

# 1822/1825

Single-Phase  
Phase Angle  
with DC output

## FEATURES

- Soft start
- Missing cycle detection
- Diagnostic indicator
- Electrical isolation of command signal from load and line voltages.
- DC voltage control and line voltage compensation.
- Continuous operation at 55°C



## APPLICATIONS

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



## DESCRIPTION

The models 1822 and 1825 are single-phase, phase-angle power controllers with DC output. 1822 responds to command signals of 0-5Vdc, 0-10Vdc or a potentiometer. 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.

## ADVANTAGES

Provides slow application of power, reducing inrush (surge) currents. Prevents nuisance fuse blowing and circuit breaker tripping.

Missing cycle detection prevents transformer saturation or damage due to power interruptions.

Light emitting diode (LED) provides visual indication of controller operation.

Eliminates potential ground loops. Provides safe operation with inexpensive, non-isolated process controllers.

Provides a stable control loop because DC load voltage is proportional to command signal and is minimally affected by line voltage variations.

No de-rating required below 55°C.

## BENEFITS

Controllers may be used to operate loads that have a low cold resistance such as lamps.

Prevents surge currents often seen in inductive or variable resistance loads.

Provides an easily understood means to troubleshoot by inexperienced personnel.

Reduces down-time.

A less costly, more reliable means to achieve good process control.

Product quality remains constant.

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.

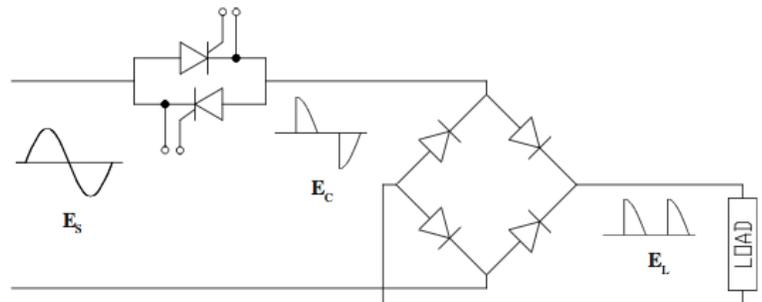


Fig. 1 Phase angle control of DC output at 50% power

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.

# SPECIFICATIONS

<b>Control Mode</b>	Single phase, Phase-Angle control of DC load voltage.			
<b>Command Signal</b>	Model 1822;	0-5 Vdc, 0-10 Vdc or potentiometer.	Impedance: 100K Impedance: 200K	
	Model 1825;	4-20 mA	Impedance: 300W	
<b>Power Circuit</b>	Inverse parallel silicon controlled rectifier (SCRs) and full wave bridge rectifier.			
<b>Feedback Selection</b>	Average, Fast Average or RMS			
<b>Operating Line Voltage</b>	120 or 240 Vac (+10%, -20%) 50/60 Hertz			
<b>DC Output Voltage</b>	95 Vdc (120 Vac in.) or 190 Vdc (240 Vac in.)			
<b>Ambient Temperature</b>	Operating:	0° to 55°C (32 to 131°F)		
	Storage:	-40° to 80°C (-40 to 176°F)		
<b>Humidity</b>	0 to 90%, non-condensing.			
<b>Isolation</b>	Isolation between power circuit, command signal and ground is greater than 2500 volts RMS.			
<b>Linearity</b>	The DC load voltage is linear within 2% of span of the command signal.			
<b>Control Range</b>	0 to 95 Volts DC (or 0 to 190 Volts DC).			
<b>Soft Start and Missing Cycle Detection</b>	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.			
<b>dV/dT and MOV Protection</b>	200 volts/usec minimum dv/dt snubber circuit and an MOV are used to protect against high frequency transients (dv/dt) and voltage spikes.			
<b>Zero and Span Adjustment</b>	20% of span.			
<b>Mounting</b>	Vertical surface with fins vertical.			
<b>Diagnostic Indicator</b>	The intensity of the LED is proportional to the command signal.			
<b>Heat Dissipation</b>	1.2 watts per amp.			
<b>Physical</b>	Weight; 10 & 20 Amp = 3.5 Lbs, 30 Amp = 7 Lbs. Dimensions: Refer to installation drawings on page 4.			
<b>Current Rating</b>	<b>Model</b>	<b>Continuous DC amps</b>	<b>Surge Current (amps)</b>	
			<b>Peak 1 Cycle</b>	<b>RMS 1 Second</b>
	1822/25-XX-10	10	120	22
	1822/25-XX-20	20	250	40
1822/25-XX-30	30	625	80	

