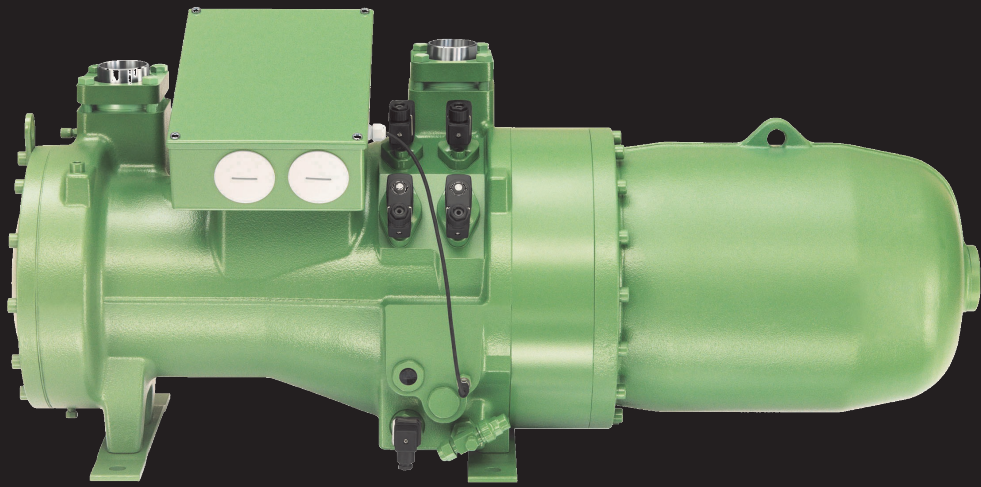




# BITZER PRESSURE AND TEMPERATURE CAPACITY CONTROLLERS

For CSH Series Screw Compressors



TB-0012



The Temperature Controller has been obsolete. The below data is for informational purposes only

## BITZER Capacity Controller for CSH Compressors – Temperature Sensor

The **BITZER CSH Capacity Controller (PN# 085-0164-13)** is designed to control the loading and unloading of the CSH series compressors based on temperature. This controller does not have the capability of starting or stopping the compressor nor does it have the ability to operate as a system safety device. These functions must be controlled by other devices in the system.

**Mounting the Controller:** Cut or punch a 3.8" x 1.9" rectangular hole in the door of the enclosure or flat panel. Install the unit into the panel by sliding it back first into the opening and pressing firmly against the surface until the mounting clips capture the device.

### Sensor Types

Two types of temperature sensors are available for this controller.

**Sealed End (bulb type)** sensor that can be mounted to the exterior of a pipe or mounted on a rod and centered in an air stream (PN# 085-0164-14) (See **Figure 5**). To line mount this sensor, first the surface of the pipe should be cleaned to a bright metal appearance. Heat transfer paste should be used to assure proper operation. The bulb can be held in place with the use of a pipe clamp.

**1/4" NPT** sensor that can be inserted into the process stream (PN# 085-0164-15) (See **Figure 6**).

These sensors are connected to the controller by a three prong plug that is located on the back of the controller.

### Power Wiring

The Controller can be utilized with either 120 or 240 VAC control voltage power.

**120 Volt Power:** the hot lead should be connected to the "120/240V" terminal and the neutral lead should be connected to the "Neutral" terminal. A jumper must be installed across the two terminals labeled "Install Jumper for "120V".

**240 Volt Power:** the hot lead should be connected to the "120/240V" terminal and the neutral lead

should be connected to the "Neutral" terminal. **No** jumper should be installed across the two terminals labeled "Install Jumper for 120V".

### Capacity Control

The controller has "Dual Capacity Control Functions". It can operate the compressor either by "Infinite Capacity Control" or by "4-Step Capacity Control" by changing the placement of a jumper on the back of the controller (See **Figure 1** through **Figure 4**).

### Infinite Capacity Control

The Jumper must be installed on the center and left prongs located under "Step" and "Infinite". Solenoid coils must be installed on "CR3 and CR4". The controller will cycle these coils to maintain the set point temperature within the differential temperature programmed. The compressor capacity will be varied from 25 to 100% of its rated capacity.

