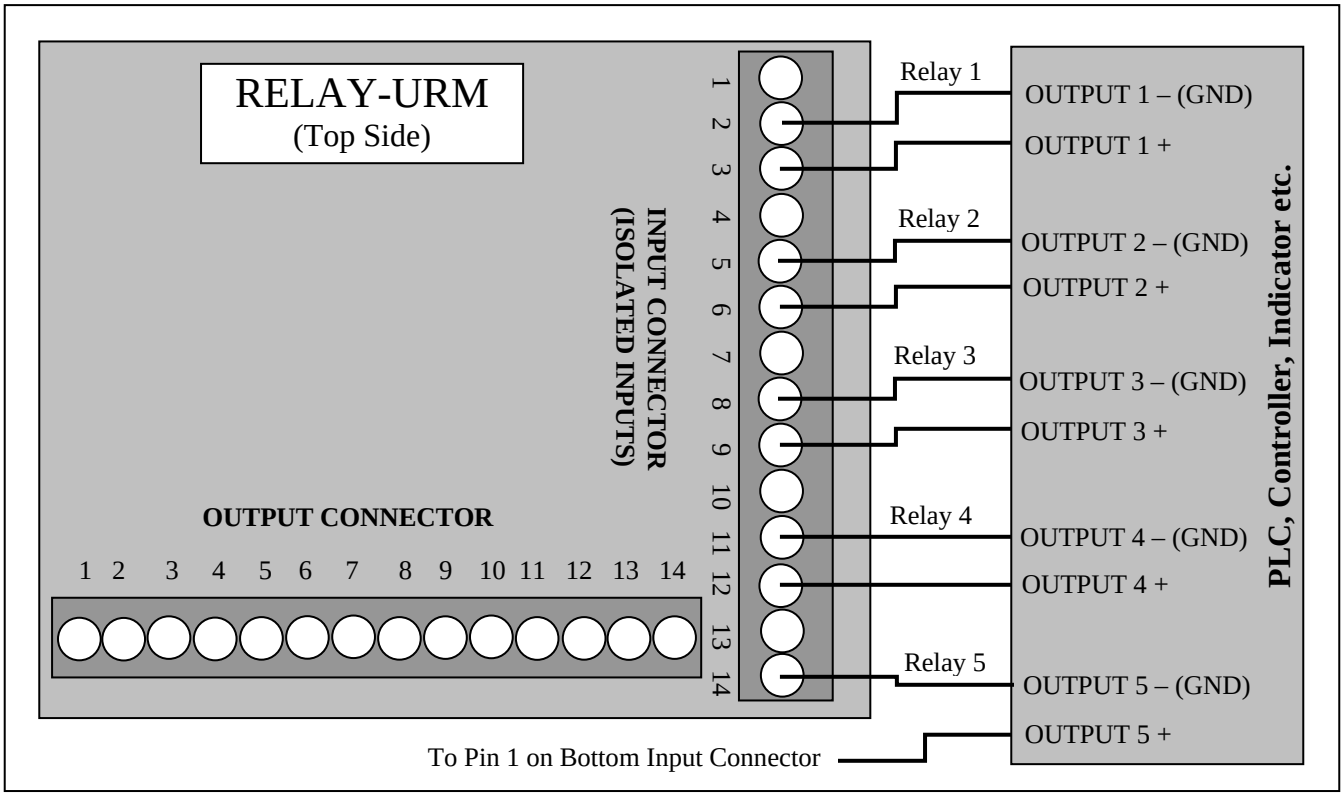


Figure 7: Active High Input Signal Hookup for Relays 1-5 – (Direct Acting)



