



**ELECTRICAL & CONTROLS  
INSTALLATION INSTRUCTIONS  
VEHICLE ARREST SYSTEM**

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**ELECTRICAL HOOK UP**

**Number of Barriers:** One Phalanx Barrier

**Control and Options:** Standard 24 VDC Controls

- Barrier Fully Up Limit Switch (Optional)
- Barrier Fully Down Limit Switch (Optional)
- Barrier Front Face Lights (Optional)
- Safety Loop Detector, Model 3546 (Optional)
- Stop/Go Signal Lights, MPL-10 (Optional)
- Stop/Go Signal Gate, Model AG812 (Optional)
- Master Control Panel (Optional)
- Slave Control Panel (Optional)
- Emergency Fast Operation Circuit (Optional)
- Annunciator Circuit (Optional)

**Referenced Drawings:**

905XX	Hydraulic Power Unit, Single Barrier Set
906x0-1	Control Circuit and Motor Starter, 120-240/24 VDC, Single
90605	Main Board Logic Diagram
907XX-X	Master Control Panel, Single Barrier Set
908XX-X	Slave Control Panel, Single Barrier Set

The following charts have been prepared to assist in the Electrical Interconnect of the Hydraulic Power System, the System Control Circuits, the Remote Control/Status Panels (Master and Slave), as well as various other options offered with Delta Barrier Systems. These charts are designed to supplement the detailed circuit drawings that are furnished with each system.

The voltage carried by each conductor, unless otherwise specified, is 24 VDC. These conductors are indicated by this symbol ">>>>>>>>". The maximum power at this voltage is 250 watts for hot/neutral wires, 1 watt for device wires. Where the voltage is other than 24 VDC, the conductor is indicated by this symbol ">>>>>> \* >>>>>>" and a footnote specifies the voltage and current requirement. Either multi-conductor cable or single conductor wire can be used at the option of the installer. The wire size should be selected based on the pull length, current and voltage requirements and local codes and specifications.

Terminals are designated by a PCB board number followed by two letters followed by the terminal number, i.e. 1 CB 11. The first number is PCB Board number, in this case Barrier # 1, the first letter is the strip location, in this case "control circuit", while the second letter defines the terminal voltage. 'A' and some 'C' codes are low voltage 24 VDC. Some 'B' & 'C' codes are the specified local control voltage.



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### **ELECTRICAL CONNECTION CHART**

Reference Drawings: 906x0-1 & 90605.

➤ Signal Lights for Barrier # 1

This circuit synchronizes the stop/go lights with the Barrier. As soon as the Barrier starts to rise the red "stop" light comes on and stays on until the Barrier has been lowered and is fully down. The green "go" light comes on at this point.

<u>Signal Lights</u>		<u>Control Circuit</u>
Supply Voltage (Note 3)	>>>> Note 2 >>>>	1 CB 1
Supply Voltage (Note 3)	>>>> Note 2 >>>>	1 CB 2
Common Terminal	>>>> Note 2 >>>>	1 CB 3
Signal Green Light	>>>> Note 1 >>>>	1 CB 4
Signal Red Light	>>>> Note 1 >>>>	1 CB 5

Note 1: These lines must be sized to handle one 40 Watts (maximum) incandescent bulb operating at the AC Control Voltage. If back to back lights are used, twice the current must be handled.

Note 2: If the commons are combined, the total of all currents must be considered.

Note 3: The supply voltage is applied at terminals 1 CB 1 (Hot) and 1 CB 2 (Neutral). This voltage can be whatever the signal lights require. If the lights are to be operated on 24 VDC, customer must insure when using the Delta power supply, the power supply rating is not exceeded.

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**ELECTRICAL CONNECTION CHART**

➤ Stop/Go Signal Gate, Model AG812

Reference Drawings: 906x0-1 & 90605

The Stop/Go Signal Gate Model AG812 is designed to have its motion coordinated with its companion Barrier. Upon raising the Barrier, the Signal Gate will lower to provide visual indication to drivers to stop. The Signal Gate will remain in the down position until the Barrier is again lowered to the full down position at which point the Barrier's down limit switch will cause the Signal Gate to raise.

<u>Stop/Go Signal Gate</u>		<u>Control Circuit</u>
Terminal 12	>>>> Note 1 >>>>	1 CB 10
Terminal 14	>>>> Note 1 >>>>	1 CB 11

Note 1: The Model AG812 Signal Gate has the local control voltage brought to terminals L1 and L2. Signal Gate jumpers are on terminals CA 3 and CA 5 (changed from terminals CA 4 and CA 5).





