

# INVERTER SCROLL HEAT PUMP CHILLER

LG Air Conditioning Technologies



**R-410A**  
Refrigerant

# WHY INVERTER SCROLL HEAT PUMP CHILLER?

The LG Inverter Scroll Heat Pump Chillers are state-of-the-art, self-contained automatic refrigerating units crafted with the latest engineering components for compactness and efficiency. Each unit has several air-cooled condensers with built-in sub-cooler sections, along with two or more hermetically sealed inverter scroll compressors that are easy to access, an evaporator that works efficiently, and electronic expansion valves. With its cutting-edge design, the Inverter Scroll Heat Pump Chillers deliver unparalleled performance and reliability, making them ideal for a range of industrial and commercial applications.

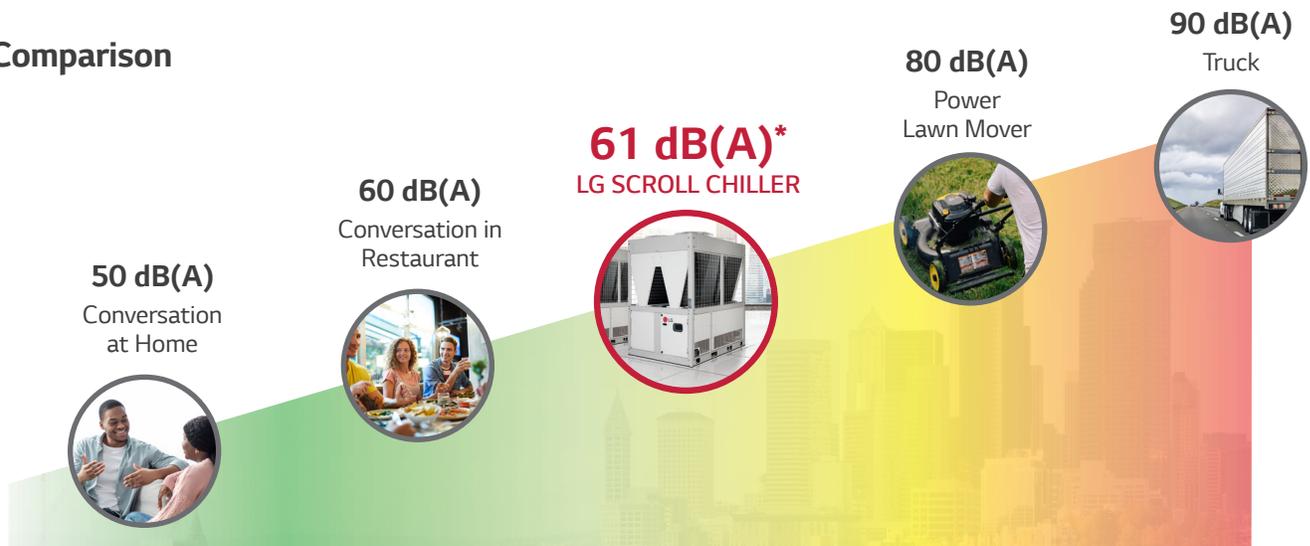
## Line-up

| Tons     |                   | 17    | 20    | 33  | 40    | 50    | 60    |
|----------|-------------------|-------|-------|-----|-------|-------|-------|
| Capacity | Cooling (kBtuh/h) | 194   | 222   | 389 | 444   | 584   | 666   |
|          | Heating (MBH)     | 214.5 | 250.3 | 429 | 500.6 | 643.6 | 750.9 |

## Low Noise Level

Lower noise provides a quieter, more comfortable environment.

### Noise Comparison



\*LG 60 TON Inverter Heat Pump Chiller Sound Pressure at 30 Feet, individual unit. Sound Power Tested per ANSI/AHRI Standard 370-2015 (Based on individual systems).  
 LG Sound Pressure Values provided based on Q=2 180 degree profile:  $L_p = L_w - 10 \log [Q / (4\pi r^2)]$   
 Handbook for Environmental Acoustics James P. Cowan, 1994.

