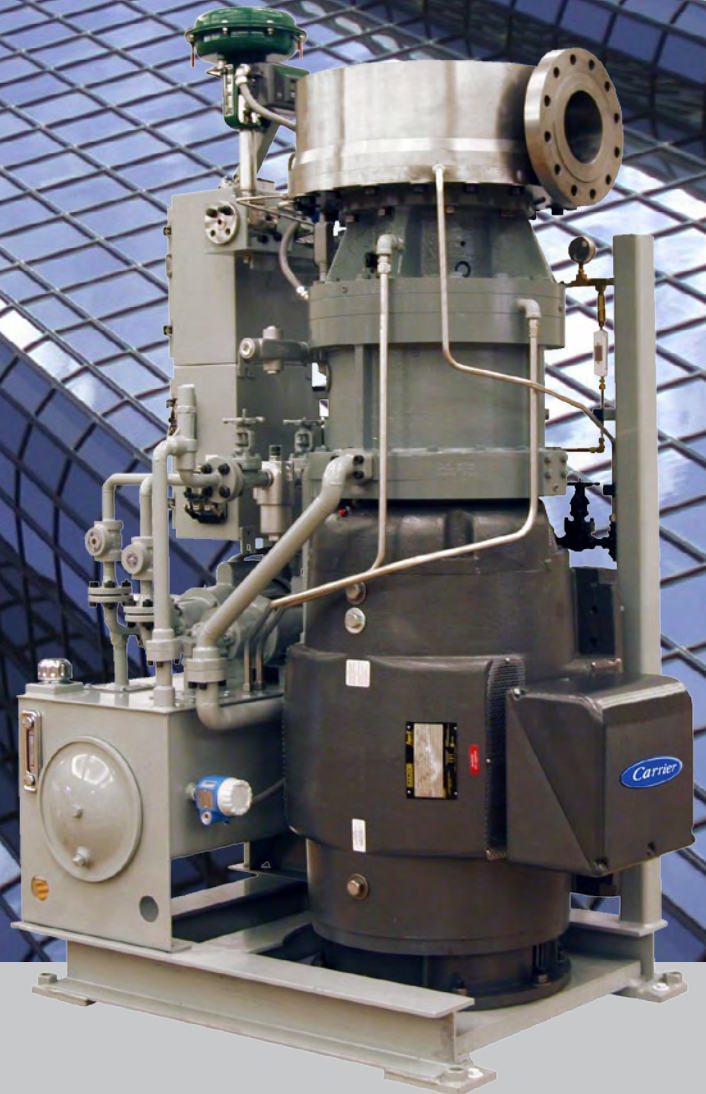


Microsteam® Power System  
Distributed Power Generation



Turn to the Experts.™





# Microsteam® Power System

## Generate Electricity from Waste Steam Energy



Buildings that have boilers or steam service with pressure reducing valves (PRVs) now have the potential to generate their own electric power with the innovative technology of the Microsteam power system by Carrier.

The operating principle of the Microsteam power system is simple – pressure energy normally dissipated by reducing steam pressure through a PRV is instead converted to power by channeling that steam through a patented radial outflow turbine. The Microsteam turbine then generates electricity that can be used in the building reducing the need to buy power.

### Environmentally Responsible Technology

The Microsteam power system represents a significant opportunity to optimize an existing energy resource, increase energy efficiency and take an important step towards creating a sustainable future.

- Zero-emissions power, officially acknowledged by the California Air Resources Board through DG-017 certification
- Helps obtain Leadership in Energy and Environmental Design (LEED®) points for city buildings by reducing up to 275 kW of the electricity demand from the utility company
- No pollution or contaminants emitted
- Reduced carbon footprint
- Qualifies for federal stimulus funds and regional efficiency technology subsidies

### Pioneering Power System

The Microsteam power system by Carrier is a compact, self contained turbine system designed to generate electric power from available steam. Rather than dissipating excess through a PRV, that steam can be channeled through the Microsteam power system, generating electricity to power a facility, run chillers, and more, offsetting peak electric demand and reducing the risk of demand charges. The key component to the system is based on the patented radial outflow turbine with its highly efficient design.

