01

NZTAP TECHNOLOGY
CASE STUDY/FEATURE

Panasonic

NZTAP MANUFACTURER CASE STUDY

MANUFACTURER BACKGROUND

Panasonic Corporation, formerly known as Matsushita Electric Industrial Co., Ltd., is a Japanese multinational electronics corporation headquartered in Kadoma, Osaka, Japan.
The company was founded in 1918 as a producer of lightbulb sockets and has grown to become one of the largest Japanese electronics producers. In addition to electronics, it offers non-electronic products and services.
As of March 31, 2012, Panasonic employed about 330,000 staff and had around 580 subsidiary companies.

WHAT IS IT?

An air-source heat pump can provide efficient heating and cooling for your home. When properly installed, an air-source heat pump can deliver one-and-a-half to three times more heat energy to a home than the electrical energy it consumes. This is possible because a heat pump moves heat rather than converting it from a fuel like combustion heating systems do.

Air-source heat pumps have been used for many years in nearly all parts of the United States and Canada, but until recently they have not been used in areas that experienced extended periods of subfreezing temperatures. However, in recent years, air-source heat pump technology has advanced so that it now offers a legitimate space heating alternative in colder regions.

A heat pump's refrigeration system consists of a compressor and two coils made of copper tubing (one indoors and one outside), which are surrounded by aluminum fins to aid heat transfer. In heating mode, liquid refrigerant in the outside coils extracts heat from the air and evaporates into a gas. The indoor coils release heat from the refrigerant as it condenses back into a liquid. A reversing valve, near the compressor, can change the direction of the refrigerant flow for cooling as well as for defrosting the outdoor coils in winter. The efficiency and performance of today's air-source heat pumps is a result of technical advances such as the following:

- Thermostatic expansion valves for more precise control of the refrigerant flow to the indoor coil
- Variable speed blowers, which are more efficient and can compensate for some of the adverse effects of restricted ducts, dirty filters, and dirty coils
- Improved coil design
- Improved electric motor and two-speed compressor designs
- Copper tubing, grooved inside to increase surface area.

INSTALLATION

In Ontario this is installed by the mechanical/HVAC contractor. Trade certification is not a requirement in Ontario, but the HRAI does provide designer qualifications, recognized by the municipalities.

- **Step 1 Installing indoor units:** or a ductless system, the contractor will locate an unobstructed place on the wall inside the zone to place the unit. A mounting plate will be installed to hold up the indoor unit, and then secure the indoor unit to it. For a ducted system, the indoor unit will also be connected to the ductwork (whether in the attic, basement, or elsewhere). If there is no existing ductwork in the home, installing ductwork to circulate the air will be one of the first steps to be completed.
- **Step 2 Create an access point in wall for connection:** The installer will drill a hole in the wall to run piping and lines. This will provide an outlet for the refrigerant lines, electrical lines, as well as a condensate drain line that will transport water from the indoor unit to the outside. In a ducted system, the access point is where the indoor air handler is going to be located inside the home (most often in an attic or basement).
- **Step 3 Connect the pipes to the indoor unit:** Next, the refrigerant line and the condensate line are connected to the indoor units.
- **Step 4 Install outdoor unit:** For larger (packaged or central systems), installers will typically put a concrete slab on the ground to hold the outdoor condenser. If this is a mini split system, or an air source heat pump with a smaller system, it will often be mounted to the side of the home. This mount will typically be lifted above the ground, especially in colder areas where the installer will ideally mount the system above possible snowlines.
- **Step 5 Connect wiring and electricity:** After the indoor and outdoor unit are installed, the installer will connect them through the refrigerant line and electrical wires. Installers will insulate these lines and run them through the conduits on the side of the home to protect the wiring. A drain line will be installed on the outside of the home to bring condensation from the unit away from the inside of the home.
- **Step 6: Finishing touches**

STANDARDS & CERTIFICATIONS

All products meets all applicable Canadian standards.

CONTACT?

Do we want to provide contact info here

BENEFITS AND COSTS

A typical system would be $6,000 to $9,000 depending on the size. A 9 zone system might be around $12,000.

Single zone heat pump benefits:

- Eliminate natural gas connection and monthly delivery charge
- No change to the ductwork as compared to the traditional system
- Smart home ready: Easily connects with Schneider controls and sensors
- Outdoor unit up to 58,500 Btu's
- Efficiency (SEER 16) (HSPF 8.6)
- Zero-combustion system or, add Panasonic Solar PV and a battery bank system to obtain net-zero

Net-Zero Multi-Zone heat pump benefits:

- Use Panasonic Li-on Battery and solar photovoltaics
- HVAC uses the same outdoor unit as a single-zone VRF
- Provides the same benefits as a single-zone VRF in addition to:
  - Control the temperature of each zone separately; increasing comfort and system efficiency
- Minimize ductwork that does not penetrate floors
- Indoor units vary in size depending on requirements (7,000Btu - 58,500Btu) Mid-static Ducted units.