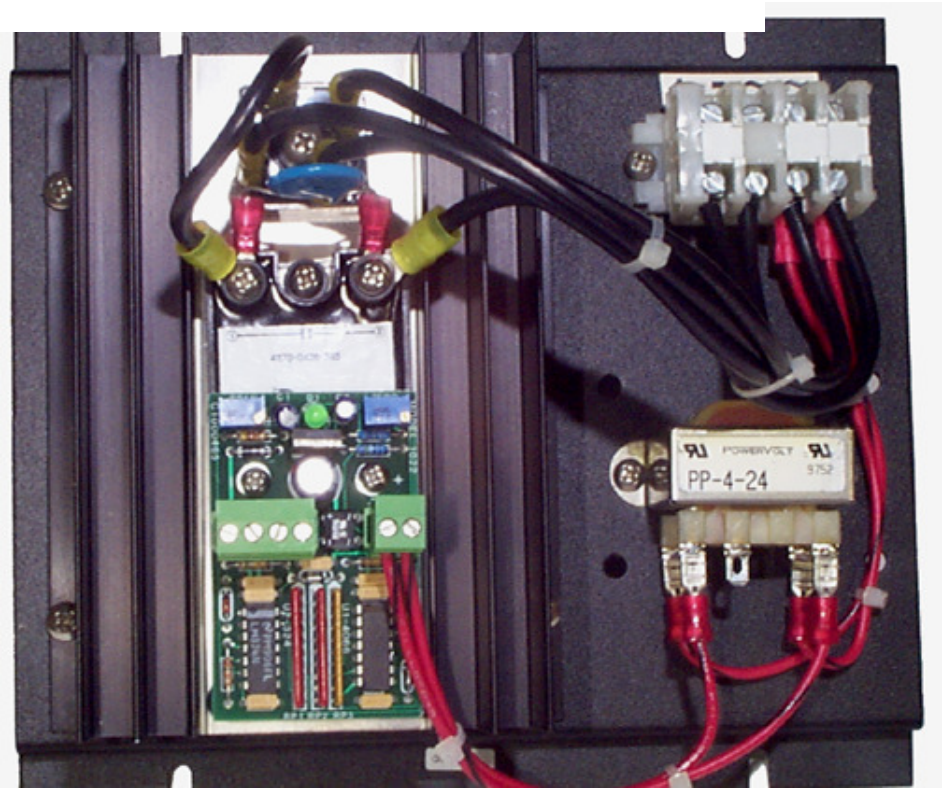
CONTROL CONCEPTS

1822/1825



Single-Phase, Phase-angle Control with DC Output

Description

The models 1822 and 1825 are single-phase, phase-angle power controllers with DC output.

The model 1822 controller responds to command signals of 0-5Vdc, 0-10Vdc or a potentiometer.

The model 1825 controller responds to a 4-20mA current command signal.

Both models control the DC voltage to the load, proportional to the command signal, independent of line voltage changes.

The command signal is electrically isolated from the line and load voltages and the heatsink.

Applications

- **Field Control for Saturated Core Reactors**
- **Magnetic Clutches**
- **Magnetic Brakes**

CONTROL CONCEPTS

800.765.2799 | www.ccipower.com
Phone: 952.474.6200 Fax: 952.474.6070
7870 Park Drive, Chanhassen, MN 55317, U.S.A.

Features	Advantages	Benefits
Soft start	Provides slow application of power, reducing inrush (surge) currents. Prevents nuisance fuse blowing and circuit breaker tripping.	Controllers may be used to operate loads that have a low cold resistance such as lamps.
Missing cycle detection	Missing cycle detection prevents transformer saturation or damage due to power interruptions.	Prevents surge currents often seen in inductive or variable resistance loads.
Diagnostic indicator	Light emitting diode (LED) provides visual indication of controller operation.	Provides an easily understood means to troubleshoot by inexperienced personnel. Reduces down-time.
Electrical isolation of command signal from load and line voltages.	Eliminates potential ground loops. Provides safe operation with inexpensive, non-isolated process controllers.	A less costly, more reliable means to achieve good process control.
DC voltage control and line voltage compensation.	Provides a stable control loop because DC load voltage is proportional to command signal and is minimally affected by line voltage variations.	Product quality remains constant.
Continuous operation at 55°C	No de-rating required below 55°C.	Improves reliability and provides long life operation.