# APPLICATIONS

The compact design, low noise, and versatility of the LG Inverter Scroll Heat Pump Chiller is ideal for applications such as, but not limited to, the following:

**4-Pipe Systems:** Provides heating and cooling as well as cooling and dehumidification.

**Data Centers:** Reduces the size of emergency power generators and electrical infrastructures.

**Electrification & Decarbonization:** Effective replacement for traditional gas and oil heating systems.

**Ice Rinks:** Ideal for ice production and maintaining the facility environment.

**Museums & Schools:** Ensures tight temperature control and operates with very low sound.

**Process Cooling:** Suitable to provide cooling or heating needs for industrial, food, or product machines and processes.

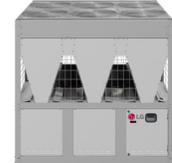
**Secondary Low Temperature Loop:** Ideal for use in medical procedure rooms when primary loop chilled water temperature is too high.

**Technology and Science:** Ideal for marine aquariums and pharmaceutical applications.

**Water Source Systems (68°F to 88°F):** Primary loop as a replacement for boilers, cooling towers, or both.

# INVERTER SCROLL HEAT PUMP CHILLER

## R-410A 208-230V



| Inverter Scroll Heat Pump Chiller           |  | Unit                 | ACHH017VBAB                             | ACHH020VBAB  | ACHH033VBAB    | ACHH040VBAB    | ACHH050VBAB    | ACHH060VBAB    |
|---|--|----------------------|---|--------------|----------------|----------------|----------------|----------------|
| Power                                       |  | Phase, Lines, V, Hz  | 3, 3, 208-230, 60                       |              |                |                |                |                |
| Capacity                                    | Cooling  | RT                   | 16.2                                    | 18.5         | 32.4           | 37.0           | 48.7           | 55.5           |
|   |  | kBtuh/h              | 194                                     | 222          | 389            | 444            | 584            | 666            |
| Input Power                                 | Heating  | MBH                  | 214.3                                   | 250.0        | 428.6          | 500.0          | 643.0          | 750.1          |
|   |  | kW                   | 18.0                                    | 21.5         | 36.2           | 43.0           | 54.3           | 64.5           |
| Efficiency                                  | Cooling  | EER (btuh/W)         | 10.75                                   | 10.33        | 10.75          | 10.33          | 10.75          | 10.33          |
|   | Heating (120°F LWT, 15 Δ, 47 F)                | COP (W/W)            | 3.26                                    | 3.21         | 3.26           | 3.21           | 3.26           | 3.21           |
| AHRI 550-590 Cooling Performance and Rating |  | IPLV (btuh/W)        | 19.46                                   |              |                |                |                |                |
| Sound Power                                 | Cooling  | dB(A)                | 78                                      | 78           | 86             | 87             | 88             | 88             |
| Sound Pressure 30'                          | Cooling  | dB(A)                | 49                                      | 51           | 52             | 54             | 54             | 56             |
| Sound Pressure 5'                           | Cooling  | dB(A)                | 69                                      | 71           | 72             | 74             | 74             | 76             |
| Sound Power                                 | Heating  | dB(A)                | 83                                      | 83           | 86             | 87             | 88             | 88             |
| Sound Pressure 30'                          | Heating  | dB(A)                | 49                                      | 51           | 52             | 54             | 54             | 56             |
| Sound Pressure 5'                           | Heating  | dB(A)                | 69                                      | 71           | 72             | 74             | 74             | 76             |
| Compressors                                 | Type: Inverter Scroll                          | EA                   | 2                                       | 2            | 4              | 4              | 6              | 6              |
|   | PVE Oil Charge Each                            | OZ/EA                | 33.8                                    |              |                |                |                |                |
| Refrigerant                                 | Type   |                      | 410A                                    |              |                |                |                |                |
|   | Amount of Charge EA Circuit                    | lbs/EA               | (15.4 x 2)                              | (15.4 x 2)   | (15.4 x 4)     | (15.4 x 4)     | (15.4 x 6)     | (15.4 x 6)     |
|   | Metering                                       |                      | 2000 Step Electronic Expansion Valve    |              |                |                |                |                |
| Condenser Coils                             | Coated Aluminum Fin and Tube                   | 10,000 HRS ASTMB-117 | 2                                       | 2            | 4              | 4              | 6              | 6              |
|   | Type: Stainless Brazed Plate                   | EA                   | 1                                       | 1            | 2              | 2              | 3              | 3              |
