

# Digital Thermostat Installation in RV HVAC Systems

## Coleman Mach to Hunter Digital Thermostat Instructions

Credit given where credit is due: This page written by Ken Lenger and derived from the text from Alan Paskey and Les Adams. Credit for the original concept and details of the Coleman modification is given to Alan Paskey. Les Adams further developed this concept to work with the Dometic A/C and Atwood furnace. Their comments follow page 2.

The Coleman Mach analog RV thermostat can be replaced with a Digital Hunter thermostat part number 42999(B) or 42995 to provide tighter temperature control in both heating and cooling modes. The hysteresis program for the Hunter thermostat is +/-1 degree of set temperature, and also provides a digital readout of ambient temperature. The Hunter unit can be purchased from Wal\*Mart for about \$20. I have also verified that this mod will work with the Lux TX500 thermostat, which is available at many hardware stores.

Although the Hunter thermostat is designed to work with milli-volt and 24 vac residential HVAC systems, it can be used in an RV DC system because the thermostat uses battery power to run all of the thermostat electronics, which in turn controls internal relays to run the heating and air-conditioning equipment.

Function	Coleman Mach Wire Color	Hunter P/N 42999 or 42995 Terminal Designation
+12 VDC Power	Red	RH and RC (Note 1)
DC Ground	Blue	Not Connected (Note 2)
Furnace (+12 VDC switched)	White	W
Fan High (+12 VDC switched)	Green	G (see Note 3)
Fan Low (+12 VDC switched)	Gray	G (see Note 3)
A/C Comp (+12 VDC switched)	Yellow	Y

Note 1: The +12 VDC wire is required because the Hunter thermostat switches this power through switches and relays to operate the HVAC equipment. The RH terminal supplies power to the heating equipment and the RC terminal supplies power to the air conditioning equipment.

Note 2: The DC ground wire is not used. On the Coleman Mach thermostat, power to operate the electronics is derived from RV +12 VDC power. The +12 VDC power and DC ground were required for this. Since the Hunter thermostat uses battery power to operate it's electronics, the DC ground wire is not required.

Note 3: There are three options for the fan control terminal wiring:

Option 1: The G terminal can be connected to the green wire removed from the Coleman thermostat for manual high speed fan operation, or to the gray wire for low speed fan operation.  
Option 2: The G terminal can be connected through a SPDT switch to select either high or low speed.

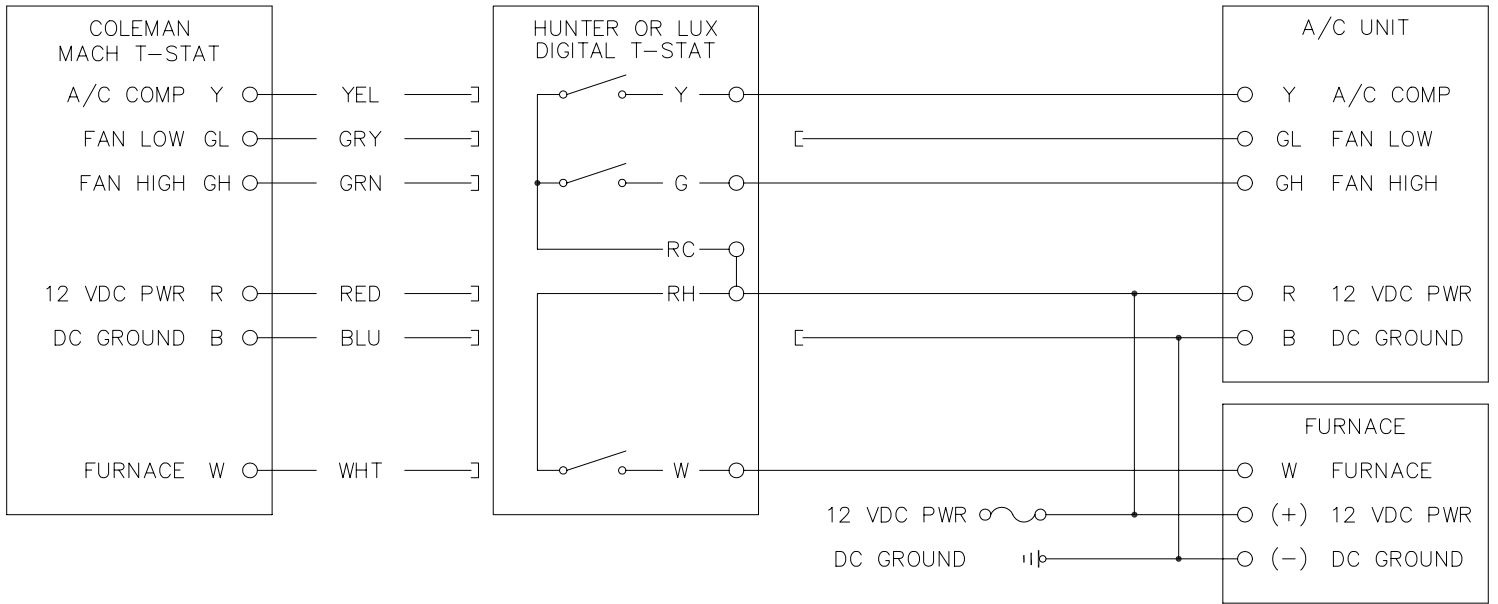
Option 3: The G terminal can be connected through a relay so that the fan runs on low speed whenever the fan is turned on with the FAN switch on the T-stat (G terminal), and runs at high speed whenever the A/C compressor is running (Y terminal). This option allows you to run the fan at low speed to circulate air, but still have the A/C run at maximum capacity when on.

