MANUFACTURER DATA SHEET

PLC-CPU

Manufacturer:

Allen-Bradley/Rockwell

Model Number:

MicroLogic 1500

See www.geomartin.com for additional PDF datasheets

Martin Part Number:	VendorPartNumber:
E-065167-01	AB# 1764-24BWA. Base Unit
E-065174-00	AB# 1764-LSP, Processor 7K
E-065167-00	AB# 1764-LRP, Processor 14K

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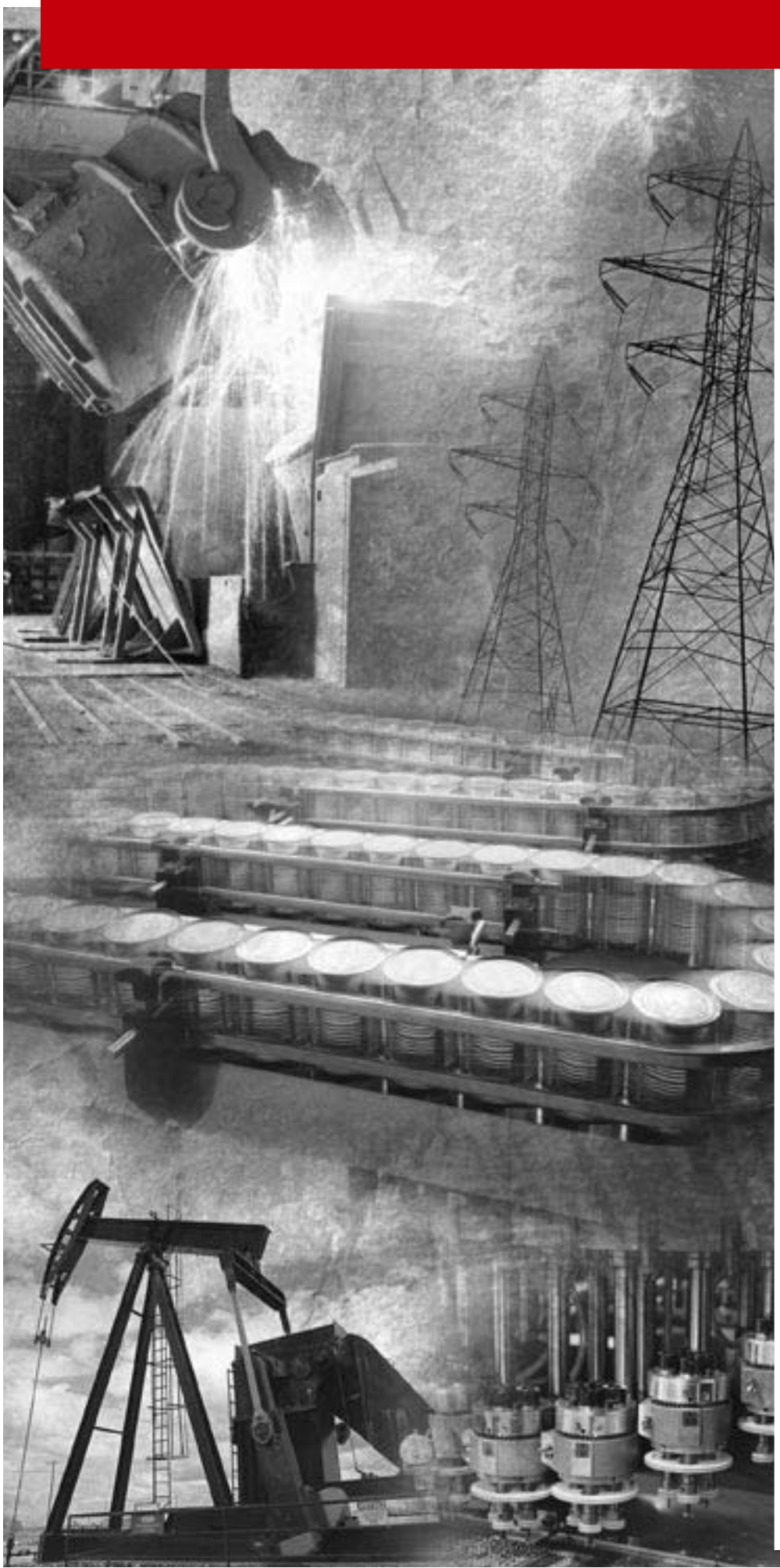


Allen-Bradley

MicroLogix™ 1500 Programmable Controllers

(Bulletin 1764)

User Manual

Rockwell Automation

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell International Corporation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Rockwell Automation publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Rockwell Automation office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION

Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss

Attention statements help you to:

- identify a hazard
- avoid a hazard
- recognize the consequences

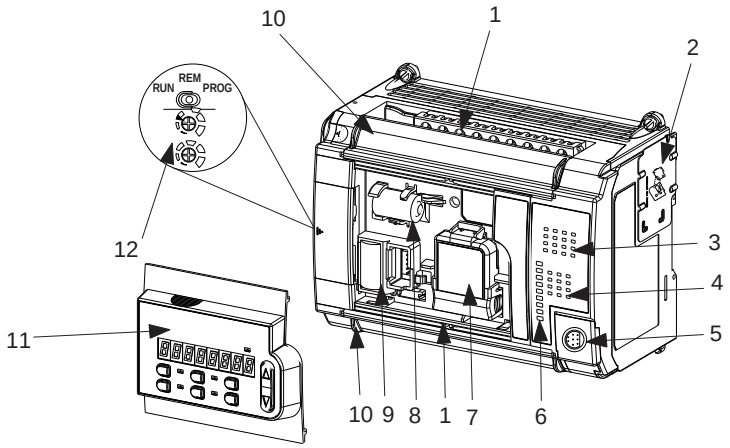
IMPORTANT Identifies information that is critical for successful application and understanding of the product.

Hardware Overview

Hardware Features

The MicroLogix 1500 programmable controller contains a power supply, input circuits, output circuits, and a processor. The controller is available in 24 I/O and 28 I/O configurations.

The hardware features of the controller are:



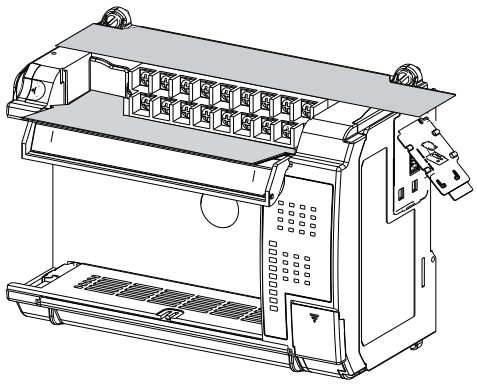
Feature	Description	Feature	Description
1	Removable Terminal Blocks	7	Memory Module/Real-Time Clock(1)
2	Interface to Expansion I/O, Removable ESD Barrier	8	Replacement Battery(1)
3	Input LEDs	9	Battery
4	Output LEDs	10	Terminal Doors and Label
5	Communication Port	11	Data Access Tool(1)
6	Status LEDs	12	Mode Switch, Trim Pots

(1) Optional.