|   | Pressure Drop                                  | ftAg                 | 2.7                                     | 3.1          | 2.7            | 3.1            | 2.7            | 3.1            |
|   | Operating Maximum Pressure (Refrigerant/Water) | psi                  | 597/142                                 |              |                |                |                |                |
| Evaporator                                  | Refrigerant Volume (EA.)                       | ft <sup>3</sup>      | 2 x (.18)                               | 2 x (.18)    | 4 x (.18)      | 4 x (.18)      | 6 x (.18)      | 6 x (.18)      |
|   | Cooling Water Flow (10F Delta)                 | GPM                  | 38.9                                    | 44.4         | 77.8           | 88.7           | 116.7          | 133.1          |
|   | Cooling Water Flow (Min-Max)                   | GPM                  | 19.4 - 97                               | 22.2 - 111   | 38.8 - 194     | 44.4 - 222     | 58.2 - 291     | 66.6 - 333     |
|   | Heating Water Flow (15F Delta)                 | GPM                  | 28.6                                    | 33.4         | 57.2           | 66.7           | 85.8           | 100.1          |
|   | Heating Water Flow (Min-Max)                   | GPM                  | 18.4 - 107.3                            | 18.7 - 125.1 | 36.9 - 214.5   | 37.3 - 250.3   | 55.4 - 321.8   | 56 - 375.4     |
|   | Inlet/Outlet Water Connection                  | inches/flange        | 2" / 150 lb                             | 2" / 150lb   | 2 1/2" / 150lb | 2 1/2" / 150lb | 2 1/2" / 150lb | 2 1/2" / 150lb |
|   | Total System Water Volume                      | GL                   | 2.68                                    | 2.68         | 7.91           | 7.91           | 14.48          | 14.48          |
| Fan Motor                                   | Type: Variable BLDC                            | EA                   | 2                                       | 2            | 4              | 4              | 6              | 6              |
|   | No. of Blades per Fan                          | EA                   | 6                                       |              |                |                |                |                |
|   | Air Flow Rate                                  | CFM                  | 8684                                    |              |                |                |                |                |
| Weight                                      | Motor Power                                    | W                    | 900                                     |              |                |                |                |                |
|   |  | lbs                  | 1162                                    | 1162         | 2218           | 2218           | 3208           | 3208           |
| Dimensions                                  | Width  | inches               | 30 1/8                                  | 30-1/8       | 60-5/8         | 60-5/8         | 90-13/16       | 90-13/16       |
|   | Height   | inches               | 86-5/8                                  |              |                |                |                |                |
|   | Depth  | inches               | 84-13/16                                |              |                |                |                |                |
| Foot Print                                  |  | ft <sup>2</sup> /RT  | 1.09                                    | 0.96         | 1.09           | 0.96           | 1.09           | 0.96           |
| Exterior Panel                              |  | Epoxy Powder Coat    | Rated at 450 HRS per ASTMB-117          |              |                |                |                |                |
| Remote Monitoring and Control               |  | Type                 | Optional BACnet Gateway                 |              |                |                |                |                |
| Protection Devices                          | High/Low Pressure                              | Electronic           | Internal                                |              |                |                |                |                |
|   | Flow Switch                                    | Paddle/ADJ.          | Internal                                |              |                |                |                |                |
|   | Freeze Protection                              | On/Off Contact Only  | Heat Trace Elements and Power by Others |              |                |                |                |                |
| Supply Water Temperature Range              | Cooling  | F                    | 14 - 68                                 |              |                |                |                |                |
|   | Heating  | F                    | 86 - 140*                               |              |                |                |                |                |
| Approved Water Delta T                      | Cooling and Heating                            | F                    | 04 - 20                                 |              |                |                |                |                |
| Ambient Temperature Operational Range       | Cooling  | F                    | 5 - 125                                 |              |                |                |                |                |
|   | Heating  | F                    | -22 - 95                                |              |                |                |                |                |
| Guaranteed Load Capacity Range              |  | %                    | 20 - 100                                |              |                |                |                |                |

\*Lower LWT down to 66°F available upon special configuration.