Note 4: The HG / HE switch in the T-stat should be left in the HG position. In the HG (heat-gas) position, the furnace fan is controlled by the furnace electronics. In the HE (heat-electric) position, the Hunter thermostat controls the furnace fan independently of the furnace burner.

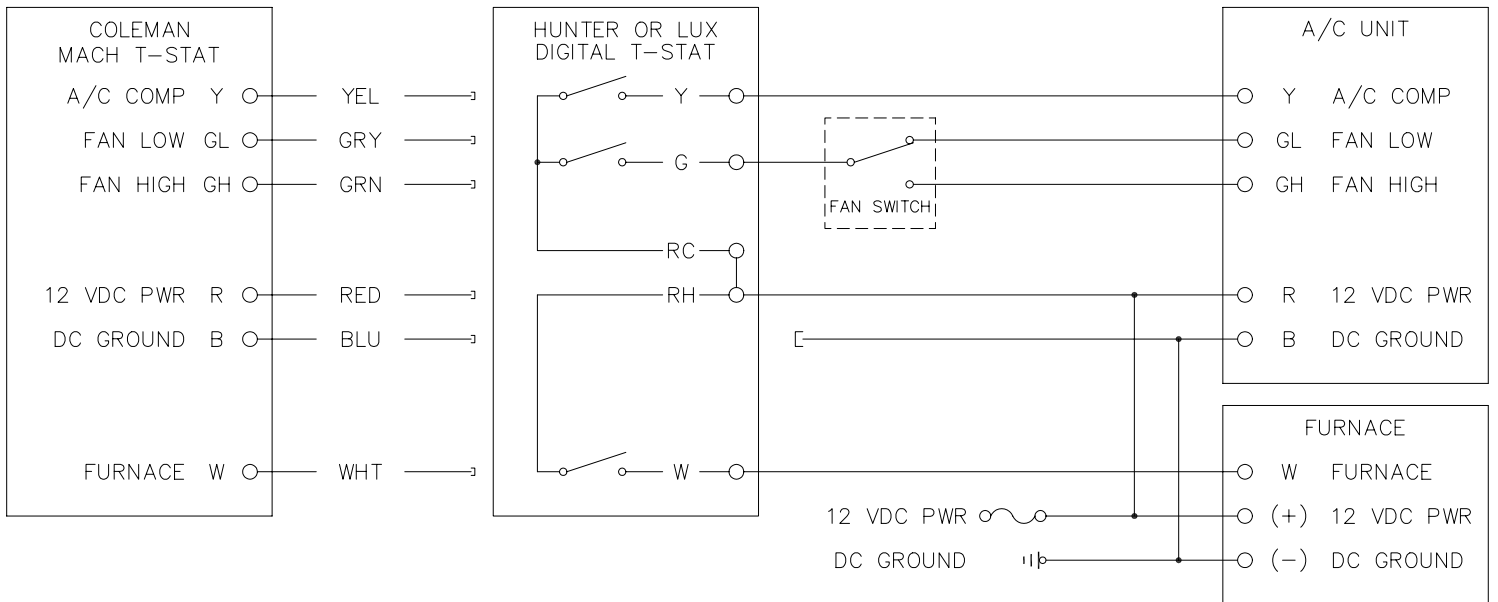
This document can be found at <http://www.klenger.net/arctic-fox/hunter-tstat/>

