GOODMAN TECHNICAL SERVICES

# GoodNews Tech Tips

VOLUME 3, ISSUE 1 JANUARY 2012

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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

## LIGHT COMMERCIAL OPTIONS IN 2012

Many dealers are aware of our current line of factory-installed options which include:

- Treated condenser coils
- Stainless-steel heat exchangers
- Powered and non-powered convenience outlets
- Down-flow economizers
- High-static options
- Low-ambient controls
- Louvered condenser-coil hail guards

In the upcoming year, Goodman is looking to introduce a few new factory-installed options to further enhance our commercial product lines.

- 5mm condenser coils on many CPC and CPG models are scheduled for release in the first quarter of this year.
- Factory-installed smoke detectors for either supply side, return side or both will give the contractor greater service-ability and access to controls.
- Service disconnects will consist of a separate built –in control box with a handled breaker as a means to kill unit power and for ease of wiring.
- DDC controls will give the end user the ability, through either Lon Works, BACnet or Modbus protocols, to be integrated into most building management systems.
- Phase monitors to protect against voltage fluctuations that can damage electrical components.

As our commercial product line grows we are looking forward to providing more options to meet the needs of our industry and customers alike.

JANUARY 2012

Goodman Air Conditioning & Heating

# LP GAS FURNACE INSTALLATION

Approximately 10% of our gas furnaces sold are field converted for use with LP gas. Customers using propane enjoy the same high level of efficiency as the natural gas version. Although both natural-gas and LP-gas furnace installations have several things in common, there are several differences that require special attention when doing propane installations. Also, when performing service calls on an LP furnace, don't assume that these installation items have been done properly.

LP - Tank Sizing - This is normally done by the LP fuel provider. There are several factors to consider: A) the total BTUH of all LP appliances, B) how often your provider will be in your area to refill. A larger tank may allow the homeowner to take advantage of buying and storing LP when prices are in their favor C) vaporization rate- LP fuel is stored in a liquid state but is consumed in the vapor state. The surface area of the tank as well as ambient temperatures determine the vaporization rate of the LP. In cold climates, it is possible to have a tank large enough to hold enough propane between fill ups, but at the same time not provide enough area for proper vaporization rate. This would result in low supply pressure and incomplete combustion

LP - Tank Placement - Follow proper distance requirements from the home per local and National codes.

Regulator(s) and Gas-line Sizing - Most LP installations will have two regulators, a first-stage regulator on the tank and a second-stage regulator usually mounted on the house which reduces the gas down to houseline pressure. Undersized gas lines and regulators can cause low pressures and incomplete combustion.

LP-Leak Detection Device - Consider using a device that will warn the homeowner in the event of an LP-gas leak. Since LP gas is heavier than air, in the event of a leak, it will collect in low areas.

Use the Proper LP-Conversion Kit for your Furnace - Most kits consist of new springs for the gas valve and a set of orifices to be installed in the gas manifold. The exception is our modulating furnace. The LP kits for these furnaces contain a new gas valve, manifold assembly and new burners (since the modulating gas valve is non-adjustable). The burners supplied in the modulating furnace LP kit provide better flame characteristics in lower firing rates than the burners used for natural gas.



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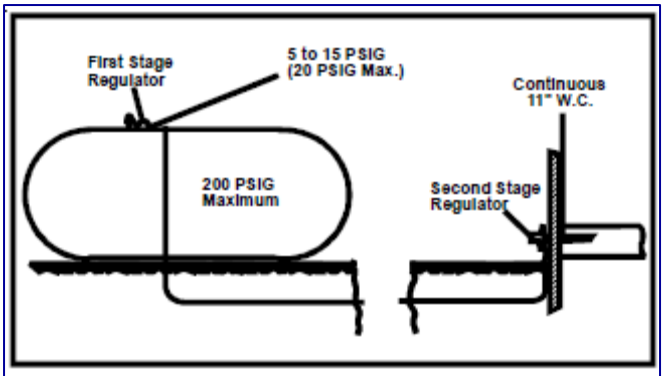
# LP GAS FURNACE INSTALLATION

Use a Low - Pressure Shut Off Device - These devices will keep a furnace from operating when supply pressure is below the acceptable minimum. A low LP tank or improperly operating LP supply system can cause incomplete combustion and by-products that include carbon and carbon monoxide. For single - and two - stage White-Rodgers or Honeywell gas valves use the LPLP02 kit. We will also be releasing a new kit soon to work with the modulating furnace.