Operation

The model 1822 and 1825 are phase-angle controllers with full wave bridges to provide a DC output. The load voltage is controlled by turning the appropriate SCR on for a portion of each electrical half cycle of the line voltage as shown in figure 1.

The waveform shown as E_S represents the Source voltage.

The waveform shown as E_c represents the "ON" time of the SCRs in each half cycle and therefore represents the voltage waveform applied to the bridge rectifier.

The waveform shown as E_L represents the rectified voltage which is applied to the load.

To increase the load voltage, the SCRs are turned ON earlier in the cycle. To decrease the load voltage, the SCRs are turned on later in the cycle. The DC load voltage can be varied from 0 to full output.

Output voltages are limited to 95 Volts DC max. for a 120 Volt AC line and 190 Volts DC max. for a 240 Volt AC line.

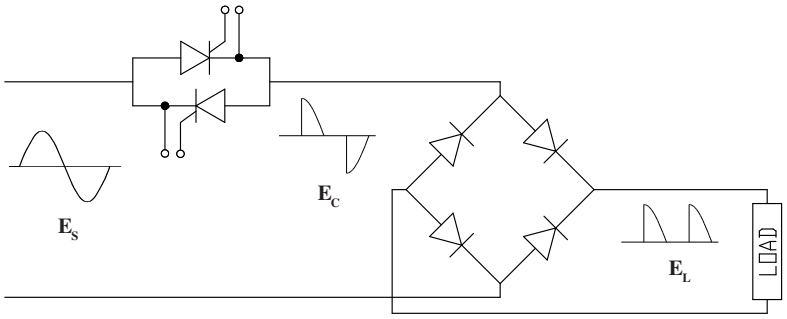


Fig. 1 Phase angle control of DC output at 50% power

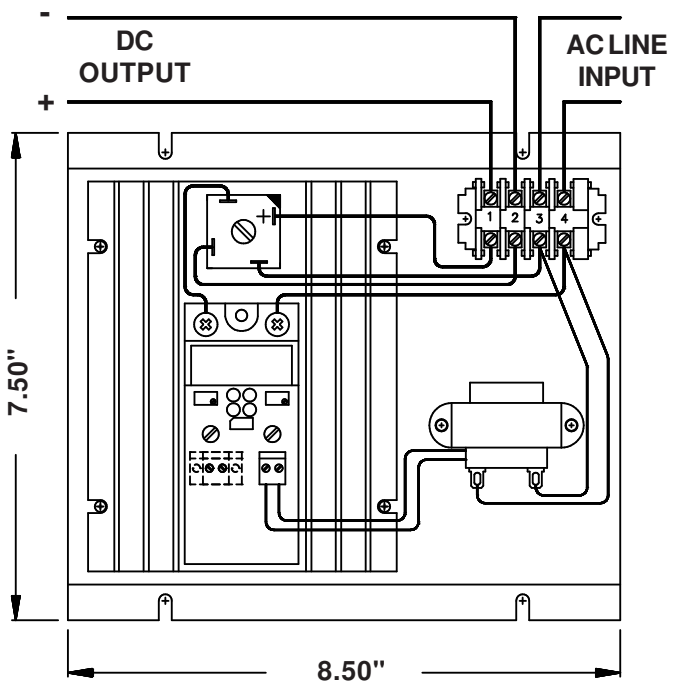
Specifications

Control Mode	Single phase, Phase-Angle control of DC load voltage.
Command Signal	Model 1822; 0-5 Vdc, Impedance: 100K 0-10 Vdc or potentiometer. Impedance: 200K Model 1825; 4-20 mA Impedance: 300Ω
Power Circuit	Inverse parallel silicon controlled rectifier (SCRs) and full wave bridge rectifier.
Feedback Selection	Average, Fast Average or RMS
Operating Line Voltage	120 or 240 Vac (+10%, -20%) 50/60 Hertz
DC Output Voltage	95 Vdc (120 Vac in.) or 190 Vdc (240 Vac in.)
Ambient Temperature	Operating: 0° to 55°C (32 to 131°F) Storage: -40° to 80°C (-40 to 176°F)
Humidity	0 to 90%, non-condensing.
Isolation	Isolation between power circuit, command signal and ground is greater than 2500 volts RMS.
Linearity	The DC load voltage is linear within 2% of span of the command signal.
Control Range	0 to 95 Volts DC (or 0 to 190 Volts DC).
Soft Start and Missing Cycle Detection	On startup, or after momentary power interruptions, the SCR conduction angle (SCR "on" time) is set to zero and then allowed to ramp to the desired value. This prevents surge currents often seen in inductive or variable resistance loads.
