

# HVAC Technology

Department of State

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Building Operations

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# Minimizing HVAC Issues After Move In

- **Custom design** HVAC system for building type, size and geographic location.
  - Proper sizing and installation of equipment is critical to achieve optimal performance.
- **Building Automation Systems** - provide increased occupant comfort, greater flexibility and optimized control of heating, ventilation and air conditioning systems
- **Innovative Features:**
  - **High-Pressure Switch** – extends the life of the unit by providing a safeguard against excessive pressure.
  - **Low-Pressure Switch** – extends the life of the compressor by safeguarding against loss-of-charge.
  - **High-Capacity Liquid Line Filter/Drier** – extends the life of the unit by trapping moisture and dirt that could contaminate the system.
  - **Selective Zoning using flex dampeners** – Flex dampeners are powered by air with no bulky motors present (they inflate and deflate quickly).
- **Two-Stage Scroll Compressor** – operates on low stage most of the time for quieter, more consistent comfort and better humidity control.
- **Crankcase Heater** – protects the compressor against refrigerant migration that can occur during low ambient operations.

# Maintaining Security

- **Biological Agent Protection Systems** protect against bio-terrorism attacks (Case: Pentagon installed Novatron Bioprotector™ Air Sterilization System)
  - effectively kills anthrax, bacteria, viruses, and mold
- **New detection technology** is under development for ultra sensitive detection of chemical and biological agents
- **Wireless Building Automation Systems** – ensures network integrity by creating multiple redundant paths of communication; the network cannot be compromised because the signal is automatically able to circumvent obstructions and find its target; a mesh topology field level network is inherently self-forming and self-healing, so users won't have to worry about losing communication with control devices across the building automation system.
- **Computer controlled/access heating and cooling** – provides instant access and control of HVAC system from a desk top or laptop computer.

# Being Environmentally Responsible

- **Legislation** – Energy Policy Act of 2005 – will affect the design of new equipment by 2009.
- **Dedicated Outside Air Systems** – lowers energy consumption in many geographic locations, excels at humidity control, eradicates microbial problems and related sick-building issues.
- **Air sterilization, purification and treatment systems** – use for hospitals, operating rooms, isolation rooms, pharmaceutical and other manufacturing clean rooms; and use to improve indoor air quality.
- **Building Automation Systems software** – use for adherence to regulatory requirements.
- **Environmentally friendly refrigerants**, for example - R-410A Refrigerant – engineered with the new, EPA-recognized, chlorine-free refrigerant. Provides exceptional comfort without exacting a costly environmental toll.
- **Two-Stage Scroll Compressors** – less noise, operates on low stage most of the time for quieter, more consistent comfort and better humidity control.

# Monitoring Critical Infrastructure Operation and Status and Remote Troubleshooting

- **HVAC Direct Digital Control** – mechanical and electrical systems are joined with microprocessors that communicate with each other and possibly to a computer.
- **Wireless Building Automation Systems software** – use to profile energy usage, allocate utility costs, analyze HVAC performance, support sustainability programs, adhere to regulatory requirements, monitor critical environments, adhere to specified operating conditions, integrate data from multiple systems.
- **Wireless Building Automation Systems web applications** – use to graphically monitor and control the building environment, troubleshoot and tune system from remote location, export data to 3<sup>rd</sup>-party applications, manage alarm and graphics, override and command set-points and control parameters, create and override schedules, and run reports.
- **Remote Notification (RENO)** – get alarm system and event information from your mobile phone, pager, or email; provides escalation capabilities to ensure response to critical events.
- **Wireless room temperature sensors with mesh networking technology** – immune to signal interruption.