MicroLogix 1500 Component Descriptions

A controller is composed of a standard processor (1764-LSP or enhanced 1764-LRP with RS-232 port) and one of the base units listed below. The FET transistor outputs are available on the 1764-28BXB base only.

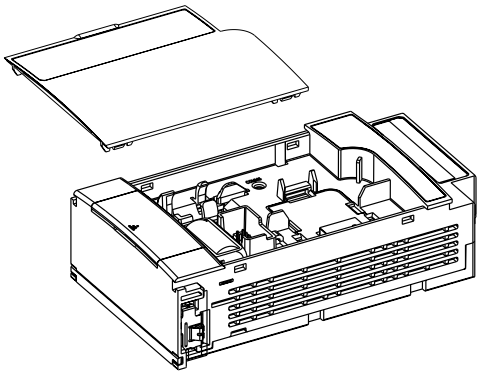
Base Units



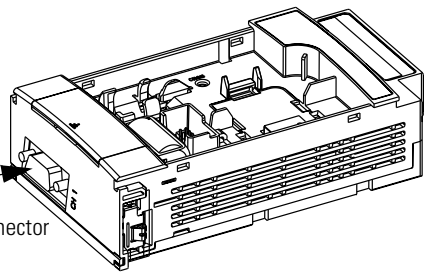
Catalog Number	Base Unit I/O and Power Supply
1764-24AWA	Twelve 120V ac inputs, twelve relay outputs and 120/240V ac power supply
1764-24BWA	Twelve 24V dc inputs, twelve relay outputs and 120/240V ac power supply
1764-28BXB	Sixteen 24V dc inputs, six FET and six relay outputs and 24V dc power supply

Processors

Processor (Catalog Number 1764-LSP)



Processor (Catalog Number 1764-LRP)

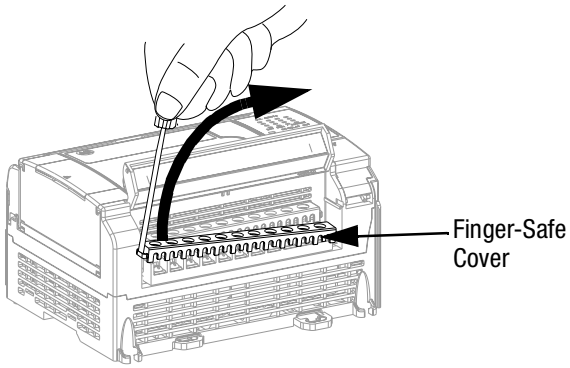


Communications Port
- DTE (male) 9-pin D-shell connector
- 30V dc isolation

Wiring with Spade Lugs

The diameter of the terminal screw head is 5.5 mm (0.220 in.). The input and output terminals of the MicroLogix 1500 base unit are designed for a 6.35mm (0.25 in.) wide spade (standard for #6 screw for up to 14 AWG) or a 4 mm (metric #4) fork terminal.

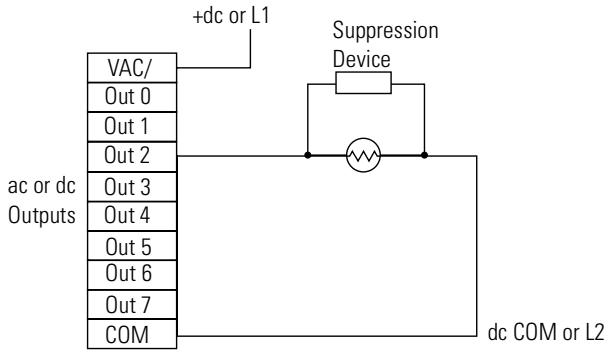
When using spade lugs, use a small, flat-blade screwdriver to pry the finger-safe cover from the terminal blocks as shown below. Then loosen the terminal screw.



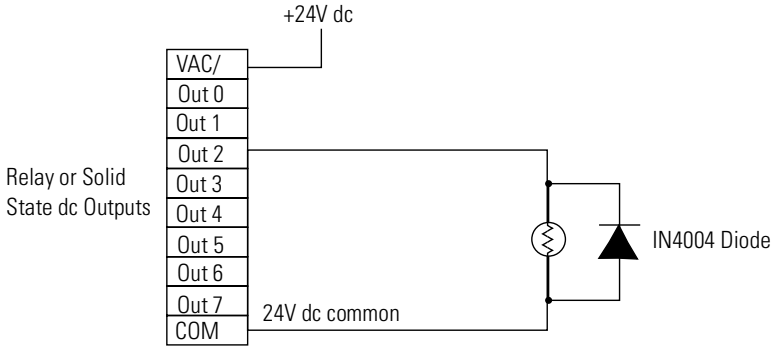
Using Surge Suppressors

Inductive load devices, such as motor starters and solenoids, require the use of some type of surge suppression to protect and extend the operating life of the controller's output contacts. Switching inductive loads without surge suppression can *significantly* reduce the life expectancy of relay contacts. By adding a suppression device directly across the coil of an inductive device, you prolong the life of the output or relay contacts. You also reduce the effects of voltage transients and electrical noise from radiating into adjacent systems.

The following diagram shows an output with a suppression device. We recommend that you locate the suppression device as close as possible to the load device.

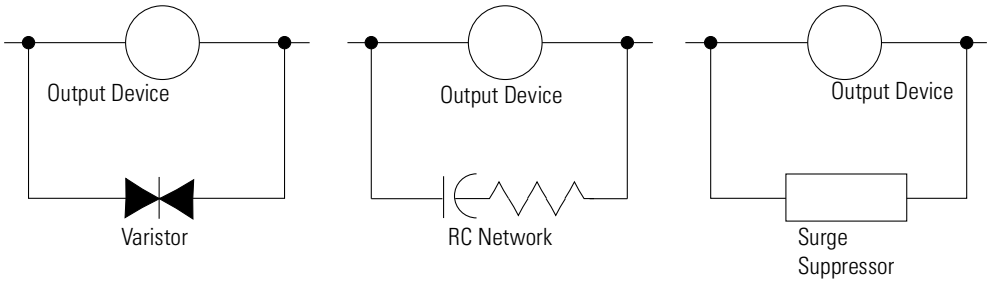


If the outputs are dc, we recommend that you use an 1N4004 diode for surge suppression, as shown below.



Suitable surge suppression methods for inductive ac load devices include a varistor, an RC network, or an Allen-Bradley surge suppressor, all shown below. These components must be appropriately rated to suppress the switching transient characteristic of the particular inductive device. See the table on page 3-5 for recommended suppressors.

