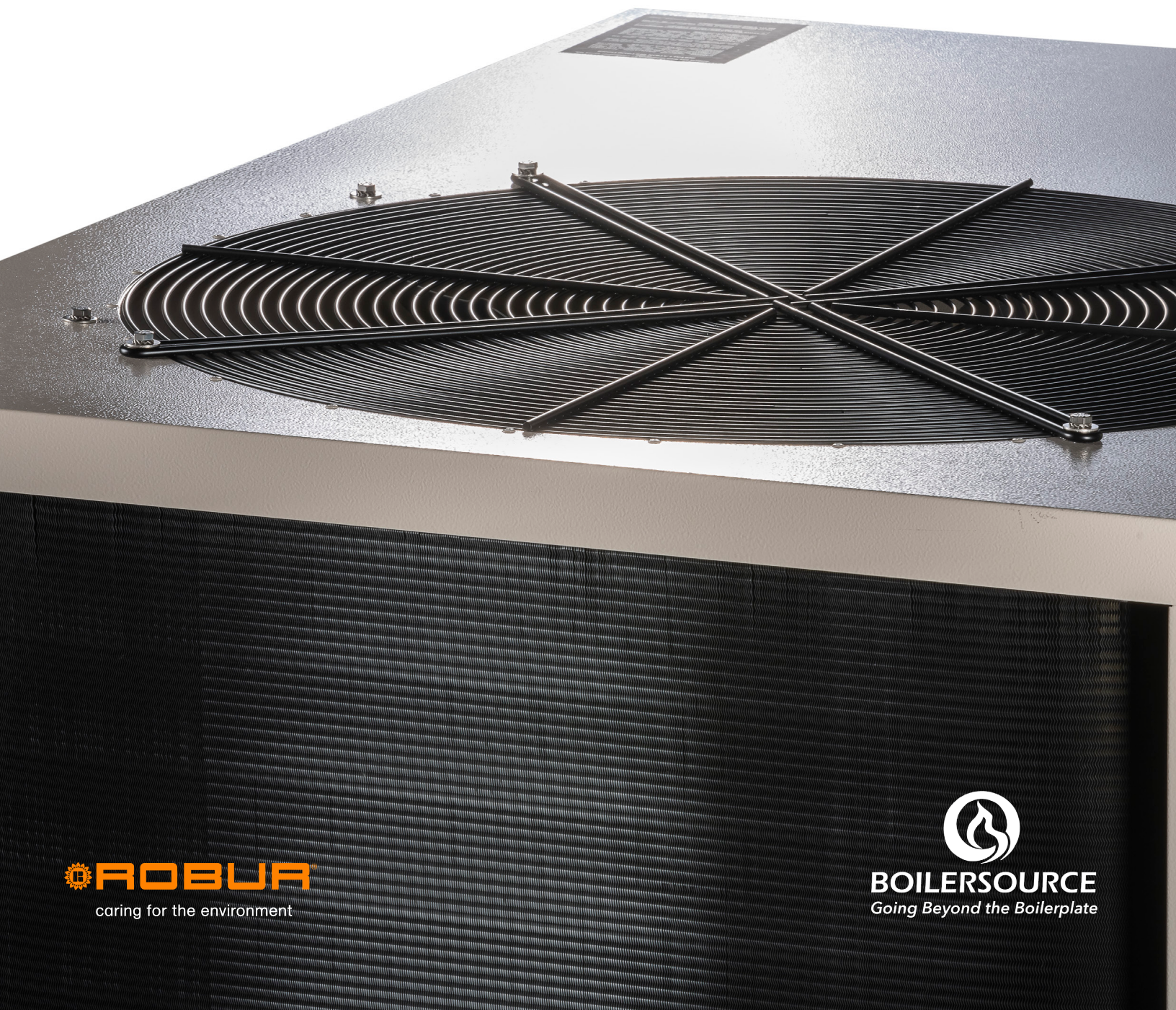


Gas Fired Absorption Heat Pumps

Main advantages



GAHP units combine all the advantages of the two most common heating technologies.

