GOODMAN TECHNICAL SERVICES

# GoodNews Tech Tips

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**NATE Certification**

Goodman encourages and supports HVAC contractors who earn NATE Certification. The NATE badge is a symbol recognized by an ever-increasing number of homeowners as the official mark of technician

## 14 SEER Dual Fuel Package Units

We are pleased to introduce our new line of Dual Fuel package equipment. Production began the week of August 29th of this year. These 14 SEER units will be available in both Goodman and Amana models which will include:

*PD1424070M41

*PD1430090M41

*PD1436090M41

*PD1442115M41

*PD1448115M41.

These units will feature Tubular Aluminized Heat Exchangers( Stainless Steel on Amana products), Copeland Scroll Compressors, Ranco Reversing Valves, Swept Wing Fan Blades, EEM Blower Motors, Flowrator Metering Devices, and White Rodgers 2-Stage gas valves, just to name a few.

The 14 SEER Dual Fuel Package units are capable of running with any 1-cool/ 2-heat heat pump thermostat, but for optimal performance, it is recommended to use a 1-cool/ 2-heat dual fuel thermostat with a remote sensor or with an OTDFPKG-01 outdoor thermostat, which is sold as an accessory for the system.



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# 14 SEER Dual Fuel Package Units Continued

The OTDFPKG-01 thermostat is set in a “Birdhouse” enclosure and has a temperature range of 0 – 45°F. The temperature setting is determined by the local climate and the energy rates, with 40°F being a typical setting. For ease of installation, a Molex plug is pre-wired to the outdoor thermostat; therefore, eliminating the need for additional wiring to the unit. Pre-stamped holes and knockouts on the unit - corner post ensure correct positioning of the control. This control was designed to get the true Dual Fuel benefit from the system while still using a standard 1- cool/ 2-heat heat pump thermostat.

## OTDFPKG-01 Outdoor thermostat with “Birdhouse” Enclosure

# Charging Labels Added to Goodman/Amana Heat Pumps

In our continuing effort to make our heat pumps the most dependable and user-friendly units on the market, we are adding charging labels to all split-system heat pumps (see illustration below). These labels will be located on the inside of the control box cover. The label will contain the expanded performance charts for the heating cycle and the proper method of determining the superheat and subcooling in the cooling cycle. The expanded heating charts should enable our dealers to increase the accuracy of their charging during the heating cycle, which should result in fewer callbacks saving dealers time and money.

**HEATING MODE**

Pressures shown are for most popular match indoor unit WITH NO FROST ON OUTDOOR COIL. Due to factors like airflow, charge, indoor coil & frost, pressures will vary significantly. Liquid (small) service valve pressures should be ± 20 psig & suction (access port) pressures should be ±5 psig of the values listed in this chart.