### The Microsteam Turbine Offers:

- 80 percent energy efficiency for maximum productivity with minimum operating cost
- Quick return on investment
- Remote monitoring capabilities
- Rugged titanium alloy construction for durability
- Titanium rotor can process even poor quality steam

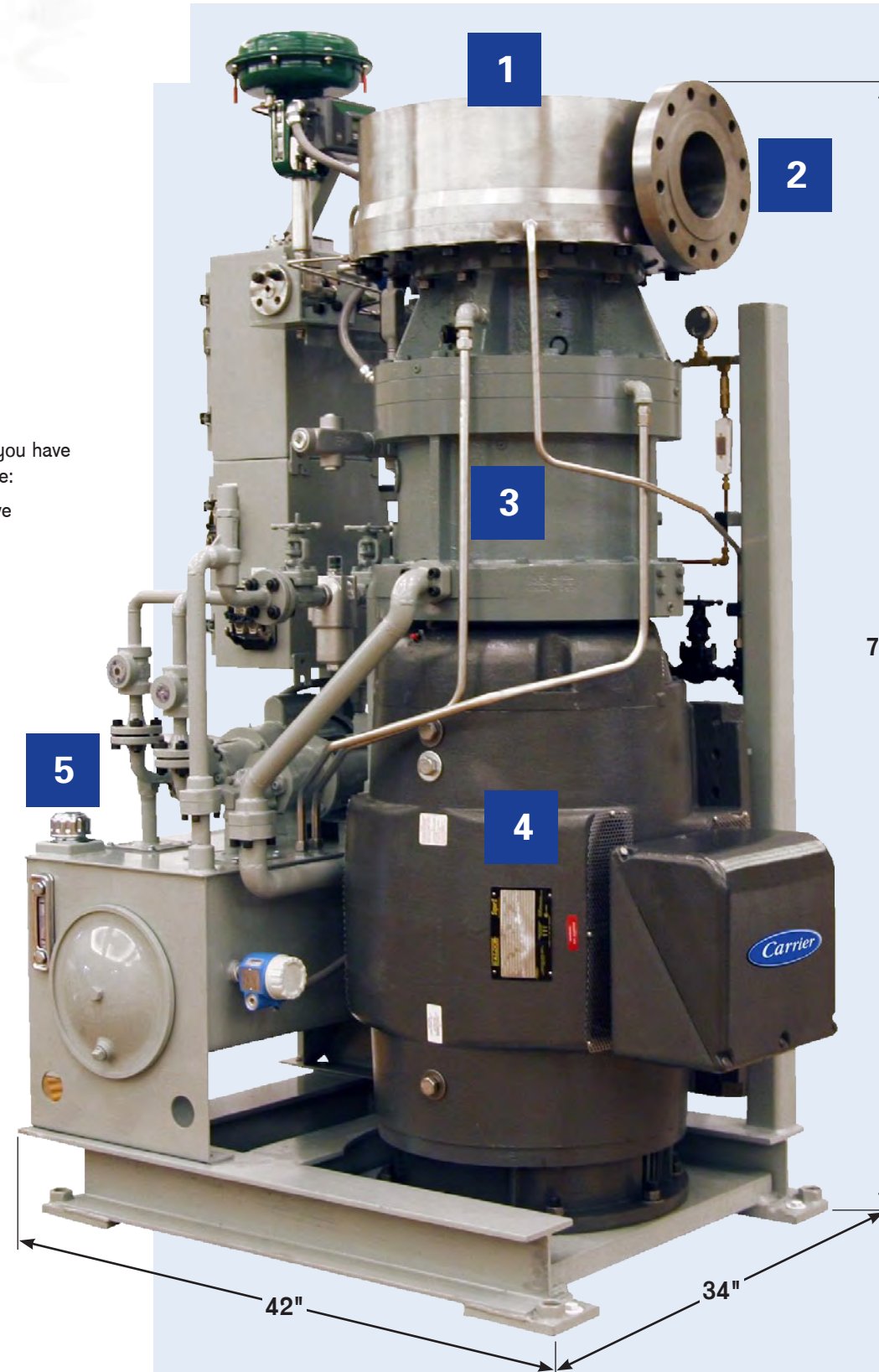
### Is Your Facility Microsteam Turbine Ready?