The Robur Gas Absorption Heat Pumps utilize natural gas as the primary energy source supplying hot water up to 140 °F. Suitable for heating systems where the most efficient gas appliance is required with gas efficiencies at rated conditions of 129%. These units are ideal for full load heating needs or for raising the average efficiency of a traditional boiler system.



Condensing boiler advantages

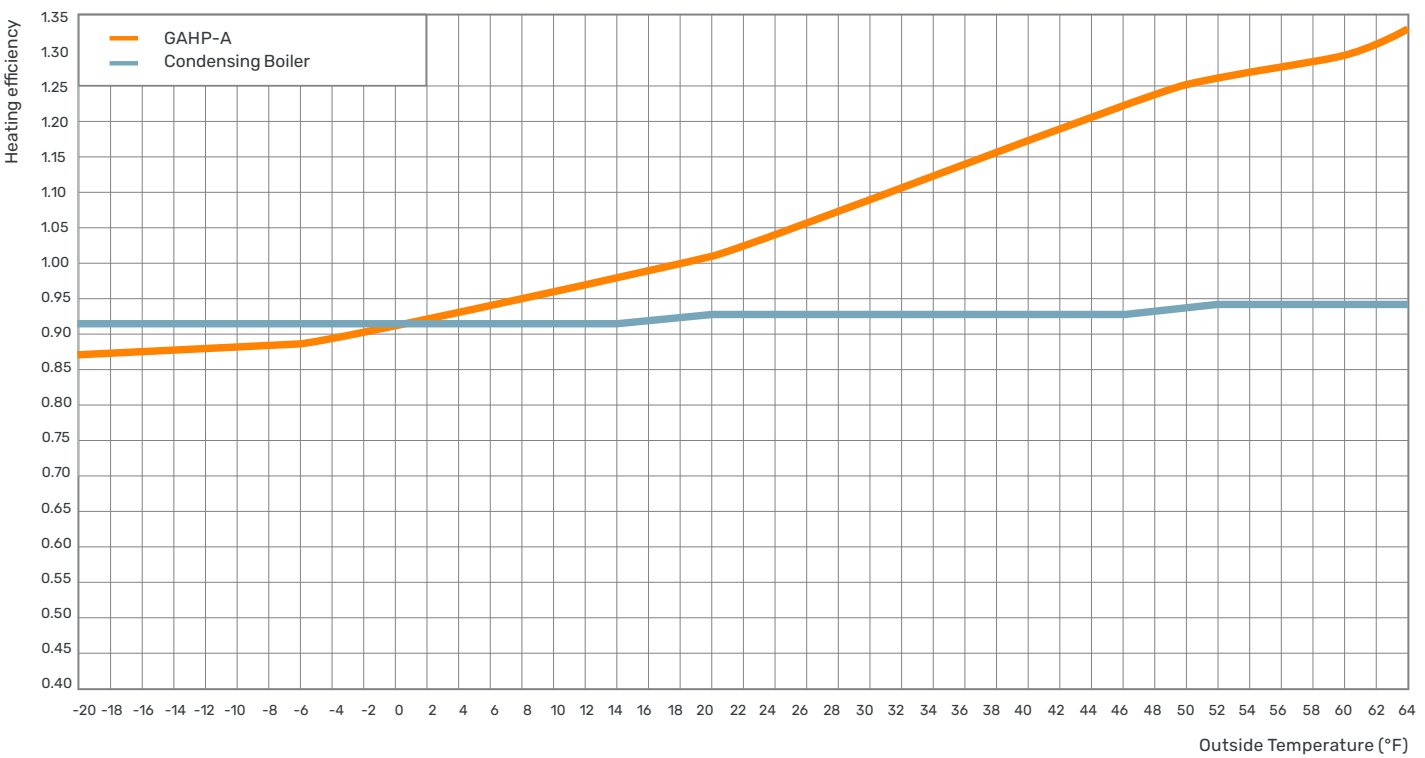
- Environmentally friendly using natural gas
- DHW supply
- Only 1/10 of electricity consumption in comparison to electrical heat pumps
- Ideal integration into existing or new installations
- High Reliability
- Easy Maintenance
- No use of Harmful Refrigerants

