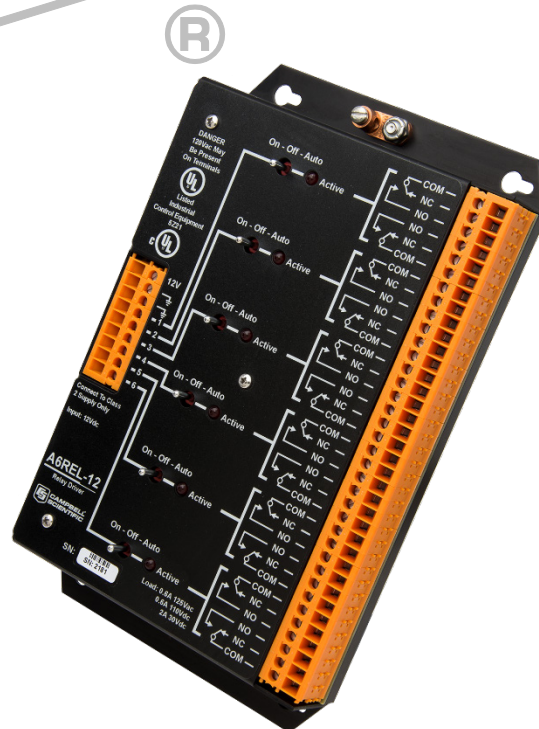


INSTRUCTION MANUAL



A6REL-12 Relay Driver

Revision: 4/17



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General

- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations, such as those of the FAA in the USA.
- Use only qualified personnel for installation, use, and maintenance of tripods and towers, and any attachments to tripods and towers. The use of licensed and qualified contractors is highly recommended.
- Read all applicable instructions carefully and understand procedures thoroughly before beginning work.
- Wear a **hardhat** and **eye protection**, and take **other appropriate safety precautions** while working on or around tripods and towers.
- **Do not climb** tripods or towers at any time, and prohibit climbing by other persons. Take reasonable precautions to secure tripod and tower sites from trespassers.
- Use only manufacturer recommended parts, materials, and tools.

Utility and Electrical

- **You can be killed** or sustain serious bodily injury if the tripod, tower, or attachments you are installing, constructing, using, or maintaining, or a tool, stake, or anchor, come in **contact with overhead or underground utility lines**.
- Maintain a distance of at least one-and-one-half times structure height, 20 feet, or the distance required by applicable law, **whichever is greater**, between overhead utility lines and the structure (tripod, tower, attachments, or tools).
- Prior to performing site or installation work, inform all utility companies and have all underground utilities marked.
- Comply with all electrical codes. Electrical equipment and related grounding devices should be installed by a licensed and qualified electrician.

Elevated Work and Weather

- Exercise extreme caution when performing elevated work.
- Use appropriate equipment and safety practices.
- During installation and maintenance, keep tower and tripod sites clear of un-trained or non-essential personnel. Take precautions to prevent elevated tools and objects from dropping.
- Do not perform any work in inclement weather, including wind, rain, snow, lightning, etc.

Maintenance

- Periodically (at least yearly) check for wear and damage, including corrosion, stress cracks, frayed cables, loose cable clamps, cable tightness, etc. and take necessary corrective actions.
- Periodically (at least yearly) check electrical ground connections.

WHILE EVERY ATTEMPT IS MADE TO EMBODY THE HIGHEST DEGREE OF SAFETY IN ALL CAMPBELL SCIENTIFIC PRODUCTS, THE CUSTOMER ASSUMES ALL RISK FROM ANY INJURY RESULTING FROM IMPROPER INSTALLATION, USE, OR MAINTENANCE OF TRIPODS, TOWERS, OR ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC.

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A6REL-12 Relay Driver

1. Function

The A6REL-12 (FIGURE 1-1) drives six dual single pole double throw internal relays for control of up to 12 external AC or DC devices. Each of the six relays has a three position toggle switch: **ON** and **OFF** for manual override, and **AUTO** for datalogger control. In the **ON** position, the common (**COM**) and normally open (**N.O.**) contacts are shorted (FIGURE 1-2 and FIGURE 1-3). In the **AUTO** position, the state of a relay is controlled by a datalogger control port.

Please note that the A6REL-12 is not compatible with CR200(X)-series dataloggers.

