



744-HC Series Step Controller

### Description

The 744-HC and 744-HCP Series are “first on/last off” electronic step controllers. They are available in 2, 4, or 6 stages, with S.P.D.T. (Form C) isolated pilot duty relays. Three Controllers may be sequenced providing up to 18 stages. The Step Controllers are assembled and mounted in a track with cover.

The 744-HC Series is capable of accepting five electric/electronic input signals; 10K (65° – 85°F), Temperature Sensing IC (30° – 160°), 1 – 20 VDC, 1 – 20 mA and 0 – 135 Ohms. In addition, the 744-HC Series comes with an on-board setpoint and remote sensor. Each input signal has its own designated terminal block located on the PC board.

The 744-HCP Series features an on-board pneumatic transducer that directly accepts a 0 – 15 psi pneumatic input.

The versatile field programming allows the installer to select and program specific control functions to meet varying application requirements.

- Set any stage(s) on either heating or cooling internal ramp within the input signal range.
- Assign stage(s) to either direct or reverse acting mode.
- Each stage’s differential (hysteresis) is adjustable.

The Control incorporates two (0.6 – 14V DC) internal (heating/cooling) ramps that span the input signal ranges. This feature eliminates the requirement for separate span adjustment on each ramp.

The 744-HC and 744-HCP stages are N.O./N.C. (Form C) isolated output relays, each with a dedicated common terminal. The isolated control voltage may be common or separate for each output relay. A built-in 14 second inter-stage time-delay assures that stages cannot be energized simultaneously. Stages will de-energize sequentially as setpoint satisfaction is sensed. A zero to 14 second time delay occurs before all stages are de-energized simultaneously (input shutdown).

A special “power interruption” protection feature is incorporated into all 744 Series Step Controllers that ignores power interruptions of 15 milliseconds or less. The Controller will automatically reset stages for all interruptions in excess of 15 milliseconds. This feature will recycle the Controller through its sequential steps with time delay and protect against relay chatter.

The 906 Series Thermostats, wall or remote, are available in two temperature ranges; 65° – 85°F and 30° – 160°F. When using the (30° – 160°F) on-board setpoint, a Remote Sensor (P/N 490-0037-007) is required.

### Application

The 744-HC & 744-HCP Controllers are designed for maximum functional flexibility for sequencing stages utilizing typical analog input signals.

#### NOTE

**744-HC & 744-HCP will accept two input signals simultaneously, with one exception; 1 – 20V DC and 1 – 20 mA. This feature allows each application to utilize two separate inputs to control the proportional output of the load.**

### Typical Applications

- Compressors, or compressors and unloaders.
- Pumps • Blowers • Fans • Boilers
- Electric heating elements (circuits)

The Controller is designed to be installed in a typical control panel protected from the weather. Installations should be condensation free and within the specified temperature limitations. Do not install Controller on a vibrating surface or in an airtight compartment.

#### NOTE

**If the 24V AC power must be grounded, ground only the line to/terminal marked “LO”. (U.L. 1995)**

If a Master Step Controller's selected input signal is pneumatic, the first six stages of the control require an on-board transducer (featured on the 744-HCP). Any additional Slave Controller(s) for pneumatic applications only require a 744-HC model (non-pneumatic).

Deadband is determined by measuring the first stage of heating and/or cooling pickup from setpoint on the Input Signal/Temp vs. Ramp Volts Graph. The control can function in heating/cooling, or dehumidification/humidification, utilizing N.O./N.C. (Form C) stages in sequence. Each stage is dependent upon the previous stage energizing before the next stage can be energized.

The Controller is designed to protect against (nominal) induced impulse noise. Be sure that external control sources do not impose excessive impulse noise that may effect the Controller's functions. Should impulse noise be present, contact HCC directly for a "snubber" accessory kit that reduces external noise sources.

## Features

### 1st Control 2nd Control 3rd Control

- Staging 2, 4, or 6 8, 10, or 12 14, 16, or 18
- N.O./N.C. (Form C) isolated relay output.
- Direct or Reverse Acting mode selection.
- Adjustable deadband.
- Adjustable differential (hysteresis).
- L.E.D. indicator for each stage.
- Programming Tabs for either Calibration or Operation.
- Factory calibrated.

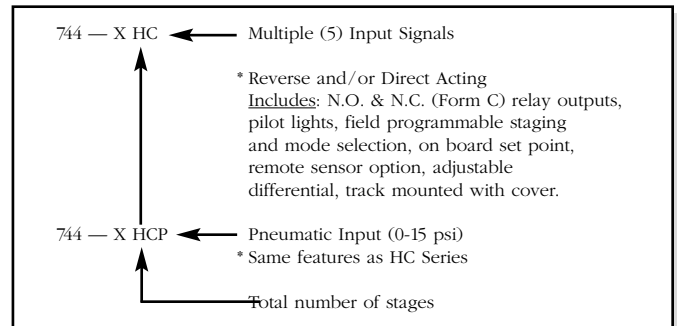
## Specifications

Input Voltage	
Nominal	24V AC
Minimum/Maximum	21V AC/30V AC
Power	6 VA
Frequency	50/60 Hz
Input Signal(s)	
744-HC 10K, Temp. Sensing IC, VDC, mA DC, Ohms	
744-HCP Pneumatic, 0 – 15 psi	
Environmental Limits	
Operating	-30°F to 167°F
Non-Operating	-40°F to 167°F
Humidity	Non-condensing
Ramp Voltage Ranges, Heat & Cool	0.6 – 14 VDC
Relay Rating, Inductive 4 Amps	24 to 277 VAC
Interstate Delay	
Energizing	14 Seconds
De-energize (simultaneously)	0 – 14 Seconds
Dimensions	10.0" (L) x 5.0" (W) x 1.50" (H)

## 906 Series Thermostats

Model	Size	Type	Range °F
906-13W	Standard	Wall	65 – 85
906-13AW	Miniature	Wall	65 – 85
906-13ADRW	Miniature	Remote, Duct	65 – 85
906-13DRW	Standard	Remote, Duct	65 – 85
906-19CDRW	Miniature	Remote, Duct	30 – 160
490-0029-007	Sensor Only	(906-13DRW, 13ADRW)	65 – 85
490-0037-007	Sensor Only	(906-19CDRW)	30 – 160

## Features and Nomenclature



## Input Options

Input Signals	Input Range	Ramp Span Volts DC
<b>744-HC Series</b>		
10K (Thermistor)	65° – 85°F	0.6 – 7.0
Temp. Sensing IC	30° – 160°F	0.6 – 7.0
Ohms	10 – 135 Ohms	0.6 – 14.0
Volts DC	1 – 10 Volts DC	0.6 – 3.5
Volts DC	1 – 20 Volts DC	0.6 – 7.7
mA, DC	1 – 10 mA	0.6 – 3.5
mA, DC	1 – 20 mA	0.6 – 7.5
<b>744-HCP Series</b>		
Input Signal	Input Range	
psi	0 – 15 psi	0.6 – 7.5

## Factory Standard Calibration

Input Signal Range	Input Signal @ Set Point	Offset From: Set Point Between Stages
65° – 85°F	°F Selected	0.7°F
30° – 160°F	°F Selected	2.0°F
10 – 135 Ohms	70 Ohms	8.0 Ohms
1 – 10 Volts DC	5 Volts DC	1.2 Volts DC
1 – 10 mA	5 mA	1.2 mA
9 – 13 psi	2.0 psi	0.5 psi

## HoffmanControls