Electric heat pump advantages

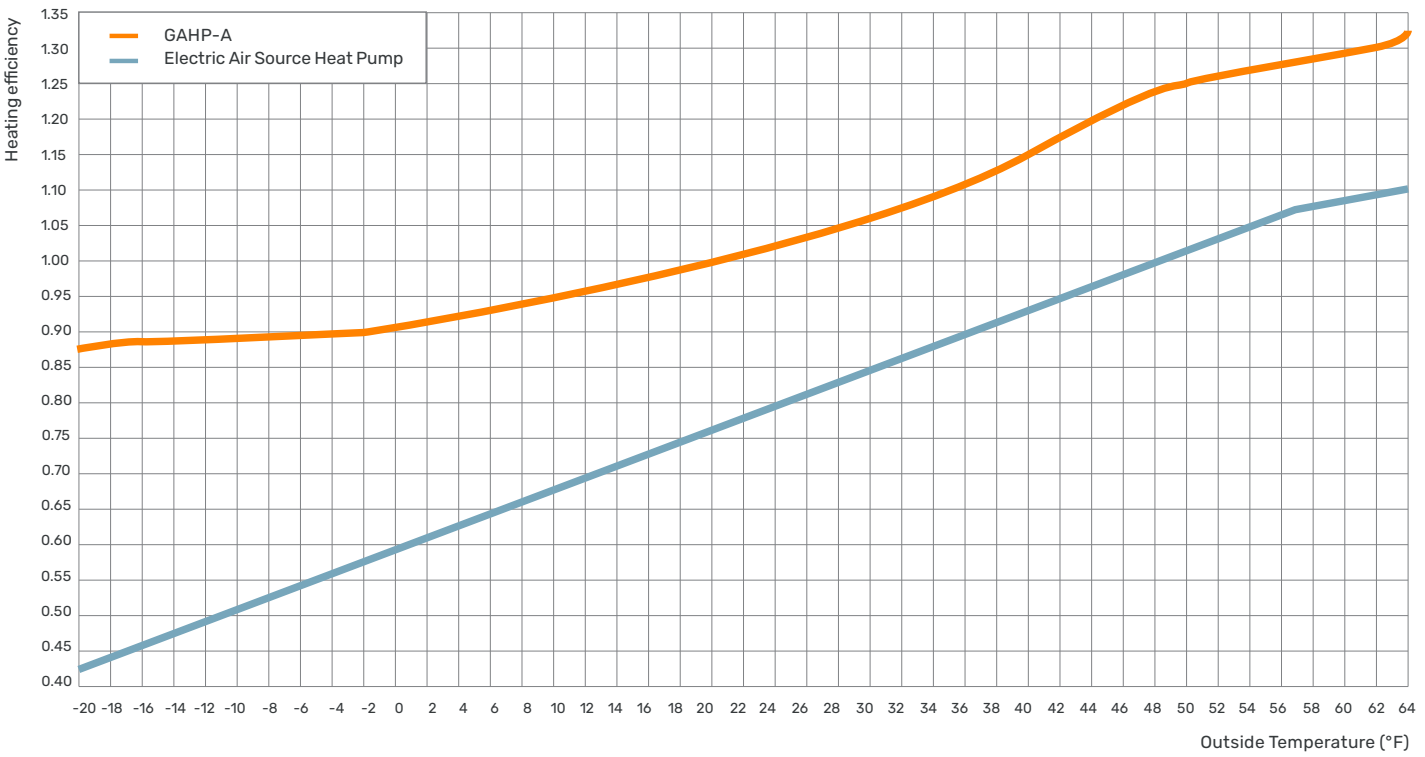
- Use of renewable energies
- Cooling supply
- No need of mechanical room

Advantages in using Robur GAHP

Compared to Condensing boiler system the Robur units can increase overall average building heating efficiencies by approximately 40%.



Compared to High Efficiency electric heat pumps the Robur units can increase overall average building heating efficiencies by approximately 35% while also reducing Electrical Energy usage by as much as 80%.