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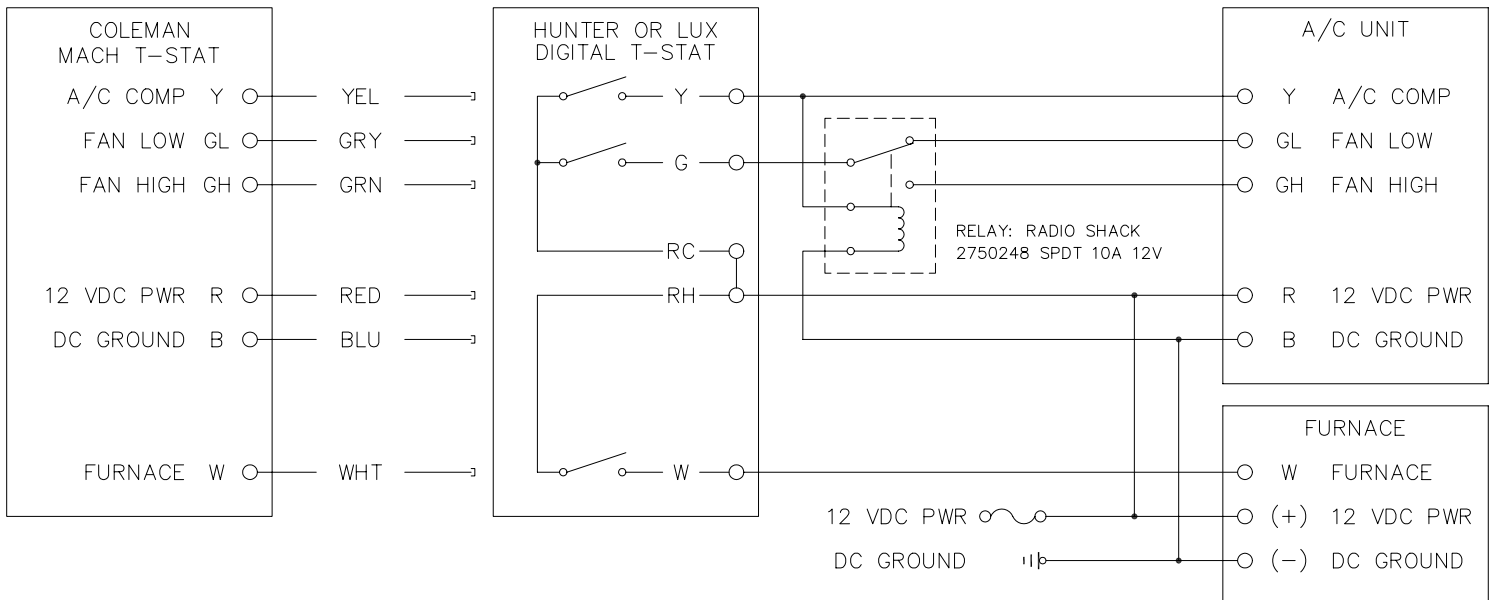
## OPTION 1



## OPTION 2



## OPTION 3



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TEXT OF ALAN PASKEY'S ARTICLE as FOLLOWS (FOR COLEMAN UNITS)

The wires coming out of the a/c are as follows:

Red	=	+12 VDC
Blue	=	-12 VDC
Green	=	Fan High
Gray	=	Fan Low
White	=	Furnace
Yellow	=	Compressor

The wire terminals on the new stat are as follows:

RC	=	cooling relay
RH	=	heating relay
G	=	Fan
W	=	Heat
Y	=	A/C compressor

I hooked up everything as follows:

RC	=	Red wire
RH	=	Red wire
G	=	see notes below
W	=	White wire
Y	=	Yellow wire

Notes:

1. I did not use the Blue wire (-12 VDC)... The book says it goes to all relay coils but as far as I can tell in the stat, it is used for a delay circuit for the compressor... I MAY BE COMPLETELY WRONG!!! I have the circuit drawn out if there is an EE or someone smarter than I am that can figure it out... It looks like a simple circuit with 2 caps and a transistor... If someone knows what it is really for, please let me know...
2. I took a wire from "G" on the stat to the common on a single pole double throw (SPDT) switch... I wired the fan high and fan low to the switch... This allows me to still control the high and low of the fan just like the old stat...
3. This has worked for me but I can't make any promises for anyone else... A little research should be able to determine if it will work for you or not...
4. Total cost: \$19.99 +tax for the stat from Wal Mart and \$2.99 +tax for the switch from Radio Shack...