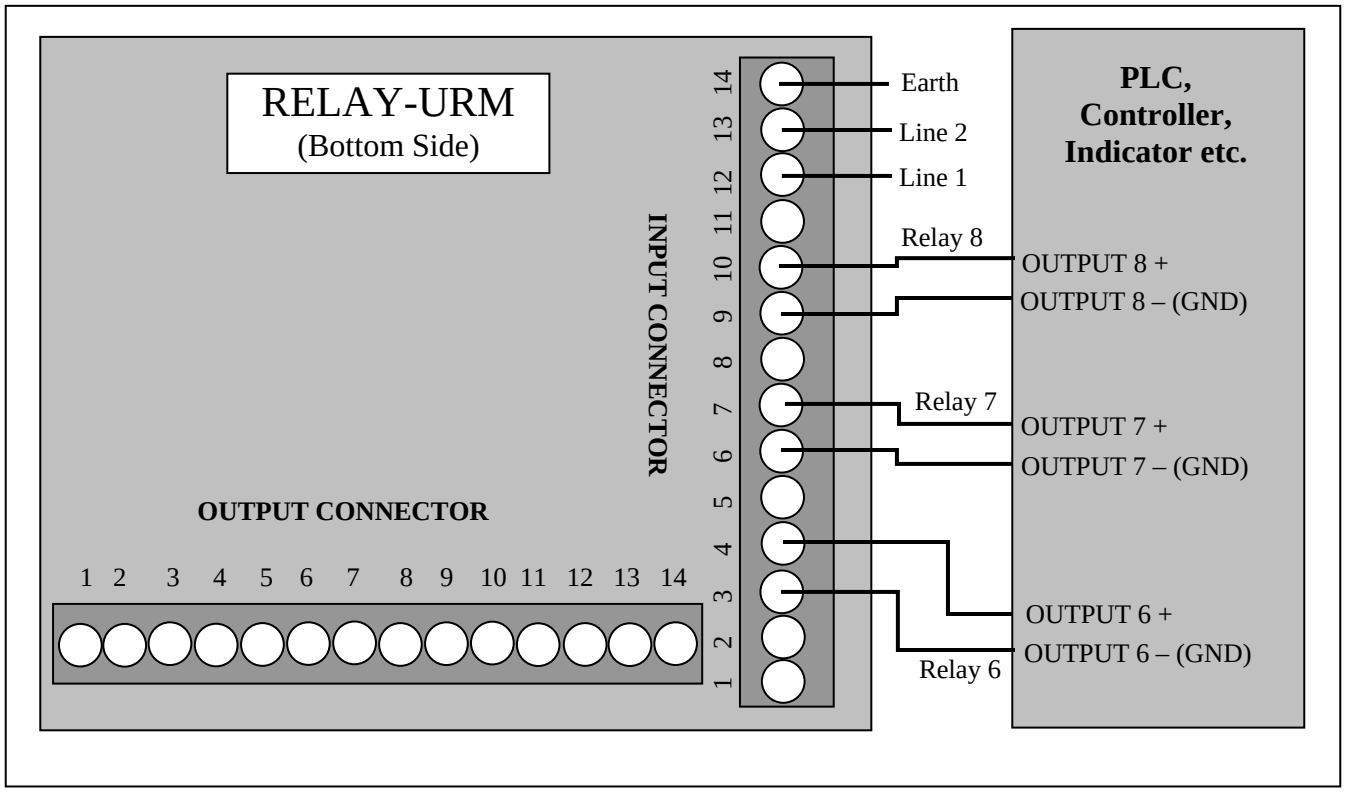


Figure 8: Active High Input Signal Hookup for Relays 6-8 – (Direct Acting)

NOTE: ***MAKE SURE THAT DIRECT ACTING AND REVERSE ACTING SIGNAL IS NOT CONNECTED INTO THE SAME RELAY AT THE SAME TIME. AN INPUT SHOULD EITHER HAVE A DIRECT ACTING OR A REVERSE ACTING SIGNAL … NOT BOTH. APPLYING BOTH SIGNALS TO THE SAME INPUT AT THE SAME TIME WILL DAMAGE THE UNIT PERMANENTLY.***

REMOTE SWITCH/CONTACT ACTIVATION:

Many process control instruments have low power relays which provide contact closure for low amperage switching but are not suitable for handling heavy loads. In such applications, Relay-URM series comes in handy. Simply connect the low power relay contact output to Relay-URM unit and instantly you have the capability of up to eight 15 ampere load switching relays. For example, if it is desired to activate Relay number 1 on a remote switch or contact closure, then connect the remote switch/contact to Pin 1 (on Top Signal Connector) and 14 (on the top Output Connector as shown in figure 7 . This will activate Relay number 1 whenever remote switch/contact is closed and will remain active till the switch/contact is opened. Refer to the following tables for detail on configuring all the eight relays.

REMOTE SWITCH/CONTACT FOR RELAYS 1-4:

The following table provides detailed input connections for Relays 1 through 4. They will be activated when Pin 14 (on Output Connector-see Fig. 9) is connected to Active low pins of relays 1-4 (i.e. Pins 1, 4, 7,& 10) through the remote switch/contact.