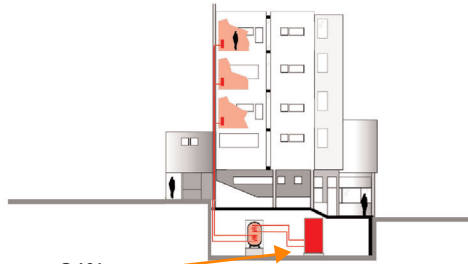


Retrofit application

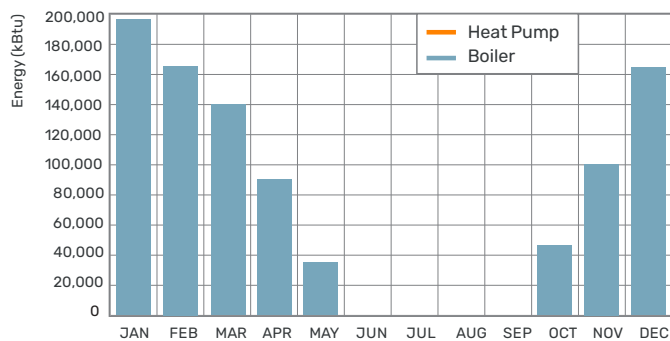
Boston, MA - Design Temperature: 7 °F - Building Load: 400,000 Btu/h - Design water temperature: 167 °F

Boiler only

Seasonal System Efficiency: 86%
No outdoor reset curve

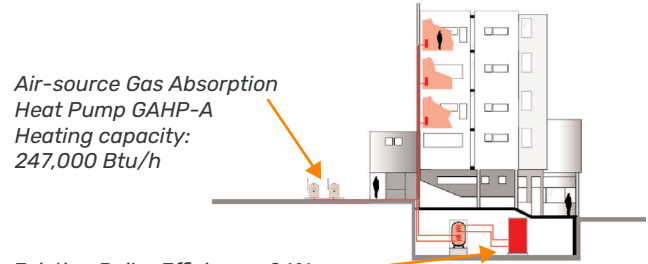


Existing Boiler Efficiency: 86%
Existing Boiler Capacity: 400,000 Btu/h



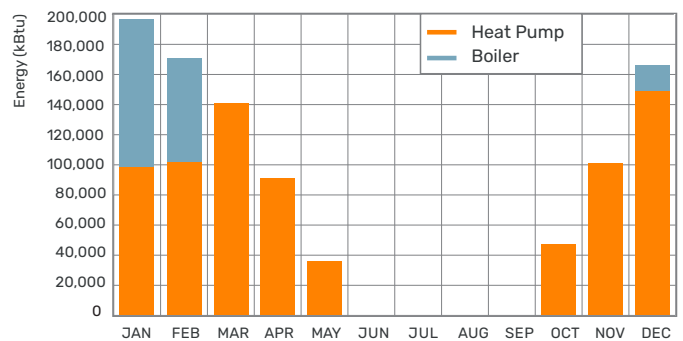
Boiler + Heat Pumps

Seasonal System Efficiency: 113%
Outdoor reset curve



Existing Boiler Efficiency: 86%
Existing Boiler Capacity: 400,000 Btu/h

+31%

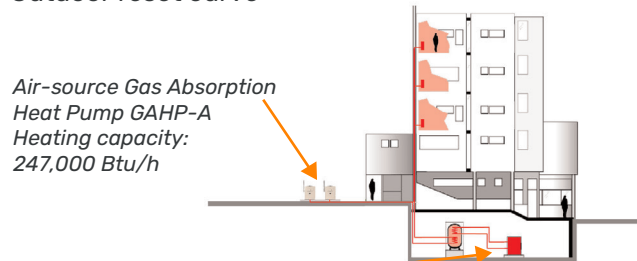


New application

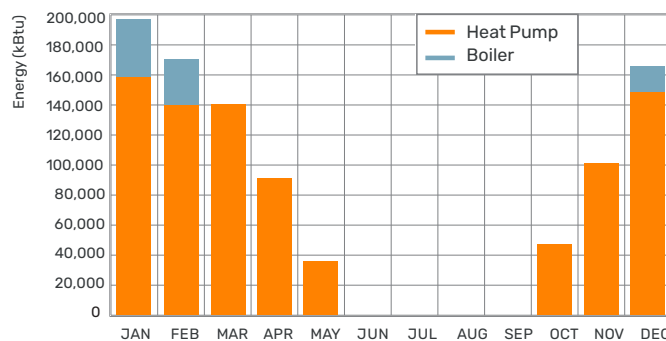
Boston, MA - Design Temperature: 7 °F - Building Load: 400,000 Btu/h - Design water temperature: 140 °F

Boiler + Heat Pumps

Seasonal System Efficiency: 121%
Outdoor reset curve



New Boiler Efficiency: 93%
New Boiler Capacity: 220,000 Btu/h



Don't reinvent the wheel



Robur GAHP's...

