

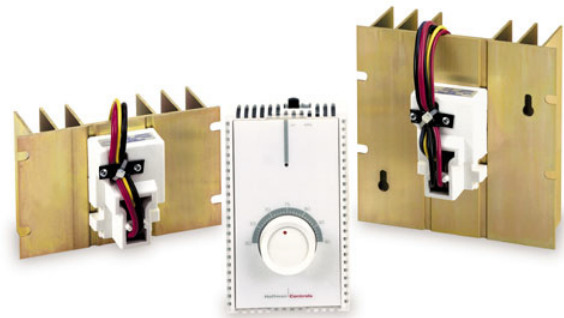
Description

The 701 Series Duct Heater Control System is a modulating electrical heating controller incorporating an electronic temperature sensing thermostat and a power unit. The Controller automatically proportions power over a fixed time base with respect to the error between the set point and the temperature sensed. The low voltage thermostat incorporates the logic that furnishes the proportional control signal. The power Controller turns on at zero voltage (crossing), thus minimizing RFI (Radio Frequency Interference). The thermostat develops pulses that are duty cycle modulated in direct proportion to the temperature error. Proportioning is accomplished by applying power to the heating elements for a percentage of the 300 sine waves occurring over the 5 second time base.

The 701 Electronic Thermostat is very responsive (19-sec./C° time constant) to temperature change and, when coupled with the 5 second time base, provides an almost immediate response to varying load conditions. Accuracy of $\pm 0.1^\circ$ F of set point is obtained through thermistor sensing and all solid state circuitry. The Controller is designed for use with the 701 Series thermostats. It may also accept other commercial input signals when used with a 707 Series Interface.

Application

The 701 Series controller is designed for use in a Master/Slave configuration/connection. Every Master or Slave controls one phase and/or circuit system. Only one Master is required for each thermostat input for single or three phase applications. A Master and Slave must, however, be utilized in a circuit (single or three phase) that does not exceed the maximum current rating of the power unit. Master and Slaves are available in two (heat sink) sizes, resulting in maximum current ratings of 12.5, 16.6, and 25 amps.



701 Power Units with Thermostat

Features and Benefits

- Thermistor temperature sensing provides precise and accurate temperature control regulation within 0.1°F and fast response time to temperature changes.
- Time proportioning temperature control provides regulation from 0 – 100% of heat output.
- Zero voltage switching minimizes RFI (Radio Frequency Interference).
- Complete electronic reliability.
- Utilized on any electric heating element application.
- Any quantity of Slaves within limits can be used to increase capacity when used with any one Master and Thermostat.
- Optional temperature ranges available.

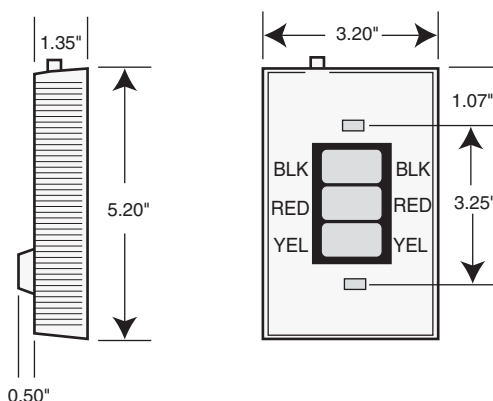
The 701 Series power Controllers are identified as Masters or Slaves by the two or three suffix after the model number. Table 1 lists all models of Masters and Slaves that are designed for duct heater or baseboard application. Low voltage power Controllers are also listed. See separate specifications for line voltage Controllers.

Three Phase Applications

1. Three separate single phase circuits are required for each power unit of a three phase system.
2. The initial three phase circuit of a load will require one Master and two Slaves.
3. Any additional circuit of a three phase load will require three Slaves.
4. Circuit load should not exceed the maximum current rating for the specific Master and Slaves being used in each phase of the three phase circuit.
5. Each Master and each Slave acts as a single phase control in the three phase circuit.
6. Master and Slave power units are similar in appearance.
7. Only one Master is required for each Thermostat input.