dV/dT and MOV Protection	200 volts/usec minimum dv/dt snubber circuit and an MOV are used to protect against high frequency transients (dv/dt) and voltage spikes.
Zero and Span Adjustment	20% of span.
Mounting	Vertical surface with fins vertical.
Diagnostic Indicator	The intensity of the LED is proportional to the command signal.
Heat Dissipation	1.2 watts per amp.
Physical	Weight; 10 & 20 Amp = 3.5 Lbs, 30 Amp = 7 Lbs. Dimensions: Refer to installation drawings on page 4.

Current Rating

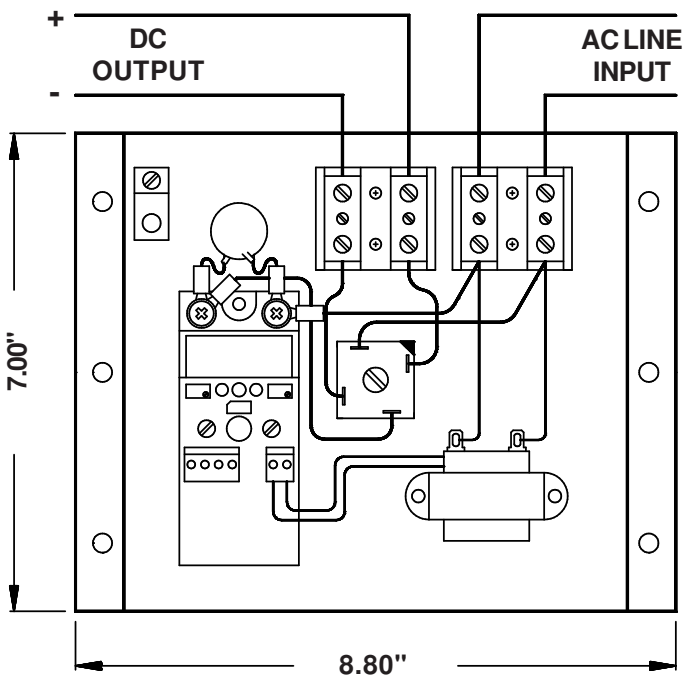
Model	Continuous DC amps	Surge Current (amps)	
		Peak 1 Cycle	RMS 1 Second
1822/25-XX-10	10	120	22
1822/25-XX-20	20	250	40
1822/25-XX-30	30	625	80

Dimensions & Connections



Maximum Height 5.0"

10 or 20 Amp Frame



Maximum Height 5.50"

30 Amp Frame

Ordering Information

182X - (xx-xx) - (xxx)Vdc - (xxx) - (xxxx)

- (xxxx): Command Signal.
- (xxx): Feedback: **AVG**, **FAVG** or **RMS**
- (xxx)Vdc: Output Volts: **95** Vdc. Other voltages may be available.
- (xx-xx):
  - **12-10** = 120Vac line, 10 Amps
  - **12-20** = 120Vac line, 20 Amps
  - **12-30** = 120Vac line, 30 Amps
  - **24-10** = 240Vac line, 10 Amps
  - **24-20** = 240Vac line, 20 Amps
  - **24-30** = 240Vac line, 30 Amps
- 182X: Model: **1822** or **1825**

Note: A DC controller similar to the 1822, but with the added feature of current limiting, is available as a Control Concepts model **1832**. Please call factory for information. 1-800-765-2799.

Complementary Products

Control Concepts, Inc., offers a wide variety of phase angle and zero cross power controllers designed for your toughest process control applications. Single and Three Phase controllers with current ratings from 10 to 1000 amps in either single or three phase. In addition, Control Concepts, Inc. offers custom SCR power controllers to meet your unique requirements.

Control Concepts, Inc. has the expertise and the products to meet your specific industrial control needs. Call us today for answers that work. **(800)-765-2799**

Manufactured bv

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