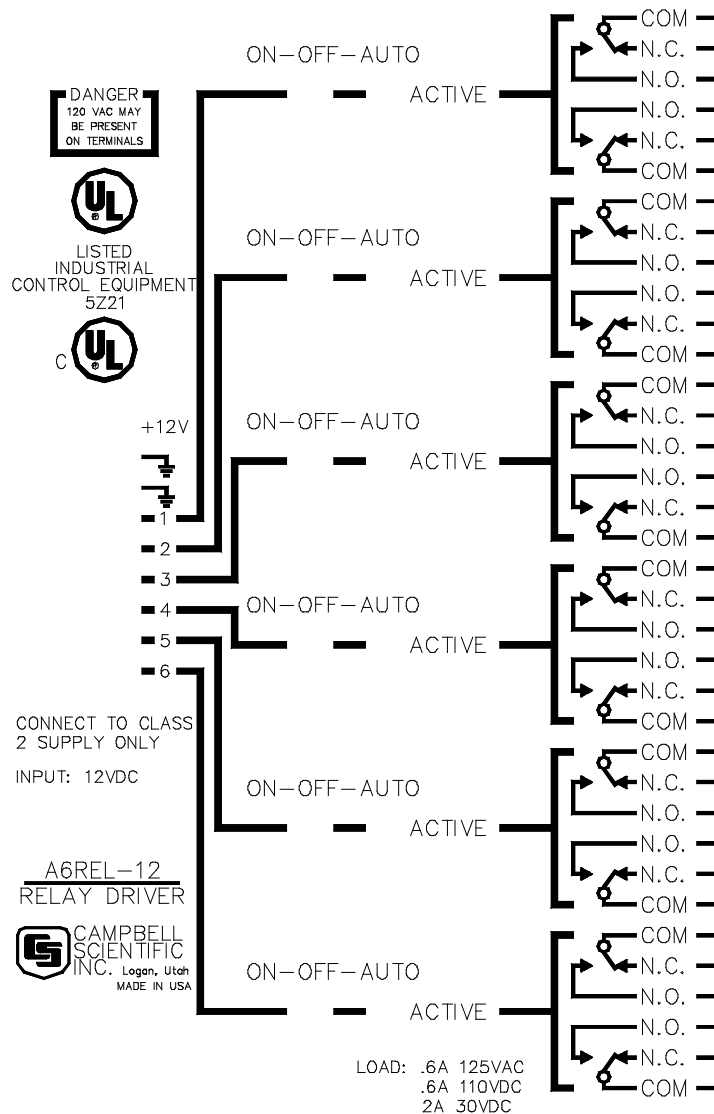


FIGURE 1-1. A6REL-12 panel view

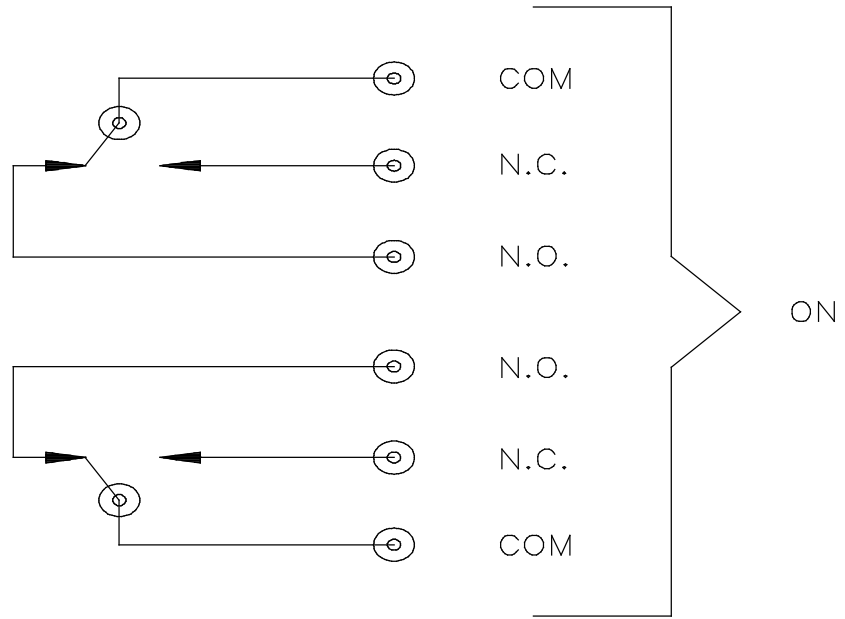


FIGURE 1-2. Position of contacts when coil IS energized (ON)