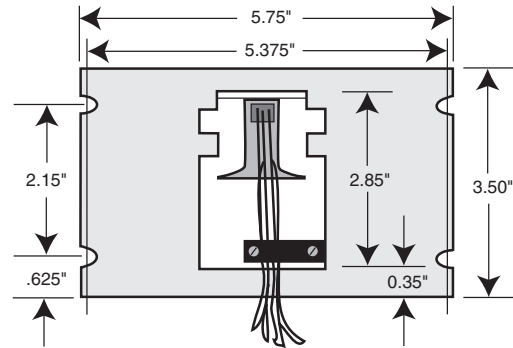
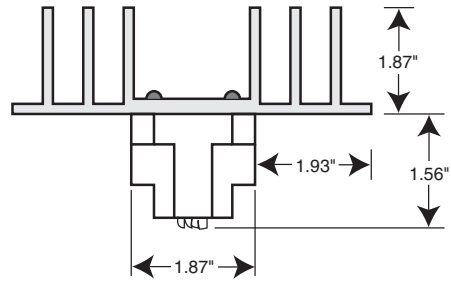
Single Phase Applications

1. A separate single phase circuit is required for each Master and Slave.

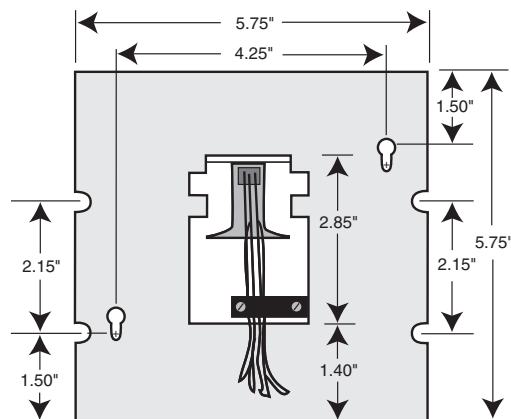
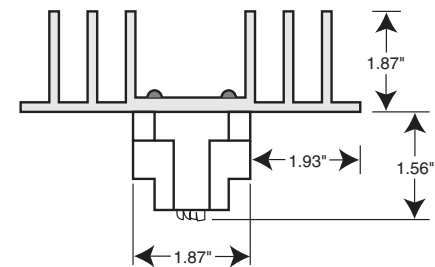


701 Series Thermostat Dimensions

2. Circuit loads should not exceed the maximum current rating for the specific Master or Slave being used.
3. Additional Slaves may be used (one per circuit) to accommodate the total load.
4. Master and Slave power units are similar in appearance.
5. Only one Master is required for each Thermostat input.



701 Series Master/Slave Dimensions
12.5 Amp and 16.6 Amp



701 Series Master/Slave Dimensions
25 Amp

Specifications

Power Unit (Master and/or Slave)

Voltage	120/208/240/277/480 Volts
Current	12.5 to 25 Amps
Frequency	50/60 Hz
Max. Ambient Temp.	40°C
Max. Heat Sink Temp.	75°C
Min. Load	500 Watts
Max. Load	See Table 1

Thermostat Unit – by Hoffman Controls

Type	Thermistor
Signal	10K
Time Constant	19 sec./°C
Proportional Band	Factory Set. 2°F
Control Regulation	0.1°F
701-1	Stand-by Switch Std.
701-2	No stand-by switch
Set Point Range	60°F to 90°F