Installs like an outdoor boiler

Typical Hydronic System

Multiple Zones

Outdoor Installations

Does not need to be in the mechanical room

Heat Emitter Flexibility

Component Flexibility

Target Applications



- Limited Electrical Capacity
- Multi-Family
- Assisted Living
- Student Housing / Dormitories
- Senior Living
- Healthcare Facilities

- Education
- Hospitality
- Restaurants
- Retail
- Data Center
- Mission Critical

- Satellite Buildings
- Grow Rooms
- Office Buildings
- Churches
- Historical Buildings
- Custom Residential

Target DHW Applications

Multi-Family

- Low to Mid-rise

- Apartments
- Condominiums
- Mixed-Use
- Senior Housing
- Student Housing
- Affordable Housing
- Subsidized Housing

Hospitality

- Restaurants
- Hotels

Grocery Stores





Ideal Sites for Gas Heat Pumps

Look for lower water temperature applications like:

- Domestic Hot Water Preheating
- Radiant In-floor Building Comfort Heating
- Air Systems using Hot Water and/or Chilled Water
 - If hot water requirement is above 148°F may need supplemental heating from a boiler
- Snow Melting
- Pool Heating
- Any other heating application that requires 140°F or lower

Look for:

Sites that have limited electrical power

Centralized gas meter (Master Meter)

Centralized building comfort heating or domestic water heating

Good location and adequate space for the equipment:

- Air Source: Outdoor location (ground level or roof top)
- Water Source: Indoor but must be vented
 - Use a fluid cooler for air source or geothermal
- Tandem or Hybrid systems are the key
- Remember, with outdoor reset lower temps are needed during the shoulder months

Poor Sites for Gas Heat Pumps

- High water temperatures above 148°F requirements without outdoor reset, are not the best option
- Not applicable to DIRECT steam systems, only water
 - Look for Domestic Hot Water Preheating or other loads
- Don't forget about derating at lower ambient temperatures (see COP vs Outdoor Air Temp Chart)
- Be aware of the venting requirements of the units and do not locate near operable windows
Follow NFGC venting guidelines
- Avoid buildings with individual unit gas meters
- Avoid buildings with individual unit heating or domestic water heating systems

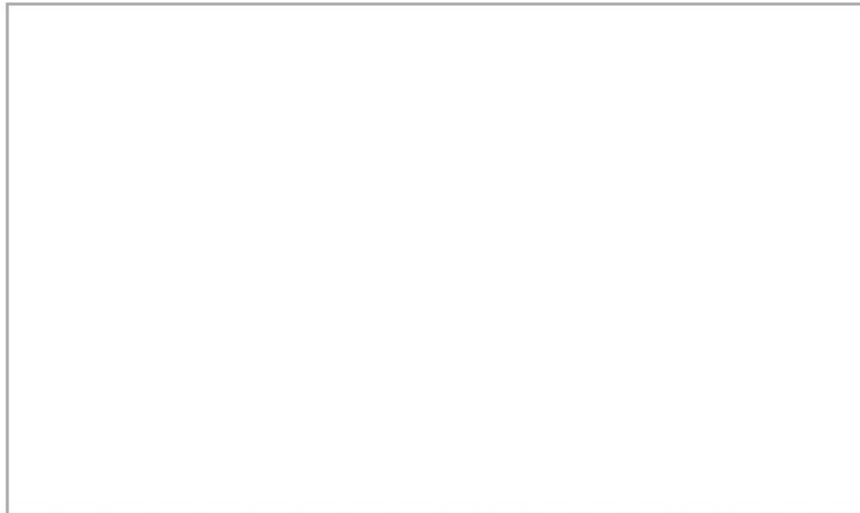


BOILERSOURCE

Going Beyond the Boilerplate



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caring for the environment

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