### 4-Step Capacity Control

The jumper must be installed on the center and right prongs located under "step" and "infinite". Solenoid coils must be installed on CR1, CR2, CR3 and CR4. The controller will cycle these coils to vary the compressors capacity in 4 discrete steps of 25, 50, 75 and 100% of its rated capacity.

For a detailed description on the capacity control of the CSH series compressors, refer to the Application Manual SH-170-3.

**Set Point Temperature:** To enter the set point temperature press and hold the "Set Point Temp" button and press the up and/or down buttons until the desired value is played.

**Differential Temperature:** To set the differential temperature, press and hold the "Diff Temp" button and press the up and/or down buttons until the desired value is displayed.

**Temperature Probe Calibration:** If calibration of the temp probe is necessary, change the set point temperature until it matches the "Actual" temperature reading. Press and hold the "set Point Temp" and "Diff Temp" buttons at the same time and hold for 10 seconds. The display will flash indicating the calibration is complete. Return the set point temperature to the desired value.

# Wiring Diagrams for the Screw Compressor Control

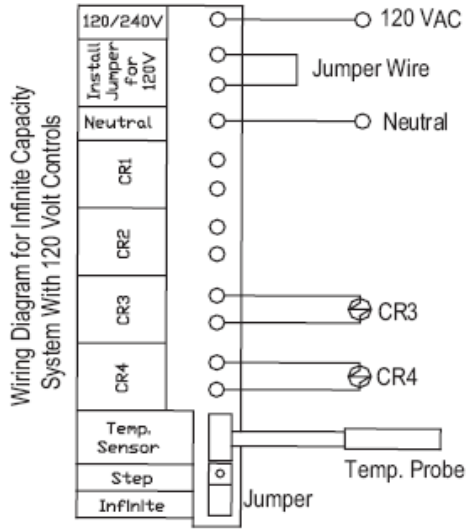


Figure 1

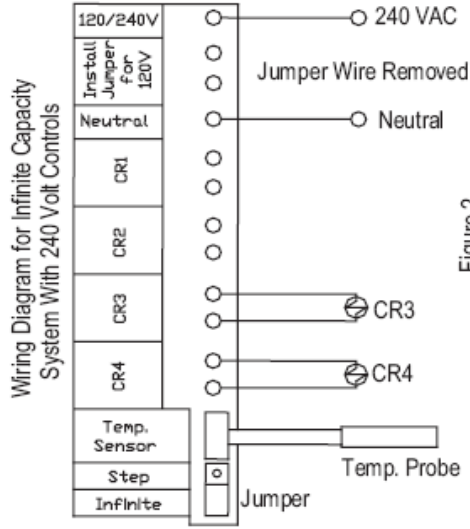


Figure 2

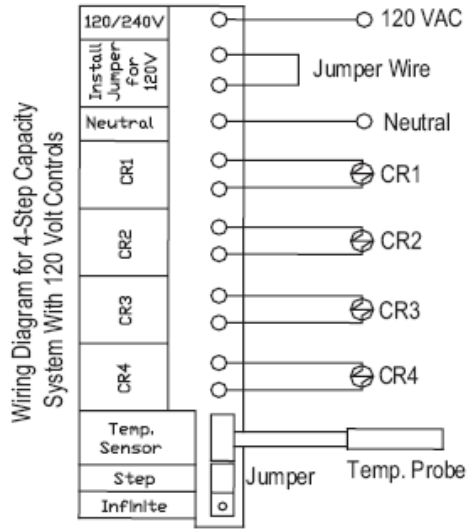


Figure 3

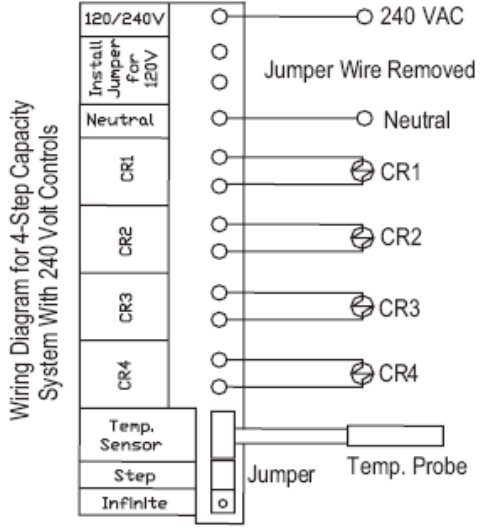


Figure 4

# Temperature Sensor Options for the Screw Compressor Control

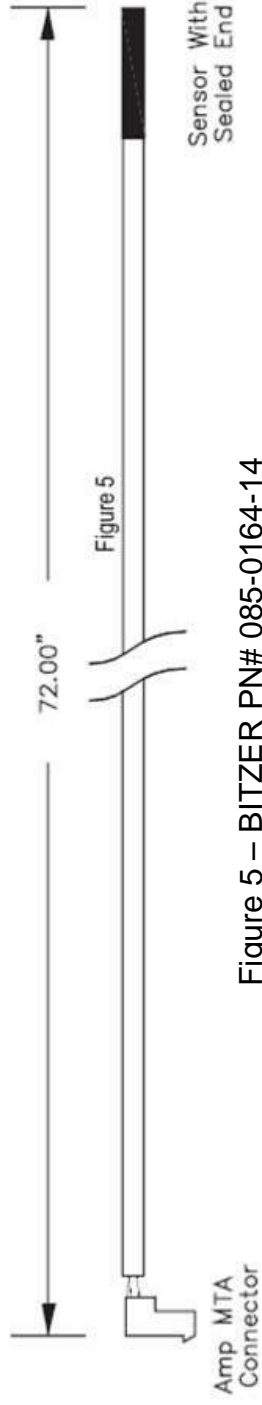


Figure 5 – BITZER PN# 085-0164-14

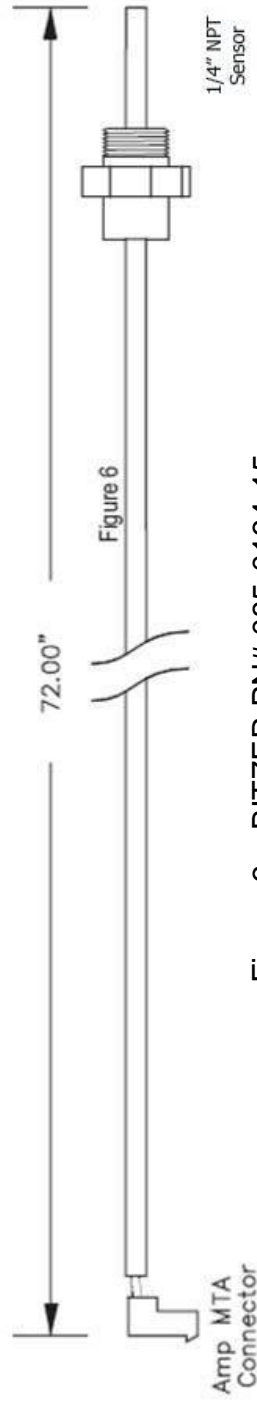
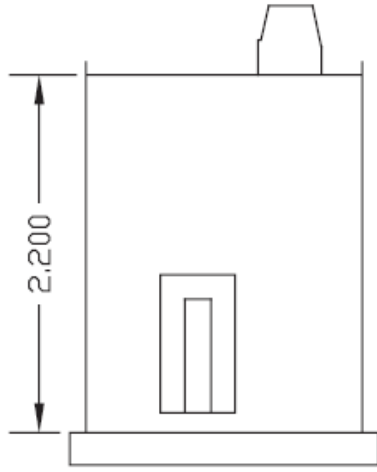