- Due to our policy innovations some specification may be changed without prior notification.
- AHRI 550-590 Cooling Capacity Conditions: 95F Ambient Air, 54°F EWT and 44°F LWT.
- AHRI 550-590 Medium Temp 120°F LWT Heating Capacity Test Condition.
- Sound Power Tested per ANSI/AHRI Standard 370-2015 (Based on individual systems)
- Sound Pressure Values provided based on Q=2 180 degree profile:  $L_p = L_w - 10 \log [Q / (4\pi r^2)]$

6. The ACHH\*\*\*VBAB models are certified by AHRI to AHRI Standard 550-590.

7. For the latest version of Certified LATS ISC Selection Software go to, [www.ahridirectory.org](http://www.ahridirectory.org)

8. Heating Performance Tested per the AHRI 550-590 procedure. Heating Performance is not in certification scope of AHRI 550-590.

9. This product contains (R410A, GWP: 2087.5t-CO2 eq = F-gas (kg) x GWP / 1000)

# INVERTER SCROLL HEAT PUMP CHILLER

## R-410A 460V



| Inverter Scroll Heat Pump Chiller           |  | Unit                 | ACHH017HBAB                             | ACHH020HBAB  | ACHH033HBAB  | ACHH040HBAB  | ACHH050HBAB  | ACHH060HBAB  |
|---|--|----------------------|---|--------------|--------------|--------------|--------------|--------------|
| Power                                       |  | Phase, Lines, V, Hz  | 3, 3, 460, 60                           |              |              |              |              |              |
| Capacity                                    | Cooling  | RT                   | 16.2                                    | 18.5         | 32.4         | 37.0         | 48.7         | 55.5         |
|   |  | kBtuh/h              | 194                                     | 222          | 389          | 444          | 584          | 666          |
| Input Power                                 | Heating  | MBH                  | 214.3                                   | 250.0        | 428.6        | 500.0        | 643.0        | 750.1        |
|   |  | kW                   | 18.0                                    | 21.5         | 36.2         | 43.0         | 54.3         | 64.5         |
| Efficiency                                  | Cooling  | EER (btuh/W)         | 10.75                                   | 10.33        | 10.75        | 10.33        | 10.75        | 10.33        |
|   | Heating (120°F LWT, 15 Δ, 47 F)                | COP (W/W)            | 3.26                                    | 3.21         | 3.26         | 3.21         | 3.26         | 3.21         |
| AHRI 550-590 Cooling Performance and Rating |  | IPLV (btuh/W)        | 19.46                                   |              |              |              |              |              |
| Sound Power                                 | Cooling  | dB(A)                | 78                                      | 83           | 86           | 87           | 87           | 88           |
| Sound Pressure 30'                          | Cooling  | dB(A)                | 49                                      | 51           | 52           | 54           | 54           | 56           |
| Sound Pressure 5'                           | Cooling  | dB(A)                | 69                                      | 71           | 72           | 74           | 70           | 76           |
| Sound Power                                 | Heating  | dB(A)                | 83                                      | 83           | 86           | 87           | 88           | 88           |
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| Sound Pressure 5'                           | Heating  | dB(A)                | 69                                      | 71           | 72           | 74           | 74           | 76           |
| Compressors                                 | Type: Inverter Scroll                          | EA                   | 2                                       | 2            | 4            | 4            | 6            | 6            |
|   | PVE Oil Charge Each                            | OZ/EA                | 33.8                                    |              |              |              |              |              |
| Refrigerant                                 | Type   |                      | 410A                                    |              |              |              |              |              |
|   | Amount of Charge EA Circuit                    | lbs/EA               | (10.4 x 2)                              | (10.4 x 2)   | (10.4 X4)    | (10.4 x 4)   | (10.4 x 6)   | (10.4 x 6)   |
|   | Metering                                       |                      | 2000 Step Electronic Expansion Valve    |              |              |              |              |              |
| Condenser Coils                             | Coated Aluminum Fin and Tube                   | 10,000 HRS ASTMB-117 | 2                                       | 2            | 4            | 4            | 6            | 6            |