| | Indoor Air Flow Rate | Indoor Return Air Dry Bulb Temperature (°F) | Outdoor Air Dry Bulb Temperature (°F) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 17 | | 22 | | 27 | | 32 | | 37 | | 42 | | 47 | | 52 | | 57 | | 62 | | 67 | |
| | | | Liquid Valve & Compressor Suction Pressure | | | | | | | | | | | | | | | | | | | | | |
| | | | Liq | Suct | Liq | Suct | Liq | Suct | Liq | Suct | Liq | Suct | Liq | Suct | Liq | Suct | Liq | Suct | Liq | Suct | Liq | Suct | Liq | Suct |
| Low Stage | 740 | 65 | 249 | 51 | 258 | 61 | 267 | 72 | 277 | 82 | 286 | 92 | 295 | 103 | 305 | 113 | 314 | 124 | 324 | 134 | 333 | 144 | 343 | 155 |
| | | 70 | 267 | 51 | 277 | 61 | 286 | 71 | 295 | 82 | 305 | 92 | 314 | 102 | 324 | 113 | 333 | 123 | 343 | 134 | 352 | 144 | 362 | 154 |
| | | 75 | 286 | 50 | 296 | 61 | 306 | 71 | 315 | 81 | 325 | 92 | 334 | 102 | 344 | 112 | 354 | 123 | 363 | 133 | 373 | 144 | 382 | 154 |
| | 860 | 65 | 240 | 50 | 249 | 61 | 258 | 71 | 267 | 81 | 276 | 92 | 285 | 102 | 295 | 112 | 304 | 122 | 313 | 133 | 322 | 143 | 331 | 154 |
| | | 70 | 258 | 51 | 267 | 61 | 276 | 71 | 286 | 82 | 295 | 92 | 304 | 102 | 313 | 113 | 322 | 123 | 331 | 133 | 341 | 144 | 350 | 154 |
| | | 75 | 277 | 51 | 286 | 61 | 295 | 72 | 305 | 82 | 314 | 92 | 323 | 103 | 332 | 113 | 342 | 124 | 351 | 134 | 360 | 144 | 369 | 154 |
| | 960 | 65 | 234 | 50 | 243 | 61 | 252 | 71 | 261 | 81 | 269 | 91 | 278 | 102 | 287 | 112 | 296 | 122 | 305 | 133 | 314 | 143 | 323 | 153 |
| | | 70 | 252 | 51 | 260 | 61 | 269 | 71 | 278 | 82 | 287 | 92 | 296 | 102 | 305 | 112 | 314 | 123 | 323 | 133 | 332 | 143 | 341 | 154 |
| | | 75 | 270 | 51 | 279 | 61 | 288 | 72 | 297 | 82 | 306 | 92 | 315 | 103 | 324 | 113 | 333 | 123 | 342 | 134 | 351 | 144 | 360 | 154 |
| High Stage | 1090 | 65 | 271 | 60 | 281 | 68 | 290 | 76 | 300 | 84 | 310 | 92 | 320 | 100 | 330 | 109 | 340 | 117 | 350 | 125 | 360 | 133 | 370 | 141 |
| | | 70 | 291 | 60 | 301 | 68 | 311 | 76 | 321 | 84 | 331 | 92 | 341 | 100 | 351 | 108 | 361 | 116 | 371 | 124 | 380 | 132 | 390 | 140 |
| | | 75 | 312 | 60 | 322 | 68 | 332 | 76 | 342 | 84 | 352 | 92 | 362 | 100 | 372 | 108 | 382 | 116 | 392 | 124 | 402 | 132 | 412 | 140 |
| | 1250 | 65 | 262 | 60 | 271 | 68 | 281 | 76 | 290 | 84 | 300 | 92 | 309 | 100 | 319 | 108 | 328 | 116 | 338 | 124 | 348 | 132 | 357 | 139 |
| | | 70 | 281 | 60 | 291 | 68 | 300 | 76 | 310 | 84 | 320 | 92 | 329 | 100 | 339 | 108 | 348 | 116 | 358 | 124 | 368 | 132 | 377 | 140 |
| | | 75 | 301 | 61 | 311 | 69 | 321 | 77 | 331 | 85 | 340 | 93 | 350 | 101 | 360 | 109 | 369 | 117 | 379 | 124 | 389 | 132 | 398 | 140 |
| | 1410 | 65 | 255 | 60 | 264 | 68 | 274 | 76 | 283 | 84 | 292 | 92 | 301 | 100 | 311 | 107 | 320 | 115 | 330 | 123 | 339 | 131 | 349 | 139 |
| | | 70 | 274 | 60 | 284 | 68 | 293 | 76 | 302 | 84 | 312 | 92 | 321 | 100 | 330 | 108 | 340 | 116 | 349 | 124 | 358 | 132 | 368 | 140 |
| | | 75 | 294 | 61 | 303 | 69 | 313 | 77 | 323 | 85 | 332 | 92 | 341 | 100 | 351 | 108 | 360 | 116 | 370 | 124 | 379 | 132 | 388 | 140 |

The charging charts were added in production to the *SZC16 and *SZC18 SEER heat pumps starting in May, 2011. Charging charts will be added to the *SZ13 and *SZ14 SEER heat pumps starting in October, 2011. Dealers need to be reminded that proper airflow must be determined before charging begins. Without the correct airflow, charging charts or any other method will not be successful. **NOTE:** It is still recommended that the dealer return and verify the charge of the unit in the cooling cycle by checking superheat and or subcooling.

# Aluminum Coils Introduced in Condensing Units

In May, 2011, Goodman introduced a limited production of the VSX130241BA condenser with our new 5mm aluminum condenser coil. Due to the success of this unit, it has been decided to introduce a limited production of the GSC130241GA R22 dry charge unit in the 23" chassis with the new aluminum coil. These units are tentatively scheduled for production starting in December, 2011. The 23" chassis will have the following features.

1. Smaller footprint for easier handling and to resolve clearance issues.
2. New two-piece louver assembly for easier removal during service.
3. Hinged control panel for easier access to compressor and interior of unit.
4. Contactor mounted higher in control box for better access.
5. New base pan for more service valve clearance.
6. Relocated wiring to eliminate wires contacting tubing.

# Installation and Service of Communicating Capable Equipment

For the last two years we have been producing communicating heating and cooling equipment in Goodman and Amana® brands. As part of the manufacturing process, shared data is programmed into each unit on the assembly line. This data collection holds information specific to the equipment being programmed, such as operating CFM, equipment match-up information and the model and serial number of the equipment. This process works very well and is verified by run testing each unit.