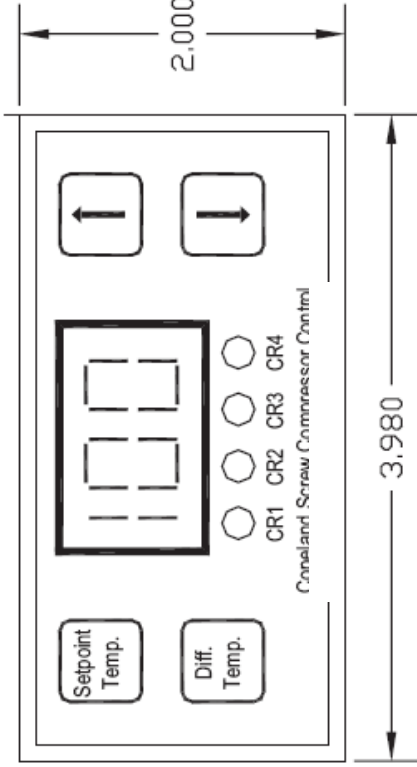
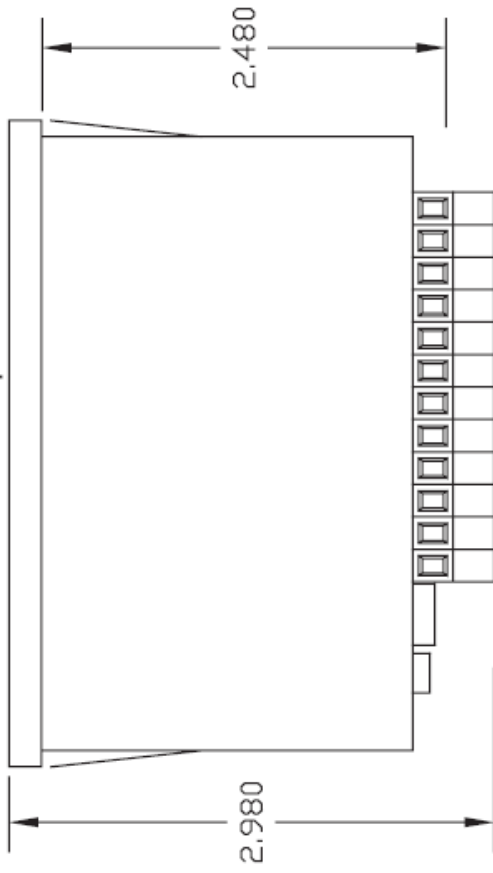
Figure 6 – BITZER PN# 085-0164-15

# Screw Compressor Control

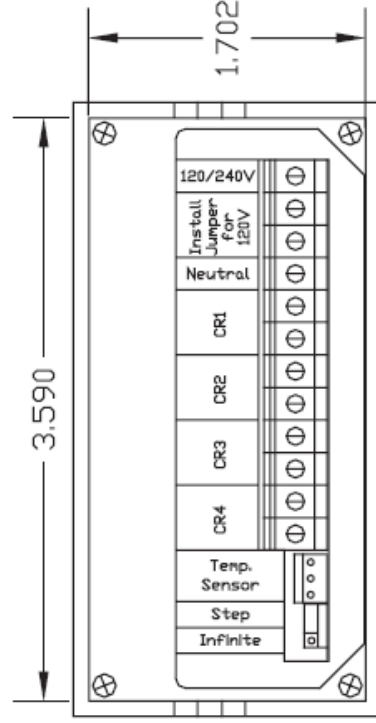
Side View



Top View



Front View



Back View

**Specifications for the BITZER Screw Temperature Capacity Controller SCC-10A  
(Obsolete PN# 085- 0164-13) and Sensors  
(PN# 085-0164-14 (Bulb Type) or PN# 085-0164-15 (NPT)).**

**Both components were available in kit form (Obsolete PN# 999-0003-01 (Bulb Type Sensor) or Obsolete PN# 999-0004-01 (NPT Sensor))**