|   | Type: Stainless Braze Plate                    | EA                   | 1                                       | 1            | 2            | 2            | 3            | 3            |
|   | Pressure Drop                                  | ftAg                 | 6.23/4.52                               | 7.15/5.31    | 6.23/4.52    | 7.15/5.31    | 6.23/4.52    | 7.15/5.31    |
| Evaporator                                  | Operating Maximum Pressure (Refrigerant/Water) | psi                  | 597/142                                 |              |              |              |              |              |
|   | Refrigerant Volume (EA)                        | ft <sup>3</sup>      | 2 x (.18)                               | 2 x (.18)    | 4 x (.18)    | 4 x (.18)    | 6 x (.18)    | 6 x (.18)    |
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|   | Inlet/Outlet Water Connection                  | inches/flange        | 2"/150 lb                               | 2"/150lb     | 2 1/2"/150lb | 2 1/2"/150lb | 2 1/2"/150lb | 2 1/2"/150lb |
|   | Total System Water Volume                      | GL                   | 2.68                                    | 2.68         | 7.91         | 7.91         | 14.48        | 14.48        |
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|   | No. of Blades per Fan                          | EA                   | 6                                       |              |              |              |              |              |
|   | Air Flow Rate                                  | CFM                  | 8684                                    |              |              |              |              |              |
| Weight                                      | Motor Power                                    | W                    | 900                                     |              |              |              |              |              |
|   |  | lbs                  | 1162                                    | 1162         | 2218         | 2218         | 3208         | 3208         |
| Dimensions                                  | Width  | inches               | 30-1/8                                  | 30-1/8       | 60-5/8       | 60-5/8       | 90-13/16     | 90-13/16     |
|   | Height   | inches               | 86-5/8                                  |              |              |              |              |              |
|   | Depth  | inches               | 84-13/16                                |              |              |              |              |              |
| Foot Print                                  |  | ft2/RT               | 1.09                                    | 0.96         | 1.09         | 0.96         | 1.09         | 0.96         |
| Exterior Panel                              |  | Epoxy Powder Coat    | Rated at 450 HRS per ASTMB-117          |              |              |              |              |              |
| Remote Monitoring and Control               |  | Type                 | Optional BACnet Gateway                 |              |              |              |              |              |
| Protection Devices                          | High/Low Pressure                              | Electronic           | Internal                                |              |              |              |              |              |
|   | Flow Switch                                    | Paddle/ADJ.          | Internal                                |              |              |              |              |              |
|   | Freeze Protection                              | On/Off Contact Only  | Heat Trace Elements and Power by Others |              |              |              |              |              |
| Supply Water Temperature Range              | Cooling  | F                    | 14 - 68                                 |              |              |              |              |              |
|   | Heating  | F                    | 86 - 140*                               |              |              |              |              |              |
| Approved Water Delta T                      | Cooling and Heating                            | F                    | 04 - 20                                 |              |              |              |              |              |
| Ambient Temperature Operational Range       | Cooling  | F                    | 5 - 125                                 |              |              |              |              |              |
|   | Heating  | F                    | -22 - 95                                |              |              |              |              |              |
| Guaranteed Load Capacity Range              |  | %                    | 20 - 100                                |              |              |              |              |              |

\*Lower LWT down to 66°F available upon special configuration.