PIN NO. (Top Signal Connector)	DESCRIPTION
1	Remote Switch/Contact connection1 for Relay # 1
2	No Connection
3	No Connection
4	Remote Switch/Contact connection1 for Relay # 2
5	No Connection
6	No Connection
7	Remote Switch/Contact connection1 for Relay # 3
8	No Connection
9	No Connection
10	Remote Switch/Contact connection1 for Relay # 4
11	No Connection
12	No Connection
13	Remote Switch/Contact connection1 for Relay # 5
14	No Connection

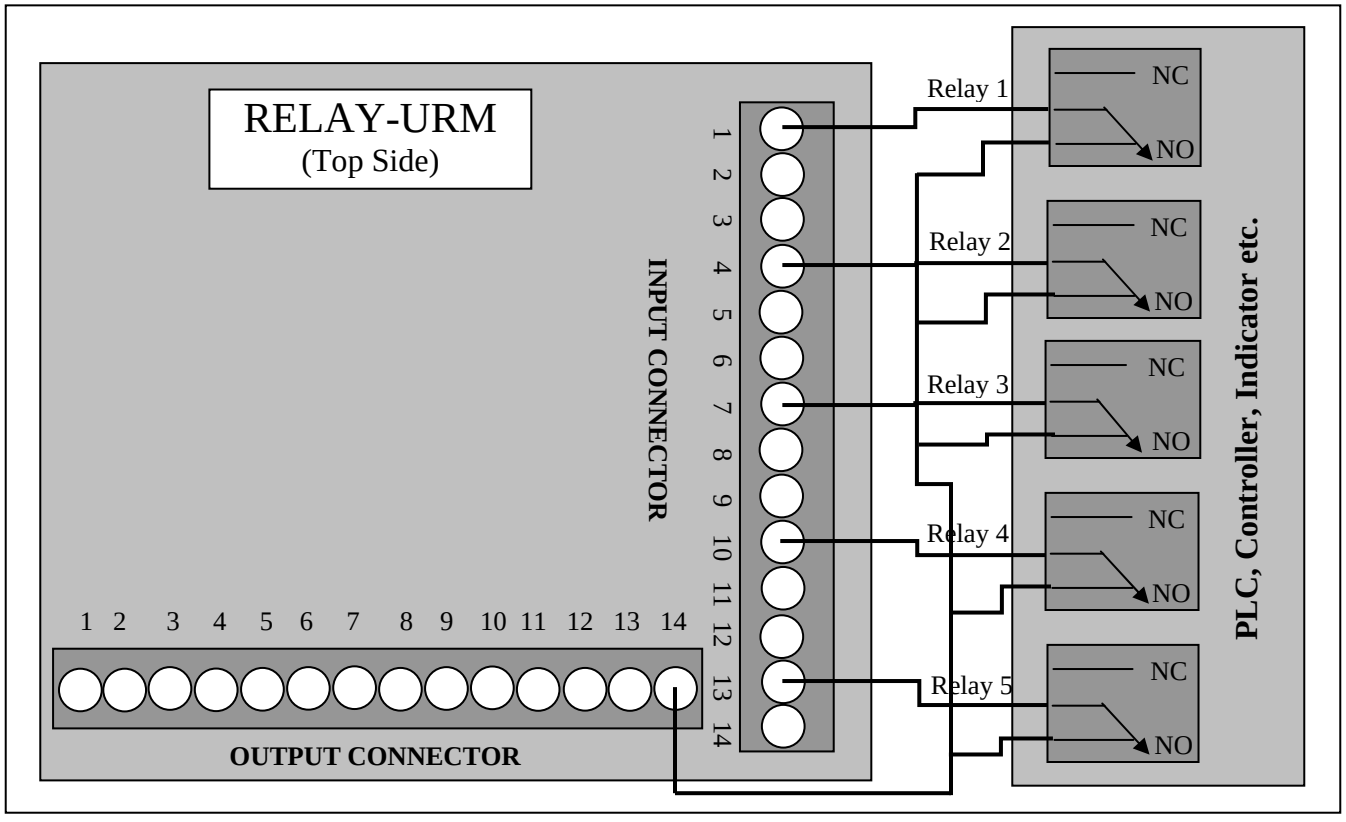


Figure 9: Wiring for Remote Switch/Contact Activation of Relays 1-4

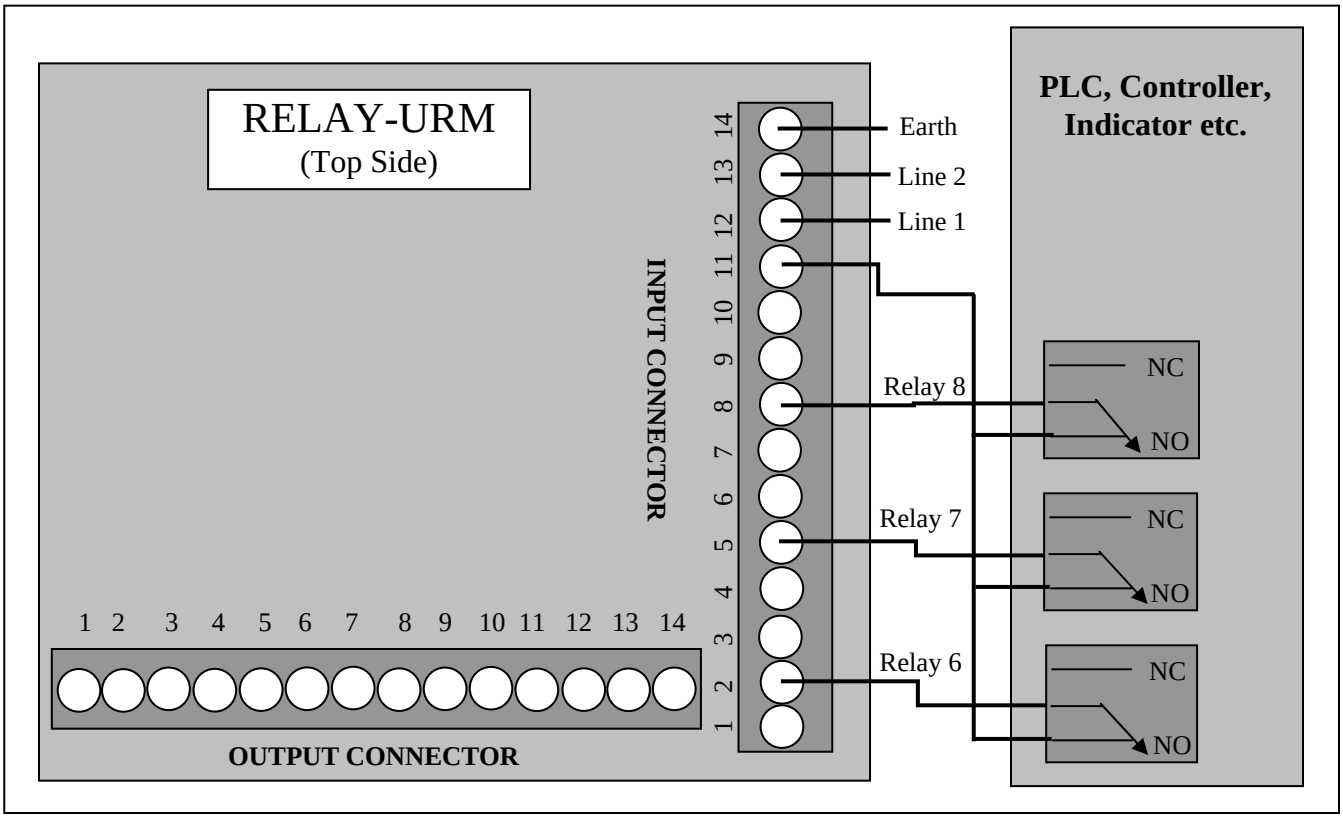


Figure 10: Wiring for Remote Switch/Contact Activation of Relays 5-8

REMOTE SWITCH/CONTACT FOR RELAYS 5-8:

Figures 10 and 11 shows input and output connections for Relays 5 through 8. Following is the detail about those connections:

PIN NO.	**INPUT CONNECTION DESCRIPTION**
13 (Top Input Connector)	Remote Switch/Contact connection1 for Relay # 5
14 (Top Input Connector)	Remote Switch/Contact connection 2 for Relay # 5
1	No Connection
2	Remote Switch/Contact connection1 for Relay # 6
3	No Connection
4	No Connection
5	Remote Switch/Contact connection1 for Relay # 7
6	No Connection
7	No Connection
8	Remote Switch/Contact connection1 for Relay # 8
9	No Connection
10	No Connection
11	Common Connection for Relays 6, 7 & 8
12	AC Line 1
13	AC Line 2
14	Earth