When installing and troubleshooting communicating equipment, it is extremely important to pay attention to the connection of data wires. These wires connect to terminals 1 & 2 of the ComfortNet Control (CTK01AA / CTK02AA), to your air handler or furnace and also to a communicating outdoor condensing unit. Typically, wires from the ComfortNet control and the outdoor unit will be terminated at the low-voltage terminal strip of the furnace or air handler. The two data #1 wires must be first twisted together before being placed under the data #1 screw on the low-voltage terminal strip. Likewise, the two data #2 wires must be twisted together before being placed under the data #2 screw. Solid #18 gauge wire should be used and should not contain splices.

Upon being powered up, the ComfortNet control will search for communicating devices and will report any equipment found on the screen of the control. This process is usually complete in a few minutes. In the event of continuous "searching" but not finding equipment, the data wire connections should be checked. The wire itself should also be checked for open or shorted conductors. Less than perfect connections often go undetected on 24-volt control systems but will definitely be an issue in a communicating system which operates on small voltages. The vast majority of service issues on this type of system are not caused by device failure but rather by poor connections.

Refer to the chart on the following page for troubleshooting.

## Installation and Service of Communicating Capable Equipment Continued

| LED | LED Status | Indication | Possible Cause | Corrective Action | Notes |
|---|---|---|---|---|---|
| Red Communi-cations LED | Off | Normal after 2 flashes | Normal op | none | |
| | 1 Flash | Communications Failure | BIAS and TERM switches off | Depress learn button for 2 sec-onds | |
| | | | | Verify that BIAS and TERM switches are in the ON position | |
| | 2 Flashes | Normal Operation on start up | Normal op | none | |
| | No Flash on start up | No Power | No power to furnace | Check circuit breaker | Verify safe condition with volt meter |
| | | | | Depress learn button for 2 sec-onds | |
| Green receive LED | 1 Steady Flash | No network found | Broken / dis-connected data wire | ~Check commu-nications wiring, data 1, data 2 | Twist data 1 wires together, twist data 2 wires together |
| | | | Furnace in-stalled as non-communicating | Check voltage on communica-tion wires 2.6vdc & 2.3vdc to ground & .2-.6vdc between data 1 & data 2 | Verify power is turned off to repair |
| | Rapid flashing | Normal network traffic | Control is talk-ing on network, normal opera-tion | none | |
| | On solid | Data 1 / Data 2miss-wire | Data 1 / Data 2 wires are crossed or shorted, | Check wiring connections | Verify power is turned off to repair |

# Thermostatic Expansion Valves

With more and more systems using Thermostatic Expansion Valves (TXV) instead of Fixed Orifice metering (Flowrators, Cap Tubes) , there is a need to accurately diagnose TXVs. The TXV is designed to control the rate of flow of the refrigerant in exact proportions into the evaporator coil. The TXV does this by controlling the superheat. The valve responds to the temperature of the gas leaving the evaporator (the feeler bulb on the suction line) and the pressure of the refrigerant in the coil. The refrigerant amount going into the evaporator is regulated because the metering of the flow of the refrigerant prevents the return of liquid refrigerant back to compressor.

## Three forces govern the operation of the bulb:

1. The pressure created in the power head assembly by the expansion and contraction of the refrigerant that is the bulb. Good contact between the bulb and the suction line is a must if the valve is to
control within specs.

2. The evaporator pressure.

3. The equivalent pressure of the super spring in the valve.

## Trouble Shooting TXVs

## External Equalizer line

The external equalizer line reads the evaporator pressure during the operating of system.

## Overfeeding

Overfeeding by the TXV will result in a high-suction, cold-suction line and slugging of the compressor. Make sure that remote bulb is firmly attached to suction line.

## Underfeeding

Underfeeding will result in low-system capacity and low-suction pressure.

Check if the symptoms happen.



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# Thermostatic Expansion Valves Continued

## Checking Expansion Valve Remote Operation.

1. Remove the remote bulb of the valve from the valve.

2. Cool the bulb in a container of ice water, closing the valve.

3. Start the system and warm the bulb in your hand.

4. Feel the suction line.  If a temperature chance is felt, the valve is working.

5. If no change is noticed, the valve is restricted or power element is faulty.

6. Remove the charge and replace valve and drier.

## Refrigerant Overcharge

An overcharge system is normally indicated by excessively high-head pressure. A system containing noncondensable air may also have high-head pressure.

## Adjustable TXVs

Some of Goodman TXVs have an adjustment stem. It is best to leave the valve at its factory setting, unless the technician has had a lot of experience with adjusting TXVs in the past. You should measure your superheat at the bulb position. To gain more superheat, the valve stem should be turned clockwise , and for less super heat, the valve should be turned counterclockwise. Adjust TXV to 7 to 9 ºF superheat, and then check subcooling.

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**Thank goodness for Goodman™.**

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