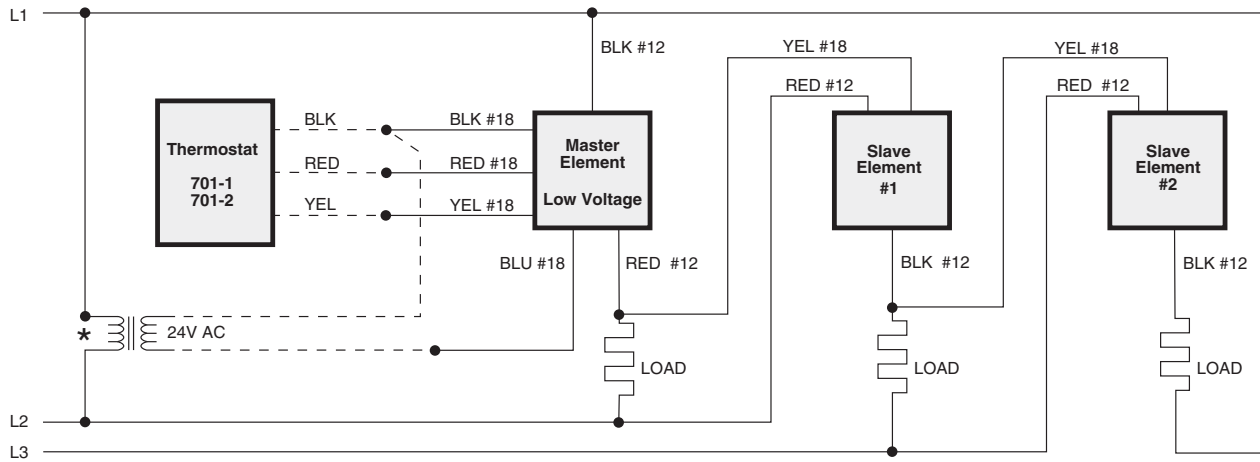
Optional Thermostat Inputs

See 707 Series Product Data (Table 2) for available inputs other than Hoffman 701 Series Electronic Thermostats.

Low Voltage Masters
Table 1

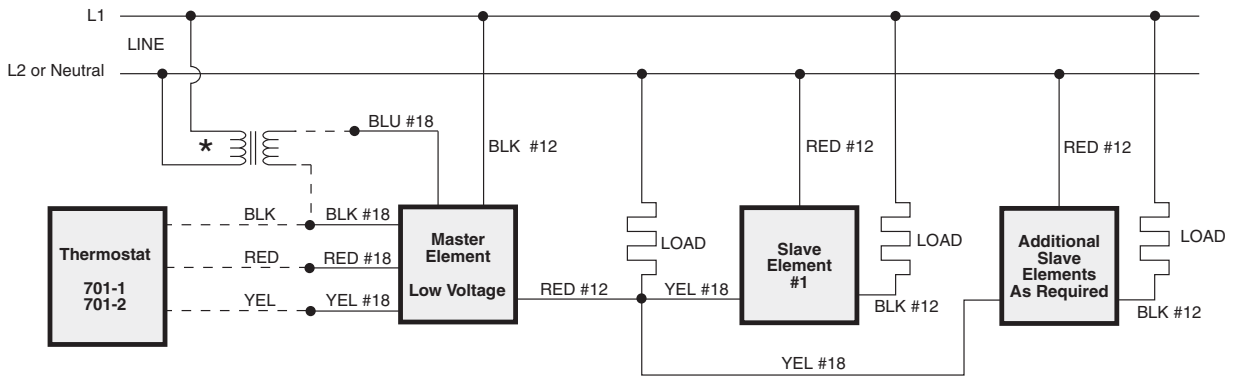
Duct Heater Part Number	Ceiling Cable Baseboard Part Number	Volts	Amps	Kw
Low Voltage Masters				
701-90	701-83	120	16.6	2
*701-123	*701-130	120	25.0	3
701-73	701-80	208/240	16.6	3.45/4
701-74	701-81	277	14.0	4
701-75	701-82	480	12.5	6
701-35	701-24	208/240	25.0	5.2/6
701-36	701-25	277	25.0	7
701-26	701-6	480	25.0	12
Slaves				
701-87	701-85	120	16.6	2
*701-124	*701-131	120	25.0	3
701-68	701-32	208/240	26.6	3.45/4
701-70	701-77	277	14.0	4
701-72	701-79	480	12.5	6
701-48	701-38	208/240	25.0	5.2/6
701-50	701-40	277	25.0	7
701-27	701-7	480	25.0	12
Slaves (4 Wire WYE only)				
*701-115	*701-116	120	16.6	2
*701-127	*701-132	120	25.0	3
*701-117	*701-118	277	14.0	7
*701-119	*701-120	277	25.0	7

