

## CM 100 & CM 101 Relay Module Installation Instructions



### DESCRIPTION

The CM100/101 control module contains the relay logic necessary to operate the DUNGS VPS 504 or VDK 200A valve proving systems on a system start-up and during a system shutdown. On startup the valve proving system will interrupt the start-up sequence if it detects an open shutoff valve, thus preventing ignition under potentially dangerous conditions. On shutdown, an open valve detection causes a manual lock-out requiring reset, and an alarm contact will energize; an optional blower terminal can also be energized.

**CM 100: Contains enclosure and relay board**  
NEMA Type 1 Enclosure (IEC 529, IP 30)

**CM101: Relay board only for panel mounting**  
No Enclosure

### SPECIFICATIONS

#### Electrical Rating

110-120 Vac / 60 Hz

When operated at 50Hz, the CM will run a hotter.

Therefore, the contact ratings are reduced. In addition, the internal timers will be slower by a factor of 1.2.

#### Ambient Temperature

+5° F to 140° F

#### Power Consumption

1 Amp

#### Approvals

UL Recognized Component: File MH 17004

FM Approved: File J.I. 3004006



#### Contact Ratings

**Input @120 Vac/60 Hz**

J2,J3: 13 A res

J4: 12 A res

J6,J7: 1 A res

J9,J10: 1 A res

**Output@120 Vac/60 Hz**

J1: 13 A res

J5: 12 A res

J8: 6 A res

### ATTENTION

- Read these instructions carefully.
- Failure to follow them and/or improper installation may cause explosion, property damage and injuries.
- Installation must be done with the supervision of a licensed burner technician.
- Check the ratings in the specifications to make sure that they are suitable for your application.
- Never perform work if gas pressure or power is applied, or in the presence of an open flame.
- Ensure that the switch is not subject to vibration during operation.
- Once installed, perform a complete checkout.
- Label all wires prior to disconnection when servicing. Wiring errors can cause improper and dangerous operation.
- Verify proper operation after servicing.
- The system must be installed, used, and maintained to meet all applicable national and local code requirements such as but not limited to NFPA 70, NFPA 86, CSD-1, ANSI Z21.13, UL 795, NFPA 85, or CSA B149.3.

## WIRING

### Preparation

- Reference the General Wiring Schematic on page 3.
- Disconnect all power to the valve proving system and the flame safeguard before wiring to prevent electrical shock and equipment damage.
- All wiring must comply with local electrical codes, ordinances, and regulations.
- Do not exceed the terminal ratings given in the specifications.
- Loosen the screw which secures the cover. (CM 100 only)
- Open the cover.
- Route the wires through the conduit connectors.
- Provide adequate strain relief.

### Wiring

- A typical wiring diagram for operating a valve proving system on burner start-up and after shutdown is shown in the wiring diagram on page 2.
- If the blower is to be operated every time the valve proving system detects an open valve, connect the blower to J1, and the blower terminal of the flame safeguard to J6. (The connection from the flame safeguard blower terminal to J6 is required to provide proper operation of the blower during a normal start-up procedure.) If the above is not required, connect the blower directly to the flame safeguard terminal and do not make the connection from the flame safeguard blower terminal to J6. Terminal J1 can be used to energize an alarm.

- **NOTE:** Frequency converters with insufficient shielding can cause faults in the VPS 504/VDK 200A as the result of transients. Make sure that the equipment is provided with sufficient shielding.

## OPERATION

### 1 Initial Power:

When the main system is first powered (L1) and there is no call for heat, J2 gets powered. With internal normally closed contact, J8 gets energized. This applies 120Vac to the valve proving system, which will cycle, verifying the automatic shutoff valves position.

### 2 Valve Proving - Pass

If the valve proving system confirms that both automatic shutoff valves are closed, it energizes terminal J9, which closes normally open contact C2. If terminal J4 is also powered due to a call for heat, the flame safeguard's safety interlock terminal is then energized, and the burner continues its ignition sequence. If there is no call for heat terminal J4 is not powered, terminal J5 will remain de-energized, and the burner will not continue with the ignition sequence.

### 3 Valve Proving - Failure

If at anytime the valve proving system fails to prove the automatic shutoff valve are closed, it energizes terminal J10, which closes normally open relay C1. The blower turns on if it is wired to J1 as shown in the wiring diagram. The internal contact C2 remains opened, and J5 cannot be energized even if J4 is energized; this prevents the burner system from continuing with the ignition sequence.