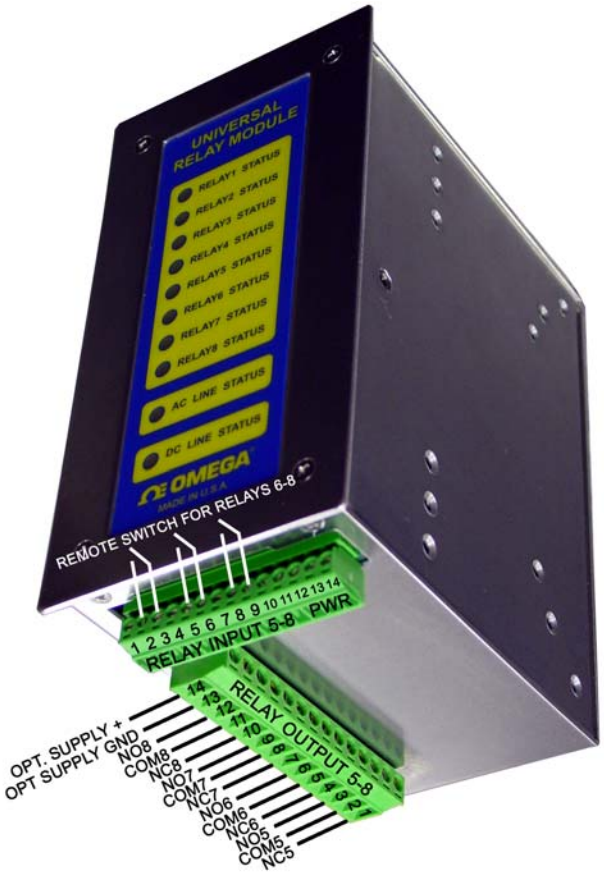


Figure 11: Remote Switch/Contact Activation of Relays 6-8

POWER SUPPLY:

Relay-URM comes with a built-in power supply which provides power to the internal electronics. Additionally, it also provides 20watts of power for external use. This is brought out on terminals 13 and 14 of the top output connector. Pin 14 is Supply ground and Pin 13 is +5vdc. Optionally, 12 or 24 volt supply is available. This optional supply output is available on pins 13 and 14 of the bottom output connector. Pin 13 is Supply ground and Pin 14 is Supply Positive output (on the bottom Output Connector). For connection detail, refer to “Output Connections” above.

MOUNTING:

Versatility of Relay-URM enclosure allows it to be mounted in a number of different ways. For applications requiring the unit to be housed in another enclosure, front panel mounting can be used. For those applications which require DIN-Rail mounting, the unit can be ordered with DIN-Rail mounting accessory. The unit can just as easily be mounted on a wall, if that is what the application calls for. Following pictures show mounting of the units in three different ways.

Figure 12: Mounting configurations

PANEL CUTOUT DIMENSIONS

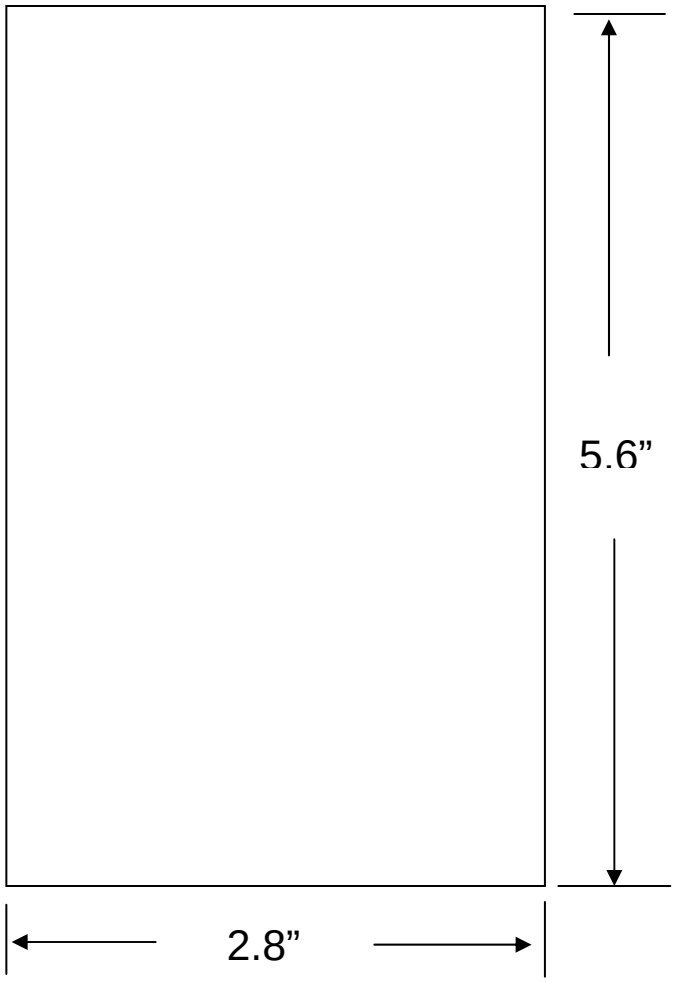


Figure -13. Panel Cutout dimensions

1. Cut out Panel per the dimensions shown in figure 6.
2. Remove the screws from the mounting bracket (if screwed to the unit).
3. Insert the unit into the hole until it is flush with the panel.
4. Install the mounting bracket, push it tight against the panel and then tighten the screws.

MADE IN USA

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) 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 which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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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:

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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
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- Datalogging 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

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