Surge Suppression for Inductive ac Load Devices



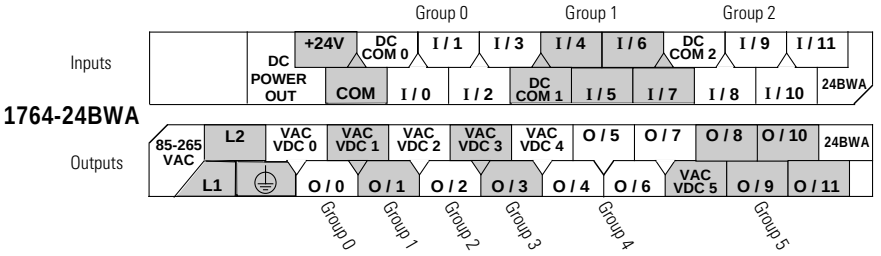
If you connect an expansion I/O triac output to control an inductive load, we recommend that you use varistors to suppress noise. Choose a varistor that is appropriate for the application. The suppressors we recommend for triac outputs when switching 120V ac inductive loads are a Harris MOV, part number V175 LA10A, or an Allen-Bradley MOV, catalog number 599-K04 or 599-KA04. Consult the varistor manufacturer's data sheet when selecting a varistor for your application

For inductive dc load devices, a diode is suitable. A 1N4004 diode is acceptable for most applications. A surge suppressor can also be used. See the table on page 3-5 for recommended suppressors.

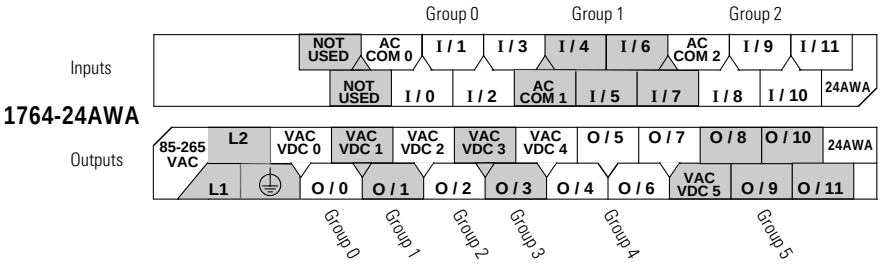
Terminal Block Layouts

The base unit terminal block layouts are shown below. The shading on the labels indicates how the terminals are grouped. A detail of the groupings is shown in the table following the terminal block layouts.

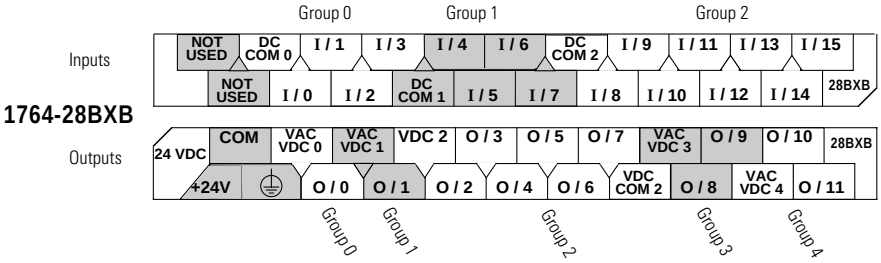
1764-24BWA



1764-24AWA



1764-28BXB



Terminal Groupings

Controller	Inputs		
	Input Group	**Common Terminal**	**Input Terminal**
1764-24BWA	Group 0	DC COM 0	I/0 through I/3
	Group 1	DC COM 1	I/4 through I/7
	Group 2	DC COM 2	I/8 through I/11
1764-24AWA	Group 0	AC COM 0	I/0 through I/3
	Group 1	AC COM 1	I/4 through I/7
	Group 2	AC COM 2	I/8 through I/11
1764-28BXB	Group 0	DC COM 0	I/0 through I/3
	Group 1	DC COM 1	I/4 through I/7
	Group 2	DC COM 2	I/8 through I/15

Controller	Outputs		
	Output Group	**Voltage Terminal**	**Output Terminal**
1764-24BWA	Group 0	VAC/VDC 0	O/0
	Group 1	VAC/VDC 1	O/1
	Group 2	VAC/VDC 2	O/2
	Group 3	VAC/VDC 3	O/3
	Group 4	VAC/VDC 4	O/4 through O/7
	Group 5	VAC/VDC 5	O/8 through O/11
1764-24AWA	Group 0	VAC/VDC 0	O/0
	Group 1	VAC/VDC 1	O/1
	Group 2	VAC/VDC 2	O/2
	Group 3	VAC/VDC 3	O/3
	Group 4	VAC/VDC 4	O/4 through O/7
	Group 5	VAC/VDC 5	O/8 through O/11
1764-28BXB	Group 0	VAC/VDC 0	O/0
	Group 1	VAC/VDC 1	O/1
	Group 2	VDC 2, VDC COM 2	O/2 through O/7
	Group 3	VAC/VDC 3	O/8 and O/9
	Group 4	VAC/VDC 4	O/10 and O/11

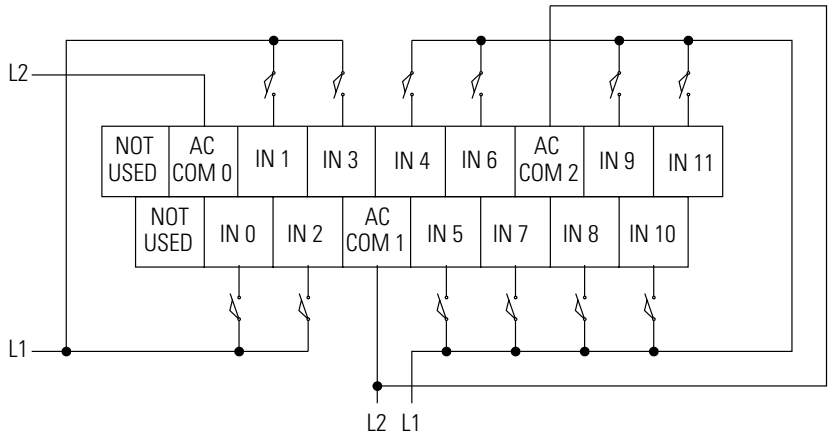
Sinking and Sourcing Circuits

Any of the MicroLogix 1500 DC embedded input groups can be configured as sinking or sourcing depending on how the DC COM is wired on the group. See pages 3-11 through 3-14 for sinking and sourcing wiring diagrams.

Type	Definition
Sinking Input *connection of a PNP sourcing device*	The input energizes when high-level voltage is applied to the input terminal (active high). Connect the power supply VDC (-) to the DC COM terminal.
Sourcing Input *connection of an NPN sinking device*	The input energizes when low-level voltage is applied to the input terminal (active low). Connect the power supply VDC (+) to the DC COM terminal.