* Manufactured to U.L. Standards but not U.L. Recognized



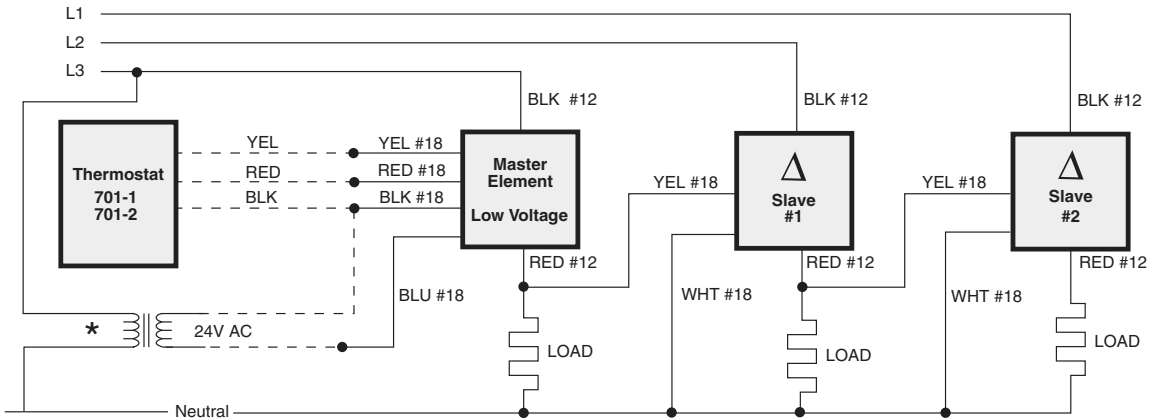
Notes: * Transformer must be on same phase as the Master
 Field wiring - - - - -

Three Phase Delta Low Voltage Thermostat Wiring



Notes: * Transformer must be on same phase as the Master
 Field wiring - - - - -

Single Phase Low Voltage Thermostat Wiring

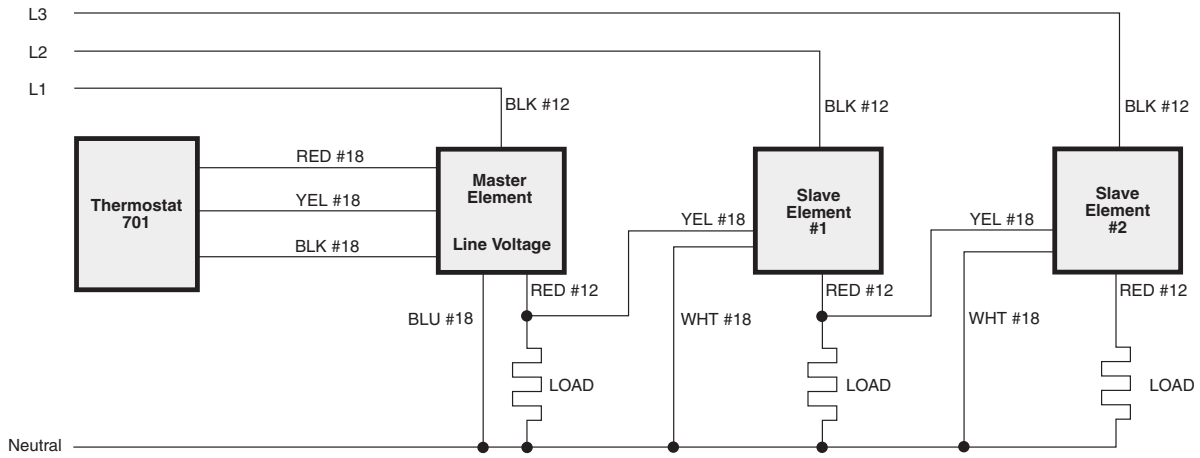


Notes: * Transformer must be on same phase as the Master.
 Field wiring - - - - -