Your facility can profit from a Microsteam power system if you have one or more of the following steam energy sources available:

- Pressure reduction station of 4" pipe diameter and above
- Boiler plants over 300 BHP
- District steam
- Cogen exhaust
- Low pressure absorption cooling over 300 Tons
- Domestic hot water preset
- Electric chiller fuel switch
- Turbine cooling replacement

### Steam Energy Sources Are Typically Found In These Facilities:

- Chemical industry
- Colleges and universities
- Food processing plants
- Hotels
- Hospitals
- Petrochemical industry
- Pulp and paper industry
- Pharmaceutical industry
- Manufacturing facilities
- Commercial and office towers
- Biomass
- Cogeneration
- Solar plants

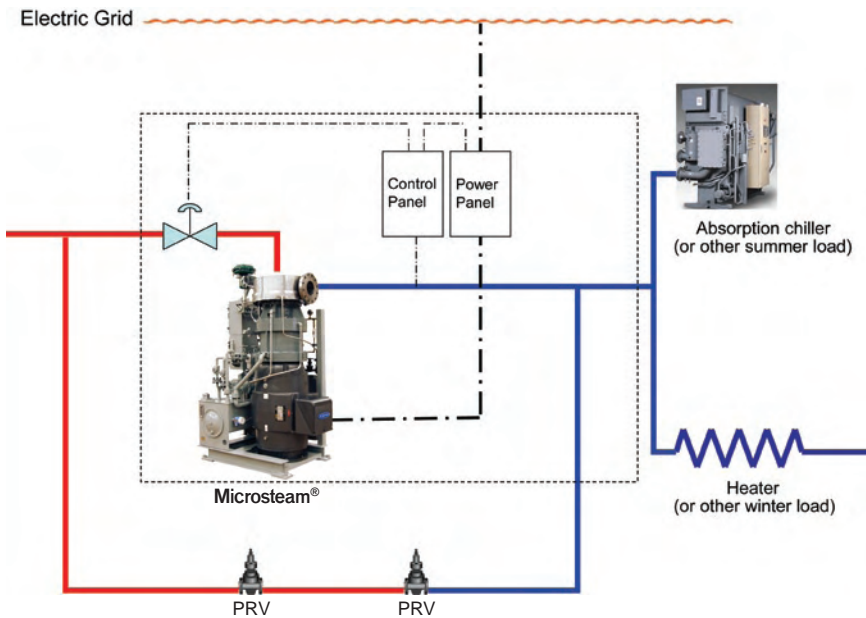


### Advantages of the Microsteam power system

- **High Turbine Efficiency:** Levels measured greater than 80 percent in testing at the United Technologies Research Laboratory
- **Reliable, Resistant to Corrosion and Erosion:** Titanium alloy construction designed to clear particulates or contamination found in poor quality steam
- **Compact Design:** 34" wide x 42" long x 78" high allows easy access through standard doors
- **Simple Installation:** All instrumentation wiring and skid ancillary power connections are pre-wired and pre-tested at the factory. Once in position, installation consists of steam, power and plant utility connections
- **Simple Operation:** Single button startup and shutdown, unattended operation with automatic electrical synchronization and safety controls
- **Easy to Use Control Panel:** Separable from steam equipment with prefabricated quick-connect cables
- **Carrier Installation and Service:** Quality and reliability

- 1 Steam inlet
- 2 Steam outlet
- 3 Epicyclic gear
- 4 Generator
- 5 Lube oil pump

# Microsteam® Power System Configuration



With a turbine efficiency of approximate 80 percent, the Microsteam power system can efficiently generate up to 275 kWe. For installations with a major amount of steam available, multiple units can be installed and the potential can become MWs of energy to be produced.

## Product Features

## Specifications

High efficiency radial outflow turbine	80% at pressure ratio 2.5:1 / 70% at pressure ratio 5:1
Erosion resistant alloy construction tolerant of poor quality steam	Titanium alloy rotor
High efficiency epicyclic gearbox	97% at 300 kW shaft
High efficiency induction generator	96% at 275 kWe
Quiet operation	85 dBA untreated acoustically
Programmable logic controller (PLC) control system with color panel display	Single button startup / automatic synchronization / unattended operation capability / hardwired safety trips
Pre-wired, factory tested instrumentations and controls	Quick connect cables / plug and play operation / minimum installation costs
Full load power output	Up to 275 kWe, 480V / 60Hz / 3ph (208V optional)
Full load heat rate	3,690 BTU/kWh
Typical inlet pressure	100 – 250 psig
Typical exhaust pressure	0 – 30 psig
Typical steam flow rate	4,000 - 20,000 lbs/hr
Long life	15-20 year design



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