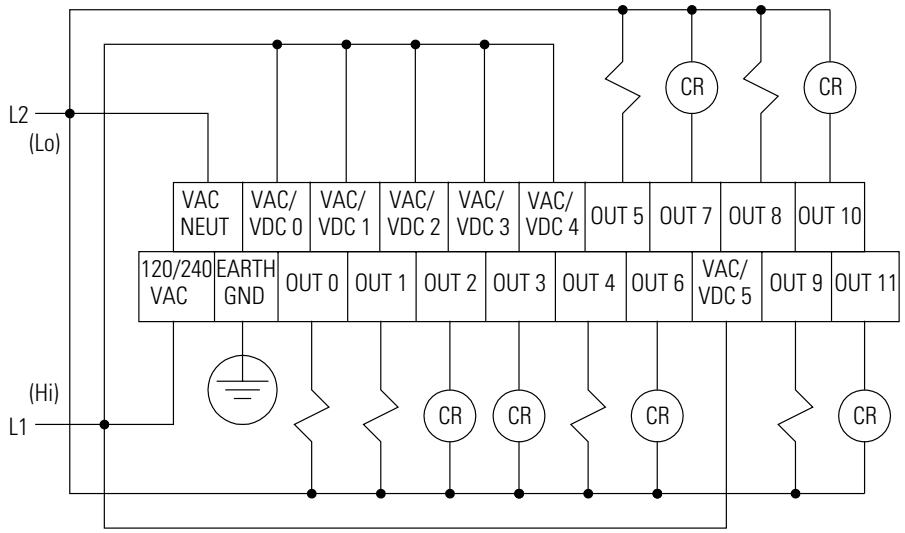
1764-24AWA Wiring Diagram

Input Terminals



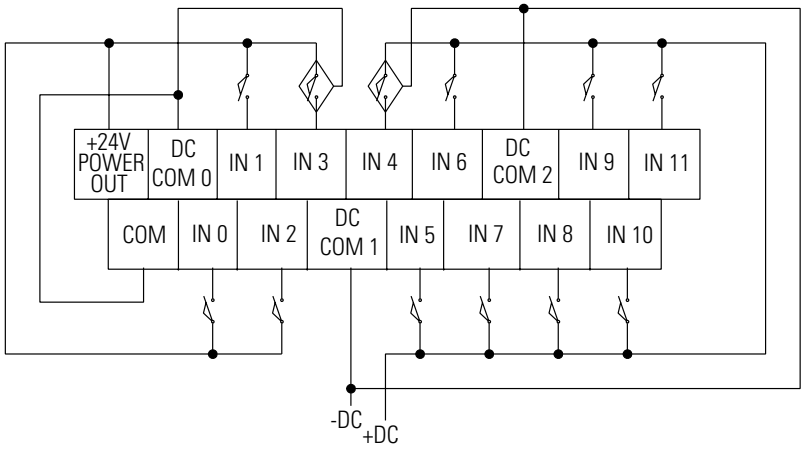
"NOT USED" terminals are not intended for use as connection points.