Propane Gas Installation (Typ.)



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# LP GAS FURNACE INSTALLATION

**Sizing Between First and Second Stage Regulator***

Maximum Propane Capacities listed are based on 2 psig pressure drop at 10 psig setting.
Capacities in 1,000 BTU/hour.

| Pipe or Tubing Length Feet | Tubing Size, O.D. Type L | | | | | Nominal Pipe Size Schedule 40 | |
|---|---|---|---|---|---|---|---|
| | 3/8" | 1/2" | 5/8" | 3/4" | 7/8" | 1/2" | 3/4" |
| 10 | 730 | 1,700 | 3,200 | 5,300 | 8,300 | 3,200 | 7,500 |
| 20 | 500 | 1,100 | 220 | 3,700 | 5,800 | 2,200 | 4,200 |
| 30 | 400 | 920 | 2,000 | 2,900 | 4,700 | 1,800 | 4,000 |
| 40 | 370 | 850 | 1,700 | 2,700 | 4,100 | 1,600 | 3,700 |
| 50 | 330 | 770 | 1,500 | 2,400 | 3,700 | 1,500 | 3,400 |
| 60 | 300 | 700 | 1,300 | 2,200 | 3,300 | 1,300 | 3,100 |
| 80 | 260 | 610 | 1,200 | 1,900 | 2,900 | 1,200 | 2,600 |
| 100 | 220 | 540 | 1,000 | 1,700 | 2,600 | 1,000 | 2,300 |
| 125 | 200 | 490 | 900 | 1,400 | 2,300 | 900 | 2,100 |
| 150 | 190 | 430 | 830 | 1,300 | 2,100 | 830 | 1,900 |
| 175 | 170 | 400 | 780 | 1,200 | 1,900 | 770 | 1,700 |
| 200 | 160 | 380 | 730 | 1,100 | 1,800 | 720 | 1,500 |

To convert to capacities at 15 psig settings - multiply by 1.130
To convert to capacities at 5 psig settings - multiply by 0.879

## Propane Gas Piping Chart I

**Sizing Between Second or Second Stage Regulator & Appliance***

Maximum Propane Capacities listed are based on 1/2" W.C. pressure drop at 11" W.C. setting.
Capacities in 1,000 BTU/hour.

| Pipe or Tubing Length Feet | Tubing Size, O.D. Type L | | | | | Nominal Pipe Size Schedule 40 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3/8" | 1/2" | 5/8" | 3/4" | 7/8" | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" |
| 10 | 39 | 92 | 199 | 329 | 501 | 275 | 567 | 1,071 | 2,205 | 3,307 |
| 20 | 26 | 62 | 131 | 216 | 346 | 189 | 393 | 732 | 1,496 | 2,299 |
| 30 | 21 | 50 | 107 | 181 | 277 | 152 | 315 | 590 | 1,212 | 1,858 |
| 40 | 19 | 41 | 90 | 145 | 233 | 129 | 267 | 504 | 1,039 | 1,559 |
| 50 | 18 | 37 | 79 | 131 | 198 | 114 | 237 | 448 | 913 | 1,417 |
| 60 | 16 | 35 | 72 | 1,211 | 187 | 103 | 217 | 409 | 834 | 1,275 |
| 80 | 13 | 29 | 62 | 104 | 155 | 89 | 185 | 346 | 724 | 1,066 |
| 100 | 11 | 26 | 55 | 90 | 138 | 78 | 162 | 307 | 630 | 976 |
| 125 | 10 | 24 | 48 | 81 | 122 | 69 | 146 | 275 | 567 | 866 |
| 150 | 9 | 21 | 43 | 72 | 109 | 63 | 132 | 252 | 511 | 787 |
| 200 | 8 | 19 | 39 | 66 | 100 | 54 | 112 | 209 | 439 | 665 |
| 250 | 8 | 17 | 36 | 60 | 93 | 48 | 100 | 185 | 390 | 590 |

*Data in accordance with NFPA pamphlet No. 54

## Propane Gas Piping Chart II



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# ARE WE SELLING TOTAL INDOOR COMFORT

The human body is equipped with a complicated and sensitive control system to maintain a constant 98.6°F body temperature. Though this is the ideal body temperature, it is not the accepted ideal indoor environmental conditions of 75°F temperature and 50% relative humidity.