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**ELECTRICAL CONNECTION CHART**

➤ Slave Control Panel (Optional) Continued

Note 3: If two Slave panels are being used: The terminals 1 SA and 2 SA for these lines can be commoned. A jumper will be required between the circuit boards in the control circuit.

Note 4: Size neutral and hot for 50 watts (maximum). All other lines are 1 watt each.

Note 5: If two Master panels are being used: The terminals 1 MA and 2 MA for these lines are jumpered at the factory; 1 MA 3 to 2 MA 3, 1 MA 18 to 2 MA 18, etc. A jumper will be required between the circuit boards in the control circuit.

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**ELECTRICAL CONNECTION CHART**

➤ Hydraulic Power Unit and Motor

Reference Drawings: 906x0-1 & 90605

Note: These connections have been made at the factory but are shown here as an aid for troubleshooting.

Hydraulic Power Unit <u>Valve Solenoids</u>		Control Circuit <u>Barrier #1</u>
UP	>>>> Note 1 >>>>	1 CB 17
UP COMMON	>>>> Note 1 >>>>	1 CB 18
DOWN	>>>> Note 1 >>>>	1 CB 19
DOWN COMMON	>>>> Note 1 >>>>	1 CB 20
EMERGENCY OPERATE	>>>> Note 2 >>>>	1 CB 21
EO COMMON	>>>> Note 2 >>>>	1 CB 22
		Motor Control Circuit <u>Barrier #1</u>
LEVEL SWITCH	>>>> Note 3 >>>>	CC 8 (CC 18)
LEVEL / PRESSURE SWITCH	>>>> Note 3 >>>>	CC 9 (CC 19)
PRESSURE SWITCH	>>>> Note 3 >>>>	CC 10 (CC 20)

Note 1: These lines must be sized to carry 30 watts at 24 VDC.

Note 2: These lines must be sized to carry 20 watts at 24 VDC.

Note 3: Starter coil power consumption is less than 100 va inrush, and less than 10 va sealed.

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## **ELECTRICAL CONNECTION CHART**

### **Control Circuit**

The Control Circuit is fed from the customer's local AC control voltage supply (either 100-120/1/50-60 or 200-240/1/50-60). Connection is to terminals CC 1(+) and CC 2(-). Supply should be adequate to provide a minimum of 250 Watts of power.

The control circuit contains a power supply, which reduces the local voltage to 24 VDC for use on the remote control panels. The feed out of the control circuit for these remotes is on terminal CA 1(+) and CA 2(-). Standard power capability is 150 watts. Battery back up power supply/charger and batteries are optionally available.

**Note:** Use caution when installing the field conduits and wiring to the control circuit enclosure. Shield metal chips and wire fragments from falling on to or in to components. Component failure can be caused by careless installation.

### **Power Unit Motors**

The motor has been ordered and supplied to the actual site voltage. Please confirm before hookup. The motor is factory wired to an automatic starter controlled by the hydraulic power unit pressure switch, oil level switch and (optional) three phase power monitor. Thermal overload protection is integrally provided.

The customer should provide branch circuit protection as required by national and local code. Care should be taken in arriving at the correct wire size for the length of cable provided.

### **Hydraulic Power Unit Wiring**

The three phase power is brought into the HPU terminal box to the line side of the door mounted disconnect switch at L1, L2 and L3.

Verify that the motor runs in the correct direction. Units with phase monitors (three phase only) are factory set to run in the correct direction. If motor does not run, or runs in the wrong direction, reverse any two incoming wires at L1, L2 or L3; motor should now run and in the correct direction.

Power for the starter contactor coil is the same as the primary voltage of the control circuit. Coil voltage legend plates are on the starter so that this can be confirmed. Connection points for the coil power are 'CC 1(+)' and 'CC 2(-)'. Starter coil power consumption is less than 100 va inrush, and less than 10 va sealed.

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### **ELECTRICAL CONNECTION CHART**

#### **Barrier and HPU Heaters**

The system is furnished with electric heaters for the purpose of melting snow and ice, which may otherwise freeze the Barrier in either the up or down position.

The hydraulic oil reservoir also is equipped with an immersion heater located within the oil level. It is equipped with a thermostat dial and should be set to a value between 60 to 75°F [15 to 25°C].

The electric feed to the heaters is fused in the control circuit. See appropriate wiring diagram for the connections.

**Important:** Before energizing the heater circuits at the start of each season, the elements must be megger tested. This is typically done with a megger capable of delivering 500 volts to the circuit. A value in excess of 50,000 ohms to ground is acceptable for energizing the heater circuits. Call the factory if a lower reading is found.

Failure of the elements will in no way cause the Barrier to malfunction unless there is an ice or snow build up inside the machine.