Output Terminals

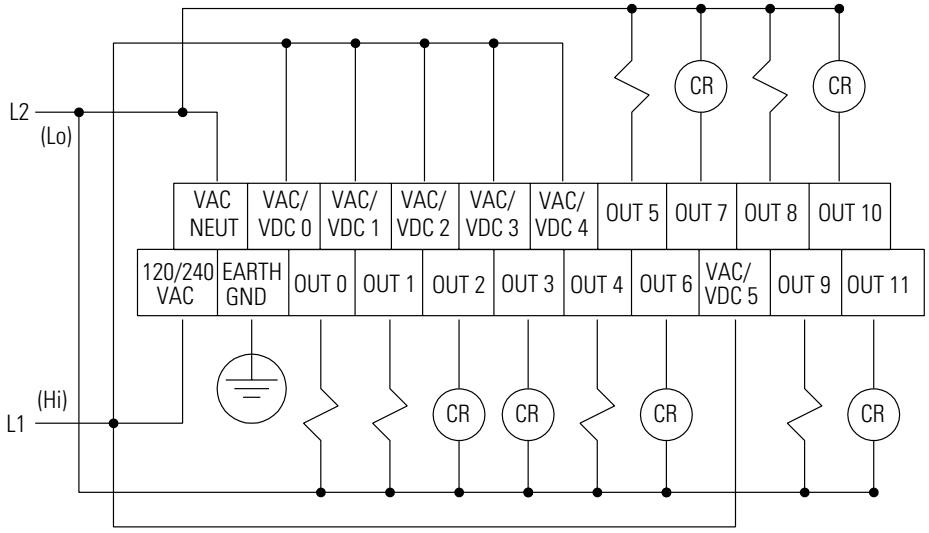


1764-24BWA Sinking Wiring Diagram

Input Terminals

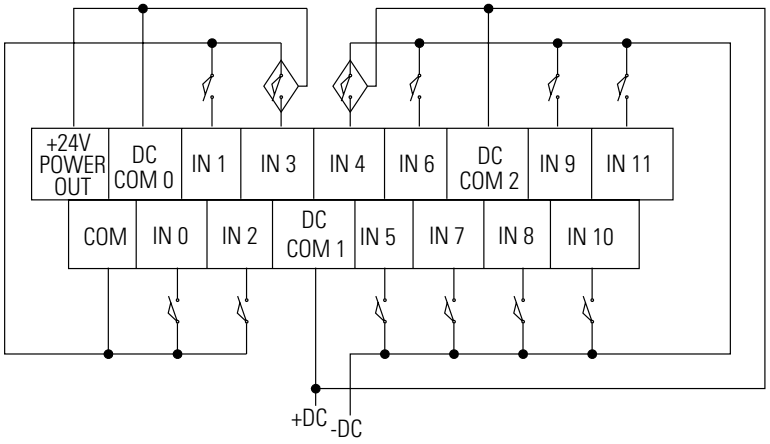


Output Terminals

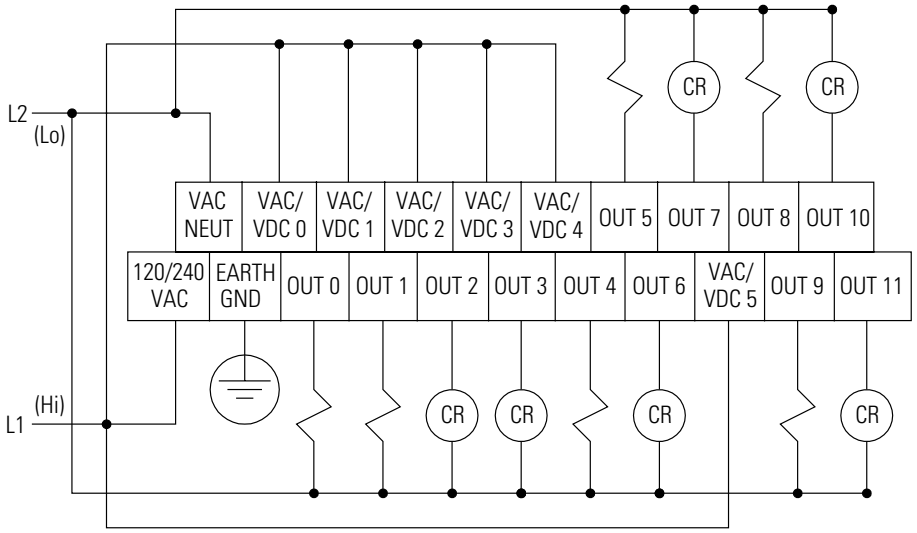


1764-24BWA Sourcing Wiring Diagram

Input Terminals

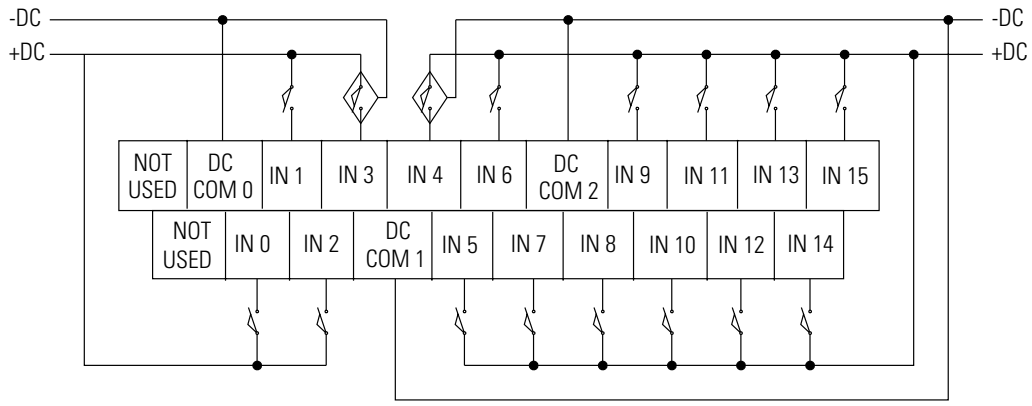


Output Terminals



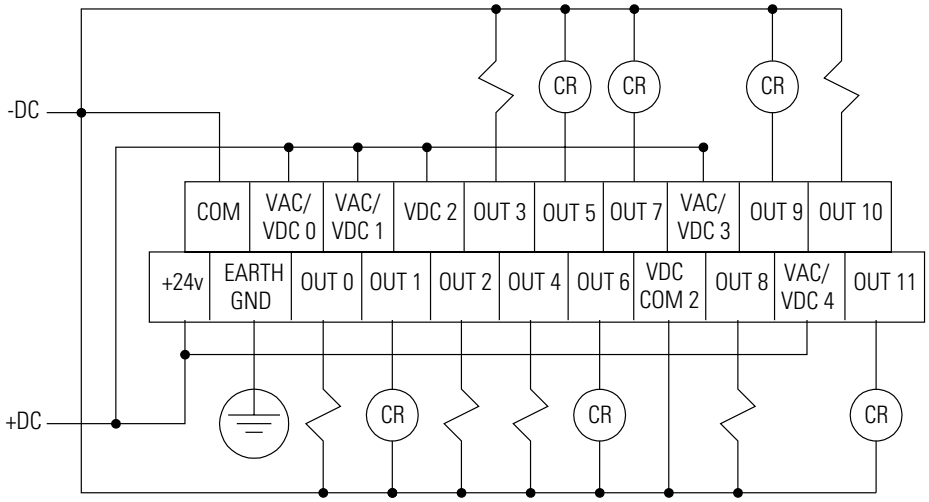
1764-28BXB Sinking Wiring Diagram

Input Terminals



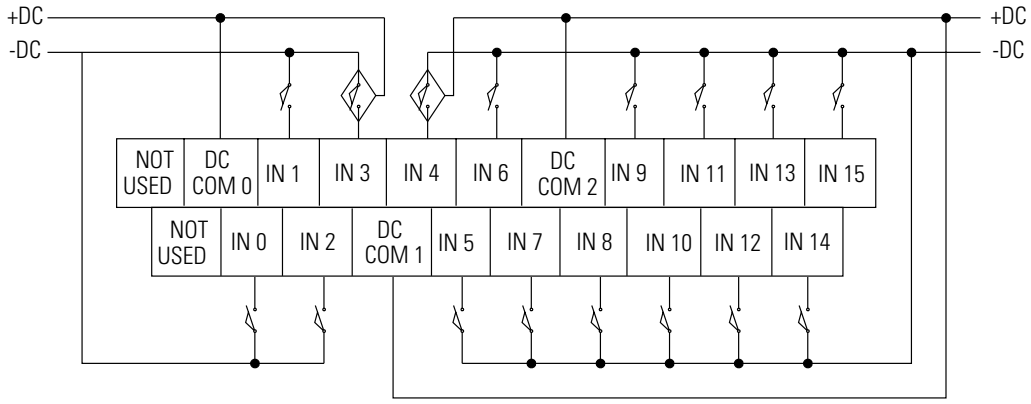
"NOT USED" terminals are not intended for use as connection points.

Output Terminals



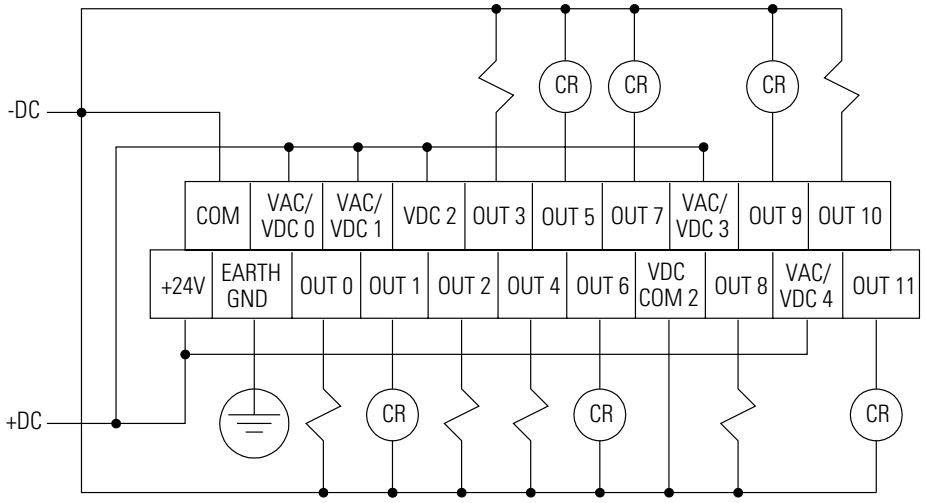
1764-28BXB Sourcing Wiring Diagram

Input Terminals



"NOT USED" terminals are not intended

Output Terminals



Lithium Battery (1747-BA)

IMPORTANT When the processor's Battery Low indicator is lit, install a replacement battery immediately. After the indicator turns on, the battery lasts for at least:

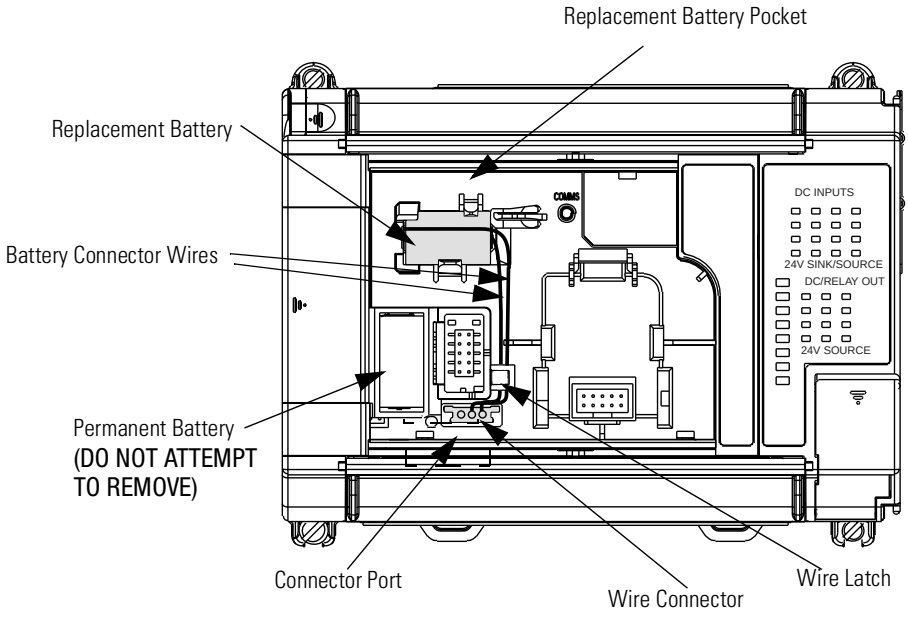
- 14 days for the 1764-LSP
- 7 days for the 1764-LRP

Installing

Follow the procedure below to ensure proper replacement battery installation.

IMPORTANT Do not remove the permanent battery when installing replacement battery.

1. Insert battery into replacement battery pocket with wires facing up.
2. Insert replacement battery wire connector into connector port.
3. Secure battery wires under wire latch (as shown below).



White Paper

Wiring Diagrams for MicroLogix™ 1500 Programmable Controllers and Compact Discrete I/O Modules

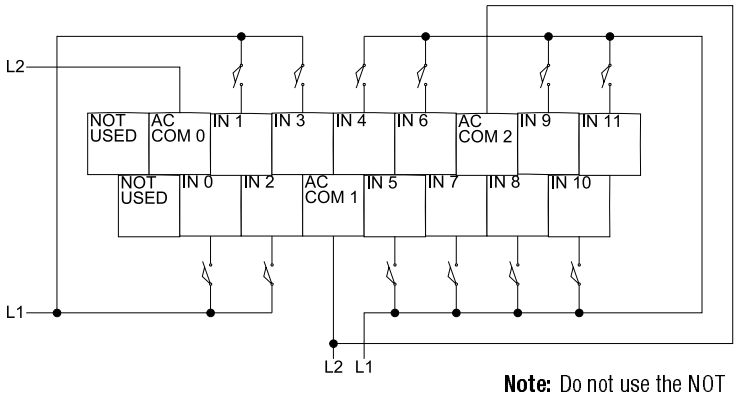
(Bulletin 1764 and 1769)

List of Diagrams

1764-901 - April 1999

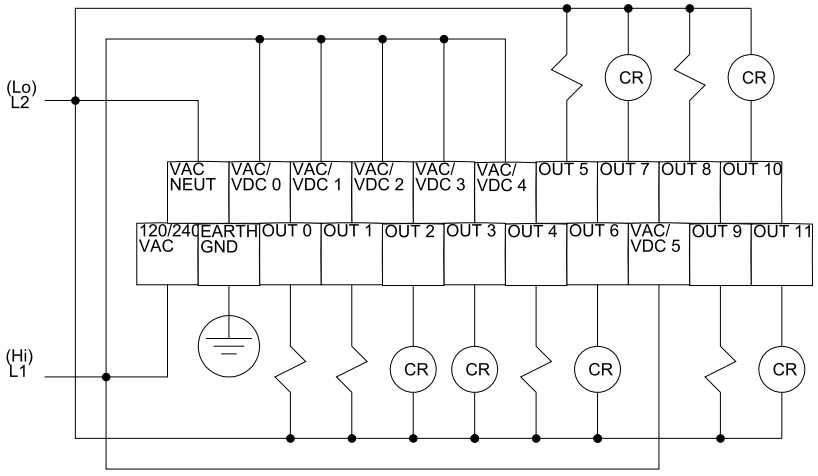
1764-24AWA Base Unit, AC Power, 12 AC Inputs/ 12 Relay Outputs

Input Terminals



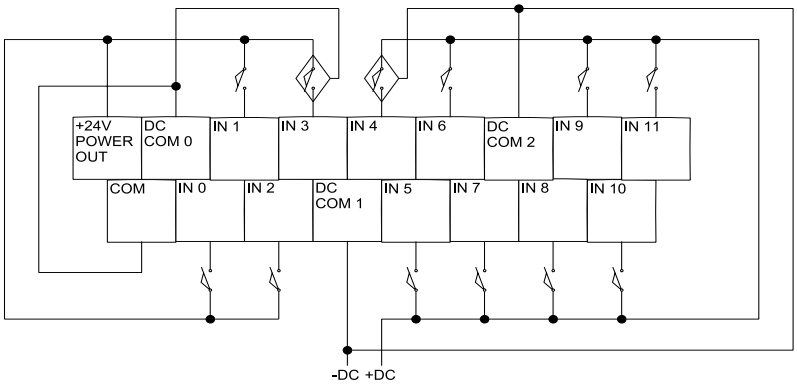
Note: Do not use the NOT USED terminals as connection points.