Complete human comfort must deal with more than temperature and humidity. There are four factors vital to maintaining the ideal indoor comfort conditions.

1. Temperature
2. Humidity
3. Air Filtration
4. Air Distribution

In the real world normal body temperature has little to do with body comfort. The human body contains an unequaled temperature control system, but it regulates the internal temperature only - not the surrounding environment.

Comfort is controlled by external influences on the human body. When the external balance is achieved, we have Total Indoor Comfort with temperature, humidity, air filtration and air distribution equally contributing to an ideal indoor environment. Each factor needs to be looked at individually as it relates to human comfort.

**Temperature**

The first factor in Total Indoor Comfort is temperature, a measure of the presence of or the lack of heat. In nature, the primary source of heat is the radiant energy from the sun. There are three methods of transmitting heat from one object to another: radiation, convection and conduction.

All three forms of heat transmission can be found in the home. The sun beaming in through the windows pours “radiant” heat into the house. The sun also heats the outside of the walls and roof, and this heat is “conducted” by the structure to the inside of the house. The air is then heated by the walls and “convects” to the ceiling, where the heat is transferred to the cooler surface. Today’s modern temperature controls and heating and air conditioning systems can regulate the temperature of a house within a few degrees in the coldest or hottest days, maintaining Total Indoor Comfort.

**Humidity**

Humidity, or the water content of air, is the most important factor influencing Total Indoor Comfort, because it has such a significant affect on temperature. In nature, all air contains some humidity. The saturation point for a given volume of air depends on the density and temperature of that air. Relative humidity is the percentage of moisture in a given volume of air at a certain temperature and barometric reading, relative to the saturation point of that air. In terms of human comfort, humidity is a vital factor to consider.

Since Humidity is so important in the search for Total Indoor Comfort, we need to consider the “cause



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# ARE WE SELLING TOTAL INDOOR COMFORT

and effect" of moisture-laden air on heating and cooling of the house.

During the hot summer months, the humidity inside a non-conditioned house is usually greater than that outdoors. This is because the hot air inside of the house can absorb more moisture due to evaporation in the bath, kitchen and laundry room. Relative humidity may be up to 40% higher inside the house than it is outside. This excess moisture is not only uncomfortable, but can damage furniture, woodwork, fabrics and is responsible for sticking doors and drawers. These issues occur as the heavy, moisture laded air condenses as it touches any object that is cooler. The water vapor reverts back to a liquid state upon contact with these surfaces.

On the other hand cold, dense, sub-freezing air can be close to saturation; but when introduced into the house through infiltration and heated to three or four times its original temperature, the air may end up with less than 15% Relative Humidity, even with the normal evaporation from typical household activities. This winter-dry climate causes wooden material to split and crack, static electricity and chapped skin. All this happens because the air inside the house expands as it is heated. This lowers the moisture content per cubic foot making it easy for this rapidly circulating air to evaporate more moisture from inside the house. This leads to an uncomfortable sensation that is felt from this dry heated air when the human body perspires. This perspiration evaporates due to the forced circulation, and the occupants feel cool or chilly rather than comfortably warm.

These factors make it imperative that, in the summer, the air conditioner be properly sized and operating correctly to dehumidify, and that, in the winter, a humidifier be installed to furnish the proper humidity level in the house to maintain Total Indoor Comfort.

**Air Filtration**

Air filtration is essential to the ideal maintenance of physical comfort. This consists of the removal of millions of microscopic particles from the air. Literally tons of pollen, dust, oils, combustion residue and lint from paper and clothing have polluted our atmosphere.

Some of the uncomfortable results of poorly filtered air are the germs and bacteria that are bred and circulating, causing a real threat to our heath and constant irritation to asthma and allergy sufferers. Air filtration can be accomplished by the use of throwaway or permanent filters, media air cleaners or electronic air cleaners. Dust and pollution present a battle that must be constantly fought to assure Total Indoor Comfort.