Input Voltage	
120V Terminal	90 to 132 VAC
240V Terminal	180 to 264 VAC
Frequency Range	50 to 60 Hz
Output Rating	5 Amps at 120/240 VAC
Temperature Range:	
Operational	0° to 105°F (calibrated)
Storage	-40° to 158°F (un-calibrated)
Temp. Sensing Accuracy	+/- 1°F (calibrated) +/- 5°F (un-calibrated)
Humidity Tolerance	0 to 97 % (non-condensing)
Operating Parameters:	
Set Point Range	(0 + Diff. Temp) to 100°F (Infinite Capacity) (0 + 2 x Diff. Temp) to 100°F (Step Capacity)
Differential Temperature Range	1 to 5°F (Infinite Capacity) 1 to 20°F (Step Capacity)
CR1 Turn-On Level	Not Applicable for Infinite Capacity < Set Point, > Set Point - Diff. Temp (Step Capacity)
CR2 Turn-On Level (Step Capacity)	Not Applicable for Infinite Capacity < Set Point - Diff. Temp, > Set Point-2 x Diff Temp
CR3 Turn-On Level	< Set Point - Diff. Temp (Infinite Capacity) < Set Point - 2 x Diff. Temp (Step Capacity)
CR4 Turn-On Level	> Set Point + Diff. Temp (Infinite Capacity) Automatic upon application of power, (Step Capacity) until CR1, CR2 or CR3 energizes. Then CR4 operates with 10 second on and off intervals

## BITZER Capacity Controller for CSH Compressors – Pressure Sensor

**The BITZER Screw Pressure Capacity Controller SCC-10P** (PN# 085-0164-18) is designed to control the loading and unloading of the CSH series compressors based on pressure. This controller does not have the capability of starting or stopping the compressor, nor does it have the ability to operate as a system safety device. These functions must be controlled by other devices in the system.

### Mounting the Controller

Cut or punch a 3.8" X 1.9" rectangular hole in the door of the enclosure or flat panel. Install the unit into the panel by sliding it back first into the opening and pressing firmly against the surface until the mounting clips capture the device.

### Sensor Types

One type of pressure sensor is available for this controller.

**1/4" NPT** sensor that can be inserted into the process stream (PN# 085-0164-19) (See **Figure 7**). This sensor is connected to the controller by a three prong plug that is located on the back of the controller.

### Power Wiring

The controller can be utilized with either 120 or 240 VAC control voltage power.

**120 Volt** power, the hot lead should be connected to the "120/240V" terminal and the neutral lead should be connected to the "**Neutral**" terminal. A jumper must be installed across the two terminals labeled "**Install Jumper for 120V.**"

**240 Volt** power, the hot lead should be connected to the "120/240V" terminal and the neutral lead should be connected to the "**Neutral**" terminal. **No** jumper should be installed across the two terminals labeled "**Install Jumper for 120V.**"

### Capacity Control

The controller has dual capacity control functions. It can operate the compressor either by Infinite

Capacity Control or by 4-Step Capacity Control by changing the placement of a jumper on the back of the controller (See **Figure 1** through **Figure 4**).

### Infinite Capacity Control

The jumper must be installed on the center and left prongs located under "Step" and "Infinite." Solenoid coils must be installed on CR3 and CR4. The controller will cycle these coils to maintain the set point pressure within the differential pressure programmed. The compressor capacity will be varied from 25 to 100% of its rated capacity.

### 4-Step Capacity Control

The jumper must be installed on the center and right prongs located under "Step" and "Infinite." Solenoid coils must be installed on CR1, CR2, CR3 and CR4. The controller will cycle these coils to vary the compressor's capacity in 4 discrete steps, 25, 50, 75 and 100% of its rated capacity.

For a detailed description on the capacity control of the Compact series compressors, refer to the Application Manual SH-170-3.

### Set Point Pressure

To enter the set point pressure, press and hold the "Set Point Press" button and press the up and down buttons until the desired value is displayed.