Hope this helps someone else out. - Alan Paskey

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## LES ADAMS ARTICLE FOR WIRING HUNTER DIGITAL THERMOSTAT INTO DOMETIC A/C AND ATWOOD FURNACE

There was a thread on another BBS by Alan Paskey about his installation of a Hunter Digital Thermostat for his A/C and heat... I have been wanting to do this for some time now and finally got around to going over to "Wally World" (Wal Mart) and buying the thermostat and "getting off my duff" and installing it!!!

I installed it yesterday... Unfortunately, I have a Dometic (Duo Therm) ducted A/C unit and Atwood Furnace and Alan Paskey's unit was a Coleman... His wiring documentation DID NOT work for me... I spent the better part of the day figuring out how the Dometic contact closures worked and then another few hours doing the same for the digital thermostat and marrying the two together...

The digital thermostat is a Hunter - Part #42995 and is \$19.95 at "Wally World" (Wal Mart)... The advantage to the digital thermostat is tighter hysteresis (+/- 1 degree of temperature change yields "turn on" or "turn off"), a digital temperature readout, and no guesswork about where temperature is set for your particular "comfort zone"...

The Hunter Thermostat runs on 2 AA pen cells which are NOT supplied... I would suggest you carry spares as well, for if the batteries go dead, so does your thermostat (AND A/C and Heat)!!!

The following documentation will apply ONLY to my particular Dometic type A/C unit and Atwood furnace although it should work on other similar Dometic systems and possibly other manufacturers as well... As previously mentioned,

Alan's wiring documentation (his was a Coleman) DID NOT work on my unit, so bare in mind that some wiring changes may be necessary to make the Hunter Digital thermostat function properly with your particular system if they are different than the two referenced within this article...

Duo Therm (original)	OEM Wire Color used in trailer	Hunter stat terminal
Ground	Black or green	"RC"
Fan	Orange or Tan	"G"
Cool	Yellow	"Y"
Ground	Black or Green	"RH"
Furnace	White	"W"
High Fan	Blue	Thru SPST switch to "G" (Tan)
Red	+7.5 volts DC	not used

## Digital Thermostat Installation in RV HVAC Systems

Hunter thermostat Heating System Selector switch set to "HG"... "F/C" selector switch to "F" ...

Note that both the Hunter "RC" and "RH" terminals have the ground lead connected to them... I fashioned a jumper wire from one terminal to another... BOTH these terminals are grounded from the same point in my installation...

This setup worked very well for me last night... I will continue to test but I believe this wiring documentation is correct for Dometic/Atwood...

The Hunter Thermostat has two fan positions - "Auto" and "ON" which enables you to run the fan only, if desired, in the A/C mode only...

I used a Radio Shack subminiature DPDT slide switch for the "High Fan" function... I cut out a little notch in the upper right hand corner of the back of the Hunter thermostat and mounted the switch there with the supplied "very tiny" screws... The Radio Shack part number for this switch is 275-407 ... I had this switch in my "junk box" of electronic components for quite a few years so I don't know if they still make it, but any switch will work... Actually you only need a SPST but this is what I had so I used it...

Additionally, I kept all of the standard thermostat leads (OEM red wire is not used with Hunter) just in case the Hunter fails and I have to switch back to the Duo Therm... The Duo Therm thermostat is in the TT and can be reinstalled in just minutes if necessary...

For those with a Coleman setup, I also have the original article for the Coleman written by Alan Paskey and the wiring directions associated with it... The text of Alan's article is shown below and was used for Alan's Coleman setup...

Good Luck and Best Regards,

Les

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### HUNTER DIGITAL THERMOSTAT FOLLOW UP REPORT AS OF 10/26/01 WRITTEN BY LES ADAMS

The Hunter Digital Thermostat was installed in my 27' Nomad travel trailer in the Spring of this year(2001)... We used the TT all year long utilizing both the heating mode and cooling mode... The Hunter performed quite well coming "on" at 1 degree above set point and going "off" at 1 degree below set point...

Although this is actually a 3 degree range as opposed to the advertised +/- 1 degree, theoretically, it is within the spec of +/- 1 degree (of set point) and the Hunter operates much better than the standard Duo Therm analog thermostat...

This is a great modification to make if your dissatisfied with the hysteresis (on/off ratio) of your current thermostat... I find the digital much easier to use because you simply set the desired temperature... With the OEM Duo Therm analog thermostat that came with the TT, you had to play with the "temp set arm" until you found the most comfortable setting while trying to "interpolate" the temperature marks on the thermostat... The hysteresis of the Duo Therm thermostat seemed to be larger than the Hunter... It was not uncommon to be either too hot or too cold while waiting for the old thermostat to kick on or off... The temperature range within the trailer is much more comfortable using the Hunter digital thermostat...