Output Terminals

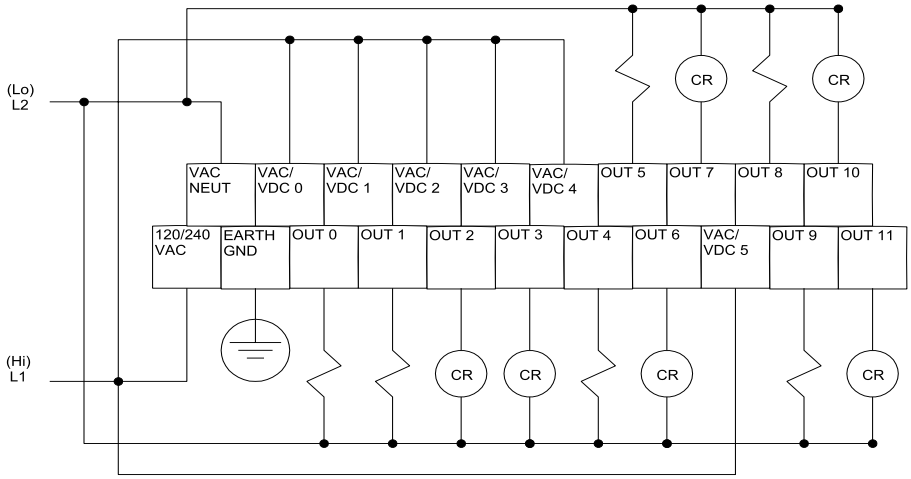


1764-24BWA Base Unit, AC Power, 12 DC Inputs/ 12 Relay Outputs - Sinking

Input Terminals

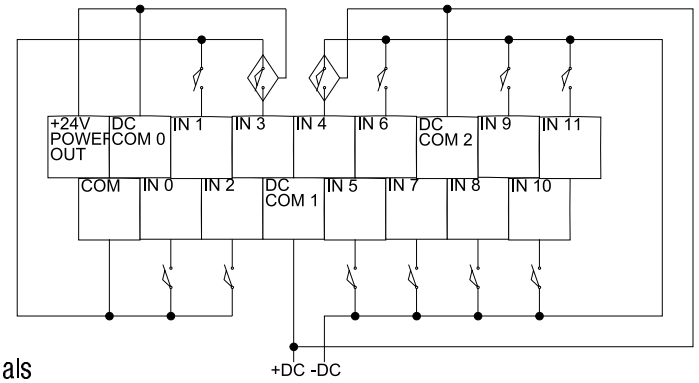


Output Terminals

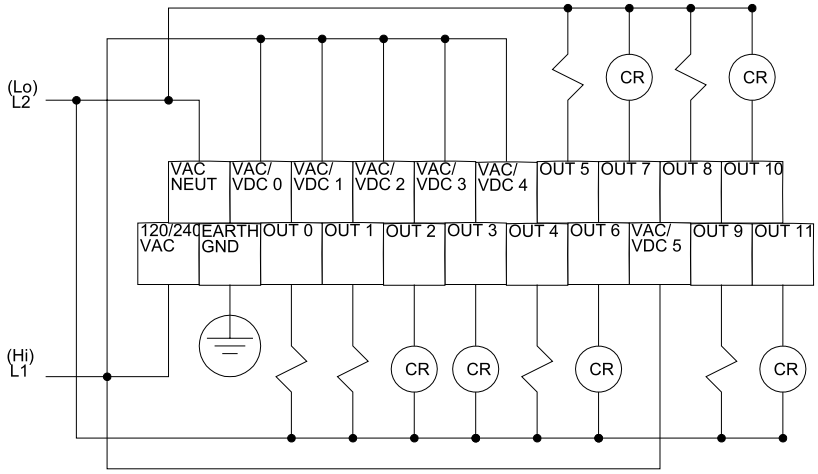


1764-24BWA Base Unit, AC Power, 12 DC Inputs/ 12 Relay Outputs - Sourcing

Input Terminals



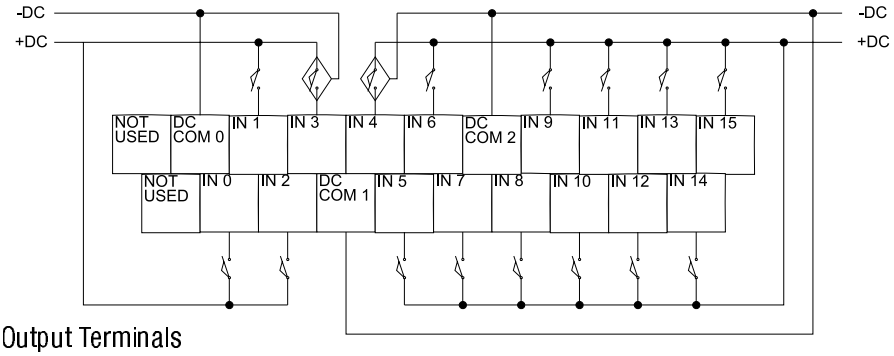
Output Terminals



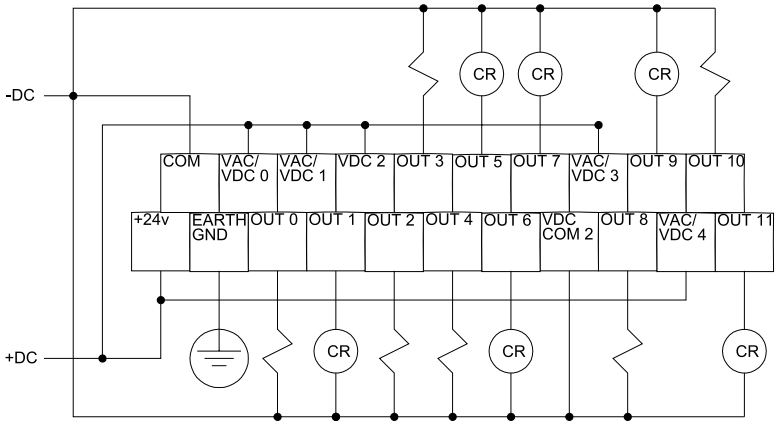
1764-28BXB Base Unit, DC Power, 16 DC Inputs/ 6 Relay and 6 FET Outputs - Sinking

Input Terminals

Note: Do not use the NOT USED terminals as connection points.



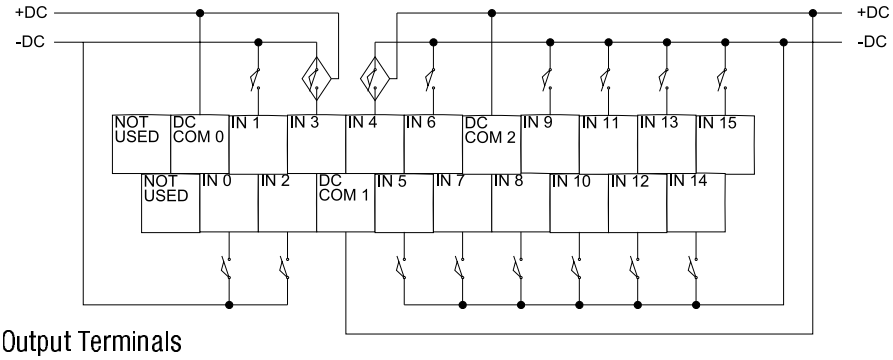
Output Terminals



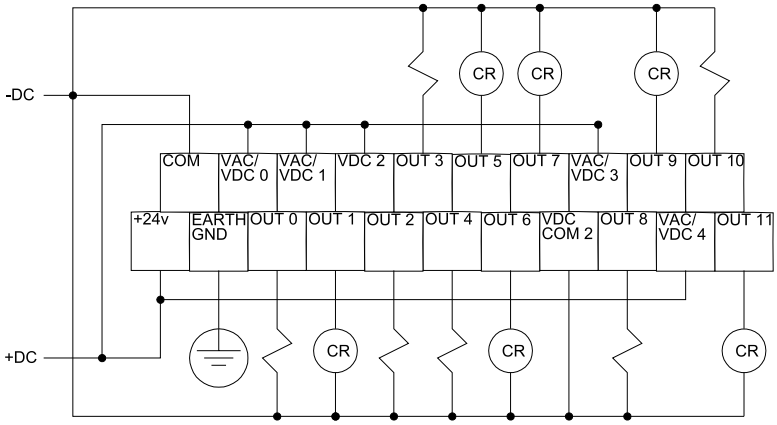
1764-28BXB Base Unit, DC Power, 16 DC Inputs/ 6 Relay and 6 FET Outputs - Sourcing