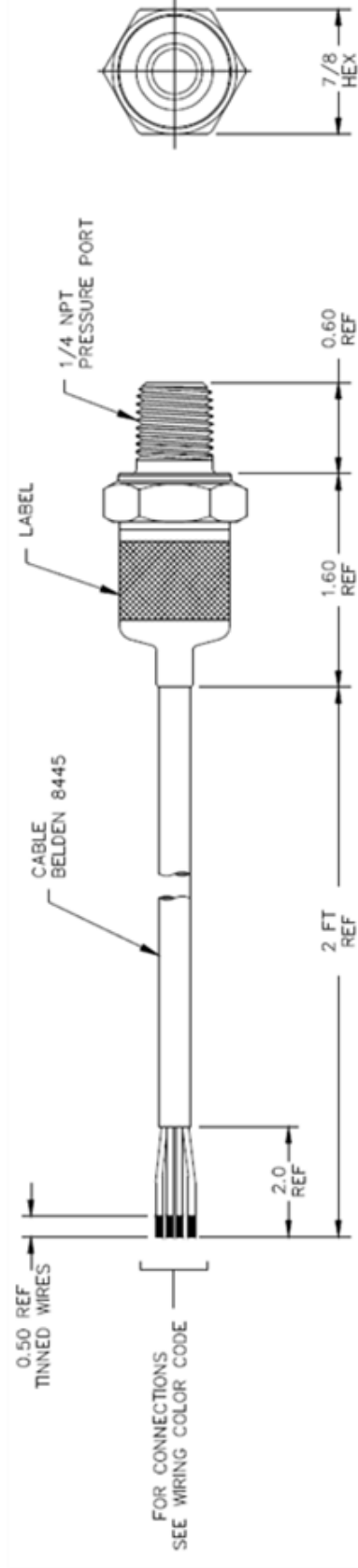
### Differential Pressure

To set the differential pressure, press and hold the "Diff Press" button and press the up and down buttons until the desired value is displayed.

### Pressure Probe Calibration

If calibration of the pressure probe is necessary, change the set point pressure until it matches the "Actual" temperature reading. Press and hold the "Set Point Press" and "Diff Press" buttons at the same time and hold for 10 seconds, the display will flash indicating the calibration is complete. Return the set point temperature to the desired value.

# Pressure Transducer



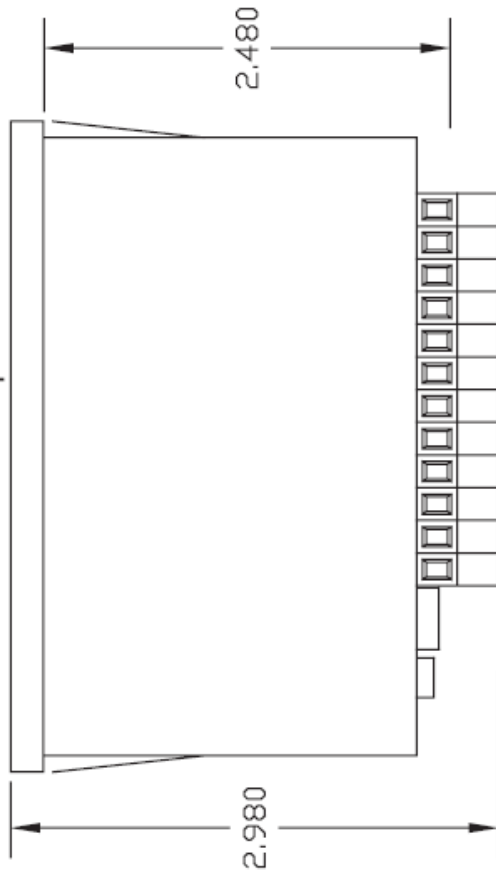
Code	Output	+Supply	-Supply	+Out	-Out
3	0.5 – 4.5 V (ratiometric)	Red	Black	White	N/A