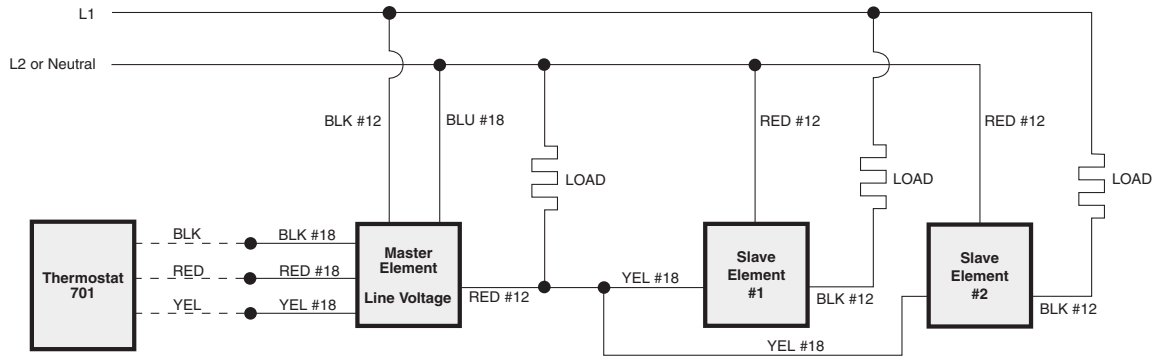
△ Slaves must be 4 Wire WYE type.

For special wiring applications including line voltage controls, fan control, base board, etc., request addition information.

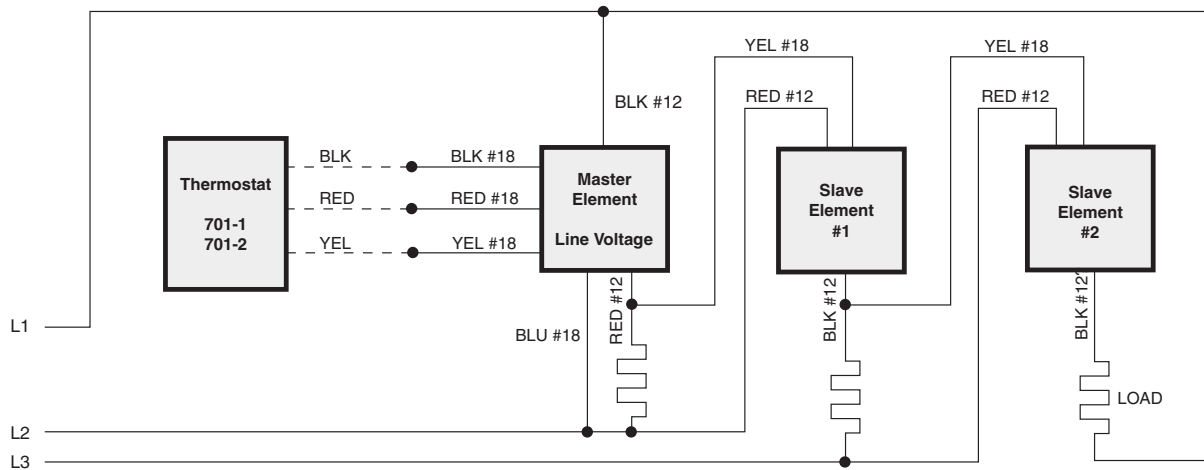
Three Phase 4 Wire WYE Low Voltage Thermostat Wiring



Three Phase 4 Wire WYE Line Voltage Thermostat Wiring



Single Phase Line Voltage Thermostat Wiring



Three Phase Delta Line Voltage Thermostat Wiring

Hoffman|Controls