Input Terminals

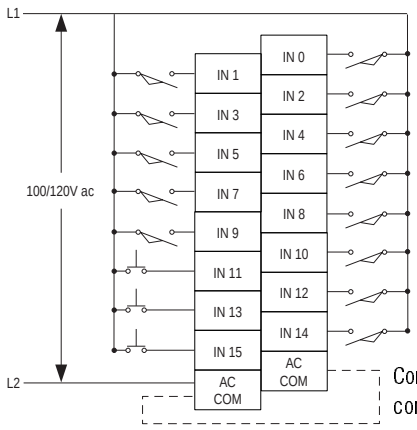
Note: Do not use the NOT USED terminals as connection points.



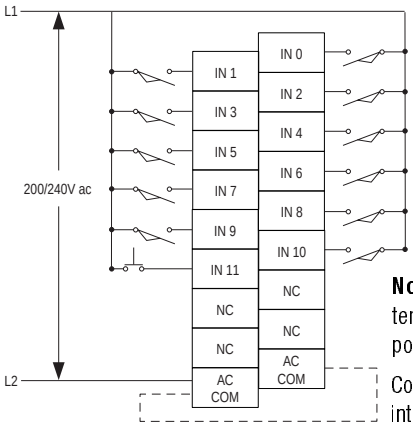
Output Terminals



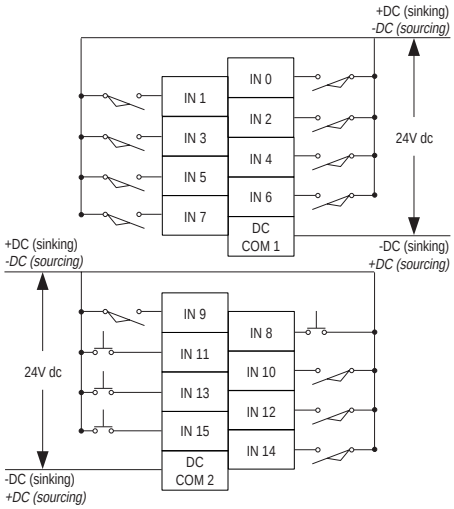
1769-IA16 100/120V ac 16-Point Input Module



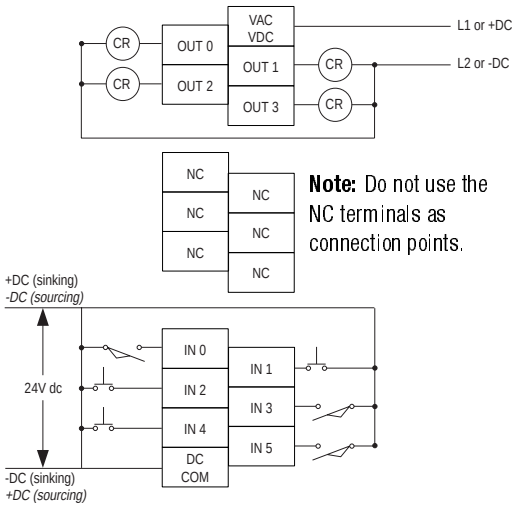
1769-IM12 200/240V ac 12-Point Input Module



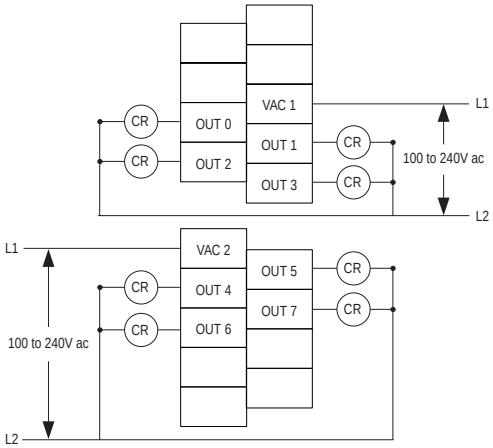
1769-IQ16 24V dc Sinking/ Sourcing 16-Point Input Module



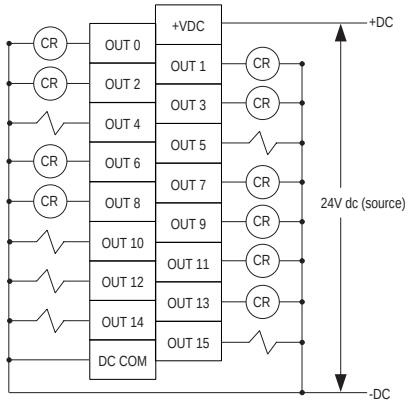
1769-IQ6XOW4 24V dc Sinking/ Sourcing 6-Point Input, AC/DC 4-Point Normally Open Relay Output Module



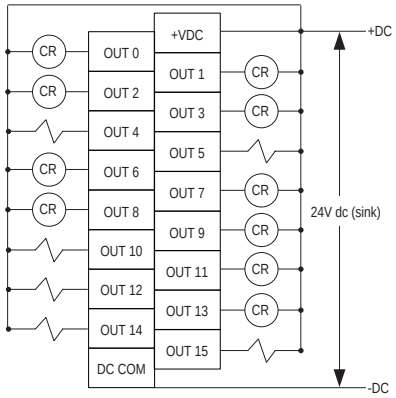
1769-OA8 100 to 240V ac 8-Point Output Module



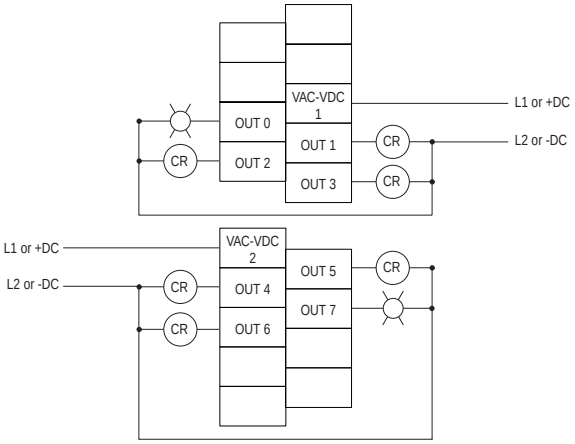
1769-OB16 24V dc Sourcing 16-Point Output Module



1769-OV16 24V dc Sinking 16-Point Output Module



1769-OW8 AC/DC Normally Open Relay 8-Point Output Module



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