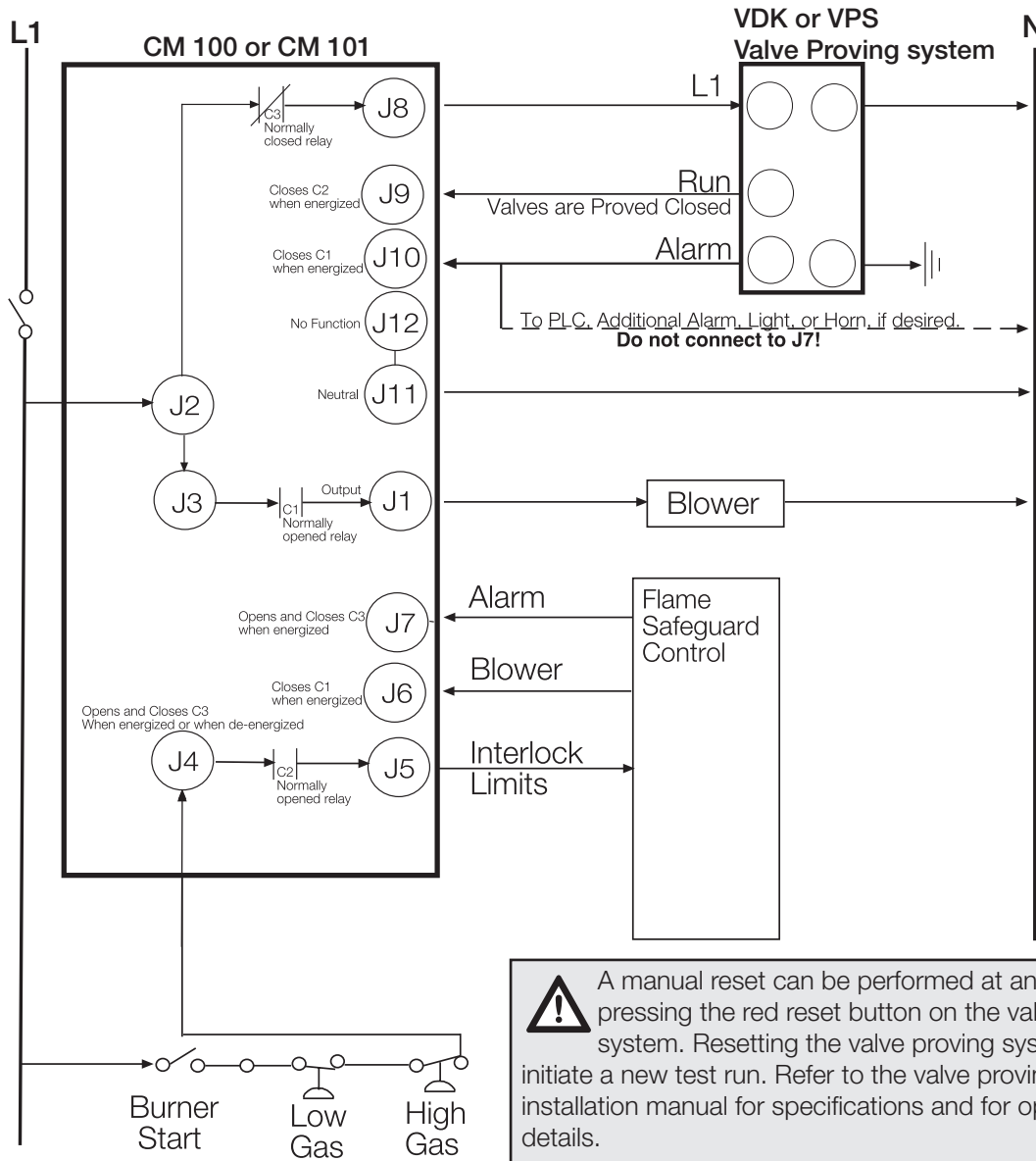
### 4 Safety Shutdown:

During a safety shutdown, the flame safeguard control energizes J7, which opens and closes normally closed relay C3. This resets the valve proving system. If the valves are proved closed, J9 is energized and closes C2. If the valve proving fails, J10 will be energized and C2 remains open.

### 5 Normal Shutdown:

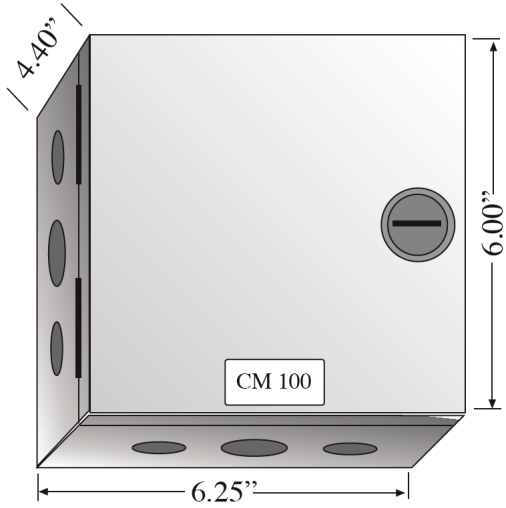
On normal shutdown, J4 and subsequently J5 are de-energized when the "burner start" switch is opened. When J4 is de-energized, C3 opens and closes, the valve proving system resets and verifies the position of the two automatic shutoff valves. If the valves are proved closed, J9 is energized and closes C2. If the valve proving fails, J10 will be energized and C2 remains open.

# GENERAL WIRING SCHEMATIC AND INTERNAL LOGIC

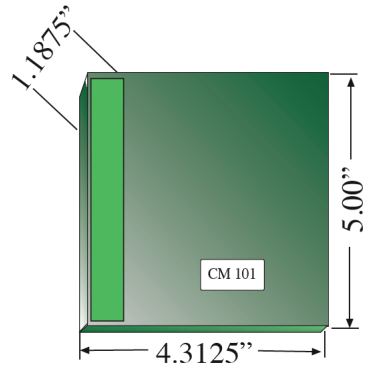


## DIMENSIONS

**CM 100**



**CM 101**



## PART NUMBERS

Type	Description	Part Number
<b>CM 100</b>	Contains enclosure and relay board NEMA Type 1 Enclosure (IEC 529, IP 30)	46022
<b>CM101</b>	Relay board only for panel mounting No Enclosure	46023