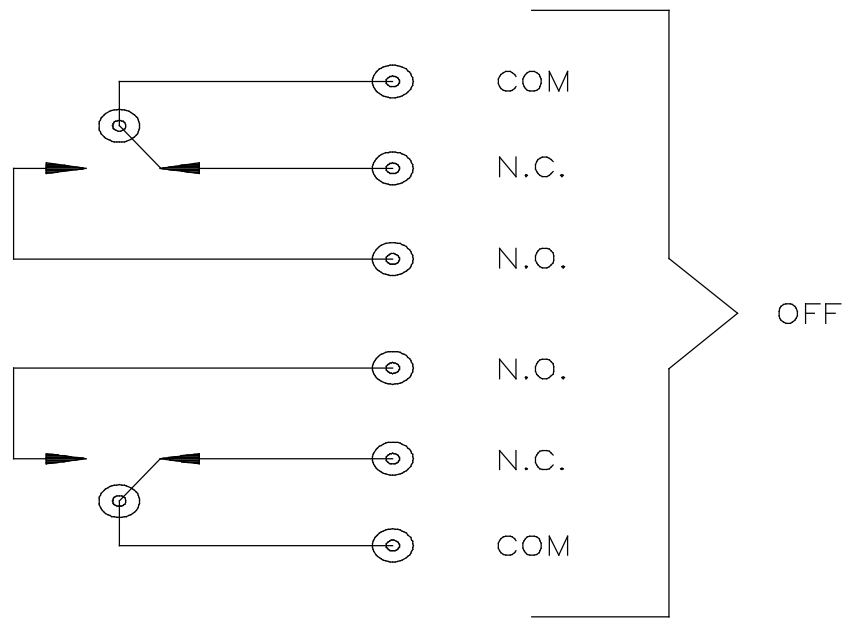


FIGURE 1-3. Position of contacts when coil IS NOT energized (OFF)

2. Specifications

Operating voltage:	12 Vdc nominal (8.4 to 24)
Current drain at 12 Vdc:	6 μ A quiescent; 30 mA per active LED (switch ON or AUTO active).
Toggle Switch:	ON/OFF manual override; AUTO for datalogger control.

RELAY SPECIFICATIONS

Arrangement:	Dual single pole double throw Break before make
Contact material:	Gold-clad silver
Individual contact rating:	2 A at 30 Vdc 0.6 A at 125 Vac
Coil voltage:	8.4 to 24 Vdc
Coil resistance:	720 Ω \pm 10%
Expected life (contact closures)	
Mechanical:	10 ⁸
Electrical:	2 A at 30 Vdc 5x10 ⁵ 1 A at 30 Vdc 2x10 ⁶
Actuation/release time:	Approx. 3 ms
Operating temperature:	-40 to 70 °C
Standards:	Underwriters Laboratories (UL) listed product (E162021) Canadian Underwriters Laboratories (CUL) listed product (5Z21)
Dimensions:	22.4 x 13.9 x 4.1 cm (8.8 x 5.5 x 1.6 in) including switches and mounts
Weight:	635 g (1.4 lb)

NOTE

The A6REL-12 protects each contact against voltage surges of 180 Vdc (130 V rms) or greater with a power content of 8 Watts maximum and maximum duration of 0.1 ms.

3. Installation

The A6REL-12 relay driver includes mounting flanges with keyhole slots that attach to the backplate of a Campbell Scientific enclosure.

The A6REL-12 must be in an enclosure that provides a pollution degree 2 environment (normally, only nonconductive pollution; however, a temporary conductivity caused by condensation may be expected). All Campbell Scientific enclosures meet this requirement.

TABLE 3-1 shows the cables recommended for connecting the relays. A two-foot length should be sufficient if the datalogger and A6REL-12 are housed in the same enclosure. Tightening torque should be 4.5 in/lb. A user-supplied cable can be used if the cable has:

- only copper conductors
- wire range of 26 to 14 AWG
- minimum 60/75 °C wire

Input power must be connected to a class 2 supply only. All Campbell Scientific power supplies meet the class 2 supply requirements.

Number of Relays Controlled	Recommended Cable(s)
1	(1) CABLE3CBL-L
2	(1) CABLE4CBL-L
3	(1) CABLE5CBL-L
4	(2) CABLE3CBL-L
5	(1) CABLE3CBL-L and (1) CABLE4CBL-L
6	(2) CABLE4CBL-L

4. Example Program

In the following programming example, temperature is being controlled between 96 and 99 °F. A copper-constantan thermocouple is measured to determine the temperature. If the temperature drops below 96 °F, terminal **C1** is set high to activate the associated relay and turn the heater on. If the temperature equals or exceeds 99 °F, terminal **C1** is set low to turn the heater off.

Although the following example is a CR1000 program, other dataloggers that use CRBasic such as the CR800 and CR3000 are programmed similarly.

CRBasic Example 4-1. Measuring Temperature Through an A6REL-12

```

'CR1000 Series Datalogger

'Declare Public Variables
Public PTemp, batt_volt, P, TC

'Define Data Tables
DataTable (Test,1,-1)
  DataInterval (0,15,Sec,10)
  Minimum (1,batt_volt,FP2,0,False)
  Sample (1,PTemp,FP2)
  Sample (1,TC,FP2)

EndTable

'Main Program
BeginProg
  Scan (5,Sec,0,0)
    Battery (Batt_volt)
    'Measure TC reference temperature
    PanelTemp (PTemp,250)
    'Make temperature measurement and convert it to degrees Fahrenheit
    TCDiff (TC,1,mV2_5C,1,TypeT,PTemp,True ,0,250,1.8,32)
    'If temperature is greater than 99, set Port Low
    If TC>99 then
      P=0
      'If temperature is less than 96, set Port high
    ElseIf TC<96 then
      P=1
    EndIf
    PortSet (1 ,P)
    'Call Output Tables
    'Example:
    CallTable Test
  NextScan
EndProg

```


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