1. Due to our policy innovations some specification may be changed without prior notification.

2. AHRI 550-590 Cooling Capacity Conditions: 95F Ambient Air, 54°F EWT and 44°F LWT.

3. AHRI 550-590 Medium Temp 120°F LWT Heating Capacity Test Condition.

4. Sound Power Tested per ANSI/AHRI Standard 370-2015 (Based on individual systems)

5. Sound Pressure Values provided based on Q=2180 degree profile:  $L_p = L_w - 10 \log [Q / (4\pi r^2)]$

6. The ACHH\*\*\*HBAB models are certified by AHRI to AHRI Standard 550-590.

7. For the latest version of Certified LAITS ISC Selection Software go to, [www.ahridirectory.org](http://www.ahridirectory.org)

8. Heating Performance Tested per the AHRI 550-590 procedure. Heating Performance is not in certification scope of AHRI 550-590.

9. This product contains (R410A, GWP: 2087.5t-CO2 eq = F-gas (kg) x GWP / 1000)

# INVERTER COMPRESSOR TECHNOLOGY

As the core technology of the Inverter Scroll Heat Pump Chiller, the inverter compressor of Multi V™ 5 boasts efficiency and durability, designed based on the unique technology and innovation of LG Air Conditioning Technologies.



## Convenience

- Low vibration and noise level
- Silent operation function setting
- 5 inch HMI touch controller with various functions
- Compact size



## Reliability & Stability

- Continuous heating minimizes the decrease of water outlet temperature during defrosting for multi circuit model
- If one compressor or one cycle needs to be troubleshooted or repaired, backup operation helps whole cycle to operate continuously
- Quick maintenance using black box function
- Prevent compressor damage due to excessively compressed refrigerant, more efficiently than 4 by-pass valves
- Corrosion resistance 'Black Fin'
- PEEK (Polyetheretherketone) bearing design increases operation range and durability

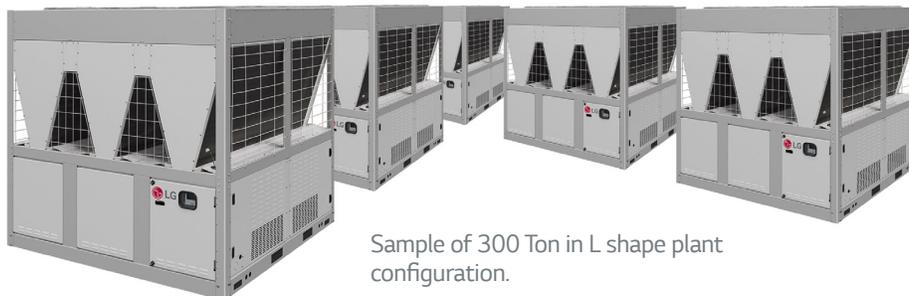


## High Efficient Inverter Technologies

- Fully driven Inverter Scroll Compressor
- Vapor Injection with wide operating range via two-stage compression
- Wide Operation Range from 30 to 120 Hz with improved part load efficiency at all operation ranges
- Compressor efficiency is increased through HiPOR™ application by recovering oil to the compressor directly

## Compact Size Offers Flexible Installation

The modular design of LG Inverter Heat Pump Chillers enables customized assembly based on project requirements, providing engineers with a cost-effective and properly sized solution that overcomes the limitations of fixed-capacity, fixed-frame chillers.



Sample of 300 Ton in L shape plant configuration.