**Air Distribution**

In considering physical comfort, there are two types of air movement: "Natural" that includes the wind and thermally-induced draft (the rising of hot air and the falling of cool air or "Mechanical" which covers all forced air systems such fans and blowers). Modern high-efficiency heating and cooling systems are normally the convector type systems using an indoor section with a blower assembly to satisfy the air demands of the heating cycle and the cooling cycle. Air delivered in both cycles, historically, was sufficient to supply the ventilation requirements of the average home. But in the world of energy efficient home construction, ventilation requirements must be considered in equipment sizing as well as the Total Indoor Comfort.

# ARE WE SELLING TOTAL INDOOR COMFORT

Air Distribution is the last and most vital factor to establishing Total Indoor Comfort; because evaporation and its cooling effect increases in proportion to the amount of air being moved. Without a properly sized and installed air distribution system, we have defeated any attempt to provide Total Indoor Comfort to our customer. On new installations the dealer has the opportunity and the obligation to size and install the duct system to provide the most efficient system to the homeowner. When replacing existing equipment it is imperative to inspect the duct system for proper sizing and repair and seal the duct system to assure the homeowner is receiving the full benefit of the new equipment.

Temperature, humidity, air filtration and air distribution are the four factors essential to Total Indoor Comfort in the conditioned environment of the home. A total comfort controlled home creates a relaxed and healthy environment. If we skip any of these factors, are we selling “Total Indoor Comfort” or “Air in a Box”?

# APG15/GPG15 INDUCER BLOWER MOTOR

Changes to the inducer blower motor for the A/GPG15 gas packs have caused questions concerning the ability to interchange with other systems. It is very important to get the full model and serial number for the system to insure the customer gets the correct parts.

The new design assembly, 0131G00009 (Picture 1), is NOT interchangeable with the 0131G00001S, since the blower plate and mounting holes are different. This change was made on the AC revision systems.

Picture 1: 0131G00009 – New AC Revision

The 0131G00001S (Picture 2) is still available for the AA and AB revision systems.

Picture 2: 0131G00001S – AA & AB Revision



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# Technical Training Programs

It is the beginning of a new year and we all know what that means. It's time for the New Year's Resolutions. This year, Goodman Technical Services is making a New Year's Resolution that there will be a strong increase in the number of training opportunities available for dealers and distributors .

This increase will occur on several fronts, the first of which will be Webinars. Technical Services is putting on a minimum of four Webinar classes per month. The class topics will include Proper Evacuation and Charging, R-410A, ComfortNet Technology, Modulating Furnaces, High Efficiency Furnaces, 80% Furnaces, Heat Pumps, Electric Motors, Compressors, TXV's, Electrical Troubleshooting, etc.

If you are not taking advantage of these opportunities to train, Goodman encourages you to sign up to be included as a participant in the classes that are of interest to you.

- Go to www.goodmanmfg.com
- Click on "Partnerlink," which is located at the bottom right-hand corner of the page in the gray bar.
- Enter the user name "goodman" and the password "dealer," both in lower case only, then click the red button labeled "Go."
- Click on "Dealer Webinar Registration," which is located on the left-hand side of the page in the red block.
- Enter your information which will register you to receive email notifications of all upcoming webinar training events.

Of course, we will continue to have Technical Trainers available to come to different areas of the country to do face-to-face training. In order to get a class held in your area, contact your local distributor and request that they set up training for you and others in your area.

Additionally, Goodman Technical Services is partnering with ESCO to enhance further our ability to train dealers, and we are working with other national training groups as well.

Goodman has made its New Year's Resolution to you, and you are cordially invited to join us. Have a great year.

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**Thank goodness for Goodman ™.**

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Heating & Air Conditioning
Amana

**Lasts and Lasts and Lasts™**

**We've become one of the largest manufacturers of residential and light commercial air conditioning, heating, and indoor air quality products and systems by focusing on just one thing-building the most reliable and refreshingly affordable indoor comfort products in the market.**

**The complete line if Goodman brand products are built on the principle of founder Harold Goodman, a former air conditioning contractor.**

**Harold's goal was to manufacture air conditioning and heating equipment that:**

- **Provides industry leading product warranties**
- **Offers greater reliability and longer-lasting performance than competing products**
- **Is designed for quick., trouble-free installations**
- **Makes reliable cooling and heating as affordable as possible.**

**Building our products to Harold's standards, and protecting those products with some of the best limited warranties in the industry, has helped to make the Goodman brand widely recognized as a leading brand in the residential and light commercial heating, ventilation and air conditioning industry today.**

**We're on the web!**

**www.goodmanmfg.com**