Figure 7 – BITZER PN# 085-0164-19

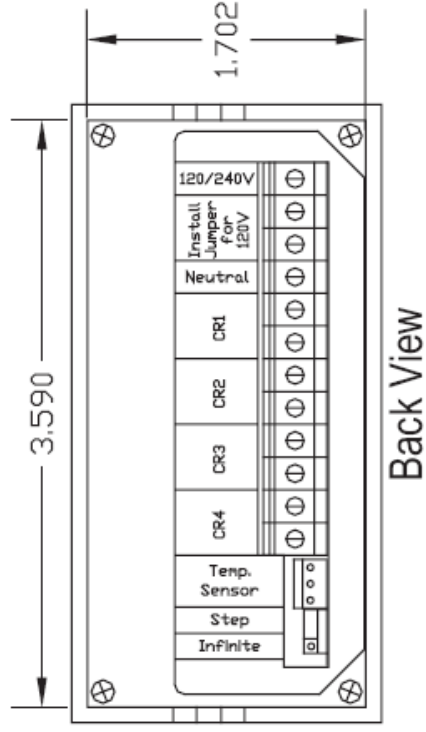
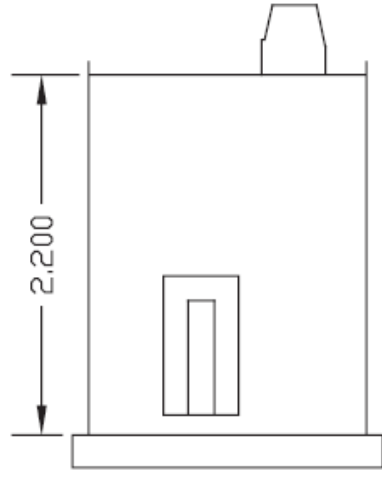


# Screw Compressor Control

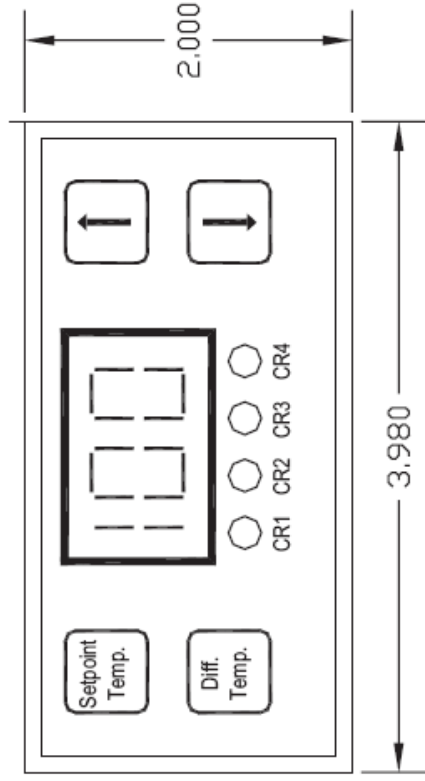
Top View



Side View



Back View



Front View

**Specifications for the BITZER Screw Pressure Capacity Controller SCC-10P  
(PN# 085-0164-18) and Sensor (PN# 085-0164-19).**

**Both components are available in kit form (PN# 999-0005-01).**

Input Voltage	
120V Terminal	90 to 132 VAC
240V Terminal	180 to 264 VAC
Frequency Range	50 to 60 Hz
Output Rating	1 Amp at 120/240 VAC
Temperature Range:	
Operational	0° to 105° F (calibrated)
Storage	-40° to 158° F (un-calibrated)
Pressure Sensing Accuracy	Plus/Minus 3 psi
Humidity Tolerance	0 to 97% (non-condensing)
Operating Parameters:	
Set Point Pressure Range	18 to 110 Psia (3 to 96 Psig)
Differential Pressure Range	0.5 to 10 Psid
CR1 Turn-On Level	Not Applicable for Infinite Capacity < or = Set Point, > Set Point – Diff. Press for step capacity
CR2 Turn-On Level	Not Applicable for Infinite Capacity < or = Set Point – Diff. Press, > Set Point – 2 x Diff. Press for step capacity
CR3 Turn-On Level	< / = Set Point – Diff. Press (Infinite Capacity) < / = Set Point – 2 x Diff. Press (Step Control)
CR4 Turn-On Level	> Set Point + Diff. Press (Infinite Capacity) Automatic upon application of power, (Step Capacity) until CR1, CR2 or CR3 energizes. Then CR4 operates with 1 second on and 10 seconds off intervals

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