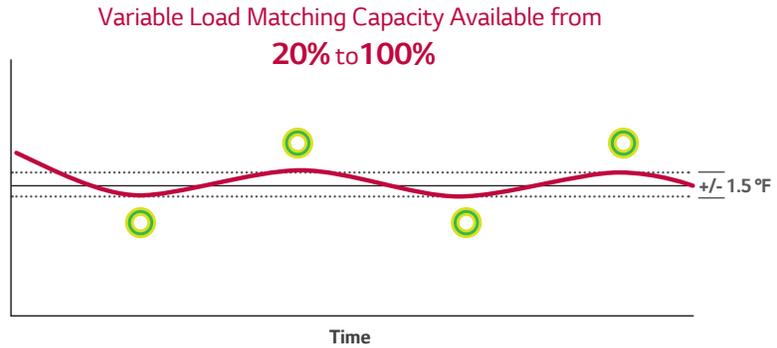
# High Energy Efficiency Critical Load Operation

LG inverter scroll compressors with Multi V™ technologies improve energy efficiency with 20% - 100% variable capacity available to match the load and eliminate leaving water temperature hunting, providing a 1.5°F degree hysteresis above and below the desired leaving water temperature setpoint.

## LG Variable Inverter Scroll Compressor Design



Leaving Water Temperature Setpoint  
 Continuous On

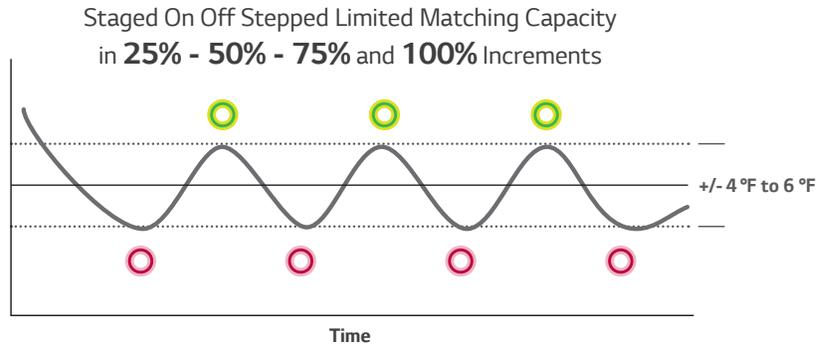


Staged On-Off Capacity Design Systems are often built to match the test procedure of 25% incremental steps, with capacity performance of 25% - 50% - 75% and 100%. Compared to LG's Variable Capacity Design, Staged Designed Systems will over-cool or lag to provide needed capacity, providing a broader variance to the desired Leaving Water Temperature as the load on the chiller increases or decreases.

## Typical Staged Compressor System Design

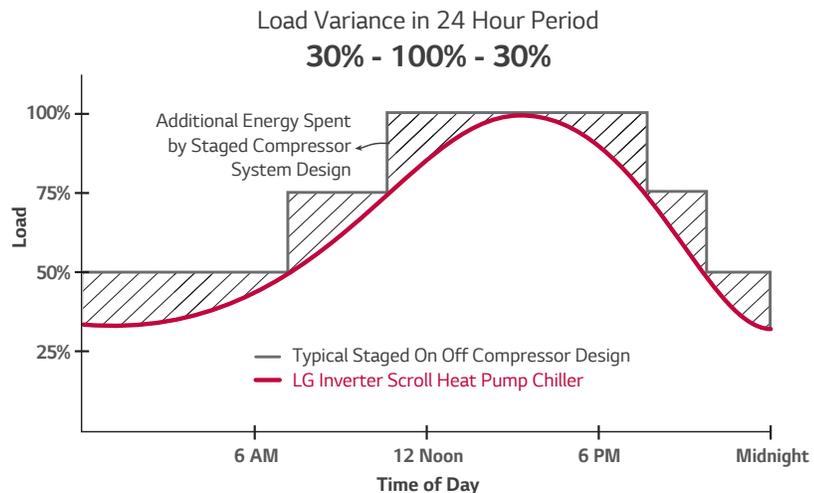


Leaving Water Temperature Setpoint  
 Off On



## The LG Advantage

The LG Inverter Scroll Heat Pump Chiller adapts to fluctuating daily cooling and heating needs, surpassing the efficiency of the staged compressor system design. While staged chillers can use bypass circuits to moderate the leaving water temperature, they still consume power in fixed 25% to 100% increments. LG's system adjusts the compression cycle capacity to the actual load, cutting out the inefficiency of staged operation and reducing energy consumption.





## LG Electronics USA, Inc.

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